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Flora and Fauna Assessment

Cronulla High School, 31 Bate Bay Road, Greenhills Beach 2230

Proposed Development

Prepared for: Cronulla High School

25 January 2023 Version: 2.2 Final

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Glossary and abbreviations

Acronym	Description
BC Act	NSW *Biodiversity Conservation Act 2016*
BOM	Bureau of Meteorology
CEEC	Critically Endangered Ecological Community
DAWE	Commonwealth Department of Agriculture, Water and the Environment
DPE	Department of Planning and Environment
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
FFA	Flora and Fauna Assessment
GHFF	Grey-headed Flying-fox
ha	hectares
HBT	Hollow Bearing Tree
IBRA	Interim Bioregionalization of Australia
LGA	Local Government Area
MNES	Matters of National Environmental Significance
PCT	Plant community type
SEPP-CM	State environmental Planning Policy (Coastal Management)
SIC	Significant Impact Criteria
SSLEP	Sutherland Shire Local Environment Plan
TEC	Threatened ecological community
TSSC	Threatened Species Scientific Committee
WoNS	Weeds of National Significance
*	Denotes exotic species

1. Introduction

1.1 Purpose of report and legislative context

This flora and fauna assessment (FFA) has been prepared to assess the ecological impacts of a proposed development application at Cronulla High School, located at 31 Bate Bay Road (Lot 1 // DP 815804), Greenhills Beach, NSW, 2230. The area proposed for development is hereafter referred to as the 'study area' (**Figure 1.1**). The purpose of this report is to assess the likely impacts of the proposed development application on flora and fauna, and for the report to accompany a Development Application (DA). This report addresses the legislative context provided in **Table 1.1**.

The proposal does not trigger the Biodiversity Offsets Scheme (BOS) as:

- The proposed development will not exceed the native vegetation clearing thresholds (0.5 ha based on the lot size) as only 0.04 ha of planted native vegetation will be cleared
- The area to be impacted does not appear on the Biodiversity Values Map
- The proposal is not a State Significant Development.

As a result, the environmental impact of the proposal can be assessed via an FFA.

Table 1.1: Legislative framework reviewed in this report (Commonwealth, State, and Local)

Instrument	Considerations	Context
Commonwealth		
Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)	Matters of National Environmental Significance	An action will require approval from the Minister if the action has, will have, or is likely to have, a significant impact on a matter of national environmental significance.
State (New South Wales)		
Environmental Planning and Assessment Act 1979 (EP&A Act)	Part 5	Describes the planning context for local development consent and environmental impact assessment.
Biodiversity Conservation Act 2016 (BC Act)	Part 4, Divisions 2 and 5 Part 7	Lists threatened species, populations, ecological communities and key threatening processes to be considered under Part 7 of the BC Act. Establishes that a proposed development triggers the biodiversity offset scheme if it involves the clearing of native vegetation on land included on the Biodiversity Values Map.

Instrument	Considerations	Context
Local		
Sutherland Shire Local Environmental Plan (SLEP) *2015*	Part 6, Clause 6.5	Land within the study area is mapped 'Environmentally Sensitive Land – Terrestrial Biodiversity'
Instrument	**Considerations**	**Context**
Commonwealth		
Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)	Matters of National Environmental Significance	An action will require approval from the Minister if the action has, will have, or is likely to have, a significant impact on a matter of national environmental significance.

1.2 Site description

1.2.1 Study area

The ***subject site*** is defined as 'the area directly affected by the proposal', and the ***study area*** includes 'the subject site and any additional areas which are likely to be affected by the proposal, either directly or indirectly', in accordance with OEH (2018). For the purposes of this FFA, the subject site and study area are synonymous and will subsequently be referred to as the study area. The study area is bound by Captain Cook Drive to the north, Shearwater Estate to the east, Elouera Road to the west and Bate Bay Road to the south.

The study area is approximately 6.04 ha in area (**Figure1.1**). Currently the study area supports native and exotic vegetation. The study area is currently being used as an Educational Establishment (zoned as SP2 - Infrastructure) (**Figure 1.3**), currently lying within an urban area adjoined by cleared land and residential developments. No part of the study area is mapped on the Biodiversity Values Map (DPE 2022).

1.2.2 Surrounding area

The land surrounding 5 km of the study area is predominantly zoned RE1 – Public Recreation R2 – Low Density Residential, C4 – Environmental Living, C1– National Parks and Nature Reserves, C2 – and SP2 – Infrastructure (**Figure 1.3**).

1.2.3 Description of the proposal

The Development Application is for the proposed development of additional buildings and the refurbishment of areas within (Lot 1 // DP 815804) (**Figure 1.1**). The development will require the clearing of native vegetation, much of which has been grown from plantings from the 1980s. The site was almost completely cleared of remnant vegetation in the 1950/60s. Impacts associated with this development are outlined in **Figure 1.2**.

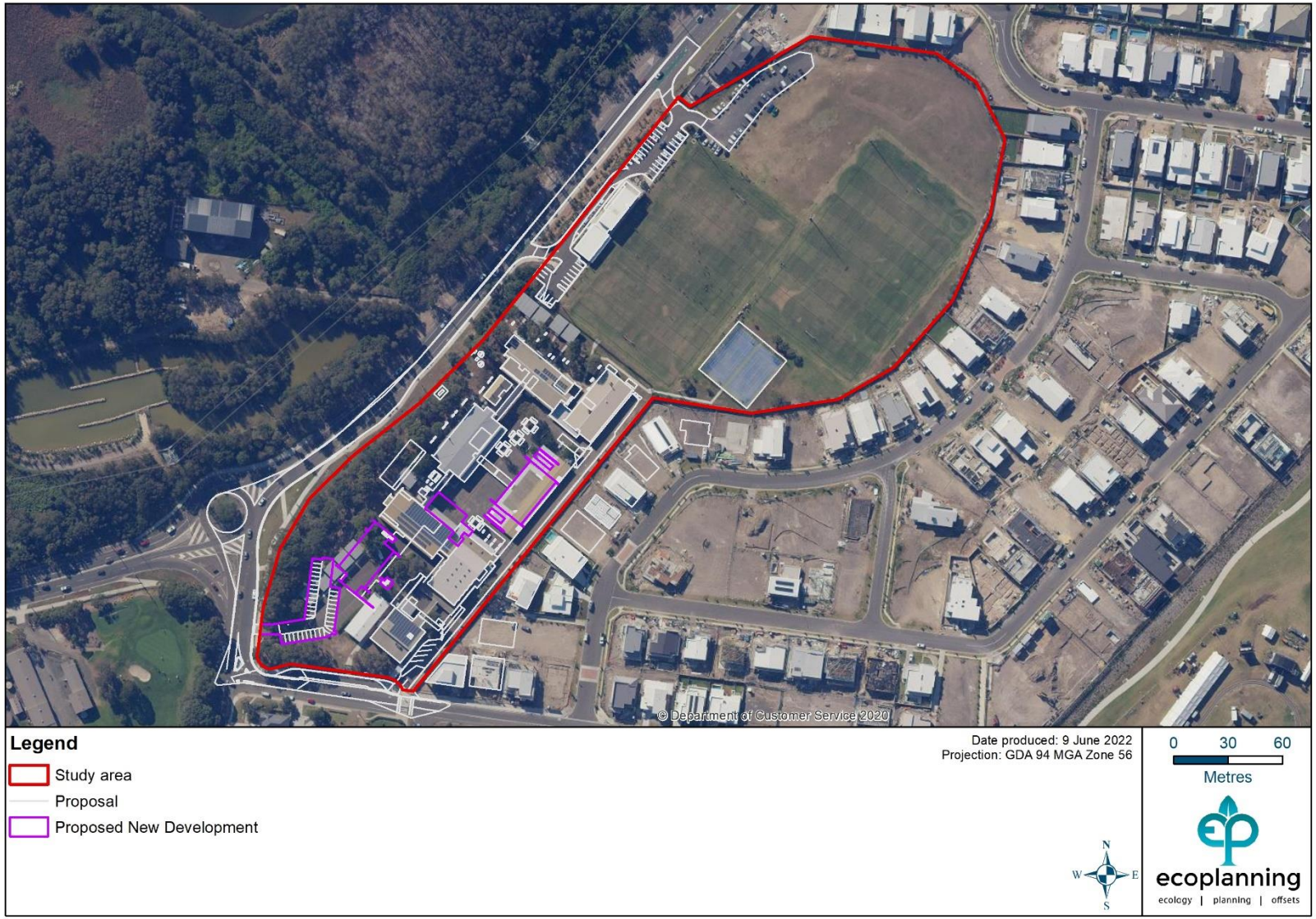

Figure 1.1: Location of the proposed development (study area).

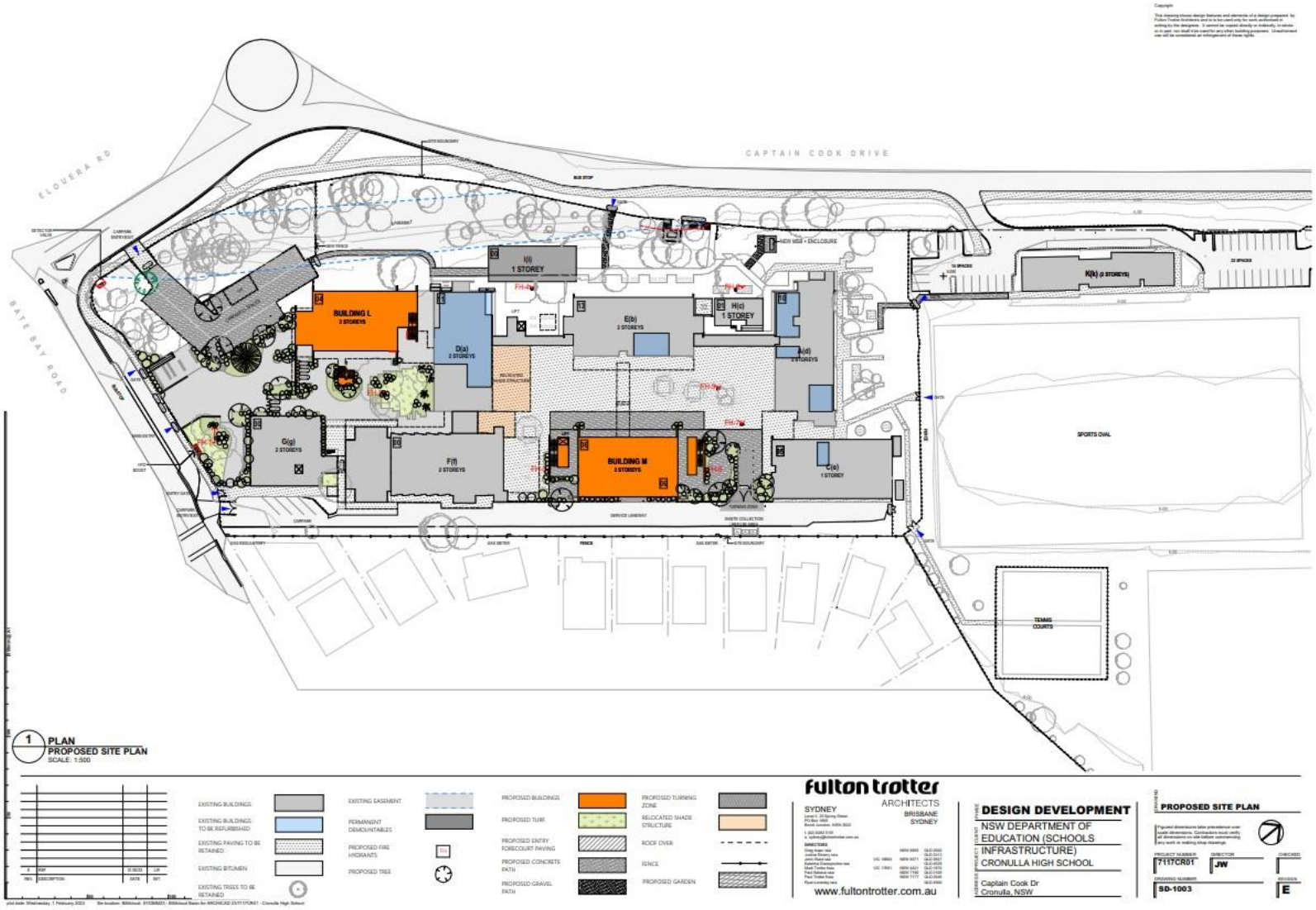

Figure 1.2: Proposed development, refurbishment and layout 31 Bate Bay Road, Greenhills Beach (Fulton Trotter Architects 2023)

