

Appendix C

Flora and Fauna Management Sub-plan

Western Harbour Tunnel

May 2024

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Document control

Approval and authorisation

Approved on behalf of ACCIONA by	Andrew Marsonet
Signed	
Dated	9 December 2022

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Contents

Contents	ii
Glossary/ Abbreviations.....	v
1 Introduction	2
1.1 Context	2
1.2 Background and project description	2
1.3 Scope and staging	3
1.4 Interface with other planning documents	4
2 Purpose and objectives	6
2.1 Purpose	6
2.2 Objectives.....	6
2.3 Targets	7
3 Environmental requirements.....	8
3.1 Relevant legislation and guidelines	8
3.1.1 Legislation	8
3.1.2 Additional approvals, licences, permits and requirements.....	8
3.1.3 Guidelines	8
3.2 Minister's Conditions of Approval	9
3.3 Revised Environmental Management Measures	9
4 Consultation	26
4.1 Consultation for Plan Preparation	26
4.2 Ongoing consultation	26
5 Existing environment.....	27
5.1 Threatened ecological communities.....	27
5.2 Threatened or otherwise significant flora species.....	28
5.3 Terrestrial fauna habitat	29
5.4 Threatened fauna and endangered populations.....	30
5.5 Aquatic fauna.....	33
5.6 Groundwater dependent ecosystems.....	34
5.7 Wetlands and conservation areas.....	34
6 Environmental aspects and impacts	35
6.1 Construction activities	35
6.2 Ecological impacts arising from construction.....	35
6.2.1 Removal of vegetation.....	35
6.2.2 Invasion and spread of weeds, pathogens and disease.....	35

6.2.3	Removal of fauna habitat.....	36
6.2.4	Fauna injury and mortality	36
6.2.5	Noise and vibration.....	36
6.2.6	Loss of aquatic habitat and water quality impacts.....	36
6.2.7	Cumulative impacts	37
7	Environmental mitigation and management measures	38
7.1	Demolition inspections.....	38
7.2	Clearing Procedure	38
7.2.1	Initial pre-clearing inspection	38
7.2.2	Clearing Hold Point.....	39
7.2.3	Clearing Process	39
7.2.4	Salvage of Habitat Features	39
7.3	Unexpected Threatened Species Protocol	39
7.4	Fauna Handling	41
7.4.1	Fauna Handling during dewatering of waterbodies at WHT13	42
7.5	Biodiversity offsets.....	43
7.6	Replacement Planting.....	44
7.7	Landscape Strategy Report	44
7.8	Management and mitigation measures	44
8	Compliance management.....	53
8.1	Roles and responsibilities	53
8.2	Training	53
8.3	Monitoring and inspections	53
8.4	Auditing	54
8.5	Incidents and Non-compliances	54
8.6	Reporting.....	54
9	Review and improvement	55
9.1	Continuous improvement.....	55
9.2	Plan update and amendment.....	55
	Appendix C1 - Weed Management Protocol	56
1.	Purpose	58
2.	Scope	58
3.	Induction and training	58
4.	Weed management	58
4.1	Environmental weeds and Weeds of National Significance	59
5.	Pathogens	65
6.	Weed control	65
7.	Ongoing management and monitoring	66

Appendix C2 – WHT Surface Sites.....	67
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Appendix C3 – Fauna Relocation Procedure	68
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List of Figures

Figure 5-1 Field validated existing Plant Community Types at Emu Plains construction support site (WHT13)	28
Figure 5-2: Approximate location of the Grey-headed Flying-Fox camp in relation to the Emu Plains Construction Support Site (WHT13). (Source: MOD2 report Appendix M – BDAR)	32
Figure 5-3: Known GHFF camp (image provided by Penrith City Council).	33
Figure 7-1 Unexpected Finds Procedure from <i>Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA, 2011)</i>	41
Figure 7-2: Waterbodies within the Emu Plains (WHT13) site (Source: Figure 14 of the WHT MOD2 BDAR).	43

