Budawang School
Biodiversity Development Assessment Report

School Infrastructure NSW

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DOCUMENT TRACKING

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Template 2.8.1

Executive Summary

Eco Logical Australia Pty Ltd (ELA) was engaged by School Infrastructure NSW (SINSW) to prepare a Biodiversity Development Assessment Report (BDAR) to support the State Significant Development (SSD) application for the construction of a new school, the Budawang School, in Milton, NSW. The development site is located within the Shoalhaven Local Government Area (LGA) and is zoned RU1 Primary Production under the Shoalhaven Local Environmental Plan (LEP) 2014.

As required for a SSD, the Planning Secretary Environmental Assessment Requirements (SEARs) have been issued (SSD-8845345, 7 September 2020), which requires the provision of a "BDAR that assesses the biodiversity impacts of the proposed development in accordance with the requirements of the *Biodiversity Conservation Act 2016*, *Biodiversity Conservation Regulation 2017*, and the Biodiversity Assessment Method (BAM)".

This BDAR has been prepared to meet the requirements of the Biodiversity Assessment Method (BAM) established under Section 6.7 of the NSW *Biodiversity Conservation Act 2016* (BC Act).

The subject land, which is made up of the development footprint and bush fire asset protection zone (APZ), is part of a former private school and consists of buildings, a soccer field, access roads and car parking. Amongst this are garden beds, which include trees and shrubs, and landscaping plantings, such as lines of trees bordering driveways and car parks. The arrangement and structure of vegetation within the overall development site suggest planting for landscaping purposes of visual amenity, shading and screening. Whilst the species of trees and shrubs are predominantly Australian natives, many are not necessarily native to the region, e.g. *Lophostemon confertus* (Brush Box – natural distribution is coast and ranges north from the Hunter Valley). In addition, there are also exotic trees and shrubs interspersed amongst the natives. For these reasons, it was determined that the BAM streamlined assessment module for planted native vegetation would be appropriate for this BDAR.

Assessments using the planted native vegetation streamlined module of the BAM are not required to assess native vegetation, identify Plant Community Types (PCT) and Threatened Ecological Communities (TEC), or determine the vegetation integrity score for native vegetation on the subject land (BAM Appendix D.1.5). Likewise, assessments using the planted native vegetation streamlined module are not required to assess the suitability of habitat for threatened species within the subject land, including identification of species requiring assessment and survey requirements (BAM Appendix D.1.5). Therefore, the BAM Calculator (BAMC) has not been applied to calculate offset requirements for this BDAR.

Under Appendix D.2, however, the BAM requires that the suitability of planted native vegetation for use by threatened species must be assessed. This includes any incidental sightings or evidence (e.g. scats) of threatened (flora and fauna) species using, inhabiting or being part of the planted native vegetation. Field surveys were undertaken within the subject land to search for threatened species and determine threatened species habitat suitability. No evidence of any existing threatened fauna species was detected during traverses of the outdoor areas of the subject land. One threatened flora species was observed, a planted *Eucalyptus scoparia* (Wallangarra White Gum). No evidence of use by threatened bats was identified within and around existing buildings.

Impact assessment found that the proposed development will have the following direct impact:

- Native vegetation – approximately 0.15 ha of planted native vegetation will be removed
- Threatened Ecological Communities (TECs) – no TECs, listed under the BC Act or the EPBC Act, have been identified for the subject land and therefore no TECs will be directly impacted by the proposed development
- Threatened species and threatened species habitat – no threatened species were identified on the subject land, apart from the planted *Eucalyptus scoparia* (Wallangarra White Gum), which is a long way from its natural range on the NSW-Queensland border. The planted native vegetation across the subject land could provide marginal foraging habitat for the *Pteropus policephalus* (Grey-headed Flying-fox) though it is unlikely to be of great importance considering the wide abundance of foraging habitat around the local area. Therefore, no threatened species, or their habitat, listed under the BC Act or the EPBC Act, will be directly impacted by the proposed development
- Prescribed biodiversity impacts – no prescribed biodiversity impacts have been identified for the subject land, therefore there will be no direct prescribed biodiversity impacts.

A likelihood of occurrence assessment was conducted for threatened species and threatened ecological communities listed as Matters of National Environmental Significance (MNES) based on the Protected Matters Search Tool Report and a BioNet Atlas search for the site. Following a detailed habitat assessment for each MNES with the potential to be affected, no MNES were considered likely to be significantly impacted by the project. Therefore, a referral to the Commonwealth is not required.

This BDAR outlines the measures taken to avoid, minimise and mitigate impacts on the vegetation and species habitat within and adjacent to the subject land and measures to minimise impacts during construction and operation of the development.

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Abbreviations

Abbreviation	Description
APZ	Asset Protection Zone
BAM	Biodiversity Assessment Method
BAMC	Biodiversity Assessment Method Credit Calculator
BC Act	NSW *Biodiversity Conservation Act 2016*
BDAR	Biodiversity Development Assessment Report
DET	NSW Department of Education and Training
DAWE	Commonwealth Department of Agriculture, Water and the Environment
DPIE	NSW Department of Planning, Infrastructure and Environment
ELA	Eco Logical Australia Pty Ltd
EP&A Act	NSW *Environmental Planning and Assessment Act 1979*
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
FM Act	NSW *Fisheries Management Act 1994*
GIS	Geographic Information System
IBRA	Interim Biogeographic Regionalisation for Australia
LEP	Local Environment Plan
LGA	Local Government Area
MNES	Matters of National Environmental Significance
NSW	New South Wales
PCT	Plant Community Type
SEARs	Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy
SINSW	School Infrastructure NSW
SSD	State Significant Development
TEC	Threatened Ecological Community
WM Act	NSW *Water Management Act 2000*

1. Stage 1: Biodiversity assessment

1.1 Introduction

This Biodiversity Development Assessment Report (BDAR) has been prepared for School Infrastructure NSW (SINSW), to support the State Significant Development (SSD) application for the construction of a new school, the Budawang School, in Milton, NSW.

As required for a SSD, the Planning Secretary Environmental Assessment Requirements (SEARs) have been issued (SSD-8845345, 7 September 2020), which requires the provision of a "BDAR that assesses the biodiversity impacts of the proposed development in accordance with the requirements of the *Biodiversity Conservation Act 2016*, *Biodiversity Conservation Regulation 2017*, and the Biodiversity Assessment Method (BAM)".

This BDAR has been prepared in accordance with the NSW Biodiversity Assessment Method (BAM; DPIE 2020a) by Bronwyn Callaghan, an Accredited Assessor (#BAAS20019) under the NSW *Biodiversity Conservation Act 2016* (BC Act).

1.1.1 General description of the development site

The development site for Budawang School is located in the Shoalhaven Local Government Area (LGA), on the southern edge of Milton at 17 Croobyar Rd (Lot 200 // DP 1192140) (**Figure 1**). The 7.7 ha site is zoned RU1 Primary Production under the Shoalhaven Local Environment Plan (LEP) 2014. The site, formerly the Shoalhaven Anglican School, was purchased by Department of Education and Training (DET) in 2018 and includes educational buildings, infrastructure and a large sports oval. As the existing facilities were considered not suitable for the needs of the proposed Budawang School will be a purpose-built facility located in the north-east section of the development site. The new school will replace the existing Budawang School, currently located in the nearby town of Ulladulla, NSW, and will involve the construction of five new buildings, outdoor play areas and parking.

1.1.2 Subject land

The "subject land" is defined by the BAM as the area to which a BDAR applies and includes all areas that will be directly and indirectly impacted by a proposed development. For the purposes of this BDAR the subject land is bound by the red polygon in **Figure 2**. This 1.44 ha area includes the proposed development footprint as well as the Asset Protection Zone (APZ). The required APZ for the proposed development footprint is detailed in the Budawang School Bush Fire Assessment report by ELA (2020). The vegetation cover currently within the APZ complies with the APZ requirements (Table 12, ELA 2020) so no vegetation removal is required for establishment of the APZ.

1.1.3 Development footprint

The development footprint for the Budawang School is located in the north-east section of the development site (**Figure 1**). The majority of this area is currently maintained as an open lawn (former soccer field) with small clusters of planted native trees. The eastern edge of the development footprint area is occupied by a former child-care centre building, outdoor play area and fences. An internal road forms the western boundary and there are further roads and parking areas in the south of the area, beyond which are the school buildings of the former Shoalhaven Anglican School. Construction of the new school will involve the removal of two existing buildings (the child-care centre and Building L) and

some of the existing gardens and landscaping (**Figure 2**). Details of which trees will be retained and which will be removed are provided in the Arborist Report (Allied Tree Consultancy 2020) for the project and can been seen in the Construction plan (**Figure 3**).

The main construction components of the Budawang School development are shown in **Figure 2** and **Figure 3**, and include:

- Five new buildings, incorporating seven Homebases, Multi-purpose Hall, Library, Staff and Administration, Hydrotherapy
- New parking and drop-off area
- New landscaping, incorporating some of the existing trees
- New pathways
- New round-about on existing entrance road.

1.1.4 Sources of information used

The following data sources were reviewed as part of this report:

- BioNet Atlas of NSW Wildlife (DPIE, 2020c)
- BioNet Vegetation Classification (DPIE, 2020d)
- Threatened Biodiversity Data Collection (DPIE, 2020e)
- EPBC Protected Matters Search Tool (DAWE, 2020a)
- National Flying-fox monitoring viewer (DAWE, 2020b)
- Biodiversity Values Map and Threshold Tool (DPIE, 2020b)
- Aerial mapping and photography
- Additional GIS datasets including soil, topography, geology and drainage.

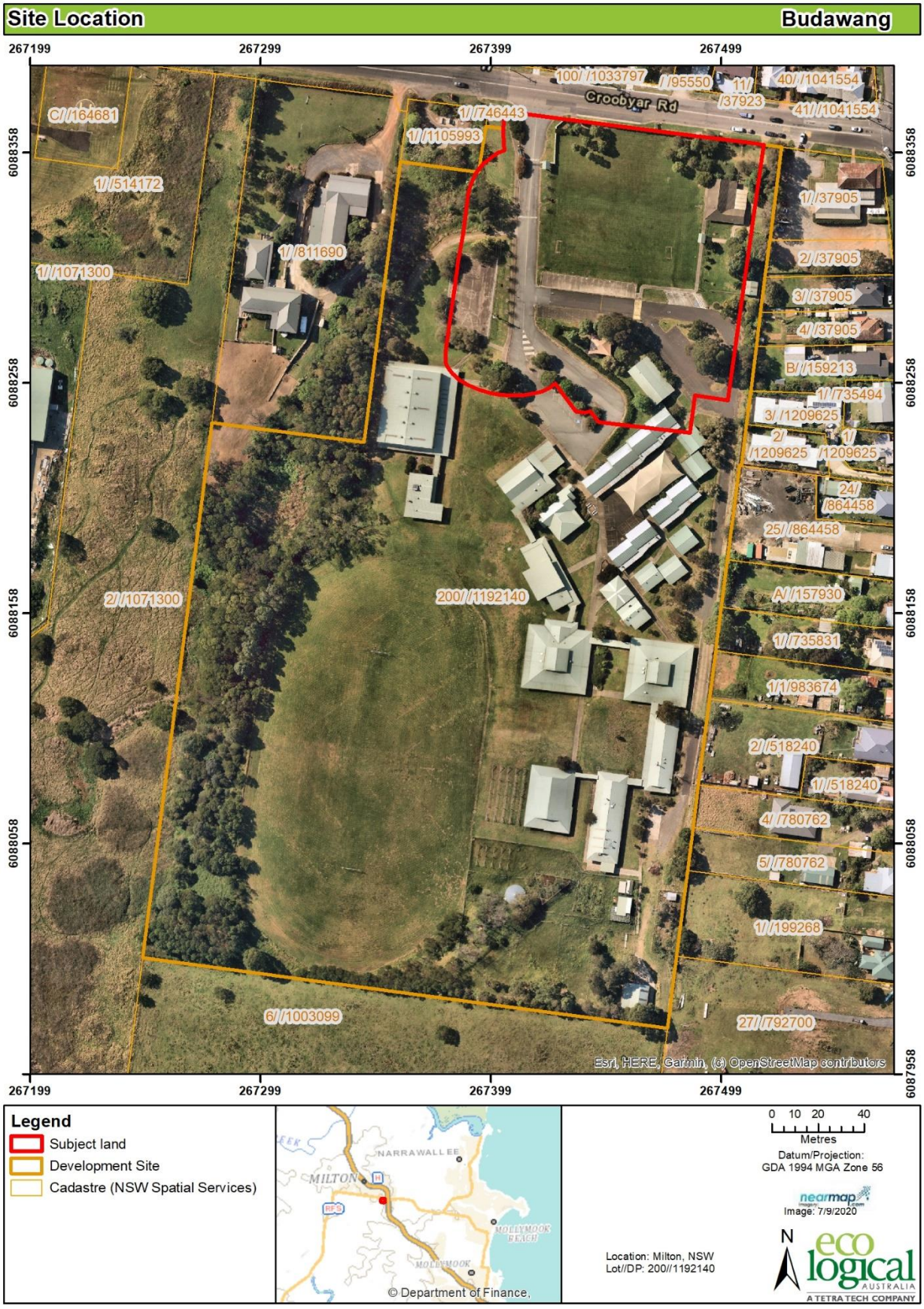

Figure 1: Development site location

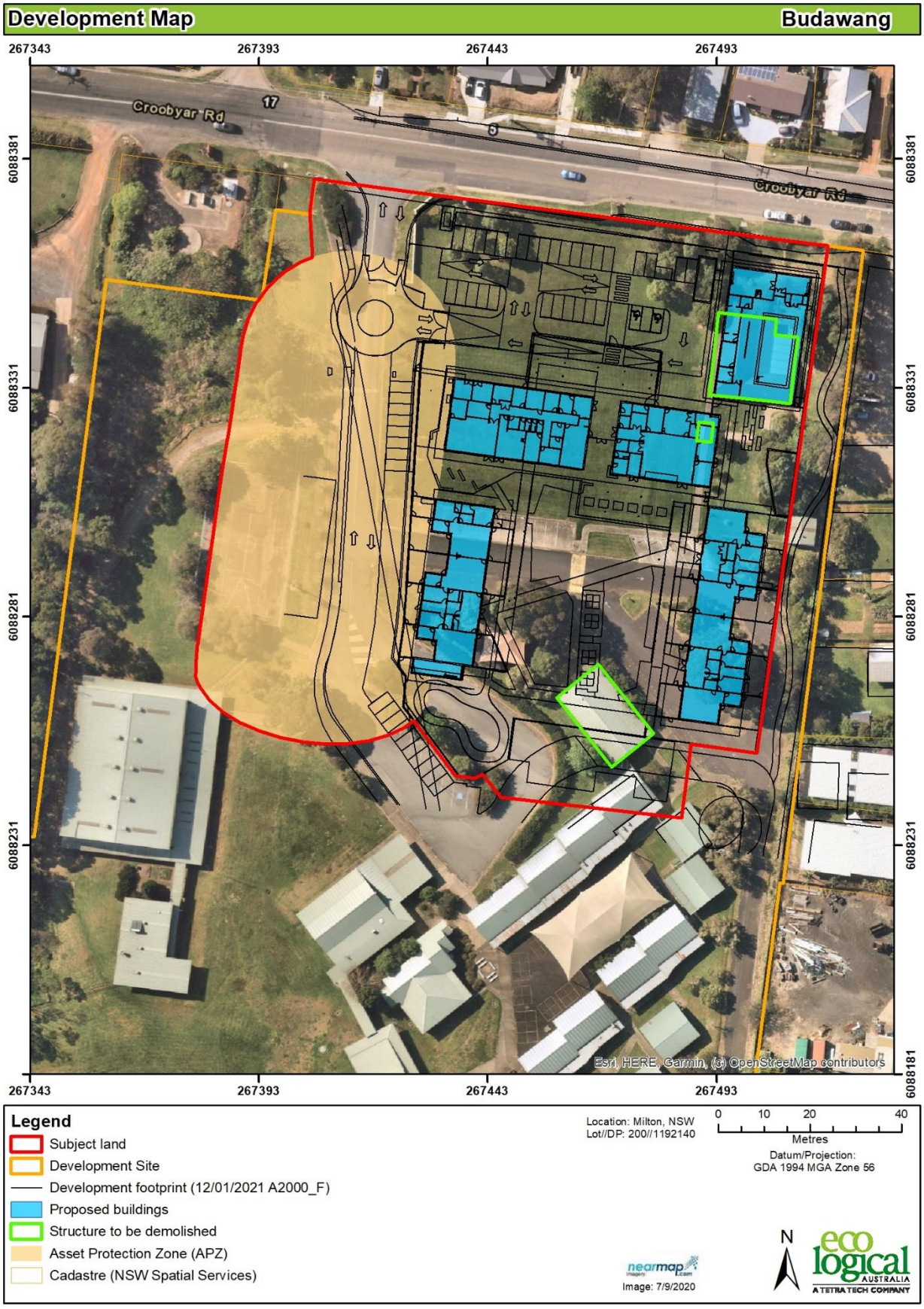

Figure 2: Subject land, including development footprint and Asset Protection Zone (APZ)