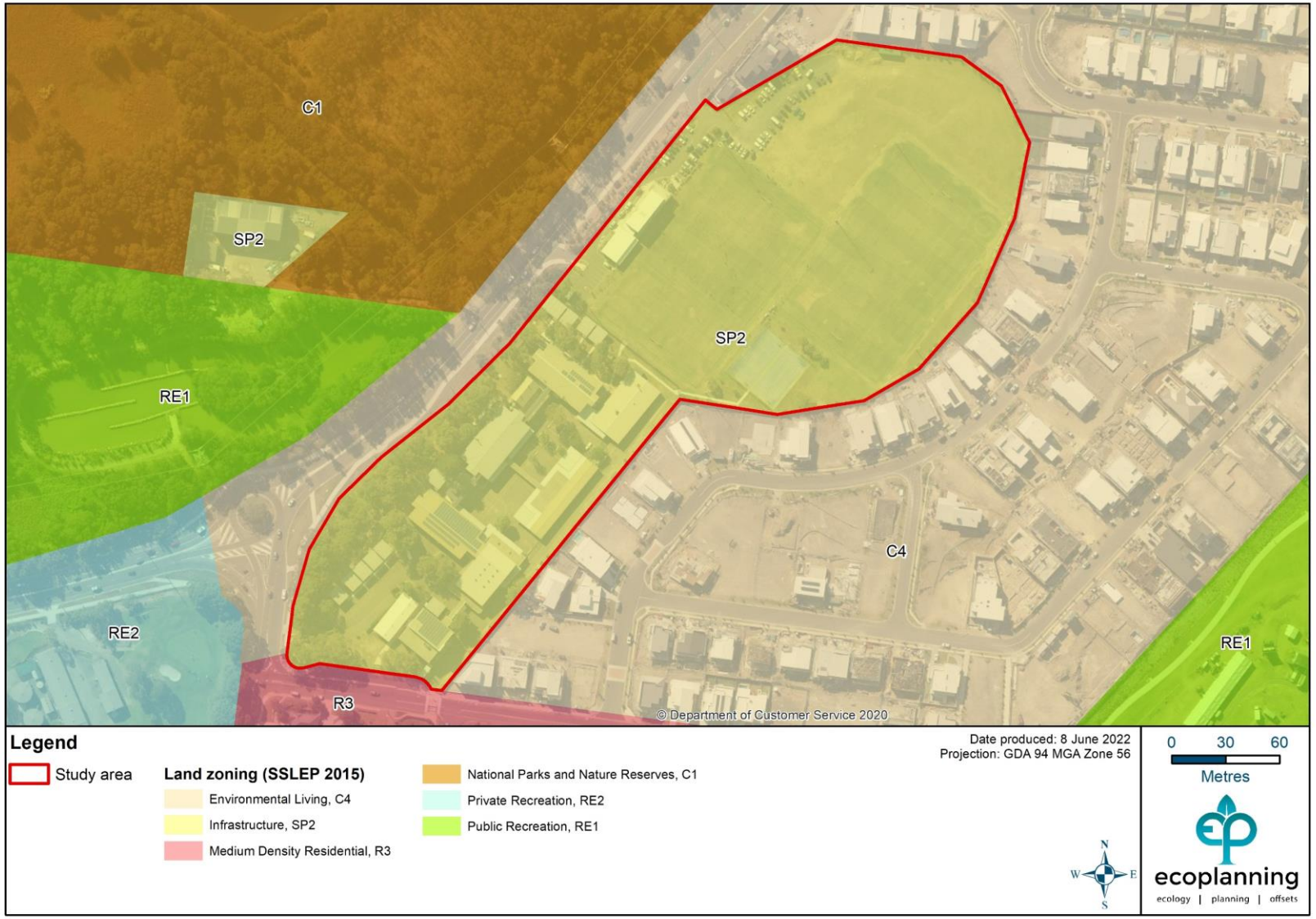

Figure 1.3: Study area and immediate vicinity land zoning (SSLEP 2015)

2. Methods

2.1 Literature and database review

A site-specific and database review was undertaken for the study area prior to undertaking the field survey and the preparation of this report. This included desktop analysis of aerial photography and review of regional scale information from the following sources:

- BioNet Atlas (DPE 2022)
- Protected Matters Search Tool (DAWE 2022)
- SIX Maps (Land and Property Information 2020)
- The Native Vegetation of the Sydney Metropolitan Area (OEH 2016)

2.2 Vegetation mapping and plant community types

Regional vegetation mapping was reviewed prior to site surveys to determine which potential vegetation communities were likely to be present. The regional vegetation mapping layer known as 'The Native Vegetation of the Sydney Metropolitan Area' published by OEH (2016) was reviewed for this report.

In NSW, vegetation communities are divided into discrete units, known as plant community types (PCTs). PCTs are determined by the species assemblage, relative cover, and several abiotic factors that includes landscape position, residing soils, and annual rainfall. All NSW PCTs are compiled on the BioNet Vegetation Classification (DPE 2022b). All relevant information gathered during the field survey were tested against the PCT characteristics identified in the BioNet Vegetation Classification to prescribe the most likely PCT for the native vegetation within the study area. Aerial imagery from 1961 and 1994 were also viewed online (Sutherland Shire Council 2022) to understand the land use history of the study area and to determine the presence remnant native vegetation.

2.3 Threatened species

Threatened species, populations, and migratory species recorded during the literature and database review were consolidated and their likelihood of occurrence was considered by:

- A review of available habitat within the study area and surrounding area,
- A review of scientific literature pertaining to each species and population, and
- Applying expert knowledge to each species.

The potential for each threatened species, population and/or migratory species to occur was then considered. Only species sightings in the past 20 years (from 1 January 2002) were considered relevant to this report. Following field surveys and review of available habitat within the study area, the species with potential to use the study area and be directly or indirectly impacted by the proposed development were considered as either:

- 'recent record' – species has been recorded in the study area within the past 5 years,
- 'high' – species has previously been recorded in the study area (<5 years) or in proximity (for mobile species), and/or habitat is present that is likely to be used by a local population,

- 'moderate' – suitable habitat for a species is present onsite but no evidence of a species has been detected and a relatively high number of recent records (5-20 years) in the locality or a species is highly mobile,
- 'low' – suitable habitat for a species is present onsite but is limited or highly degraded, no evidence for a species has been detected and a relatively low number of recent records,
- 'not present' – suitable habitat for the species is not present onsite or an adequate survey has determined that the species does not occur in the study area.

2.4 Field survey

A field survey was undertaken on 13 May 2021 by Brian Towle (Senior Ecologist) and on 4 October 2022 by Nicholas Agostino (Field Ecologist).

Weather conditions during the survey are in **Table 2.1** (BOM 2022).

Table 2.1: Daily weather observations at Cronulla.

Date	Temp (°C)		Rainfall (mm)	Max wind	
	Min	Max		Direction	Speed (km/h)
13/05/2021	13.3	24.4	0.8	W	50
4/10/2022	11.2	23.6	0.0	NW	32

The flora survey aimed to record as many species as possible. However, a definitive list of the flora within the study area cannot be gathered without systematic traverses and survey across several seasons. Additional species may be recorded during a longer survey over various seasons, however, the survey was considered adequate to gather the data necessary to validate the vegetation communities and vegetation condition in the study area and assess the likelihood of occurrence of any threatened flora species.

Field survey was undertaken to validate regional vegetation mapping of OEH (2016) and Tozer (2003) within the study area. Vegetation communities were checked against threatened ecological communities (TEC) described and listed under the EPBC Act and/or the BC Act.

Opportunistic fauna survey was undertaken for birds, amphibians, reptiles and mammals, which included opportunistic observations along with signs of direct and indirect occupancy (i.e., scats, owl pellets, fur, bones, tracks, bark scratches, foliage chew marks and check cones of *Allocasuarina* spp. or *Pinus* spp. as well as some of the other planted cultivars known to be used by native fauna).

Fauna habitat searches were conducted for potential foraging, roosting, breeding or nesting habitat of nocturnal and diurnal species. This includes tree hollows, stags, bird nests, possum dreys, decorticating bark, mature / old growth trees, food trees (e.g., winter-flowering eucalypts, Banksia spp., and Allocasuarina spp.), culverts, dens, dams, riparian areas and refuge habitats of anthropogenic structures, including derelict sheds.

Identification of species used the following resources:

- Flora – Harden (1990 – 2002)
- PlantNET (RBGDT 2022)
- Reptiles and Amphibians – Cogger (2018)
- Birds – Menkhorst et al. (2017)
- Mammals – Van Dyck and Strahan (2008)

3. Results

3.1 Literature and database review

3.1.1 Topography, soils, and drainage

A reviewed of historic aerial photography showed that the study area was subject to considerable land clearing, indicating that all vegetation on site was likely planted (**Appendix B**).

The soil landscapes within proximity of the study area were reviewed to inform the identification of the vegetation communities that are likely to be present, as some vegetation communities are only found on particular soil landscapes.

The study area is mapped as Acid Sulfate Soils Class 4 on the Sutherland Shire Council Acid Sulfate Soils Map. Section 6.1 of the Sutherland Shire Local Environmental Plan (SSLEP) (2015), aims to ensure that development does not disturb, expose or drain acid sulfate soils and cause environmental damage. For class 4 soils, development consent is required if works are more than 2 m below the natural ground surface and/or works by which the watertable is likely to be lowered more than 2 m below the natural ground surface.

Within the study area, only the Wollongong-Port Hacking soil landscape in a 'disturbed terrain 'condition was identified (**Figure 3.1**). This soil landscape is derived from the Hawkesbury Sandstone geological group. Soils of the Wollongong-Port Hacking soil landscape has the potential to influence the type of vegetation community present in and around the study area.

The study area is located entirely within the Pittwater subregion (Version 7) and Sydney Basin IBRA region (Version 7). According to Mitchell Landscapes (Mitchell landscapes V3) (Mitchell 2002), the study area is entirely within Sydney – Newcastle Barries and Beaches landscape.

No mapped streams, rivers or wetlands occur within the study area Towra Point Nature Reserve, a Ramsar site, is located within 500 m of the study area (**Figure 3.2**). However, the development will not impact the reserve.