List of Tables

Table 1-1: Key interfaces with the FFMP	4
Table 2-1: Performance outcomes identified in the EIS relevant to this Plan.....	6
Table 3-1: Minister’s Conditions of Approval relevant to this Plan	10
Table 3-2: Revised environmental management measures relevant to FFMP.....	20
Table 5-1: Threatened or otherwise significant flora species.....	29
Table 5-2: Fauna habitat types.....	30
Table 5-3: Threatened fauna.....	30
Table 5-4: Fisheries habitat within the construction footprint	34
Table 7-1: Flora and fauna management and mitigation measures.....	45
Table 8-1: General monitoring requirements relating to flora and fauna	53

Glossary/ Abbreviations

Abbreviations	Expanded text
BC Act	<i>Biodiversity Conservation Act 2016</i>
BDAR	Biodiversity Development Assessment Report
CEMP	Construction Environmental Management Plan
CSSI	Critical State Significant Infrastructure
DPI	Department of Primary Industries
DPHI	NSW Department of Planning, Housing and Infrastructure (formerly Department of Planning and Environment)
EEC	Endangered ecological community
EESG	Environment, Energy and Science Group of the Department of Planning and Environment (former NSW Office of Environment and Heritage)
EIS	Environmental Impact Statement
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EPBC Act	<i>Environmental Protection and Biodiversity Conservation Act 1999</i>
ER	Environmental Representative
EWMS	Environmental Work Method Statement
FFMP	Flora and Fauna Management Sub-plan (this document)
FM Act	<i>Fisheries Management Act 1994</i>
MCoA	NSW Minister's Conditions of Approval
MOD2	Western Harbour Tunnel and Warringah Freeway Upgrade TBM solution of crossing Sydney Harbour – Modification 2
NPW Act	<i>National Parks and Wildlife Act 1974</i>
NW Act	<i>Noxious Weeds Act 1993</i>
Project, the	Western Harbour Tunnel project
Project Area	The area required to facilitate the construction of the Project (i.e. construction footprint)
REMM	Revised Environmental Management Measure

Abbreviations	Expanded text
Roads and Maritime	Former NSW Roads and Maritime Services, now Transport for NSW
RTA	Formerly the Roads & Traffic Authority
RtS	Response to Submissions Report
SMART	Specific, Measurable, Achievable, Relevant and Time-based
TEC	Threatened Ecological Communities
TfNSW	Transport for NSW
WHT	Western Harbour Tunnel (component of the Western Harbour Tunnel and Warringah Freeway Upgrade project)

1 Introduction

1.1 Context

This Flora and Fauna Management Sub-plan (FFMP or Plan) forms part of the Construction Environmental Management Plan (CEMP) for the Western Harbour Tunnel (WHT) (the Project), a component of the Western Harbour Tunnel and Warringah Freeway Upgrade project.

This FFMP has been prepared to address the flora and fauna requirements of the Minister's Conditions of Approval (MCoA) for the Western Harbour Tunnel and Warringah Freeway Upgrade project (SSI #8863), the Western Harbour Tunnel and Warringah Freeway Upgrade Environmental Impact Statement dated January 2020 (the EIS), the Western Harbour Tunnel and Warringah Freeway Upgrade Response to Submissions report dated September 2020 (the RtS), the Western Harbour Tunnel and Warringah Freeway Upgrade TBM solution of crossing Sydney Harbour – Modification 2 (MOD2) and applicable guidelines and legislation.

This Plan describes how ACCIONA propose to manage potential flora and fauna impacts during the construction of the Project.

1.2 Background and project description

The Western Harbour Tunnel and Warringah Freeway Upgrade project comprises a new motorway tunnel connection across Sydney Harbour, and an upgrade of the Warringah Freeway to integrate the new motorway infrastructure with the existing road network and to enable the future connection of the Beaches Link and Gore Hill Freeway Connection project.

The Project will connect the M4-M5 Link in Rozelle to the Warringah Freeway at North Sydney/Cammeray. The Project will traverse from Rozelle to Cammeray, primarily comprising twin 6.5-kilometre bored/excavated tunnels with a crossing of Sydney Harbour, supported by surface based ancillary facilities.