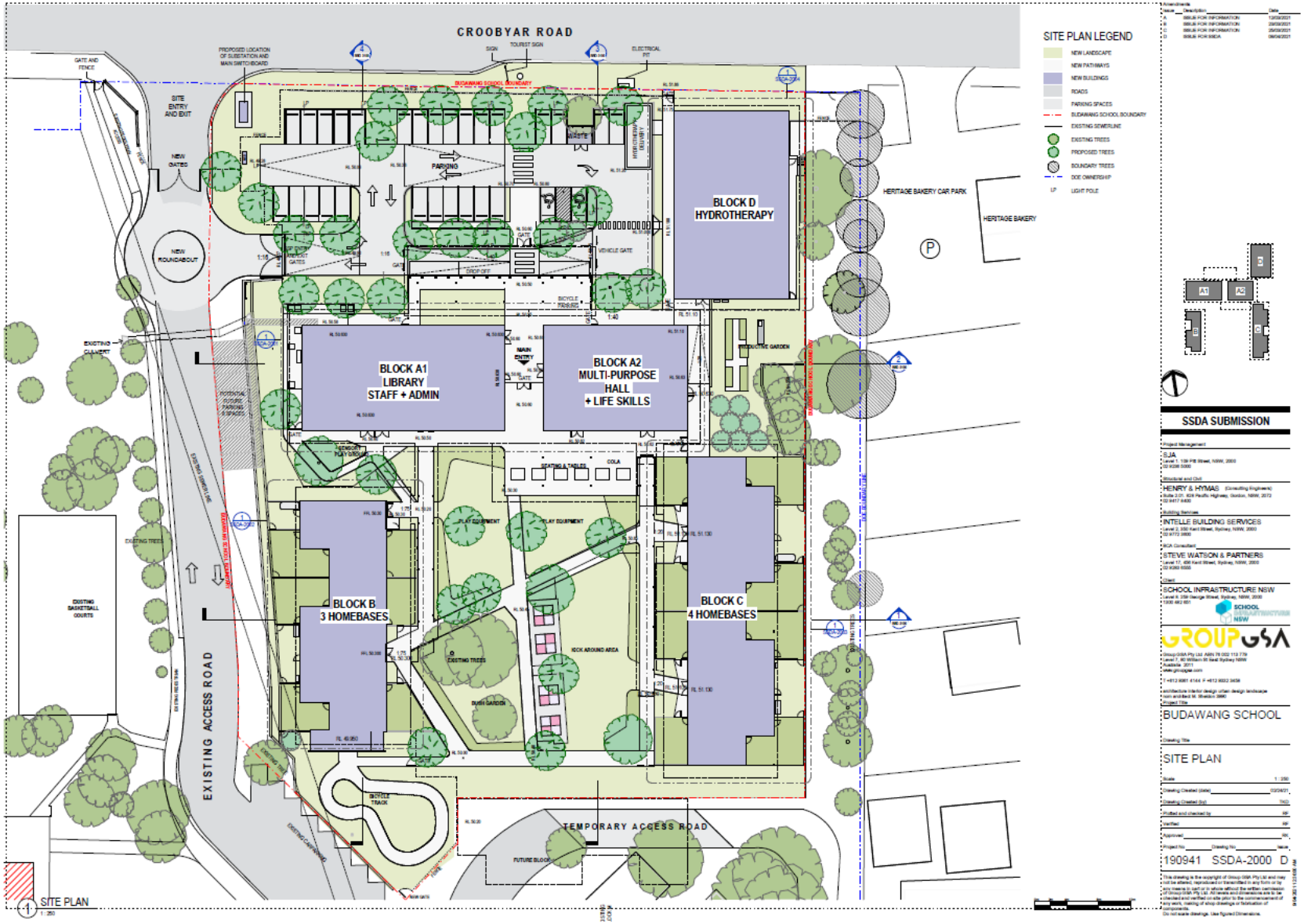

Figure 3: Construction plan

1.2 Legislative context

Table 1: Legislative context

Name	Relevance to the project
COMMONWEALTH	
***Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act)**	One Matter of National Environmental Significance (MNES) has been identified on the subject land. The MNES in question is the threatened species *Pteropus poliocephalus* (Grey-headed Flying-fox). This report assesses impacts to MNES (**Section 2.4**) and concludes that the development is not likely to have a significant impact on the identified MNES.
STATE	
***Environmental Planning and Assessment Act 1979* (EP&A Act)**	The proposed development is State Significant Development (SSD) and is to be assessed under Part 4.1 of the EP&A Act. Secretary's Environmental Assessment Requirements (SEARs) have been issued (SSD-8845345, 7 September 2020) and require the provision of a "BDAR that assesses the biodiversity impacts of the proposed development in accordance with the requirements of the Biodiversity Conservation Act 2016, Biodiversity Conservation Regulation 2017, and the Biodiversity Assessment Method (BAM)".
***Biodiversity Conservation Act 2016* (BC Act)**	The proposed development will assess impacts to threatened entities though application of the BAM in this Biodiversity Development Assessment Report (BDAR).
***Fisheries Management Act 1994* (FM Act)**	The development does not involve impacts to Key Fish Habitat, does not involve harm to marine vegetation, dredging, reclamation or obstruction of fish passage. A permit or consultation under the FM Act is not required.
***Water Management Act 2000* (WM Act)**	The project does not involve works on waterfront land. A Controlled Activity Approval under s91 of the WM Act is not required.
PLANNING INSTRUMENTS	
State Environmental Planning Policy (Koala Habitat Protection) 2020 (Koala SEPP)	The proposed development is located within a Local Government Area to which the Koala SEPP applies. The proposed development does not impact on core koala habitat as defined by the Koala SEPP (**Section 2.4**).
Shoalhaven Local Environment Plan (LEP) 2014	The subject land is zoned RU1 Primary Production under the Shoalhaven LEP (2014). In this zone development of educational establishments are permitted with consent.

1.3 Streamlined assessment module – Planted native vegetation

The BAM makes provision for streamlined assessments of proposals with particular impacts. The streamlined assessment modules outline specific approaches for assessing impacts on biodiversity for the purpose of preparing a BDAR. The circumstances in which a streamlined assessment module can be applied, and the specific assessment requirements are provided in the BAM Appendices (B, C, and D).

Following field survey of the subject land, it was determined that the streamlined assessment for planted native vegetation would be appropriate for this BDAR. Appendix D of the BAM provides a framework in the form of a decision-making key for applying the planted native vegetation module. The application of the decision-making key to the subject land is outlined below, following a description of vegetation within the subject land.

1.3.1 Vegetation description

Field surveys were undertaken within the subject land by ELA ecologist Griffin Taylor-Dalton on 15th October 2020, for seven hours, and ELA ecologist Bronwyn Callaghan on 3rd December 2020, for four hours. Weather conditions were fine and sunny throughout both survey days. Surveys involved traversing the entire subject land and mapping vegetation and habitat features. For the vegetation survey, this involved using the field-based GIS program, ArcGIS Collector (ESRI, version 20.0.1.0), on a field tablet. This allowed addition of accurate location-based polygons and points to which the surveyor recorded details of the vegetation, including:

- Structure – heights and densities of the different stratum (e.g. upper, mid, and ground layers)
- Dominant and common species
- Habitat features – e.g. hollows, logs, litter.

Vegetation within the subject land is a mixture of planted garden beds, which include trees and shrubs, and landscaping plantings, such as lines of trees bordering driveways and car parks. The arrangement and structure of vegetation within the overall development site suggest planting for landscaping purposes of visual amenity, shading and screening. Whilst the species of trees and shrubs are predominantly Australian natives, many are not necessarily native to the region, e.g. *Lophostemon confertus* (Brush Box – natural distribution is coast and ranges north from the Hunter Valley). In addition, there are also exotic trees and shrubs interspersed amongst the natives. This planted native vegetation covers 0.26 ha of the subject land.

The detailed vegetation description below divides the vegetation within the subject land into natural units, e.g. discrete garden beds or corridors of trees, each of which are numbered and indicated on the vegetation map (**Figure 4**). All plant species recorded on site are listed in **Appendix B:.**

1. 6 X *Lophostemon confertus* (Brush Box) trees planted in cluster at edge of sports field. These trees are 5 – 10 m tall and have no hollows. There is no mid-storey, the ground layer is mown lawn (predominantly *Cenchrus clandestina*) and there is no litter, sticks or logs on the ground.
2. 6 X *Lophostemon confertus* (Brush Box) trees plus 3 X *Leptospermum petersonii* (Lemon-scented Teatree) planted in cluster at edge of sports field (**Plate 1**). These trees are 5 – 10 m tall and have no hollows. There is no mid-storey, the ground layer is mown lawn (predominantly *Cenchrus clandestinus* (Kikuyu)) and there is no litter, sticks or logs on the ground.

3. Cluster of mixed native and exotic trees above mown lawns and paving at entrance to former child care centre. Trees are 5 – 10 m tall and have no hollows. The majority of tree cover is provided by the exotic *Fraxinus angustifolia* (Claret Ash). Other trees present include *Fraxinus griffithii* (Ash) and *Callistemon rigidus* (Stiff Bottlebrush).

4. Boundary planting of native / exotic trees with weedy understorey. Trees are 10-20 m tall and have no hollows and species include: *Callistemon salignus* (Willow Bottlebrush), *Melaleuca quinquenervia* (Broad-leaved Paperbark) and *Populus nigra* (Lombardy Poplar). Some mid-storey *Callistemon viminalis* (Weeping Bottlebrush) shrubs are interspersed amongst the trees.

5. Courtyard garden: this is an outdoor paved and gravel play area of the former child care centre, which is surrounded by a boundary of planted native and exotic trees and shrubs (**Plate 3** and **Plate 2**). Native tree species ranged between 5 and 10 m and included: *Callistemon salignus* (Willow Bottlebrush), *Lophostemon confertus* (Brush Box), *Melaleuca styphelioides* (Prickly-leaved Paperbark) and *Syzygium* sp. (Lilly Pilly), *Tristaniopsis laurina* (Water Gum) (**Plate 2**). Exotic tree species included *Harpephyllum caffrum* (Kaffir Plum) and *Fraxinus angustifolia* (Claret Ash). None of the trees had hollows. The shrubs were up to 2 m tall and filled in many of the gaps between tree trunks, effectively providing a screen around two edges of the courtyard boundary. Shrub species were native to the region and included: *Acmena smithii* (Lilly Pilly), *Banksia spinulosa* (Hairpin Banksia) and *Melaleuca hypericifolia* (Hillock Bush). The raised garden bed in the middle of the court yard now only contains weeds and exotic garden species such as: *Agave attenuata* (Foxtail Agave), *Araujia sericifera* (Moth Vine), *Chlorophytum comosum* (Spider Plant), *Cirsium vulgare* (Spear Thistle), *Ehrharta erecta* (Panic Veldtgrass) and *Phytolacca octandra* (Inkweed) (**Plate 3**).

6. Boundary fence planting, consisting of native trees ranging from 5 to 15 m tall, predominantly She-Oaks: *Casuarina glauca* (Swamp Oak) and *Allocasuarina littoralis* (Black She-oak) (**Plate 4**). None of these tree have hollows. A mid-layer consisted of shrubs which were almost continuous from the ground to about 5 m. These were predominantly native and included: *Callistemon pallidus* (Yellow Bottlebrush), *Leptospermum petersonii* (Lemon-scented Teatree) and *Pittosporum undulatum* (Sweet Pittosporum). In addition, a number of shrubby weed species has successfully established in this dense vegetation including: *Ligustrum sinense* (Small leaved Privet) and *Senna pendula*. The ground layer is dominated by the row of planted *Lomandra longifolia* (Spiny-headed Mat-rush) which borders the planted trees and shrubs. Weed incursion, however, has been significant and the ground layer now also includes a large number of weed species including: Ageratina adenophora (Crofton weed), *Bidens pilosa* (Cobblers Pegs), *Conyza* sp. (Fleabane), *Cirsium vulgare* (Spear Thistle), *Cenchrus clandestinus* (Kikuyu), *Ehrharta erecta* (Panic Veldtgrass), *Paspalum dilatatum*, *Phytolacca octandra* (Inkweed) and *Wisteria sinensis*.

7. Native garden bed in round-about (**Plate 5**). This consisted of a canopy of various commonly planted native *Eucalyptus* spp. and a mid layer of native species, some of which are native to the region. Whilst these trees are getting tall, 10 – 20 m, they are still relatively young (less than 20 years) and none of them have hollows. Species included: *Corymbia maculata* (Spotted Gum), *Cupaniopsis anacardioides* (Tuckeroo), *Eucalyptus longifolia* (Woollybutt), *E. punctata* (Grey Gum), *E. saligna* (Sydney Blue Gum), *E. scoparia* (Wallangarra White Gum). Shrub species included planted shrubs, both native, e.g. *Acacia floribunda* (White Sally), *A. melanoxylon* (Blackwood) and *Callistemon rigidus*, and exotic, e.g. *Camellia japonica* (Camellia) as well as weeds, such as *Ochna serrulata* (Mickey Mouse Plant). The ground layer has been planted native *Lomandra longifolia* (Spiny-headed

Mat-rush), however due to the span of time since the gardens were actively managed, weed incursion was significant and included *Anthoxanthum odoratum* (Sweet Vernal Grass), *Cenchrus clandestinus* (Kikuyu), *Ehrharta erecta* (Panic Veldtgrass), *Gamochaeta* sp., *Gomphocarpus fruticosus* (Narrow-leaved Cotton-bush). It is noted that *Eucalyptus scoparia* (Wallangarra White Gum) is listed as endangered under the BC Act and as vulnerable under the EPBC Act. This species is a commonly planted tree and in this location is significantly outside of its natural distribution, which is a very limited area around the NSW-Queensland border near Tenterfield.

8. Line of planted *Callistemon viminalis* (Weeping Bottlebrush) shrubs at edge of drop-off turning circle (**Plate 6**). No ground layer present.
9. Playground shade trees planted around paved playground area and amongst buildings (**Plate 7**). The maximum heights of these trees were 15 m and they contained no hollows. The main species were *E. punctata* (Grey Gum) and *Lophostemon confertus* (Brush Box).
10. Planted hedge of exotic *Camellia japonica* (Camellia).
11. Planted line of *Acer rubrum* (Red Maple) trees at edge of footpath and road (**Plate 8**). These are young, mostly less than 3 m tall, and have no hollows.
12. Planted native trees, providing shade around sports court. These are all relatively young, none of them are taller than 5 m, and they have no hollows. The ground layer under them is mown grass. Species include: *Hymenosporum flavum* (Native Franjipanni) and *Lophostemon confertus* (Brush Box).
13. Planted native Riparian species in drainage line (**Plate 8**). This includes one *Casuarina glauca* (Swamp Oak), approximately 8 m tall and two small *Eucalyptus robusta* (Swamp Mahogany), approximately 5 m tall. In addition to these planted trees, there a couple of small native tree saplings, *Melia azedarach* (White Cedar) and *Pittosporum undulatum* (Sweet Pittosporum), which are likely to have germinated at this site since the original site planting, as these are species known to readily colonise disturbed sites from seeds introduced to the area by birds. Other than these native trees, the entire cover of this patch is dominate by shrubby weeds, predominantly *Rubus anglocandicans* (Blackberry), and herbaceous weeds which favour wetter sites, e.g. *Rumex sagittatus* (Turkey Rhubarb) and *Ranunculus repens* (Creeping Buttercup).

As the species, structure and location of much of the vegetation within the subject land indicated that it had all been planted as a part of the development of the site as a school campus, historical aerial photographic imagery was sourced to investigate the timing of when the plantings on site occurred (**Figure 5**). This showed that the development site was a treeless paddock (apart from one paddock tree south of the subject land) up to the mid 1990's, when the first three buildings of the original school were constructed. Until the early 2000's, when the rest of the buildings were developed, there remains no vegetation, other than lawns, on site. The first of the garden and landscape plantings appear on aerial imagery around 2004. The riparian area to the west of the subject land remains bare of structural vegetation (trees and shrubs) till 2004, when plantings of tree saplings can be seen in rows.

