Queenscliff Pedestrian & Cycle Bridge, Manly Lagoon

Review of Environmental Factors

Northern Beaches Council

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Abbreviations

Abbreviation	Description
ABP	Allowable bearing pressures
ADD	Aboriginal Due Diligence Assessment
AHIMS	Aboriginal Heritage Information Management System
AHIP	Aboriginal Heritage Impact Permit
ASS	Acid Sulfate Soils
BC Act	*Biodiversity Conservation Act 2016*
BDAR	Biodiversity Development Assessment Report
BH	Bore hole
Biodiversity Conservation SEPP	*State Environmental Planning Policy (Biodiversity Conservation) 2021*
Biosecurity Act	*Biosecurity Act 2015*
CAA	Controlled Activity Approval
CI	CI Australia Pty Ltd
CEMP	Construction Environmental Management Plan
CM Act	*Coastal Management Act 2016*
CoP	*Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales*
Council	Northern Beaches Council
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DPE	Department of Planning and Environment
DPI	Department of Primary Industries
EHG	Environment and Heritage
EIS	Environmental Impact Statement
ELA	Eco Logical Australia Pty Ltd
EP&A Act	*Environmental Planning & Assessment Act 1979*
EP&A Regulation	*Environmental Planning & Assessment Regulation 2021*
EPA	NSW Environment Protection Authority
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
EPI	Environmental Planning Instrument
EPL	Environmental Protection Licence
FM Act	*Fisheries Management Act 1994*
ha	hectares
HDPE	High Density Polyethylene
Heritage Act	*Heritage Act 1977*
KFH	Key Fish Habitat
kPa	Kilopascal (unit of pressure)
LEP	Local Environmental Plan
LGA	Local Government Area
LSPS	Local Strategic Planning Statement
Manly LEP 2013	*Manly Local Environmental Plan 2013*
MNES	Matters of National Environmental Significance
NDP	North District Plan
NES	National Environmental Significance

Abbreviation	Description
NPW Act	*National Parks and Wildlife Act 1974*
NPWS	National Parks and Wildlife Service
NRAR	Natural Resources Access Regulator
PASS	Potential Acid Sulfate Soils
PMA Regulation	*Ports and Maritime Administration Regulation 2012*
POEO Act	*Protection of the Environment Operations Act 1977*
REF	Review of Environmental Factors
Resilience and Hazards SEPP	*State Environmental Planning Policy (Resilience and Hazards) 2021*
RMS	Roads and Maritime Services
RSWMP	Regional Strategic Weed Management Plans
SDS	Safety Data Sheets
SEPP	State Environmental Planning Policy
SHR	State Heritage Register
SIS	Species Impact Statement
SREP	Sydney Regional Environmental Plan
TfNSW	Transport for New South Wales
Transport and Infrastructure SEPP	*State Environmental Planning Policy (Transport and Infrastructure) 2021*
WIRES	NSW Wildlife Information, Rescue and Education Service Inc.
WM Act	*Water Management Act 2000*

Executive Summary

The proposed Queenscliff Pedestrian and Cycle Bridge (the Project) is a 4 m wide pedestrian and cycling bridge that will be located adjacent to the existing bridge at Pittwater Road, Queenscliff over Manly Lagoon. The Project aims to provide a safe and accessible transport and recreation solution for pedestrians and cyclists across Pittwater Road. The Project is aligned with a growing network of pedestrian and cycling paths throughout the Northern Beaches Council local government area (LGA).

This Review of Environmental Factors (REF) has been prepared to support the application for approval of the Project under Part 5 of the New South Wales (NSW) Environmental Planning and Assessment Act 1979 (EP&A Act) with Northern Beaches Council (herein referred to as Council) as the determining authority. The REF describes the Project, considers potential environmental, social, and economic impacts of the Project, and outlines measures to minimise and avoid these impacts. The REF is a robust, thorough, and comprehensive document with analysis and input from leading technical and scientific experts.

The REF has been prepared by Eco Logical Australia Pty Limited (ELA) on behalf of Council to support the approval of the Project. Council will carry out a regulatory assessment and determine whether the Project should be approved and any conditions to be applied to the consent, should it be granted. Below, a summary of the REF is provided.

WHAT IS THE PROJECT?

Council is proposing to construct Queenscliff Bridge, a pedestrian and cycle bridge across Manly Lagoon adjacent to the Pittwater Road existing bridge across Manly Lagoon, Queenscliff NSW 2096. Pittwater Road is a State listed road under Transport for NSW (TfNSW) and experiences high traffic flows daily. The existing bridge provides limited pedestrian and cycle access with limited safety barriers. A safe and accessible solution is required for active transport and recreational users to move across Manly Lagoon and connect to the network of active transport options across the Northern Beaches LGA. The existing bridge provides little protection between the road and the footpaths and is part of the busy Pittwater Road. The existing bridge is not sufficient to provide a safe and reliable transport option for pedestrians and cyclists across Manly Lagoon.

The proposed 4 m wide bridge will be constructed adjacent to Pittwater Road and provide improved access for pedestrians and cyclists. No supporting in-water piers are proposed, to minimise impacts to the waterway and Key Fish Habitat (KFH). This REF assesses the direct and indirect impacts of the Project and provides information on a range of environmental constraints to consider in the design process (such as minimising tree removal).

The Project will ensure the bridge is large enough to cater for the community at peak use and is designed with long-term durability in mind. It will facilitate safe and active movements by pedestrians and cyclists, as well as greatly reducing the potential for hazards and collisions to occur between road users and cyclists.

STATUTORY REQUIREMENTS

The environmental assessment and determination of the Project has been undertaken in accordance with Part 5 of the NSW EP&A Act For this Project, Council is both a public authority proponent and the determining authority. Council must examine and consider, to the fullest extent possible, all matters affecting or likely to affect the environment because of the proposed works. This assessment has been prepared in accordance with Section 171 of the *Environmental Planning & Assessment Regulation 2021*,

(EP&A Regulation) which sets out a non-exhaustive list of environmental factors required to be assessed by public authorities. Consideration of Section 171 factors is provided in Table 27.

LAND OWNERSHIP & NOTIFICATION

The works are proposed partially within NSW Crown Land. NSW Crown Land applies to Manly Creek and Hinkler Park, while Crown Reserve # R500056 applies to Hinkler Park only. While Council is responsible for park management, it is recommended that Council consult with Crown Land as the landowner prior to finalisation of this REF and during the bridge design process. A permit, lease, license, or other right to work under the *Crown Land Management Act 2016* (CLM Act) may be required to proceed.

Assessment of Impacts

LANDFORM AND SOILS

The study area contains the Newport and Warriewood soil landscapes. Newport soils are non-cohesive, sandy soils that are prone to erosion, which is typical for the coastal environment of the study area. Warriewood soils are associated with swamps and lagoons, with a depth of more than 1.5 m.

There is a high potential for acid sulfate soils (ASS) to occur within the impact area. Disturbance of ASS can cause harm to the environment, including killing plants and animals, and cause irritation to humans. Additional testing of soils before construction is recommended and an ASS Management Plan should be prepared, if deemed required.

WATER QUALITY

The study area contains Manly Creek, associated with Manly Lagoon, which is a 4th order Strahler stream and mapped as Key Fish Habitat (KFH) by DPI Fisheries. There is a moderate risk of water quality degradation because of increased turbidity by disturbing the sediments either side of Manly Creek during works, for installation of the new bridge. No piles are proposed in-stream to minimise direct impacts on Manly Creek. Strict sediment and erosion controls (e.g., silt curtains) will be required to manage water quality during construction. More detailed aquatic habitat has been addressed under a Marine Ecology Assessment and is summarised below.

TERRESTRIAL ECOLOGY

Vegetation within the study area comprises PCT 4028 *Estuarine Swamp Oak Twig-rush Forest*, planted native vegetation, exotic vegetation, and exotic grasses. PCT 4028 in poor condition corresponds to the endangered ecological community (EEC) listed as *Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and Southeast Corner Bioregions* under the *Biodiversity Conservation Act 2016* (BC Act). PCT 4028 in the study area did not meet the condition thresholds for listing as a threatened ecological community (TEC) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Tests of Significance in accordance with the BC Act, and Assessments of Significance in accordance with the EPBC Act, were completed for the threatened ecological community, *Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and Southeast Corner Bioregions,* and threatened fauna (including birds and microbats) that are likely or have the potential to occur in the study area. The assessments determined no significant impact would result from the Project, provided that the recommended mitigation measures are implemented.

MARINE ECOLOGY

Type 1 (Highly Sensitive) Key Fish Habitat was identified in the study area. No seagrasses were present based on underwater survey, and no threatened fish species are considered likely to occur in the study area. The proposed bridge has been positioned to avoid direct and indirect impact to *Avicennia marina* (Grey Mangrove), including pruning for maintenance and overshadowing. Therefore, a permit to harm marine vegetation under Section 205 of the *Fisheries Management Act 1994* (FM Act) is not required.

In accordance with Section 200, Part 7 of the FM Act, a dredging and reclamation permit is required as Council is the consent authority for their works on Council-managed Crown Land; and the works are located on the banks of key fish habitat.

ABORIGINAL HERITAGE

An assessment of Aboriginal heritage has been undertaken in accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW 2010). The assessment determined that there are no previously recorded Aboriginal sites within or adjacent to the study area, and the visual inspection identified that the majority of the study area has been highly modified by the construction of the existing bridge and Pittwater Road, indicating there is a low potential for *in situ* subsurface archaeological deposits to be impacted by the proposed works. No further assessment is required.

HISTORIC HERITAGE

There are no listed historic heritage items within the study area, though two locally listed heritage items are located within 90 m of the study area: 'Row of Norfolk Island Pine Trees' (item no. I166 on the Manly LEP 2013) and 'Group of 2 Storey Residential Flat Buildings' (item no. 193 on the Manly LEP 2013). The proposed works will not have any visual or physical impact upon the significance of any listed heritage items within the vicinity of the study area. No approval under the *Heritage Act 1977* or the EP&A Act is required regarding heritage.

CUMULATIVE IMPACTS AND STRATEGIC CONTEXT

The works are not likely to cause significant cumulative impacts. A dedicated pedestrian and cycle bridge will provide a benefit to the Northern Beaches community and supports several strategic planning priorities at a local, regional and district level.

Evaluation

The Project has been underpinned by principles to avoid and minimise environmental impacts where possible and has been developed through an iterative design and comprehensive assessment approach.

This REF has determined that the Project is not likely to have a significant impact on any aspect of the environment, subject to the implementation of recommended mitigation measures and safeguards. The Project itself may be affected by natural hazards including flooding and sea level rise, which are anticipated to increase in severity under climate change. This should be considered by Council in determining this REF.

There are multitudes of benefits resulting from the Project. It is in support of several planning priorities under community, local, regional and district strategic plans. The Project is in the public interest, providing many benefits for the Northern Beaches community and will not cause significant environmental impacts, and the longevity of the Project has been considered regarding future predicted flood levels and suitable design solutions in flood prone land.

1. Introduction

1.1. Project Background

Northern Beaches Council (herein referred to as Council) are proposing a new 4 m wide pedestrian and cycling bridge, Queenscliff Bridge, adjacent to the existing Pittwater Road bridge that spans Manly Lagoon. Eco Logical Australia (ELA) was engaged by Council to provide an assessment of the proposal, herein referred to as the 'Project', as part of a Review of Environmental Factors (REF). The Project is in Queenscliff NSW at Pittwater Road, between Hinkler Park and Aitken Avenue (Figure 1).

The Project is required to address safety concerns regarding pedestrian and cyclist access on the existing Pittwater Road bridge. Conflicts between pedestrians and cyclists occur due to the limited width of the existing bridge, and the high traffic volumes of Pittwater Road pose a risk to bridge users given the lack of safety barriers. The Project will support a growing network of active transport and outdoor recreation assets that provide safe and accessible pedestrian and cyclist access throughout the Northern Breaches local government area (LGA).

The Project has been assessed under Part 5 of the *Environmental Planning & Assessment Act 1979* (EP&A Act) with Council as the determining authority. This REF has assessed all environmental factors listed in Section 171 of the *Environmental Planning & Assessment Regulation 2021* (EP&A Regulation); and outlined impact mitigation measures to be undertaken, in line with Council policies and procedures. For the purposes of this assessment, ELA has assumed an indicative impact area based on information provided by Council.

As part of this REF, the following technical assessments have been completed by ELA:

- Terrestrial Flora and Fauna Assessment (FFA) (Section 3.3, Appendix A)
- Marine Ecology Assessment (Section 3.4)
- Aboriginal Due Diligence (ADD) Assessment (Section 3.5, Appendix B)

The findings of these assessments have been included as a chapter in this REF, eliminating the need for additional standalone reports.

1.1. Terms used in this report

- Study area – presented as a red boundary on Figure 1.
- Impact area – the area subject to direct and indirect impacts. Denoted by a yellow dashed line (direct impacts) and blue dashed line (indirect impacts) on Figure 1.

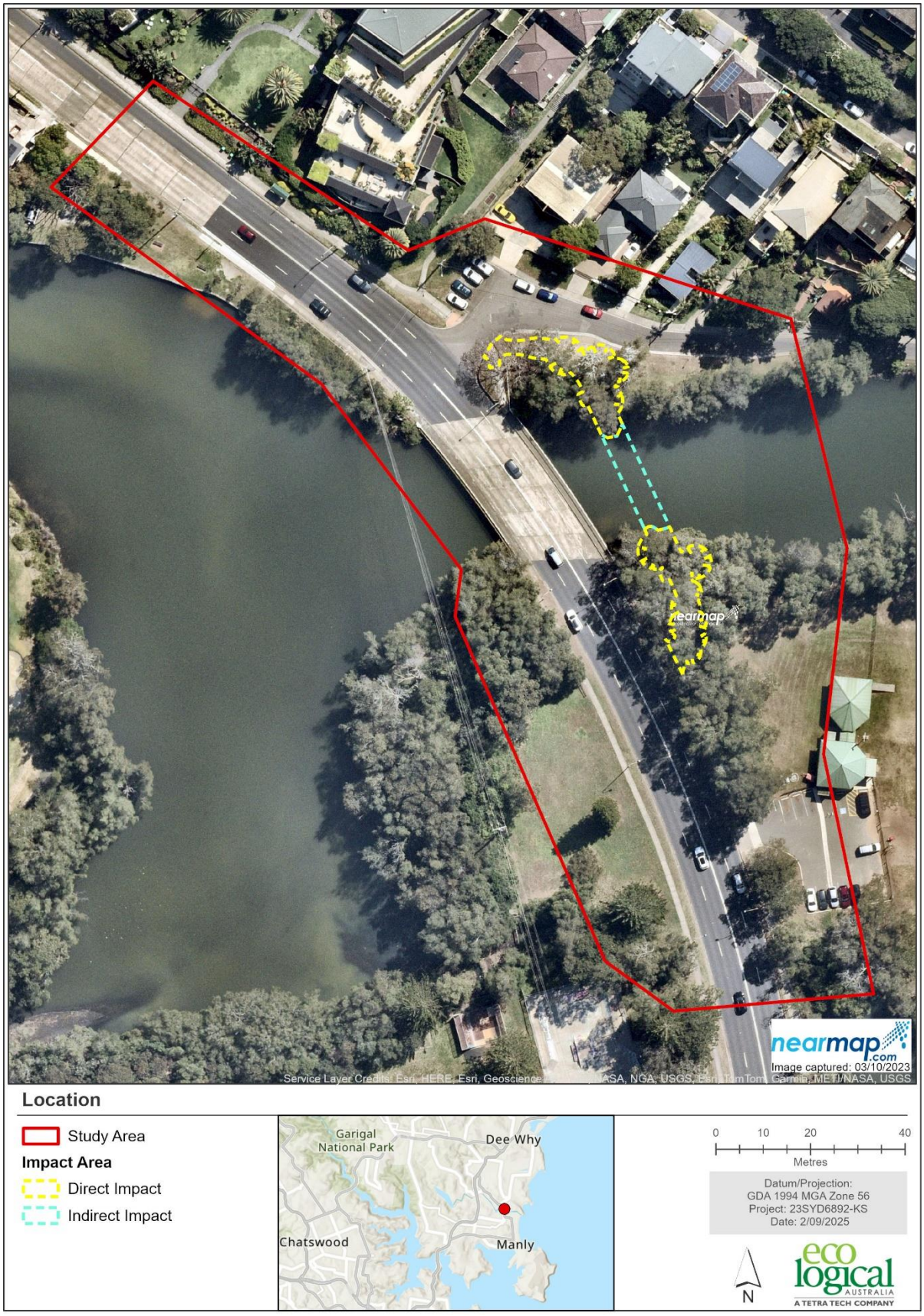


Figure 1: Location of the Project

1.2. Proposed Works

The scope of proposed works under the Project will include:

- Vegetation removal for bridge establishment
- Construction of a 4 m wide bridge adjoining existing Pittwater Road
- Installation of low-level lighting for user safety
- Landscape plantings and finishing works

The Project will be completed under 'Get NSW Active' funding supported by Transport for NSW, with $3.95 m allocated to the Project. Details of the Project scope are provided in Section 1.5.

1.3. Location Context

The Project is to be located alongside the existing Pittwater Road bridge spanning Manly Lagoon in Queenscliff NSW. It is approximately 12 km northeast of the Sydney central business district (CBD). Queenscliff Beach is located 800 m southeast of the study area. The Project will span Manly Lagoon from Hinkler Park, across Manly Creek, starting from Hinkler Park to Aitken Avenue. The study area is located within the suburb of Queenscliff, at its junction with Manly to the south and North Manly to the northwest. Several green open spaces are in the immediate vicinity, including Keirle Park, Lagoon Park and Mill Park.

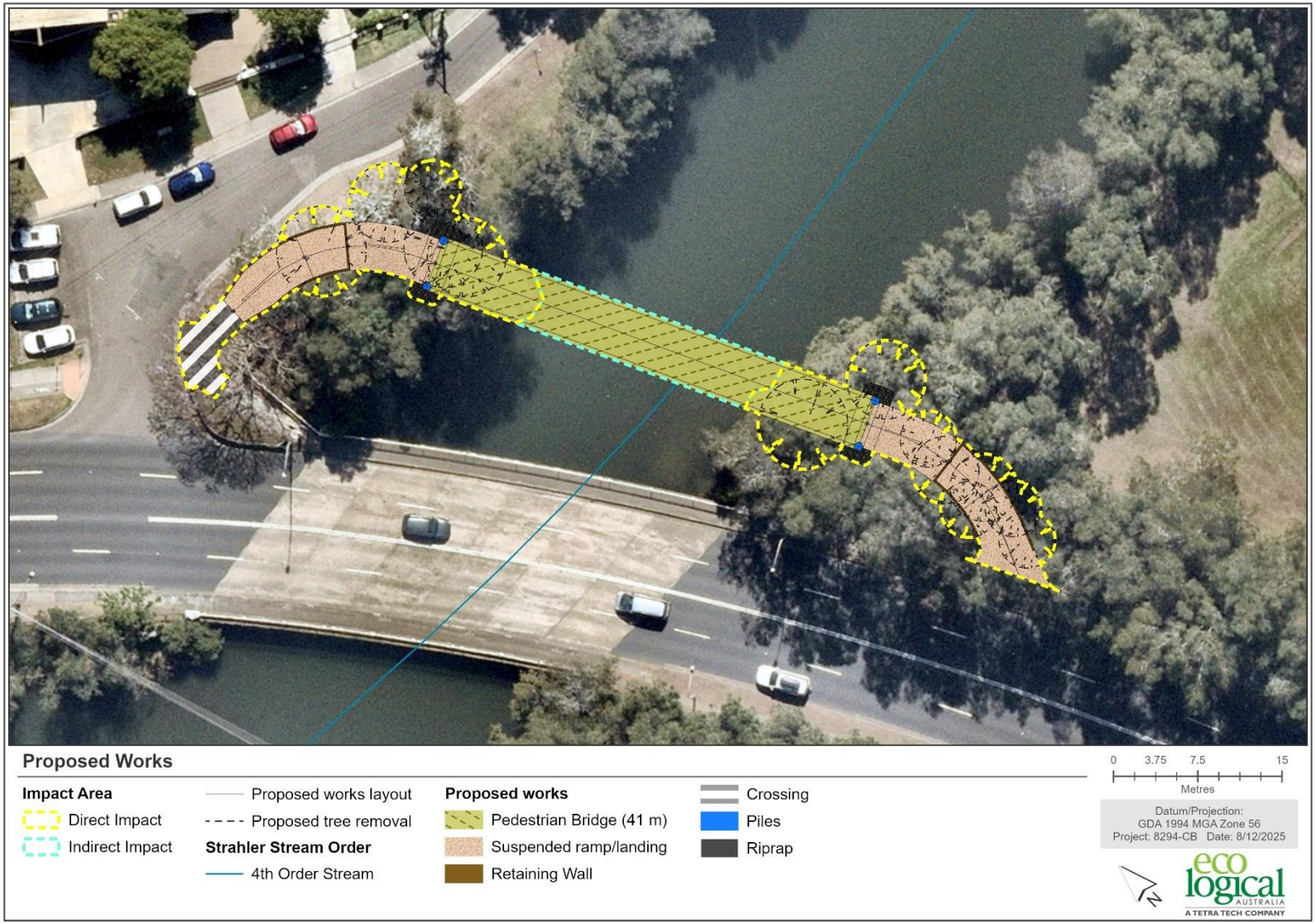


Figure 2: Proposed works layout

1.4. Land Use and Ownership

1.4.1. Land Use Zones

Under the Warringah Local Environmental Plan 2011 (Warringah LEP), the study area is zoned as RE1 (Public Recreation), SP2 (Classified Road) and R2 (Low Density Residential) (Figure 3). The objectives of relevant land use zones are described below.

RE1 Public Recreation

a) *To enable land to be used for public open space or recreational purposes.*
b) *To provide a range of recreational settings and activities and compatible land uses.*
c) *To protect and enhance the natural environment for recreational purposes.*
d) *To protect, manage and restore areas visually exposed to the waters of Middle Harbour, North Harbour, Burnt Bridge Creek and the Pacific Ocean.*
e) *To ensure that the height and bulk of any proposed buildings or structures have regard to existing vegetation, topography and surrounding land uses.*

SP2 Classified Road

a) *To provide for infrastructure and related uses.*
b) *To prevent development that is not compatible with or that may detract from the provision of infrastructure.*

R2 Low Density Residential

a) *To provide for the housing needs of the community within a low density residential environment.*
b) *To enable other land uses that provide facilities or services to meet the day to day needs of residents.*
c) *To ensure that low density residential environments are characterised by landscaped settings that are in harmony with the natural environment of Warringah.*

1.4.2. Land Ownership

The study area is primarily Crown land (Figure 4), except for the northern extent of the proposed bridge and raised crossing. The southern extent of the proposed bridge, on land at Hinkler Park, is within Crown Reserve #R500056.

Council, in its capacity as Crown land Manager (CLM) is a public authority for the purposes of the EP&A Act. As CLM, Council may submit a development or other application without the need for consent of the Crown (the landowner) provided that notice of intention to make the application is served upon the Crown for comment prior to lodgement. The final construction documentation, along with this REF, will be provided to Crown Lands for comment prior to the commencement of works.

Figure 3: Land use zoning

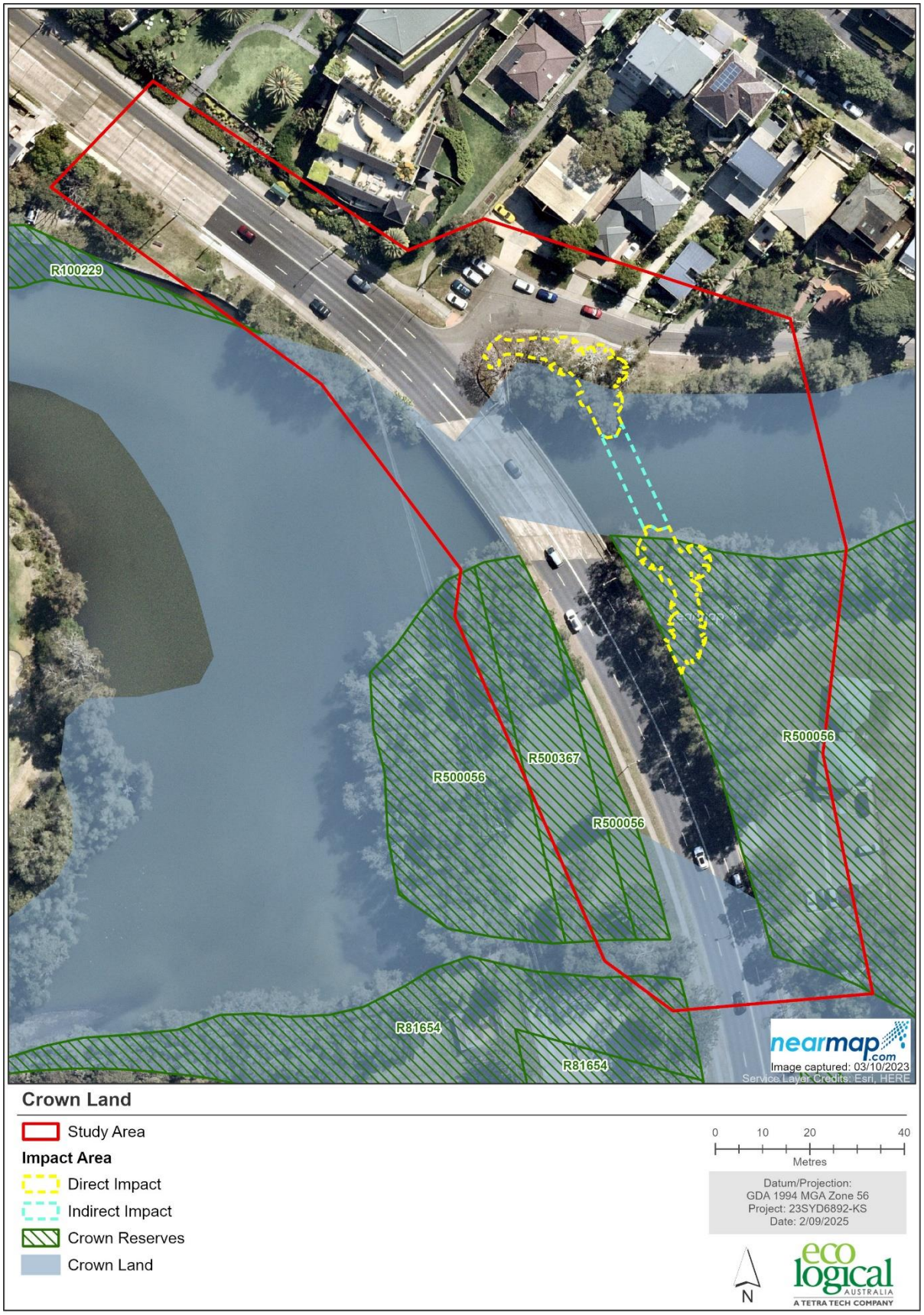


Figure 4: NSW Crown Land and Crown reserves

1.5. Detailed Scope of Works

Construction is anticipated to commence in late 2025, pending necessary approvals. The likely sequence of works used to inform this environmental assessment is described below.

1.5.1. Site Establishment

- A Dial Before You Dig Assessment (DBYD) prior to any excavation or construction works to locate any service infrastructure present on site.
- Transport of machinery, equipment and materials to the site and establishment of site storage and parking areas (likely to utilise existing carparking at Hinkler Park).
- Installation of sediment and erosion protection measures in accordance with the 'Blue Book' *Soils and Construction, Managing Urban Stormwater* (Landcom 2004) with reference to Chapter 5 *Erosion Control: Management of Water*.
- Installation of protection and exclusion fencing around vegetation that is to be protected and to delineate work area.
- Installation of fencing to restrict pedestrian access and temporary park closure signage.

1.5.2. Construction Works

A detailed scope of works and construction activities will be determined by the Design & Construct Contractor for the main construction works:

- Construction of a 4 m wide single span pedestrian and cycling bridge across Manly Lagoon
- Installation of low-level safety lighting

It is recommended that an AQF Level 5 Consulting Arborist must be present on site during the works to ensure appropriate tree protection measures and construction methods are implemented for retention of trees (including mangroves), in accordance with the detailed design and intentions of Council.

1.5.3. Post-Construction Work

On completion of the main construction works, the following will occur:

- Removal of excess materials and disposal of excavated debris as appropriate
- Reinstate any disturbed surfaces
- Reinstate access
- Removal of signage and fencing
- Site landscaping and vegetation reestablishment as required

1.5.4. Duration and Working Hours

Construction will be in accordance with Northern Beaches Council standard daytime work times, which aims to minimise impacts to residents in proximity to the works. Standard work hours will be:

- Monday to Friday 7.00 am to 5.00 pm
- Saturday 8.00 am to 1.00 pm

No construction works will take place on Sunday or Public Holidays.

1.5.5. Machinery and Equipment

A list of machinery that may be used at different points of the Project is provided below:

- Excavator
- Crane
- Barge
- Hand tools for vegetation trimming, hand digging.

Required machinery will be determined by the contractor and stored in a designated construction compound.

1.5.6. Site Access

The site will be accessible via parking off Pittwater Road at Hinkler Park. Some access may be required, and temporary partial closure of single lane(s), along Pittwater Road during construction.

1.6. Project Justification and Consideration of Alternatives

1.6.1. 'Do Nothing' Approach

Many safety and accessibility issues, as well as conflicts between pedestrians and cyclists, have been identified in relation to the existing Pittwater Road bridge. The do-nothing approach would not address these ongoing conflicts and safety concerns and does not support the strategic direction of the Northern Beaches LGA (as discussed in Section 2.4).

Therefore, the do-nothing approach is not the preferred option.

1.6.2. Preferred Option – The Project

Construction of a new 4 m wide pedestrian and cycling bridge is the preferred option, and is the subject of this REF. Alternate design options may become apparent during the design process and would be documented here where relevant. The Project is justified by a range of benefits to the community, including:

- Increased user safety – the Project will provide a physical separation between the busy Pittwater Road carriageway and people walking/cycling across Manly Lagoon.
- Improved accessibility – a 4 m wide bridge will reduce user conflicts by allowing plenty of space for high volumes of walking and cycling users.
- Support for strategic plans – as discussed in Section 2.4, improved accessibility, active transport and connection to nature are key directions of the many community, local, regional and district strategic plans that will shape the Northern Beaches LGA over the next 20 years. The Project is required to support an existing and planned network of safe and enjoyable active transport options and recreational opportunities in the outdoor environment.

As such, the Project is the most beneficial option and has been subject to a detailed design and community consultation process to achieve the best outcomes.

2. Statutory Context

2.1. Commonwealth Statutory Framework

Table 1: Commonwealth Statutory Framework

Name of Act	Relevance to the Project
Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)	**Matters of National Environmental Significance** The EPBC Act protects matters of National Environmental Significance (MNES), such as threatened species and ecological communities, migratory species (protected under international agreements), and National Heritage places (among others). Any actions that will or are likely to have a significant impact on the MNES require referral and approval from the Australian Government Environment Minister. Significant impacts are defined by the Commonwealth (see http://www.environment.gov.au/epbc/guidelines-policies.html) for MNES. The following MNES have been identified as potentially occurring within the study area: • *Calidris acuminata* (Sharp-tailed Sandpiper) – Migratory • *Hirundapus caudacutus* (White-throated Needletail) – Migratory • *Hydroprogne caspia* (Caspian Tern) – Migratory • *Limosa lapponica* (Bar-tailed Godwit) – Migratory • *Pluvialis squatarola* (Grey Plover) – Migratory • *Thalasseus bergii* (Greater Crested Tern) – Marine and Migratory • *Calyptorhynchus lathami lathami* (South-eastern Glossy Black-Cockatoo) – Vulnerable Assessments of Significance (EPBC Act) were completed in accordance with the Significant Impact Criteria (provided in Appendix A4). The assessments determined that a significant impact to MNES is not likely to result if the recommended mitigation measures are implemented.

2.2. New South Wales State Legislation

Table 2: NSW State Legislation

Name of Act	Relevance to the Project
Biodiversity Conservation Act 2016 (BC Act)	Section 7.3 of the BC Act requires proponents of activities subject to Part 5 of the EP&A Act to determine whether they will have a significant impact on threatened species. The test for significant impact is described in Section 7.3 of the BC Act. A significant impact also occurs if the activity is carried out in an area of outstanding biodiversity value. A Likelihood of Occurrence assessment has been completed to determine the potential presence or habitat occurrence for threatened ecological communities, fauna and flora species listed under the BC (Appendix A2). Tests of Significance were completed in Appendix A3 for the following threatened ecological community and threatened fauna species: • *Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions* – Endangered • *Calyptorhynchus lathami lathami* (South-eastern Glossy Black-Cockatoo) – Vulnerable • *Haematopus fuliginosus* (Sooty Oystercatcher) – Vulnerable • *Haematopus longirostris* (Pied Oystercatcher) – Endangered • *Haliaeetus leucogaster* (White-bellied Sea-Eagle) – Vulnerable • *Ixobrychus flavicollis* (Black Bittern) – Vulnerable • *Ninox strenua* (Powerful Owl) – Vulnerable • *Pandion cristatus* (Eastern Osprey) – Vulnerable • *Chalinolobus dwyeri* (Large-eared Pied Bat) – Vulnerable • *Miniopterus australis* (Little Bentwing-bat) – Vulnerable • *Miniopterus orianae oceanensis* (Large Bent-winged Bat) – Vulnerable • *Myotis macropus* (Southern Myotis) – Vulnerable

Name of Act	Relevance to the Project
	It was concluded no threatened flora or fauna species listed (BC Act) are likely to be significantly impacted by the proposed works. A Species Impact Statement (SIS) or Biodiversity Development Assessment Report (BDAR) is not recommended.
Biosecurity Act 2015 (Biosecurity Act)	The *Biosecurity Act 2015* repealed the *Noxious Weeds Act 1993* and provides a framework for the prevention, elimination and minimisation of biosecurity risks posed by biosecurity matter, dealing with biosecurity matter, carriers and potential carriers, and other activities that involve biosecurity matter, carriers, or potential carriers. Part 3 of the *Biosecurity Act 2015* applies a general biosecurity duty for any person who deals with biosecurity matter or a carrier to prevent, eliminate or minimise any biosecurity risk they may pose. Under section 23 of the Act, a person who fails to discharge a biosecurity duty is guilty of an offence. Whilst the Act provides for all biosecurity risks, implementation of the Act for weeds is supported by Regional Strategic Weed Management Plans (RSWMP) developed for each region in NSW. Appendix 1 of each RSWMP identifies the priority weeds for control at a regional scale. However, landowners and managers must take appropriate actions to reduce the impact of problem weed species regardless of whether they are listed in Appendix 1 of the RSWMP or not as the general biosecurity duty applies to these species. No priority weeds, as identified within the Greater Sydney RSWMP, were present within the study area.
Crown Land Management Act 2016 (CLM Act)	The proposed works are located primarily on NSW Crown land (Figure 4). In Council's capacity as CLM, Council may submit a development or other application without the need for consent of the Crown as landowner, if notice of intention is provided to Crown Land for comment prior to lodgement. The final construction documentation and REF should be provided to Crown Lands for comment.
Environmental Planning and Assessment Act 1979 (EP&A Act)	The EP&A Act is the principal planning legislation for NSW. It provides a framework for the overall environmental planning and assessment of proposals. As Northern Beaches Council (a public authority) is the proponent, the works are to be assessed as 'development permissible without consent' under Part 5 of the EP&A Act. Accordingly, Council must satisfy Sections 5.5 and 5.7 of that Act by examining, and considering to the fullest extent possible, all matters which are likely to affect the environment. This REF is intended to assist, and ensure compliance, with the EP&A Act including Sections 5.5 and 5.7. This report addresses the requirements of Section 171 of the EP&A Regulation.
Fisheries Management Act 1994 (FM Act)	The FM Act provides for the protection, conservation, and recovery of threatened species defined under the Act. It also makes provision for the management of threats to threatened species, populations, and ecological communities defined under the Act, as well as the protection of fish and fish habitat in general. In particular, the FM Act has mechanisms for the protection of saltmarsh, mangroves, seagrasses and seaweeds on public water land and foreshores below the highest astronomical tide mark. **Part 7 Permit Requirements** Council, as a local government authority and crown land manager, will require a Section 200 dredging/reclamation permit under Part 7 of the FM Act. The works would not obstruct fish passage or harm marine vegetation, so other permits under Part 7 of the FM Act are not required. **Threatened Species** No threatened fish listed under the FM Act are considered likely to occur within the study area. A Likelihood of Occurrence assessment has been completed in Appendix A2. No further assessment is required.
National Parks and Wildlife Act 1974 (NP&W Act)	The NP&W Act is administered by the Director-General of the National Parks and Wildlife Services (NPWS), who is responsible for the control and management of all national parks, historic sites, nature reserves, and Aboriginal areas (among others). The Act aims to conserve the natural and cultural heritage of NSW. Where works will disturb Aboriginal objects, an Aboriginal Heritage Impact Permit (AHIP) is required. ELA has undertaken an Aboriginal Heritage Due Diligence (ADD) assessment to determine if the proposed works have the potential to impact upon any Aboriginal objects or places. There are no previously recorded Aboriginal sites within or adjacent to the study area (Figure 46), and the visual inspection identified that the majority of the proposed impact area has been highly

Name of Act	Relevance to the Project
	modified by the construction of Pittwater Road and the existing bridge, indicating there is a low potential for *in situ* subsurface archaeological deposits to be impacted by the proposed works.
Heritage Act 1977 (Heritage Act)	The Heritage Act provides protection of the environmental heritage of the State which includes places, buildings, works, relics, movable objects, or precincts that are of State or local heritage significance. The NSW State Heritage Register (SHR) is the statutory register under part 3A of the Heritage Act. Listing on the SHR means that any proposed works or alterations (unless exempted) to listed items must be approved by the Heritage Council or its delegates under Section 60 of the Act. Two locally listed heritage items are located approximately 90 m to the south of the study area (Figure 47): ● 'Row of Norfolk Island Pine Trees' – Item No. I166 (Manly LEP 2013) ● 'Group of 2 Storey Residential Flat Buildings' – Item No. I93 (Manly LEP 2013) The bridge is not a State listed heritage item, and the proposed works will not impact upon the significance of the listed heritage items in the vicinity. Further heritage approvals are not required.
Protection of the Environment Operations Act 1997 (POEO Act)	The POEO Act is the key environmental protection and pollution statute. The POEO Act is administered by the NSW Environment Protection Authority (EPA) and establishes a licensing regime for waste, air, water, and pollution. Relevant sections of the Act are listed below: ● Part 5.3 Water Pollution ● Part 5.4 Air Pollution ● Part 5.5 Noise Pollution ● Part 5.6 Land Pollution and Waste Any work potentially resulting in pollution must comply with the POEO Act. Relevant licences must be obtained if required. No licences have been identified as being required including an Environmental Protection Licence (EPL).
Water Management Act 2000 (WM Act)	The main objective of the WM Act is to manage NSW water in a sustainable and integrated manner that will benefit current generations without compromising future generations' ability to meet their needs. The WM Act is administered by Natural Resources Access Regulator (NRAR) and establishes an approval regime for activities within waterfront land, defined as the land 40 m from the highest bank of a river, lake, or estuary. Approvals under Section 91 are required for controlled activities on waterfront land. Under the WM Act, a controlled activity means: ● *the erection of a building or the carrying out of a work (within the meaning of the Environmental Planning and Assessment Act 1979),* ● *the removal of material (whether or not extractive material) or vegetation from land, whether by way of excavation or otherwise,* ● *the deposition of material (whether or not extractive material) on land, whether by way of landfill operations or otherwise, or* ● *the carrying out of any other activity that affects the quantity or flow of water in a water source.* Section 91E (1) of the WM Act identifies that it is an offence to carry out a controlled activity in, on or under waterfront land without gaining a controlled activity approval. However, under Schedule 4, Part 6, Clause 49 of the *Water Management (General) Regulation 2025* (WM Regulation) public authorities are exempt from Section 91E (1) of the WM Act, and therefore do not require any approvals for controlled activities on waterfront land.