3.1.2 Threatened species, populations, and migratory species

A review of the Protected Matters Search Tool identified 99 threatened species or populations that have been recorded within 5 km of the study area, including twenty-five threatened flora species and 74 threatened fauna species (forty birds, thirteen mammals, six reptiles, three frogs, six fish, five sharks and one snail). Of these 99 species, 35 are listed under the EPBC Act, two are listed under the BC Act and 62 are listed under both the EPBC and BC act. Eleven threatened ecological communities were also recorded within a 5 km radius of the study area. The likelihood of occurrence desktop analysis revealed a total of 66 (four flora species and 62 fauna species) threatened that have been previously recorded within 5 km of the study area (**Figure 3.5**) (BioNet Atlas), and the likelihood of these species using the study area was assessed.

A site visit and further desktop analysis reduced the initial list of 66 threatened species to the following 1 species which has a 'moderate' or greater likelihood of occurring in the study area, and which may be impacted by the development of the study area:

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

3.1.3 Vegetation and threatened ecological communities

No threatened ecological communities are mapped within the study area.

The extent of native vegetation within 5 km of the study area was assessed using desktop GIS analysis (**Figure 3.3**). Regional vegetation mapping undertaken by OEH (2016) identified one vegetation community marginally within the study area Coast Banksia - Coast Wattle dune scrub of the Sydney Basin Bioregion and South East Corner Bioregion (PCT 772).

Coast Banksia – Coast Wattle dune scrub of the Sydney Basin Bioregion and South East Corner Bioregion (PCT 772)

PCT 772 consists of low dense scrub which is found on coastal sand mass frontal dunes and beach ridges along the eastern coastline of New South Wales. Its Coast Tea-tree (*Leptospermum laevigatum*) and Coastal Wattle (*Acacia longifolia*) are pruned by the prevailing winds that buffet these exposed scarped dunes. Some of the small patches that remain are derived from native plantings as part of dune stabilisation works and bush regeneration. As a result, some scrubs are species poor, with more diverse remnants include salt-tolerant succulent herbs and grasses, several of which are unique to these environments.

The Protected Matters Search Tool identified eleven threatened ecological communities with potential to occur within or adjacent to the study area within a 5 km radius. These are:

- Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland
- River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria
- Coastal Upland Swamps in the Sydney Basin Bioregion
- Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community
- Shale Sandstone Transition Forest of the Sydney Basin Bioregion
- Subtropical and Temperate Coastal Saltmarsh
- Castlereagh Scribbly Gum and Agnes Banks Woodlands of the Sydney Basin Bioregion
- Posidonia australis seagrass meadows of the Manning-Hawkesbury ecoregion
- Eastern Suburbs Banksia Scrub of the Sydney Region
- Littoral Rainforest and Coastal Vine Thickets of Eastern Australia
- Upland Basalt Eucalypt Forests of the Sydney Basin Bioregion

Of these communities, River-flat Eucalypt Forest on coastal floodplains of southern New South Wales and eastern Victoria, Shale Sandstone Transition Forest of the Sydney Basin

Bioregion, Eastern Suburbs Banksia Scrub of the Sydney Region and Littoral Rainforest and Coastal Vine Thickets of Eastern Australia are listed as Critically Endangered under the EPBC Act.

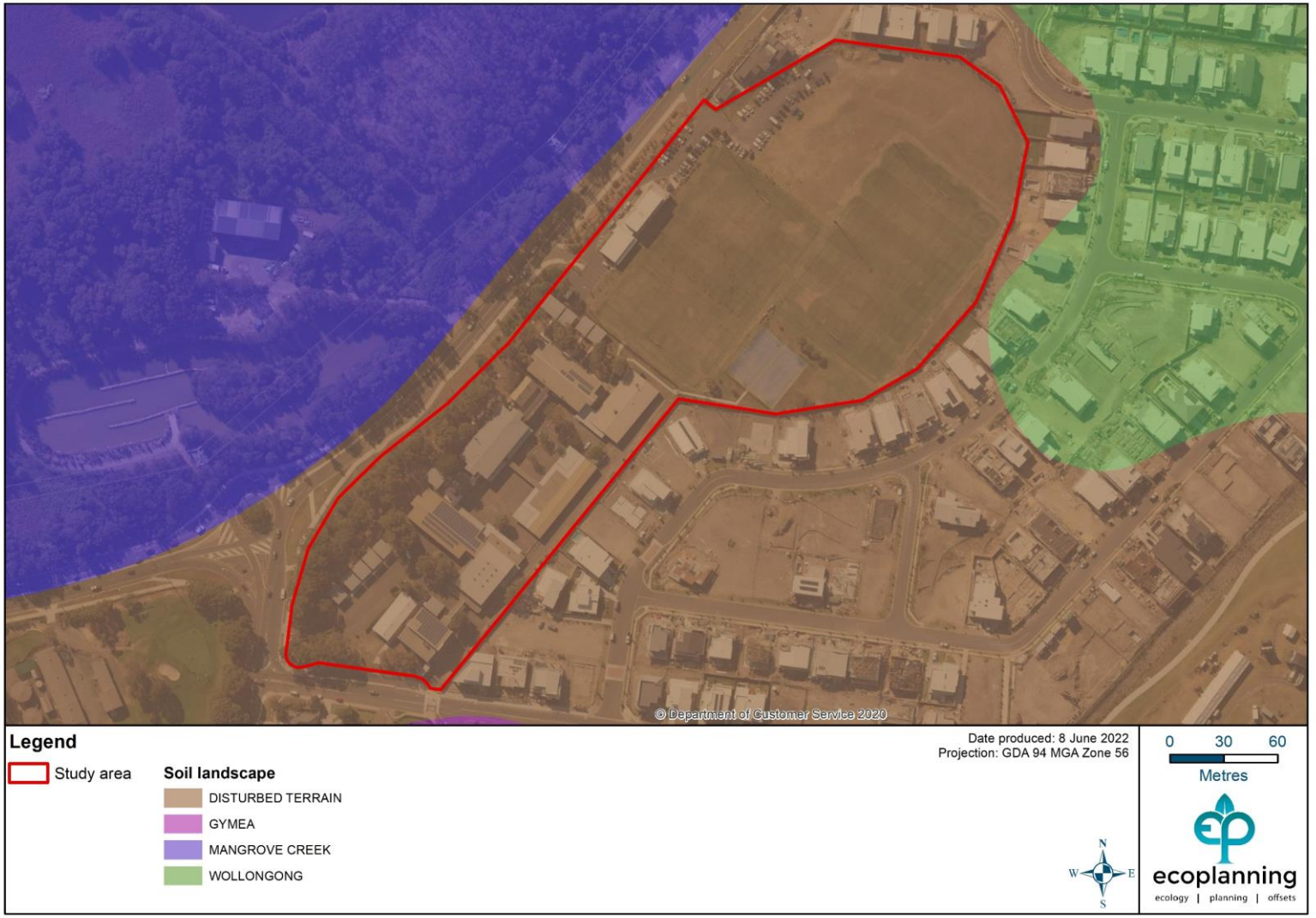

Figure 3.1 Soil landscapes found within the study area and surrounds.

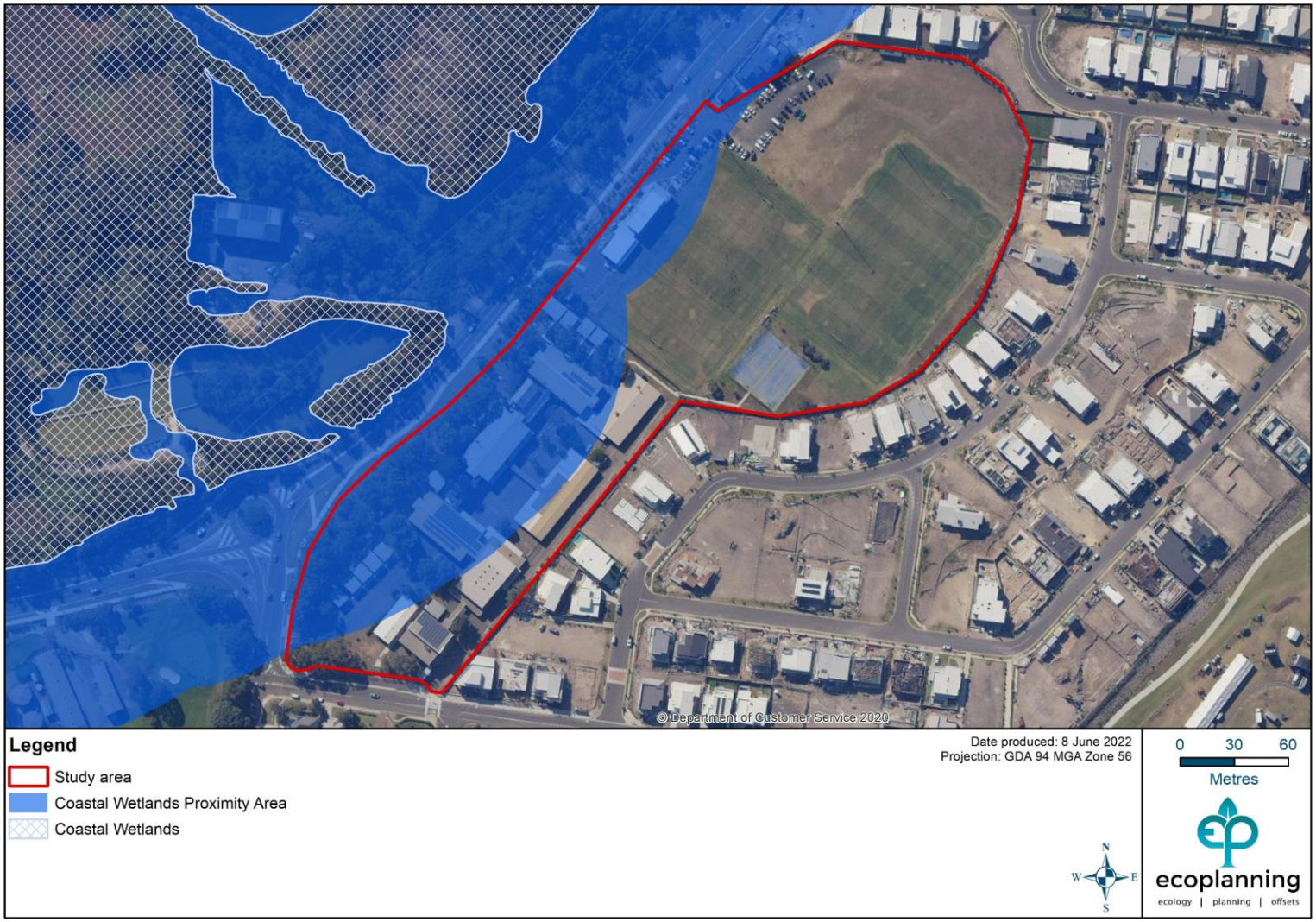

Figure 3.2: Waterways adjacent to the study area.