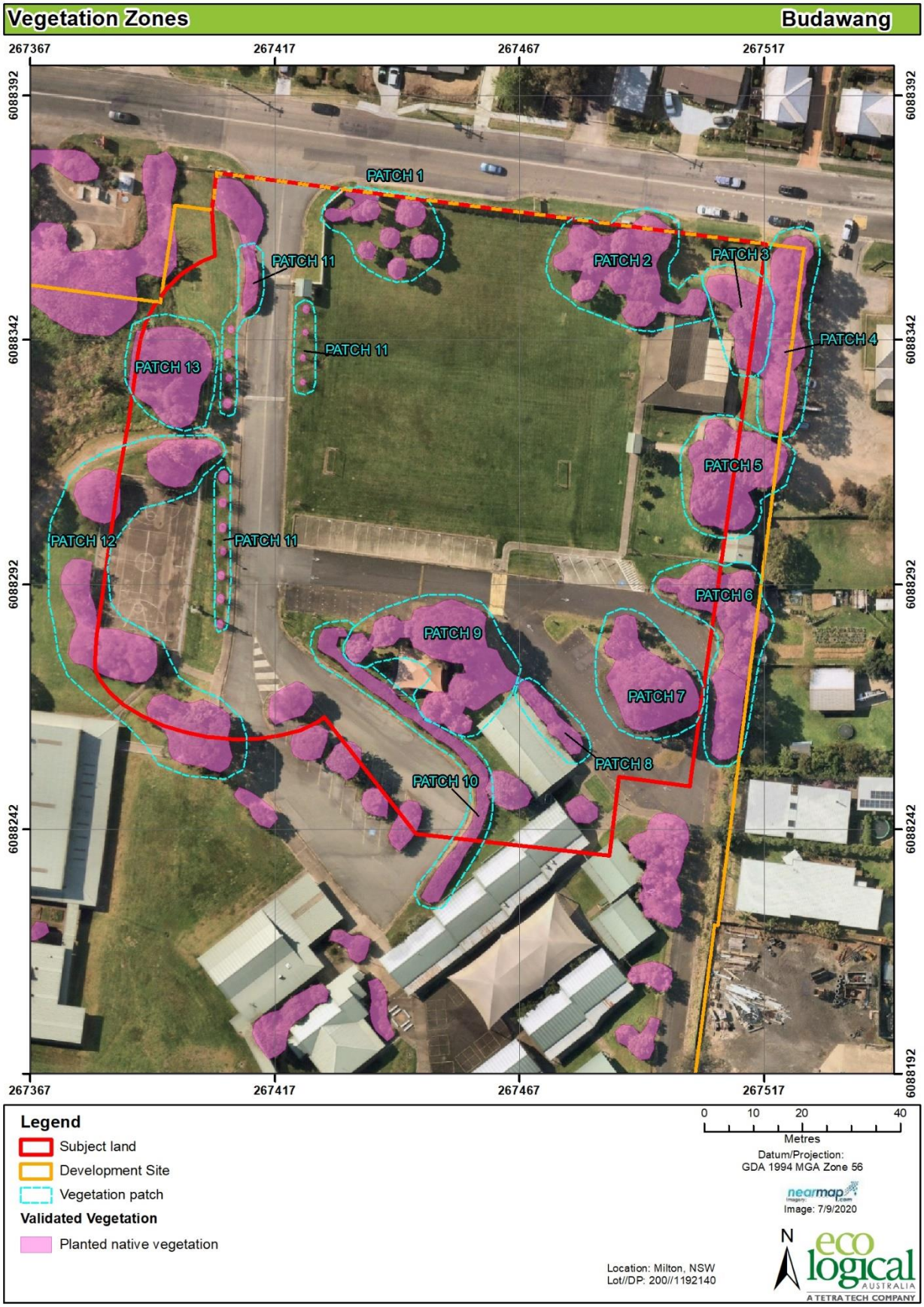

Figure 4: Vegetation on subject land; patch descriptions can be found above in Section 1.3.1.

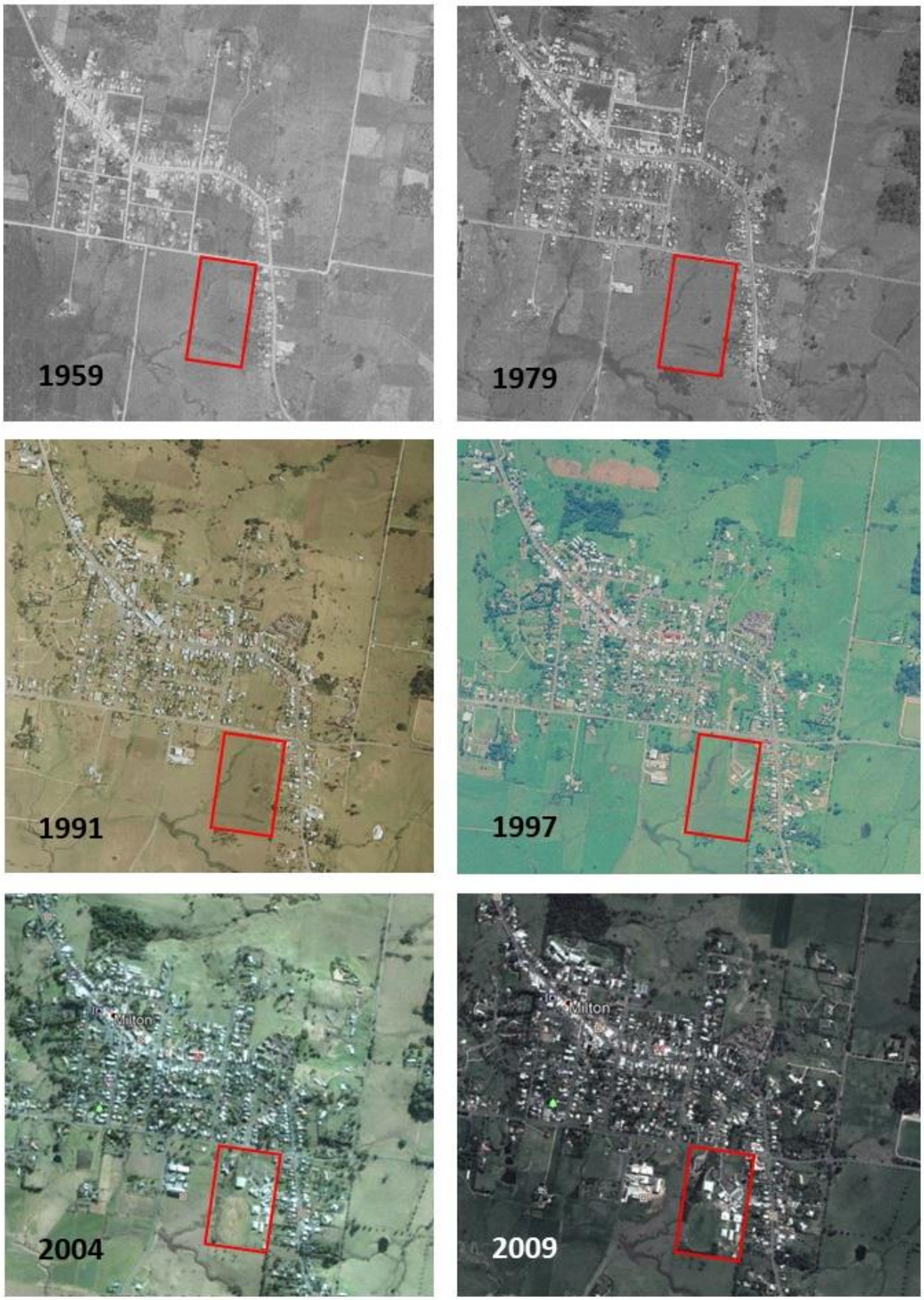

Figure 5: Aerial photographs of Milton 1959 – 2009, showing location of development site in red

Plate 1: Cluster of small native trees in middle north of subject land

Plate 2: Trees and shrubs forming boundary of outdoor play area of former Child Care Centre

Plate 3: Outdoor play area of former Child Care Centre

Plate 4: Eastern boundary planting of She-Oaks with Lomandra ground-layer

Plate 5: Eucalypt planting in middle of round-about in the south-east of the subject land

Plate 6: Line of *Callistemon viminalis* shrubs

Plate 7: Shade tree plantings around buildings.

Plate 8: Line of *Acer rubrum* (Red Maple) along driveway and *Casuarina glauca* planted in drainage line

1.3.2 Decision-making key for planted native vegetation (BAM Appendix D)

NB: text in italics is copied directly from BAM Appendix D

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

i. ~~Yes .... The planted native vegetation must be allocated to the best-fit PCT and the BAM must be applied~~.

ii. No..... Go to 2.

Justification:

All vegetation within the subject land has been planted around or after 2004. Prior to this the site was a completely clear paddock with no native vegetation bordering or near the site (**Figure 5**). There is no remnant vegetation within or surrounding the subject land.

2: *Is the planted native vegetation:*

a. planted for the purpose of environmental rehabilitation or restoration under an existing conservation obligation listed in BAM Section 11.9(2.), and

b. the primary objective was to replace or regenerate a plant community type or a threatened plant species population or its habitat?

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

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

Justification:

The vegetation within the subject land was planted for landscaping purposes of visual amenity, shading and screening. There is no existing conservation obligation.

There is no evidence that the vegetation was planted to replace or regenerate a plant community type. Evidence of this would be the exclusive use of plant species native to the region. Many native species used extensively in the plantings are not native to the region, including: *Lophostemon confertus* (Brush Box – natural distribution is coast and ranges north from the Hunter Valley); and *Callistemon viminalis* (Weeping Bottlebrush – natural distribution is coast and ranges north from the Gloucester area). In addition, it would be expected that more focus would be placed on mid- and ground layer species characteristic to the PCT's of this region. There is no evidence of such a focus and the only obvious ground layer species that has been actively planted is *Lomandra longifolia*, which, whilst native to the region, is a commonly planted species.

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

a. a species recovery project

b. Saving our Species project

c. other types of government funded restoration project

d. condition of consent for a development approval that required those species to be planted or translocated for the purpose of providing threatened species habitat

e. legal obligation as part of a condition or ruling of court. This includes regulatory directed or ordered remedial plantings (e.g. Remediation Order for clearing without consent issued under the BC Act or the Native Vegetation Act)

f. ecological rehabilitation to re-establish a PCT or TEC that was, or is carried out under a mine operations plan, or

g. approved vegetation management plan (e.g. as required as part of a Controlled Activity Approval for works on waterfront land under the NSW Water Management Act 2000)?

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

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

Justification:

Planted native vegetation within the subject land does not include any individuals of a threatened species or other native species planted/translocated for the purpose of providing threatened species habitat under any of the projects, plans, orders or consent conditions listed.

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

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

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

Justification:

The choice of species and the spatial arrangement of trees and shrubs suggests that revegetation or environmental rehabilitation or restoration was not the primary objective of the planted native vegetation on the subject land. Many of the species have been chosen predominantly for their attractive foliage or flowers and are not native to Australia, e.g. *Acer rubrum* (Red Maple) and *Fraxinus*

angustifolius (Claret Ash) , or the region, e.g. *Lophostemon confertus* (Brush Box – natural distribution is coast and ranges north from the Hunter Valley); and *Callistemon viminalis* (Weeping Bottlebrush – natural distribution is coast and ranges north from the Gloucester area). This indicates plant species choice based on improving the visual amenity of the facilities. The locations and spatial arrangement of the tree plantings also indicates motivations other than revegetation or rehabilitation, such as providing shade within and around play outdoor areas.

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

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

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

Justification:

The native vegetation within the subject land was planted for the purpose of landscaping in parks, gardens and sport fields/complexes. The arrangement and structure of the vegetation points to choices made for the purpose of improving the visual amenity of the site, complement the built environment, provide shade for student recreating outdoors, and provide screening and privacy for such areas as the child care playground.

1.4 Landscape features

In order to identify important biodiversity values the BAM requires the assessment of landscape features within the subject land and the surrounding assessment area, defined as the subject land plus a 1500 m buffer. These landscape features assist in establishing the context of the subject land and identifying likely habitat suitable for threatened entities. The landscape features identified below are shown in **Figure 6** and **Figure 7**.

1.4.1 IBRA regions and subregions

The subject land and assessment area are wholly located within the 'Sydney Basin' IBRA region and 'Jervis' subregion.

1.4.2 Rivers, streams, estuaries and wetlands

The subject land does not contain any Strahler first order (or higher) streams, however a first order stream is located just beyond the western boundary and its buffer falls within the APZ of the subject land (**Figure 6**).

The assessment area (1500 m buffer) contains a number of rivers and streams (**Figure 7**), as outlined in **Table 2**, the largest of which is Pettys Creek, which is over 500 m to the south-west of the subject land.

Table 2: Rivers and streams

Order	River/stream names	Total length within Assessment Area
1st	none named	13,225.37 m
2nd	none named	7,274.60 m
3rd	Pettys Creek	1,950.51 m

The subject land does not contain any wetlands, however there is a small wetland mapped on the western edge of the development site (to the south-west of the subject land), which was a dam on the first order stream which run through this part of the site.

A number of small wetlands are mapped within the assessment area (1500m buffer) (**Figure 7**). These are all small dams on low-order Strahler streams.

1.4.3 Habitat connectivity

The subject land does not contain any features that are considered to contribute to habitat connectivity.

The assessment area (1500 m buffer) contains the habitat connectivity features related to links between continuous and connected patches of native vegetation (**Figure 7**).

1.4.4 Karst, caves, crevices, cliffs, rocks and other geological features of significance

The subject land and assessment area do not contain areas of karst, caves, crevices, cliffs, rocks and other geological features of significance.

1.4.5 Areas of outstanding biodiversity value

The subject land and assessment area do not contain areas of outstanding biodiversity value.

1.4.6 NSW (Mitchell) landscape

Identification of NSW (Mitchell) landscapes is not required under the streamlined assessment module for planted native vegetation (BAM Section 3.1.3.10).

1.4.7 Native vegetation cover

The only native vegetation cover in the subject land is the planted native vegetation described above in **Section 1.3.1**. The area of planted native vegetation in the subject land is 0.26 ha (**Figure 4**). This was calculated from fine scale mapping produced by ELA from field survey. The native vegetation cover in the assessment area was calculated using Geographic Information System (GIS) and a combination of existing vegetation maps (OEH 2017) and aerial imagery sourced from SIX Maps. The area of native vegetation within the assessment area is 244 ha and can be seen in **Figure 7**.

Assessment of percent native vegetation is not required under the streamlined assessment module for planted native vegetation (BAM Section 3.2.4).