2.3. Environmental Planning Instruments

Table 3: NSW Environmental Planning Instruments (EPIs)

Name of EPI	Relevance to Project
	State Environmental Planning Policy (SEPP)
State Environmental Planning Policy (Transport and Infrastructure) 2021 (Transport and Infrastructure SEPP)	**Permissibility** The aim of this Policy is to facilitate the effective delivery of infrastructure across NSW by identifying whether certain types of infrastructure require consent, can be carried out without consent or are exempt development. Pursuant to Section 2.109 (Part 2.1 Division 17) of the Transport and Infrastructure SEPP, development for the purpose of road or road infrastructure facilities may be carried out by or on behalf of a public authority without consent on any land. This includes construction works. **Consultation** Part 2.2 Division 1 of the Transport and Infrastructure SEPP contains provisions for public authorities to consult with other agencies prior to the commencement of development. Consultation requirements are detailed in Section 4 of this REF.
State Environmental Planning Policy (Resilience and Hazards) 2021 (Resilience and Hazards SEPP)	Chapter 2 of the Resilience and Hazards SEPP 2021 aims to manage development within coastal zones and protect the environmental assets of the coast. In accordance with Section 5 of the *Coastal Management Act 2016* (CM Act), the term coastal zone is defined as any area of land that is comprised of the following coastal management areas: • Coastal wetlands and littoral rainforests • Coastal vulnerability areas • Coastal environment areas • Coastal use areas. The study area is in the Coastal Environment Area and Coastal Use Area under the Resilience and Hazards SEPP (Figure 5). Controls for these areas under the SEPP apply where development consent is required. As the Project is being assessed under Part 5 of the EP&A Act, development consent is not required.
State Environmental Planning Policy (Biodiversity and Conservation) 2021 (Biodiversity and Conservation SEPP)	The following chapters of the Biodiversity and Conservation SEPP are relevant to the Project: • Chapter 4 Koala Habitat Protection. • Chapter 6 Water Catchments. Chapter 4 Koala Habitat Protection 2021 of the SEPP is relevant to the study area, as the proposed works are located within a LGA specified in Schedule 2 of the SEPP (Northern Beaches). The Northern Beaches LGA corresponds to the Central Coast Koala Management Area (KMA). The Likelihood of Occurrence Assessment (Appendix A2) found that Koala is unlikely to occur within the study area, given that marginal foraging habitat is present, and the species is not known from the study area (no BioNet records). The study area is not within a regulated catchment in accordance with Chapter 6 of this SEPP. Therefore, development controls under Section 6.7 of the SEPP relating to water quality and aquatic ecology do not apply.
	Local Environmental Plan (LEP)
Warringah Local Environmental Plan 2011 (Warringah LEP)	**Land Use Zoning** The impact area is zoned RE1 (Public Recreation), SP2 (Classified Road) and R2 (Low Density Residential) under the Warringah LEP 2011 (Figure 3). The objectives of each relevant land use zones are provided in Section 1.4.1. The works are in accordance with the Land Use Zone objectives where impacts to the environment are minimised, through detailed design, effort to avoid harm to marine vegetation and adopting the recommended mitigation measures. **Acid Sulfate Soils** In accordance with the Warringah LEP, the study area is mapped as having Class 5, Class 3 and Class 1 Acid Sulfate Soils (ASS). Overall, a high risk of ASS occurrence was identified in the study area (Figure 12). **Terrestrial Biodiversity**

Name of EPI	Relevance to Project
	The study area does not contain any terrestrial biodiversity mapped under the Warringah LEP.
Manly Local Environmental Plan 2013 (Manly LEP)	**Terrestrial Biodiversity** A small part of the study area, to the south, contains vegetation mapped under the Manly LEP terrestrial biodiversity overlay. No impacts to vegetation under this overlay are anticipated to occur because of the Project, based on the indicative impact area shown in Figure 6.

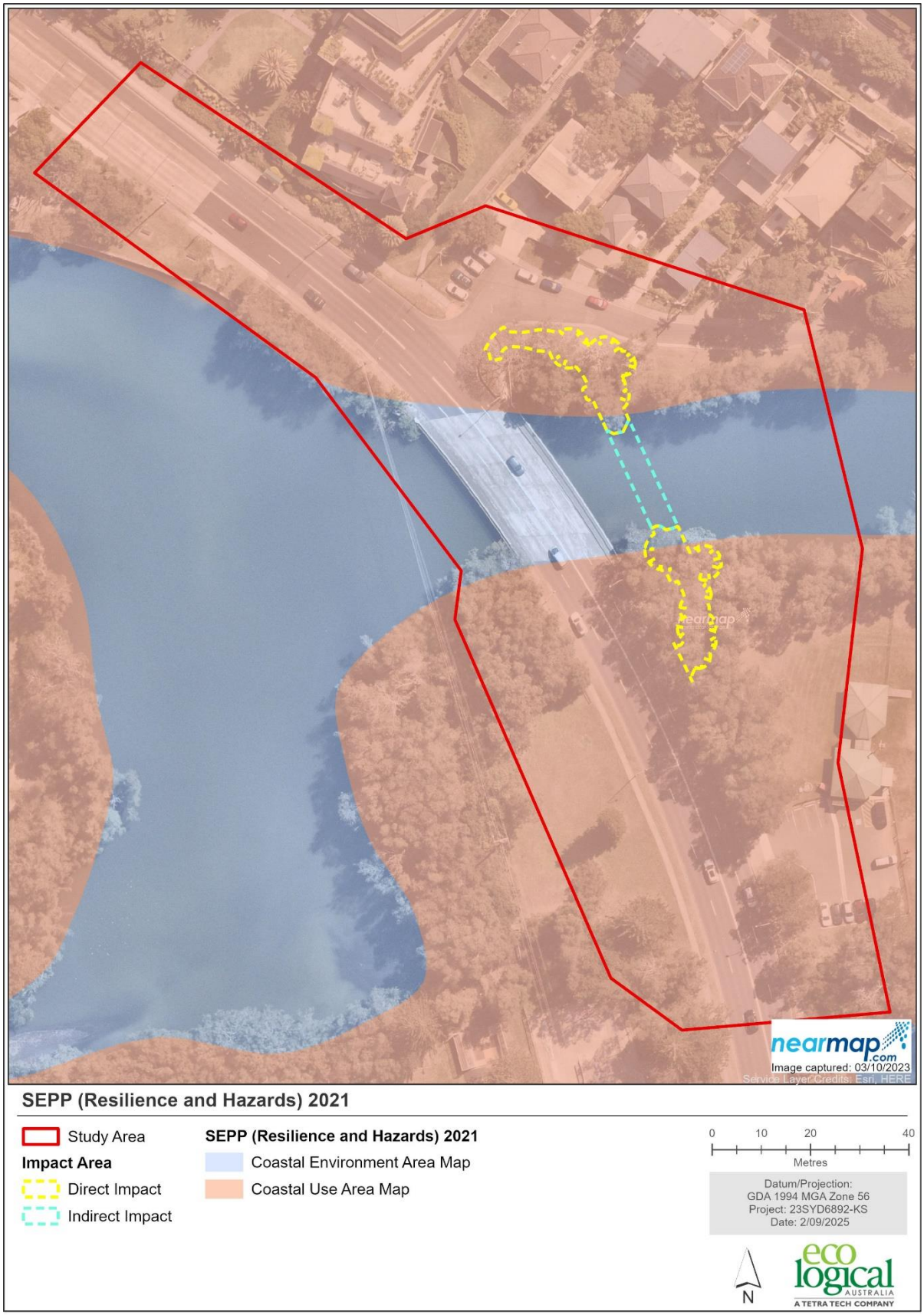


Figure 5: Resilience and Hazards SEPP

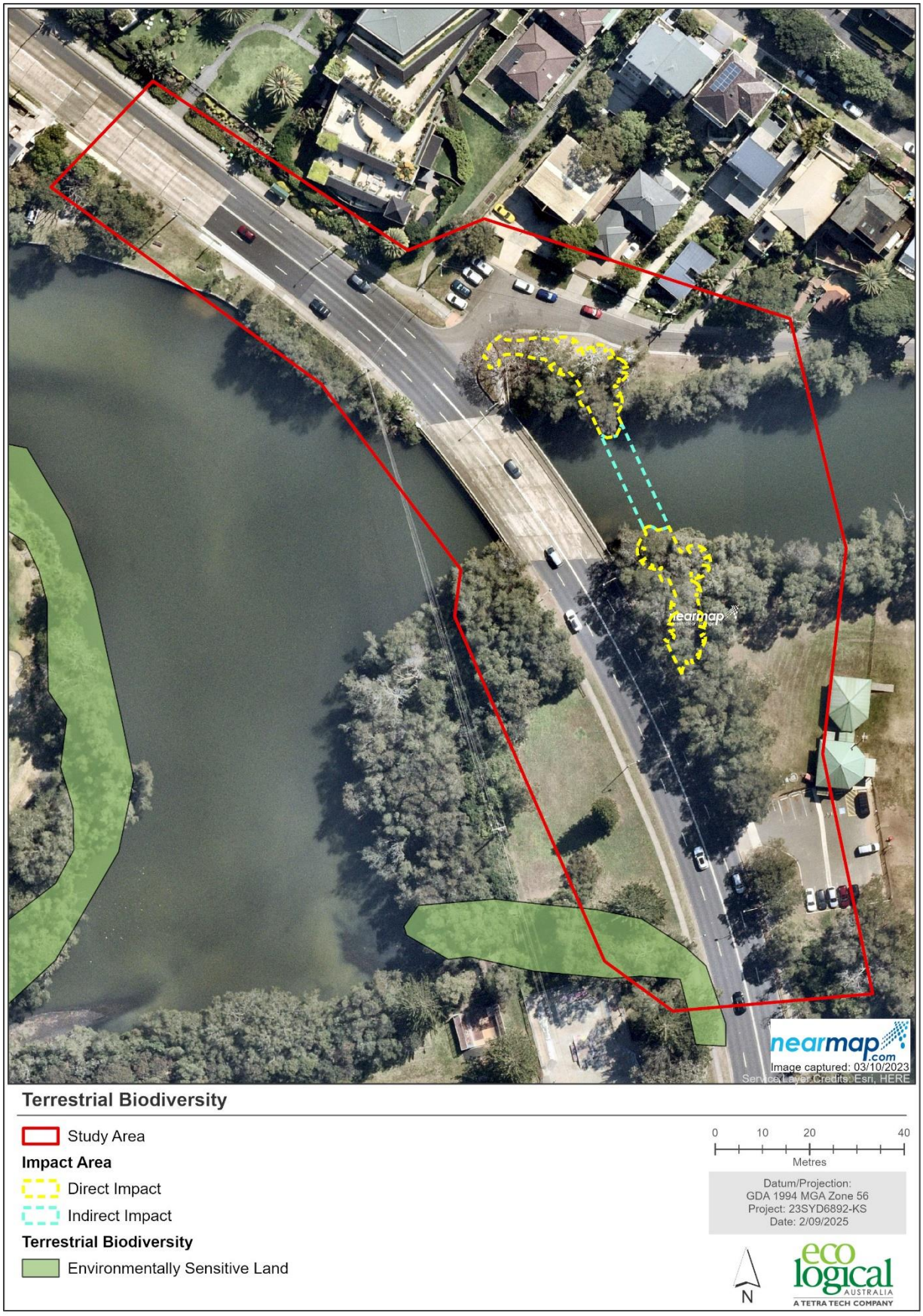


Figure 6: Terrestrial biodiversity overlay (Manly LEP 2013)

2.4. Strategic Planning Context

In accordance with Section 171 of the EP&A Regulation, the proposed works are to be considered in the context of any relevant local strategic planning statements, regional strategic plans or district strategic plans made under the EP&A Act. This context is assessed below, and the relationship between the strategic plans is summarised in Figure 7.

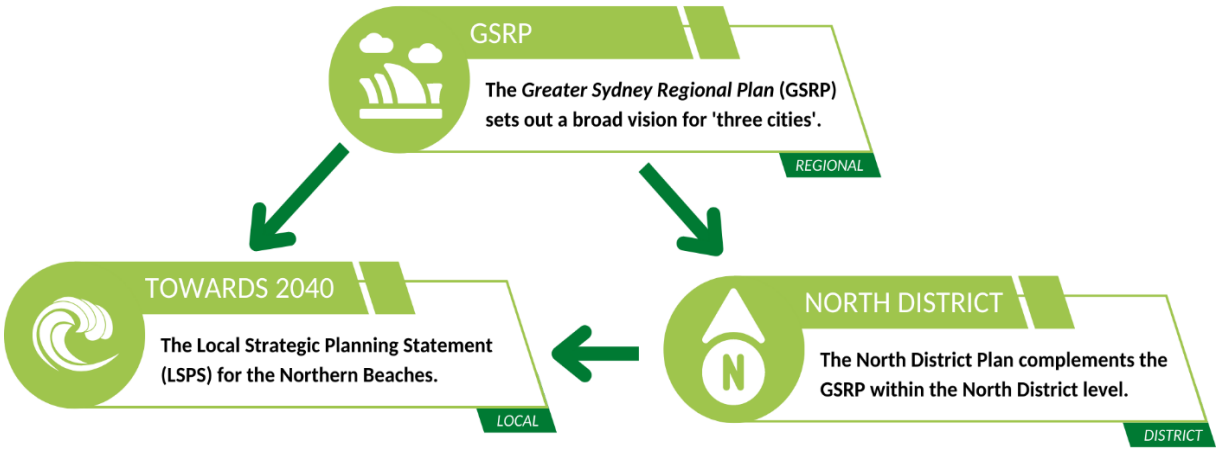


Figure 7: Relationship between the strategic plans relevant to the project

2.4.1. Community Strategic Plans

The *Community Strategic Plan 2040* is a Northern Beaches Council strategy that prioritises outcomes for the next 20 years including transport, technology, and connectivity. The Project supports the *Community Strategic Plan 2040* by improving the safety and connectivity of pedestrian and cycle movements throughout the LGA, encouraging active transport and healthy lifestyles.

On a local and community level, the Project also supports the *Move – Northern Beaches Transport Strategy* and will provide users with a wider path and greater accessibility for walking and cycling. It will offer transport and recreation opportunities for the community.

2.4.2. Greater Sydney Region Plan – A Metropolis of Three Cities

The *Greater Sydney Region Plan* (GSRP) is the regional plan that applies to the broader Sydney region including its future growth centres. It sets out the vision to build a city in which most residents live within thirty minutes of employment, education, health, services, and open spaces. The study area is within the 'North District', one of five districts under the GSRP.

One of the key directions of the GSRP is to create 'a well-connected city' and 'a city supported by infrastructure'. As described in Table 4 below, the Project supports the GSRP strategies by providing connectivity for walk and cycle infrastructure.

Table 4: GSRP Strategies relevant to the Project

GSRP Strategy		Relevance To Project
2.2	*Sequence infrastructure across Greater Sydney using a place-based approach*	The dedicated pedestrian and cycle bridge will provide an active transport corridor within the Northern Beaches LGA and will help link infrastructure within the broader area.
6.1	*Deliver social infrastructure that reflects the needs of the community now and in the future*	The Project will achieve this objective by providing a dedicated bridge for pedestrians and cyclists at Manly Lagoon. This reflects the needs of the community now, as identified through community consultation, and into the future, by contributing to the broader active transport network across the Northern Beaches.
6.2	*Optimise the use of available public land for social infrastructure*	The Project will achieve this objective by constructing a dedicated bridge for pedestrians and cyclists and making the crossing at Manly Lagoon more accessible, increasing the range of users
7.1	*Deliver healthy, safe, and inclusive places for people of all ages and abilities that support active, resilient, and socially connected communities*	The Project will achieve this objective by improving access to high quality walk and cycle routes, helping to encourage active and social modes of transport as well as providing more walkable places and reducing the potential for injury to occur between road users and pedestrians on the existing, unprotected footpath.

2.4.3. North District Plan

The *North District Plan* (NDP) is a complementary strategic plan to the GSRP, prepared by the Greater Sydney Commission (GSC) in 2018 at a district level, for the northern region of Greater Sydney. This encompasses many LGAs north of the Sydney Harbour and includes the Northern Beaches. The NDP sets out the vision for the Future of the North District through the following planning priorities which are supported by the Project:

- Creating a safe and dedicated pedestrian and cycle bridge for increased usability
- Adapting to the impacts of urban and natural hazards and climate change
- Protecting and maintaining the health and enjoyment of Sydney Harbour and the District's waterways
- Delivering high quality open space
- Facilitating a healthy, connected, and safe community

2.4.4. Towards 2040 - Local Strategic Planning Statement

Towards 2040 is the Northern Beaches Councils' first Local Strategic Planning Statement (LSPS), being a 20-year land use planning vision prepared as required under the EP&A Act. The LSPS contains thirty planning priorities that will help to achieve the *Towards 2040* vision. The priorities which apply to the Project, and their relevance, are described in Table 5.

The LSPS aligns with several strategic plans that apply to the study area in its broader context, including the GSRP and the NDP.

Table 5: Towards 2040 LSPS planning priorities relevant to the project

Planning Priority		Relevance To Project
6	*High quality open space for recreation*	The use of the existing Queenscliff bridge is limited by narrow pedestrian corridors either side of the busy Pittwater Road. There is limited

Planning Priority		Relevance To Project
		protection separating the footpath and the roadway so by providing a dedicated pedestrian and cycle bridge, the Project will provide high quality and safe infrastructure to be used for outdoor recreation.
11	*Community facilities and services that meet changing community needs*	There has been a significant increase in the number of people engaging with recreational cycling with more and more people taking to bikes within the Northern Beaches. The Project will support changing community needs and attitudes towards active, outdoor recreation by providing an expanded, safe, and dedicated crossing over Manly Lagoon.
12	*An inclusive, healthy, safe, and socially connected community*	The proposed works will facilitate a healthy, safe, and socially connected community by providing dedicated access across Manly Lagoon. The pedestrian and cycle bridge will help promote healthy activities and improve connectivity between local communities.

3. Environmental Impact Assessment

3.1. Landform and Soils

3.1.1. Existing Environment

3.1.1.1. Soils and Geology

Within estuarine and anthropogenic (modified) geological deposits (Figure 10), the study area spans the Newport and Warriewood soil landscapes (Figure 11). Newport is an aeolian (wind-formed) soil landscape characterised by Holocene sands atop other soil materials or bedrock. It has limitations related to its non-cohesive properties such as erosion hazard and low fertility. Vegetation on this soil landscape typically consists of coastal scrub and heathland in exposed locations, like Manly Lagoon.

The Warriewood soil landscape is associated with swamps, depressions, and infilled lagoons on Quaternary sands. It is a highly permeable, deep soil landscape over more than 1.5 m and contains a changing, but typically high, water table. Limitations of this soil landscape includes localised flooding, salinity, and strongly acid soils. The high-water table and permeability can also pose limitations where development is concerned. A geotechnical assessment has not yet been completed.

3.1.1.2. Contaminated Land

The Contaminated Land Register (EPA 2025) was checked for known contaminated land or potential contamination risk within the LGA 'Northern Beaches Council' on 2 September 2025. There are no current contamination notices applied within or near the study area. There was no obvious gross contamination (staining, odours, or distressed vegetation) noted within the study area during field survey. While some litter was noted around the study area, it is unlikely that gross contamination is present. Soils and water have not been tested for contamination as part of this assessment.

3.1.1.3. Acid Sulfate Soils

In accordance with Clause 6.1 of the Warringah LEP, the study area is partially mapped as having Class 5, Class 3, and Class 1 Acid Sulfate Soils (ASS). ASS are generally not found in areas mapped under Class 5. Class 1 typically indicates a known or high potential for ASS to occur. ASS are common around coastal areas of NSW, and do not pose a risk left undisturbed. An overall high probability of encountering ASS was identified (Figure 12).

3.1.1.4. Topography – Flood Prone Land

The study area is identified as a high-risk precinct for flooding under the Northern Beaches Council Flood Hazard Map (NBC 2023). Historically, in addition to the recent March 2022 floods, parts of Pittwater Road have flooded to the point where vehicle access has become unsafe. Evidence of historic floods affecting Pittwater Road are provided in Figure 8 (1942) and Figure 9 (1949).

Figure 8: Historic flooding (1942) of Manly Lagoon at Pittwater Road, Queenscliff (Northern Beaches Council)

Figure 9: Historic flooding (1949) of Manly Lagoon at Pittwater Road, Queenscliff (Northern Beaches Council)

Figure 10: Geology of the study area

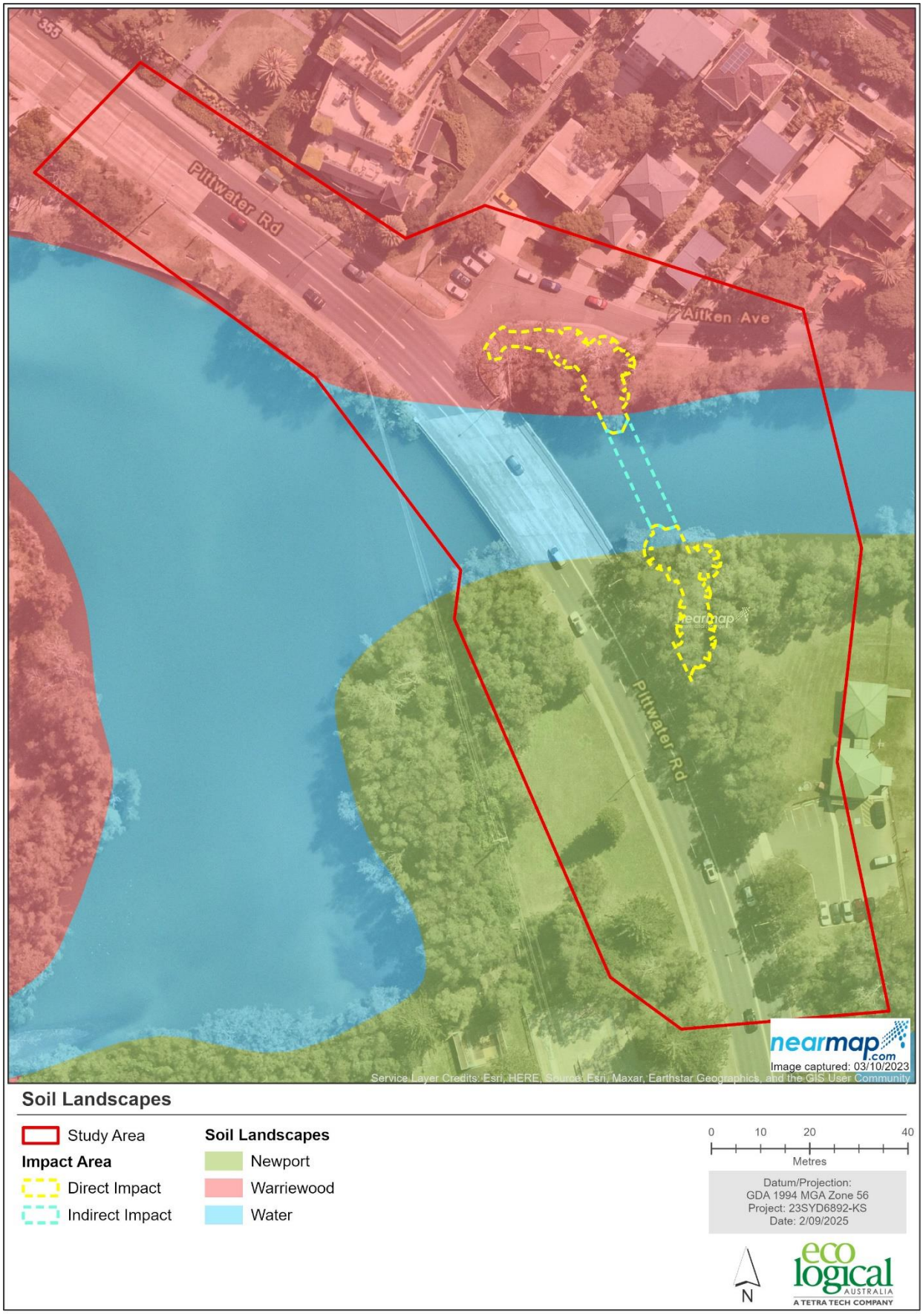


Figure 11: Soil landscapes within the study area

Figure 12: ASS risk in relation to the study area

3.1.2. Impact Assessment

3.1.2.1. Soils, Erosion and Sedimentation

The proposed works will require excavation on the creek bank either side of Manly Creek, to construct the bridge abutments. These works have the potential to impact on soil stability and cause sedimentation of the adjacent aquatic habitat. Whilst there is potential during construction for erosion and sedimentation to occur, these are expected to be mitigated through the use of strict sediment and erosion controls.

The effects of soil erosion and sedimentation on the surrounding environment is therefore considered to be low if the mitigation measures described in Section 5 are implemented.

3.1.2.2. Contamination

Based on current site condition, there is low potential for contamination to exist within the study area. If contaminated soils are suspected such as through visual assessment or odours, further assessment should be completed to determine the risk.

If any excess soils are to be taken offsite for disposal or reuse, material should be tested to ensure they are safe for their end use or disposed of in accordance with EPA (2014) *Waste Classification Guidelines*. If contamination is suspected, contact the Council Compliance and Natural Environment and Climate Change units.

Use of hazardous materials will be required to undertake the works (e.g., fuel for machinery). Potential environmental impacts include pollution of soils and waterways from accidental chemical or fuel spills. Proper use and storage of hazardous materials/chemicals is to be adhered to, outlined in Table 6 below.

3.1.2.3. Acid Sulfate Soils

ASS do not pose a risk when left undisturbed. Disturbance of ASS causes a chemical reaction, potentially causing harm to waterways, animals, plants, buildings (including infrastructure) people because of acid entering the air and water (DPE 2019). Disturbed ASS can kill fauna and plants and enter waterways eventually killing immobile fauna (such as oysters) and infauna as it reaches the bed. Harm to humans can include irritation of the eyes or skin (e.g., dermatitis). There is a high likelihood of ASS of occurring within the study area, therefore potential impacts must be considered and managed accordingly to mitigate harm to the environment, people, and infrastructure.

It is recommended that soils are tested for ASS prior to the works proceeding, and an ASS Management Plan prepared as required. Testing and management should be completed in accordance with the Acid Sulfate Soil Manual (ASSMAC 1998).

3.1.2.4. Flood Risk

The works are within a high-risk precinct in relation to flooding. The works comprise a bridge and raised pedestrian crossing, which is still prone to flooding based on historic flood evidence. Materials should be used that are suitable for flood prone areas, to protect the proposed Queenscliff Bridge and ensure longevity of use. Consultation with the State Emergency Service (SES) is required in line with consultation under the Transport and Infrastructure SEPP.

Mitigation measures relating to landform and soils are provided below in Table 6 and Section 5.

3.1.3. Mitigation Measures

Table 6: Landform and soils mitigation measures

Impact Description	Safeguards/Mitigation Measures
• Soil erosion and sedimentation during removal of the existing vegetation • Sedimentation, erosion and runoff caused by vehicle movements and/or heavy rainfall. • Soil erosion, sedimentation, and bioturbation during excavation	• Prepare a Construction Environmental Management Plan (CEMP) prior to any construction works to address measures to be adopted to minimise impacts on the environment because of the construction works, including soil erosion and sedimentation. • Schedule the work outside of predicted heavy rain periods. • Stop work during and after heavy rainfall to reduce risk of mobilising sediment. • A Sediment and Erosion Control Plan is to be implemented prior to works, with the aim of achieving an outcome of no visible turbid plumes migrating through the waterway. This should include: • Sediment and erosion controls to protect the waterway from bank works and vegetation removal. • A floating sediment curtain to enclose all suspended sediments and organic material generated within the worksite. • Sediment curtain must be positioned and secured properly. • Tarps to be placed carefully over beds within the immediate work area to prevent infauna from being smothered by sediment and organic matter resulting from excavations. • Tarps are to be rolled up and sediments and debris removed from the waterway and disposed of at an appropriate waste facility. • Tarps must not remain on the creek bed for more than 24 hours. • Inspect erosion controls regularly (daily during workdays) and after rainfall. Fix damaged controls immediately. Remove accumulated sediment or waste material from within the sediment controls regularly. • Leave erosion and sediment controls in place until after the works are completed.
• Unexpected contamination • Pollution of sediment from chemical spills (e.g., fuel or oil from machinery)	• If contaminated soils are uncovered during the works, all works within the vicinity of the find must cease immediately and the relevant authority must be notified immediately. • For any excess spoil where potentially, contaminating activities have been identified on site this material will be tested and classified prior to leaving site. For any excess spoil material classified as contaminated, disposal of this material will be at an appropriately licensed landfill in accordance with the EPA (2014) *Waste Classification Guidelines*. • Store all chemicals (e.g., fuel, oil) in appropriate bunding/storage systems within the approved storage facility out of the riparian zone. • Ensure appropriate spill kits are carried with the equipment.
• Disturbance of ASS	• Test soils prior to any ground disturbance works. • Prepare and implement an ASS Management Plan in accordance with the *Acid Sulfate Soils Manual* (ASSMAC 1998) if ASS are confirmed within the area subject to disturbance.
• Increased flood hazard or damage due to floods	• Use of construction materials suitable for flood risk environments • Consult with SES with regard to works in Flood Prone Land

3.2. Waterways and Wetlands

3.2.1. Existing Environment

3.2.1.1. Waterbodies

The study area contains Manly Creek, which is a 4th order Strahler stream associated with Manly Lagoon (Figure 16). Manly Creek is identified as KFH by DPI Fisheries, and overall is classed as Type 1 Highly Sensitive KFH: *coastal lakes and lagoons that have a natural opening and closing regime (i.e., are not permanently open or artificially opened or are subject to one off unauthorised openings)*. Impact to KFH is addressed in Section 3.4 below.

Manly Lagoon has a catchment area of 1,720 ha, size of 10 ha, volume of 35.6 ML and an average depth of 0.4 m (EHG 2025). Water quality is regularly monitored by Department of Planning and Environment (DPE) in Manly Lagoon, which generally finds that water quality is poor. As of the most recent water quality assessment, algae levels were considered very poor and water clarity to be good (Figure 13). ELA measured salinity of the lagoon at 19.3 parts per trillion (ppt), indicating a moderate marine influence.

No Ramsar Wetlands or Coastal Wetlands (under Chapter 2 Coastal Management of the Resilience and Hazards SEPP) have been identified within the study area.

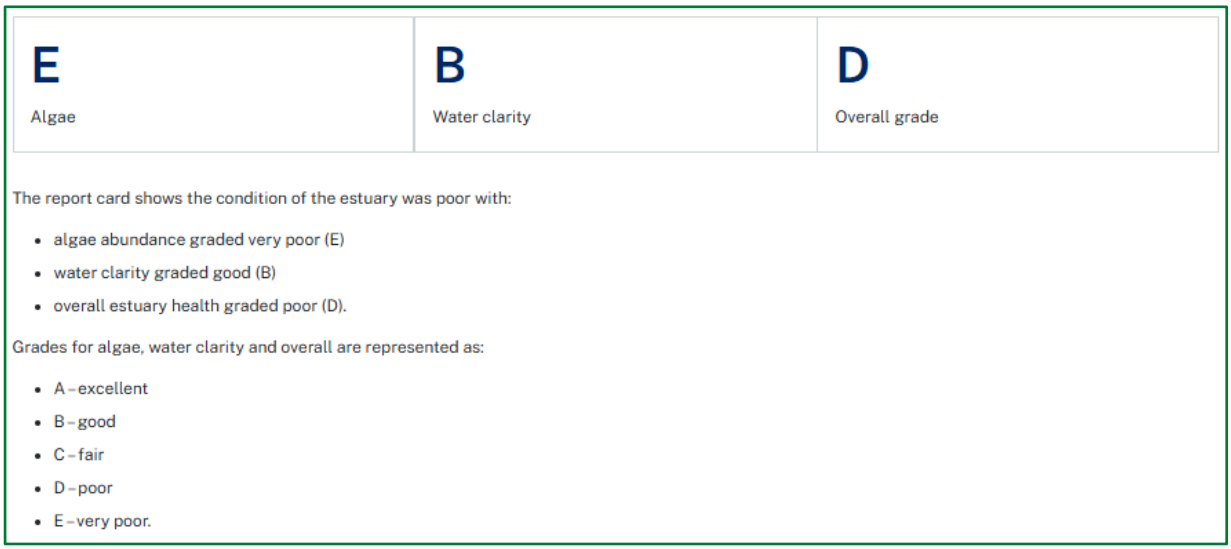


Figure 13: Manly Lagoon water quality results (Summer 2023-24) (EHG 2025)

3.2.1.2. Coastal Environment and Use Areas

The study area is within a mapped Coastal Use Area and Coastal Environment Area under the Resilience and Hazards SEPP. Development controls for these areas under the SEPP do not apply, because development consent is not required for the Project. Regardless, the Project should be designed and carried out in accordance with the required considerations under Part 2, Division 3, Section 2.10 and Section 2.11 of the Resilience and Hazards SEPP wherever possible.

3.2.1.3. Navigable Waters

Manly Lagoon is not classified as navigable waters, considering it is closed off from adjoining waterbodies and not easily accessible by boat (Figure 14). Recreational access (e.g., kayak) may occur in Manly Lagoon. Impacts to marine navigability are not expected to occur because of the Project.

3.2.1.4. Climate Change – Sea level rise

Manly Lagoon is in a coastal environment that is potentially susceptible to climate change. The location of the study area is expected to be below the tideline after +1°C of global warming because of sea level rise. This estimation of long-term sea level outcomes indicates that the study area may become inundated within this century on its current trajectory of greenhouse gas emissions.