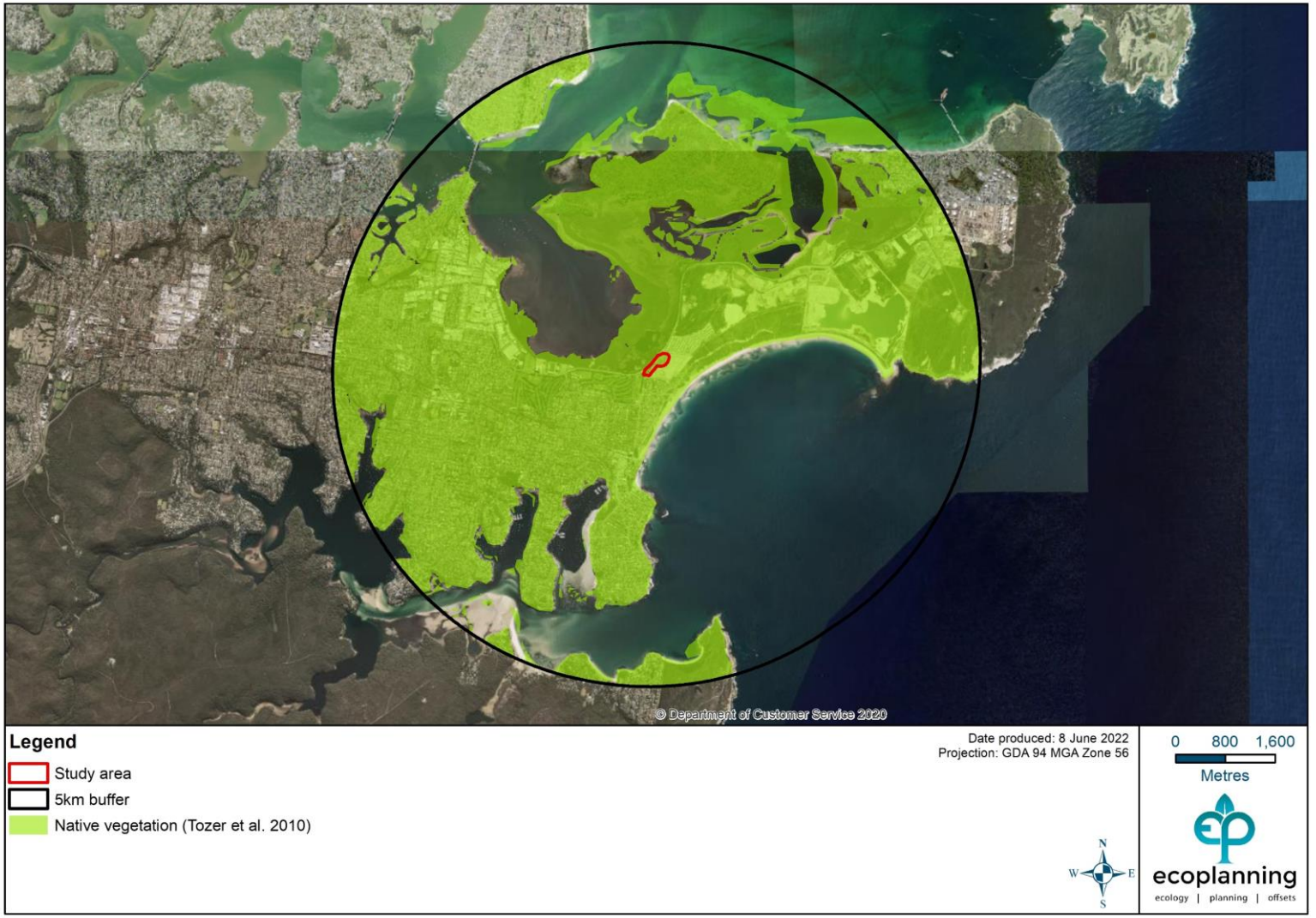

Figure 3.3: Areas mapped as native vegetation by OEH (2016), within 5 km of the study area.

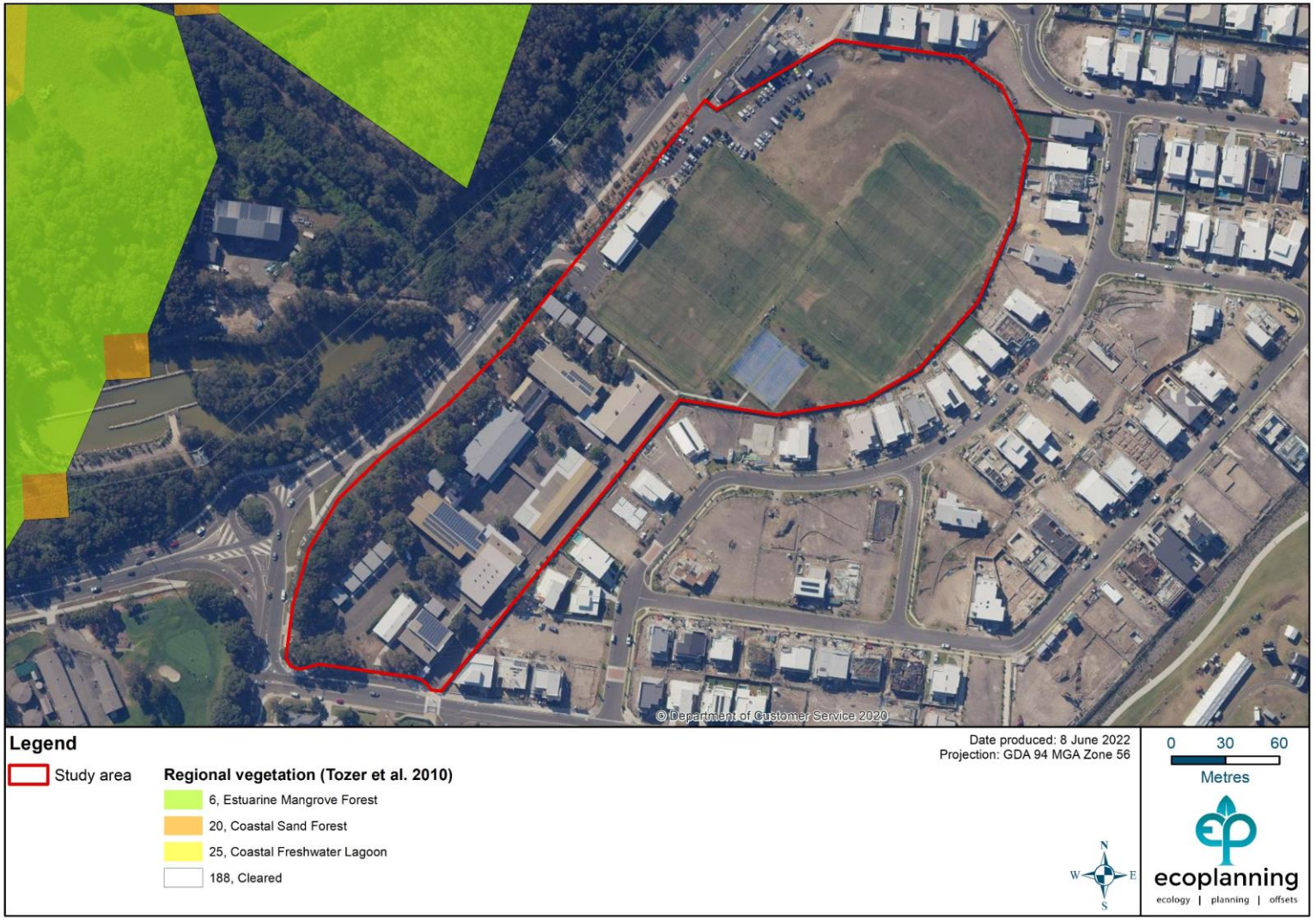

Figure 3.4: Native vegetation mapped within the study area, as mapped by Tozer et al. (2010).

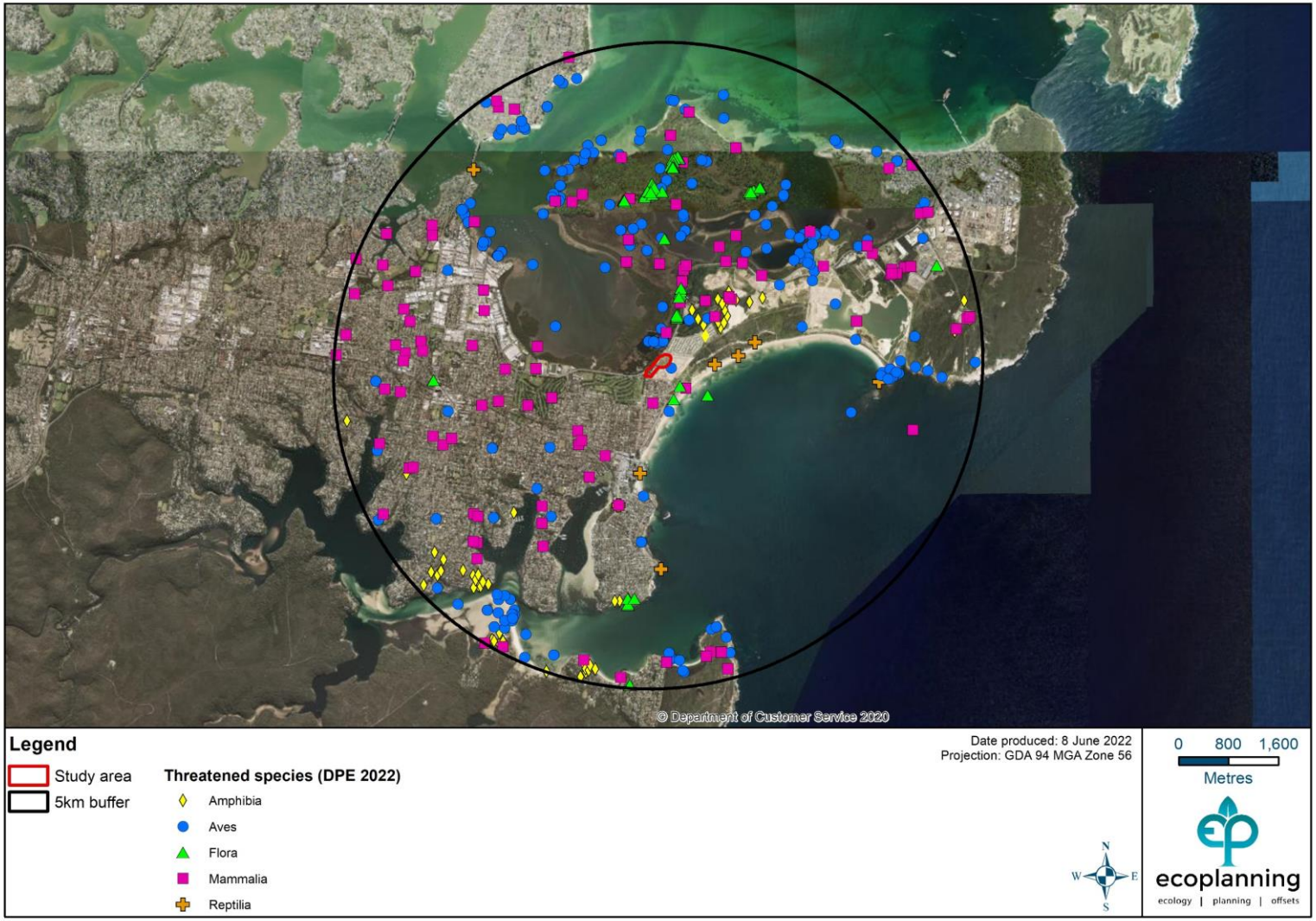

Figure 3.5: Threatened species within 5 km of the study area (DPE 2022a).