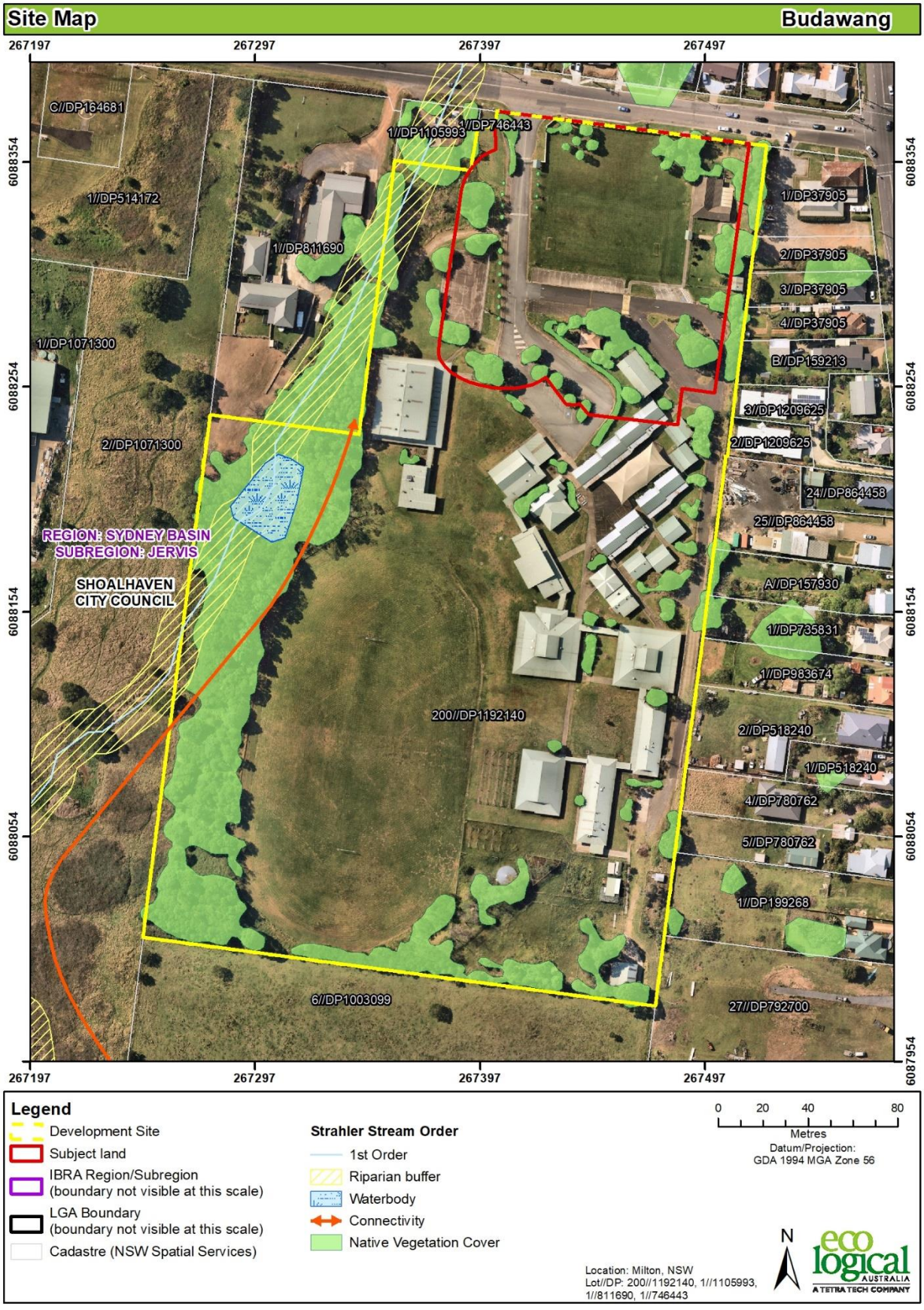

Figure 6: Site map

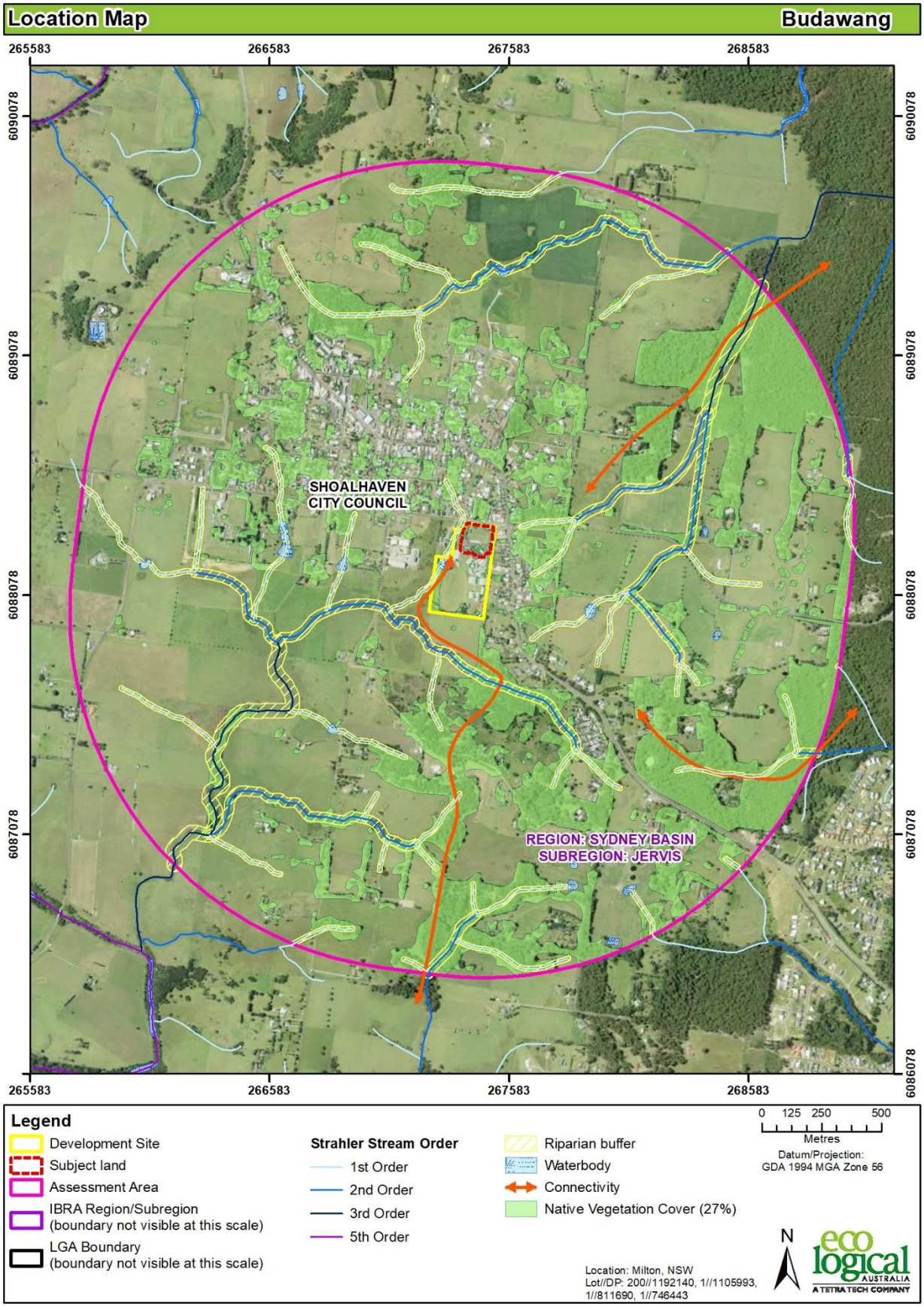

Figure 7: Location map

1.5 Native vegetation, threatened ecological communities and vegetation integrity

Chapter 4 of the BAM describes the requirements to assess native vegetation, identify Plant Community Types (PCT) and Threatened Ecological Communities (TEC) and determine the vegetation integrity score for native vegetation on the subject land. As all vegetation on the entire subject land has been shown to be planted native vegetation and the application of the planted native vegetation module has been justified (**Section 1.3.1**), Chapter 4 of the BAM is not required to be applied as specified in BAM Appendix D.1.5.

1.6 Assessment of planted native vegetation for threatened species habitat

Chapter 5 of the BAM describes the requirements to assess the suitability of habitat for threatened species within the subject land, including identification of species requiring assessment and survey requirements. As all vegetation on the entire subject land has been shown to be planted native vegetation and the application of the planted native vegetation module has been justified (**Section 1.3.1**), Chapter 5 of the BAM is not required to be applied as specified in BAM Appendix D.1.5..

Under Appendix D.2, however, the BAM requires that the suitability of planted native vegetation for use by threatened species must be assessed. This includes any incidental sightings or evidence (e.g. scats) of threatened (flora and fauna) species using, inhabiting or being part of the planted native vegetation.

1.6.1 Identifying potential threatened species

A list of threatened species that could potentially use the planted native vegetation on the subject land was prepared by doing a 5 km search in the BioNet Atlas (DPIE, 2020c). These are listed in **Appendix C:**.

1.6.2 Field survey

Field surveys for threatened species habitat suitability were undertaken within the subject land by ELA ecologist Griffin Taylor-Dalton on 15th October 2020, for seven hours, and ELA ecologist Bronwyn Callaghan on 3rd December 2020, for four hours. Weather conditions were fine and sunny throughout both survey days. Surveys involved traversing the entire subject land and inspecting all vegetation for evidence of threatened species and habitat features. In addition, all existing buildings that are located within the subject land (child-care centre and Building L) and within close proximity to the subject land boundary (Building N) were inspected. The three buildings were inspected for evidence of microbat activity or habitat. The ecologist inspected any areas that had potential to provide habitat for microbats (i.e. skirtings, gutters, crevices, light fittings, underneath buildings).

1.6.3 Field results

Field survey did not find evidence of any existing threatened fauna species during traverses of the outdoor areas of the subject land. One planted *Eucalyptus scoparia* (Wallangarra White Gum) was observed within patch 7 (Figure 4). This species is listed as endangered under the BC Act and as vulnerable under the EPBC Act. This species does not naturally occur within this region and was present as a horticultural planting.

Within and around existing buildings, no bat wash or bats were identified during the field survey. In areas that could act as flyways, large amounts of spider's webs (Plate 9) were observed, suggesting that microbats are not flying through this area nor foraging on the insects within the buildings. There were no areas that microbats could inhabit on the outside of the buildings that could not be visually inspected by the ecologist. Examples of key areas that were inspected included in between light fittings (**Plate 10**),

underneath gutters and wooden struts (**Plate 11**), concealed corners within the rooms or tight spaces underneath the buildings (**Plate 12**). In addition to this, a groundskeeper enters the property each week to maintain the property. Maintenance activities include mowing the lawns and maintaining the gardens. This could act as a deterrent for microbats.

Plate 9: Space beneath one of the two buildings to be demolished. Large amount of spider webs suggesting nothing is flying through this area.

Plate 10: Gaps between light fitting were inspected for evidence of use

Plate 11: Wooden supports lining the roof. No evidence of bat activity was observed within this area

Plate 12: Space beneath one of the buildings to be demolished

1.7 Identifying prescribed additional biodiversity impacts

Chapter 6 of the BAM describes the requirements for identifying and assessing additional prescribed biodiversity impacts. Each prescribed impact and its relevance to this BDAR are addressed below.

1.7.1 Karst, caves, crevices, cliffs, rocks and other geological features of significance

As described in **Section 1.4.4** there are no karst, caves, crevices, cliffs, rocks and other geological features of significance in the subject land.

1.7.2 Human-made structures and non-native vegetation

As described in **Section 1.1.3** the proposed development will involve the demolition of two un-used buildings within the subject land (**Figure 2**). The northern one is the former child-care centre and the southern one is Building L of the former Shoalhaven Anglican College. Both these buildings are just over 20 years old, having been built in the late 1990's. They are both small single storey stand-alone buildings, with an open plan interior that could be divided into smaller classrooms using moveable dividing walls. The child-care centre is brick-veneered with a tiled roof and Building L has weatherboard-style cladding and a corrugated iron roof.

Threatened species which are known to use abandoned building as habitat are predominantly microbats. Five microbats species have been recorded within a 5 km radius of the subject site. These species could potentially use the existing buildings as roosting habitat. These species are:

- *Micronomus norfolkensis* (Eastern Coastal Free-tailed Bat)
- *Miniopterus australis* (Little Bentwing-bat)
- *Miniopterus orianae oceanensis* (Large Bent-winged Bat)
- *Myotis macropus* (Southern Myotis)
- *Phoniscus papuensis* (Golden-tipped Bat)

As described above in **Sections 1.6.2** and **1.6.3** field surveys were conducted to determine the presence of these species and the likelihood that the abandoned buildings are being used as habitat for any threatened species. These surveys detected none of the species listed above and found no evidence of the buildings being utilised by any bat species.

1.7.3 Habitat connectivity

As described in **Section 1.4.3** the subject land does not contain any features that are considered to contribute to habitat connectivity.

1.7.4 Water bodies, water quality and hydrological processes

No water bodies or any hydrological processes that sustain threatened entities occur on the subject land.

1.7.5 Wind farm developments

This BDAR does not apply to a wind farm development.

1.7.6 Vehicle strikes

The only roads within the subject land, both existing and proposed, are those leading to, or within, car parks and will therefore not result in additional through-traffic. Being within a school grounds, the speed at which vehicles will be allowed to move along these roads will be very limited. There is very limited fauna habitat adjacent to these roads (**Figure 2**). Together, these factors contribute to the conclusion that the proposed development will not result in vehicle strikes on threatened fauna.

2. Stage 2: Impact assessment (biodiversity values)

2.1 Avoiding impacts

Chapter 7 of the BAM outlines requirements for demonstrating what strategies and actions will be taken to avoid or minimise impacts on biodiversity values during proposal planning.

2.1.1 Locating a project to avoid and minimise impacts on native vegetation threatened entities and habitat

The development has been located in a way which avoids and minimises impacts as outlined in **Table 3**.

Table 3: Locating a project to avoid and minimise impacts on vegetation and habitat

Approach	How addressed	Justification
locating the project in areas lacking biodiversity values	The project is located in areas of the development site with minimal biodiversity values.	The development footprint is located in the north-east corner of the development site, which has been highly modified and developed for educational buildings, roads, car parks and sports grounds. All vegetation within this area of the site is recently planted native and exotic trees and shrubs. The proposed new buildings are sited in locations which requires no change to the existing vegetation to establish and maintain the required APZ.
locating the project in areas where the native vegetation or threatened species habitat is in the poorest condition	The project is located in an area where native vegetation is of a poor quality and provides limited habitat for threatened species.	All native vegetation within the development footprint has been planted within the last 20 years. Patches of vegetation also often contain a number of planted and weedy exotic species. Most patches have a very simple structure, being of a single strata (tree or shrub) with no ground layer other than mown lawn or paved areas, thus comprising very poor condition native vegetation or threatened species habitat.
locating the project in areas that avoid habitat for species with a high biodiversity risk weighting or land mapped on the important habitat map, or native vegetation that is a TEC or highly cleared PCT	The project is located in areas which only contain planted native vegetation which does not provide habitat for species with a high biodiversity risk weighting. The project is not located on, or near, land mapped on the important habitat map. The project is located in areas where there is no highly cleared PCTs or TECs.	No species with a high biodiversity risk weighting were assessed as likely to be present or utilise the habitat (planted native vegetation) within the development footprint. The project is not located on, or near, land mapped on the Biodiversity Values map, which incorporates the important habitat map (DPIE 2020b). There are no highly cleared PCTs or TECs within or near the subject land.
locating the project outside of the buffer area around breeding habitat features such as nest trees or caves	The project is located outside a buffer area around breeding habitat features.	There are no caves within the development site or in the vicinity of the development site that would include the subject land within a buffer. None of the trees within the subject land, and immediately surrounding, were identified as key nest trees for any of the likely threatened fauna. No hollows or nests were identified during the field survey.

2.1.2 Designing a project to avoid and minimise impacts on native vegetation threatened entities and habitat

The development has been designed in a way which avoids and minimises impacts as outlined in **Table 4**.

Table 4: Designing a project to avoid and minimise impacts on vegetation and habitat

Approach	How addressed	Justification
reducing the proposal's clearing footprint by minimising the number and type of facilities	The proposed development has been designed to minimise clearing	The spatial arrangement of the buildings within the development footprint allows for the retention of many of the larger and established native trees (**Figure 3**).
locating ancillary facilities in areas that have no biodiversity values	The proposed development has been designed to locate ancillary features in areas with little or no biodiversity values	Ancillary features, such as access roads and car parks, are predominantly located in cleared and highly modified areas, such as sports grounds and existing roads (**Figure 2**).
locating ancillary facilities in areas where the native vegetation or threatened species habitat is in the poorest condition (i.e. areas that have a lower vegetation integrity score)	The development footprint has been designed to locate ancillary features in areas of low quality native vegetation and threatened species habitat	Ancillary features, such as access roads and car parks, are predominantly located in cleared and highly modified areas, such as sports grounds and existing roads (**Figure 2**). Trees requiring removal for the development of ancillary features are groups of small trees, many not native to the region, with mowed lawn or paving in place of ground cover.
locating ancillary facilities in areas that avoid habitat for species and vegetation that has a high threat status categories (e.g. an EEC, CEEC or SAII entity)	The development footprint has been designed to avoid habitat for species and vegetation in high threat categories	There are no EEC's or CEEC's within, or near, the subject land.

2.1.3 Locating and designing the project to avoid or minimise prescribed biodiversity impacts

The subject land does not have any prescribed biodiversity impacts, as described in **Section 1.7**.

2.2 Assessment of impacts

Chapter 8 of the BAM outlines the requirements for assessing impacts of the proposed development on biodiversity values.

2.2.1 Direct impacts

The direct impacts on native vegetation, TECs, threatened species and their habitat and prescribed biodiversity impacts are summarised below in **Table 5**.

Table 5: Direct impacts of the proposed development

Impact category	Description	Direct Impact
Native vegetation	The only native vegetation within the subject land is the planted native vegetation described in **Section 1.3.1**. This covers approximately 0.26 ha of the 1.44 ha subject land. A number of larger trees have been indicated as to be retained. Together these cover approximately 0.11 ha. This planted native vegetation is not associated with any PCT	Approximately 0.15 ha of planted native vegetation will be impacted by the proposed development
Threatened Ecological Communities (TECs)	There are no TECs associated with the planted native vegetation that is on the subject land. Field survey did not find any vegetation on the subject land or development site that are TEC.	No TECs, listed under the BC Act or the EPBC Act, will be directly impacted by the proposed development
Threatened species and threatened species habitat	Field survey did not identify any threatened species or any evidence of threatened species utilisation of the subject land. The planted native vegetation across the subject land could provide marginal foraging habitat for the *Pteropus policephalus* (Grey-headed Flying-fox) though it is unlikely to be of great importance considering the wide abundance of foraging habitat around the local area. The abandoned buildings within the subject land could provide habitat for threatened bats, including: • *Micronomus norfolkensis* (Eastern Coastal Free-tailed Bat) • *Miniopterus australis* (Little Bentwing-bat) • *Miniopterus orianae oceanensis* (Large Bent-winged Bat) • *Myotis macropus* (Southern Myotis) • *Phoniscus papuensis* (Golden-tipped Bat All areas of these buildings which potentially provide habitat were inspected during the field survey. This found no evidence of use by bats (**Section 1.6.3**).	No threatened species, or their habitat, listed under the BC Act or the EPBC Act, will be directly impacted by the proposed development
Prescribed biodiversity impacts	The development does not have any prescribed biodiversity impacts, as described above in **Section 1.7**.	There will be no direct impacts on prescribed biodiversity impacts

2.2.2 Change in vegetation integrity

As all vegetation within the entire subject land has been shown to be planted native vegetation and the application of the planted native vegetation module has been justified (**Section 1.3.1**), Chapter 4 of the BAM was not required to be applied as specified in BAM Appendix D.1.5. This is the Chapter which describes the requirements to assess native vegetation, identify Plant Community Types (PCT) and Threatened Ecological Communities (TEC) and determine the vegetation integrity score for native vegetation on the subject land. Therefore, vegetation integrity scores were not required to be calculated for this BDAR.