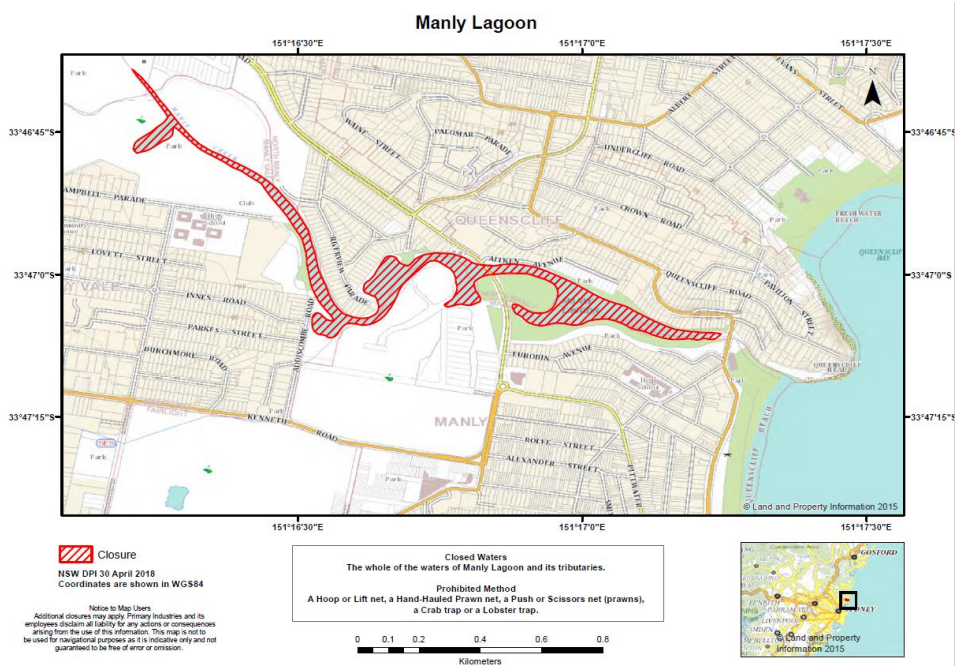


Figure 14: Closure of Manly Lagoon (DPI Fisheries)

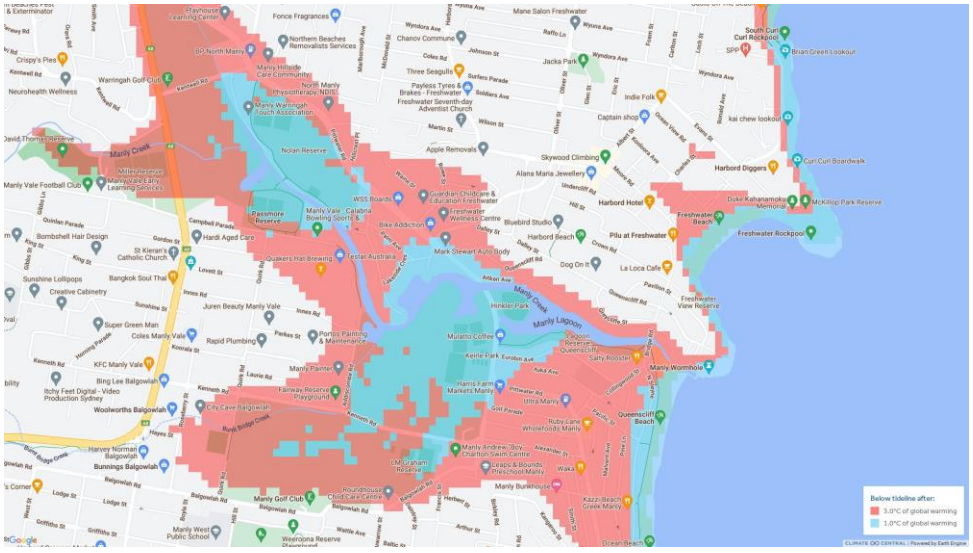


Figure 15: Sea level rise under 1.5°C warming (blue) and 3°C warming (red) (Climate Central 2021)

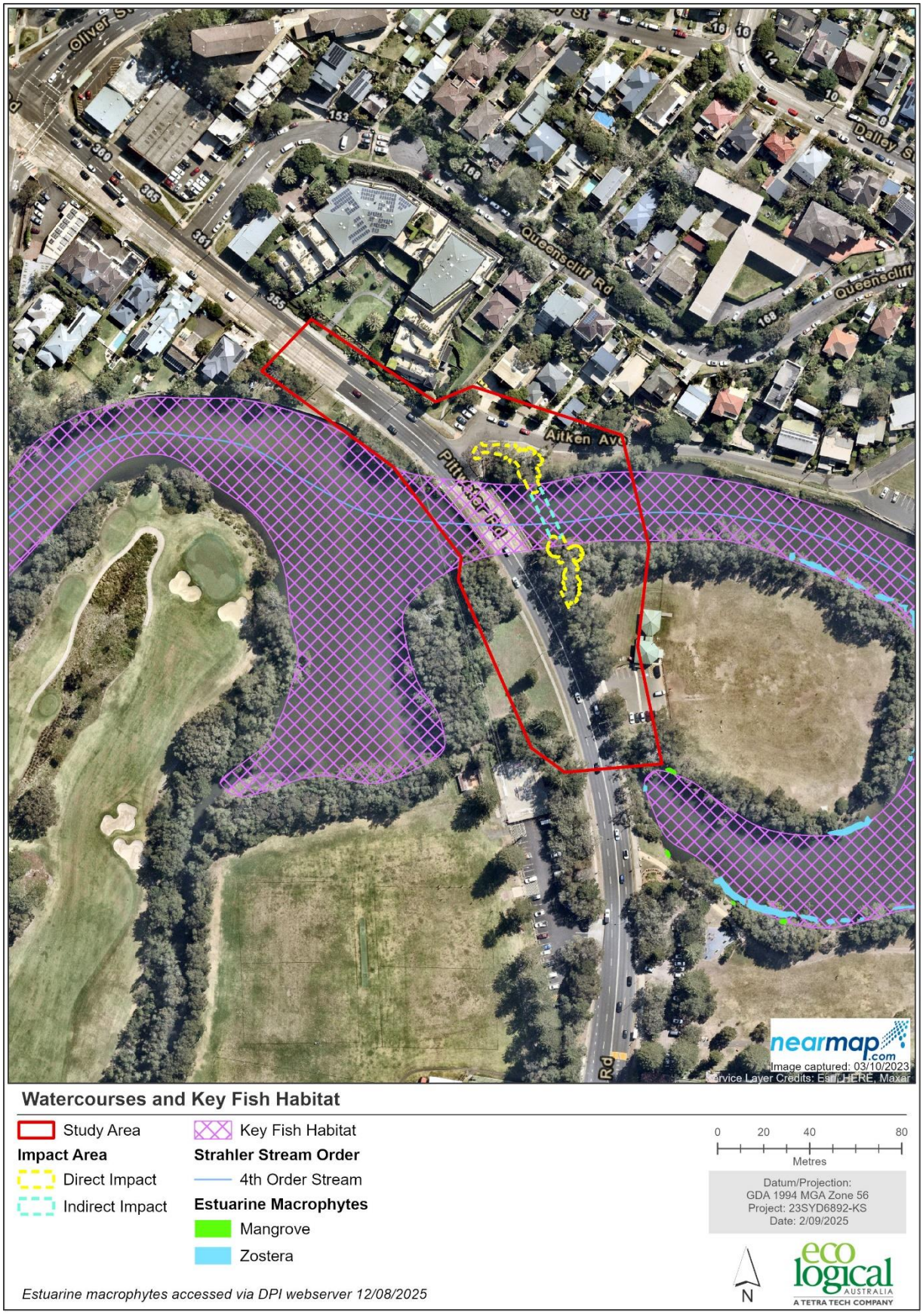


Figure 16: Watercourses and Key Fish Habitat (KFH)

3.2.2. Impact Assessment

Works that involve ground disturbance in such close proximity to a waterbody have the potential to degrade water quality by introducing sediments and increasing turbidity of the watercourse. Increased turbidity is likely to be localised to the immediate area where works are taking place. Disturbed sediments are likely to be marine sand (e.g., of the Newport soil landscape) or finer soils (on the northern side associated with Warriewood soils). Sediments would not stay suspended in the water column for an extended period. As such, impacts on water quality would be short-term and temporary in nature.

Some aquatic organisms live within the dominant substrate of their environment, in this case sand or seafloor sediments, and are known as infauna. Localised and temporary siltation of substrate and infauna burrows has the potential to occur because of the works. Mitigation measures have been provided in Section 3.2.3 and Section 5 to manage potential water pollution and siltation.

3.2.2.1. Key Fish Habitat

The Proposal would result in a net loss of KFH if the final design cannot avoid harm to mangroves. Impact to KFH is describe further in the Marine Ecology Assessment below in Section 3.4.

3.2.2.2. Coastal Use and Environment Area (Resilience and Hazards SEPP)

The Project should be generally in line with the development controls for the Coastal Environment Area and Coastal Use Area wherever possible, however the controls do not apply because development consent is not required.

Table 7: Resilience and Hazards SEPP

SEPP Clause	Response
Division 3 Coastal environment area	
Development consent must not be granted to development on land that is within the coastal environment area unless the consent authority has considered whether the proposed development is likely to cause an adverse impact on the following— *a) the integrity and resilience of the biophysical, hydrological (surface and groundwater) and ecological environment,* *b) coastal environmental values and natural coastal processes,* *c) the water quality of the marine estate (within the meaning of the Marine Estate Management Act 2014), in particular, the cumulative impacts of the proposed development on any of the sensitive coastal lakes identified in Schedule 1,* *d) marine vegetation, native vegetation and fauna and their habitats, undeveloped headlands and rock platforms,* *e) existing public open space and safe access to and along the foreshore, beach, headland or rock platform for members of the public, including persons with a disability,* *f) Aboriginal cultural heritage, practices and places,* ***g)** the use of the surf zone.*	This REF includes mitigation measures to reduce impacts to the biophysical, hydrological, and ecological environment including water quality, marine vegetation, and fauna where feasible. These mitigations are provided in Table 7 below, and Section 5 of this REF.
Division 4 Coastal use area	
Development consent must not be granted to development on land that is within the coastal use area unless the consent authority— *a) has considered whether the proposed development is likely to cause an adverse impact on the following—* *(i) existing, safe access to and along the foreshore, beach, headland or rock platform for members of the public, including persons with a disability,* *(ii) overshadowing, wind funnelling and the loss of views from public places to foreshores,*	This REF includes mitigation measures to reduce impacts to the biophysical, hydrological, and ecological environment including water quality, marine vegetation, and fauna where feasible. These mitigations are

SEPP Clause	Response
(iii) the visual amenity and scenic qualities of the coast, including coastal headlands, *(iv) Aboriginal cultural heritage, practices and places,* *(v) cultural and built environment heritage, and* *b) 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) if that impact cannot be reasonably avoided—the development is designed, sited and will be managed to minimise that impact, or* *(iii) if that impact cannot be minimised—the development will be managed to mitigate that impact, and* **a)** *has taken into account the surrounding coastal and built environment, and the bulk, scale and size of the proposed development.*	provided in Table 7 below, and Section 5 of this REF.

3.2.3. Mitigation Measures

Table 8: Water quality and hydrology mitigation measures

Impact Description	Safeguards/Mitigation Measures
• Excess sediment input into waterway • Pollution of foreshore from chemical spills (e.g., fuel or oil)	• Weather forecasts will be checked daily to ensure that work is not carried out before or during high rainfall. • Store all chemicals (e.g., fuel, oil) offsite and if required to be stored onsite, chemicals should be stored in appropriate bunding/storage systems and only for short periods. • Ensure appropriate spill kits are present onsite. • Ensure all equipment is in good working order. • Carry associated Safety Data Sheets (SDS) for all chemicals. • Wash all equipment, including hulls of barges, anchors, sediment curtains and trailers to prevent spread of aquatic pests including *Caulerpa taxifolia* (Caulerpa). Provide contractors on site with copy of *Make 'clean' part of your routine* (DPI, 2015). • A visual check for Caulerpa on all equipment and vessels to be used in the activities must be carried out before work commences.

3.3. Terrestrial Biodiversity

3.3.1. Existing Environment

The study area is located on Manly Lagoon with patches of remnant native vegetation. The 'study area' refers to the area subject to this assessment, while the 'impact area' refers to the area that would be directly impacted by the proposed works – noting that final bridge design is yet to be provided, and these impacts may be subject to change. The impact area is located completely within the study area.

A desktop literature and data review was completed to identify threatened ecological communities, flora, fauna and migratory species either known or considered likely to occur in the study area. Searches under the BioNet Atlas of NSW Wildlife and the EPBC Act Protected Matters Search Tool (PMST) were carried out within a 5 km radius of the study area. The search identified nine threatened ecological communities, 146 threatened fauna species and 40 threatened flora species with BioNet records or modelled habitat (under PMST) within 5 km of the study area (Appendix A2).

Field survey was completed by ELA Ecologist Alice Ridyard on 14 November 2023, and included the following tasks:

- Validation of previously mapped vegetation communities (Figure 23).

- Identification of habitat features including nests, hollow bearing trees, culverts, woody debris and leaf litter.
- Recording opportunistic fauna sightings.

Validated Vegetation Communities

Four vegetation zones were identified during the field survey in the study area (Figure 24):

- PCT 4028: Estuarine Swamp Oak Twig-rush Forest
- Planted Native
- Planted Exotic
- Exotic Grasses

ESTUARINE SWAMP OAK TWIG-RUSH FOREST (PCT 4028)

The majority of the study area was historically cleared of all vegetation. Historical imagery indicates that clearing occurred prior to 1975 (Spatial Services 2025).

A recent aerial photo of the study area shows significant areas of trees, shrubs as well as other areas of vegetation (Figure 1). Some of this vegetation is likely to be planted, as evidenced by straight lines (Figure 18), while other areas of vegetation may be either planted or naturally regenerated from nearby remnant vegetation or from seed and roots that remained after clearing. Vegetation that occurs within an area that contains a mosaic of planted and remnant native vegetation and can be reasonably assigned to a PCT known to occur in the same IBRA subregion, has all been assigned to PCT 4028.

Estuarine Swamp Oak Twig-rush Forest was found in several patches in poor condition (Figure 17). The canopy was dominated by *Casuarina glauca* (Swamp Oak), with the occasional *Eucalyptus botroides* (Bangalay). The midstorey contained the occasional *Avicennia marina* (Grey Mangrove), *Pittosporum undulatum* (Native Daphne), *Melaleuca quinquenervia* (Broad-leaved Paperbark) and *Melaleuca nodosa* (Prickly-leaved Paperbark). The ground storey was dominated by exotic species such as *Ehrharta erecta* (Panic Veldtgrass) and *Tradescantia fluminensis* (Trad) with *Phragmites australis* (Common Reed) and *Tetragonia tetragonoides* (Warrigal Greens) growing along the water's edge. In the northeastern extent was a single large remnant *Casuarina glauca* (Swamp Oak) within a resident's garden with a planted understorey with species including *Melaleuca bracteata* (Black Tea-tree), *Camelia* sp. and mown exotic grasses.

PCT 4028 corresponds to an endangered ecological community (EEC) under both the BC Act and EPBC Act. The extent of PCT 4028 in the study area meets the BC Act definition of *Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and Southeast Corner Bioregions* (TSSC 2011).

However, PCT 4028 within the study area does not meet the EPBC condition thresholds for listing as *Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and Southeast Queensland ecological community*. These areas conform to the category of "small patch" and meet the key diagnostics, but do not have a predominantly native understorey (i.e., non-native species comprise greater than 20% of total understorey vegetation cover) (DEE 2018).

Figure 17: PCT 4028 in poor condition within the study area

PLANTED NATIVE

In the western extent of the study area, there is an area of *Eucalyptus robusta* (Swamp Mahogany) and *Lophostemon confertus* (Brush Box) with a mown *Stenotaphrum secundatum* (Buffalo Grass) understorey (Figure 18). These are likely planted specimens due uniform patterning and being an even-aged stand. In the northern extent of the study area are a *Cupaniopsis anacardioides* (Tuckeroo) within private property and a *Callistemon viminalis* (Weeping Bottlebrush) street tree. These are also likely to be planted due to historical aerial photography showing their absence (Spatial Services 2025) and positioning within the suburban landscape (Figure 19, Figure 20). Planted native vegetation does not form part of any native ecological community or PCT.

Figure 18: Planted native vegetation in western extent of study area

Figure 19: Planted *Cupaniopsis anacardioides* (Tuckeroo)

Figure 20: *Callistemon viminalis* (Weeping Bottlebrush)

PLANTED EXOTIC

The planted exotic vegetation included the occasional exotic tree, such as *Araucaria columnaris* (Cook Pine), *Araucaria heterophylla* (Norfolk Island Pine) and *Jacaranda mimosifolia*. (Figure 21). Underneath these trees was generally mown exotic grasses, including *Cenchrus clandestinus* (Kikuyu), *Sporobolus africanus* (Parramatta Grass) and *Poa annua* (Winter Grass). Planted exotic vegetation does not form part of any native ecological community.

Figure 21: Planted exotic vegetation within the study area

EXOTIC GRASSES

There were several patches of mown exotic grasses (Figure 22). In these areas there was no canopy or mid-storey. The ground layer consisted of exotic grasses such as *Stenotaphrum secundatum* and *Cenchrus clandestinus* and the occasional *Dichondra repens* (Kidney Weed).

Areas of vegetation dominated by exotic grasses does not form part of any native ecological community.

Figure 22: Exotic grasses within the study area

Figure 23: Previously mapped terrestrial and aquatic vegetation

Figure 24: Validated vegetation within the study area

Threatened Species Habitat Assessment

No hollow bearing trees were identified in the study area during survey. The underneath of the bridge was inspected by Aquatic Ecologist Ian Dixon using a remotely controlled camera on 23 November 2023. No microbat activity was observed. However, potential roosting cracks for some microbats were apparent (Figure 25). Threatened microbats, as well as threatened birds, may use some of the vegetation in the study area for foraging purposes.

Manly Lagoon passes underneath the existing Pittwater Road bridge (Figure 26), adjacent to the proposed bridge location. This is potential foraging habitat for the *Myotis Macropus* (Southern Myotis) as was as for waterbirds. *Gambusia* sp. were observed in Manly Lagoon (Figure 27). There was also a narrow drainage line at the south western extent of the study area (Figure 28). The degraded condition of the vegetation, brackish water, and presence of *Gambisia* sp. make these waterbodies unlikely to provide habitat for threatened amphibians.

No other habitat features such as caves, or significant leaf litter or woody debris were identified in the study area during survey.

Opportunistic Fauna Sightings

A total of five terrestrial fauna species were sighted or heard opportunistically during the survey, including *Acridotheres tristis* (Common Myna), *Manorina melanocephala* (Noisy Miner) and *Cacatua galerita* (Sulphur-crested Cockatoo) (Appendix A1). No threatened terrestrial fauna were opportunistically observed.

Threatened Flora

A search for threatened species using the Protected Matters Search Tool (PMST) and Atlas of NSW Wildlife (within a 5 km buffer around the study area) and the review of literature identified 38 threatened flora species under the BC and / or EPBC Acts, which may have the potential to occur within a 5 km radius of the study area. However, no threatened flora species records were found within the study area (Figure 30). After completing a likelihood of occurrence assessment (Appendix A2), it was determined that it is unlikely that any threatened flora occur within the study area.

Threatened Fauna

The literature review identified 123 threatened fauna species listed under the BC Act and/or EPBC Act, which may have the potential to occur within a 5 km radius of the study area. However, no threatened terrestrial fauna species records were found within the study area (Figure 29). A Likelihood of Occurrence assessment for terrestrial and aquatic fauna records within 5 km is contained within Appendix A2.

The following terrestrial threatened fauna species have potential to occur within the study area:

BIRDS:

- *Calidris acuminata* (Sharp-tailed Sandpiper) – Migratory (EPBC Act)
- *Calyptorhynchus lathami lathami* (South-eastern Glossy Black-Cockatoo) – Vulnerable (BC Act and EPBC Act)
- *Haematopus fuliginosus* (Sooty Oystercatcher) – Vulnerable (BC Act)
- *Haematopus longirostris* (Pied Oystercatcher) – Endangered (BC Act)

- *Haliaeetus leucogaster* (White-bellied Sea-Eagle) – Vulnerable (BC Act)
- *Hirundapus caudacutus* (White-throated Needletail) – Migratory (EPBC Act)
- *Hydroprogne caspia* (Caspian Tern) – Migratory (EPBC Act)
- *Ixobrychus flavicollis* (Black Bittern) – Vulnerable (BC Act)
- *Lathamus discolor* (Swift Parrot) – Endangered (BC Act) and Critically Endangered (EPBC Act)
- *Limosa lapponica* (Bar-tailed Godwit) – Migratory (EPBC Act)
- *Ninox strenua* (Powerful Owl) – Vulnerable (BC Act)
- *Pandion cristatus* (Eastern Osprey) – Vulnerable (BC Act)
- *Pluvialis squatarola* (Grey Plover) – Migratory (EPBC Act)
- *Thalasseus bergii* (Greater Crested Tern) – Marine and Migratory (EPBC Act)

MICROBATS:

- *Chalinolobus dwyeri* (Large-eared Pied Bat) – Vulnerable (BC Act)
- *Miniopterus australis* (Little Bentwing-bat) – Vulnerable (BC Act)
- *Miniopterus orianae oceanensis* (Large Bent-winged Bat) – Vulnerable (BC Act)
- *Myotis Macropus* (Southern Myotis) – Vulnerable (BC Act)

Figure 25: Potential microbat roosting habitat under bridge

Figure 26: Manly Lagoon

Figure 27: Gambusia in Manly Lagoon

Figure 28: Drainage line

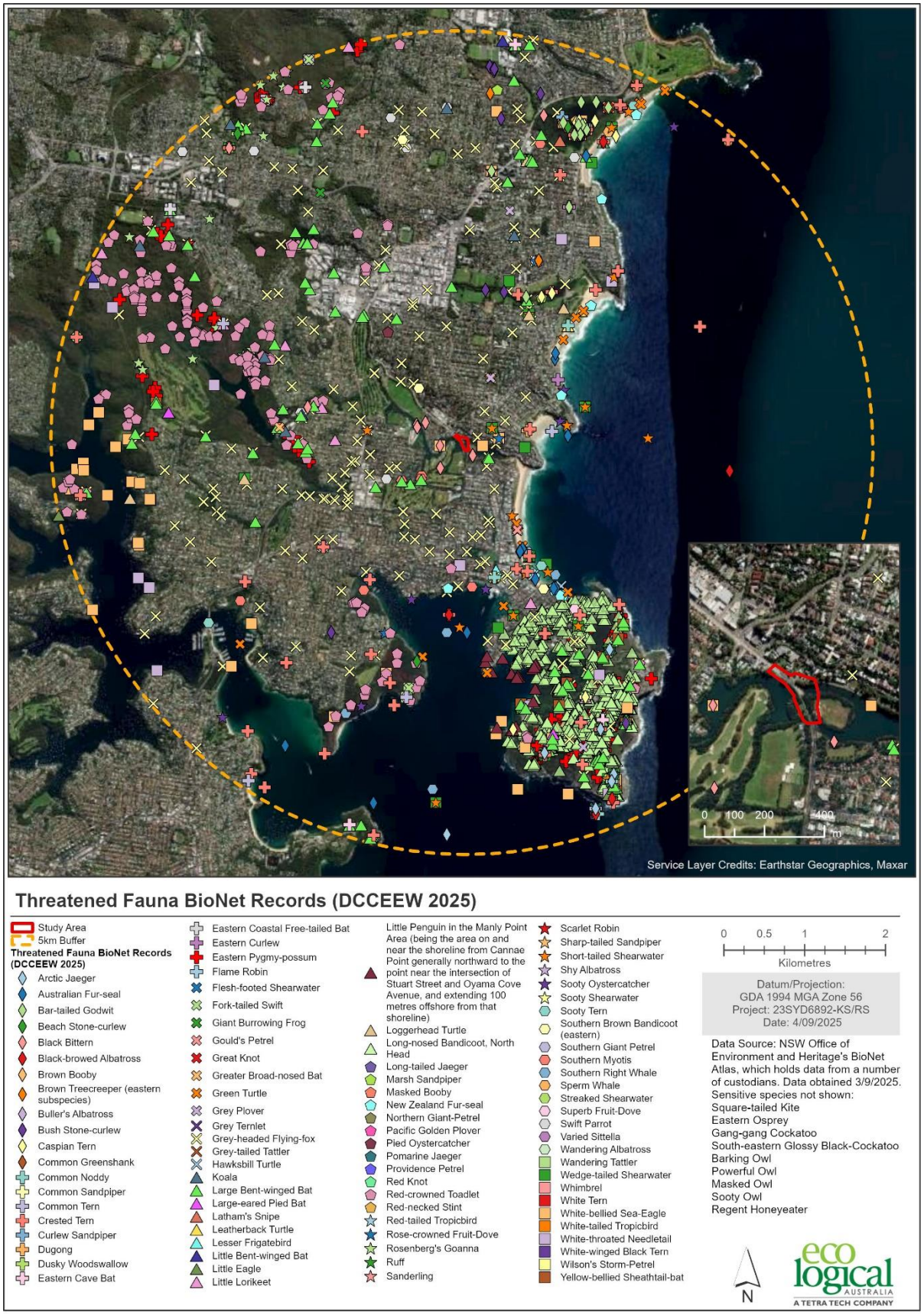


Figure 29: BioNet Atlas threatened fauna records within 5 km

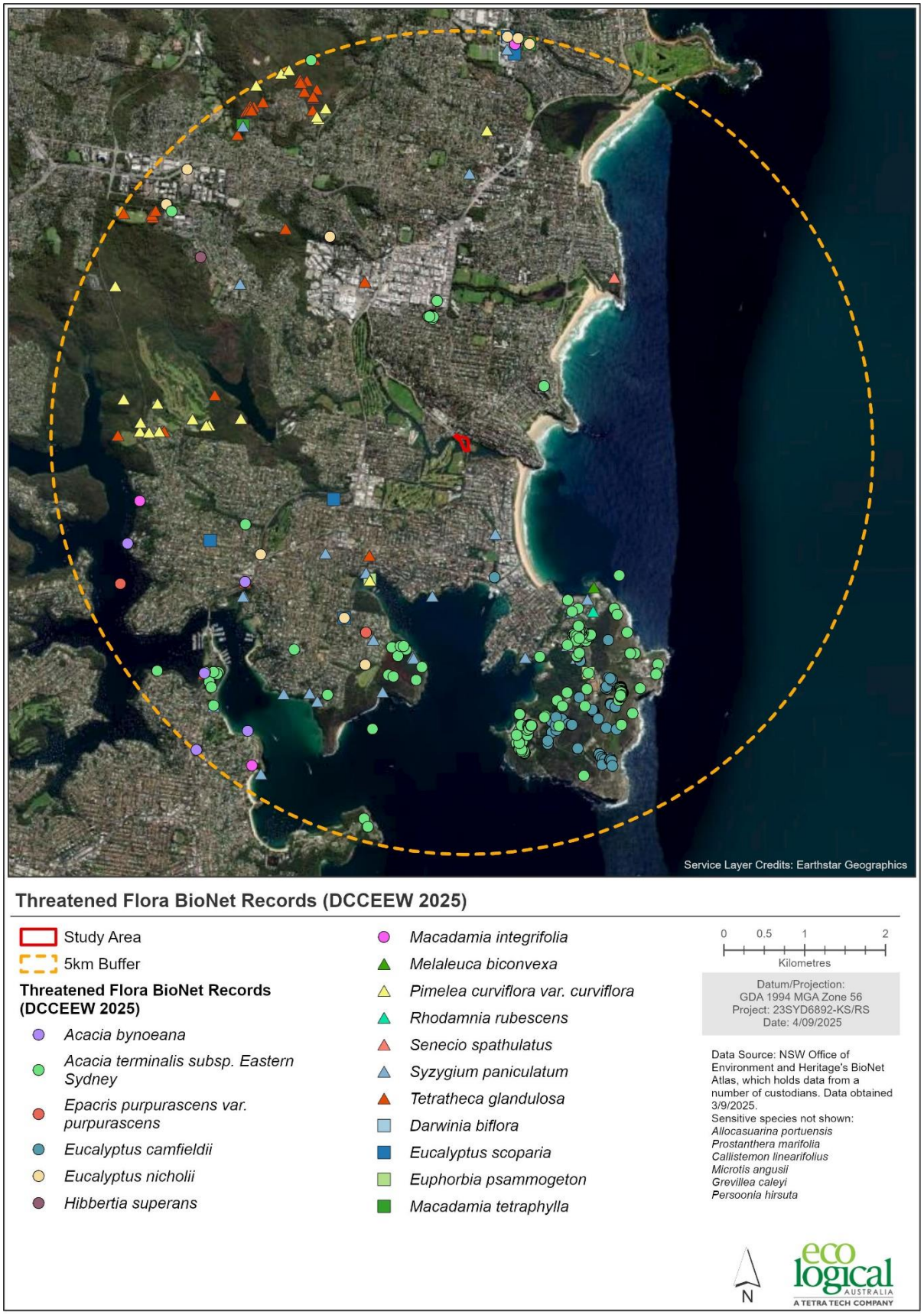


Figure 30: BioNet Atlas records of threatened flora species within 5 km

3.3.2. Impact Assessment

3.3.2.1. Direct Impacts

Approximately 0.043 ha of PCT 4028, 0.004 of exotic vegetation grasses will be directly affected (Table 9).

PCT 4028 within the impact area meets the criteria for the BC listed TEC *Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions,* but does not meet the EPBC condition thresholds for a TEC.

PCT 4028 represents marginal foraging habitat for several threatened birds and microbats and there is potential microbat roosting habitat under the bridge. *Pteropus poliocephalus* (Grey-Headed Flying-Fox) is not likely to forage within the direct impact area due to the lack of Myrtaceae species in the canopy layer.

Table 9: Direct impacts to terrestrial vegetation

Vegetation type	Area (ha)
Exotic Planted	0.003
Exotic Grass	< 0.001
PCT 4028: Estuarine Swamp Oak Twig-rush Forest (Poor)	0.043
Total	**0.047**

3.3.2.2. Terrestrial Biodiversity

BC ACT ASSESSMENT OF SIGNIFICANCE

Tests of Significance were applied to threatened species or ecological communities either known or considered likely or potential to occur in the direct impact area. No targeted surveys for threatened flora species were undertaken within the study area. Tests of Significance were applied to the threatened entities listed below.

Threatened Ecological Community (TEC):

- *Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions* – endangered (BC Act).

Birds:

- *Calyptorhynchus lathami lathami* (South-eastern Glossy Black-Cockatoo) – Vulnerable (BC Act)
- *Haematopus fuliginosus* (Sooty Oystercatcher) – Vulnerable (BC Act)
- *Haematopus longirostris* (Pied Oystercatcher) – Endangered (BC Act)
- *Haliaeetus leucogaster* (White-bellied Sea-Eagle) – Vulnerable (BC Act)
- *Ixobrychus flavicollis* (Black Bittern) – Vulnerable (BC Act)
- *Ninox strenua* (Powerful Owl) – Vulnerable under the BC

Microbats:

- *Chalinolobus dwyeri* (Large-eared Pied Bat) – Vulnerable (BC Act)

- *Miniopterus australis* (Little Bentwing-bat) – Vulnerable (BC Act)
- *Miniopterus orianae oceanensis* (Large Bent-winged Bat) – Vulnerable (BC Act)
- *Myotis Macropus* (Southern Myotis) – Vulnerable (BC Act)

The BC Act Tests of Significance concluded that the proposed works are unlikely to constitute a significant impact on the threatened ecological values listed above for the following reasons:

- The Project would remove approximately 0.043 ha of PCT 4028 in poor condition. The poor condition patches of these communities to be removed have a degraded understorey and are considered marginal foraging habitat for these species;
- Large stretches of similar vegetation exist in the locality;
- The Project will not substantially or adversely modify the composition of the community within the locality;
- Microbats have a low fidelity rate outside of breeding season and would rely on a range of hollow bearing trees and other roosting resources such as culverts, abandoned buildings and caves;
- There were no hollows within the study area;
- The species are highly mobile and forage widely and would only rely on the resources within the study area on an occasional basis.

A full assessment of impacts to threatened ecological values is in Appendix A3.

EPBC ACT SIGNIFICANT IMPACT CRITERIA

Significant Impact Criteria were applied to threatened ecological values either known or considered likely or with potential to occur in the direct impact area:

Birds:

- *Calidris acuminata* (Sharp-tailed Sandpiper) – Migratory (EPBC Act)
- *Calyptorhynchus lathami lathami* (South-eastern Glossy Black-Cockatoo) – Vulnerable (EPBC Act)
- *Hirundapus caudacutus* (White-throated Needletail) – Migratory (EPBC Act)
- *Hydroprogne caspia* (Caspian Tern) – Migratory (EPBC Act)
- *Limosa lapponica* (Bar-tailed Godwit) – Migratory (EPBC Act)
- *Pluvialis squatarola* (Grey Plover) – Migratory (EPBC Act)
- *Thalasseus bergii* (Greater Crested Tern) – Marine and Migratory (EPBC Act)

The application of the significant impact criteria concluded that the proposed works are unlikely to constitute a significant impact on the threatened ecological values listed above for the following reasons:

- The Project would remove approximately 0.043 ha of PCT 4028, which is considered marginal foraging habitat for these species;
- Large stretches of similar vegetation exist in the locality that can be used as habitat;
- The Project will not substantially or adversely modify the composition of the community within the locality;
- Microbats have a low fidelity rate outside of breeding season and would rely on a range of hollow bearing trees and other roosting resources such as culverts, abandoned buildings and caves;
- There were no hollows within the study area; and

- The species are highly mobile and forage widely and would only rely on the resources within the study area on an occasional basis.

A full assessment of impacts to threatened ecological values is provided in Appendix A4.

3.3.3. Mitigation Measures

Table 10: Biodiversity mitigation measures

Impact Description	Safeguards/Mitigation Measures
Crushing and damage to vegetation that is not proposed for removal	● Pre-works briefing to be led by Council and/or the project Ecologist, advising construction staff of environmentally sensitive areas and relevant safeguards for these areas (e.g., no-go zones to protect retained vegetation). ● Establish clearly defined areas, such as the works area and 'no-go' areas within/adjacent to the work site. These are to be demarcated using high-visibility bunting or exclusion fencing.
Unexpected threatened species finds	● Works must be stopped if any previously undiscovered threatened species or communities are discovered during works. An assessment of the impact and any required approvals must be obtained. Works must not recommence until written approval has been provided to do so.
Harm to identified threatened fauna species; injured or orphaned wildlife	● Establish clearly defined areas, such as the works area and 'no-go' areas outside the approved impact area. These are to be demarcated on land and water as necessary. ● Conduct pre-clearance surveys for any vegetation to be removed, to ensure no fauna are present and will not be harmed during vegetation removal. Any fauna requiring relocation must be done so in accordance with a Relocation Management Plan by a qualified Ecologist. ● Works must be stopped if any previously undiscovered threatened species or communities are discovered during works. An assessment of the impact and any required approvals must be obtained. Works must not recommence until written approval has been provided to do so. ● A site-specific CEMP is to be prepared and will include instructions for dealing with orphaned or injured native animals and include the contact details for the NSW Wildlife Information, Rescue and Education Service Inc (WIRES). ● Store and decant chemicals outside of work area.
Introduction or spread of priority weeds	● Wash down equipment and vehicles prior to and after use, to manage the introduction and spread of weed propagules.

3.4. Marine Ecology

3.4.1. Existing Environment

3.4.1.1. Database and literature review

Online database searches were used to confirm the presence of recorded species in the region prior to a field survey, which was used to assess the likelihood of species presence within the study area. The desktop search covered a 10 km buffer around the study area. Databases accessed include:

- EPBC Act Protected Matters Search Tool (DCCEEW 2023)
- FM Act – Listed protected and threatened species and populations, including species profiles, 'Primefact' publications and expected distribution maps (Riches et al 2016)
- Online Zoological Collections of Australian Museums (OZCAM) and Atlas of Living Australia (ALA) – individual species searches to determine likelihood of occurrence of threatened species.

Only aquatic species known to use estuarine/marine water or intertidal foreshores are considered in this section. Terrestrial biodiversity has been addressed in Section 3.3 above.

The statewide mapping of estuarine macrophytes (mangroves, saltmarsh, and seagrass) by DPI Fisheries highlights the presence of *Zostera* sp. seagrass and mangroves in Manly Lagoon (Creese *et al.* 2009, Figure 31). Earlier mapping conducted by DPI in 2006 also identified saltmarsh along the southern perimeter of Hinkler Park (Figure 32) but no specifically mapped seagrasses or mangroves within the study area for this Project.