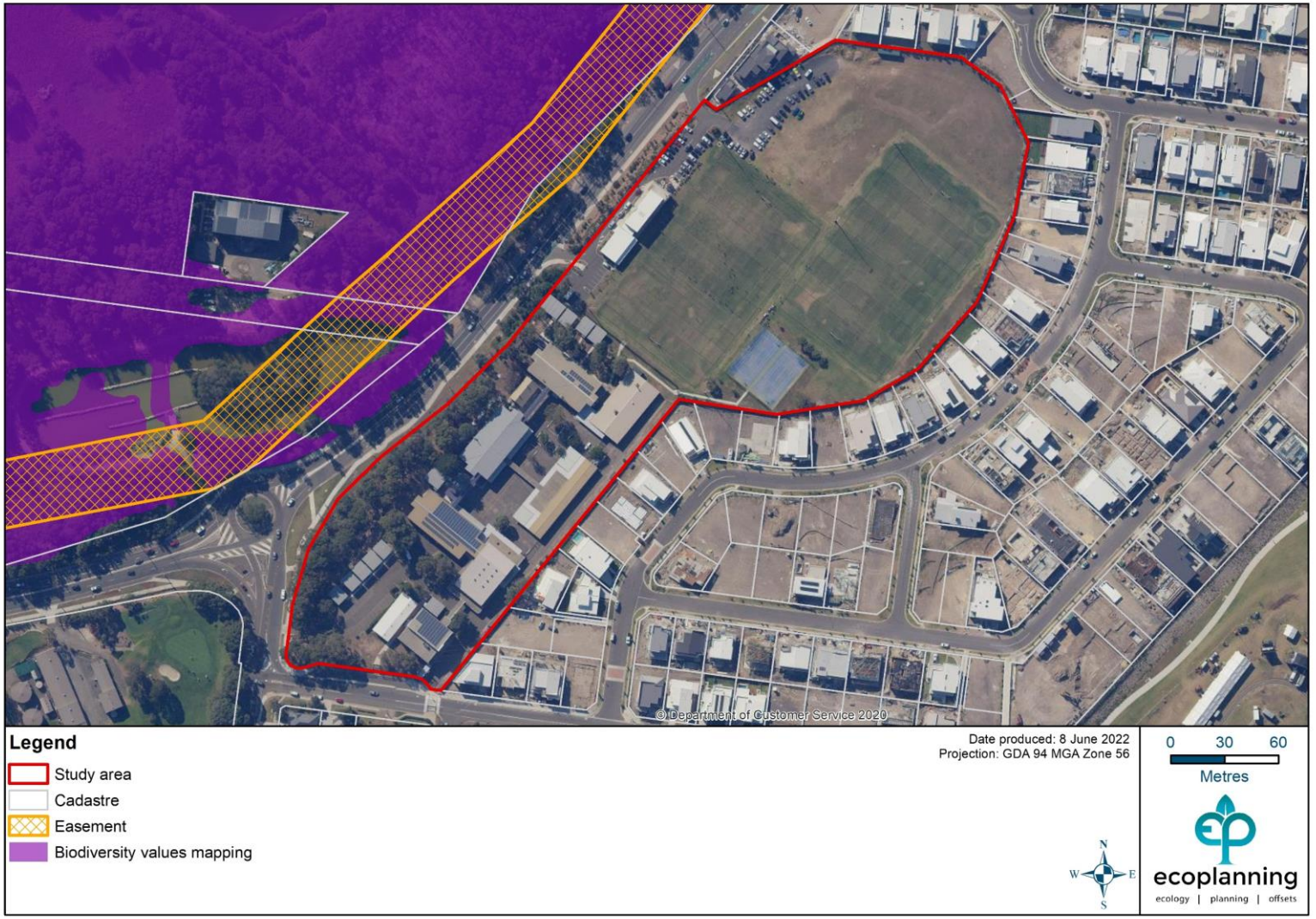

Figure 3.6: Biodiversity Values Mapping in vicinity of study area (DPE 2022a).

3.2 Field survey

3.2.1 Native vegetation

A review of historical aerial imagery shows the study area was cleared of all vegetation in 1961 to allow for school development (**Appendix B**). Field survey confirmed that the study site was devoid of endemic native vegetation and had been subject to landscaping and amenity planting (**Figure 3.7**). Species that are characteristic of PCT 772 do occur on site, but no longer form part of this community and were likely planted post 1961 (**Appendix B**). Species planted in the school grounds that are characteristic of this PCT include *Banksia integrifolia* subsp. *integrifolia* (Coastal Banksia), *Leptospermum laevigatum* (Coast Tea-tree) and *Lomandra longifolia* (Spiny-headed Mat-rush) (**Appendix E**). However, the vegetation is considered "planted vegetation" rather than a described PCT.

Table 3.1: Vegetation communities found within the study area.

PCT	Area[1] (ha)
Planted native vegetation	0.61
Total native vegetation	**0.61**
Cleared land/exotic vegetation	5.43
Total exotic vegetation	**5.43**
Total vegetation coverage	**6.04**

[1] subject to rounding errors.

3.2.2 Other vegetation and infrastructure

Exotic grassland and cleared land

The vegetation within the study area is composed of landscaped land within the school site, and is surrounded by hard surfaces, fences and a road to the north. It is highly likely that there has been considerable soil disturbance when the school was constructed. Much of the cleared land on site is dominated by a high proportion of exotic grasses such as *Stenotaphrum secundatum* (Buffalo Grass), *Elymus repens* (English Couch) and *Cenchrus clandestinus* (Kikuyu grass) (**Figure 3.8**).

Figure 3.7: Validated vegetation mapping and impacts to vegetation.

3.2.3 Flora species

At total of 20 flora species were identified within the study area during field survey, of which ten were exotic species (**Appendix D**). No individuals or populations of threatened flora species were recorded or were expected to occur in the study area.

3.2.4 Fauna species and habitat

The school is a modified environment on the edge of urban development. Trees and shrubs planted for amenity and landscape gardens provide roosting and foraging habitat for birds common in urban landscapes. No hollow bearing trees (HBT's) were identified within the study area. Regular management of ground covers and woody debris limits the potential for the site to provide habitat for ground dwelling fauna.

The site is in proximity to a RAMSAR site, and an area frequented by migratory shorebirds. Shorebirds are known to forage on the sand and mudflats of Towra Point and Taren Point through the warmer months of the year. It is possible that the migration pathway of a shorebird may pass over the school. However, it is highly unlikely that migratory shorebirds would forage or roost in the school ground. The subject land has not been identified as being part of the flight path for shorebirds or other migratory or threatened biota. Nevertheless, the proposed development involves construction of buildings of similar heights to current buildings within the school. Thus, if species were to fly over the school, the proposed development is unlikely to interfere with the flight path of any threatened or migratory species which may currently use the site and surrounding areas as a flight path. For this reason, the occurrence of migratory and non-migratory shorebirds was given a likelihood of 'low'.

No threatened fauna species were observed during the field survey within the study area, although surveys were limited to opportunistic observations at the time of the survey. No trees located within the study area were identified as potentially containing hollows.

Figure 3.8: Cleared land dominated by exotics (Ecoplanning 2022).

4. Impact assessment

This section outlines the potential direct and indirect impacts of the development on the ecological values of the study area.

4.1 Direct impacts

Direct impacts associated with the proposed development within the study area includes the clearing of native vegetation. Approximately 0.04 ha of planted native vegetation will be cleared is approximately 0.04 ha (**Figure 4.1**) This includes the removal of nine (9) tress to facilitate the proposed development and removal one (1) tree due to poor health (Travers Bushfire and Ecology 2022).

4.1.1 Vegetation clearing

The proposed works will remove approximately 0.04 ha of planted native vegetation that is composed of planted native and exotic vegetation. The native vegetation to be removed within the study area does not conform to a PCT due to the highly disturbed history of the site and given that most native vegetation in the study area is amenity planting and landscaped gardens (**Appendix B, C** and **D**).

4.1.2 Loss of fauna habitat

The proposed development may involve the removal of fauna habitat in the form of planted trees, which may be used by highly mobile avian and mammal species as foraging or roosting sites. None of the tree species found represent important habitat within the local landscape. No hollow-bearing trees will be cleared as a result of the proposed development.

4.2 Indirect impacts

The proposal is located within an existing high school. It is likely that the existing indirect impacts associated with this land use will continue with the future operation of the school. This includes lighting, noise and frequent maintenance.

This is potential for short term indirect impacts during construction, such as additional noise, sedimentation, and erosion.

The proposal is not likely to interfere with the migratory pathways, or habitat of shorebirds that forage and roost in Towra Point and Taren Point.

4.3 Avoidance and mitigation

4.3.1 Impacts to native vegetation

The potential impact of the proposal can be minimised and mitigated by adhering to the following recommendations:

- Erosion and sediment control measures will be established before work begins and maintained in effective working order throughout the duration of the works, and until the study area has been stabilised, to prevent off-site transport of eroded sediments.

- Any exotic vegetation removed from the study area will be disposed of at an approved facility.

4.4 Legislative context

4.4.1 Commonwealth Environmental Protection and Biodiversity Conservation Act 1999

The EPBC Act establishes a process for assessing the environmental impact of activities and developments where 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 national environmental significance" is defined as a "controlled action", and requires approval from the Commonwealth Department of Agriculture, Water and the Environment (DAWE) who are responsible for administering the EPBC Act.

Threatened flora and fauna species

No threatened flora and fauna species listed under the EPBC Act were identified within the study area. However, one fauna species has a moderate likelihood of occurring in the study area, therefore, the Significant Impact Criteria (SIC) was applied to this species and concluded that a significant impact to these species is unlikely.

Threatened ecological communities

The proposal includes direct impacts to approximately 0.04 ha of vegetation classified as 'planted vegetation'.

4.4.2 State Listings

4.4.3 State Environmental Planning Policy (Resilience and Hazards) 2021

The subject site is located within Coastal use area. Consent cannot be granted if a proposed development will significantly impact on the use of the coastal area under the State Environmental Planning Policy (Resilience and Hazards 2021). The western portion of the subject site is mapped as proximity area for coastal wetlands, due to its proximity Woolooware Wader Lagoon (**Figure 3.2**).

Clause 2.8 of NSW's Resilience and Hazards SEPP 2021 provides that development consent must not be granted for land identified as 'proximity area for coastal wetlands' unless the consent authority is satisfied the development will not significantly impact on:

- the biophysical, hydrological or ecological integrity of the adjacent coastal wetland, or
- the quantity and quality of surface and groundwater flows to and from the adjacent coastal wetland.

The proposed development will not have a significant impact on the adjacent coastal wetlands. No native vegetation that is part of or directly connected to the coast wetlands will be cleared.

This report aims to identify the ecological impacts which may come about through the proposed upgrade to the High School. None of the above clauses from Section 2.8 (1-2) from the SEPP-R&H are triggered by this proposal.

a. is satisfied that—
- *i. the development is designed, sited and will be managed to avoid an adverse impact referred to in paragraph (a), or*
- *ii. (ii) if that impact cannot be reasonably avoided—the development is designed, sited and will be managed to minimise that impact, or*
- *iii. (iii) if that impact cannot be minimised—the development will be managed to mitigate that impact, and*

4.4.4 Threatened flora and fauna species

No threatened flora, fauna or TECs listed under the BC Act were identified within the study area.

Of the four flora species and 62 fauna species that have been previously recorded within 5 km of the study area (BioNet Atlas), the likelihood of these species using the study area was assessed. While some species were considered to have a moderate likelihood of occurrence in the study area prior to survey, only one species had a moderate likelihood of occurrence post survey (**Appendix A**). *Pteropus poliocephalus* (Grey-headed Flying-fox) which is listed as Vulnerable under the BC and EPBC Act.

All other species were considered to have a low likelihood of occurrence following field work. This is primarily due to the size of the study area, the age of the trees and lack of habitat in the study area and BioNet data.