2.2.3 Indirect impacts

The indirect impacts of the development are outlined in **Table 6**.

Table 6: Indirect impacts

Indirect impact	Project phase	Nature	Extent	Frequency	Duration	Timing
inadvertent impacts on adjacent habitat or vegetation	Construction / operation	Damage to adjacent habitat or vegetation	Adjacent vegetation	Daily, during construction and operational phases	Throughout project period	Potentially long-term impacts
reduced viability of adjacent habitat due to edge effects	Construction	Weed introduction, increased light / drying	Adjacent vegetation	Daily, during construction works	Cumulative, during and following construction works	Potentially long-term impacts
reduced viability of adjacent habitat due to noise, dust or light spill	Construction	Noise and dust created from machinery. No night works proposed so no light spill.	Adjacent vegetation	Daily, during construction works	Sporadic throughout construction period	Short-term impacts
transport of weeds and pathogens from the site to adjacent vegetation	Construction / operation	Spread of weed seed and pathogens from incoming machinery and equipment	Potential for spread into nearby habitat	Daily, during construction and operational phases	Throughout project period	Potentially long-term impacts
increased risk of starvation or exposure, and loss of shade or shelter	Construction	Minimal habitat present in subject land	N/A	N/A	N/A	N/A
loss of breeding habitat	Construction	No breeding habitat identified in subject land	N/A	N/A	N/A	N/A
trampling of threatened flora species	Construction / operation	No threatened flora species present	N/A	N/A	N/A	N/A
inhibition of nitrogen fixation and increased soil salinity	Operation	Minimal removal of vegetation within subject land is not likely to result in increased soil salinity	N/A	N/A	N/A	N/A
fertiliser drift	Construction	No agricultural activities requiring fertiliser spray proposed	N/A	N/A	N/A	N/A
rubbish dumping	Construction / operation	Illegal dumping by workers and others with access to site	Potential for rubbish to spread into areas outside subject land	Potential to occur at any time during construction and operational phases	Throughout life of project	Potentially long-term impacts

Indirect impact	Project phase	Nature	Extent	Frequency	Duration	Timing
wood collection	Construction / operation	Removal of wood from adjacent vegetation	Throughout adjacent vegetation	Potential to occur at any time during construction and operational phases	Throughout life of project	Short-term impacts
removal and disturbance of rocks, including bush rock	Construction / operation	Minimal rocks present or available for removal in adjacent vegetation	N/A	N/A	N/A	N/A
increase in predators	Construction / operation	Proposed development unlikely to result in increase to predatory species population	N/A	N/A	N/A	N/A
increase in pest animal populations	Construction / operation	Potential to increase if food scraps/rubbish is left on site. Potential to increase -/+ decrease due to disturbance to existing vegetation	Throughout adjacent vegetation	Likely to occur gradually after disturbance to vegetation takes place	During construction phase	Short-term impacts
changed fire regimes	Construction / operation	Potential for fire to spark during construction and operation from any machinery or electrical works	Throughout adjacent vegetation	Potential to occur at any time throughout the operational or construction phases	During operating/ construction hours	Short-term impacts
disturbance to specialist breeding and foraging habitat, (e.g. beach nesting for shorebirds).	Construction / operation	No specialist breeding or foraging habitat identified	N/A	N/A	N/A	N/A

2.2.4 Mitigating and managing impacts

Measures proposed to mitigate and manage impacts at the subject land before, during and after construction are outlined in **Table 7**.

Table 7: Measures proposed to mitigate and manage impacts

Measure	Risk before mitigation	Risk after mitigation	Action	Outcome	Timing	Responsibility
adoption of clearing protocols that identify vegetation to be retained, prevent inadvertent damage and reduce soil disturbance; for example, a chainsaw is preferable to heavy machinery to remove native vegetation for partial clearing	Minor	Negligible	Clearing protocols to be established to minimise damage to soil and retained vegetation, e.g. use of chainsaw on on-site mulching, in place of heavy machinery.	Damage to retained vegetation and soil minimised	Duration of construction works	Project Manager
using noise barriers, or daily/seasonal timing of construction and operational activities to reduce impacts of noise	Moderate	Negligible	Daily timing of construction activities is recommended in accordance with Table 1 of Interim Noise Guidelines (2009)	Noise impacts associated with the development will be managed in accordance with guidelines	Duration of construction works	Project Manager
using light shields, or daily/seasonal timing of construction and operational activities to reduce impacts of light spill	Moderate	Negligible	Construction will only occur during daylight hours, and night lights will not be used	Light impacts associated with the construction will be avoided as works will occur during daylight hours	Duration of construction works	Project Manager
using adaptive dust management and monitoring programs to control air quality	Moderate	Minor	Dust suppression measures	Mitigate dust created during construction/operation	Duration of the project	Project Manager
scheduling the timing of construction activities to avoid impacts (e.g. timing the construction for when migratory species are not at the site, or when particular species known to, or likely to use the habitat on the site, are not breeding or nesting)	Negligible	Negligible	Species unlikely to be breeding within subject land. No action required unless specific breeding habitat identified	No impacts to fauna during breeding/nesting	N/A	N/A

Measure	Risk before mitigation	Risk after mitigation	Action	Outcome	Timing	Responsibility
erecting temporary fencing to protect significant environmental features, such as riparian zones	Moderate	Minor	Riparian area on western edge of the development site will be fenced to prevent entry	Riparian area protected from machinery and human disturbance	Duration of construction works	Project Manager
using hygiene protocols to prevent the spread of weeds or pathogens between infected and uninfected areas	Moderate	Minor	All machinery/equipment cleaned prior to entering/exiting the property. There are currently no weeds listed under the NSW Biosecurity Act 2015 in the development footprint. Future weed infestations should be managed/removed by a qualified Bush Regenerator	Prevent the spread of weeds or pathogens	Duration of project	Project Manager
training staff and conducting site briefings to communicate environmental features to be protected and measures to be implemented	Minor	Negligible	All staff working on the development will undertake an environmental induction as part of their site familiarisation. Site briefings should be updated based on phase of the work. This induction will include items such as: 1. Site environmental procedures (vegetation management, sediment and erosion control, exclusion fencing and noxious weeds) 2. What to do in case of environmental emergency (chemical spills, fire, injured fauna) 3. Key contacts in case of environmental emergency	All staff entering the site are fully aware of all environmental aspects relating to the development and know what to do in case of any environmental emergencies	To occur for all staff entering / working at the site and when environmental issues become apparent	Project Manager, all staff

2.3 Impact summary

Following implementation of the BAM – planted native vegetation streamlined assessment module, the following impacts have been determined.

2.3.1 Serious and Irreversible Impacts (SAII)

There are no candidate entities for Serious and Irreversible Impacts (SAII) within the subject land.

2.3.2 Impacts requiring offsets

There are no impacts associated with the proposed development that require offsets, as specified for planted native vegetation streamlined assessment module in Appendix D of the BAM (DPIE 2020a).

2.3.3 Impacts not requiring offsets

The impacts of the development to native vegetation that do not require offsets include the removal of 0.15 ha of planted native vegetation, which cannot be assigned to any PCT, as detailed in **Section 1.3.1**.

The impacts of the development that do not require offsets for threatened species and threatened species habitat include:

- the removal of 0.15 ha of planted native vegetation, which may provide marginal foraging habitat for *Pteropus poliocephalus* (Grey-headed Flying-fox). It was determined that the proposed development is unlikely to result in a significant impact to this species (**Section 2.4.1**).
- the demolition of two abandoned buildings, which may provide habitat for several species of microbat. Upon investigation, no evidence of microbat use was observed suggesting no individuals are using the two buildings for roosting habitat.

2.3.4 Areas not requiring assessment

A total of 1.13 ha of the subject land does not require assessment as these do not contain any vegetation or abandoned buildings. Areas not requiring assessment are all areas outside the vegetation patches marked on **Figure 4**, and buildings to be demolished indicated on (**Figure 2**).

2.3.5 Credit summary

No ecosystem credits or species credits are required to be offset as a result of the development, as all vegetation was assessed under the planted native vegetation streamlined assessment module (Appendix D of the BAM).

2.4 Consistency with legislation and policy

Additional matters relating to impacts on flora and fauna which are not covered by the BC Act must also be addressed for the proposed development.

2.4.1 Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

The EPBC Act establishes a process for assessing the environmental impact of activities and developments where Matters of National Environmental Significance (MNES) may be affected. Under the Act, any action which 'has, will have, or is likely to have a significant impact on a matter of MNES' is defined as a 'controlled action', and requires approval from the Commonwealth Department of Agriculture, Water and the Environment (DAWE), which is responsible for administering the EPBC Act (DotE 2013).

The process includes an assessment for listed threatened species and ecological communities that will be affected as a result of the proposed action. A likelihood of occurrence for each threatened species and ecological community that could potentially occur on the subject land has been provided in **Appendix C:**. The Commonwealth has developed Significant impact guidelines (DotE 2013) and species-specific referral guidelines that outline a number of criteria, to provide assistance in assessing impacts on MNES and help decide whether or not a referral to the Commonwealth is required.

It was determined (**Appendix C:**) that that one threatened species listed under the EPBC Act is likely to occur within the subject land or be impacted by the proposed development. As such, a test of significance was carried out for this species.

The species addressed in this assessment is:

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

It is noted that one planted *Eucalyptus scoparia* (Wallangarra White Gum) was identified within the subject site. This species is listed as vulnerable under the EPBC Act. This individual tree is a horticultural planting species as Wallangarra White Gum is a commonly planted tree and in this location is significantly outside of its natural distribution, which is a very limited area around the NSW-Queensland border near Tenterfield. As such, it was determined that a test of significance would not be required for this species.

2.4.1.1 Pteropus poliocephalus (Grey-headed Flying-fox)

The Grey-headed Flying-fox (GHFF) is listed as a vulnerable species under the EPBC Act.

This species utilises a wide variety of habitats (including disturbed areas) for foraging and have been recorded travelling long distances on feeding forays. Fruits and flowering plants of a wide variety of species are the main food source. The species roosts in large 'camps' of up to 200,000 individuals. Camps are usually formed close to water and along gullies, however, the species has been known to form camps in urban areas.

There is one camp located within 10 km of the development site (DAWE 2020b). This camp is listed below:

- Yatteyattah camp – approximately 7.37 km to the north-east

Table 8: EPBC Act test of significance for *Pteropus poliocephalus* (Grey-headed Flying Fox)

Criterion	Question	Response
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:		
1)	lead to a long-term decrease in the size of an important population of a species	The Matters of National Environmental Significance Impact Guidelines 1.1 (Commonwealth of Australia, 2013) defines an important population as a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are: • Key source populations either for breeding or dispersal • Populations that are necessary for maintaining genetic diversity, and/or • Populations that are near the limit of the species range The development site does not provide habitat for a breeding camp however it could provide marginal foraging habitat for travelling Flying-foxes. Considering the small size of the impact and the amount of more suitable foraging habitat in the locality, it is considered unlikely that action will result on a long-term decrease in the size of an important population.
2)	reduce the area of occupancy of an important population	Considering the small size of the impacted marginal foraging habitat (0.15 ha) and the amount of other suitable areas of occupancy in the locality, it is considered unlikely that the proposed development will result in a long-term reduction of an area of occupancy of an important population.
3)	fragment an existing important population into two or more populations	The marginal foraging habitat to be removed is considered of low importance relative to nearby potential foraging habitat, such as that located in either Narrawallee Creek Nature Reserve or Yatteyattah Nature Reserve. Whilst the potential foraging habitat may contribute as a 'stepping stone' for this highly mobile species to other more substantial foraging habitat sites, this function is unlikely to be significantly inhibited by the proposed works as habitat will be remaining in the patch of native vegetation to the west of the development site. Furthermore, this species has been recorded in urban environments and is likely to continue to forage adjacent to the development site and across the broader locality. Therefore, the proposed works are unlikely to fragment an existing important population into two or more populations.
4)	adversely affect habitat critical to the survival of a species	Foraging habitat critical to the survival of this species includes natural habitat that is productive during winter and spring when food bottlenecks have been identified, known to support populations of > 30,000 individuals within a 50km radius, productive during the final stages of gestation, during the weeks of birth, lactation and conception (September to May), productive during the final stages of fruit development and ripening in commercial crops affected by GHFF, and known to support a continuously occupied camp (DECCW 2009). The vegetation to be removed represents a small amount of potential foraging

Criterion	Question	Response
		resources (0.15 ha) in the locality. Potential foraging habitat will persist in close proximity to the development site. Given that this species is highly mobile (traveling up to 50 km to forage), it is considered unlikely that the works would adversely affect habitat critical to the survival of this species
5)	disrupt the breeding cycle of an important population	The nearest active GHFF camp occurs approximately 7.37 km to the north-west of the development site at the Yatteyattah camp (DAWE 2020b). Considering this distance, the marginal nature of the foraging resources in the development site, and the amount other suitable foraging resources in the locality it is considered unlikely that the action will disrupt the breeding cycle of an important population.
6)	modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Given the small amount of potential foraging habitat to be removed relative to the amount remaining in the locality, it is considered likely that potential foraging habitat will persist adjacent to the development site and across the locality. This species is highly mobile, and it is unlikely that the habitat to be removed would cause the species to decline. Furthermore, according to the National Flying-fox Monitoring Program, no GHFF camps currently occur within the development site (DAWE 2020b). The nearest active GHFF camp occurs approximately 10.3 km to the north-east of the development site at the Wetherill Park camp (DAWE 2020). Therefore, no known GHFF roosting camps for this species will be impacted by the proposed works.
7)	result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	The proposed developing will not result in invasive species that are harmful to the species being present within the development site.
8)	introduce disease that may cause the species to decline, or	The proposed works will not result in the introduction of a disease that is harmful to the GHFF.
9)	interfere substantially with the recovery of the species.	Considering the above factors, the proposed works will not interfere substantially with the recovery of the species.
Conclusion	Is there likely to be a significant impact?	Taking the above points into consideration, the proposed development is unlikely to have a significant impact on the GHFF. One camp is located within approximately 7.37 km of the development site however it is unlikely that the 0.15 ha of marginal foraging habitat is vital to the survival of this camp. With Narrawallee Creek Nature Reserve and Yatteyattah Nature Reserve both acting as areas of potential foraging habitat, it is unlikely that the proposed development will result in a significant impact under the EPBC Act for the GHFF.

2.4.2 State Environmental Planning Policy (Koala Habitat Protection) 2020 (Koala SEPP)

The State Environmental Planning Policy (Koala Habitat Protection) 2020 (Koala SEPP) provides for the conservation and management of areas of natural vegetation that provide habitat for koalas to ensure a permanent free-living population over their present range and reverse the current trend of koala

population decline. The Koala SEPP applies to the subject land as it occurs in Shoalhaven City Council, which is one of the local government areas listed in Schedule 1, and it is over 1 ha in size.

The Koala SEPP outlines steps for determining if land to which it applies contains core koala habitat. The first step is to determine if the land is potential koala habitat. This is defined as areas of native vegetation where trees of the types listed in Schedule 2 constitute at least 15% of the total number of trees in the upper or lower strata of the tree component. The only trees within the subject land which are listed in Schedule 2 are:

- a single *Eucalyptus punctata* (Grey Gum) in the garden bed in the middle of the carpark round-about (Patch 7 description in **Section 1.3.1**)
- two *Eucalyptus punctata* (Grey Gum) in the shade trees planted around paved playground area and amongst buildings (Patch 9 description in **Section 1.3.1**)
- two small *Eucalyptus robusta* (Swamp Mahogany), approximately 5 m tall, on the western edge of the subject land (Patch 13 description in **Section 1.3.1**).

Together these trees account for 8% of the tree on site (based on the total listed in the Arborists Report (Allied Tree Consultancy, 2020)). Therefore, the subject land is not considered to contain potential koala habitat and a Koala Management Plan is not required to be prepared as a part of the development application.