Figure 31: Most recent (2010) DPI Fisheries mapping of marine macrophytes within Manly Lagoon

Figure 32: Previous DPI Fisheries mapping of marine macrophytes within Manly Lagoon, mapped in 2006.

3.4.1.2. Field survey methodology

Field survey was completed on 21 November 2023 by ELA Aquatic Ecologists Ian Dixon and Lily Tonks to determine the types of aquatic habitat within the study area and classify according to Key Fish Habitat (KFH) Type.

The study area included an area extending about 10 m west and 65 m east from the edge of the existing Pittwater bridge across Manly Lagoon. Weather conditions were calm and there was no swell. At the time of field survey, Manly Creek was closed off from the ocean by a sand bar (except for slow seaward drainage through a culvert) and was not influenced by tides. Underwater visibility was relatively poor but did not affect the assessment.

Underwater survey was completed using a remotely operated vehicle (ROV) from depths of 0.3 – 2.0 m with footage streamed live to an iPhone. Video footage was also recorded to allow post-field examination of habitat extent and condition. Habitat types were digitally mapped in the field using Avenza Maps. The extent of validated aquatic flora and KFH types were merged into a final map using ArcPro. Results of the field survey are described below.

3.4.1.3. Aquatic Habitat

Distinct habitat zones were identified during the field survey, as mapped in Figure 33, with representative photographs provided in Figure 43 – Figure 39. Specifically, the distinct habitat zones identified include:

- Subtidal bare silty sand with low density infauna, unvegetated, with:
    - Woody debris, including *Casuarina glauca* (Swamp Oak) needles
    - Rubbish, both sift litter and large concrete/metal items (possibly thrown off the bridge)
- Intertidal silty sand with gravel and pebble, partially vegetated, with:
    - Sparse *Phragmites australis* (Common Reed)
    - Six *Avicennia marina* (Grey Mangrove) individuals
    - One snag > 3 m in length

Aquatic habitat features are presented in Figure 33 and summarised in Table 11 below. Fish observed around the site were primarily schools of *Mugil cephalus* (Sea Mullet).

Table 11: Aquatic habitat validated within the study area

Vegetation Community	Area (ha) or qty	KFH Type	FM Act Status
Coastal lagoon with natural opening and closing regime	0.31	Type 1	N/A
Avicennia marina (Grey Mangrove)	0.01	Type 2	Protected
Phragmites australis (Common Reed)	0.02	Type 2	N/A
Snag >3 m	1 snag	Type 2	Key threatening process: Removal of large woody debris from New South Wales rivers and streams.
Subtidal bare silty sand with low density infauna	0.26	Type 3	N/A
Intertidal silty sand with gravel and pebble	0.05	Type 3	N/A
Riparian vegetation (see Section 3.3 above)	-	-	Estuarine and marine waters are excluded from the Key threatening process: Degradation of native riparian vegetation along New South Wales water courses.
Total	**0.13 ha**	**Type 1**	

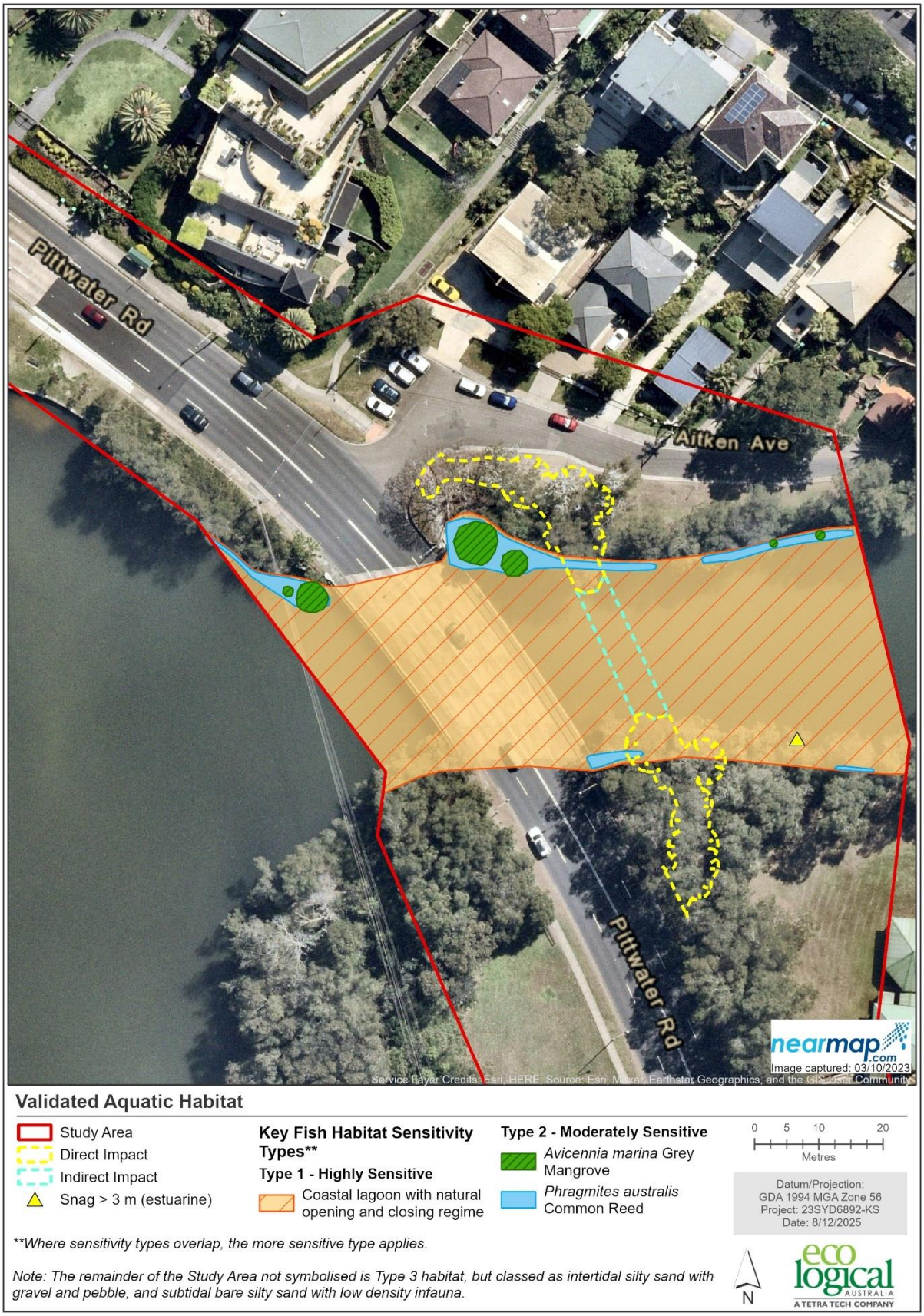


Figure 33: Field validated aquatic habitat (Key Fish Habitat types)

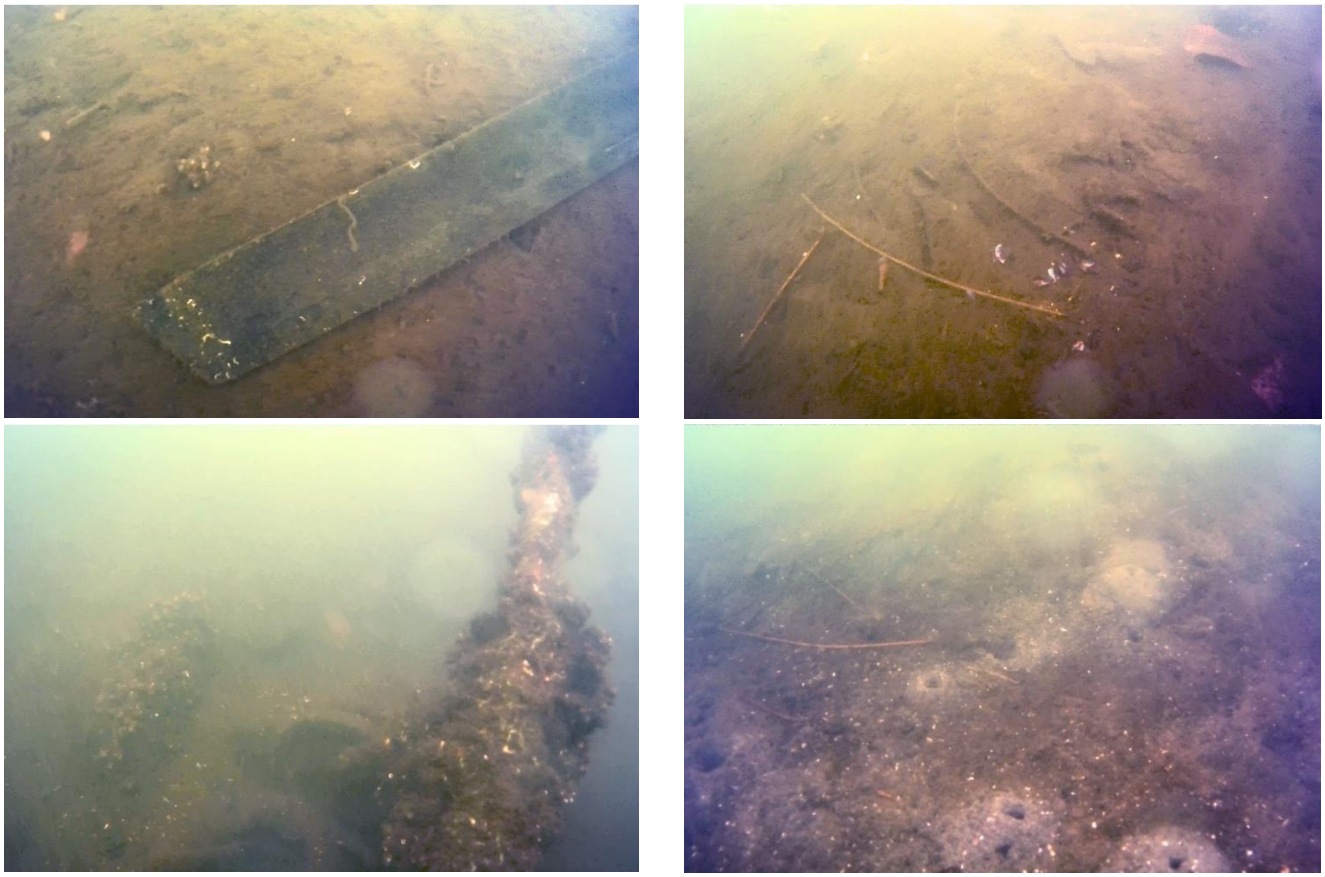


Figure 34: Subtidal bare silty sand with low density infauna and woody debris, including Swamp Oak needles

Figure 35: Intertidal silty sand with gravel and pebble, sparsely vegetated with Common Reeds and Grey Mangroves

Figure 36: Grey Mangroves and Common Reeds occupying the intertidal zone north-east of the existing bridge

Figure 37: Grey Mangroves and Common Reeds occupying the intertidal zone north-west of the existing bridge

Figure 38: Snag >3m located south-east of the existing bridge

Figure 39: Manly Lagoon from the existing bridge, closed to the ocean at the time of field survey, looking east (left) and west (right)

3.4.1.4. Key Fish Habitat

Key Fish Habitat (KFH) is located within the study area (Figure 16) associated with the 4th order Strahler stream, Manly Creek. Field survey was completed to classify KFH into the following types:

- Type 1 (highly sensitive) KFH dominates the study area, as Manly Lagoon is a coastal lagoon that has a natural opening and closing regime.
- Type 2 (moderately sensitive) KFH represented by *Phragmites australis, Avicennia marina* and one snag
- Type 3 (minimally sensitive) KFH includes the subtidal bare silty sand with low density infauna, and the intertidal silty sand with gravel and pebble.

Where KFH types overlap, the highest sensitivity type applies. Therefore, the entirety of the aquatic habitat within the study area is KFH Type 1 (Figure 33).

Regarding other DPI Fisheries policies and guidelines, no aquaculture lease or hauling grounds are located near Manly Lagoon, and the noxious algae *Caulerpa taxifolia* was not observed on site.

3.4.2. Impact Assessment

3.4.2.1. Removal of Native Vegetation

The proposed works are located above the Manly Creek waterway and within areas of aquatic habitat either side of the waterway.

A precautionary approach has been taken for the impact assessment of the proposed works. The site plans include tree removal identification, which has informed this assessment of direct impacts. Indirect impacts occur for the span of the bridge across the lagoon. Detailed design has ensured the retention of Grey Mangrove within the study area.

If removal or harm (including pruning or damage to roots) to marine vegetation is required, a Permit under Part 7 of the FM Act must be obtained. A summary of the direct and indirect impacts expected to occur to aquatic habitat is provided in Table 12. It is noted that the impact area of intertidal and subtidal sand is listed, however this area will remain in situ and is not expected to be subject to substantial impacts where mitigation measures are implemented.

It is anticipated that impacts will be lesser than what is described below by implementing the mitigation measures presented in Section 5.

Table 12: Aquatic habitat impacts

Vegetation Community	Direct impact (m^2)	% directly impacted	Indirect impact (m^2)	% indirectly Impacted
Coastal lagoon with natural opening and closing regime	93.02	3%	109.63	4%
Avicennia marina (Grey Mangrove)	-	0%	-	0%
Phragmites australis (Common Reed)	8.71	4%	-	-
Subtidal bare silty sand with low density infauna	50.47	2%	109.63	4%
Intertidal silty sand with gravel and pebble	42.60	9%	-	0%
Total	**194.79**		**219.26**	

3.4.2.2. Loss of Key Fish Habitat

The proposed works would result in the loss of areas of Type 1 KFH as identified in Figure 33.

Construction works within the direct impact area would cause the loss or damage of up to 194.79 m^2 (0.02 ha) of Type 1 KFH, noting that because Type 1 KFH is present across the majority of the study area this classification supersedes Type 2 or Type 3 KFH.

DPI Fisheries has a 'no net loss' policy regarding aquatic habitats. A precautionary approach has been adopted for calculating the loss of KFH as a result of the proposed works. It has been assumed that all KFH within the direct impact area will be directly harmed or removed as part of the proposed activities.

The indirect impact area (i.e., across the lagoon) would cause shading to the waterbody. Given the lack of seagrasses and threatened fish species, this indirect impact is considered minor and would not substantially affect or remove KFH.

No mangroves will be cleared or overshadowed as a result of the proposed works.

3.4.2.3. Noise Impacts

Underwater noise will not occur, as no instream works (piles) are proposed. Some noise may carry from land to the marine environment. Fish in the vicinity may be affected by minor underwater noise. However, with gentle start-up of heavy and loud machinery, fish will have the opportunity to move away from the area during construction and the impact would be low and minor. During operation, the noise from pedestrian and cyclists would be negligible compared to the adjacent road crossing.

3.4.2.4. Temporary Degradation of Water Quality

Installation of the bridge may lead to increased turbidity, due to required excavations of abutments. Turbidity within the marine environment can reduce the amount of light that is available for aquatic flora and fauna and reduce the productivity of these species. Scouring of benthic sediments if a barge is required or from propellers during transport of materials by boat (if required) could cause benthic sediments to become suspended in the water, increasing turbidity. The increased sediment load would temporarily reduce light penetration through the water column, and sediment particles may settle on aquatic plants. Sediment movement may also smother infauna burrows. Considering that no seagrasses are present, and works will be managed by strict sediment and erosion controls to limit turbidity, these impacts are considered temporary and minor.

Mitigation measures are provided in Section 3.4.3 and Section 5.

3.4.2.5. Introduction of Aquatic Pest Species

Vessels and machinery used to construct the bridge could inadvertently spread the aquatic pest species *Caulerpa taxifolia* (Caulerpa) into the study area. Caulerpa is a hardy, tropical species of algae that is banned from sale and possession in NSW (DPI, 2016). No Caulerpa was identified during the site survey. Recommendations are provided in Section 5.

3.4.2.6. Assessment of Significance (FM Act)

If a species, population, or ecological community listed under Division 2 of the FM Act is impacted, a Test of Significance must be undertaken. Section 221ZV of the FM Act requires the determination of whether the action proposed is likely to significantly affect threatened species, populations or ecological communities, or their habitats. Section 221ZV outlines the factors that must be considered when assessing an impact under this section.

No threatened species listed under the FM Act area likely to occur within the study area. No further assessments are required under the FM Act.

3.4.3. Mitigation Measures

Table 13: Marine ecology mitigation measures

Impact Description	Safeguards/Mitigation Measures
Harm to marine vegetation, aquatic fauna, and water quality	● Implement a CEMP to address pollution, contamination and unnecessary disturbance which could arise during construction, such as: ○ sediment and debris control ○ oil/fuel/chemical storage and spill management ○ machinery and engine maintenance schedule to reduce oil/fuel leakage ○ low impact barge positioning to prevent propeller scouring and thrust wash onto benthic habitats (along the foreshore)

Impact Description	Safeguards/Mitigation Measures
	○ minimise footprint and establish no-go zones in shallow habitats, especially on mangrove roots ○ accidental waste/material overboard response (e.g. construction materials dropped into the lagoon) ○ biological hygiene (e.g. prevent spread of noxious species on and off the site) ○ other measures listed below. ● Positioning of barges and equipment unloading should occur during calm conditions. ● Avoid shallow water when turning vessels. Large vessels/barges should avoid banks at low tide. ● Any mooring lines where a barge is required should be suspended off the seafloor to minimise drag across benthic habitat. ● Use of a floating boom with silt curtain encompassing full works area (each abutment, but not bank to opposite bank). The curtain is to remain in place until all suspended material has settled (no visible plumes). ● All waste material should be disposed of on land and not reused in the construction or left on the seafloor. ● Care should be taken not to introduce *Caulerpa taxifolia*. For example, an anchor used at another site with Caulerpa should be thoroughly cleaned of plant propagules and sediment before being used at another location. Fragments of Caulerpa can remain viable for up to three days out of the water. Best hygiene practices are outlined in the *NSW Control Plan for the Noxious Marine Alga Caulerpa taxifolia* (NSW I&I 2009). ● Gentle start-up of heavy machinery is recommended to allow undetected aquatic fauna to leave the works area and avoid hearing damage. Include staged breaks, such as 10 minutes loud, 30 minutes quiet as necessary. Work in the creek banks should be stopped if large aquatic fauna is observed nearby. ● Consult with DPI Fisheries and implement any required mitigation measures and/or permit conditions. ● Obtain a **Part 7 Permit** under the FM Act for dredging and reclamation and comply with all conditions of the permit.

3.5. Aboriginal Heritage

The following section regarding Aboriginal heritage has been conducted in accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (hereafter referred to as 'CoP') (DECCW 2010).

The due diligence process aims to determine whether Aboriginal objects will be harmed by the proposed works, as required under Part 6 of the NPW Act. The CoP sets out the reasonable and practicable steps which individuals and organisations need to take to:

- Identify whether or not Aboriginal objects are, or are likely to be, present in an area;
- Determine whether or not their activities are likely to harm Aboriginal objects (if present); and,
- Determine whether an Aboriginal Heritage Impact Permit (AHIP) from Heritage NSW or further assessment is required.

The methodology of this Aboriginal heritage due diligence assessment includes the following tasks:

- Undertake a search of the Aboriginal Heritage Information Management System (AHIMS) register maintained by Heritage NSW to establish if there are any previously recorded Aboriginal objects or places within or within 200m of the study area;
- Undertake a search of the NSW State Heritage Inventory and the Australian Heritage Database to determine if there are any sites of Aboriginal significance or sensitivity located within the study area.
- Undertake a desktop review of relevant previous archaeological assessments to understand the local archaeological context and assist in predicting the likely occurrence of unrecorded archaeological sites or objects.
- Review historic aerial photographs, if available, to determine past land use and any historic disturbance to the study area.
- Undertake a site inspection to identify any sensitive landforms which may suggest Aboriginal objects exist and review landform features to assess whether there are likely to be areas of Aboriginal archaeological potential.

3.5.1. Existing Environment

Heritage Database Searches

Searches of the Australian Heritage Database and the State Heritage Inventory were conducted on 18 July 2025, to determine if any places of Aboriginal archaeological significance were located within the study area.

No Aboriginal archaeological sites or heritage items were recorded on these databases as being within the study area.

AHIMS Search

The AHIMS database retains information and records pertaining to identified Aboriginal cultural heritage sites, objects and declared places throughout NSW. It is maintained and regulated by Heritage NSW under Section 90Q of the NP&W Act.

An extensive search of the AHIMS database was conducted on 18 July 2025 to identify if any registered Aboriginal sites were present within, or adjacent to, the study area (Figure 46). The AHIMS search

represents 3 km around the study area and was conducted within the following coordinates: GDA Zone 56, Eastings 337845-343845, Northings 6257486-6263486. The search resulted in the identification of one hundred and five (105) Aboriginal sites and one Aboriginal place within the vicinity of the study area (Figure 46).

No Aboriginal sites have previously been recorded within the study area (Figure 46). AHIMS ID 45-6-2851, AHIMS ID 45-6-0008 and AHIMS ID 45-6-0263 have been listed as 'not a site' and AHIMS ID 45-6-0696 has been listed as 'deleted'. AHIMS ID 45-6-2748 has been listed as a restricted site, AHIMS confirmed on 30th of October 2023 that this site will not be impacted by the proposed works. The results have been amended.

The majority of sites within the vicinity of the study area have been recorded as art sites (35.6%) followed by shell middens (23.8%). The frequencies of site types recorded within the AHIMS database search area are listed in Table 14 below.

Table 14: Types of Aboriginal sites found within the AHIMS search area

Site Features	Number of sites	%
Art (Pigment or Engraved)	36	35.6
Art; Grinding Groove; Potential Archaeological Deposit (PAD)	1	0.9
Art; Water Hole	1	0.9
Artefact	8	7.9
Artefact; Art	1	0.9
Artefact; Burial; Non-Human Bone and Organic Material; Shell	1	0.9
Burial	3	2.9
Grinding Groove	2	1.9
Grinding Groove; Art	1	0.9
Habitation Structure	1	0.9
Habitation Structure; Earth Mound	1	0.9
PAD	4	3.9
PAD; Shell	1	0.9
Shell	11	10.9
Shell; Artefact	24	23.8
Shell; Artefact; Art	2	1.9
Shell; Artefact; Art; Burial	1	0.9
Shell; Artefact; Burial	1	0.9
Water Hole; Art; PAD	1	0.9
Total	**101**	**100**

Previous Archaeological Assessments

ECO LOGICAL AUSTRALIA, 2018. *FORTY BASKETS BEACH TIDAL POOL MAINTENANCE WORKS – REVIEW OF ENVIRONMENTAL FACTORS.* PREPARED FOR NORTHERN BEACHES COUNCIL.

ELA were engaged by the Northern Beaches Council to undertake an Aboriginal Heritage Due Diligence Assessment, to inform a REF for the proposed maintenance works of the Forty Baskets Beach Tidal Pool. This assessment was undertaken approximately 2.5 km to the south-west of the current study area.

The desktop assessment identified three previously recorded Aboriginal sites within 200 m of the assessment area, including a shell midden located approximately 40m to the south. The majority of sites recorded within the vicinity of the assessment area were middens, including middens associated with open camp sites and shelters. Most of these sites were located in areas associated with freshwater streams and sandstone platforms adjacent to salt water.

The visual inspection found that the existing tidal pool had been constructed by the insertion of timber piles into the beach and sandy ocean floor. The recorded shell midden was identified as being outside of the impact area and the visual inspection did not identify any concentrated areas of shell or evidence of the recorded midden, though it was noted that ground visibility was poor due to boats obscuring the interface between the beach and grassed area behind it. The sandstone platform adjacent to the existing pool was also inspected, and no shell midden material or cultural markings were identified.

As a result of the assessment and visual inspection, it was found that the proposed works would be confined to areas that had already been disturbed by the construction of the existing pool and would not impact any nearby recorded AHIMS sites. No new sites were identified during the visual inspection and the assessment area was identified as having a low to nil potential for *intact* subsurface Aboriginal objects. No further assessment was recommended.

ECO LOGICAL AUSTRALIA 2021. *MANLY DAM LINK TRAIL – REVIEW OF ENVIRONMENTAL FACTORS.* PREPARED FOR NORTHERN BEACHES COUNCIL.

ELA were engaged by the Northern Beaches Council to undertake an Aboriginal Heritage Due Diligence Assessment, to inform a REF for the proposed Manly Dam Link Trail within the Manly Warringah War Memorial State Park. This assessment was undertaken approximately 3 km to the west of the current study area.

The desktop assessment identified the majority of Aboriginal sites within the vicinity of the assessment area and wider region comprised shelters with midden (23%), shell middens (18%) and rock engravings (20%). Most of these sites were located in areas associated with freshwater streams.

The visual inspection did not identify any Aboriginal objects and found that the southern and northern extent of the assessment area had been modified by the existing park facilities and landscaping. The central portion of the assessment area was noted to have no observable disturbances and limited surface visibility, though a thick soil profile over sandstone bedrock was observed. In areas of exposed sandstone along the edges of the water, no grinding grooves or cultural markings were observed.

The assessment found that disturbances from previous land use, vegetation clearance and the shallow soil profile indicated a low potential for *intact* subsurface deposits to be present. Recommendations included a standard unexpected finds policy be implemented and a heritage induction be undertaken with all contractors working on the site.

Visual Inspection

The CoP states that further investigation in the form of a visual inspection must be conducted if activities are proposed to be:

- *within 200 m of waters, or*
- *located within a sand dune system, or*
- *located on a ridge top, ridge line or headland, or*
- *located within 200 m below or above a cliff face, or*
- *within 20 m of or in a cave, rock shelter, or a cave mouth and is on land that is not disturbed land.*

The definition of disturbed land is as follows:

> "*Land is disturbed if it has been the subject of a human activity that has changed the land's surface, being changes that remain clear and observable*."

Examples include ploughing, construction of rural infrastructure (such as dams and fences), construction of roads, trails and tracks (including fire trails and tracks and walking tracks), clearing vegetation, construction of buildings and the erection of other structures, construction or installation of utilities and other similar services (such as above or below ground electrical infrastructure, water or sewerage pipelines, stormwater drainage and other similar infrastructure) and construction of earthworks" (DECCW 2010).

A visual inspection was conducted by ELA Archaeologist Kate Storan on the 13th of November 2023. Visual inspection aimed to identify Aboriginal objects if present and assess the archaeological potential of the study area.

The visual inspection identified that the majority of the study area had undergone prior ground disturbance and had been highly modified by the construction of Pittwater Road and the existing pedestrian footbridge, as well as by the installation of below-ground services, drainage culverts, concrete footpaths, vegetation clearance and associated landscaping works (Figure 40 – Figure 45).

Moderate levels of disturbance were observed along the baseline of Manly Creek in relation to landscaping works, the installation of drainage culverts and concrete footings for the existing pedestrian footbridge, which had been built into the original topography (Figure 44, Figure 45). Surface visibility within the study area was low due to the bitumen road base and concrete pathways, and surface visibility along the base of Manly Creek was limited by regrowth vegetation and leaf litter (Figure 42, Figure 45). No surface artefacts or deposits of shell were observed within the study area or along the base of Manly Creek.

Figure 40: View north along Pittwater Road showing existing pedestrian footbridge, footpath, regrowth vegetation and the installation of below-ground services

Figure 41: View south-west showing regrowth trees lining Manly Creek, existing pedestrian footbridge and approximate works area

Figure 42: View west towards Pittwater Road showing landscaping and gentle slope towards Manly Creek

Figure 43: View south along existing pedestrian footbridge crossing Manly Creek

Figure 44: View south-west showing concrete footings of existing pedestrian footbridge along Pittwater Road and approximate works area

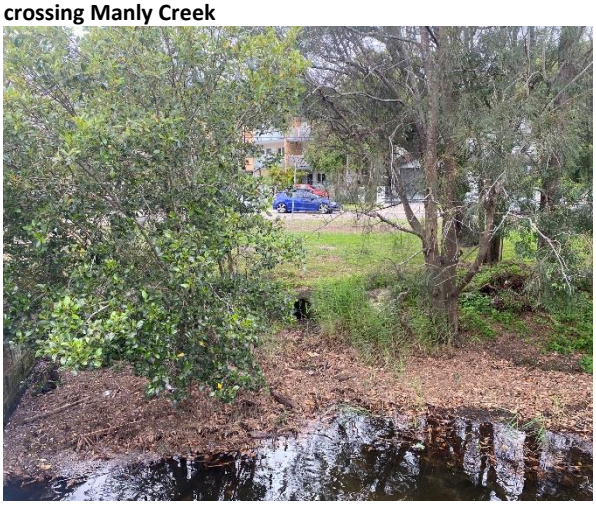


Figure 45: View north towards approximate works area showing drainage culvert and regrowth vegetation along Manly Creek

Figure 46: Registered AHIMS Sites within approx. 2 km of the study area

3.5.2. Impact Assessment

There are no previously recorded Aboriginal sites within the study area (Figure 46) and the visual inspection undertaken as part of this assessment identified that the study area has been highly modified by the construction of Pittwater Road and the existing footbridge, as well as by the construction of pedestrian footpaths, the installation of below-ground services, drainage culverts and associated landscaping.

The proposed works will be conducted over areas that have previously been highly modified, indicating there is a low likelihood for *in situ* subsurface archaeological deposits to be impacted by the proposed works. No further assessment will be required, provided the recommended mitigation measures are implemented (see Table 15 and Section 5).

3.5.3. Mitigation Measures

Table 15: Aboriginal heritage mitigation measures

Impact Description	Safeguards/Mitigation Measures
• Discovery of unexpected Aboriginal objects • Discovery of human remains	• All contractors undertaking works on site should be briefed on the protection of Aboriginal heritage objects under the *NPW Act*, and the penalties for damage to these items. • Aboriginal objects are protected under the *NPW Act* regardless of whether they are registered on AHIMS or not. If an item (or suspected item) of Aboriginal objects, such as stone artefacts are located during works, works must cease in the affected area and the area fenced off with suitable markers (star pickets, flagging or barrier mesh). Engage an archaeologist to assess the finds. If the finds are found to be Aboriginal objects, Heritage NSW must be notified under section 89A of the *NPW Act*. Appropriate management and avoidance or approval under a section 90 AHIP should then be sought if Aboriginal objects are to be moved or harmed. • In the extremely unlikely event that human remains are found, works should immediately cease, and NSW Police should be contacted. If the remains are suspected to be Aboriginal, Heritage NSW must also be contacted to assist in determining appropriate management.

3.6. Historic Heritage

3.6.1. Existing Environment

3.6.1.1. Heritage Database Searches

Searches of the Australian Heritage Database, the Manly Local Environmental Plan (LEP) 2013 and the State Heritage Inventory were undertaken on 18 July 2025, to determine if any places of historic heritage are located within or in proximity to the study area.

There are no listed heritage items within the study area, though two locally listed heritage items are located within 90 m of the proposed works (Figure 47):

- 'Row of Norfolk Island Pine Trees' – Item No. I166 (Manly LEP 2013); and
- 'Group of 2 Storey Residential Flat Buildings' – Item No. I93 (Manly LEP 2013).

3.6.2. Potential Impacts

The existing road and bridge are not heritage items and there are no listed historic heritage items within the study area. The proposed works will not have any visual or physical impact upon the significance of any listed heritage items within the vicinity of the study area provided the recommended mitigation measures are implemented. Mitigation measures to avoid impact to any unexpected Historical heritage items are detailed below in Table 16 below, and in Section 5.

3.6.3. Mitigation Measures

Table 16: Historic heritage mitigation measures

Impact Description	Safeguards/Mitigation Measures
• Unexpected Impacts to Historic Heritage Items	• A heritage induction should be presented to workers before construction begins. • In accordance with Section 146 of the *Heritage Act*, if an archaeological relic (such as a deposit, feature, or artefact) is uncovered during works, work must cease in the affected area and Heritage NSW must be notified. Further advice and consultation would be required, and approvals may be required from Heritage NSW under delegation regarding any relics, should they be discovered during works. • Stop work if human remains are found and contact NSW Police. If remains are suspected to be Aboriginal, Heritage NSW must be notified as well.

Figure 47: Listed heritage items in relation to the study area

3.7. Noise and Vibration

3.7.1. Impact Assessment

The study area is located nearby a highly urbanised residential area with the major State Road, Pittwater Road. Existing noise sources in the general vicinity include the current vehicle movement and general residential and community activities, including activity within the Hinkler Reserve Park and adjacent to sensitive residential receivers at Aitken Avenue.

Work hours will be in accordance with Northern Beaches Council standard daytime work times, which will minimise impacts to residents and other sensitive receivers in proximity to the works:

- Monday to Friday 7.00 am to 5.00 pm
- Saturday 8.00 am to 1.00 pm
- No works on Sundays or Public Holidays

Mitigation measures are provided in Table 17 below and Section 5 to further minimise noise impact. Overall, noise impacts are considered to be minor and short-term.

3.7.2. Mitigation Measures

Table 17: Noise and vibration mitigation measures

Impact Description	Safeguards/Mitigation Measures

• Noise impacts on sensitive receivers in proximity	• Avoid simultaneous operation of noisy plant within discernible range of sensitive receivers
	• Limit construction works to the following times:
	  ○ Monday to Friday 7:00 am to 6:00 pm
	  ○ Saturday 8:00 am to 1:00 pm
	• Maximise the distance between noisy plant items and nearby residential receivers and/or potential fauna habitat (i.e., retained vegetation)
	• Use slow start-up of heavy machinery for works on the creek banks to allow fish to move away from the area.

3.8. Air Quality

3.8.1. Existing Environment

The air quality within the study area is expected to be typical of an urban coastal environment, likely of moderate quality. The National Pollutant Inventory (DEE 2020) was reviewed to identify potential sources of air pollutants near the study area. No known sources of pollution or industrial facilities are located in proximity to the study area. The nearest facility is 2 km north at Brookvale, being the 4 Pines Brewing site and Harrison Manufacturing Co located in Brookvale, NSW.

3.8.2. Impact Assessment

Some particle/dust emissions are predicted as part excavation works to install the new bridge. The study area is surrounded by residential land use, as such dust has the potential to impact nearby residents as well as the environment. The proposed works are within an environmentally sensitive area, being Manly Lagoon/Manly Creek.

The anticipated impact on residents and the environment is low considering that the Project will be short term and is not anticipated to create excessive dust. Sediments will be managed in accordance with soil and erosion controls, as described in Section 3.1 above.

Mitigation measures have been provided below in Table 18 and in Section 5 to manage potential impacts.

3.8.3. Mitigation Measures

Table 18: Air quality mitigation measures

Impact Description	Safeguards/Mitigation Measures
• Dust generation from vibrating and ground disturbing works • Dust from vehicles • Fumes generation from machinery • Cumulative impacts of greenhouse gas emissions	• Works must be minimised during high wind periods. • Dust suppression should be applied as required to limit excessive dust generation. • Plant and equipment must be regularly inspected to ascertain that fitted emission controls are operating efficiently. • Plant and equipment must be maintained in accordance with manufacturer's specifications to ensure that it is in a proper and efficient condition. • Do not leave machinery running while not in use. • Minimise use of machinery for required activity only. • Vehicles to maintain recommended speed. • Look for excessive dust generation and slow down if needed. • Limit construction works to standard daytime working hours.

3.9. Waste Management

3.9.1. Existing Environment

The proposed works have the potential to utilise a range of different resources and generate several types of waste throughout the construction phase, with little waste expected during its operational lifespan. The construction of the Project would require the use of several resources such as electricity, water, and general construction materials.

3.9.2. Impact Assessment

Waste is expected to be generated in the form of construction waste, organic waste (from the removal of vegetation or groundcovers), general waste (produced by contractors) and excess soil (generated by earthworks or leftover materials). Additional waste may be generated from excess sediment from earthworks during bridge installation either side of the lagoon, and general waste from staff and contractors. Hazardous waste may be produced where ASS are encountered and excavated. Potential impacts from waste generation include:

- reduced aesthetics in community areas;
- potential health and environment impacts from hazardous waste (ASS);
- minor spills from hazardous fuel and chemical use; and
- pollution of the environment from other general wastes.

Any excess sediment from any minor earthworks is proposed to be classified in accordance with waste classification guidelines and disposed of at an appropriately licenced waste facility. No waste is to be imported into the study area.

Removal and appropriate disposal of general waste generated by the contractors during the proposed works is the responsibility of the contractors unless advised differently by Council. Potential for minor spills or leaks will be managed through mitigation measures described below. No significant issues with the management of waste are anticipated, provided that the mitigations in Table 19 and Section 5 are adopted.