Therefore, the Test of Significance was applied to *Pteropus poliocephalus* (Grey-headed Flying-fox) as outlined in **Appendix F**. The Test of Significance concluded that the proposal would not have a significant impact on this species.

Threatened ecological communities

The proposal will modify approximately 0.04 ha of planted vegetation within the subject site (**Figure 3.7**). This vegetation does not conform to a TEC. Therefore, the Test of Significance was not required to be applied.

Therefore, a Biodiversity Development Assessment Report is not required given that there is unlikely to be a significant impact on the threatened ecological community.

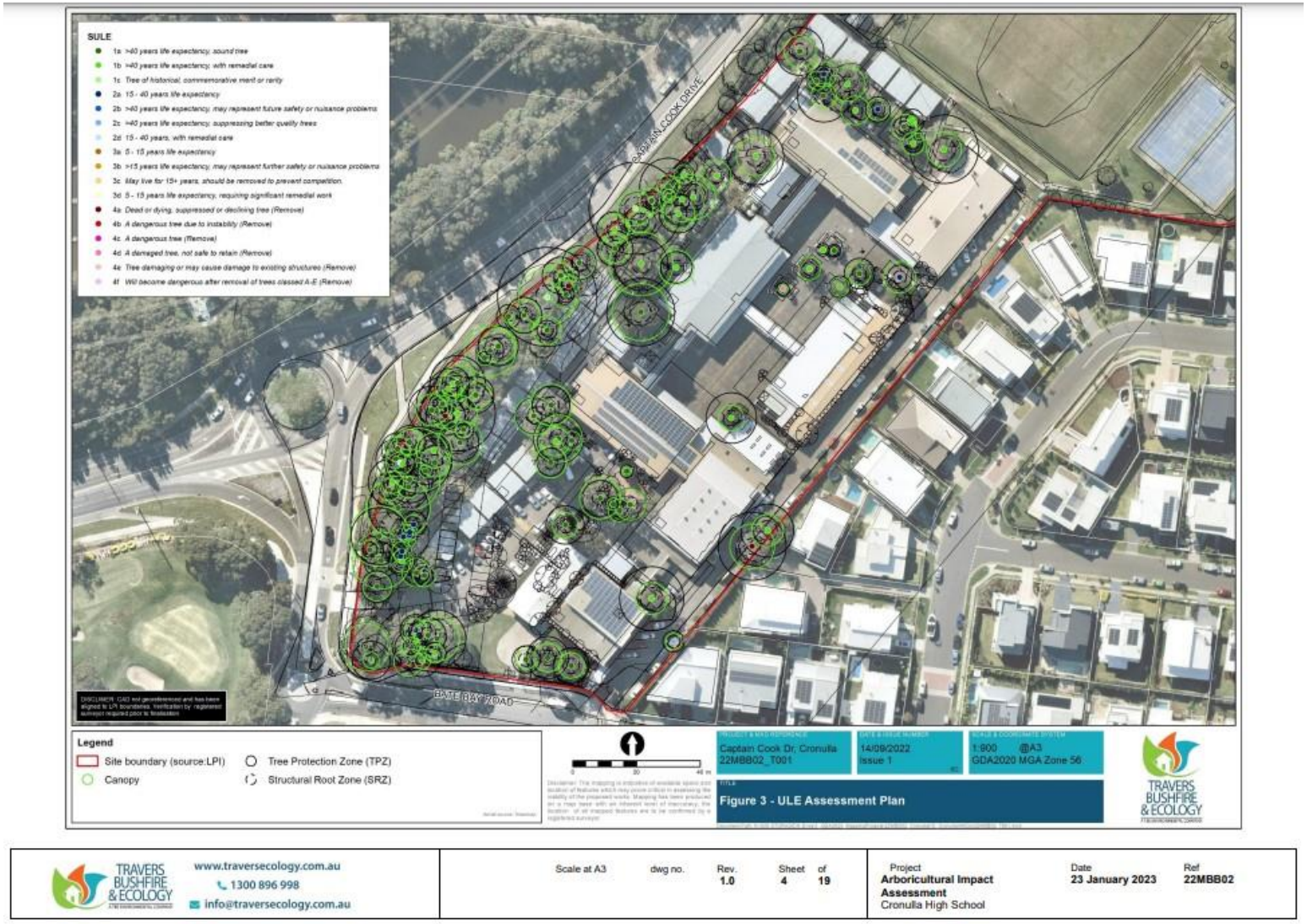

Figure 4.1: Impacts to planted native vegetation (Travers Bushfire and Ecology 2023).

5. Conclusions and recommendations

This Flora and Fauna Assessment has been undertaken for a proposed development of areas within Cronulla High School (Lot 1 // DP 815804) (**Figure 1.1**) which will require the clearing of planted native vegetation.

Desktop survey revealed that a small portion of the study area was mapped by OEH (2018) as PCT 772 Coast Banksia - Coast Wattle dune scrub of the Sydney Basin Bioregion and South East Corner Bioregion. However, field survey confirmed the study area no longer conforms to any native vegetation community due to extensive historical clearing beginning in 1961 (**Appendix B, C** and **D**). Vegetation was removed and the landform altered to establish the school over 60 years ago (as evident in 1961 aerial photography) and planted vegetation along Captain Cook Drive only became visible on site in 1994 aerial imagery (Sutherland Shire Council 2022).

One threatened fauna species (Grey-headed Flying-fox) listed as vulnerable under the BC Act and EPBC Act was identified as having a moderate likelihood of occurrence within the study area. A significant impact assessment and Test of Significance was undertaken for the GHFF, which concluded that the proposal is unlikely to substantially interfere with the recovery of the species as the amount of potential habitat requiring removal is very small, with majority of the foraging habitat in the study area being retained. The proposal is also unlikely to have an impact on the breeding cycle of nearby populations, nor is it likely to have an adverse effect on critical habitat for the GGHF.

The proposal will remove 0.04 ha of planted vegetation. Potential indirect impacts associated with the proposal will be minimised and mitigated through measures recommended in **Section 4.3** of this report.

No threatened flora or fauna species have been recorded or have been determined as likely to occur within the study area. No suitable habitat for threatened species was located within the study area. A moderate likelihood of occurrence was given to 19 species due to high numbers of records in the surrounding areas. It was determined there would not be a significant impact to these fauna species in the significance assessment due to the disturbed and degraded condition of the study area, and the limited size of the study area (**Figure 1.2**). No hollow-bearing trees will be cleared as a result of the proposed development.

Towra Point, which is close to the study area, is an important area for migratory shorebirds. However, the subject land has not been identified as being part of the flight path for shorebirds or other migratory or threatened biota. Nevertheless, the proposed development involves construction of buildings of similar heights to current buildings within the school. Thus, if species were to fly over the school, the proposed development is unlikely to interfere with the flight path of any threatened or migratory species which may currently use the site and surrounding areas as a flight path.

Based on the current assessment no significant impact on any threatened species or vegetation communities are likely and no further assessment under the EPBC Act or BC Act is required.

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Appendix A Species likelihood of occurrence

Scientific Name Common Name	Legal Status	Number of records	Closest records and date	Most recent and proximity	Likelihood of occurrence	
					Prior to field assessment	Post field assessment
KINGDOM: *Animalia*, CLASS: *Amphibia*						
Litoria aurea (Green and Golden Bell Frog)	BC Act = E1 EPBC Act = V	427	0.6 km (06/03/2007)	(31/12/2011) 0.7 km	Moderate	Low
KINGDOM: *Animalia*, CLASS: *AVES*						
Actitis hypoleucos (Common Sandpiper)	EPBC Act = C,J,K	11	0.2 km (16/11/2002)	(08/12/2007) 3 km	Low	Low
Ardenna pacifica (Wedge-tailed Shearwater)	EPBC Act = J	2	0.9 km (06/02/2009)	(06/02/2009) 0.9 km	Low	Low
Ardenna tenuirostris (Short-tailed Shearwater)	EPBC Act = C,J,K	7	2.1 km (16/06/2016)	(16/06/2016) 2.1 km	Low	Low
Arenaria interpres (Ruddy Turnstone)	EPBC Act = C,J,K	270	0.3 km (28/09/2002)	(07/10/2017) 3.6 km	Moderate	Low
Botaurus poiciloptilus (Australasian Bittern)	BC Act = E1 EPBC Act = E	4	0.4 km (15/05/2006)	(12/10/2009) 4.7 km	Low	Low
Calidris acuminata (Sharp-tailed Sandpiper)	EPBC Act = C,J,K	73	0.2 km (16/11/2002)	(11/12/2015) 3.6 km	Moderate	Low
Calidris alba (Sanderling)	BC Act = V EPBC Act = C,J,K	13	3.5 km (08/12/2007)	(11/08/2017) 3.6 km	Low	Low
Calidris canutus (Red Knot)	EPBC Act = E,C,J,K	38	0.3 km (08/12/2002)	(14/11/2016) 3.6 km	Moderate	Low
Calidris ferruginea (Curlew Sandpiper)	BC Act = E1 EPBC Act = CE,C,J,K	69	0.3 km (05/10/2002)	(14/11/2016) 3.6 km	Moderate	Low
Calidris ruficollis (Red-necked Stint)	EPBC Act = C,J,K	267	0.2 km (16/11/2002)	(07/10/2017) 3.6 km	Moderate	Low
Calidris tenuirostris (Great Knot)	BC Act = V EPBC Act = CE,C,J,K	9	0.3 km (07/12/2002)	(10/12/2016) 3.6 km	Low	Low
Callocephalon fimbriatum (Gang-gang Cockatoo)	BC Act = V	1	3 km (24/02/2012)	(24/02/2012) 3 km	Low	Low
Charadrius leschenaultii (Greater Sand-plover)	BC Act = V EPBC Act = V,C,J,K	4	3.6 km (15/10/2016)	(15/10/2016) 3.6 km	Low	Low