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Appendix A: Definitions

Terminology	Definition
Biodiversity credit report	The report produced by the Credit Calculator that sets out the number and class of biodiversity credits required to offset the remaining adverse impacts on biodiversity values at a development site, or on land to be biodiversity certified, or that sets out the number and class of biodiversity credits that are created at a biodiversity stewardship site.
BioNet Atlas	The BioNet Atlas (formerly known as the NSW Wildlife Atlas) is the OEH database of flora and fauna records. The Atlas contains records of plants, mammals, birds, reptiles, amphibians, some fungi, some invertebrates (such as insects and snails) and some fish
Broad condition state:	Areas of the same PCT that are in relatively homogenous condition. Broad condition is used for stratifying areas of the same PCT into a vegetation zone for the purpose of determining the vegetation integrity score.
Connectivity	The measure of the degree to which an area(s) of native vegetation is linked with other areas of vegetation.
Credit Calculator	The computer program that provides decision support to assessors and proponents by applying the BAM, and which calculates the number and class of biodiversity credits required to offset the impacts of a development or created at a biodiversity stewardship site.
Development	Has the same meaning as development at section 4 of the EP&A Act, or an activity in Part 5 of the EP&A Act. It also includes development as defined in section 115T of the EP&A Act.
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 EP&A Act.
Ecosystem credits	A measurement of the value of EECs, CEECs and threatened species habitat for species that can be reliably predicted to occur with a PCT. Ecosystem credits measure the loss in biodiversity values at a development site and the gain in biodiversity values at a biodiversity stewardship site.
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.
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 5 cm; (c) the hollow appears to have depth (i.e. you cannot see solid wood beyond the entrance); (d) the hollow is at least 1 m above the ground. Trees must be examined from all angles.
Important wetland	A wetland that is listed in the Directory of Important Wetlands of Australia (DIWA) and SEPP 14 Coastal Wetlands
Linear shaped development	Development that is generally narrow in width and extends across the landscape for a distance greater than 3.5 kilometres in length
Local population	The population that occurs in the study area. In cases where multiple populations occur in the study area or a population occupies part of the study area, impacts on each subpopulation must be assessed separately.
Local wetland	Any wetland that is not identified as an important wetland (refer to definition of Important wetland).
Mitchell landscape	Landscapes with relatively homogeneous geomorphology, soils and broad vegetation types, mapped at a scale of 1:250,000.

Terminology	Definition
Multiple fragmentation impact development	Developments such as wind farms and coal seam gas extraction that require multiple extraction points (wells) or turbines and a network of associated development including roads, tracks, gathering systems/flow lines, transmission lines
Operational Manual	The Operational Manual published from time to time by OEH, which is a guide to assist assessors when using the BAM
Patch size	An area of intact native vegetation that: a) occurs on the development site or biodiversity stewardship site, and b) includes native vegetation that has a gap of less than 100 m from the next area of native vegetation (or ≤30 m for non-woody ecosystems). Patch size may extend onto adjoining land that is not part of the development site or stewardship site..
Proponent	A person who intends to apply for consent to carry out development or for approval for an activity.
Reference sites	The relatively unmodified sites that are assessed to obtain local benchmark information when benchmarks in the Vegetation Benchmarks Database are too broad or otherwise incorrect for the PCT and/or local situation. Benchmarks can also be obtained from published sources.
Regeneration	The proportion of over-storey species characteristic of the PCT that are naturally regenerating and have a diameter at breast height <5 cm within a vegetation zone.
Remaining impact	An impact on biodiversity values after all reasonable measures have been taken to avoid and minimise the impacts of development. Under the BAM, an offset requirement is calculated for the remaining impacts on biodiversity values.
Retirement of credits	The purchase and retirement of biodiversity credits from an already-established biobank site or a biodiversity stewardship site secured by a biodiversity stewardship agreement.
Riparian buffer	Riparian buffers applied to water bodies in accordance with the BAM
Sensitive biodiversity values land map	Development within an area identified on the map requires assessment using the BAM.
Site attributes	The matters assessed to determine vegetation integrity. They include: native plant species richness, native over-storey cover, native mid-storey cover, native ground cover (grasses), native ground cover (shrubs), native ground cover (other), exotic plant cover (as a percentage of total ground and mid-storey cover), number of trees with hollows, proportion of over-storey species occurring as regeneration, and total length of fallen logs.
Site-based development	a development other than a linear shaped development, or a multiple fragmentation impact development
Species credits	The class of biodiversity credits created or required for the impact on threatened species that cannot be reliably predicted to use an area of land based on habitat surrogates. Species that require species credits are listed in the Threatened Biodiversity Data Collection.
Subject land	Is land to which the BAM is applied in Stage 1 to assess the biodiversity values of the land. It includes land that may be a development site, clearing site, proposed for biodiversity certification or land that is proposed for a biodiversity stewardship agreement.
Threatened Biodiversity Data Collection	Part of the BioNet database, published by OEH and accessible from the BioNet website.
Threatened species	Critically Endangered, Endangered or Vulnerable threatened species as defined by Schedule 1 of the BC Act, or any additional threatened species listed under Part 13 of the EPBC Act as Critically Endangered, Endangered or Vulnerable.

Terminology	Definition
Vegetation Benchmarks Database	A database of benchmarks for vegetation classes and some PCTs. The Vegetation Benchmarks Database is published by OEH and is part of the BioNet Vegetation Classification.
Vegetation zone	A relatively homogenous area of native vegetation on a development site, land to be biodiversity certified or a biodiversity stewardship site that is the same PCT and broad condition state.
Wetland	An area of land that is wet by surface water or ground water, or both, for long enough periods that the plants and animals in it are adapted to, and depend on, moist conditions for at least part of their life cycle. Wetlands may exhibit wet and dry phases and may be wet permanently, cyclically or intermittently with fresh, brackish or saline water
Woody native vegetation	Native vegetation that contains an over-storey and/or mid-storey that predominantly consists of trees and/or shrubs

Appendix B: Plant species list

Family	Species	Common Name	Growth Form Group (native species only)
Agavaceae	*Agave attenuata**	Foxglove Agave	
Anacardiaceae	*Harpephyllum caffrum**	Kaffir Plum	
Anthericaceae	*Chlorophytum comosum**	Spider Plant	
Apocynaceae	*Araujia sericifera***	Moth Vine	
	*Gomphocarpus fruticosus**	Narrow-leaved Cotton Bush	
	Parsonsia straminea	Common Silkpod	Other (OG)
Asteraceae	*Ageratina adenophora***	Crofton Weed	
	Bidens pilosa var. *pilosa**	Cobblers Pegs	
	*Cirsium vulgare**	Spear Thistle	
	Conyza sp.*	Fleabane	
	Cotula australis	Common Cotula	Forb (FG)
	*Gamochaeta calviceps**	Cudweed	
	*Gamochaeta purpurea**	Purple Cudweed	
	*Hypochaeris radicata**	Catsear	
	*Sonchus oleraceus**	Common Sowthistle	
	*Taraxacum officinale**	Dandelion	
Brassicaceae	*Lepidium didymum**	Lesser Swinecress	
Campanulaceae	*Wahlenbergia gracilis*	Sprawling Bluebell	Forb (FG)
Caryophyllaceae	*Cerastium glomeratum**	Mouse-ear Chickweed	
	*Polycarpon tetraphyllum**	Four-leaved Allseed	
	*Stellaria media**	Common Chickweed	
Casuarinaceae	*Allocasuarina littoralis*	Black She-Oak	Tree (TG)
	Casuarina glauca	Swamp Oak	Tree (TG)
Chenopodiaceae	*Chenopodium album**	Fat Hen	
	Einadia trigonos subsp. *trigonos*		Forb (FG)
Convolvulaceae	*Dichondra repens*	Kidney Weed	Forb (FG)
Euphorbiaceae	*Euphorbia peplus**	Petty Spurge	
	Euphorbia dallachyana	Mat Spruge	Forb (FG)
Fabaceae (Caesalpinioideae)	*Senna pendula***		
Fabaceae (Faboideae)	*Erythrina crista-galli***	Cockspur Coral Tree	
	*Trifolium arvense**	Haresfoot Clover	
	*Trifolium repens**	White Clover	
	*Wisteria sinensis**	Chinese wisteria	
Fabaceae (Mimosoideae)	*Acacia floribunda*	White Sally	Shrub (SG)
	Acacia melanoxylon	Blackwood	Tree (TG)
Lamiaceae	*Stachys arvensis**	Stagger Weed	
Lomandraceae	*Lomandra longifolia*	Spiny-headed Mat-rush	Grass & grasslike (GG)
Malvaceae	*Modiola caroliniana**	Red-flowered Mallow	
	*Sida rhombifolia**	Paddy's Lucerne	
Meliaceae	*Melia azedarach*	White Cedar	Tree (TG)
Myrtaceae	*Acmena smithii*	Lilly Pilly	Tree (TG)
	Callistemon rigidus	Stiff Bottlebrush	Shrub (SG)
	Callistemon salignus	Willow Bottlebrush	Shrub (SG)
	Callistemon pallidus	Yellow Bottlebrush	Shrub (SG)
	Callistemon viminalis	Weeping Bottlebrush	Tree (TG)
	Corymbia maculata	Spotted Gum	Tree (TG)

Family	Species	Common Name	Growth Form Group (native species only)
	Eucalyptus longifolia	Woollybutt	Tree (TG)
	Eucalyptus punctata	Grey Gum	Tree (TG)
	Eucalyptus robusta	Swamp Mahogany	Tree (TG)
	Eucalyptus saligna	Sydney Blue Gum	Tree (TG)
	Eucalyptus scoparia	Wallangarra White Gum	Tree (TG)
	Leptospermum petersonii	Lemon-scented Teatree	Shrub (SG)
	Lophostemon confertus	Brush Box	Tree (TG)
	Melaleuca hypericifolia	Hillock bush	Shrub (SG)
	Melaleuca quinquenervia	Broad-leaved Paperbark	Tree (TG)
	Melaleuca styphelioides	Prickly-leaved Tea Tree	Shrub (SG)
	Syzygium sp.	Lilly Pilly	Shrub (SG)
	Tristaniopsis laurina	Water Gum	Tree (TG)
Ochnaceae	*Ochna serrulata***	Mickey Mouse Plant	
Oleaceae	*Fraxinus angustifolia**	Claret Ash	
	*Fraxinus griffithii**	Ash	
	*Ligustrum sinense***	Small-leaved Privet	
Oxalidaceae	*Oxalis perennans*		Forb (FG)
Phormiaceae	*Dianella caerulea* var. *caerulea*		Forb (FG)
Phytolaccaceae	*Phytolacca octandra**	Inkweed	
Pittosporaceae	*Hymenosporum flavum*	Native Frangipani	Shrub (SG)
	Pittosporum undulatum	Sweet Pittosporum	Shrub (SG)
Plantaginaceae	*Plantago lanceolata**	Lamb's Tongues	
Poaceae	*Anthoxanthum odoratum**	Sweet Vernal Grass	
	*Bromus catharticus**	Praire Grass	
	*Cenchrus clandestinus***	Kikuyu Grass	
	Cynodon dactylon	Common Couch	Grass & grasslike (GG)
	*Ehrharta erecta***	Panic Veldtgrass	
	*Holcus lanatus**	Yorkshire Fog	
	*Paspalum dilatatum***	Paspalum	
	*Poa annua**	Winter Grass	
Polygonaceae	*Acetosa sagittata***	Rambling Dock	
	Persicaria decipiens	Slender Knotweed	Forb (FG)
	*Rumex conglomeratus**	Clustered Dock	
Primulaceae	*Lysimachia arvensis**	Scarlet Pimpernel	
Proteaceae	*Banksia spinulosa*	Hairpin Banksia	Shrub (SG)
Ranunculaceae	*Ranunculus repens***	Creeping Buttercup	
Rosaceae	*Rubus anglocandicans***	Blackberry	
Rubiaceae	*Galium aparine**	Goosegrass	
Salicaceae	*Populus nigra**	Lombardy Poplar	Tree (TG)
Sapindaceae	*Acer rubrum**	Red Maple	
	Cupaniopsis anacardioides	Tuckeroo	Tree (TG)
Solanaceae	*Solanum nigrum**	Black-berry Nightshade	
Theaceae	*Camellia japonica**	Camellia	
Typhaceae	*Typha domingensis*	Narrow-leaved Cumbungi	Grass & grasslike (GG)
Verbenaceae	*Verbena rigida* var. *rigida**	Veined Verbena	

* exotic species

** high threat weed

Appendix C: Likelihood of Occurrence

An assessment of likelihood of occurrence was made for threatened species (**Table 10**) and threatened ecological communities (**Table 9**) identified from a database search (EPBC Act Protected Matters Search Tool Report (DAWE 2020a) and NSW BioNet Atlas records (DPIE 2020c). Five terms for the likelihood of occurrence of species are used in this report. This assessment was based on database or other records, presence or absence of suitable habitat, features of the proposal site, results of the field survey and professional judgement. The assessment refers to the subject land only. The terms for likelihood of occurrence are defined below:

- "yes" = the species was or has been observed on the site
- "likely" = a medium to high probability that a species uses the site
- "potential" = suitable habitat for a species occurs on the site, but there is insufficient information to categorise the species as likely to occur, or unlikely to occur
- "unlikely" = a very low to low probability that a species uses the study area, and
- "no" = habitat on site and in the vicinity is unsuitable for the species.

A test of significance was conducted for threatened species or ecological communities, listed under the EPBC Act, that were recorded within the study area or had a higher likelihood of occurring and were not recorded during the site visit. It is noted that some threatened fauna species that are highly mobile, wide ranging and vagrant may use portions of the study area intermittently for foraging. For these fauna species, the habitat present and likely to be impacted is not considered to be important to the threatened species, particularly in relation to the amount of similar habitat remaining in the surrounding landscape. As such, a test of significance in reference to Commonwealth legislation was not considered necessary.

The records column refers to the number of records occurring within 5 km of the study area, as provided by the BioNet Atlas and Protected Matters Search Tool database search.

Information provided in the habitat associations' column has primarily been extracted (and modified) from the Commonwealth Species Profile and Threats Database and the NSW Threatened Species Data Collection.

Table 9: Likelihood of occurrence table for threatened ecological communities.

Scientific Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Likelihood of Occurrence
ECOLOGICAL COMMUNITIES				
Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South East Queensland	E	E	The structure of the community may vary from open forests to low woodlands, scrubs or reedlands with scattered trees. It has a dense to sparse tree layer in which *Casuarina glauca* (swamp oak) is the dominant species northwards from Bermagui. Other trees including *Acmena smithii* (lilly pilly), *Glochidion spp.* (cheese trees) and *Melaleuca spp.* (paperbarks) may be present as subordinate species and are found most frequently in stands of the community northwards from Gosford. *Melaleuca ericifolia* is the only abundant tree in this community south of Bermagui. The understorey is characterised by frequent occurrences of vines, *Parsonsia straminea, Geitonoplesium cymosum* and *Stephania japonica var. discolor,* a sparse cover of shrubs, and a continuous groundcover of forbs, sedges, grasses and leaf litter. The composition of the ground stratum varies depending on levels of salinity in the groundwater.	No - this community was not identified within the study area during field survey.
Illawarra Subtropical Rainforest in the Sydney Basin Bioregion	E		Characteristic tree species include *Baloghia inophylla* (Brush Bloodwood), *Brachychiton acerifolius* (Flame Tree), *Dendrocnide excelsa* (Giant Stinging Tree), *Diploglottis australis* (Native Tamarind), *Ficus* spp., *Pennantia cunninghamii* (Brown Beech), and *Toona ciliata* (Red Cedar). Species of *Eucalyptus, Syncarpia* and *Acacia* may also be present as emergents or incorporated into the dense canopy. While rainforest canopies are generally closed, in highly disturbed stands the canopy of ISR may be irregular and open. The height of the canopy varies considerably, and structurally some stands of ISR are scrub. Illawarra coastal plain and escarpment foothills, rarely extending onto the upper escarpment slopes. Recorded from the local government areas of Wollongong, Shellharbour, Shoalhaven and Kiama. Mainly occurs between Albion Park and Gerringong, but outlying occurrences extend south to the Shoalhaven River and west into the Kangaroo Valley.	No - this community was not identified within the development site during field survey.
Littoral Rainforest and Coastal Vine Thickets of Eastern Australia	E	CE	Typically is a closed canopy of trees that can be interspersed with canopy gaps that are common in exposed situations or with storm events. The canopy forms a mosaic due to canopy regeneration, typically in the form of basal coppice following canopy decapitation due to prevailing salt laden winds and storm events. Emergents may be present, for example, Banksia or *Eucalyptus*. The ground stratum of the vegetation typically is very sparse. Typically occurs within two kilometres of the coast; in NSW, found in the NSW North Coast, Sydney Basin and South East Corner bioregions.	No - this community was not identified within the development site during field survey.