3.9.3. Mitigation Measures

Table 19: waste management mitigation measures

Potential Impact	Mitigation Measure
• Minor spills or leaks of fuels or chemicals	• Store all chemicals (including fuel/oil) offsite wherever possible. • If required to be stored onsite, chemicals should be stored in appropriate bunding/storage systems and only for short periods. • Ensure appropriate spill kits are present onsite. • Ensure all equipment is in good working order. • Carry associated Safety Data Sheets (SDS) for all chemicals. • Refuel away from any drainage lines and waterways.
• General waste	• An adequate number of bins must be placed at the site for workers and all litter will be placed in these bins. Work areas would be kept clean and free of litter, including cigarette butts, at all times.

Potential Impact	Mitigation Measure
• Generation of organic and hard waste materials	• Removal of vegetation will be required. Removed vegetation is to be handled in accordance with the *Waste classification guidelines* (EPA 2014). • Any removed vegetation and excess soils are to be taken offsite for disposal, or for reuse, materials should be tested for safety in accordance with the *Waste Classification Guidelines* (EPA 2014). • Any potentially hazardous waste (i.e., ASS) must be handled with care in accordance with an ASS Management Plan and *Part 4: Acid Sulfate Soils* of the *Waste Classification Guidelines.* • Cover all loads when transporting waste material. • Any signs of potential contamination encountered during creation and removal of waste materials must be reported to the relevant site supervisor and project manager. • Upon completion of waste disposal, all original weighbridge or disposal receipts issued by the receiving waste facility must be retained in a waste register as evidence of proper disposal. • All waste must be removed from the site on completion of works.

3.10. Traffic and Transport

3.10.1. Impact Assessment

The Project will be completed directly adjacent to the existing State Road, Pittwater Road. Pittwater Road experiences high traffic volume and is a major roadway for commuters across the Northern Beaches LGA.

The Project spans between Hinkler Park to Aitken Avenue adjacent to Pittwater Road. Existing parking exists in Hinkler Park and is accessible to large vehicles. The site can therefore be accessed off Pittwater Road via Hinkler Park and Aitken Avenue, with potential temporary and partial road closures required on Pittwater Road to facilitate construction. Minor impacts to traffic flow for some duration of construction may occur.

Mitigation measures to manage adverse impacts are provided below in Table 26 and in Section 5.

3.10.2. Mitigation Measures

Table 20: Traffic and transport mitigation measures

Impact Description	Safeguards/Mitigation Measures
• Disruption to traffic flows	• Vehicles, materials and equipment must be positioned to minimise impacts to public access and parking. • Heavy vehicles, if required, will be restricted to specified routes. • The REF will be provided to TfNSW for comment in relation to potential impacts on Pittwater Road. • Prepare a Traffic Management Plan (TMP) to be implemented before and during construction. • Necessary licenses or approvals where partial road closures are required will be sought.

3.11. Visual Amenity and Landscape

3.11.1. Existing Environment

Manly Lagoon offers moderate to high scenic value, albeit in a relatively modified environment with the presence of road and residential development. The study area contains some dense native vegetation, scenic outlook across the waterway and recreational value for connection to nature.

Community initiatives, such as Manly Lagoon Friends, are dedicated to the protection of the lagoon environment. The organisation promotes its natural beauty and provides news and information sources for the community, as well as highlighting the potential for nature recreation throughout the lagoon (Figure 48).

Figure 48: Recreational opportunities in Manly Lagoon (Manly Lagoon Friends)

3.11.2. Impact Assessment

The Project involves construction of a 5 m wide bridge adjacent to the existing Pittwater Road structure. Being adjacent to an existing road environment the Project is not expected to cause significant changes to the visual amenity of the study area.

Low level lighting will be installed for user safety, however, would not significantly affect nearby residential areas with existing street lighting. Impacts to visual amenity resulting from increased light will be mitigated by low level lighting and design in accordance with Australian Standard (AS) 4282 – *Control of the obtrusive effects of outdoor lighting*. This may include shielding and use of certain light temperatures.

Mitigation measures have been recommended in Table 21 and Section 5 to manage potential impacts.

3.11.3. Mitigation Measures

Table 21: Visual amenity and landscape mitigation measures

Impact Description	Safeguards/Mitigation Measures
• Reduced visual amenity • Removal of vegetation	• Notify community or neighbours prior to construction works. • Notify nearby receivers that may be affected by lighting installation • Position lighting in residential areas to direct light away from sensitive receivers (houses, dense bushland) wherever possible. • Install lighting in accordance with the AS 4282 – *Control of the obtrusive effects of outdoor lighting* to minimise adverse effects on the natural environment • Use visually similar materials to the existing roadway and/or natural materials that complement the surrounding environment • Reinstate any disturbed vegetation, including groundcover, on completion of works.

3.12. Social and Economic

3.12.1. Existing Environment

Many community requests have been made to improve the cycling and pedestrian connection across Manly Lagoon, for the safety and access of all users. A Community Engagement Report was prepared for the Project in its early conception, with consultation occurring between 25 January 2022 to 18 February 2022. Feedback indicated a strong level of support for the Project noting the much-needed safety benefits. Many of the comments concurred that the current bridge is too narrow and poses pedestrian and cyclist conflict, in addition to the close proximity to traffic.

3.12.2. Impact Assessment

Potential impacts to community resulting from the Project are short-term and minor. Single-lane or partial traffic closures may be required on Pittwater Road to facilitate access for construction, and Hinkler Park may be closed temporarily while the works take place.

Overall, the community benefit is long-term and positive. The Project facilitates active transport and recreational access through a scenic area of the Northern Beaches LGA, connecting more people to nature and ensuring the safety of all users.

Measures to mitigate potential social and economic impacts are provided below in Table 22 and in Section 5.

3.12.3. Mitigation Measures

Table 22: Social and economic mitigation measures

Impact Description	Safeguards/Mitigation Measures
• Partial road closure or change to traffic flow • Temporary closure of Hinkler Park	• Notify the surrounding residential community of the works at least 10 days before the works are due to commence • Establish appropriate fencing and signage to alert community and park users of the works and protect the construction site from unauthorised access • Reinstate access for pedestrians, traffic and park users as soon as possible

3.13. Cumulative Environmental Impacts

3.13.1. Impact Assessment

Cumulative impacts may result if several planned works are to occur that affect the same environmental factors – namely Manly Lagoon and associated native vegetation (PCT 4028). If additional works are proposed within Manly Lagoon, or nearby, Council should consult with the relevant Project Manager and ensure construction periods are timed appropriately so that cumulative impacts (such as closures, noise, water turbidity) are minimised.

Community notification, coordination with other Council teams and relevant Project Managers is recommended to avoid cumulative impacts where works are co-occurring.

3.13.2. Mitigation Measures

Table 23: Cumulative impact mitigation measures

Impact Description	Safeguards/Mitigation Measures
• Co-occurring works in locality	• Notify the surrounding residential community of the works at least 10 days prior • Coordinate concurrent works internally with Council or relevant Project Managers

3.14. Matters of National Environmental Significance

Under the environmental assessment provisions of the EPBC Act, the following MNES and impacts on Commonwealth land are required to be considered to assist in determining whether the project should be referred to the Australian Government Department of the Environment. Table 24 addresses the MNES for the Project.

A Significance Assessment has been undertaken for EPBC Act listed endangered species and is contained in Appendix A4 of this REF. The Assessments concluded that no significant impact to MNES are likely to result from the Project.

Table 24: Consideration of Matters of National Environmental Significance

Matters of NES	Impact
Any environmental impact on a World Heritage property?	No
Any environmental impact on National heritage places?	No
Any environmental impact on RAMSAR wetlands?	No
Any environmental impact on Commonwealth listed threatened species or ecological communities?	Not significant
Any environmental impact on Commonwealth listed migratory species?	No
Does any part of the project involve nuclear action?	No
Any environmental impact on a Commonwealth marine area?	No
Any impact on Commonwealth land?	No

4. Consultation

Division 1 of the Transport and Infrastructure SEPP provides guidance on consultation with Council, agencies, and stakeholders. This is described in Section 4.1 below.

Additional consultation will occur regarding works in KFH with DPI Fisheries, as part of the Part 7 Permit process.

4.1. Consultation Requirements under the Transport and Infrastructure SEPP

Table 25: Transport and Infrastructure SEPP consultation requirements

Section	Section Relevance	Consultation Required?
2.10	**Consultation with councils – development with impacts on council-related infrastructure or services** Consultation is required if the development: *(a) will have a substantial impact on stormwater management services provided by a council, or* *(b) is likely to generate traffic to an extent that will strain the capacity of the road system in a local government area, or* *(c) involves connection to, and a substantial impact on the capacity of, any part of a sewerage system owned by a council, or* *(d) involves connection to, and use of a substantial volume of water from, any part of a water supply system owned by a council, or* *(e) involves the installation of a temporary structure on, or the enclosing of, a public place that is under a council's management or control that is likely to cause a disruption to pedestrian or vehicular traffic that is not minor or inconsequential, or* *(f) involves excavation that is not minor or inconsequential of the surface of, or a footpath adjacent to, a road for which a council is the roads authority under the Roads Act 1993 (if the public authority that is carrying out the development, or on whose behalf it is being carried out, is not responsible for the maintenance of the road or footpath).*	No, Council is the determining authority.
2.11	**Consultation with councils – development with impacts on local heritage** Consultation is required if the development: *(a) is likely to affect the heritage significance of a local heritage item, or of a heritage conservation area, that is not also a State heritage item, in a way that is more than minor or inconsequential, and* *(b) is development that this Chapter provides may be carried out without consent*	No, Council is the determining authority.
2.12	**Consultation with councils – development with impacts on flood liable land** *In this section, flood liable land means land that is susceptible to flooding by the probable maximum flood event, identified in accordance with the principles set out in the manual entitled Floodplain Development Manual: the management of flood liable land published by the New South Wales Government and as in force from time to time.* *A public authority, or a person acting on behalf of a public authority, must not carry out, on flood liable land, development that this Chapter provides may be carried out without consent and that will change flood patterns other than to a minor extent unless the authority or person has –* *(a) given written notice of the intention to carry out the development (together with a scope of works) to the council for the area in which the land is located, and* *(b) taken into consideration any response to the notice that is received from the council within 21 days after the notice is given.*	No, Council is the determining authority.
2.13	**Consultation with State Emergency Service – development with impacts on flood liable land**	The proposed works are on flood liable land. Consultation with SES is

Section	Section Relevance	Consultation Required?
	A public authority, or a person acting on behalf of a public authority, must not carry out development on flood liable land that may be carried out without development consent under a relevant provision unless the authority or person has— *(a) given written notice of the intention to carry out the development (together with a scope of works) to the State Emergency Service, and* *(b) taken into consideration any response to the notice that is received from the State Emergency Service within 21 days after the notice is given.*	required. This REF should be provided to SES for comment.
2.14	**Consultation with councils – development with impacts on certain land within the coastal zone** Consultation is required of the development: *(1) This section applies to development on land that is within a coastal vulnerability area and is inconsistent with a certified coastal management program that applies to that land.*	No, Council is the determining authority.
2.15	**Consultation with public authorities other than councils** Consultation is required if the development is: *(a) development adjacent to land reserved under the National Parks and Wildlife Act 1974 or to land acquired under Part 11 of that Act*, *(b) development on land in Zone E1 National Parks and Nature Reserves or in a land use zone that is equivalent to that zone, other than land reserved under the National Parks and Wildlife Act 1974*, *(c) development comprising a fixed or floating structure in or over navigable waters*—Transport for NSW, *(d) development that may increase the amount of artificial light in the night sky and that is on land within the dark sky region as identified on the dark sky region map*—the Director of the Observatory *(e) development on defence communications facility buffer land within the meaning of clause 5.15 of the Standard Instrument*—the Secretary of the Commonwealth Department of Defence, *(f) development on land in a mine subsidence district within the meaning of the* Mine Subsidence Compensation Act 1961—the Mine Subsidence Board.	No – not applicable.

4.2. Consultation with DPI Fisheries

The REF is to be provided to DPI Fisheries for comment and consultation. Any requirements or comments from Fisheries on the REF or design of the Project will be addressed or implemented as required by Council.

4.3. Community Consultation

Community consultation was undertaken via Council's YourSay platform. A total of 190 unique responses were recorded, with feedback focussed around environmental considerations, cost and feasibility, and integration with existing paths. The outcomes of consultation influenced the refinement of the bridge design to avoid key environmental values. Responses to community feedback were published in the Community and Stakeholder Engagement Report (Northern Beaches Council 2025).

5. Mitigation Measures

Table 26: Recommended mitigation measures

Environmental Aspect	Impact Description	Safeguards/Mitigation Measures	Responsibility
Soil Erosion and Sedimentation	• Soil erosion and sedimentation during removal of the existing vegetation • Sedimentation, erosion and runoff caused by vehicle movements and/or heavy rainfall. • Soil erosion, sedimentation, and bioturbation during excavation	• Prepare a Construction Environmental Management Plan (CEMP) prior to any construction works to address measures to be adopted to minimise impacts on the environment because of the construction works, including soil erosion and sedimentation. • Schedule the work outside of predicted heavy rain periods. • Stop work during and after heavy rainfall to reduce risk of mobilising sediment. • A Sediment and Erosion Control Plan is to be implemented prior to works, with the aim of achieving an outcome of no visible turbid plumes migrating through the waterway. This should include: • Sediment and erosion controls to protect the waterway from bank works and vegetation removal. • A floating sediment curtain to enclose all suspended sediments and organic material generated within the worksite. Curtains are not to obstruct fish passage. • Sediment curtain must be positioned and secured properly. • Tarps to be placed carefully over beds within the immediate work area to prevent infauna from being smothered by sediment and organic matter resulting from excavations. • Tarps are to be rolled up and sediments and debris removed from the waterway and disposed of at an appropriate waste facility. • Tarps must not remain on the creek bed for more than 24 hours. • Inspect erosion controls regularly (daily during workdays) and after rainfall. Fix damaged controls immediately. Remove accumulated sediment or waste material from within the sediment controls regularly. • Leave erosion and sediment controls in place until after the works are completed.	Project Manager All Staff/Contractors
Soil Contamination	• Unexpected contamination • Pollution of sediment from chemical spills (e.g., fuel or oil from machinery)	• If contaminated soils are uncovered during the works, all works within the vicinity of the find must cease immediately and the relevant authority must be notified immediately.	Project Manager All Staff/Contractors

Environmental Aspect	Impact Description	Safeguards/Mitigation Measures	Responsibility
		• For any excess spoil where potentially, contaminating activities have been identified on site this material will be tested and classified prior to leaving site. For any excess spoil material classified as contaminated, disposal of this material will be at an appropriately licensed landfill in accordance with the EPA (2014) *Waste Classification Guidelines*. • Store all chemicals (e.g., fuel, oil) in appropriate bunding/storage systems within the approved storage facility out of the riparian zone. • Ensure appropriate spill kits are carried with the equipment.	
Acid Sulfate Soils (ASS)	• Disturbance of ASS	• Test soils prior to any ground disturbance works. • Prepare and implement an ASS Management Plan in accordance with the *Acid Sulfate Soils Manual* (ASSMAC 1998) if ASS are confirmed within the area subject to disturbance.	Project Manager All Staff/Contractors
Flood Prone Land	• Contributing to or damage as a result of flood hazard	• Appropriate design measures to respond to 1:100 year flood levels • Use of construction materials suitable for flood risk environments • Consult with SES with regard to works in Flood Prone Land	Project Manager
Water Quality and Hydrology	• Excess sediment input into waterway • Pollution of foreshore from chemical spills (e.g., fuel or oil)	• Weather forecasts will be checked daily to ensure that work is not carried out before or during high rainfall. • Store all chemicals (e.g., fuel, oil) offsite and if required to be stored onsite, chemicals should be stored in appropriate bunding/storage systems and only for short periods. • Ensure appropriate spill kits are present onsite. • Ensure all equipment is in good working order. • Carry associated Safety Data Sheets (SDS) for all chemicals. • Wash all equipment, including hulls of barges, anchors, sediment curtains and trailers to prevent spread of aquatic pests including *Caulerpa taxifolia* (Caulerpa). Provide contractors on site with copy of *Make 'clean' part of your routine* (DPI, 2015). • A visual check for Caulerpa on all equipment and vessels to be used in the activities must be carried out before work commences.	Project Manager All Staff/Contractors
Biodiversity – Vegetation	• Crushing and damage to vegetation that is not proposed for removal	• Pre-works briefing to be led by Council and/or the project Ecologist, advising construction staff of environmentally sensitive areas and relevant safeguards for these areas (e.g., no-go zones to protect retained vegetation).	Project Manager All Staff/Contractors

Environmental Aspect	Impact Description	Safeguards/Mitigation Measures	Responsibility
		• Establish clearly defined areas, such as the works area and 'no-go' areas within/adjacent to the work site. These are to be demarcated using high-visibility bunting or exclusion fencing.	
Biodiversity – Fauna	• Harm to identified threatened fauna species; injured or orphaned wildlife • Unexpected threatened species finds	• Establish clearly defined areas, such as the works area and 'no-go' areas outside the approved impact area. These are to be demarcated on land and water as necessary. • Conduct pre-clearance surveys for any vegetation to be removed, to ensure no fauna are present and will not be harmed during vegetation removal. Any fauna requiring relocation must be done so in accordance with a Relocation Management Plan by a qualified Ecologist. • Works must be stopped if any previously undiscovered threatened species or communities are discovered during works. An assessment of the impact and any required approvals must be obtained. Works must not recommence until written approval has been provided to do so. • A site-specific CEMP is to be prepared and will include instructions for dealing with orphaned or injured native animals and include the contact details for the NSW Wildlife Information, Rescue and Education Service Inc (WIRES). • Store and decant chemicals outside of work area. • Works must be stopped if any previously undiscovered threatened species or communities are discovered during works. An assessment of the impact and any required approvals must be obtained. Works must not recommence until written approval has been provided to do so.	Project Manager All Staff/Contractors
Biodiversity – Marine Environment	• Harm to marine vegetation, aquatic fauna and water quality	• Implement a CEMP to address pollution, contamination and unnecessary disturbance which could arise during construction, such as: ○ sediment and debris control ○ oil/fuel/chemical storage and spill management ○ machinery and engine maintenance schedule to reduce oil/fuel leakage ○ low impact barge positioning to prevent propeller scouring and thrust wash onto benthic habitats (along the foreshore) ○ minimise footprint and establish no-go zones in shallow habitats, especially on mangrove roots ○ accidental waste/material overboard response (e.g. construction materials dropped into the lagoon)	Project Manager All Staff/Contractors

Environmental Aspect	Impact Description	Safeguards/Mitigation Measures	Responsibility
		○ biological hygiene (e.g. prevent spread of noxious species on and off the site) ○ other measures listed below. ● Positioning of barges and equipment unloading should occur during calm conditions. ● Avoid shallow water when turning vessels. Large vessels/barges should avoid banks at low tide. ● Any mooring lines where a barge is required should be suspended off the seafloor to minimise drag across benthic habitat. ● Use of a floating boom with silt curtain encompassing full works area (each abutment, but not bank to opposite bank). The curtain is to remain in place until all suspended material has settled (no visible plumes). ● All waste material should be disposed of on land and not reused in the construction or left on the seafloor. ● Care should be taken not to introduce *Caulerpa taxifolia*. For example, a drill head or anchor used at another site with Caulerpa should be thoroughly cleaned of plant propagules and sediment before being used at another location. Fragments of Caulerpa can remain viable for up to three days out of the water. Best hygiene practices are outlined in the *NSW Control Plan for the Noxious Marine Alga Caulerpa taxifolia* (NSW I&I 2009). ● Gentle start-up of heavy machinery is recommended to allow undetected aquatic fauna to leave the works area and avoid hearing damage. Include staged breaks, such as 10 minutes loud, 30 minutes quiet as necessary. Work in the creek banks should be stopped if large aquatic fauna is observed nearby. ● Obtain a **Part 7 Permit** under the FM Act for dredging and reclamation and comply with all conditions of the permit.	
Priority Weeds	● Introduction or spread of priority weeds	● Wash down equipment and vehicles prior to and after use, to manage the introduction and spread of weed propagules.	All Staff/Contractors
Aboriginal Heritage	● Discovery of unexpected Aboriginal objects ● Discovery of human remains	● All contractors undertaking works on site should be briefed on the protection of Aboriginal heritage objects under the NPW Act, and the penalties for damage to these items. ● Aboriginal objects are protected under the NPW Act regardless of whether they are registered on AHIMS or not. If an item (or suspected item) of	Project Manager All Staff/Contractors

Environmental Aspect	Impact Description	Safeguards/Mitigation Measures	Responsibility
		Aboriginal objects, such as stone artefacts are located during works, works must cease in the affected area and the area fenced off with suitable markers (star pickets, flagging or barrier mesh). Engage an archaeologist to assess the finds. If the finds are found to be Aboriginal objects, Heritage NSW must be notified under section 89A of the NPW Act. Appropriate management and avoidance or approval under a section 90 AHIP should then be sought if Aboriginal objects are to be moved or harmed. ● In the extremely unlikely event that human remains are found, works should immediately cease, and NSW Police should be contacted. If the remains are suspected to be Aboriginal, Heritage NSW must also be contacted to assist in determining appropriate management.	
Historic Heritage	● Unexpected Impacts to Heritage Items	● A heritage induction should be presented to workers before construction begins. ● In accordance with Section 146 of the Heritage Act, if an archaeological relic (such as a deposit, feature, or artefact) is uncovered during works, work must cease in the affected area and Heritage NSW must be notified. Further advice and consultation would be required, and approvals may be required from Heritage NSW under delegation regarding any relics, should they be discovered during works. ● Stop work if human remains are found and contact NSW Police. If remains are suspected to be Aboriginal, Heritage NSW must be notified as well.	Project Manager All Staff/Contractors
Noise and Vibration	● Noise impacts on sensitive receivers in proximity	● Avoid simultaneous operation of noisy plant within discernible range of sensitive receivers ● Limit construction works to the following times: ○ Monday to Friday 7:00 am to 6:00 pm ○ Saturday 8:00 am to 1:00 pm ● Maximise the distance between noisy plant items and nearby residential receivers and/or potential fauna habitat (i.e., retained vegetation) ● Use slow start-up of heavy machinery for works on the creek banks to allow fish to move away from the area.	Project Manager All Staff/Contractors
Air Quality	● Dust generation from vibrating and ground disturbing works ● Dust from vehicles ● Fumes generation from machinery	● Works must be minimised during high wind periods. ● Dust suppression should be applied as required to limit excessive dust generation.	Project Manager All Staff/Contractors

Environmental Aspect	Impact Description	Safeguards/Mitigation Measures	Responsibility
	• Cumulative impacts of greenhouse gas emissions	• Plant and equipment must be regularly inspected to ascertain that fitted emission controls are operating efficiently. • Plant and equipment must be maintained in accordance with manufacturer's specifications to ensure that it is in a proper and efficient condition. • Do not leave machinery running while not in use. • Minimise use of machinery for required activity only. • Vehicles to maintain recommended speed. • Look for excessive dust generation and slow down if needed. • Limit construction works to standard daytime working hours.	
Waste Management	• Minor spills or leaks of fuels or chemicals • General Waste • Generation of organic and hard waste materials	• Store all chemicals (including fuel/oil) offsite wherever possible. • If required to be stored onsite, chemicals should be stored in appropriate bunding/storage systems and only for short periods. • Ensure appropriate spill kits are present onsite. • Ensure all equipment is in good working order. • Carry associated Safety Data Sheets (SDS) for all chemicals. • Refuel away from any drainage lines and waterways. • An adequate number of bins must be placed at the site for workers and all litter will be placed in these bins. Work areas would be kept clean and free of litter, including cigarette butts, at all times. • Removal of vegetation will be required. Removed vegetation is to be handled in accordance with the Waste classification guidelines (EPA 2014). • Any removed vegetation and excess soils are to be taken offsite for disposal, or for reuse, materials should be tested for safety in accordance with the *Waste Classification Guidelines* (EPA 2014). • Any potentially hazardous waste (i.e., ASS) must be handled with care in accordance with an ASS Management Plan and Part 4: Acid Sulfate Soils of the Waste Classification Guidelines. • Cover all loads when transporting waste material. • Any signs of potential contamination encountered during creation and removal of waste materials must be reported to the relevant site supervisor and project manager.	All Staff/Contractors

Environmental Aspect	Impact Description	Safeguards/Mitigation Measures	Responsibility
		• Upon completion of waste disposal, all original weighbridge or disposal receipts issued by the receiving waste facility must be retained in a waste register as evidence of proper disposal. • All waste must be removed from the site on completion of works.	
Traffic and Navigation	• Disruption to traffic flows	• Vehicles, materials and equipment must be positioned to minimise impacts to public access and parking. • Heavy vehicles, if required, will be restricted to specified routes. • The REF will be provided to TfNSW for comment in relation to potential impacts on Pittwater Road. • Prepare a Traffic Management Plan (TMP) to be implemented before and during construction. • Necessary licenses or approvals where partial road closures are required will be sought.	Project Manager All Staff/Contractors
Visual Amenity and Landscape	• Reduced visual amenity • Removal of vegetation	• Notify community or neighbours prior to construction works. • Notify nearby receivers that may be affected by lighting installation • Position lighting in residential areas to direct light away from sensitive receivers (houses, dense bushland) wherever possible. • Install lighting in accordance with the AS 4282 – *Control of the obtrusive effects of outdoor lighting* to minimise adverse effects on the natural environment • Use visually similar materials to the existing roadway and/or natural materials that complement the surrounding environment • Reinstate any disturbed vegetation, including groundcover, on completion of works.	Project Manager All Staff/Contractors
Social and Economic	• Partial road closure or change to traffic flow • Temporary closure of Hinkler Park	• Notify the surrounding residential community of the works at least 10 days prior • Establish appropriate fencing and signage to alert community and park users of the works • Reinstate access for pedestrians, traffic and park users as soon as possible	Project Manager All Staff/Contractors
Cumulative Impacts	• Co-occurring works in locality	• Notify the surrounding residential community of the works at least 10 days prior • Coordinate concurrent works internally with Council or relevant Project Managers	Project Manager

6. Conclusion

6.1. Section 171 of the EP&A Regulation

Section 171 of the EP&A Regulation sets out a non-exhaustive list of factors which must be considered when undertaking a Review of Environmental Factors under Part 5 of the EP&A Act. These factors have been addressed throughout this report and are summarised in Table 27 below.

Table 27: Section 171 Factors under the EP&A Regulation

Section 171 Factor		Assessment Outcome
(a)	the environmental impact on the community,	Noise and other impacts on the community are anticipated to be minimal. The Project will result in a positive impact on the community through providing an improved active transport and recreational asset.
(b)	the transformation of the locality,	No significant transformation of locality is likely as part of the works. The Project occurs in a relatively modified environment, adjacent to an existing road bridge.
(c)	the environmental impact on the ecosystems of the locality,	There will be no significant environmental impact on ecosystems of the locality provided the recommended mitigation measures are followed. Mitigation measures will ensure the protection fauna through preclearance surveys (prior to tree felling if required), and detailed design that has avoided and minimised harm to marine vegetation. No significant impacts to terrestrial flora or other threatened species will result from the proposed works based on the indicative impact area.
(d)	reduction of the aesthetic, recreational, scientific or other environmental quality or value of the locality,	The works will not reduce the aesthetic value or any environmental quality of the study area long-term. Recreational value of the locality will be enhanced by providing an improved active transport and recreational asset for the local community.
(e)	the effects on any locality, place or building that has— aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance, or other special value for present or future generations,	The proposed works will not affect any known historical heritage or Aboriginal sites, provided that the recommended mitigation measures are implemented. The majority of the study area has previously been highly modified by the construction of Pittwater Road and the existing pedestrian footbridge, indicating there is a low potential for *in situ* subsurface archaeological deposits to be impacted by the proposed works. The proposed works will not have any effect upon a building/s having aesthetic, architectural, cultural, historical, scientific, or social significance or any other special value for present or future generations.
(f)	the impact on the habitat of protected animals, within the meaning of the *Biodiversity Conservation Act 2016*,	No protected animals listed (BC Act) will be significantly impacted by the proposed works. Some removal of fauna habitat will be required and is to be managed in accordance with the recommended mitigation measures (including preclearance survey).
(g)	the endangering of a species of animal, plant or other form of life, whether living on land, in water or in the air,	No significant impacts to threatened fauna or flora will result from the Project provided the recommended mitigation measures are implemented.
(h)	long-term effects on the environment,	The Project will not have a long-term effect on the environment. It will provide a long-term benefit to the local Northern Beaches community through the creation of new active transport and recreation asset, connecting the community to nature and promoting outdoor recreation.

Section 171 Factor		Assessment Outcome
(i)	degradation of the quality of the environment,	No significant impacts to the quality of the environment were found based on the indicative impact area. No significant or long-term degradation to the quality of the environment should occur if mitigation measures are adhered to.
(j)	risk to the safety of the environment,	A low risk to the environment is associated with the Project. There is a potential for a chemical spill to occur during construction, and for water quality to be affected. The risk to the environment is considered minor and short-term if the prescribed mitigation measures are adopted.
(k)	reduction in the range of beneficial uses of the environment,	No reduction in the range of beneficial uses of the environment will result as part of the works. The Project will not limit or modify any uses of the environment. The Project will provide improved access across Manly Lagoon which is a beneficial use of the environment for the community and any visitors.
(l)	pollution of the environment,	No pollution of the environment is proposed or likely. The risk is minimal if the appropriate mitigation measures are followed.
(m)	environmental problems associated with the disposal of waste,	All waste is to be taken offsite and disposed of appropriately. No environmental problems associated with the disposal of waste are expected to occur.
(n)	Any increased demands on resources (natural or otherwise) that are or are likely to become in short supply?	No resources that are being utilised as part of this project are known or expected to become in short supply.
(o)	the cumulative environmental effect with other existing or likely future activities,	Minimal cumulative environment effects are anticipated to result from the proposed works and can be effectively managed through mitigation measures.
(p)	the impact on coastal processes and coastal hazards, including those under projected climate change conditions,	The bridge is located above a coastal environment at a raised location and would not exacerbate or significantly influence flooding or coastal processes. Suitable materials for the marine and flood prone environment are to be used. Rising sea levels under climate change may occur in the study area and potentially limit access either side of the bridge, either temporarily or permanently. Being in a coastal environment, this impact is difficult to predict and mitigate however the Project is likely to be affected by climate change condition at some point. The design of the bridge has been considered in response to current 1:100 year flood level standards, and will be constructed to a higher point than the adjacent existing Pittwater Road bridge.
(q)	applicable local strategic planning statements, regional strategic plans or district strategic plans made under the Act, Division 3.1,	The proposed works support the local, regional and district strategic plans by providing a safe and accessible recreational asset for the local community.
(r)	other relevant environmental factors.	All relevant factors have been addressed in this REF.

6.2. Evaluation

The Project has been subject to assessment under Division 5.1, Part 5 of the EP&A act. This REF has examined and taken into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the proposed activity. This has included consideration of other environmental planning instruments as well as other NSW and Commonwealth legislation.

The proposal will aid in the delivery of multiple objectives identified both in the North District Plan and Northern Beaches Council LSPS such as providing improved social infrastructure and delivering high quality open space for current and future generations.

The Project as described in this REF best meets the proposal objectives, however, would still result in some impacts. Potential environmental impacts associated with the proposal would generally be limited to impacts on aquatic habitat and fauna. Impacts to the Project in the mid- to long-term under predicted climate change scenarios are likely unavoidable and this should be considered in the determination of the Project. It falls short of supporting local and regional strategic plans by way of climate resilience.

Appropriate mitigation measures have been recommended to ensure such impacts are minimised during construction of the Project. This includes implementation of several management plans including:

- Construction Environmental Management Plan (CEMP)
- Sediment and Erosion Control Plan
- Traffic Management Plan
- Obtaining and complying with a Part 7 permit for dredging and reclamation (Section 200 of the FM Act)

This REF has considered and assessed these impacts in accordance with Section 171 of the EP&A Regulation and the requirements of the EPBC Act. Based on the assessment contained in this REF, it is considered that the proposal is not likely to have a significant impact upon the environment or any threatened species, populations, or communities. Accordingly, an Environmental Impact Statement (EIS) is not recommended. Impacts, including flooding, resulting from climate change are not likely to be exacerbated by the Project, however the relationship with climate resilience objectives should be considered in Council's determination of this REF and proceeding with the Project. The design of the bridge has taken future predicted flood levels into consideration.

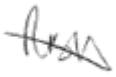
The Project has also considered the principles of ecologically sustainable development and the objects of the EP&A Act. The proposal would be delivered with benefit for the community, be cost effective and minimise any adverse impacts on the environment. Residual impacts to the environment will be managed through mitigation measures described in this document under the Project's CEMP. On balance, the Project is considered justified and in the public interest.

7. REF Determination and Conditions

7.1. Assessor Declaration

This REF provides a true and fair review of the activity in relation to its likely effects on the environment. It addresses to the fullest extent possible all matters affecting or likely to affect the environment as a result of the Project and provides sufficient information to determine whether there is likely to be a significant impact on the environment as a result of the Project.

I have considered all environmental impacts and safeguards to the best of my knowledge and have sought advice where required.

Assessor's Declaration and Approval	
Project Director Rebecca Ben-Haim Eco Logical Australia Level 13/420 George Street, Sydney NSW 2000 Ph: 02 9259 3745	 Date: 4/09/25
Project Manager Courtney Blick Eco Logical Australia Level 13/420 George Street, Sydney NSW 2000 Ph: 02 9259 3756	 Date: 4/09/25

7.2. Determiner Declaration and Approval

I have reviewed the document and consider that the Project will not have a significant impact and can proceed subject to the controls outlined in this REF.

Determiner's Declaration and Approval	
Role: Name: Organisation: Address: Ph:	Date:
Role: Name: Organisation: Address: Ph:	Date:

8. References

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Appendix A Biodiversity Appendices

A1 Species List

Table 28: Flora species list

Species Name	Common Name	Exotic (X)
Acacia saligna	Golden wreath wattle	
Acetosa sagittata	Turkey rhubarb	x
Agapanthus sp.	Agapanthus	x
Agave attenuata	Foxtail	x
Araucaria columnaris	Cook Pine	x
Araucaria heterophylla	Norfolk Island Pine	x
Araujia sericifera	Moth vine, Moth plant	x
Asparagus aethiopicus	Ground asparagus	x
Aster sp.	Aster	x
Avicennia marina var. *australasica*	Grey Mangrove	
Banksia serrata	Old Man Banksia	
Bidens pilosa	Cobblers Pegs	x
Bromus catharticus	Prairie Grass	x
Callistemon citrinus	Crimson Bottlebrush	
Callistemon sp.	-	
Callistemon viminalis	Weeping Bottlebrush	
Camellia sp.	Camellia	x
Cardiospermum grandiflorum	Balloon vine	x
Casuarina glauca	Swamp Oak	
Clivia sp.	Clivia	x
Commelina cyanea	Scurvy Weed	
Convolvulus sp.	Bindweed	
Cupaniopsis anacardioides	Tuckeroo	
Cyclospermum leptophyllum	Slender Celery	x
Cynodon dactylon	Couch	
Dianella caerulea var. *caerulea*	Blue Flax-lily	
Dichondra repens	Kidney Weed	
Ehrharta erecta	Panic Veldtgrass	x
Eleusine tristachya	Goose Grass	x
Erthrina crista-galli	Cockspur coral tree	x
Eucalyptus botrioydes	Bangalay	
Gamochaeta sp.	Cudweed	x
Hakea dactyloides	Finger Hakea	
Homalanthus populifolius	Bleeding Heart	
Howea sp.	Howea	
Hydrocotyle sp.	Pennywort	
Hypochaeris sp.	Catsear	x
Kunzea ambigua	Tick Bush	
Lantana camara	Lantana	x

Species Name	Common Name	Exotic (X)
Lepidium didymum	Lesser Swinecress	x
Lolium sp.	Ryegrass	x
Lomandra longifolia	Spiny-headed Mat-rush	
Melaleuca bracteata	Black Tea-tree	
Melaleuca nodosa	Prickly-leaved Paperbark	
Melaleuca quinquenervia	Broad-leaved Paperbark	
Monstera deliciosa	Fruit Salad Plant	x
Ochna serrulata	Ochna	x
Oxalis sp.	Yellow-flowered Oxalis	x
Panicum sp.	Panic	
Parietaria judaica	Pellitory, Asthma weed	x
Pennisetum clandestinum	Kikuyu	x
Persicaria decipiens	Slender Knotweed	
Philodendron sp.	Philodendron	x
Phoenix canariensis	Phoenix palm, Canary Island date palm	x
Phragmites australis	Common Reed	
Pittosporum undulatum	Sweet Pittosporum	
Plantago sp.	-	x
Platycerium sp.	Staghorn Fern	
Poa annua	Annual Poa	x
Polycarpon tetraphyllum	Four-leaved Allseed	x
Richardia sp.	Mexican-clover	x
Roystonea regia	Cuban Royal Palm	x
Rumex sp.	Dock	x
Salpichroa origanifolia	Pampas lily of the valley	x
Solanum americanum	Glossy Nightshade	
Solanum seaforthianum	Climbing nightshade, Brazillian nightshade	x
Sonchus sp.	Sowthistle	x
Sporobolus africanus	Parramatta Grass	x
Stenotaphrum secundatum	Buffalo Grass	x
Stephania japonica	Snake Vine	
Strelitzia sp.	Bird of Paradise	
Syagrus romanzoffiana	Cocos palm	x
Tetragonia tetragonoides	New Zealand Spinach	
Tradescantia fluminensis	Trad	x
Westringia fruticosa	Coastal Rosemary	
Xylosma japonicum	-	x

Table 29: Fauna species list

Family	Scientific Name	Common Name	Observation Type
Cacatuidae	*Cacatua gallerita*	Sulphur-crested Cockatoo	Seen
Meliphagidae	*Manorina melanocephala*	Noisy Miner	Seen
Monarchidae	*Grallina cyanoleuca*	Magpie-lark	Seen
Sturnidae	*Sturnus tristus*	Common Myna	Seen

Family	Scientific Name	Common Name	Observation Type
Oriolidae	*Oriolus sagittatus*	Olive-backed Oriole	Heard
Mugilidae	*Mugil cephalus*	Sea Mullet	Seen

A2 Likelihood of Occurrence Assessment

An assessment of likelihood of occurrence was made for threatened and migratory species identified from the database search. 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 site inspection and professional judgement. The terms for likelihood of occurrence are defined below:

- "known" = 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 site
- "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 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 State or 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 Atlas of NSW Wildlife (BioNet) 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 Profiles*.