Scientific Name Common Name	Legal Status	Number of records	Closest records and date	Most recent and proximity	Likelihood of occurrence	
					Prior to field assessment	Post field assessment
Charadrius mongolus (Lesser Sand-plover)	BC Act = V EPBC Act = E,C,J,K	31	3.5 km (28/02/2004)	(03/01/2015) 3.6 km	Moderate	Low
Chlidonias leucopterus (White-winged Black Tern)	EPBC Act = C,J,K	4	3.6 km (13/02/2010)	(13/02/2010) 3.6 km	Low	Low
Circus assimilis (Spotted Harrier)	BC Act = V	1	3.6 km (16/09/2017)	(16/09/2017) 3.6 km	Low	Low
Epthianura albifrons (White-fronted Chat population in the Sydney Metropolitan Catchment Management Area)	BC Act = E2,V	25	1.7 km (17/05/2006)	(17/10/2014) 2.1 km	Moderate	Low
Esacus magnirostris (Beach Stone-curlew)	BC Act = E4A	2	3 km (20/11/2010)	(20/11/2010) 3 km	Low	Low
Gallinago hardwickii (Latham's Snipe)	EPBC Act = J,K	4	0.3 km (21/10/2006)	(13/02/2013) 3.2 km	Low	Low
Gelochelidon nilotica (Gull-billed Tern)	EPBC Act = C	1	3.5 km (25/04/2009)	(25/04/2009) 3.5 km	Low	Low
Glossopsitta pusilla (Little Lorikeet)	BC Act = V	1	2.8 km (06/04/2019)	(06/04/2019) 2.8 km	Low	Low
Haematopus fuliginosus (Sooty Oystercatcher)	BC Act = V	177	0.3 km (11/11/2002)	(15/05/2018) 2.7 km	Moderate	Low
Haematopus longirostris (Pied Oystercatcher)	BC Act = E1	883	0.2 km (15/09/2008)	(06/05/2020) 1.7 km	Moderate	Low
Haliaeetus leucogaster (White-bellied Sea-Eagle)	BC Act = V	50	0.1 km (17/07/2008)	(08/07/2017) 3.6 km	Moderate	Low
Hirundapus caudacutus (White-throated Needletail)	EPBC Act = V,C,J,K	2	2.8 km (15/02/2013)	(15/02/2013) 2.8 km	Low	Low
Hydroprogne caspia (Caspian Tern)	EPBC Act = J	88	0.3 km (20/06/2015)	(03/04/2018) 3.3 km	Moderate	Low
Ixobrychus flavicollis (Black Bittern)	BC Act = V	1	3 km (20/01/2021)	(20/01/2021) 3 km	Low	Low
Limosa lapponica (Bar-tailed Godwit)	EPBC Act = C,J,K	399	0.2 km (29/02/2004)	(03/04/2018) 3.3 km	Moderate	Low
Limosa limosa (Black-tailed Godwit)	BC Act = V EPBC Act = C,J,K	3	0.3 km (21/10/2006)	(21/10/2006) 0.3 km	Low	Low
Ninox strenua (Powerful Owl)	BC Act = V	31	1.8 km (20/06/2015)	(31/12/2019) 2.8 km	Moderate	Low
Numenius madagascariensis (Eastern Curlew)	EPBC Act = CE,C,J,K	558	0.3 km (15/03/2014)	(31/03/2020) 2.5 km	Moderate	Low

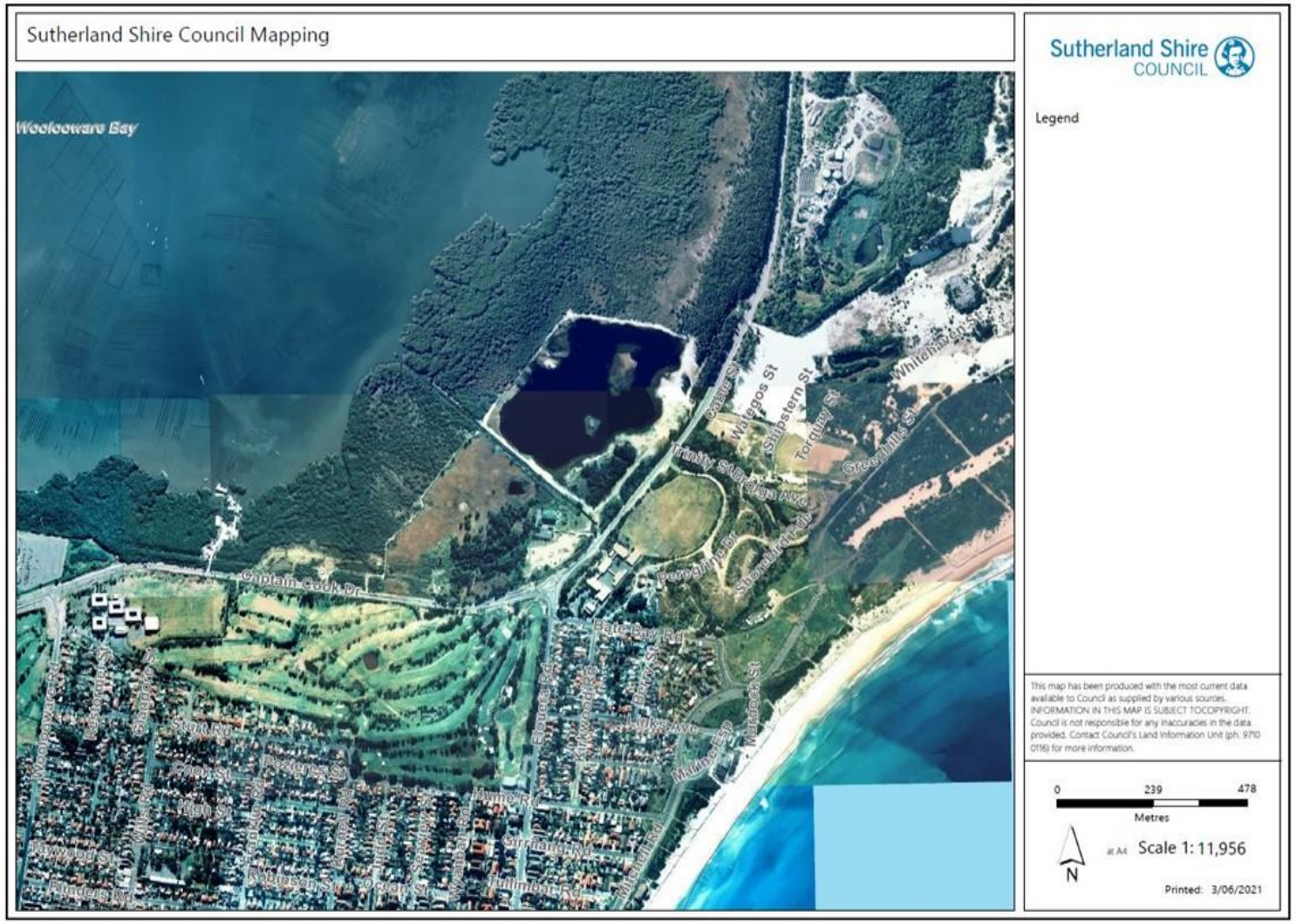
Scientific Name Common Name	Legal Status	Number of records	Closest records and date	Most recent and proximity	Likelihood of occurrence	
					Prior to field assessment	Post field assessment
Numenius phaeopus (Whimbrel)	EPBC Act = C,J,K	259	0.3 km (25/02/2002)	(03/04/2018) 3.3 km	Moderate	Low
Onychoprion fuscata (Sooty Tern)	BC Act = V	1	4.1 km (15/02/2013)	(15/02/2013) 4.1 km	Low	Low
Pandion cristatus (Eastern Osprey)	BC Act = V	15	0.3 km (18/06/2011)	(25/07/2020) 2.5 km	Low	Low
Pluvialis fulva (Pacific Golden Plover)	EPBC Act = C,J,K	163	1.9 km (08/01/2012)	(07/10/2017) 3.6 km	Moderate	Low
Pluvialis squatarola (Grey Plover)	EPBC Act = C,J,K	9	2.8 km (17/09/2005)	(20/12/2014) 3.6 km	Low	Low
Rostratula australis (Australian Painted Snipe)	BC Act = E1 EPBC Act = E	1	3.9 km (15/02/2013)	(15/02/2013) 3.9 km	Low	Low
Stercorarius pomarinus (Pomarine Jaeger)	EPBC Act = C,J,K	2	3.6 km (14/11/2016)	(14/11/2016) 3.6 km	Low	Low
Sterna hirundo (Common Tern)	EPBC Act = C,J,K	44	2.1 km (21/02/2018)	(21/02/2018) 2.1 km	Moderate	Low
Sternula albifrons (Little Tern)	BC Act = E1 EPBC Act = C,J,K	390	0.3 km (14/12/2013)	(22/01/2020) 3.4 km	Moderate	Low
Sula leucogaster (Brown Booby)	EPBC Act = C,J,K	2	3.6 km (27/06/2009)	(27/06/2009) 3.6 km	Low	Low
Thalasseus bergii (Crested Tern)	EPBC Act = J	439	0.3 km (13/12/2015)	(07/10/2017) 3.6 km	Moderate	Low
Thinornis cucullatus cucullatus (Eastern Hooded Dotterel)	BC Act = E4A EPBC Act = V	1	3.4 km (24/04/2013)	(24/04/2013) 3.4 km	Low	Low
Tringa brevipes (Grey-tailed Tattler)	EPBC Act = C,J,K	155	0.3 km (09/11/2002)	(15/03/2018) 3 km	Moderate	Low
Tringa incana (Wandering Tattler)	EPBC Act = J	15	3.5 km (01/04/2004)	(21/02/2015) 3.6 km	Low	Low
Tringa nebularia (Common Greenshank)	EPBC Act = C,J,K	102	0.2 km (15/02/2013)	(07/10/2017) 0.3 km	Moderate	Low
Tyto novaehollandiae (Masked Owl)	BC Act = V	2	2.6 km (16/05/2006)	(16/05/2006) 2.6 km	Low	Low
Xenus cinereus (Terek Sandpiper)	BC Act = V EPBC Act = C,J,K	32	0.3 km (16/11/2002)	(20/11/2010) 3 km	Moderate	Low
KINGDOM: *Animalia*, CLASS: *Mammalia*						
Arctocephalus forsteri (New Zealand Fur-seal)	BC Act = V	1	0.5 km (15/05/2003)	(15/05/2003) 0.5 km	Low	Not Present

Scientific Name Common Name	Legal Status	Number of records	Closest records and date	Most recent and proximity	Likelihood of occurrence	
					Prior to field assessment	Post field assessment
Cercartetus nanus (Eastern Pygmy-possum)	BC Act = V	5	4.6 km (10/05/2014)	(21/05/2014) 4.8 km	Low	Low
Eubalaena australis (Southern Right Whale)	BC Act = E1 EPBC Act = E	1	3.6 km (14/07/2001)	(14/07/2001) 3.6 km	Low	Not Present
Megaptera novaeangliae (Humpback Whale)	BC Act = V EPBC Act = V	4	3 km (09/06/2017)	(09/06/2017) 3 km	Low	Not Present
Miniopterus australis (Little Bent-winged Bat)	BC Act = V	4	1.3 km (24/02/2009)	(28/02/2009) 3.6 km	Low	Low
Miniopterus orianae oceanensis (Large Bent-winged Bat)	BC Act = V	4	1.6 km (14/02/2013)	(21/03/2016) 4.7 km	Low	Low
Myotis macropus (Southern Myotis)	BC Act = V	3	2.8 km (01/06/2017)	(12/06/2017) 4.8 km	Low	Low
Pteropus poliocephalus (Grey-headed Flying-fox)	BC Act = V EPBC Act = V	191	0.3 km (15/05/2006)	(12/06/2019) 3 km	Moderate	Moderate
Scoteanax rueppellii (Greater Broad-nosed Bat)	BC Act = V	2	1 km (28/02/2009)	(28/02/2009) 1 km	Low	Low
KINGDOM: *Animalia*, CLASS: *Reptilia*						
Caretta caretta (Loggerhead Turtle)	BC Act = E1 EPBC Act = E	3	1.1 km (31/05/2009)	(11/06/2014) 2.1 km	Low	Not Present
Chelonia mydas (Green Turtle)	BC Act = V EPBC Act = V	6	1.6 km (14/12/2001)	(09/09/2018) 3 km	Low	Not Present
Eretmochelys imbricata (Hawksbill Turtle)	EPBC Act = V	2	0.7 km (02/02/2010)	(02/02/2010) 0.7 km	Low	Not Present
KINGDOM: *Plantae*						
Callistemon linearifolius (Netted Bottle Brush)	BC Act = V	4	3.3 km (18/11/2015)	(18/11/2015) 3.3 km	Low	Low
Eucalyptus scoparia (Wallangarra White Gum)	BC Act = E1 EPBC Act = V	2	4.9 km (07/03/2003)	(07/03/2003) 4.9 km	Low	Low
Prostanthera densa (Villous Mint-bush)	BC Act = V EPBC Act = V	7	3.6 km (18/08/2007)	(23/01/2020) 3.6 km	Low	Low
Senecio spathulatus (Coast Groundsel)	BC Act = E1	3	0.4 km (07/09/2005)	(12/10/2011) 0.5 km	Low	Low
Syzygium paniculatum (Magenta Lilly Pilly)	BC Act = E1 EPBC Act = V	93	0.6 km (16/01/2019)	(25/03/2019) 4.5 km	Moderate	Low