The EIS was prepared to assess the impacts of construction and operation of the Western Harbour Tunnel and Warringah Freeway Upgrade project. As part of the EIS development, a Biodiversity Development Assessment Report (BDAR) (Appendix S (*Technical working paper: Biodiversity Development Assessment Report*) of the EIS), and a marine ecology paper (Appendix T (*Technical working paper: Marine ecology*) of the EIS) were prepared to address biodiversity issues. The findings of the BDAR and marine ecology paper are summarised in Chapter 19 (Biodiversity) of the EIS.

A RtS report was prepared in response to submissions received on the EIS. The RtS includes clarifications as well as further detail relating to flora and fauna management issues of the Project. The EIS environmental management measures were revised and included in Part D of the RtS report.

The Western Harbour Tunnel and Warringah Freeway Upgrade project was declared to be Critical State Significant Infrastructure (CSSI) by the Minister for Planning and Public Spaces (the Minister) on 9 November 2020 and approved by the Minister on 21 January 2021.

The MOD2 application modifies the construction methodology across Sydney Harbour from an immersed tube tunnel (IMT) design with transition structures at both ends of the harbour crossing, to a tunnel boring machine (TBM) methodology and to include an additional construction support site at Emu Plains. MOD2 was lodged on 14 July 2023 and was approved by the Minister on 27 January 2024. The RtS environmental management measures were revised and included in Section 12 of the MOD2 report, with specific flora and fauna measures contained in this Plan.

The documents listed in the planning approval concluded that the construction phase of the Project will result in direct biodiversity impacts in the vicinity of construction works. The measures and management requirements to minimise impacts are detailed within this Plan.

1.3 Scope and staging

The scope of this Plan is to describe how ACCIONA will manage potential flora and fauna impacts during construction of the Project.

As described in Transport for New South Wales (TfNSW) Staging Report, this Project will be managed in stages with the CEMP. This document applies to the WHT Package 3B and 3C which includes the following scope:

Stage 3B – WHT Northern Tunnelling and Integration works

- Excavation of twin mainline tunnels about 2.5 kilometres long and each accommodating three lanes of traffic in each direction, connecting portals adjacent to the Cammeray Golf Course to the Harbour Crossing section of the tunnel at Berrys Bay.
- Excavation of Falcon Street off-ramp tunnel.
- Excavation of Berry Street on-ramp tunnel.
- Cut and cover infrastructure surface construction at the Ridge Street North construction support site (WHT9), Berry Street and the Warringah Freeway portals.
- Integration works including Mechanical and Electrical (M&E) fit out for the Southern and Northern tunnelling sections, paving, surface connections, ventilation cavern fitout, integration and fitout of the Motorway Operation Centre (MOC) and Motorway Control Centre (MCC)
- Establishment and operation of White Bay (WHT3) – southern portion, Ridge Street North (WHT9), and Cammeray Golf Course (WHT10) construction support sites. The northern portion of WHT3 (as described in the EIS) is no longer required.
- Operation of the City West Link Portal tunnelling support site (WHT12) after the completion of Stage 3A.
- Installation of acoustic structures.
- Utilities connections including but not limited to power, potable water, sewerage.
- Carrying out of surveys, test drilling, test excavations, geotechnical or contamination investigations or other tests or surveys, sampling or investigation

Stage 3C – WHT Sydney Harbour Crossing

- Excavation of about 1.8 km of twin mainline tunnels using Tunnel Boring Machine (TBM) methodology.
- Construction of launch chambers beneath Birchgrove, and receival chambers and burial beneath the Waverton Peninsula.
- Establishment and operation of an underground slurry treatment plant within an existing ventilation cavern (constructed by the Stage 3A contractor).
- Establishment and operation of an underground Water Treatment Plant.
- Establishment and operation of an underground grout batching plant.
- Access and egress via City West Link Portal (WHT12) for:
 - Spoil removal.
 - Materials and equipment delivery, including concrete tunnel segments and box culverts.

- Use of Ridge Street North (WHT9) as a tunnelling support site, including the construction of an acoustic shed.
- Construction and operation of an additional construction support site at Emu Plains (WHT13), primarily for the prefabrication and storage of tunnel lining segments, box culverts and other pre-cast concrete elements.

Requirements triggered by the 3B and 3C scope of works are identified in Table 3-1 and Table 3-2.

For more details on staging refer to the Staging Report, which has been prepared in accordance with MCoA A10.