Table 30: Likelihood of Occurrence - Ecological Communities

Ecological Community	BC Act / FM Act Status	EPBC Status	Description	Likelihood of Occurrence	Impact Assessment Required
Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South East Queensland ecological community	E	E	The canopy layer is dominated by *Casuarina glauca* (swamp oak, swamp she-oak). This often occurs as a relatively uniform upper layer of swamp oak, with height and density dependent on the local environmental conditions.	Yes – observed within the study area. BC Act TEC, but does not meet EPBC TEC criteria.	Yes
Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland	E	E	Forested palustrine wetlands, or swamp forests, found in the temperate to subtropical coastal valleys of Australia's east coast. The Coastal Sclerophyll Swamp Forest often has a layered canopy, dominated by melaleucas and/or Eucalyptus robusta.	No - this community was not identified during field survey	No
Coastal Upland Swamps in the Sydney Basin Bioregion	E	E	May include tall open scrubs, tall closed scrubs, closed heaths, open graminoid heaths, sedgelands and fernlands. Larger examples may include a complex of these structural forms.	No - this community was not identified during field survey	No
Eastern Suburbs Banksia Scrub of the Sydney Region	E	E	Predominately a sclerophyllous heath or scrub occasionally with small areas of woodland or low forest. The characteristic assemblage of plants in the community includes some but not all of the following components: *Allocasuarina distyla, Acacia longifolia, A. suaveolens, A. terminalis, Actinotus minor, Banksia aemula, B. ericifolia, B. integrifolia, B. serrata, Baekea imbricata, Bauera rubiodies, Boronia parvifolia, Bossiaea heterophylla, Brachyloma daphnoides, Darwinia spp., Epacris spp., Eucalyptus gummifera, Hakea teretifolia, Kunzea ambigua, Lambertia formosa, Leptospermum spp., Melaleuca squamea, Monotoca spp., Persoonia lanceolata, Ricinocarpus pinifolius,* and *Styphelia viridis.* Species in the understorey include *Pteridium esculentum, Caustis pentandra, Dianella revoluta, Eragrostis brownii, Haemodorum planifolium, Hypolaena fastigiata, Lepidosperma laterale, Leptocarpus tenax, Lepyrodia scariosa* and *Xanthorrhoea resinifera.*	No - this community was not identified during field survey	No
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.	No - this community was not identified during field survey	No

Ecological Community	BC Act / FM Act Status	EPBC Status	Description	Likelihood of Occurrence	Impact Assessment Required
Posidonia australis seagrass meadows of the Manning-Hawkesbury ecoregion		E	The meadows of the ecological community occur as almost pure stands of *Posidonia australis* (monospecific meadows) or multispecies meadows dominated by P. australis (for example, with *Zostera muelleri subsp. capricorni, Halophila ovalis*).	No - this community was not identified during field survey	No
River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria	E	CE	A tall forest to woodland structure, with a canopy dominated by eucalypts and an understorey of small trees, shrubs, grasses, other herbs and climbers on floodplains.	No - this community was not identified during field survey	No
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.	No - this community was not identified during field survey	No
Western Sydney Dry Rainforest and Moist Woodland on Shale	E	CE	Typically a low closed forest, slightly more open in the moist woodland form, with emergent trees up to 25 m high and a lower tree layer. In sheltered gullies and on lower slopes the canopy layer is typically dominated by *Melaleuca styphelioides* (prickly-leaved paperbark). Other diagnostic tree species include *Acacia implexa* (hickory wattle), *Alectryon subcinereus* (native quince), *Brachychiton populneus* (kurrajong), *Corymbia maculata* (spotted gum), *Melicope micrococca* (white euodia) and *Streblus pendulinus* (whalebone tree). Generally on upper slopes to undulating terrain, or at more disturbed sites, the ecological community exhibits its moist woodland form with the canopy dominated by *E. moluccana*, *E. tereticornis*, *E. crebra* and/or *Corymbia maculata*. Characteristic shrub species include *Breynia oblongifolia* (false coffee bush), *Clerodendrum tomentosum* (hairy clerodendrum) and *Notelaea longifolia f. longifolia* (large mock-olive). Vines and other climber species are typically common.The ground layer is variable and generally sparse with a diverse mix of forbs, ferns and shade-tolerant grasses.	No - this community was not identified during field survey	No

Table 31: Likelihood of occurrence assessment for threatened fauna species

Scientific Name	Common Name	BC Act / FM Act Status	EPBC Act Status	Distribution	Habitat	Number of Records within 5km	Likelihood of Occurrence	Impact Assessment Required
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.	1	Unlikely – habitat marginal and minimal records of species within 5 km	No
Anous albivitta	Grey Ternlet	V	M	Widely distributed in the southern Pacific Ocean, breeding on oceanic islands including Lord Howe Island.	Marine.	1	No – no suitable habitat	No
Anous stolidus	Common Noddy	-	M	Casual visitor to coastal NSW.	Marine.	4	No – few records of species within 5 km and unsuitable habitat	No
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).	2	No – few records of species within 5 km and unsuitable habitat	No
Apus pacificus	Fork-tailed Swift	-	M	Recorded in all regions of NSW.	Riparian woodland., swamps, low scrub, heathland, saltmarsh, grassland, Spinifex	67	Unlikely – habitat marginal and minimal records of species within 5 km	No

Scientific Name	Common Name	BC Act / FM Act Status	EPBC Act Status	Distribution	Habitat	Number of Records within 5km	Likelihood of Occurrence	Impact Assessment Required
					sandplains, open farmland and inland and coastal sand-dunes.			
Arctocephalus forsteri	New Zealand Fur-seal	V	-	Reports of non-breeding animals along southern NSW coast particularly on Montague Island, but also at other isolated locations to north of Sydney.	Prefers rocky parts of islands with jumbled terrain and boulders.	13	No – unsuitable habitat	No
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.	14	No – no records of species within 5 km and unsuitable habitat	No
Ardenna carneipes	Flesh-footed Shearwater	V	M	Recorded in NSW coastal waters. Breeds on Lord Howe Island.	Marine.	1325	No – marine species, unsuitable habitat	No
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.	3	No – unsuitable habitat	No
Ardenna pacifica	Wedge-tailed Shearwater	-	Mar, M	Breeds on the east and west coasts of Australia and on off-shore islands.	Pelagic, marine bird known from tropical and subtropical waters	36245	No – unsuitable habitat	No
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.	57800	No – unsuitable habitat	No

Scientific Name	Common Name	BC Act / FM Act Status	EPBC Act Status	Distribution	Habitat	Number of Records within 5km	Likelihood of Occurrence	Impact Assessment Required
Arenaria interpres	Ruddy Turnstone	-	M	Summer migrant to most coastal regions, with occasional records inland, including in NSW.	Tidal reefs and pools; pebbly, shelly and sandy shores; mudflats; inland shallow waters; sewage ponds, saltfields; ploughed ground.	-	Unlikely – habitat marginal and no records of species within 5 km	No
Artamus cyanopterus cyanopterus	Dusky Woodswallow	V	-	Widespread in eastern, southern and south western Australia.	Primarily inhabit dry, open eucalypt forests and woodlands	37	No – unsuitable habitat	No
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 – habitat marginal and no records of species within 5 km	No
Burhinus grallarius	Bush Stone-curlew	E1	-	In NSW, found sporadically in coastal areas, and west of the divide throughout the sheep-wheat belt.	In NSW, it occurs in lowland grassy woodland and open forest.	11	No – unsuitable habitat	No
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.**	**34**	**Potential – habitat is marginal (wetlands) and species known to occur within 5 km**	**Yes**
Calidris alba	Sanderling	V	-	Arriving from September and leaving by May (some may overwinter in Australia). Sanderlings occur along the NSW coast, with occasional inland sightings.	Often found in coastal areas on low beaches of firm sand, near reefs and inlets, along tidal mudflats and bare open coastal lagoons; individuals are rarely recorded in near-coastal wetlands.	17	Potential – study area contains coastal lagoon and species known from 5 km.	No – Lagoon habitat not directly impacted.

Scientific Name	Common Name	BC Act / FM Act Status	EPBC Act Status	Distribution	Habitat	Number of Records within 5km	Likelihood of Occurrence	Impact Assessment Required
Calidris canutus	Red Knot	V	E	In NSW it is recorded in small numbers along some of the major river estuaries and sheltered embayments of the coastline, in particular the Hunter River estuary. Large numbers arrive in September then most move south to Victoria by October.	Mainly occurs in small numbers on intertidal mudflats, estuaries, bays, inlets, lagoons, harbours and sandflats and sandy beaches of sheltered coasts. Occasionally found on sandy ocean beaches or shallow pools on exposed wave-cut rock platforms.	17	Potential – habitat within study area (lagoon) and species known from 5km.	No – Lagoon habitat not directly impacted.
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.	2	Unlikely – habitat marginal and minimal records of species within 5 km	No
Calidris melanotos	Pectoral Sandpiper	-	M	Summer migrant to Australia. Widespread but scattered in NSW. East of the Great Divide, recorded from Casino and Ballina, south to Ulladulla. West of the Great Divide, widespread in the Riverina and Lower Western regions.	Shallow fresh to saline wetlands, including coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands.	-	Unlikely – habitat marginal and no records of species within 5 km	No
Calidris ruficollis	Red-necked Stint		M	Summer migrant to Australia, widespread coastal and inland NSW.	Tidal mudflats, saltmarshes, sandy and shelly beaches, saline and freshwater wetlands, saltfields, sewage ponds.	22	Unlikely – habitat marginal and few records of species within 5 km	No
Calidris tenuirostris	Great Knot	V	V	In NSW, recorded at scattered sites along coast down to about Narooma.	Occurs within sheltered, coastal habitats containing large, intertidal mudflats	5	Potential – marginal lagoon habitat within study area	No – Lagoon not directly impacted.

Scientific Name	Common Name	BC Act / FM Act Status	EPBC Act Status	Distribution	Habitat	Number of Records within 5km	Likelihood of Occurrence	Impact Assessment Required
				Also observed inland at Tullakool, Armidale, Gilgandra and Griffith.	or sandflats, including inlets, bays, harbours, estuaries and lagoons.		however few records known from 5 km.	
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.	2	No – unsuitable habitat	No
Calonectris leucomelas	Streaked Shearwater	-	M	Regular summer visitor south to Wollongong, less common further south.	Marine.	199	No – unsuitable habitat	No
Calyptorhynchus lathami lathami	**South-eastern Glossy Black-Cockatoo**	**V**	**V**	**Uncommon although widespread throughout suitable forest and woodland habitats, from the central Queensland coast to East Gippsland in Victoria, and inland to the southern tablelands and central western plains of NSW, with a small population in the Riverina.**	**Inhabits open forest and woodlands of the coast and the Great Dividing Range where stands of sheoak occur.**	**54**	**Potential – habitat is marginal (*Casuarina glauca* stands) and species known to occur within 5 km**	**Yes**
Carcharhinus longimanus	Oceanic Whitetip Shark	-	M	Coasts of Australia	Marine	-	No – unsuitable habitat	No
Carcharias taurus (east coast population)	Grey Nurse Shark (east coast population)	CE	CE	Now confined to coastal waters off southern Queensland and along the entire NSW coast, and in Western Australia	-	-	No – unsuitable habitat	No
Caretta caretta	Loggerhead Turtle	E1	E, M	In NSW, seen in coastal waters as far south as Jervis	Marine. Nesting occurs on beaches.	5	No – unsuitable habitat	No

Scientific Name	Common Name	BC Act / FM Act Status	EPBC Act Status	Distribution	Habitat	Number of Records within 5km	Likelihood of Occurrence	Impact Assessment Required
				Bay and have been recorded nesting on the NSW north coast and feeding around Sydney.				
Cercartetus nanus	Eastern Pygmy-possum	V	-	In NSW it extents from the coast inland as far as the Pilliga, Dubbo, Parkes and Wagga Wagga on the western slopes.	Rainforest, sclerophyll forest (including Box-Ironbark), woodland and heath.	810	No – unsuitable habitat	No
Chalinolobus dwyeri	**Large-eared Pied Bat**	**V**	**V**	**Recorded from Rockhampton in Qld south to Ulladulla in NSW. Largest concentrations of populations occur in the sandstone escarpments of the Sydney basin and the NSW north-west slopes.**	**Wet and dry sclerophyll forests, Cyprus Pine dominated forest, woodland, sub-alpine woodland, edges of rainforests and sandstone outcrop country.**	**357**	**Potential – habitat is marginal (PCT 4028 and planted vegetation) and species known to occur within 5 km**	**Yes**
Chelonia mydas	Green Turtle	V	V, M	Occurs in coastal waters of NSW, generally on the north or central coast, with occasional records from the south coast. Scattered nesting records along the NSW coast.	Marine. Nesting occurs on beaches.	17	No – unsuitable habitat	No
Chlidonias leucopterus	White-winged Black Tern	-	M	Significant numbers arrive in Australia, typically by mid-August, and depart in early to mid-May.	Freshwater wetlands, marshes, and coastal lagoons	1	Unlikely – marginal habitat but few records from 5 km	No
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	V	-	From eastern through central NSW, west to Corowa, Wagga Wagga, Temora, Forbes, Dubbo and Inverell.	Eucalypt woodlands and dry open forest.	2	No – unsuitable habitat	No

Scientific Name	Common Name	BC Act / FM Act Status	EPBC Act Status	Distribution	Habitat	Number of Records within 5km	Likelihood of Occurrence	Impact Assessment Required
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.	1	No – unsuitable habitat	No
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.	-	No – unsuitable habitat	No
Dasyurus maculatus maculatus (SE mainland population)	Spotted-tailed Quoll	V	E	Found on the east coast of NSW, Tasmania, eastern Victoria and north-eastern Qld.	Rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline.	-	No – unsuitable habitat	No
Dendronephthya australis	Cauliflower Soft Coral	E	E	The only estuaries where D. australis is known to occur in abundance are Port Stephens and the Hawkesbury River (Brisbane Water area), New South Wales. They have also been recently (2018) found occurring in Sydney Harbour, Botany Bay and Jervis Bay	Confined to estuarine environments in NSW where it occurs in depths of 1 to 18 m	-	Unlikely – habitat is marginal but not known to occur within 5 km	No
Dermochelys coriacea	Leatherback Turtle	E1	E, M	All coastal waters of Australia. Large numbers feed in coastal waters south	Marine. Nesting occurs on beaches.	3	No – unsuitable habitat	No

Scientific Name	Common Name	BC Act / FM Act Status	EPBC Act Status	Distribution	Habitat	Number of Records within 5km	Likelihood of Occurrence	Impact Assessment Required
				to the central coast of NSW. Occasional breeding records from NSW coast, including between Ballina and Lennox Head in northern NSW.				
Diomedea antipodensis gibsoni	Antipodean Albatross	V	V	Regularly occurs off the NSW south coast from Green Cape to Newcastle during winter.	Marine.	-	No – unsuitable habitat	No
Diomedea exulans	Wandering Albatross	E1	V, M	Has been recorded along the length of the NSW coast.	Marine.	10	No – unsuitable habitat	No
Dugong dugon	Dugong	E1	M	Extends south to northern NSW, where its known from incidental records only.	Wide shallow protected bays, wide shallow mangrove channels and in the lee of large inshore islands. Will also occupy deeper waters.	1	No – unsuitable habitat	No
Epinephelus daemelii	Black Rockcod	V	V	This species is found in warm temperate and subtropical parts of the south-western Pacific. In NSW, it occurs along the coast, including Lord Howe Island.	A territorial species that inhabits caves, gutters and crevices. They are usually found in depths up to 50 m, although individuals have been collected from below 100 m. Juveniles are found inshore, often in coastal rockpools and estuaries.	-	No – no records and no suitable habitat in impact area.	No
Eretmochelys imbricata	Hawksbill Turtle	-	V, Mar, M	Major nesting of Hawksbill Turtles in Australia occurs at Varanus Island and Rosemary Island in Western Australia	Hawksbill Turtles spend their first five to ten years drifting on ocean currents. During this pelagic (ocean-going) phase, they are often found in association	4	No – unsuitable habitat	No

Scientific Name	Common Name	BC Act / FM Act Status	EPBC Act Status	Distribution	Habitat	Number of Records within 5km	Likelihood of Occurrence	Impact Assessment Required
					with rafts of Sargassum (a floating marine plant that is also carried by currents)			
Erythrotriorchis radiatus	Red Goshawk	E4A	V	In NSW, extends to ~30°S. Recent records confined to the Northern Rivers region north of the Clarence River.	Open woodland and forest, often along or near watercourses or wetlands. In NSW, preferred habitats include mixed subtropical rainforest, Melaleuca swamp forest and coastal riparian Eucalyptus forest.	-	Unlikely – habitat is marginal but not known to occur within 5 km	No
Esacus magnirostris	Beach Stone-curlew	E4A		Across northern and north-eastern Australia, south to the Manning River in north-eastern NSW, with occasional vagrants to south-eastern NSW and Victoria.	Exclusively along the coast, on beaches, islands, reefs and in estuaries, and edges of or near mangroves.	4	Unlikely – habitat marginal and minimal records of species within 5 km	No
Eubalaena australis	Southern Right Whale	E1	E, M	Migrate between summer feeding grounds in Antarctica and winter breeding grounds around the coasts of southern Australia.	Marine.	8	No – unsuitable habitat	No
Eudyptula minor	Little Penguin in the Manly Point Area	E2	-	This endangered population occurs from just north of Smedley's Point to Cannae Point, North Sydney Harbour, Manly (being the area on and near the shoreline from Cannae Point generally northward to the point near the intersection of Stuart Street and Oyama Cove Avenue, and extending	A range of nest sites are utilised: under rocks on the foreshore, under seaside houses and structures, such as stairs, in wood piles and under overhanging vegetation including lantana and under coral tree roots.	721	Species known to occur within 5 km, but out of range	No

Scientific Name	Common Name	BC Act / FM Act Status	EPBC Act Status	Distribution	Habitat	Number of Records within 5km	Likelihood of Occurrence	Impact Assessment Required
				100 metres offshore from that shoreline)				
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 – habitat marginal and no records of species within 5 km	No
Fregata ariel	Lesser Frigatebird	-	M	In NSW, irregularly observed after tropical cyclones south to central coast, sometimes observed south to Merimbula.	Marine.	3	No – unsuitable habitat	No
Fregata minor	Great Frigatebird	-	M	Occasionally observed coastal north-east NSW after cyclones, straggler to central coastal NSW.	Marine.	-	No – unsuitable habitat	No
Fregetta grallaria grallaria	White-bellied Storm-Petrel	V	V	Vagrant birds occur in coastal NSW waters, particularly after storm events.	Marine.	-	No – unsuitable habitat	No
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.	1	Unlikely – habitat marginal and minimal records of species within 5 km	No
Glossopsitta pusilla / Parvipsitta 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.	17	Potential – habitat is marginal (planted *Eucalyptus robusta*) and species known to occur within 5 km	No - only PCT 4028 impacted (mostly *Casuarina glauca*), with no large Eucalypts

Scientific Name	Common Name	BC Act / FM Act Status	EPBC Act Status	Distribution	Habitat	Number of Records within 5km	Likelihood of Occurrence	Impact Assessment Required
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.	-	No – unsuitable habitat	No
Gygis alba	White Tern	V	-	Occurs widely in tropical and subtropical seas and islands. The subspecies on Lord Howe Island is rarely seen on the mainland but occurs on Norfolk and Kermadec Islands.	Marine.	1	Unlikely – unsuitable habitat	No
Haematopus fuliginosus	**Sooty Oystercatcher**	**V**	**-**	**Distributed along the entire NSW coast.**	**Rocky headlands, rocky shelves, exposed reefs with rock pools, beaches and muddy estuaries.**	**20**	**Potential – habitat is marginal (waterbody) and species known to occur within 5 km**	**Yes**
Haematopus longirostris	**Pied Oystercatcher**	**E1**	**-**	**Thinly scattered along the entire NSW coast.**	**Intertidal flats of inlets and bays, open beaches and sandbanks.**	**28**	**Potential – habitat is marginal (waterbody) and species known to occur within 5 km**	**Yes**
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.**	**67**	**Potential – habitat is marginal (waterbody) and species known to occur within 5 km**	**Yes**
Heleioporus australiacus	Giant Burrowing Frog	V	V	South eastern NSW and Victoria, in two distinct populations: a northern	Heath, woodland and open dry sclerophyll forest on a variety of soil types	70	No – unsuitable habitat (degraded vegetation and	No

Scientific Name	Common Name	BC Act / FM Act Status	EPBC Act Status	Distribution	Habitat	Number of Records within 5km	Likelihood of Occurrence	Impact Assessment Required
				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.	except those that are clay based.		Gambusia sp.observed)	
Hieraaetus morphnoides	Little Eagle	V	-	Throughout the Australian mainland, with the exception of the most densely-forested parts of the Dividing Range escarpment.	Open eucalypt forest, woodland or open woodland, including sheoak or Acacia woodlands and riparian woodlands of interior NSW.	4	Unlikely – habitat marginal and minimal records of species within 5 km	No
Hippocampus whitei	White's Seahorse	E	E	White's Seahorse is endemic to the east coast of Australia. Known from eight estuaries on the NSW Coast, but is most abundant in Port Stephens, Sydney Harbour and Port Hacking.	Important habitats include natural habitats such as sponge gardens, seagrass meadows and soft corals. Also known to use artificial habitats such as protective swimming net enclosures and jetty pylons.	-	No – no records in catchment and no suitable habitat.	No
Hirundapus caudacutus	**White-throated Needletail**	**-**	**M**	**All coastal regions of NSW, inland to the western slopes and inland plains of the Great Divide.**	**Occur most often over open forest and rainforest, as well as heathland, and remnant vegetation in farmland.**	**474**	**Potential – habitat is marginal and species known to occur within 5 km**	**Yes**
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 – habitat marginal but no records of species within 5 km	No

Scientific Name	Common Name	BC Act / FM Act Status	EPBC Act Status	Distribution	Habitat	Number of Records within 5km	Likelihood of Occurrence	Impact Assessment Required
Hydroprogne caspia	Caspian Tern	-	M	Widespread in coastal and inland NSW.	Coastal offshore waters, beaches, mudflats, estuaries, rivers, lakes.	34	Potential – habitat is marginal and species known to occur within 5 km	Yes
Isoodon obesulus obesulus	Southern Brown Bandicoot (eastern)	E1	E	Found in south-eastern NSW, east of the Great Dividing Range south from the Hawkesbury River.	Heath or open forest with a heathy understorey on sandy or friable soils.	4	No – unsuitable habitat	No
Ixobrychus flavicollis	Black Bittern	V		In NSW, records are scattered along the east coast, with individuals rarely being recorded south of Sydney or inland.	Terrestrial and estuarine wetlands. Also flooded grassland, forest, woodland, rainforest and mangroves where permanent water is present.	12	Potential – habitat is marginal and species known to occur within 5 km	Yes
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.	59	Potential – habitat is marginal (*planted Eucalyptus robusta*) and species known to occur within 5 km	No - only PCT 4028 impacted (mostly *Casuarina glauca*), with no large Eucalypts
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.	38	Potential – habitat is marginal and species known to occur within 5 km	Yes

Scientific Name	Common Name	BC Act / FM Act Status	EPBC Act Status	Distribution	Habitat	Number of Records within 5km	Likelihood of Occurrence	Impact Assessment Required
Litoria aurea	Green and Golden Bell Frog	E1	V	Since 1990, recorded from ~50 scattered sites within its former range in NSW, from the north coast near Brunswick Heads, south along the coast to Victoria. Records exist west to Bathurst, Tumut and the ACT region.	Marshes, dams and stream-sides, particularly those containing Typha spp. (bullrushes) or Eleocharis spp. (spikerushes). Some populations occur in highly disturbed areas.	-	No – unsuitable habitat (degraded vegetation and *Gambusia* sp. Observed)	No
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.	8	Unlikely – habitat is marginal and minimal species known to occur within 5 km	No
Macquaria australasica	Macquarie Perch	E	E	Found in the Murray-Darling Basin (particularly upstream reaches) of the Lachlan, Murrumbidgee and Murray rivers, and parts of south-eastern coastal NSW, including the Hawkesbury/Nepean and Shoalhaven catchments.	Occur in freshwaters with lots of cover such as aquatic vegetation, snags, boulders and overhanging banks.	-	No – no suitable habitat, requires freshwater environment.	No
Macronectes giganteus	Southern Giant Petrel	E	E	The Southern Giant Petrel has a circumpolar pelagic range from Antarctica to approximately 20° S and is a common visitor off the coast of NSW.	Over summer, the species nests in small colonies amongst open vegetation on Antarctic and subantarctic islands, including Macquarie and Heard Islands and in Australian Antarctic territory.	2	No – habitat unsuitable	No

Scientific Name	Common Name	BC Act / FM Act Status	EPBC Act Status	Distribution	Habitat	Number of Records within 5km	Likelihood of Occurrence	Impact Assessment Required
Macronectes halli	Northern Giant Petrel	V	V	Distribution 40-64ºS in open oceans. Range extends into subtropical waters (to 28ºS) in winter and early spring, common visitor in NSW waters, predominantly along the south-east coast during winter and autumn.	Breeding in Australian territory is limited to Macquarie Island and occurs during spring and summer.	1	No – unsuitable habitat	No
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 – unsuitable habitat	No
Melanodryas cucullata cucullata	Hooded Robin (south-eastern form)	V	-	Found throughout much of inland NSW, with the exception of the extreme north-west, where it is replaced by subspecies picata.	Open eucalypt woodland, acacia scrub and mallee, often in or near clearings or open areas.	-	No – unsuitable habitat	No
Meridolum maryae	Maroubra Woodland Snail	E	E	Narrow band of habitat along the coast from the north-eastern corner of the Royal National Park to Palm Beach in Sydney	Found in the leaf litter of coastal vegetation communities, most commonly in heathland on foredunes	-	No – unsuitable habitat	No
Micronomus norfolkensis	Eastern Coastal Free-tailed Bat	V	-	Found along the east coast from south Queensland to southern NSW.	Occur in dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range.	2	Unlikely – habitat marginal and minimal records of species within 5 km	No
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,**	**296**	**Potential – habitat is marginal (foraging habitat, but no hollows) and species**	**Yes**

Scientific Name	Common Name	BC Act / FM Act Status	EPBC Act Status	Distribution	Habitat	Number of Records within 5km	Likelihood of Occurrence	Impact Assessment Required
					dense coastal forests and banksia scrub.		known to occur within 5 km	
Miniopterus orianae oceanensis	Large Bent-winged Bat	V	-	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.	3271	Potential – habitat is marginal (foraging habitat, but no hollows or suitable cavities) and species known to occur within 5 km	Yes
Mixophyes balbus	Stuttering Frog	E1	V	Along the east coast of Australia from southern Qld to north-eastern Victoria.	Rainforest and wet, tall open forest in the foothills and escarpment on the eastern side of the Great Dividing Range.	-	No – unsuitable habitat	No
Mobula alfredi	Reef Manta Ray	-	M	Coast of Australia	Marine	-	No – unsuitable habitat	No
Mobula birostris	Giant Manta Ray	-	M	Coast of Australia	Marine	-	No – unsuitable habitat	No
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 – habitat marginal but no records of species within 5 km	No
Motacilla flava	Yellow Wagtail	-	M	Regular summer migrant to mostly coastal Australia. In NSW recorded Sydney to Newcastle, the Hawkesbury	Swamp margins, sewage ponds, saltmarshes, playing fields, airfields, ploughed land, lawns.	-	No – unsuitable habitat	No

Scientific Name	Common Name	BC Act / FM Act Status	EPBC Act Status	Distribution	Habitat	Number of Records within 5km	Likelihood of Occurrence	Impact Assessment Required
				and inland in the Bogan LGA.				
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 – habitat marginal but no records of species within 5 km	No
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.**	**21**	**Potential – habitat is marginal (foraging habitat (waterbody), but no hollows) and species known to occur within 5 km**	**Yes**
Neophema chrysostoma	Blue-winged Parrot	V	V, Mar	breed on mainland Australia south of the Great Dividing Range. In non-breeding period can reach SE NSW.	Inhabit a range of habitats from coastal, sub-coastal and inland areas, through to semi-arid zones. They tend to favour grasslands and grassy woodlands and are often found near wetlands both near the coast and in semi-arid zones	-	Unlikely – habitat marginal but no records of species within 5 km	No
Ninox connivens	Barking Owl	V	-	Wide but sparse distribution in NSW, avoiding the most central arid regions. Core populations exist on the western slopes and plains and in some northeast coastal and escarpment forests.	Woodland and open forest, including fragmented remnants and partly cleared farmland, wetland and riverine forest.	2	Unlikely – habitat marginal but minimal records of species within 5 km	No
Ninox strenua	**Powerful Owl**	**V**	**-**	**In NSW, it is widely distributed throughout the**	**Woodland, open sclerophyll forest, tall**	**517**	**Potential – foraging habitat is marginal**	**Yes**

Scientific Name	Common Name	BC Act / FM Act Status	EPBC Act Status	Distribution	Habitat	Number of Records within 5km	Likelihood of Occurrence	Impact Assessment Required
				eastern forests from the coast inland to tablelands, with scattered records on the western slopes and plains.	**open wet forest and rainforest.**		**(but no hollows) and species known to occur within 5 km**	
Notamacropus parma	Parma Wallaby	V	V	Now confined to the coast and ranges of central and northern NSW from the Gosford district to south of the Bruxner Highway between Tenterfield and Casino.	Preferred habitat is moist eucalypt forest with thick, shrubby understorey, often with nearby grassy areas, rainforest margins and occasionally drier eucalypt forest.	-	No – unsuitable habitat	No
Numenius madagascariensis	Eastern Curlew	-	CE, M	Summer migrant to Australia. Primarily coastal distribution in NSW, with some scattered inland records.	Estuaries, bays, harbours, inlets and coastal lagoons, intertidal mudflats or sandflats, ocean beaches, coral reefs, rock platforms, saltmarsh, mangroves, freshwater/brackish lakes, saltworks and sewage farms.	7	Unlikely – habitat marginal but minimal records of species within 5 km	No
Numenius phaeopus	Whimbrel	-	M	Winters along coastal areas worldwide, from South America and southern Africa to India, Australasia, and the Pacific islands	Marine.	2	No – unsuitable habitat.	No
Onychoprion fuscata	Sooty Tern	V		In NSW only known to breed at Lord Howe Island. Occasionally seen along coastal NSW, especially after cyclones.	Marine.	121	No – unsuitable habitat	No
Pandion cristatus	**Eastern Osprey**	**V**		**Common around the northern NSW coast, and uncommon to rare from**	**Rocky shorelines, islands, reefs, mouths of large rivers, lagoons and lakes.**	**47**	**Potential – habitat is marginal (foraging habitat (waterbody)**	**Yes**

Scientific Name	Common Name	BC Act / FM Act Status	EPBC Act Status	Distribution	Habitat	Number of Records within 5km	Likelihood of Occurrence	Impact Assessment Required
				coast further south. Some records from inland areas.			and species known to occur within 5 km	
Pandion haliaetus	Osprey	-	Mar, M	Broad range	Occur in littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands.	-	Unlikely – habitat marginal but minimal records of species within 5 km	No
Perameles nasuta	Long-nosed Bandicoot, North Head	E2	-	Restricted to North Head in the Manly Local Government Area.	Occupies a variety of habitats on North Head.	6029	No – unsuitable habitat, outside range	No
Petauroides volans	Greater Glider population in the Eurobodalla local government area	E2	V	This population on the south coast of NSW is bounded by the Moruya River to the north, Coila Lake to the south and the Princes Highway and cleared land exceeding 700 m in width to the west.	Eucalypt forests and woodlands.	-	No – unsuitable habitat	No
Petaurus australis australis	Yellow-bellied Glider (south-eastern)	V	V	Found along the eastern coast to the western slopes of the Great Dividing Range, from southern Queensland to Victoria.	Occur in tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils.	-	No – unsuitable habitat	No
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.	-	No – unsuitable habitat	No
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	2	Unlikely – habitat marginal but minimal records of species within 5 km	No

Scientific Name	Common Name	BC Act / FM Act Status	EPBC Act Status	Distribution	Habitat	Number of Records within 5km	Likelihood of Occurrence	Impact Assessment Required
					forest, wetlands and tea-tree swamps.			
Petroica phoenicea	Flame Robin	V	-	Ranges from near the Queensland border to south east South Australia and also in Tasmania. In NSW, it breeds in upland areas and in winter, many birds move to the inland slopes and plains.	Breeds in upland tall moist eucalypt forests and woodlands, often on ridges and slopes. Prefers clearings or areas with open understoreys.	1	Unlikely – marginalhabitat (few Eucalypt species) and only 1 record from 5 km.	No
Phaethon lepturus	White-tailed Tropicbird	-	M	Uncommon south to Ballina January-April; casual visitor south to Batemans Bay, some well inland.	Marine.	2	No – unsuitable habitat	No
Phaethon rubricauda	Red-tailed tropicbird					2		
Phascolarctos cinereus	Koala	E	E	In New South Wales, koala populations are found on the central and north coasts, southern highlands, southern and northern tablelands, Blue Mountains, southern coastal forests, with some smaller populations on the plains west of the Great Dividing Range.	Inhabit eucalypt woodlands and forests.	6	No – unsuitable habitat	No
Philomachus pugnax	Ruff	-	M	Primarily in near-coastal wetlands	Marine.	2	No – unsuitable habitat	No
Physeter macrocephalus	Sperm Whale	V	M	Recorded off the NSW coast.	Marine.	1	No – unsuitable habitat	No
Pluvialis fulva	Pacific Golden Plover	-	M	Migrates south for the non-breeding season, primarily	Marine.	5	No – unsuitable habitat	No

Scientific Name	Common Name	BC Act / FM Act Status	EPBC Act Status	Distribution	Habitat	Number of Records within 5km	Likelihood of Occurrence	Impact Assessment Required
				wintering in Australia, New Zealand, South and Southeast Asia, and Pacific Islands.				
Pluvialis squatarola	**Grey Plover**	**-**	**M**	**Regular summer migrant to coastal Australia, including NSW. Rarely inland, on passage.**	**Mudflats, saltmarsh, tidal reefs and estuaries.**	**6**	**Potential – habitat is marginal (foraging habitat (waterbody) and species known to occur within 5 km**	**Yes**
Prototroctes maraena	Australian Grayling	E	V	South-eastern Australia, including Victoria, Tasmania and New South Wales. Rare fish are likely in South Australia. In NSW its most northern limit is now the Clyde River.	Migrate out to sea for first 4 – 6 months before migrating back to freshwater.	-	No – nearest modelled distribution is south of Wollongong	No
Pseudomys novaehollandiae	New Holland Mouse	-	V	Fragmented distribution across eastern NSW.	Open heathlands, woodlands and forests with a heathland understorey, vegetated sand dunes.	-	No – unsuitable habitat	No
Pseudophryne australis	Red-crowned Toadlet	V		Confined to the Sydney Basin, from Pokolbin in the north, the Nowra area to the south, and west to Mt Victoria in the Blue Mountains.	Open forests, mostly on Hawkesbury and Narrabeen Sandstones. Inhabits periodically wet drainage lines below sandstone ridges that often have shale lenses or cappings.	469	Unlikely – unsuitable habitat (degraded vegetation and *Gambusia* sp. observed)	No
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.	15	No – unsuitable habitat	No