Appendix B Historic aerial image (1961) of Cronulla High School

Appendix C Historic aerial image (1970) of Cronulla High School

Appendix D Historic aerial image (1994) of Cronulla High School



Appendix E Flora recorded within the study area

FLORA SPECIES RECORDED

Family	Scientific name	Common name	Native/Exotic
Myrtaceae	*Melaleuca quinquenervia*	Broad-leaved Paperbark	Native
Myrtaceae	*Agonis flexuosa*		Exotic
Myrtaceae	*Eucalyptus botryoides*	Bangalay	Native
Proteaceae	*Banksia ericifolia*	Heath-leaved Banksia	Native
Lomandraceae	*Lomandra longifolia*	Spiny-headed Mat-rush	Native
Myrtaceae	*Callistemon viminalis*	Weeping Bottlebrush	Native
Myrtaceae	*Eucalyptus scoparia*	Wallangarra White Gum	Native
Myrtaceae	*Melaleuca armillaris* subsp. *armillaris*	Bracelet Honey-myrtle	Native
Poaceae	*Stenotaphrum secundatum*	Buffalo Grass	Exotic
Poaceae	*Elymus repens*	English Couch	Exotic
Myrtaceae	*Leptospermum laevigatum*	Coast Teatree	Native
Oxalidaceae	*Oxalis* spp.		Native
Plantaginaceae	*Plantago lanceolata*	Lamb's Tongues	Exotic
Apiaceae	*Hydrocotyle bonariensis*		Exotic
Myrtaceae	*Eucalyptus microcorys*	Tallowwood	Native
Alliaceae	*Nothoscordum borbonicum*	Onion Weed	Exotic
Malvaceae	*Modiola caroliniana*	Red-flowered Mallow	Exotic
Caryophyllaceae	*Paronychia brasiliana*	Chilean Whitlow Wort, Brazilian Whitlow	Exotic
Asteraceae	*Hypochaeris radicata*	Catsear	Exotic
Poaceae	*Cenchrus clandestinus*	Kikuyu Grass	Exotic

Appendix F Significant Impact Assessments

Commonwealth listings under the EPBC Act

The EPBC Act Matters of National Significance Significant Impact Guidelines 1.1 (DotE 2013) provides 'Significant Impact Criteria' that are to be used to assist in determining whether a proposed action is likely to have a significant impact on a MNES and subsequently the need for a referral. MNES was identified within the study area in the form of potential; habitat for the Grey-headed Flying-Fox. These MNES are addressed below

Grey-headed Flying-fox (Pteropus poliocephalus) – vulnerable species

GHFF occurs within 200 km of the eastern coastline of Australia, from Rockhampton in Queensland to Adelaide in South Australia. They prefer subtropical and temperate rainforest, tall sclerophyll forests and woodlands, as well as heaths and swamps. Roosting areas are often selected upon their proximity to a regular food source (within 20 km), often in gullies, close to water, or in vegetation with a dense canopy. This species roosts communally in large, established camps which can support several thousand individuals. The GHFF can travel up to 50 km from camp to forage (typically <20 km), where they feed on nectar and pollen from *Eucalyptus, Banksia* and *Melaleuca* spp., as well as the fruits of native and exotic species.

Threats to this species include:

- Loss of roosting and foraging site
- Heat stress
- Electrocution on powerlines and entanglement in netting.

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

- lead to a long-term decrease in the size of an important population of a species

The proposal is unlikely to lead to a long-term decrease in the size of an important population of the GHFF, as the site does not contain a camp of GHFF. The most recent record of the species was made on 12 June 2019 approximately 3 km from the study area and the closest record of the species was made within 300 m of the study area on 15 May 2006 (DPE 2022a). It is likely that the GHFF may occasionally utilise the vegetation in the study area for foraging. However, the proposed development is unlikely to lead to a decrease in the population of the GHFF, as the species is not being directly impacted by the proposal and the amount of habitat to be impacted is small (0.04 ha). Large areas of vegetated land available for foraging are found within the locality, including within Towra Point Reserve.

- reduce the area of occupancy of an important population

The proposal is unlikely to reduce the area of occupancy for the GHFF, as no resident population occurs within the study area or immediate surrounds. The closest GHFF camp is located in Kurnell (DotEE 2022), approximately 4 km north-east of the study area. Furthermore, the species could continue to fly over the study area, or forage in the retained canopy trees.

- fragment an existing important population into two or more populations

The proposal is unlikely to lead to the fragmentation of a GHFF population, as the effects of fragmentation on GHFF is more important in areas directly surrounding roosting habitat. Furthermore, the ability for GHFF to travel large distances makes them less susceptible to the impacts of fragmentation. The study area is sufficiently far enough away from the closest GHFF population in Kurnell (DotEE 2022) so as to not substantially impact on the species.

- adversely affect habitat critical to the survival of a species

According to the Draft National Recovery Plan for the GHFF, foraging habitat that meets at least one of the following criteria can be explicitly identified as habitat critical to survival, or essential habitat (DECCW 2009), including:

  - productive during winter and spring, when food bottlenecks have been identified
  - known to support populations of > 30 000 individuals within an area of 50 km radius (the maximum foraging distance of an adult)

The dominant canopy species in the study area are *Banksia integrifolia* subsp*. integrifolia* (Coastal Banksia), with a moderate number of *Leptospermum laevigatum* (Coastal Teatree) also being identified within the study area. Both are winter and spring flowering species and, therefore, could provide foraging habitat for the GHFF during this period. It is possible that the study area may be utilised during food availability bottlenecks. However, given that there is a large amount of foraging resources available in the locality (including Towra Point Reserve), the importance of the habitat proposed for removal is substantially reduced. The closest known population to support >30,000 individuals is located approximately 30 km south of the study area at Centennial Park, with between 500-2,499 individuals of this species recorded from this camp in August 2016 (DotEE 2022). The vegetation in the study area likely constitutes habitat critical to the survival of the species, although the removal of a relatively small area of planted native vegetation (0.04 ha) is unlikely to result in an adverse impact.

- disrupt the breeding cycle of an important population

The proposed development is unlikely to disrupt the breeding cycle of an important population given the abundance of potential foraging habitat adjoining the site.

- modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline

The proposal would result in the removal and modification of 0.04 ha of planted vegetation to accommodate the development footprint. The species could continue to use the retained vegetation in the study area for foraging, as complete vegetation removal will not be required within the entire subject site. Given that only a relatively small area of planted native vegetation of (0.04 ha) will be removed, the proposal is unlikely to remove habitat to an extent that will cause a decline in the GHFF. Furthermore, the locality contains substantial foraging habitat for the species, including Towra Point Nature Reserve.

- result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat

The proposed works are unlikely to result in invasive species that are harmful.

- introduce disease that may cause the species to decline, or

The proposed works are unlikely to introduce disease that may cause the species to decline.

- interfere substantially with the recovery of the species.

The proposal is unlikely to substantially interfere with the recovery of the species as the amount of potential habitat requiring removal is very small and a majority of the foraging habitat in the study area will be retained.

Conclusion of EPBC Act Significant Impact Guidelines (DotE 2013) for GHFF.
A referral is not recommended for the GHFF, as:

- no breeding or roosting habitat would be removed,
- a small area (0.04 ha) of planted vegetation would be removed,
- the proposal is unlikely to impact on the breeding cycle of nearby populations, and
- the proposal is unlikely to have an adverse effect on critical habitat.

State listings under the BC Act

For the purposes of s5A of EP&A Act, particularly the administration of sections 78A, 79B, 79C, 111 and 112, the following factors and any assessment guidelines must be taken into account when deciding whether there is likely to be a significant effect on threatened species, populations or ecological communities, or their habitats. The below s5A assessments have been prepared in accordance with the appropriate guidelines (OEH 2018).

A profile of GHFF is provided in the Significant Impact Criteria above.

One hundred and ninety-one observations of the Grey-headed Flying-fox have been recorded in the locality (OEH 2019). The proposal is unlikely to lead to a long-term decrease in the size of an important population of the GHFF, as the site does not contain a camp of GHFF. The most recent record of the species was made on 12 June 2019 approximately 3 km from the study area and the closest record of the species was made within 300 m of the study area on 15 May 2006 (DPE 2022a). It is likely that the GHFF may occasionally utilise the vegetation in the study area for foraging. However, the proposed development is unlikely to lead to a decrease in the population of the GHFF, as the species is not being directly impacted by the proposal and the amount of habitat to be impacted is small (0.04 ha). Large areas of vegetated land available for foraging are found within the locality, including within Towra Point Reserve.

Threats to this species include:
- Loss of roosting and foraging site
- Heat stress
- Electrocution on powerlines and entanglement in netting.

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

The proposed development will not have an impact on the lifecycle of the species, to an extent that may place the local population at risk of extinction. The study area is unlikely to provide roosting habitat for such a large species of megabat, which often roost in the several 1,000s. The proposed action would result in the removal of approximately 0.04 ha of planted vegetation which would not represent optimal foraging habitat for this species. The remainder of the study area consists of more intact vegetation more likely to be used for foraging and extensive areas of potential foraging habitat are present adjacent to the site and in adjoining areas.

b. *In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction*

This is not an endangered population, so this is not applicable.

c. *In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:*

   i. *is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*
   ii. *is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction*.

This is not an endangered ecological community, so this is not applicable.

d. *In relation to the habitat of a threatened species, population or ecological community:*

   i. *the extent to which habitat is likely to be removed or modified as a result of the action proposed, and*
   ii. *whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and*
   iii. *the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality*

The proposal will require the removal of approximately 0.04 ha of planted vegetation of which would be of limited value as foraging habitat for this species. The vegetation in the study area is situated within an already fragmented landscape. As such, the proposal will not result in the fragmentation or isolation of other remnants, as it does not act as an intermediary patch between two (or more) areas of habitat. The importance of the habitat to be removed is likely to be low, given the condition of the vegetation, that there is some vegetation that occurs adjacent to the site. The habitat in the study area that would be affected by the proposal is unlikely to be critical to the long-term survival of the Grey-headed Flying-fox in the locality.

e. *Whether the action proposed is likely to have an adverse effect on critical habitat.*

Critical habitat cannot be declared under the BC Act for vulnerable species.

f. Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.

A draft recovery plan has been prepared for the Grey-headed Flying-fox. The proposed development is consistent with the objectives of the recovery plan. There are no threatened abatement plans of relevance to the Grey-headed Flying-fox.

g. Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

One key threatening process of relevance to this species clearing of native vegetation.

The proposed development would result in the complete removal of 0.04 ha of planted vegetation.

Conclusion of s5A assessment of significance for Grey-headed Flying-fox

The proposed development is unlikely to have a significant impact on the Grey-headed Flying-fox, as:

- no roosts were identified in the study area during field assessment
- the low importance of the vegetation proposed for removal, given the large amount of native vegetation in the locality and that the vegetation to be removed is regrowth and scattered canopy trees
- no known camp sites would be impacted.