Scientific Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Likelihood of Occurrence
Lowland Grassy Woodland in the South East Corner Bioregion	E	CE	Typically the community comprises an open tree canopy, a near-continuous groundcover dominated by grasses and herbs, sometimes with layers of shrubs and/or small trees. Undisturbed stands of the community may have a woodland or forest structure. Small trees or saplings may dominate the community in relatively high densities after partial or total clearing. The community also includes 'derived' native grasslands which result from removal of the woody strata from the woodlands and forests. Rainshadow areas of the south coast and hinterland of New South Wales. Currently known to occur within the Bega Valley, Eurobodalla and Palerang Local Government Areas.	No - this community was not identified within the development site during field survey.
Natural Temperate Grassland of the South Eastern Highlands		CE	Natural temperate grassland is grassy vegetation dominated by moderately tall (25–50 cm) to tall (50–100 cm), dense to open tussock grasses in the genera Aus*trodanthonia, Austrostipa, Bothriochloa, Poa* and *Themeda*. Up to 70% of all plant species may be forbs (i.e. herbaceous, non-grassy/non-grass-like plants). The community may be treeless or contain up to 10% cover of trees, shrubs or sedges Generally corresponds with the Monaro, Murrumbateman, Bungonia and Crookwell subregions of the South Eastern Highlands bioregion. Remnants are known to be located in various sub-regions of the Hawkesbury/Nepean, Lachlan, Murrumbidgee and Southern Rivers Catchment Management Regions of NSW.	No - this community was not identified within the development site during field survey.
River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E	E	The structure of the community may vary from tall open forests (>40m) to woodlands. The most widespread and abundant dominant trees include *Eucalyptus tereticornis* (forest red gum), *E. amplifolia* (cabbage gum), *Angophora floribunda* (rough-barked apple) and *A. subvelutina* (broad-leaved apple). *Eucalyptus baueriana* (blue box), *E. botryoides* (bangalay) and *E. elata* (river peppermint) may be common south from Sydney. *E. ovata* (swamp gum) occurs on the far south coast, *E. saligna* (Sydney blue gum) and *E. grandis* (flooded gum) may occur north of Sydney, while *E. benthamii* is restricted to the Hawkesbury floodplain. A layer of small trees may be present, including *Melaleuca decora*, *M. styphelioides* (prickly-leaved teatree), *Backhousia myrtifolia* (grey myrtle), *Melia azadarach* (white cedar), *Casuarina cunninghamiana* (river oak) and *C. glauca* (swamp oak). Scattered shrubs include *Bursaria spinosa*, *Solanum prinophyllum, Rubus parvifolius, Breynia oblongifolia, Ozothamnus diosmifolius, Hymenanthera dentata, Acacia floribunda* and *Phyllanthus gunnii*. The groundcover is composed of abundant forbs, scramblers and grasses. Found on the river flats of the coastal floodplains. Known from parts of the Local Government Areas of Port Stephens, Maitland, Singleton, Cessnock, Lake Macquarie, Wyong, Gosford, Hawkesbury, Baulkham Hills, Blacktown, Parramatta, Penrith, Blue Mountains, Fairfield, Holroyd, Liverpool,	No - this community was not identified within the development site during field survey.

Scientific Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Likelihood of Occurrence
			Bankstown, Wollondilly, Camden, Campbelltown, Sutherland, Wollongong, Shellharbour, Kiama, Shoalhaven, Palerang, Eurobodalla and Bega Valley.	
Subtropical and Temperate Coastal Saltmarsh		V	Consists mainly of salt-tolerant vegetation (halophytes) including: grasses, herbs, sedges, rushes and shrubs. Succulent herbs, shrubs and grasses generally dominate and vegetation is generally of less than 0.5 m height (with the exception of some reeds and sedges). Many species of non - vascular plants are also found in saltmarsh, including epiphytic algae, diatoms and cyanobacterial mats.In New South Wales, the lower intertidal zone is often dominated by herbs and grasses (e.g. *Sarcocornia quinqueflora, Sporobolus viginicus, Samolus repens* and *Triglochin striata*) which give way to tall sedges and rushes in the landward sections of the intertidal zone. Within a relatively narrow margin of the Australian coastline, within the subtropical and temperate climatic zones south of the South-east Queensland IBRA bioregion.	No - this community was not identified within the development site during field survey.

Table 10: Likelihood of occurrence table for threatened fauna and flora species.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Likelihood of Occurrence
FAUNA					
Actitis hypoleucos	Common Sandpiper		M	Summer migrant. In NSW, widespread along coastline and also occurs in many areas inland. Coastal wetlands and some inland wetlands, especially muddy margins or rocky shores. Also estuaries and deltas, lakes, pools, billabongs, reservoirs, dams and claypans, mangroves.	No - suitable habitat not identified within the development
Anous stolidus	Common Noddy		M	Casual visitor to coastal NSW. Marine.	No - suitable habitat not identified within the development site.
Apus pacificus	Fork-tailed Swift		M	Recorded in all regions of NSW. Riparian woodland., swamps, low scrub, heathland, saltmarsh, grassland, Spinifex sandplains, open farmland and inland and coastal sand-dunes.	Unlikely - suitable habitat not identified within the development site.
Anthochaera phrygia	Regent Honeyeater	E4A	CE	Inland slopes of south-east Australia, and less frequently in coastal areas. In NSW, most records are from the North-West Plains, North-West and South-West Slopes, Northern Tablelands, Central Tablelands and Southern Tablelands regions; also recorded in the Central Coast and Hunter Valley regions. Eucalypt woodland and open forest, wooded farmland and urban areas with mature eucalypts, and riparian forests of Casuarina cunninghamiana (River Oak).	Unlikely - suitable habitat not identified within the development site.
Arctocephalus pusillus doriferus	Australian Fur-seal	V		Reported to have bred at Seal Rocks, near Port Stephens and Montague Island in southern NSW. Haul outs are observed at isolated places along the NSW coast. Rocky parts of islands with flat, open terrain.	No - suitable habitat not identified within the development site.
Ardea alba	Great Egret		M	Widespread, occurring across all states/territories. Also a vagrant on Lord Howe and Norfolk Island. Swamps and marshes, grasslands, margins of rivers and lakes, salt pans, estuarine mudflats and other wetland habitats.	Unlikely - suitable habitat not identified within the development site.
Ardea ibis	Cattle Egret		M	Widespread and common across NSW. Grasslands, wooded lands and terrestrial wetlands.	Unlikely - suitable habitat not identified within the development site.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Likelihood of Occurrence
Ardenna carneipes	Flesh-footed Shearwater	V	M	Recorded in NSW coastal waters. Breeds on Lord Howe Island. Marine.	No - suitable habitat not identified within the development site.
Ardenna grisea	Sooty Shearwater		M	Breeds on islands off NSW from Montague Island to Broughton Island. Present off eastern NSW mainly October-February. Islands, offshore.	No - suitable habitat not identified within the development site.
Ardenna tenuirostris	Short-tailed Shearwater		M	Breeds on islands north to Broughton Island off NSW. Commonly observed south of coastal northern NSW during summer. Islands, offshore.	No - suitable habitat not identified within the development site.
Balaenoptera musculus	Blue Whale	E1	E, M	Between 20 degrees to 70 degrees South including NSW waters. Marine.	No - suitable habitat not identified within the development site.
Botaurus poiciloptilus	Australasian Bittern	E1	E	Found over most of NSW except for the far north-west. Permanent freshwater wetlands with tall, dense vegetation, particularly *Typha* spp. (bullrushes) and *Eleocharis* spp. (spikerushes).	Unlikely - suitable habitat not identified within the development site.
Calidris acuminata	Sharp-tailed Sandpiper		M	Summer migrant. Widespread in most regions of NSW, especially in coastal areas, but sparse in the south-central Western Plain and east Lower Western Regions. Shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation.	Unlikely - suitable habitat not identified within the development site.
Calidris canutus	Red Knot		E, M	Summer migrant to Australia. In NSW, widespread in suitable habitat along the coast. Occasionally recorded inland in all regions. Intertidal mudflats, sandflats sheltered sandy beaches, estuaries, bays, inlets, lagoons, harbours, sandy ocean beaches, rock platforms, coral reefs, terrestrial saline wetlands near the coast, sewage ponds and saltworks. Rarely inland lakes or swamps.	Unlikely - suitable habitat not identified within the development site.
Calidris ferruginea	Curlew Sandpiper	E1	CE, M	Occurs along the entire coast of NSW, and sometimes in freshwater wetlands in the Murray-Darling Basin. Littoral and estuarine habitats, including intertidal mudflats, non-tidal swamps, lakes and lagoons on the coast and sometimes inland.	Unlikely - suitable habitat not identified within the development site.
Callocephalon fimbriatum	Gang-gang Cockatoo population in	E2,V		The population is believed to be largely confined to an area bounded by Thornleigh and Wahroonga in the north, Epping and North Epping in the south, Beecroft and	No - development site is too far from known distribution.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Likelihood of Occurrence
	the Hornsby and Ku-ring-gai Local Government Areas			Cheltenham in the west and Turramurra/South Turramurra to the east. Forest and woodland, urban fringes.	
Callocephalon fimbriatum	Gang-gang Cockatoo	V		In NSW, distributed from the south-east coast to the Hunter region, and inland to the Central Tablelands and south-west slopes. Isolated records known from as far north as Coffs Harbour and as far west as Mudgee. Tall mountain forests and woodlands in summer; in winter, may occur at lower altitudes in open eucalypt forests and woodlands, and urban areas.	Unlikely - suitable habitat not identified within the development site.
Calonectris leucomelas	Streaked Shearwater		M	Regular summer visitor south to Wollongong, less common further south. Marine.	Unlikely - suitable habitat not identified within the development site.
Calyptorhynchus lathami	Glossy Black-Cockatoo, Riverina population	E2,V		Within the Narrandera Range and to the north-west in the Brobenah Hills, McPhersons Range, Cocoparra Range, Lachlan Range and Jimberoo State Forests, and the Naradhan Range. Largely restricted to hills and low ridges where suitable stands of its food plant Allocasuarina verticillata (Drooping Sheoak) remain.	No - development site is too far from known distribution.
Calyptorhynchus lathami	Glossy Black-Cockatoo	V		In NSW, widespread along coast and inland to the southern tablelands and central western plains, with a small population in the Riverina. Open forest and woodlands of the coast and the Great Dividing Range where stands of sheoak occur.	Unlikely - suitable habitat not identified within the development site.
Carcharias taurus	Grey Nurse Shark	E4A	CE	The Australian east coast population is found predominantly in inshore coastal waters along the coast of NSW and southern Qld, from Montague Island to Fraser Island. Temperate inshore coastal waters. Key habitat sites along the coast of NSW and southern Qld generally have sandy-bottomed gutters or rocky caves and are in the vicinity of inshore rocky reefs or islands.	No - suitable habitat not identified within the development site.
Carcharodon carcharias	Great White Shark	V	V, M	Distribution includes the coastal waters of NSW. Inshore waters around rocky reefs and islands, and often near seal colonies.	No - suitable habitat not identified within the development site.
Daphoenositta chrysoptera	Varied Sittella	V		Distribution in NSW is nearly continuous from the coast to the far west. Inhabits eucalypt forests and woodlands, mallee and *Acacia* woodland.	Unlikely - one record had been made within a 5km radius. This record was from 2011. This

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Likelihood of Occurrence
					record is located in a large patch of intact vegetation. Should this individual still be alive, it is likely that they would prioritise the vegetation it was recorded in over the fragmented planted vegetation within the development site.
Dasyornis brachypterus	Eastern Bristlebird	E1	E	There are three main populations: Northern - southern Qld/northern NSW, Central - Barren Ground NR, Budderoo NR, Woronora Plateau, Jervis Bay NP, Booderee NP and Beecroft Peninsula and Southern - Nadgee NR and Croajingalong NP in the vicinity of the NSW/Victorian border. Central and southern populations inhabit heath and open woodland with a heathy understorey. In northern NSW, habitat comprises open forest with dense tussocky grass understorey.	Unlikely - suitable habitat not identified within the development site.
Dermochelys coriacea	Leatherback Turtle	E1	E, M	All coastal waters of Australia. Large numbers feed in coastal waters south to the central coast of NSW. Occasional breeding records from NSW coast, including between Ballina and Lennox Head in northern NSW. Marine. Nesting occurs on beaches.	No - suitable habitat not identified within the development site.
Diomedea antipodensis	Antipodean Albatross	V	V	Regularly occurs off the NSW south coast from Green Cape to Newcastle during winter. Marine.	No - suitable habitat not identified within the development site.
Diomedea antipodensis gibsoni	Antipodean Albatross	V	V	Regularly occurs off the NSW south coast from Green Cape to Newcastle during winter. Marine.	No - suitable habitat not identified within the development site.
Diomedea exulans	Wandering Albatross	E1	V, M	Has been recorded along the length of the NSW coast. Marine.	No - suitable habitat not identified within the development site.
Diomedea gibsoni	Gibson's Albatross	V	V	Regularly occurs off the NSW coast usually between Green Cape and Newcastle. Marine.	No - suitable habitat not identified within the development site.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Likelihood of Occurrence
Epinephelus daemelii	Black Rockcod	V	V	Along the entire NSW coast including Lord Howe Island. Caves, gutters and beneath bomboras on rocky reefs. Small juveniles are often found in coastal rock pools, and larger juveniles around rocky shores in estuaries.	No - suitable habitat not identified within the development site.
Epthianura albifrons	White-fronted Chat population in the Sydney Metropolitan Catchment Management Area	E2		Two isolated sub-populations known from the Sydney Metropolitan Catchment Management Authority area; one at Newington Nature Reserve on the Parramatta River and one at Towra Point Nature Reserve in Botany Bay Saltmarsh of Newington Nature Reserve and in grassland on the northern bank of the Parramatta River. Saltmarsh and on the sandy shoreline of a small island of Towra Point Nature Reserve.	No - the development site is too far from the known distribution of this population.
Epthianura albifrons	White-fronted Chat	V		Occurs mostly in the southern half of the state, in damp open habitats along the coast, and near waterways in the western part of the state. Saltmarsh vegetation, open grasslands and sometimes low shrubs bordering wetland areas.	Unlikely - one record has been made with a 5 km radius of the development site. This record was made in 1983. It is unlikely that this individual is still occupying the 5 km radius.
Falco hypoleucos	Grey Falcon	E1		Arid and semi-arid zones. In NSW, found chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range. Shrubland, grassland and wooded watercourses, occasionally in open woodlands near the coast, and near wetlands.	Unlikely - suitable habitat not identified within the development site.
Fregetta grallaria grallaria	White-bellied Storm-Petrel	V	V	Vagrant birds occur in coastal NSW waters, particularly after storm events. Marine.	No - suitable habitat not identified within the development site.
Gallinago hardwickii	Latham's Snipe		M	Migrant to east coast of Australia, extending inland west of the Great Dividing Range in NSW. Freshwater, saline or brackish wetlands up to 2000 m above sea-level; usually freshwater swamps, flooded grasslands or heathlands.	No - suitable habitat not identified within the development site.
Glossopsitta pusilla	Little Lorikeet	V		In NSW, found from the coast westward as far as Dubbo and Albury. Dry, open eucalypt forests and woodlands, including remnant woodland patches and roadside vegetation.	Unlikely - vegetation within the development site lack substantial cover and diversity. The one record that has been within a 5 km radius of the