Scientific Name	Common Name	BC Act / FM Act Status	EPBC Act Status	Distribution	Habitat	Number of Records within 5km	Likelihood of Occurrence	Impact Assessment Required
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 – unsuitable habitat	No
Pterodroma solandri	Providence Petrel	V	-	Ranges across eastern Pacific. Only known breeding sites are at Lord Howe Island and Philip Island, offshore from Norfolk Island.	Marine.	13	No – unsuitable habitat	No
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.	116,169	Potential – habitat is marginal (occasional eucalypt tree) and species known to occur within 5 km	No – Myrtaceae trees lacking from canopy layer, and not impacted by proposal.
Ptilinopus regina	Rose-crowned Fruit-Dove	V	-	In NSW, found on coast and ranges north from Newcastle. Vagrants are occasionally found further south to Victoria.	Sub-tropical and dry rainforest, moist eucalypt forest and swamp forest, where fruit is plentiful.	4	No – unsuitable habitat	No
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.	3	No – unsuitable habitat	No
Pycnoptilus floccosus	Pilotbird	-	V	Upland Pilotbirds occur above 600 m in the Brindabella Ranges in the Australian Capital Territory,	Strictly terrestrial, living on the ground in dense forests with heavy undergrowth	-	No – unsuitable habitat	No

Scientific Name	Common Name	BC Act / FM Act Status	EPBC Act Status	Distribution	Habitat	Number of Records within 5km	Likelihood of Occurrence	Impact Assessment Required
				and in the Snowy Mountains in New South Wales and north-east Victoria. Lowland Pilotbirds occur in forests from the Blue Mountains west of Newcastle, around the wetter forests of eastern Australia, to Dandenong near Melbourne				
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.	-	No – unsuitable habitat	No
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.	-	Unlikely – habitat marginal but no records of species within 5 km	No
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	V	-	There are scattered records of this species across the New England Tablelands and North West Slopes. Rare visitor in late summer and autumn to south-western NSW.	Almost all habitats, including wet and dry sclerophyll forest, open woodland, open country, mallee, rainforests, heathland and waterbodies.	31	Unlikely – habitat marginal but minimal records of species within 5 km	No
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	Woodland, moist and dry eucalypt forest and rainforest.	1	Unlikely – habitat marginal but minimal records of species within 5 km	No

Scientific Name	Common Name	BC Act / FM Act Status	EPBC Act Status	Distribution	Habitat	Number of Records within 5km	Likelihood of Occurrence	Impact Assessment Required
				widespread on the New England Tablelands.				
Stagonopleura guttata	Diamond Firetail	V	-	Widely distributed in NSW, mainly recorded in the Northern, Central and Southern Tablelands, the Northern, Central and South Western Slopes and the North West Plains and Riverina, and less commonly found in coastal areas and further inland.	Grassy eucalypt woodlands, open forest, mallee, Natural Temperate Grassland, secondary derived grassland, riparian areas and lightly wooded farmland.	-	Unlikely – habitat marginal but no records of species within 5 km	No
Stercorarius longicaudus	Long-tailed Jaeger	-	M	Winters in the Southern Hemisphere's offshore waters, including those off Australia's coast	Marine.	85	No – unsuitable habitat	No
Stercorarius parasiticus	Arctic Jaeger	-	M	Summer migrant to Australian waters October/November to April, including NSW.	Marine.	62	No – unsuitable habitat	No
Stercorarius pomarinus	Pomarine Jaeger	-	M	Uncommon summer migrant to Australian waters October/November to April/May; most records near shelf break off eastern NSW.	Marine.	20	No – unsuitable habitat	No
Sterna hirundo	Common Tern	-	M	Regular summer migrant to northern and eastern coastal Australia, including coastal NSW. Also scattered inland records.	Offshore waters, ocean beaches, estuaries, large lakes. Less commonly freshwater swamps, floodwaters, sewage farms and brackish and saline lakes.	69	Unlikely – habitat marginal but minimal records of species within 5 km	No

Scientific Name	Common Name	BC Act / FM Act Status	EPBC Act Status	Distribution	Habitat	Number of Records within 5km	Likelihood of Occurrence	Impact Assessment Required
Sternula albifrons	Little Tern	E1	M	In NSW, it arrives from September to November, occurring mainly north of Sydney, with smaller numbers found south to Victoria.	Sheltered coastal environments, harbours, inlets and rivers.	-	Unlikely – habitat marginal but no records of species within 5 km	No
Sula dactylatra	Masked Booby	V	-	Widely distributed through the tropical and subtropical seas of the world. The breeding population on Lord Howe Island is the most southerly breeding colony in the world.	Marine	1	No – unsuitable habitat	No
Sula leucogaster	Brown Booby	-	M	Tropical and subtropical oceans, including the Atlantic, Pacific, and Indian Oceans.	Marine	4	No – unsuitable habitat	No
Symposiachrus trivirgatus	Spectacled Monarch	-	M	Coastal eastern Australia south to Port Stephens in NSW.	Mountain/lowland rainforest, wooded gullies, riparian vegetation including mangroves.	-	Unlikely – habitat marginal but no records of species within 5 km	No
Thalassarche bulleri	Buller's Albatross	-	V, Mar	Non-breeding visitor to Australian waters. Foraging birds are mostly limited to the Pacific Ocean and the Tasman Sea, although birds do reach the east coast of the Australian mainland	Marine, pelagic species.	5	No – no suitable habitat	No
Thalassarche carteri	Indian Yellow-nosed Albatross	-	V, Mar	Forages mostly in the southern Indian Ocean where it is particularly abundant off Western Australia	Marine bird, located in subtropical and warmer subantarctic waters	-	No – no suitable habitat	No

Scientific Name	Common Name	BC Act / FM Act Status	EPBC Act Status	Distribution	Habitat	Number of Records within 5km	Likelihood of Occurrence	Impact Assessment Required
Thalassarche cauta	Shy Albatross	V	V	Occurs along the east coast south from Stradbroke Island and across the south coast to Carnarvon in WA. It is commonly recorded off southeast NSW, though rarely north of Sydney.	Marine.	56	No – no suitable habitat	No
Thalassarche melanophris	Black-browed Albatross	V	V	Regularly recorded off the NSW coast during May-November.	Marine.	486	No – no suitable habitat	No
Thalassarche steadi	White-capped Albatross	-	V, Mar, M	Breeding colonies of the White-capped Albatross occur on a number of separate islands. common off the coast of south-east Australia throughout the year	Marine species and occurs in subantarctic and subtropical waters.	-	No – no suitable habitat	No
Thalasseus bergii	**Greater Crested Tern**	**-**	**Mar, M**	**Breeds in subtropical coastal parts of the world mainly from the Red Sea across the Indian Ocean to the western Pacific, and Australia. Outside breeding season ranges north African coast (both Mediterranean and Atlantic), Indian Ocean nearby continents, and in western Pacific north of Australia to New Guinea and Vietnam.**	**Inhabits tropical and subtropical sandy and coral coasts and estuaries**	**965**	**Potential – habitat is marginal (occasional eucalypt tree) and species known to occur within 5 km**	**Yes**
Tringa brevipes	Grey-tailed Tattler	-	M	Most common along the northern, north-western, and eastern coasts, with less frequent occurrences on the	Marine	6	No – no suitable habitat	No

Scientific Name	Common Name	BC Act / FM Act Status	EPBC Act Status	Distribution	Habitat	Number of Records within 5km	Likelihood of Occurrence	Impact Assessment Required
				south coast and in Tasmania.				
Tringa incana	Wandering Tattler	-	M	During the non-breeding season, it migrates to rocky Pacific coasts and islands, including Australia.	Marine, coastal	2	Unlikely – limited suitable habitat and few records from 5 km	No
Tringa nebularia	Common Greenshank	-	M	Summer migrant to Australia. Recorded in most coastal regions of NSW; also widespread west of the Great Dividing Range, especially between the Lachlan and Murray Rivers and the Darling River drainage basin, including the Macquarie Marshes, and north-west regions.	Terrestrial wetlands (swamps, lakes, dams, rivers, creeks, billabongs, waterholes and inundated floodplains, claypans, saltflats, sewage farms and saltworks dams, inundated rice crops and bores) and sheltered coastal habitats (mudflats, saltmarsh, mangroves, embayments, harbours, river estuaries, deltas, lagoons, tidal pools, rock-flats and rock platforms).	1	Unlikely – habitat marginal but minimal records of species within 5 km	No
Tringa stagnatilis	Marsh Sandpiper	-	M	Migrates to wintering grounds in sub-Saharan Africa, the Middle East, the Indian subcontinent, Southeast Asia, and Australia.	Favors freshwater and brackish wetland habitats, including lagoons, swamps, sewage farms, and coastal areas.	3	Potential – lagoon habitat present however few known records from 5 km	No – no direct impacts to Lagoon habitat
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.	3	No – no suitable habitat	No

Scientific Name	Common Name	BC Act / FM Act Status	EPBC Act Status	Distribution	Habitat	Number of Records within 5km	Likelihood of Occurrence	Impact Assessment Required
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.	1	No – no suitable habitat	No
Varanus rosenbergi	Rosenberg's Goanna	V	-	In NSW, found on the Sydney Sandstone in Wollemi National Park, in the Goulburn and ACT regions and near Cooma in the south. Also recorded from the South West Slopes near Khancoban and Tooma River.	Heath, open forest and woodland.	18	No – no suitable habitat (degraded vegetation and fragmented)	No
Vespadelus troughtoni	Eastern Cave Bat	V	-	Found in a broad band on both sides of the Great Dividing Range south to Kempsey, with records from the New England Tablelands and the upper north coast of NSW. The western limit appears to be the Warrumbungle Range, and there is a single record from southern NSW, east of the ACT.	Dry open forest and woodland, near cliffs or rocky overhangs, cliff-lines in wet eucalypt forest and rainforest.	3	No – no suitable habitat	No

KEY: (BC/FM ACT) E = ENDANGERED E2 = ENDANGERED POPULATION E4 = PRESUMED EXTINCT E4A = CRITICALLY ENDANGERED SPECIES V = VULNERABLE
(EPBC ACT) CD = CONSERVATION DEPENDENT CE = CRITICALLY ENDANGERED E = ENDANGERED M = MARINE V = VULNERABLE X = EXTINCT XW = EXTINCT IN THE WILD

Table 32: Likelihood of occurrence assessment for threatened flora species

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution	Habitat	No.records within 5 km	Likelihood of Occurrence	Impact Assessment Required
Acacia bynoeana	Bynoe's Wattle	E1	V	Found in central eastern NSW, from the Hunter District (Morisset) south to the Southern Highlands and west to the Blue Mountains.	Heath or dry sclerophyll forest on sandy soils.	8	No – no suitable habitat	No
Acacia terminalis subsp. *Eastern Sydney* (G.P. Phillips 126)	Sunshine Wattle	E	E	Very limited distribution, mainly in near-coastal areas from the northern shores of Sydney Harbour south to Botany Bay, with most records from the Port Jackson area and the eastern suburbs of Sydney.	Coastal scrub and dry sclerophyll woodland on sandy soils .	741	No – no suitable habitat	No
Allocasuarina portuensis	Nielsen Park She-oak	E1	E	There are no naturally-occurring plants left at the original site (Nielsen Park, Sydney); however, the species has been planted successfully at a number of locations including Nielsen Park, Gap Bluff, Hermit Point and Vaucluse House.	The original habitat is tall closed woodland, above a sandstone shelf approximately 20 m above the harbour. Soils are shallow and sandy; plantings have occurred on similar soils.	4	No – no suitable habitat	No
Asterolasia elegans	-	E1	E	Occurs north of Sydney, in the Baulkham Hills, Hawkesbury and Hornsby local government areas. Also likely to occur in the western part of Gosford local government area.	Hawkesbury sandstone. Found in sheltered forests on mid- to lower slopes and valleys.	-	No – no suitable habitat	No
Caladenia tessellata	Thick Lip Spider Orchid	E1	V	Currently known from two disjunct areas; one population near Braidwood on the Southern Tablelands and three populations in the Wyong area on the Central Coast.	Grassy sclerophyll woodland on clay loam or sandy soils, or low woodland with stony soil.	-	No – no suitable habitat	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution	Habitat	No.records within 5 km	Likelihood of Occurrence	Impact Assessment Required
Callistemon linearifolius	Netted Bottle Brush	V	-	Georges River to Hawkesbury River in the Sydney area (limited to the Hornsby Plateau area), and north to the Nelson Bay area of NSW. Also Coalcliff in the northern Illawarra.	Dry sclerophyll forest.	6	No – no suitable habitat	No
Chamaesyce psammogeton	Sand Spurge	E1	-	Sparsely along the coast from south of Jervis Bay (at Currarong, Culburra and Seven Mile Beach National Park) to Qld (and Lord Howe Island).	Fore-dunes, pebbly strandlines and exposed headlands, often with *Spinifex sericeus* (Spinifex) and *Zoysia macrantha* (Prickly Couch).	-	No – no suitable habitat	No
Cryptostylis hunteriana	Leafless Tongue Orchid	V	V	In NSW, recorded mainly on coastal and near coastal ranges north from Victoria to near Forster, with two isolated occurrences inland north-west of Grafton.	Coastal heathlands, margins of coastal swamps and sedgelands, coastal forest, dry woodland, and lowland forest.	-	Unlikely – habitat marginal but no records of species within 5 km	No
Cynanchum elegans	White-flowered Wax Plant	E1	E	Restricted to eastern NSW, from Brunswick Heads on the north coast to Gerroa in the Illawarra region, and as far west as Merriwa in the upper Hunter River valley.	Dry rainforest; littoral rainforest; *Leptospermum laevigatum-Banksia integrifolia subsp. integrifolia* (Coastal Tea-tree– Coastal Banksia) coastal scrub; *Eucalyptus tereticornis* (Forest Red Gum) or *Corymbia maculata* (Spotted Gum) open forest and woodland; and *Melaleuca armillaris* (Bracelet Honeymyrtle) scrub.	-	No – no suitable habitat	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution	Habitat	No.records within 5 km	Likelihood of Occurrence	Impact Assessment Required
Darwinia biflora	-	V	V	Recorded in Ku-ring-gai, Hornsby, Baulkham Hills and Ryde local government areas, in an area bounded by Maroota, North Ryde, Cowan and Kellyville.	Woodland, open forest or scrub-heath on the edges of weathered shale-capped ridges, where these intergrade with Hawkesbury Sandstone.	1	No – no suitable habitat	No
Epacris purpurascens var. *purpurascens*	-	V	-	Recorded from Gosford in the north, to Narrabeen in the east, Silverdale in the west and Avon Dam vicinity in the South.	Sclerophyll forest, scrubs and swamps. Most habitats have a strong shale soil influence.	2	No – no suitable habitat	No
Eucalyptus camfieldii	Camfield's Stringybark	V	V	Narrow band from the Raymond Terrace area south to Waterfall.	Coastal heath on shallow sandy soils overlying Hawkesbury sandstone, mostly on exposed sandy ridges.	104	No – no suitable habitat	No
Eucalyptus nicholii	Narrow-leaved Black Peppermint	V	V	New England Tablelands from Nundle to north of Tenterfield.	Dry grassy woodland, on shallow soils of slopes and ridges.	9	No – no suitable habitat	No
Eucalyptus scoparia	Wallangarra White Gum	E	V	In NSW it is known from only three locations near Tenterfield, including Bald Rock National Park.	Open eucalypt forest, woodland and heaths on well-drained granite/rhyolite hilltops, slopes and rocky outcrops, typically at high altitudes.	5	No – no suitable habitat	No
Euphorbia psammogeton	Sand spurge	E	-	Found sparsely along the coast from south of Jervis Bay to Queensland (and Lord Howe Island). Populations have been recorded in Wamberal Lagoon	Grows on fore-dunes, pebbly strandlines and exposed headlands, often with	3	No – no suitable habitat	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution	Habitat	No.records within 5 km	Likelihood of Occurrence	Impact Assessment Required
				Nature Reserve, Myall Lakes National Park, Moonee Beach Nature Reserve and Bundjalung National Park.	Spinifex (Spinifex sericeus) and Prickly Couch (Zoysia macrantha)			
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.	-	No – no suitable habitat	No
Grevillea caleyi	Caley's Grevillea	E4A	E	Restricted to an 8 km square area around Terrey Hills, approximately 20 km north of Sydney.	Open forest, generally dominated by *Eucalyptus sieberi* and *E. gummifera* on a ridgetop, in association with laterite soils.	1	No – no suitable habitat	No
Haloragodendron lucasii	-	E1	E	Confined to a very narrow distribution on the north shore of Sydney.	Dry sclerophyll forest and low open woodland on sheltered slopes near creeks, in moist sandy loam soils.	-	No – no suitable habitat	No
Hibbertia superans	-	E1	-	From Baulkham Hills to South Maroota in the northern outskirts of Sydney, and at one locality at Mount Boss, inland from Kempsey.	Open woodland and heathland, and appears to prefer open disturbed areas.	1	No – no suitable habitat	No
Kunzea rupestris	-	V	V	Mostly in the Maroota - Sackville - Glenorie area and one outlier in Ku-ring-gai Chase National Park.	Shrubland or heathland, in shallow depressions on large flat sandstone rock outcrops.	-	No – no suitable habitat	No
Lasiopetalum joyceae	-	V	V	Restricted to the Hornsby Plateau south of the Hawkesbury River, between Berrilee and Duffys Forest.	Heath on lateritic to shaley ridgetops over sandstone.	-	No – no suitable habitat	No
Leptospermum deanei	-	V	V	Hornsby, Warringah, Ku-ring-gai and Ryde LGAs in the Sydney region.	Woodland, riparian scrub and open	-	Unlikely – habitat	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution	Habitat	No.records within 5 km	Likelihood of Occurrence	Impact Assessment Required
					forest on lower hill slopes or near creeks, on sand or sandy alluvial soil.		marginal but no records of species within 5 km and out of range	
Leucopogon exolasius	Woronora Beard-heath	V	V	Upper Georges River area and in Heathcote National Park.	Woodland on sandstone.	-	No – no suitable habitat	No
Macadamia integrifolia	Macadamia Nut	P	V	Not known to occur naturally in the wild in NSW; recorded from Camden Haven but it is not known if the tree was cultivated or growing naturally.	Drier subtropical rainforest.	3	No – no suitable habitat	No
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.	1	Unlikely – habitat marginal but minimal records of species within 5 km and seen observed during survey	No
Melaleuca deanei	Deane's Paperbark	V	V	Ku-ring-gai/Berowra area, Holsworthy/Wedderburn area, Springwood (in the Blue Mountains), Wollemi National Park, Yalwal (west of Nowra) and Central Coast (Hawkesbury River) areas.	Heath on sandstone.	-	No – no suitable habitat	No
Microtis angusii	Angus's Onion Orchid	E1	E	Currently known from only one site at Ingleside, north of Sydney.	Ingleside location is highly disturbed and dominated by the introduced weeds Coolatai grass (*Hyparrhenia hirta)* and *Acacia saligna.* The area is likely to	1	Unlikely – outside range	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution	Habitat	No.records within 5 km	Likelihood of Occurrence	Impact Assessment Required
					have originally supported the Duffys Forest Vegetation Community, which ranges from open forest to low open forest and woodland.			
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 – habitat marginal but no records of species within 5 km	No
Persoonia hirsuta	Hairy Geebung	E1	E	Scattered distribution around Sydney, from Singleton in the north, along the east coast to Bargo in the south and the Blue Mountains to the west.	Sandy soils in dry sclerophyll open forest, woodland and heath on sandstone.	3	No – no suitable habitat	No
Pimelea curviflora var. curviflora	-	V	V	Confined to the coastal area of the Sydney and Illawarra regions between northern Sydney and Maroota in the north-west and Croom Reserve near Albion Park in the south.	Woodland, mostly on shaley/lateritic soils over sandstone and shale/sandstone transition soils on ridgetops and upper slopes.	57	No – no suitable habitat	No
Prostanthera densa	Villous Mint-bush	V	V	Currarong area in Jervis Bay, Royal National Park, Cronulla, Garie Beach and Port Stephens (Gan Gan Hill, Nelson Bay).	Sclerophyll forest and shrubland on coastal headlands and near-coastal ranges, chiefly on sandstone.	-	No – no suitable habitat	No
Prostanthera junonis	Somersby Mintbush	E1	E	Restricted to the Somersby Plateau in the Gosford and Wyong local government areas.	Open forest, low woodland and open scrub on gently	-	No – no suitable	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution	Habitat	No.records within 5 km	Likelihood of Occurrence	Impact Assessment Required
					undulating country over weathered Hawkesbury sandstone.		habitat and outside range	
Prostanthera marifolia	Seaforth Mintbush	E4A	CE	Only known from the northern Sydney suburb of Seaforth.	In or in close proximity to the endangered Duffys Forest ecological community, on deeply weathered clay-loam soils associated with ironstone and scattered shale lenses.	882	No – no suitable habitat and outside range	No
Rhodamnia rubescens	Scrub Turpentine, Brown Malletwood	CE	CE	Occurs in coastal districts north from Batemans Bay in New South Wales, approximately 280 km south of Sydney, to areas inland of Bundaberg in Queensland.	Found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest usually on volcanic and sedimentary soils.	1	No – no suitable habitat	No
Rhodomyrtus psidioides	Native Guava	CE	CE	Occurs from Broken Bay, approximately 90 km north of Sydney, New South Wales, to Maryborough in Queensland.	Pioneer species found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest often near creeks and drainage lines.	-	Unlikely – habitat marginal but no records of species within 5 km and out of range	No
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.	-	No – no suitable habitat	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution	Habitat	No.records within 5 km	Likelihood of Occurrence	Impact Assessment Required
Senecio spathulatus	Coast groundsel	E	-	Occurs in Nadgee Nature Reserve (Cape Howe) and between Kurnell in Sydney and Myall Lakes National Park (with a possible occurrence at Cudmirrah).	Grows on frontal dunes.	1	No – no suitable habitat	No
Syzygium paniculatum	Magenta Lilly Pilly	E1	V	Only in NSW, in a narrow, linear coastal strip from Upper Lansdowne to Conjola State Forest.	Subtropical and littoral rainforest on gravels, sands, silts and clays.	29	No – no suitable habitat	No
Tetratheca glandulosa	-	V	-	Found from Sampons Pass (Yengo NP) in the north to West Pymble (Lane Cove NP) in the south. The eastern limit is at Ingleside (Pittwater LGA) and the western limit is at East Kurrajong (Wollemi NP).	Heath, scrub, woodlands and open forest on upper-slopes and mid-slope sandstone benches. Soils generally shallow, consisting of a yellow, clayey/sandy loam.	879	No – no suitable habitat	No
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.	-	No – no suitable habitat	No

KEY: (BC ACT) E = ENDANGERED E2 = ENDANGERED POPULATION E4 = PRESUMED EXTINCT E4A = CRITICALLY ENDANGERED SPECIES V = VULNERABLE
(EPBC ACT) CD = CONSERVATION DEPENDENT CE = CRITICALLY ENDANGERED E = ENDANGERED V = VULNERABLE X = EXTINCT XW = EXTINCT IN THE WILD

A3 Assessment of Significance (BC Act)

The 'Assessment of Significance' (5-part test) is applied to species, populations and ecological communities listed on Schedules 1 and 2 of the BC Act and Schedules 4, 4A and 5 of the FM Act. The assessment sets out 5 factors, which when considered, allow proponents to undertake a qualitative analysis of the likely impacts of an action and to determine whether a significant impact is likely. All factors must be considered, and an overall conclusion made based on all factors in combination.

Threatened species, populations and ecological communities to be assessed (BC Act), which have potential to occur within the study area or may be indirectly impacted are:

THREATENED ECOLOGICAL COMMUNITIES:

- *Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions* – listed as Endangered (BC Act).

BIRDS:

- *Calyptorhynchus lathami lathami* (South-eastern Glossy Black-Cockatoo) – Vulnerable
- *Haematopus fuliginosus* (Sooty Oystercatcher) – Vulnerable
- *Haematopus longirostris* (Pied Oystercatcher) – Endangered
- *Haliaeetus leucogaster* (White-bellied Sea-Eagle) – Vulnerable
- *Ixobrychus flavicollis* (Black Bittern) – Vulnerable
- *Ninox strenua* (Powerful Owl) – Vulnerable
- *Pandion cristatus* (Eastern Osprey) – Vulnerable

MICROBATS:

- *Chalinolobus dwyeri* (Large-eared Pied Bat) – Vulnerable
- *Miniopterus australis* (Little Bentwing-bat) – Vulnerable
- *Miniopterus orianae oceanensis* (Large Bent-winged Bat) – Vulnerable
- *Myotis Macropus* (Southern Myotis) – Vulnerable

A3.1. **Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions**

Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions is listed as an endangered ecological community (BC Act). This community is found on the coastal floodplains of NSW. It has a tree layer dominated by *Casuarina glauca* (swamp oak), a mid-layer of sparse shrubs and ground layer of forbs, sedges, grasses and leaf litter (DCCEEW 2025d).

Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions in poor condition was recorded in the impact area. The total area of this community to be removed as a result of the proposed works is approximately 0.043 ha.

Table 33: Test of Significance – Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions

BC Act	Question	Response
7.3.1 a)	In the case of a threatened species: whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction	Not applicable. *Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions* is not a threatened species.
7.3.1 b) i	In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: 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	The proposed works will remove approximately 0.043 ha of *Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions* in poor condition. The patches are small in extent and there is similar vegetation along Manly Creek. The proposed works are unlikely to adversely impact the extent of the ecological community such that it is placed at risk of extinction.
7.3.1 b) ii	In the case of an endangered ecological community or critically endangered ecological community: Whether the proposed development or activity 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.	The proposed works will remove approximately 0.043 ha of this community in poor condition, with a dominant *Casuarina glauca* (Swamp Oak) canopy, minimal mid-storey and a ground cover consisting of a mixture of exotic and native species. The proposed works will not cause loss of species unique to a patch or the community within the locality, nor will it modify the species composition of the ecological community given its degraded structure, dominance of exotic species and minimal native midstorey.
7.3.1 c) i	In relation to the habitat of a threatened species or ecological community: The extent to which habitat is likely to be removed or modified as a result of the proposed development or activity	The proposed works will remove 0.043 ha of *Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions* habitat in poor condition.
7.3.1 c) ii	In relation to the habitat of a threatened species or ecological community: Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity	The proposed works will remove 0.043 ha of *Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions* in poor condition. The study area is largely bordered by housing and recreational areas. The patches to be removed are small area and will not create substandtial fragmentation or isolation of remaining vegetation.
7.3.1 c) iii	In relation to the habitat of a threatened species or ecological community: 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 proposed works will remove 0.043 ha of *Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions* in poor condition. The patches to be removed are small areas with similar vegetation to be retained within the study area and outside the study area along Manly Creek. The patch to be removed is in poor condition and low mid-storey cover and a weedy ground storey. This habitat is not considered important for long term survival of this ecological community due to its small size and similar surrounding vegetation (determined through a desktop assessment).
7.3.1 d)	Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).	The proposed works will not have an adverse effect on any declared area of outstanding biodiversity value.
7.3.1 e)	Whether the proposed development or activity is or is part of a key threatening process or is likely	There is one key threatening process (KTP) relevant to the Project:

BC Act	Question	Response
	to increase the impact of a key threatening process.	• Clearing of native vegetation Although the proposed works will result in the clearing of native vegetation, the patches to be removed are small in extent, and there is similar vegetation to be retained within the study area, as well as outside the study area along Manly Creek.
Conclusion	Is there likely to be a significant impact?	The proposed works are considered unlikely to have a significant impact upon Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions given the following: • the proposed works will remove 0.043 ha of Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions in poor condition • no hollows will be removed • the proposed works will not significantly fragment or isolate areas of the community within the study area as the patches to be removed are small As such, a significant impact is unlikely with respect to Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions.

A3.2. Fauna – Birds

The following bird species have habitat that may be affected by the Project, as such require a BC Act Test of Significance:

- *Calyptorhynchus lathami lathami* (South-eastern Glossy Black-Cockatoo) – Vulnerable
- *Haematopus fuliginosus* (Sooty Oystercatcher) – Vulnerable
- *Haematopus longirostris* (Pied Oystercatcher) – Endangered
- *Haliaeetus leucogaster* (White-bellied Sea-Eagle) – Vulnerable
- *Ixobrychus flavicollis* (Black Bittern) – Vulnerable
- *Ninox strenua* (Powerful Owl) – Vulnerable
- *Pandion cristatus* (Eastern Osprey) – Vulnerable

The proposed works include the removal of approximately 0.043 ha of foraging habitat for the above birds. There were no hollows identified in the impact area.

Table 34: Test of Significance – Birds

BC Act	Question	Response
7.3.1 a)	In the case of a threatened species: whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction	These bird species may use trees or water within the impact area for foraging. Viable local populations of these species are likely to use resources from a much larger area than the study area due to their mobile nature and large home ranges. There are no hollows within the impact area, so there is no breeding habitat for the Powerful Owl or South-Eastern Glossy Black Cockatoo. Pied Oystercatchers breed on

BC Act	Question	Response
		offshore islands and Pied Oystercatchers breed on beaches, So there is no breeding habitat within the impact area for these species. The lack of tall emergent eucalypts and lack of dead crowns, make this vegetation unsuitable breeding habitat for the White-bellied Sea Eagle and Eastern Osprey. However, the Black Bittern may form nests on branches overhanging the water. The suitability of the habitat for nesting is considered marginal, given it's a small area with clearing and fragmentation in surrounding landscape. Also, there is similar vegetation along Manly Creek. Therefore, the proposed works are unlikely to affect their life cycles to the extent that would place the local populations at risk of extinction.
7.3.1 b) i	In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: 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	Not applicable.
7.3.1 b) ii	In the case of an endangered ecological community or critically endangered ecological community: Whether the proposed development or activity 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.	Not applicable.
7.3.1 c) i	In relation to the habitat of a threatened species or ecological community: The extent to which habitat is likely to be removed or modified as a result of the proposed development or activity	Impacts relate to potential foraging and nesting habitat, and, in the case of the Black Bittern, potential roosting habitat. The proposed works will remove approximately 0.043 ha of potential habitat.
7.3.1 c) ii	In relation to the habitat of a threatened species or ecological community: Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity	The proposed works will not fragment or isolate areas of habitat for such mobile species given the small scale of the proposed works and similar vegetation surrounding the study area in in the vicinity. These species can utilise remaining vegetation surrounding the study area for this purpose.
7.3.1 c) iii	In relation to the habitat of a threatened species or ecological community: 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 habitat to be removed is not considered important to the long-term survival of these species given the degraded nature (providing marginal foraging and breeding habitat) and that there is similar vegetation in the broader locality. These species are highly mobile, which means they can access the habitat in surrounding vegetation and utilise a range of resources.
7.3.1 d)	Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).	The proposed works will not have an adverse effect on any declared area of outstanding biodiversity value.
7.3.1 e)	Whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.	There is one key threatening process (KTP) relevant to the proposed works and these species: • Clearing of native vegetation

BC Act	Question	Response
		Although the proposed works will result in the clearing of native vegetation, the patches to be removed are small in extent, and there are larger patches of similar vegetation surrounding the study area.
Conclusion	Is there likely to be a significant impact?	No. A significant impact is not likely to occur as a result of the Project because: ● The habitat for nesting is considered marginal and the area to be directly impacted is only 0.043 ha ● There are stretches of potential foraging and breeding habitat that form continuous areas of habitat throughout the locality along Manly Creek These species are highly mobile, which means they can access the habitat in surrounding vegetation

A3.3. Fauna – Microbats

The following microbat species may be affected by the proposed works and require a BC Act Tests of Significance:

- *Chalinolobus dwyeri* (Large-eared Pied Bat) – Vulnerable (BC Act)
- *Miniopterus australis* (Little Bentwing-bat) – Vulnerable (BC Act)
- *Miniopterus orianae oceanensis* (Large Bent-winged Bat) – Vulnerable (BC Act)
- *Myotis Macropus* (Southern Myotis) – Vulnerable (BC Act)

The proposed works include the removal of approximately 0.043 ha of foraging habitat, as well as impact upon potential roosting under the bridge. There were no hollow-bearing trees within the impact area.

Table 35: Test of Significance – Microbats

BC Act	Question	Response
7.3.1 a)	In the case of a threatened species: whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction	The extent of the local population is assessed as those individuals which may reside within a 5 km radius of the study area. The proposed works will result in impacts to 0.043 ha of potential foraging habitat for these microbats. Roosting habitat (gaps under the bridge) was identified. There were no hollows within the impact area. These microbats are highly mobile and several species may only utilise habitat within the study area on an occasional basis for foraging and dispersal. Due to their mobility, foraging habitat is unlikely to become isolated / fragmented from breeding habitat. Considering the significant area of potential foraging habitat to be available in adjacent lands (determined through a desktop assessment), the proposed works are unlikely to have an adverse effect on the lifecycle of the above listed microbats such that a viable local population would be placed at risk of extinction.
7.3.1 b) i	In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:	Not applicable.

BC Act	Question	Response
	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	
7.3.1 b) ii	In the case of an endangered ecological community or critically endangered ecological community: Whether the proposed development or activity 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.	Not applicable.
7.3.1 c) i	In relation to the habitat of a threatened species or ecological community: The extent to which habitat is likely to be removed or modified as a result of the proposed development or activity	The proposed works will result in the removal of up to 0.043 ha of potential foraging habitat for the above listed microbats, and roosting habitat impacted under the bridge.
7.3.1 c) ii	In relation to the habitat of a threatened species or ecological community: Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity	The area of habitat to be removed is 0.043 ha of potential foraging habitat for these microbats and potential roosting habitat in the form of gaps under the bridge may be impacted. The assessed microbat species are highly mobile, and utilise a range of foraging resources throughout their foraging range. For any species present within the locality, there is potential foraging habitat present along Manly Creek. Removal of the vegetation within the impact area would not fragment foraging resources in the locality due to the microbats' high mobility. Roosting habitat within the impact area is minimal (gaps under the bridge). However, as the bridge will not be removed, this roosting habitat would be retained and only impacted short-term.
7.3.1 c) iii	In relation to the habitat of a threatened species or ecological community: 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 habitat to be removed is likely to be used as an occasional foraging resource across a larger foraging and home range. The assessed microbat species would utilise a range of foraging resources within the locality. Considering the small size of potential habitat (0.043 ha) to be impacted within the study area and the high mobility of the species, the habitat to be removed is not considered critical to the long-term survival of these species within the locality.
7.3.1 d)	Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).	The proposed works will not have an adverse effect on any declared area of outstanding biodiversity value.
7.3.1 e)	Whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.	There are two key threatening process (KTP) relevant to the proposed works and these species: ● Clearing of native vegetation Although the proposed works will result in the clearing of native vegetation, the patches to be removed are small in extent, and there are areas of similar habitat and trees with surrounding the study area and along Manly Creek.
Conclusion	Is there likely to be a significant impact?	No, a significant impact is not likely because: ● These microbats are highly mobile and several species may only utilise habitat within the study

BC Act	Question	Response
		area on an occasional basis for foraging and dispersal ● The roosting habitat within the impact area is minimal and will be retained There is a significant area of potential foraging habitat available in adjacent lands

A4 Assessment of Significance (EPBC Act)

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 MNES' is defined as a controlled action, and requires approval from the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW), which is responsible for administering the EPBC Act.

The process includes undertaking an Assessment of Significance (AoS) for listed threatened species and ecological communities that represent a matter of MNES that will be affected as a result of the proposed action. Significant impact guidelines that outline several criteria have been developed by the Commonwealth of Australia (2013), to provide assistance in conducting the AoS and help decide whether or not a referral to the Commonwealth is required.

The following MNES has been assessed as a part of this assessment:

- *Calidris acuminata* (Sharp-tailed Sandpiper) – Migratory
- *Hirundapus caudacutus* (White-throated Needletail) – Migratory
- *Hydroprogne caspia* (Caspian Tern) – Migratory
- *Limosa lapponica* (Bar-tailed Godwit) – Migratory
- *Pluvialis squatarola* (Grey Plover) – Migratory
- *Thalasseus bergii* (Greater Crested Tern) – Marine and Migratory
- *Calyptorhynchus lathami lathami* (South-eastern Glossy Black-Cockatoo) – Vulnerable

A4.1. Migratory Birds

Assessments of significance have been undertaken for the following birds that are listed as migratory (EPBC Act) and have been previously recorded within a 5 km radius of the action area:

- *Calidris acuminata* (Sharp-tailed Sandpiper)
- *Hirundapus caudacutus* (White-throated Needletail)
- Hydroprogne caspia (Caspian Tern)
- *Limosa lapponica* (Bar-tailed Godwit)
- Pluvialis squatarola (Grey Plover)
- *Thalasseus bergii* (Greater Crested Tern)

The proposed works include the removal of 0.043 ha of foraging habitat for these species.