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Likelihood of Occurrence
					development site is located in a Narrawallee Creek NR where the vegetation is more likely to provide substantial foraging habitat.
Grantiella picta	Painted Honeyeater	V	V	Widely distributed in NSW, predominantly on the inland side of the Great Dividing Range but avoiding arid areas. Boree, Brigalow and Box-Gum Woodlands and Box-Ironbark Forests.	Unlikely - suitable habitat not identified within the development site.
Haematopus fuliginosus	Sooty Oystercatcher	V		Distributed along the entire NSW coast. Rocky headlands, rocky shelves, exposed reefs with rock pools, beaches and muddy estuaries.	No - suitable habitat not identified within the development site.
Haematopus longirostris	Pied Oystercatcher	E1		Thinly scattered along the entire NSW coast. Intertidal flats of inlets and bays, open beaches and sandbanks.	No - suitable habitat not identified within the development site.
Haliaeetus leucogaster	White-bellied Sea-Eagle	V		Distributed along the coastline of mainland Australia and Tasmania, extending inland along some of the larger waterways, especially in eastern Australia. Freshwater swamps, rivers, lakes, reservoirs, billabongs, saltmarsh and sewage ponds and coastal waters. Terrestrial habitats include coastal dunes, tidal flats, grassland, heathland, woodland, forest and urban areas.	Unlikely - no nests were observed during the field survey. Eagles are more likely to nest along the coast, as the BioNet Atlas records outline.
Heleioporus australiacus	Giant Burrowing Frog	V	V	South eastern NSW and Victoria, in two distinct populations: a northern population in the sandstone geology of the Sydney Basin as far south as Ulladulla, and a southern population occurring from north of Narooma through to Walhalla, Victoria. Heath, woodland and open dry sclerophyll forest on a variety of soil types except those that are clay based.	Unlikely - suitable habitat not identified within the development site.
Hoplocephalus bungaroides	Broad-headed Snake	E1	V	Largely confined to Triassic and Permian sandstones within the coast and ranges in an area within approximately 250 km of Sydney. Dry and wet sclerophyll forests, riverine forests, coastal heath swamps, rocky outcrops, heaths, grassy woodlands.	Unlikely - suitable habitat not identified within the development site.
Hydroprogne caspia	Caspian Tern		M	Widespread in coastal and inland NSW. Coastal offshore waters, beaches, mudflats, estuaries, rivers, lakes.	No - suitable habitat not identified within the development site.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Likelihood of Occurrence
Lathamus discolor	Swift Parrot	E1	CE	Migrates from Tasmania to mainland in Autumn-Winter. In NSW, the species mostly occurs on the coast and south west slopes. Box-ironbark forests and woodlands.	Unlikely - suitable habitat not identified within the development site.
Limosa lapponica	Bar-tailed Godwit		M	Summer migrant to Australia. Widespread along the coast of NSW, including the offshore islands. Also numerous scattered inland records. Intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons, bays, seagrass beds, saltmarsh, sewage farms and saltworks, saltlakes and brackish wetlands near coasts, sandy ocean beaches, rock platforms, and coral reef-flats. Rarely inland wetlands, paddocks and airstrips.	Unlikely - suitable habitat not identified within the development site.
Lophoictinia isura	Square-tailed Kite	V		In NSW, it is a regular resident in the north, north-east and along the major west-flowing river systems. It is a summer breeding migrant to the south-east, including the NSW south coast. Timbered habitats including dry woodlands and open forests, particularly timbered watercourses.	Unlikely - suitable habitat not identified within the development site.
Macronectes giganteus	Southern Giant Petrel	E1	E, M	Common visitor off the coast of NSW. Marine.	No - suitable habitat not identified within the development site.
Macronectes halli	Northern Giant-Petrel	V	V, M	Common visitor in NSW waters, predominantly along the south-east coast during winter and autumn. Marine.	No - suitable habitat not identified within the development site.
Megaptera novaeangliae	Humpback Whale	V	V, M	Regularly observed in NSW waters in June and July, on northward migration from Subantarctic waters, and in October and November, on southward migration. Marine.	No - suitable habitat not identified within the development site.
Merops ornatus	Rainbow Bee-eater			Distributed across much of mainland Australia, including NSW. Open forests and woodlands, shrublands, farmland, areas of human habitation, inland and coastal sand dune systems, heathland, sedgeland, vine forest and vine thicket.	Unlikely - suitable habitat not identified within the development site.
Micronomus norfolkensis	Eastern Coastal Free-tailed Bat	V		The Eastern Freetail-bat is found along the east coast from south Queensland to southern NSW. Occurs in dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range. Roost mainly in tree hollows but will also roost under bark or in man-made structures.	Unlikely - suitable habitat not identified within the development site. Existing buildings were inspected for any signs of microbat activity.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Likelihood of Occurrence
					No signs of activity were observed.
Miniopterus australis	Little Bentwing-bat	V		East coast and ranges south to Wollongong in NSW. Moist eucalypt forest, rainforest, vine thicket, wet and dry sclerophyll forest, Melaleuca swamps, dense coastal forests and banksia scrub.	Unlikely - suitable habitat not identified within the development site. Existing buildings were inspected for any signs of microbat activity. No signs of activity were observed.
Miniopterus orianae oceanensis	Large Bent-winged Bat	V		Large Bent-wing Bats occur along the east and north-west coasts of Australia. Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures. Hunt in forested areas, catching moths and other flying insects above the tree tops.	Unlikely - suitable habitat not identified within the development site. Existing buildings were inspected for any signs of microbat activity. No signs of activity were observed.
Monarcha melanopsis	Black-faced Monarch		M	In NSW, occurs around the eastern slopes and tablelands of the Great Divide, inland to Coutts Crossing, Armidale, Widden Valley, Wollemi National Park and Wombeyan Caves. It is rarely recorded farther inland. Rainforest, open eucalypt forests, dry sclerophyll forests and woodlands, gullies in mountain areas or coastal foothills, Brigalow scrub, coastal scrub, mangroves, parks and gardens.	Unlikely - suitable habitat not identified within the development site.
Monarcha trivirgatus	Spectacled Monarch			Coastal eastern Australia south to Port Stephens in NSW. Mountain/lowland rainforest, wooded gullies, riparian vegetation including mangroves.	Unlikely - suitable habitat not identified within the development site.
Myiagra cyanoleuca	Satin Flycatcher		M	In NSW, widespread on and east of the Great Divide and sparsely scattered on the western slopes, with very occasional records on the western plains. Eucalypt-dominated forests, especially near wetlands, watercourses, and heavily-vegetated gullies.	Unlikely - suitable habitat not identified within the development site.
Myotis macropus	Southern Myotis	V		In NSW, found in the coastal band. It is rarely found more than 100 km inland, except along major rivers. Foraging habitat is waterbodies (including streams, or lakes or reservoirs) and fringing areas of vegetation up to 20m.	Unlikely - no hollow bearing trees were observed within the development site. . Four

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Likelihood of Occurrence
					records have been made within a 5 km radius of the development site. The most recent of these being from 2014. All these records are located within along large waterbodies or in large patches of native vegetation. The watercourse located within the development site was covered by exotic flora species (such as Blackberry, Creeping Buttercup and Turkey Rubarb) which could make it harder for this species to forage over this waterbody.
Neophema chrysogaster	Orange-bellied Parrot	E4A	CE	Breeds in Tasmania and migrates in autumn to spend the winter on the mainland coast of south-eastern SA and southern Victoria. Occasional reports from NSW, most recently Shellharbour and Maroubra in May 2003. Winter habitat is mostly within 3 km of the coast in sheltered bays, lagoons, estuaries, coastal dunes and saltmarshes. Also small islands and peninsulas, saltworks, golf courses, low samphire herbland and taller coastal shrubland.	Unlikely - suitable habitat not identified within the development site.
Ninox strenua	Powerful Owl	V		In NSW, it is widely distributed throughout the eastern forests from the coast inland to tablelands, with scattered records on the western slopes and plains. Woodland, open sclerophyll forest, tall open wet forest and rainforest.	Unlikely - no large hollow-bearing trees observed during the field survey.
Numenius phaeopus	Whimbrel		M	Summer migrant to Australia. Found along almost the entire coast of NSW; scattered inland records. Estuaries, mangroves, tidal flats, coral cays, exposed reefs, flooded paddocks, sewage ponds, grasslands, sports fields, lawns.	Unlikely - suitable habitat not identified within the development site.
Pandion cristatus	Eastern Osprey	V		Common around the northern NSW coast, and uncommon to rare from coast further south. Some records from inland areas. Rocky shorelines, islands, reefs, mouths of large rivers, lagoons and lakes.	Unlikely - suitable habitat not identified within the development site.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Likelihood of Occurrence
Petrogale penicillata	Brush-tailed Rock-wallaby	E1	V	In NSW they occur from the Qld border in the north to the Shoalhaven in the south, with the population in the Warrumbungle Ranges being the western limit. Rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges.	Unlikely - suitable habitat not identified within the development site.
Petroica boodang	Scarlet Robin	V		In NSW, it occurs from the coast to the inland slopes. Dry eucalypt forests and woodlands, and occasionally in mallee, wet forest, wetlands and tea-tree swamps.	Unlikely - suitable habitat not identified within the development site.
Pezoporus wallicus wallicus	Eastern Ground Parrot	V		In NSW, found in small numbers on the north coast (Broadwater, Bundjalung, Yuraygir NPs) and Myall Lakes on the central coast. Larger populations found on south coast, particularly Barren Grounds NR, Budderoo NP, the Jervis Bay area and Nadgee NR. Small numbers are recorded at Morton and Ben Boyd NP and other areas on the south coast. Coastal or subcoastal low heathland and sedgeland.	Unlikely - suitable habitat not identified within the development site.
Phoebetria fusca	Sooty Albatross	V	V, M	There are occasional sightings off the NSW coast, north of Grafton. Marine.	No - suitable habitat not identified within the development site.
Phoniscus papuensis	Golden-tipped Bat	V		The Golden-tipped Bat is distributed along the east coast of Australia in scattered locations from Cape York Peninsula in Queensland to south of Eden in southern NSW. It also occurs in New Guinea. Found in rainforest and adjacent wet and dry sclerophyll forest up to 1000m. Also recorded in tall open forest, Casuarina-dominated riparian forest and coastal Melaleuca forests. Roost mainly in rainforest gullies on small first- and second-order streams in usually abandoned hanging Yellow-throated Scrubwren and Brown Gerygone nests modified with an access hole on the underside. Bats may also roost under thick moss on tree trunks, in tree hollows, dense foliage and epiphytes.	Unlikely - suitable habitat not identified within the development site. Existing buildings were inspected for any signs of microbat activity. No signs of activity were observed.
Physeter macrocephalus	Sperm Whale	V	M	Recorded off the NSW coast. Marine.	No - suitable habitat not identified within the development site.
Potorous tridactylus tridactylus	Long-nosed Potoroo	V	V	In NSW it is generally restricted to coastal heaths and forests east of the Great Dividing Range, with an annual rainfall exceeding 760 mm. Coastal heaths and dry and wet sclerophyll forests.	Unlikely - suitable habitat not identified within the development site.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Likelihood of Occurrence
Prototroctes maraena	Australian Grayling		V	Streams and rivers on the eastern and southern flanks of the Great Dividing Range; in NSW, it occurs south from the Shoalhaven River. Coastal rivers and streams, fresh and brackish coastal lagoons.	No - suitable habitat not identified within the development site.
Pseudomys novaehollandiae	New Holland Mouse		V	Fragmented distribution across eastern NSW. Open heathlands, woodlands and forests with a heathland understorey, vegetated sand dunes.	Unlikely - suitable habitat not identified within the development site.
Pterodroma leucoptera leucoptera	Gould's Petrel	V	E	Recorded off NSW coast. Breeds on Cabbage Tree Island offshore from Port Stephens, and on nearby Boondelbah island. Marine. Nesting habitat is located within steeply sloping rock scree gullies with a canopy of Cabbage Tree Palms.	No - suitable habitat not identified within the development site.
Pterodroma neglecta neglecta	Kermadec Petrel (west Pacific subspecies)	V	V	Vagrant birds occur in coastal NSW waters, particularly after storm events. Breeds on Balls Pyramid (near Lord Howe Island) and Phillip Island (near Norfolk Island). Marine.	No - suitable habitat not identified within the development site.
Pteropus poliocephalus	Grey-headed Flying-fox	V	V	Along the eastern coast of Australia, from Bundaberg in Qld to Melbourne in Victoria. Subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops.	Potential – the development site could act as marginal foraging habitat given the large amount of records within the immediate vicinity.
Ptilinopus superbus	Superb Fruit-Dove	V		Principally from north-eastern Qld to north-eastern NSW. Further south, it is confined to pockets of suitable habitat, and occurs as far south as Moruya. Rainforest and closed forests. May also forage in eucalypt or acacia woodland where there are fruit-bearing trees.	Unlikely - suitable habitat not identified within the development site.
Rhincodon typus	Whale Shark		V, M	Known from NSW waters. Oceanic and coastal, tropical to warm-temperate waters. Often seen far offshore, but also comes close inshore and sometimes enters lagoons of coral atolls.	No - suitable habitat not identified within the development site.
Rhipidura rufifrons	Rufous Fantail		M	Coastal and near coastal districts of northern and eastern Australia, including on and east of the Great Divide in NSW. Wet sclerophyll forests, subtropical and temperate rainforests. Sometimes drier sclerophyll forests and woodlands.	Unlikely - suitable habitat not identified within the development site.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Likelihood of Occurrence
Rostratula australis	Australian Painted Snipe	E1	E	In NSW most records are from the Murray-Darling Basin. Other recent records include wetlands on the Hawkesbury River and the Clarence and lower Hunter Valleys. Swamps, dams and nearby marshy areas.	No - suitable habitat not identified within the development site.
Scoteanax rueppellii	Greater Broad-nosed Bat	V		Both sides of the great divide, from the Atherton Tableland in Qld to north-eastern Victoria, mainly along river systems and gullies. In NSW it is widespread on the New England Tablelands. Woodland, moist and dry eucalypt forest and rainforest.	Unlikely - suitable habitat not identified within the development site. Existing buildings were inspected for any signs of microbat activity. No signs of activity was observed.
Stercorarius parasiticus	Arctic Jaeger		M	Summer migrant to Australian waters October/November to April, including NSW. Marine.	No - suitable habitat not identified within the development site.
Thinornis rubricollis	Hooded Plover	E4A		Occurs in coastal NSW north to Sussex Inlet. Occasional records from the Shoalhaven River, Comerong Beach and Lake Illawarra. Sandy ocean beaches, tidal bays and estuaries, rock platforms, rocky or sand-covered reefs, and small beaches in lines of cliffs. Also use near-coastal saline and freshwater lakes and lagoons.	Unlikely - suitable habitat not identified within the development site.
Tyto novaehollandiae	Masked Owl	V		Recorded over approximately 90% of NSW, excluding the most arid north-western corner. Most abundant on the coast but extends to the western plains. Dry eucalypt forests and woodlands from sea level to 1100 m.	Unlikely - no large hollow-bearing trees were observed within the development site.
Tyto tenebricosa	Sooty Owl	V		Occupies the easternmost one-eighth of NSW, occurring on the coast, coastal escarpment and eastern tablelands. Dry rainforest, subtropical and warm temperate rainforest, as well as moist eucalypt forests.	Unlikely - no large hollow-bearing trees were observed within the development site.
FLORA					
Correa baeuerlenii	Chef's Cap Correa	V	V	Between Nelligen (on Nelligen Creek and the Buckenbowra River) and Mimosa Rocks National Park. Riparian sites within eucalypt forests, including *Eucalyptus sieberi* (Silvertop Ash), *E. muelleriana* (Yellow Stringybark), *E. agglomerata* (Blue-leafed Stringybark) and *Corymbia maculata* (Spotted Gum), she-oak woodland and near-coastal rocky sites	Unlikely - the development site was almost entirely landscaped. This species was not identified during the field survey.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Likelihood of Occurrence
Eucalyptus scoparia	Wallangarra White Gum	E1	V	In NSW it is known from only three locations near Tenterfield. Open eucalypt forest, woodland and heaths on well-drained granite/rhyolite hilltops, slopes and rocky outcrops, typically at high altitudes.	Known - this species was recorded during the field survey however is a horticultural planting and has been planted far beyond its natural range.
Genoplesium baueri	Bauer's Midge Orchid	E1	E	Has been recorded from locations between Nowra and Pittwater and may occur as far north as Port Stephens. Dry sclerophyll forest and moss gardens over sandstone.	Unlikely - suitable habitat not identified on the development site.
Genoplesium vernale	East Lynne Midge Orchid	V	V	Known from only a narrow belt, approximately 12 km wide, on the south coast of NSW between Mogo and Ulladulla. Dry sclerophyll woodland and forest in areas with good drainage and shallow, low fertility soils.	Unlikely - suitable habitat not identified on the development site.
Melaleuca biconvexa	Biconvex Paperbark	V	V	Only found in NSW, populations found in the Jervis Bay area in the south and the Gosford-Wyong area in the north. Damp places, often near streams or low-lying areas on alluvial soils.	Unlikely - suitable habitat not identified on the development site.
Persicaria elatior	Tall Knotweed	V	V	In south-eastern NSW recorded from Mt Dromedary, Moruya State Forest near Turlinjah, the Upper Avon River catchment north of Robertson, Bermagui, and Picton Lakes. In northern NSW known from Raymond Terrace (near Newcastle) and the Grafton area (Cherry Tree and Gibberagee State Forests). Beside streams and lakes, swamp forest or disturbed areas.	Unlikely - suitable habitat not identified on the development site.
Pomaderris cotoneaster	Cotoneaster Pomaderris	E1	E	Recorded in NSW from the Nungatta area, northern Kosciuszko National Park (near Tumut), the Tantawangalo area in South-East Forests National Park and adjoining freehold land, Badgery's Lookout near Tallong, the Yerranderie area, the Canyonleigh area and Ettrema Gorge in Morton National Park. Generally dry sclerophyll forest, often on skeletal soil.	No - suitable habitat not identified within the development site.
Prasophyllum affine	Jervis Bay Leek Orchid	E1	E	Known from three areas south-east of Nowra on South Coast: Kinghorne Point, Wowly Gully near the town of Callala Bay, and near the township of Vincentia. Low heathland and sedgeland communities on poorly drained clay soils.	Unlikely - suitable habitat not identified on the development site.
Pterostylis gibbosa	Illawarra Greenhood	E1	E	Known from a small number of populations in the Hunter region (Milbrodale), the Illawarra region (Albion Park and Yallah) and the Shoalhaven region (near Nowra). Open forest or woodland, on flat or gently sloping land with poor drainage.	Unlikely - suitable habitat not identified on the development site.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Likelihood of Occurrence
Rhizanthella slateri	Rhizanthella slateri (Rupp) M.A. Clem. & Cribb in the Great Lakes local government area	E2,V	E	The population occurs near Bulahdelah (within the Great Lakes LGA). Sclerophyll forest in shallow to deep loams.	No - the development site is too far from the known distribution of this species.
Rhizanthella slateri	Eastern Australian Underground Orchid	V	E	In NSW, currently known from fewer than 10 locations, including near Bulahdelah, the Watagan Mountains, the Blue Mountains, Wiseman's Ferry area, Agnes Banks and near Nowra. Sclerophyll forest in shallow to deep loams.	Unlikely – suitable habitat not identified on the development site.
Thesium australe	Austral Toadflax	V	V	In eastern NSW it is found in very small populations scattered along the coast, and from the Northern to Southern Tablelands. Grassland on coastal headlands or grassland and grassy woodland away from the coast.	Unlikely – suitable habitat not identified on the development site.
Xerochrysum palustre	Swamp Everlasting	P	V	In NSW, found in Kosciuszko National Park and the eastern escarpment south of Badja. In or on the margins of swamps and bogs which are often dominated by heaths.	No - suitable habitat not identified within the development site.

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