Table 36: EPBC Act Assessment for Migratory Birds

Criterion	Assessment
An action is likely to have a significant impact on a migratory species if there is a real chance or possibility that it will:	
Criterion a: substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species	The proposed action would remove 0.043 ha of potential foraging habitat for the above migratory birds, which would be used on an occasional basis, and as part of a range of foraging resources throughout the species range. Habitat within and around the action area has been significantly modified over time, which means that the vegetation within the action area is not likely to be a primary foraging habitat. The proposed action would remove a small area of foraging habitat, but is unlikely to substantially modify, destroy or isolate an area of important habitat.
Criterion b: result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species	Due to the small area of native vegetation to be removed (0.043 ha), the proposed action is unlikely to result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species
Criterion c: seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.	The proposed action would not remove breeding habitat for these species. Foraging and roosting behaviour may be impacted but only to a small extent which would not disrupt the breeding cycle of the species because these species are highly mobile and use a range of resources throughout their foraging range. There is other potential foraging and roosting habitat available in the vicinity of the action area.
Conclusion	The proposed action is unlikely to have a significant impact on these migratory birds for the following reasons: ● The proposed action would not remove breeding habitat for the species. ● The potential foraging and roosting habitat to be removed is only 0.043 ha ● The species are highly mobile and could continue to forage and roost within the action area and beyond.

A4.2. *Calyptorhynchus lathami lathami* (South-eastern Glossy Black-Cockatoo)

Calyptorhynchus lathami lathami (South-eastern Glossy Black-Cockatoo) is listed as Vulnerable (EPBC Act). This species was not recorded during survey, however marginal foraging habitat was identified within the action area (*Casuarina glauca*). The South-eastern Glossy Black-Cockatoo is known to feed on *Casuarina glauca* during limited times of the year and to a lower extent compared to other sheoak species (DCCEEW, 2022).

No breeding habitat would be affected, as there were no hollows within the action area. Considering that this species may intermittently forage within the development site, the significant impact criteria has been applied in accordance with Significant Impact Guidelines (Table 37).

Table 37: *Calyptorhynchus lathami lathami* (South-eastern Glossy Black-Cockatoo)

Criterion	Assessment
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	
Criterion a: 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* (CoA, 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 proposed action would remove 0.043 ha marginal foraging habitat for South-eastern Glossy Black-Cockatoo. The species is highly mobile and would be able to access similar foraging habitat adjacent to the action area. Breeding habitat would not be impacted as there were no hollows within the action area. Therefore, it is unlikely that the action would lead to a long-term decrease in the size of an important population.
Criterion b: reduce the area of occupancy of an important population	The proposed action would reduce the area of potential foraging habitat available for the South-eastern Glossy Black-Cockatoo within the action area by 0.043 ha. This would reduce the area of occupancy of the species. The South-eastern Glossy Black-Cockatoo not use the action area for breeding, and therefore the proposed action will not reduce the area of breeding habitat available.
Criterion c: fragment an existing important population into two or more populations	There is potential that the South-eastern Glossy Black-Cockatoo population could occasionally forage within the action area. There will be an impact (0.043 ha) to foraging habitat for this population. However, the proposed action is unlikely to fragment this population into two or more populations as the South-eastern Glossy Black-Cockatoo is a highly mobile species and would therefore have the ability to forage within adjacent vegetated areas (not field validated). The removal of 0.043 ha of vegetation which comprises marginal foraging habitat is unlikely to significantly remove foraging habitat to the extent that it would impede foraging for this species and fragment this important population into two or more populations.
Criterion d: adversely affect habitat critical to the survival of a species	'Habitat critical to the survival of a species or ecological community' refers to areas that are necessary: • for activities such as foraging, breeding, roosting, or dispersal • for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators) • to maintain genetic diversity and long-term evolutionary development, or • for the reintroduction of populations or recovery of the species or ecological community. The proposed action will remove 0.043 ha of marginal foraging habitat for the South-eastern Glossy Black-Cockatoo. However, given that this species is highly mobile, and the abundant habitat resources within the locality it is considered unlikely that the development would adversely affect habitat critical to the survival of this species.

Criterion	Assessment
Criterion e: disrupt the breeding cycle of an important population	The proposed action would not remove breeding habitat for this species. Foraging behaviour may be impacted but only to a small extent which would not disrupt the breeding cycle of the species because the species is highly mobile and uses a range of resources throughout its foraging range. There is other potential foraging and roosting habitat available in the vicinity of the action area.
Criterion f: modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The proposed action would remove 0.043 ha of potential foraging and roosting habitat for the South-eastern Glossy Black-Cockatoo, which would be used on an occasional basis, and as part of a range of foraging and roosting resources throughout the species range. Habitat within and around the action area has been significantly modified over time, which means that the vegetation within the action area is not likely to be a primary foraging habitat. The proposed action would remove a small area of foraging and roosting habitat but is unlikely to cause this species to decline.
Criterion g: result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	The proposed action is unlikely to result in the establishment of an invasive species that is harmful to the South-eastern Glossy Black-Cockatoo, due to the small scale of the proposed action (i.e., removal of 0.043 ha of native vegetation).
Criterion h: introduce disease that may cause the species to decline	The proposed action is unlikely to introduce disease that may cause the South-eastern Glossy Black-Cockatoo to decline.
Criterion i: interfere substantially with the recovery of the species	The proposed action would remove 0.043 ha marginal foraging habitat. However, similar habitat is available for the highly mobile species within the adjoining land. Due to the highly mobile nature of this species, the proposed action is unlikely to fragment the population. Therefore, the proposed action is unlikely to interfere with the recovery of the species.
Conclusion	The proposed action is unlikely to have a significant impact on the South-eastern Glossy Black-Cockatoo for the following reasons: ● The proposed action would not remove breeding habitat for the species. ● The potential marginal foraging and roosting habitat to be removed is only 0.043 ha ● *Casuarina glauca* are only known as feed trees during limited times of the year and to a lower extent compared to other sheoak species (DCCEEW 2022) ● This species is highly mobile and could continue to forage and roost within the action area and beyond.

Appendix B AHIMS Search Results

AHIMS Web Services (AWS)
Search Result

Your Ref/PO Number : 23SYD6892 Update
Client Service ID : 1025005

Eco Logical Australia Pty Ltd - Sydney - Individual users

Date: 18 July 2025

PO Box 12 668 Old Princes Hwy
Sutherland New South Wales 1499

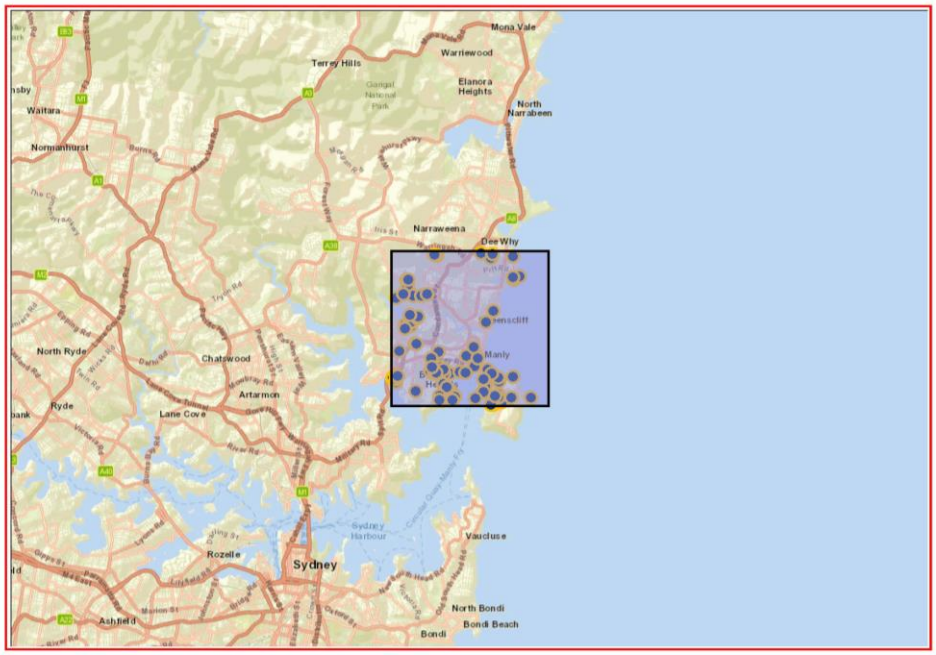
Attention: Kate Storan

Email: kate.storan@ecoaus.com.au

Dear Sir or Madam:

AHIMS Web Service search for the following area at Datum :GDA, Zone : 56, Eastings : 337845.0 - 343845.0, Northings : 6257486.0 - 6263486.0 with a Buffer of 0 meters, conducted by Kate Storan on 18 July 2025.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of Heritage NSW AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

105	**Aboriginal sites are recorded in or near the above location.**
1	**Aboriginal places have been declared in or near the above location. ***

ID	Aboriginal Place Name
79	Reef Beach Resting Place

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 23SYD6892 Update
Client Service ID : 1025005

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
45-6-0729	Spring Cove;North Head;	AGD	56	341942	6257399	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	**Recorders**	Eugene Stockton					**Permits**		
45-6-1756	QP2 duplicate of 45-6-0696	GDA	56	342525	6262434	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	
	Contact	**Recorders**	Doctor.Jo McDonald,Mr.Phil Hunt					**Permits**		
45-6-0008	Manly	AGD	56	340627	6259202	Open site	Not a Site	Art (Pigment or Engraved) : -	Not an Aboriginal Site	
	Contact	**Recorders**	Mr.Bob Conroy					**Permits**		
45-6-2851	NH 3	AGD	56	342055	6257430	Open site	Not a Site	Habitation Structure : 1		
	Contact	**Recorders**	Mr.Phil Hunt					**Permits**		
45-6-2889	Wellings Reserve 2	GDA	56	339634	6258680	Open site	Valid	Shell : 1		
	Contact	**Recorders**	Aboriginal Heritage Office					**Permits**		
45-6-3497	Manly Dam Contact Art	GDA	56	338332	6260585	Open site	Valid	Art (Pigment or Engraved) : 5		
	Contact	**Recorders**	Ms.Lorien Perchard					**Permits**		
45-6-1023	Balgowlah;Fallen Forwards Cave;	GDA	56	337904	6258470	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	
	Contact	**Recorders**	Mr.R Taplin					**Permits**		
45-6-3034	Wellings Reserve #1 MAN 079	GDA	56	339584	6258630	Closed site	Valid	Shell : -		
	Contact	**Recorders**	Aboriginal Heritage Office					**Permits**		
45-6-0725	Manly.	GDA	56	341484	6258350	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	
	Contact	**Recorders**	Michael Guider,Fred McCarthy					**Permits**		
45-6-0730	Manly;North Point;	AGD	56	342396	6257591	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	**Recorders**	Eugene Stockton					**Permits**		
45-6-0676	Rock engravings Seaforth	GDA	56	337886	6258501	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	
	Contact	**Recorders**	ASRSYS,EMM Consulting - Individual users,Ms.Megan Sheppard Brennand					**Permits**		
45-6-1024	Balgowlah;South End Cave;	GDA	56	338094	6258570	Closed site	Valid	Shell : -, Artefact : -, Art (Pigment or Engraved) : -	Shelter with Art,Shelter with Midden	2047
	Contact	**Recorders**	Mr.R Taplin					**Permits**		
45-6-1027	Balgowlah;Fishmans Bay 1;Fisher Bay 1;	GDA	56	337904	6258475	Open site	Valid	Shell : -, Artefact : -	Midden	
	Contact	**Recorders**	Val Attenbrow,Julie Stockton,Mr.R Taplin					**Permits**		
45-6-1434	Reef Beach;Balgowlah;	AGD	56	340100	6257700	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	
	Contact	**Recorders**	ASRSYS					**Permits**		
45-6-1220	Manly View Cave;North Harbour;Dobroyd;	AGD	56	340000	6257800	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	
	Contact	**Recorders**	ASRSYS					**Permits**		

Report generated by AHIMS Web Service on 18/07/2025 for Kate Storan for the following area at Datum :GDA, Zone : 56, Eastings : 337845.0 - 343845.0, Northings : 6257486.0 - 6263486.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 105

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 23SYD6892 Update
Client Service ID : 1025005

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
45-6-1233	Manly Dam; Manly Vale	GDA	56	338540	6260523	Closed site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	
	Contact	**Recorders**	ASRSYS,Sydney Water - Parramatta,Sydney Water - Parramatta,Ms.Yvonne Kaiser,I					**Permits**		
45-6-2493	North Head deposit	AGD	56	341630	6257490	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	
	Contact	**Recorders**	Kate Sullivan					**Permits**		
45-6-2088	Yellow Stencil Cave;	AGD	56	339990	6257850	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	1809
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-3498	Manly Dam 9 Grinding Grooves	GDA	56	338484	6260611	Open site	Valid	Grinding Groove : 9		
	Contact	**Recorders**	Ms.Lorien Perchard					**Permits**		
45-6-3986	Little Manly Beach Kiosk	GDA	56	341468	6257978	Open site	Valid	Potential Archaeological Deposit (PAD) : -		105074,105578
	Contact	**Recorders**	Ms.Tory Stening					**Permits**	4837	
45-6-3030	Jellicoe Street MAN 025	GDA	56	339889	6257855	Open site	Valid	Art (Pigment or Engraved) : 1		
	Contact	**Recorders**	Aboriginal Heritage Office					**Permits**		
45-6-3035	Wellings Reserve #5 MAN 085	GDA	56	339484	6258670	Closed site	Valid	Shell : -		
	Contact	**Recorders**	Aboriginal Heritage Office					**Permits**		
45-6-0727	Dee Why;	AGD	56	341507	6263089	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	
	Contact	**Recorders**	ASRSYS					**Permits**		
45-6-1028	Balgowlah;Fisher Bay 2;	AGD	56	337900	6258120	Open site	Valid	Shell : -, Artefact : -	Midden	
	Contact	**Recorders**	Julie Stockton,Mr.R Taplin					**Permits**		
45-6-1033	Manly;Flattened Lantana Cave;	AGD	56	340200	6257600	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	
	Contact	**Recorders**	ASRSYS					**Permits**		
45-6-0965	Balgowlah;200 FT Cave;	GDA	56	338734	6259820	Closed site	Destroyed	Art (Pigment or Engraved) : -	Shelter with Art	
	Contact	**Recorders**	Mr.R Taplin					**Permits**		
45-6-3363	BURNT BRIDGE CREEK PAD	GDA	56	338134	6259532	Open site	Valid	Potential Archaeological Deposit (PAD) : 1		
	Contact	**Recorders**	Mr.Andrew Costello,Jacobs Group (Australia) Pty Ltd - North Sydney					**Permits**		
45-6-4061	Royal Far West PAD Cloned	GDA	56	341564	6258864	Open site	Destroyed	Potential Archaeological Deposit (PAD) : -		105264,105739
	Contact	**Recorders**	Urbis Pty Ltd - Angel Place L8 123 Pitt Street,Urbis Pty Ltd - Angel Place L8 123 Pit					**Permits**	5086	

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Extensive search - Site list report

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
45-6-0703	North Harbour;Forty Baskets Beach 1;	GDA	56	339874	6258210	Closed site	Valid	Shell : -, Artefact : -, Art (Pigment or Engraved) : -, Burial : -	Burial/s,Rock Engraving,Shelter with Art,Shelter with Midden	
	Contact	**Recorders**	Unknown Author					**Permits**		
45-6-0706	Manly;Fairlight;	GDA	56	340104	6258690	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	
	Contact	**Recorders**	Unknown Author					**Permits**		
45-6-2505	Southern End 40;Baskets Beach;	AGD	56	339890	6257960	Open site	Valid	Shell : -, Artefact : -	Midden	
	Contact	**Recorders**	D Burns,G Wellham					**Permits**		
45-6-2091	Dobroyd Head;	AGD	56	339710	6257410	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	1809
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-1149	Clontare;	GDA	56	338804	6257980	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	
	Contact	**Recorders**	Aboriginal Heritage Office					**Permits**		
45-6-1162	Spring Cove;Hollow Cave;	AGD	56	341900	6257700	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-3036	Burtons Bush #1 MAN 083	GDA	56	339454	6258940	Open site	Valid	Shell : -		
	Contact	**Recorders**	Aboriginal Heritage Office					**Permits**		
45-6-0728	North Head;Spring Cove;	AGD	56	341926	6258222	Closed site	Valid	Artefact : -	Shelter with Deposit	
	Contact	**Recorders**	Eugene Stockton					**Permits**		
45-6-0964	Balgowlah	GDA	56	338804	6259840	Open site	Destroyed	Art (Pigment or Engraved) : -	Rock Engraving	
	Contact	**Recorders**	Mr.R Taplin					**Permits**		
45-6-0260	Balgowlah;North Harbour Reserve;	GDA	56	339354	6258770	Open site	Valid	Shell : -, Artefact : -	Midden	
	Contact	**Recorders**	Eugene Stockton					**Permits**		
45-6-1008	Balgowlah,	GDA	56	339864	6258841	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	
	Contact	**Recorders**	ASRSYS					**Permits**		
45-6-0261	Reef Beach 1	GDA	56	340223	6257831	Open site	Valid	Shell : -, Artefact : -, Burial : -	Burial/s,Midden	723,4537,9826 4,98975
	Contact	**Recorders**	Val Attenbrow,Mary Dallas Consulting Archaeologists (MDCA),M.J Walker,Eugene S					**Permits**	1924	
45-6-0710	Manly	GDA	56	340489	6258740	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	
	Contact	**Recorders**	Unknown Author					**Permits**		
45-6-1255	Allambie Heights;	AGD	56	338287	6261912	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	
	Contact	**Recorders**	ASRSYS					**Permits**		

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 23SYD6892 Update
Client Service ID : 1025005

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
45-6-2081	Cathedral Rock/Honeycomb cave	AGD	56	339800	6258480	Closed site	Partially Destroyed	Shell : -, Artefact : -	Shelter with Midden	1809
	Contact	**Recorders**	Michael Guider,Mr.Phil Hunt,Aboriginal Heritage Office					**Permits**	3140,3372	
45-6-2082	Fairlight cave;	AGD	56	339650	6258730	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	1809
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-2748	Restriction applied. Please contact ahims@environment.nsw.gov.au.					Open site	Valid			
	Contact	**Recorders**	Mr.Dean Kelly					**Permits**		
45-6-3048	Ronald Reserve Shelter WARR 194	GDA	56	341754	6261180	Closed site	Valid	Shell : -		
	Contact	**Recorders**	Aboriginal Heritage Office					**Permits**		
45-6-0721	Manly!	GDA	56	341014	6259750	Closed site	Valid	Artefact : -, Art (Pigment or Engraved) : -	Shelter with Art,Shelter with Deposit	
	Contact	**Recorders**	Unknown Author					**Permits**		
45-6-0904	Allambie Heights;	AGD	56	338268	6262167	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	
	Contact	**Recorders**	ASRSYS					**Permits**		
45-6-2975	CS1 (Brookvale)	GDA	56	339537	6263325	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Biosis Pty Ltd - Sydney,Ms.Samantha Higgs					**Permits**		
45-6-2083	Reef Beach Cave;	AGD	56	340110	6257710	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	1809
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-2085	Hydro Cave	GDA	56	338568	6260671	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	1809
	Contact	**Recorders**	Michael Guider,Sydney Water - Parramatta,Sydney Water - Parramatta,Ms.Yvonne					**Permits**		
45-6-2086	Dally Park cave;	AGD	56	340940	6258790	Closed site	Valid	Art (Pigment or Engraved) : -, Shell : -, Artefact : -	Shelter with Art,Shelter with Midden	1809
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-3167	MANLY WEST PUBLIC 1. MAN120	GDA	56	339645	6259523	Open site	Valid	Grinding Groove : -		
	Contact	**Recorders**	Mr.Phil Hunt					**Permits**		
45-6-2239	Kangaroo Lane;	AGD	56	341090	6259130	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-2372	Remnants in shelter;	AGD	56	337920	6258240	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	2047
	Contact	**Recorders**	Val Attenbrow					**Permits**		
45-6-0735	QP1;	AGD	56	342385	6262328	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	1263
	Contact	**Recorders**	Doctor.Jo McDonald					**Permits**		

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 23SYD6892 Update
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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
45-6-3038	Esplanade Park West MAN 108	GDA	56	339844	6258835	Open site	Valid	Shell : -		
	Contact	**Recorders**	Aboriginal Heritage Office					**Permits**		
45-6-0722	Manly;	AGD	56	341381	6258028	Closed site	Valid	Artefact : -	Shelter with Deposit	
	Contact	**Recorders**	Fred McCarthy					**Permits**		
45-6-0732	North Point;Manly;	AGD	56	343168	6257607	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	
	Contact	**Recorders**	W Walton					**Permits**		
45-6-1026	Balgowlah;Beds and Bottles Cave;	GDA	56	338074	6258530	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	
	Contact	**Recorders**	Aboriginal Heritage Office					**Permits**		
45-6-0881	Allambie Heights;	AGD	56	338315	6262166	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	
	Contact	**Recorders**	Charles.D Power					**Permits**		
45-6-2850	Collins Beach Obelisk	AGD	56	341820	6257570	Open site	Valid	Habitation Structure : 1		
	Contact S Scanlon	**Recorders**	Mr.Phil Hunt					**Permits**		
45-6-2973	Stuart Street	GDA	56	341409	6257995	Open site	Valid	Burial : -		105578
	Contact	**Recorders**	Miss.Cheryl Stanborough					**Permits**		
45-6-3147	Mermaid Pool (South)	GDA	56	338790	6260855	Closed site	Valid	Art (Pigment or Engraved) : -, Water Hole : -		
	Contact	**Recorders**	Sydney Water - Parramatta,Ms.Yvonne Kaiser					**Permits**		
45-6-3149	Mermaid Pool (North)	GDA	56	338831	6260908	Closed site	Valid	Water Hole : -, Art (Pigment or Engraved) : -, Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	Sydney Water - Parramatta,Ms.Yvonne Kaiser					**Permits**		
45-6-0263	North Head;Park Hill Reserve;	AGD	56	341900	6257580	Open site	Not a Site	Art (Pigment or Engraved) : -	Not an Aboriginal Site	
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-0689	Frenchs Forest;Allambie Road;	AGD	56	338536	6261528	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	
	Contact	**Recorders**	ASRSYS					**Permits**		
45-6-0693	Balgowlah; '	AGD	56	339258	6259084	Open site	Destroyed	Art (Pigment or Engraved) : -	Rock Engraving	
	Contact	**Recorders**	Unknown Author					**Permits**		
45-6-0705	Fourty Baskets Beach	AGD	56	339800	6257950	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	
	Contact	**Recorders**	Ms.Lisa Campbell					**Permits**		

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 23SYD6892 Update
Client Service ID : 1025005

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
45-6-0282	Balgowlah;Forty Basket Beach	AGD	56	339750	6258070	Open site	Valid	Shell : -, Artefact : -	Midden	2047
	Contact	**Recorders**	Val Attenbrow,A Conway					**Permits**		
45-6-1153	Cabbage Tree Bay;	GDA	56	342004	6258570	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	1447
	Contact	**Recorders**	Mr.R Taplin					**Permits**		
45-6-1351	Spring Cove;Perfect Hand Cave;	AGD	56	341700	6257300	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-2958	Undercliff Road RS and Midden	GDA	56	341465	6260726	Open site	Valid	Potential Archaeological Deposit (PAD) : -, Shell : -		
	Contact	**Recorders**	Doctor.Alan Williams					**Permits**		
45-6-3127	Manly Dam Art Shelter Art 1	GDA	56	338340	6260420	Open site	Valid	Art (Pigment or Engraved) : -		
	Contact	**Recorders**	Mr.Gareth Birch					**Permits**		
45-6-3080	WGC 1 WARR214	GDA	56	337975	6261610	Open site	Valid	Art (Pigment or Engraved) : 1, Grinding Groove : 1, Potential Archaeological Deposit (PAD) : 1		
	Contact	**Recorders**	Aboriginal Heritage Office					**Permits**		
45-6-4069	Stuart St 2; NBCS125	GDA	56	341442	6257979	Open site	Destroyed	Artefact : 1, Burial : 1, Non-Human Bone and Organic Material : 1, Shell : 1		105578
	Contact	**Recorders**	Mr.Phil Hunt,Aboriginal Heritage Office,Artefact Heritage and Environment - Pyrm					**Permits**	5347	
45-6-4146	Ashburner St Burial	GDA	56	341720	6258725	Open site	Valid	Burial : -		
	Contact	**Recorders**	Mr.Elliot Lindsay,Talking Walls Heritage Consultants					**Permits**		
45-6-4141	50-52 Monash Parade Dee Why	GDA	56	342478	6263354	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	Aboriginal Heritage Office,Ms.Susan Whitby					**Permits**		
45-6-2038	Reef Beach 3;	AGD	56	340200	6257590	Open site	Valid	Artefact : -, Shell : -	Midden,Open Camp Site	
	Contact	**Recorders**	Val Attenbrow					**Permits**		
45-6-1495	Lookout Site	AGD	56	339700	6257550	Closed site	Valid	Artefact : -	Shelter with Deposit	596,940
	Contact	**Recorders**	ASRSYS					**Permits**		
45-6-1032	Manly;	AGD	56	340112	6257455	Open site	Valid	Artefact : -, Shell : -	Midden	

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Extensive search - Site list report

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Client Service ID : 1025005

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
	Contact	Recorders	ASRSYS					Permits		
45-6-1034	North Harbour;	GDA	56	339994	6258150	Open site	Valid	Shell : -, Artefact : -	Midden	
	Contact	Recorders	Mr.R Taplin					Permits		
45-6-0887	Mosman;Dobroyd Recreation Reserve Lookout;	AGD	56	339600	6257600	Open site	Valid	Grinding Groove : -, Art (Pigment or Engraved) : -	Axe Grinding Groove,Rock Engraving	
	Contact	Recorders	Unknown Author					Permits		
45-6-1006	Manly;Balgowlah;	GDA	56	339519	6258690	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	
	Contact	Recorders	Mr.R Taplin					Permits		
45-6-3139	Monserra Engraving WARR350	GDA	56	338250	6261800	Open site	Valid	Art (Pigment or Engraved) : -		
	Contact	Recorders	Mr.Phil Hunt					Permits		
45-6-3140	Delmar Parade Engraving WARR191	GDA	56	341250	6263460	Open site	Valid	Art (Pigment or Engraved) : -		
	Contact	Recorders	Mr.Phil Hunt					Permits		
45-6-3148	Manly Dam 1	GDA	56	338518	6260973	Open site	Valid	Artefact : -		
	Contact	Recorders	Sydney Water - Parramatta,Ms.Yvonne Kaiser					Permits		
45-6-0699	Frenchs Forest;Flat Rocks;	AGD	56	338850	6261534	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	
	Contact	Recorders	Ms.Lisa Campbell					Permits		
45-6-1262	Spring Cove;Red Roos Cave;	AGD	56	341600	6257300	Closed site	Valid	Art (Pigment or Engraved) : -	Rock Engraving,Shelter with Art	
	Contact	Recorders	Michael Guider					Permits		
45-6-2090	East Esplanade Res;	AGD	56	341310	6258290	Open site	Valid	Burial : -	Burial/s	1809
	Contact	Recorders	Michael Guider					Permits		
45-6-2170	NCC Cave 2;	AGD	56	342388	6262326	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	
	Contact	Recorders	Michael Guider					Permits		
45-6-2177	Malinya Rd;	AGD	56	339052	6261610	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	
	Contact	Recorders	Michael Guider					Permits		
45-6-0731	Harboard;Dee Why Head;	AGD	56	342645	6262355	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	
	Contact	Recorders	Unknown Author					Permits		
45-6-2888	Wellings Reserve 4	GDA	56	339564	6258710	Open site	Valid	Shell : 1		
	Contact	Recorders	Aboriginal Heritage Office					Permits		
45-6-2890	Shelly Beach Midden	GDA	56	342574	6258595	Open site	Valid	Shell : -		
	Contact	Recorders	Mr.Phil Hunt					Permits		

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
45-6-2351	Fisher Bay 6	GDA	56	338025	6258625	Open site	Valid	Artefact : -	Open Camp Site	2333
	Contact	**Recorders**	Ms.Tessa Corkill,EMM Consulting - Individual users,Ms.Megan Sheppard Brennand					**Permits**	474	
45-6-3031	Peace Park, Addison MAN 076	GDA	56	341114	6257710	Closed site	Valid	Shell : -		
	Contact	**Recorders**	Aboriginal Heritage Office					**Permits**		
45-6-3037	Burtons Bush #2 MAN 084	GDA	56	339404	6258940	Open site	Valid	Shell : -		
	Contact	**Recorders**	Aboriginal Heritage Office					**Permits**		
45-6-3229	Derribong Shelter 1 WARR188	GDA	56	341670	6263435	Open site	Valid	Shell : 1		
	Contact	**Recorders**	Mr.Phil Hunt,Aboriginal Heritage Office					**Permits**		
45-6-1494	Lookout Site 2	AGD	56	339600	6257450	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	596,940
	Contact	**Recorders**	ASRSYS					**Permits**		
45-6-1025	Balgowlah;Nearly Joined Cave;	GDA	56	338089	6258555	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	
	Contact	**Recorders**	Aboriginal Heritage Office					**Permits**		
45-6-2849	Willemarrin Reserve	AGD	56	341760	6257650	Open site	Valid	Habitation Structure : 1, Earth Mound : 1		
	Contact S Scanlon	**Recorders**	Mr.Phil Hunt					**Permits**		
45-6-0700	Beacon Hill;Frenchs Forest;	AGD	56	339327	6263177	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	
	Contact	**Recorders**	Ms.Lisa Campbell					**Permits**		
45-6-2087	West Esplanade park;	AGD	56	340610	6258530	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	1809
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-2171	NCC Cave 1;	AGD	56	342384	6262330	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	
	Contact	**Recorders**	Michael Guider					**Permits**		

**** Site Status**
Valid - The site has been recorded and accepted onto the system as valid
Destroyed - The site has been completely impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There is nothing left of the site on the ground but proponents should proceed with caution.
Partially Destroyed - The site has been only partially impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There might be parts or sections of the original site still present on the ground
Not a site - The site has been originally entered and accepted onto AHIMS as a valid site but after further investigations it was decided it is NOT an aboriginal site. Impact of this type of site does not require permit but Heritage NSW should be notified

Report generated by AHIMS Web Service on 18/07/2025 for Kate Storan for the following area at Datum :GDA, Zone : 56, Eastings : 337845.0 - 343845.0, Northings : 6257486.0 - 6263486.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 105

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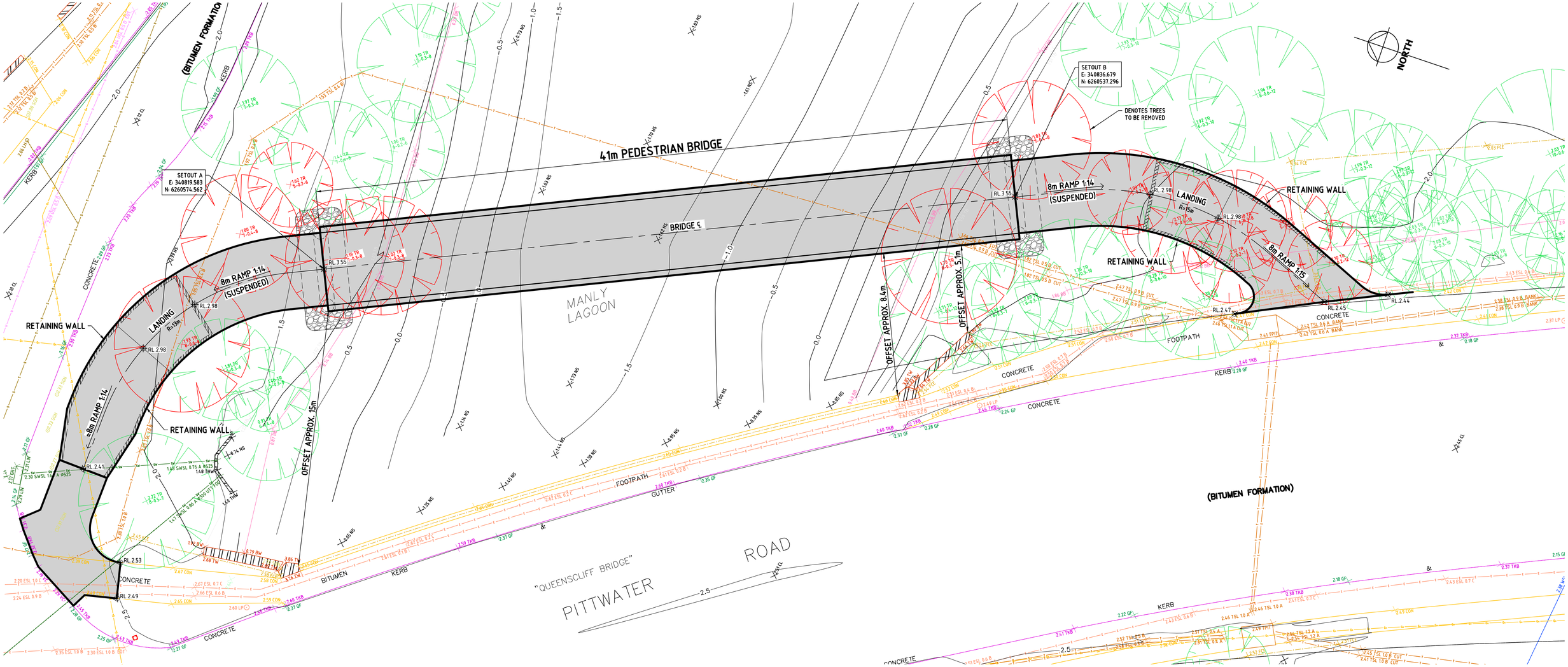
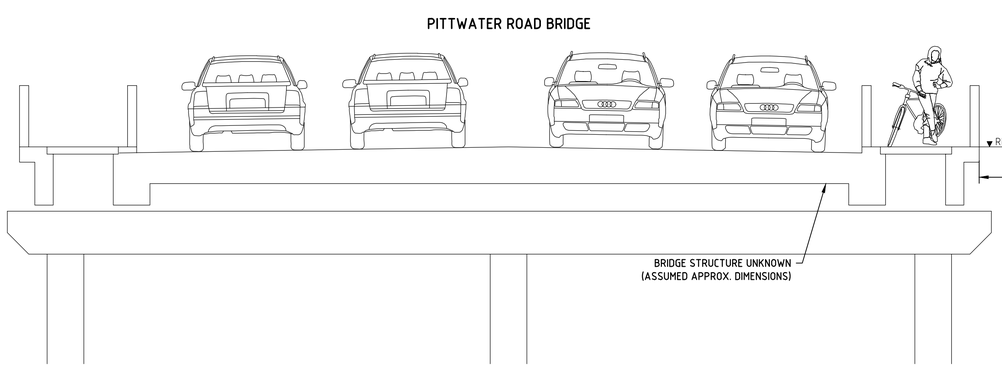
Appendix C Site Plans



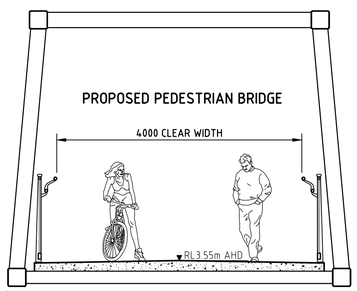
GENERAL ARRANGEMENT PLAN
N.T.S.

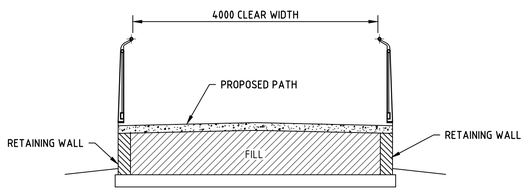


TYPICAL CROSS SECTION
N.T.S.

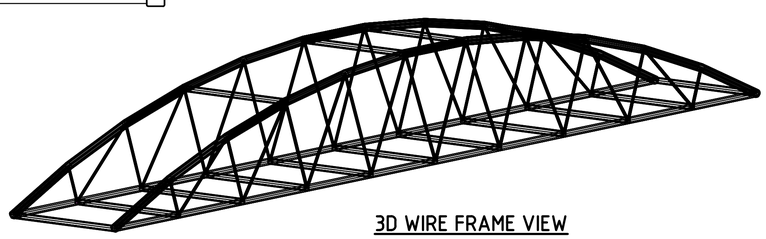
NOTE:
THE PROPOSED PEDESTRIAN BRIDGE DECK IS SET HIGHER THAN THE EXISTING ROAD BRIDGE TO MEET FLOODING REQUIREMENTS.

RL 3.14m AHD 1% AEP STORM + 5% AEP OCEAN EVENT FLOOD LEVEL





TYPICAL PATH SECTION AT RAMP
N.T.S.



3D WIRE FRAME VIEW
N.T.S.