1.4 Interface with other planning documents

This Plan is a component of a suite of documents, prepared as part of the implementation of the Project's Environmental Management System. The Environmental Management System overview is described in Section 4.1 of the CEMP.

The key documents that interface with this Plan are outlined in Table 1-1.

Table 1-1: Key interfaces with the FFMP

Plan	Interface
Construction Environmental Management Plan	▪ Provides details on overall Project staging, interactions between Sub-plans of the CEMP, and management of cumulative impacts ▪ Provides a framework for how the construction works will be managed ▪ Identifies procedures, processes and management systems that will apply in relation to construction activities ▪ Provides environmental planning and controls for construction including environmental risk assessment, regulatory requirements, protection measures and sustainability requirements
Soil and Water Management sub-plan	▪ Sets out how soil and surface water will be managed during construction of the Project ▪ Proper soil and water management will ensure that downstream aquatic and marine habitats are protected from erosion and sediment transport
Place, Design and Landscape Plan	▪ Includes the location of existing vegetation, areas of vegetation to be retained and proposed planting and seeding details, including the use of local indigenous species for revegetation activities
Community Communication Strategy and Complaints Management System	▪ Describes how community and stakeholder engagement will be managed and facilitates communication about construction of the project with the community as well as relevant councils and agencies ▪ Specifies the process for receiving, addressing, resolving and recording complaints as well as outlines the process required in the escalation of a complaint to an independent mediator

Plan	Interface
Microbat Monitoring Program	- Provides specific and adaptive mitigation and monitoring measures to address potential impacts to the Large Bent-winged Bat (<i>Miniopterus orianae oceanensis</i>) - Describes the offsetting process for the Large Bent-winged Bat in the event that impacts are deemed to be unacceptable
Landscape Strategy Report	- Details the type, size, number and location of replacement trees. The report will demonstrate how any replacement plantings are consistent with requirements of Condition E184 and Condition E185 - The LSR will be used to identify when and where new plantings will occur in order to return green area to the community and restore screening vegetation
Clearing & Grubbing Plan	The plan is prepared to identify the presence of weeds and unsound trees, and written notice on the limits of clearing and areas of weed infestation as identified in the ecologist report are marked out onsite.

2 Purpose and objectives

2.1 Purpose

The purpose of this Plan is to describe how ACCIONA will manage potential flora and fauna impacts during construction of the Project.

This Plan has been prepared to address the applicable statutory requirements and aims to ensure that the commitments in the planning approval are met with regard to impacts to flora and fauna.

2.2 Objectives

The objective of the FFMP is to ensure that all avoidance, mitigation and management measures relevant to the protection of flora and fauna including threatened species and endangered ecological communities (EECs) are properly implemented.

To achieve these objectives, ACCIONA will undertake the following:

- Ensure appropriate controls and procedures are implemented during construction activities to address potential flora and fauna impacts along the Project corridor, as well as manage risks from analysis of relevant construction activities as per MCoA C2(d)(ii)
- Ensure appropriate measures are implemented to address the relevant MCoA requirements outlined in Table 3-1 and the relevant mitigation measures detailed in the MOD2 report outlined in Table 3-2
- Implement relevant legislation and other requirements detailed in Section 3.1 of this FFMP.

Furthermore, ACCIONA will meet the performance outcomes from Table 28-4 of the EIS that are relevant to biodiversity impacts, as required by MCoA C2(d)(i), as identified in Table 2-1 below.

Table 2-1: Performance outcomes identified in the EIS relevant to this Plan

Performance outcome	How performance will be addressed	Records
The project design considers all feasible measures to avoid and minimise impacts on terrestrial and aquatic biodiversity. Offsets and/or supplementary measures are assured which are equivalent to any remaining impacts of project construction and operation.	Minimise impacts on biodiversity: • Implement the flora and fauna mitigation measures in Section 7	Environmental inspection records Sensitive Area Plans
	Where practicable, the design would minimise the need to clear vegetation • The reference design for the Project has sought to minimise the need to clear vegetation as much as practicable. • Further minimisation will be considered during detailed design for the project.	Sensitive Area Plans Detailed design

Performance outcome	How performance will be addressed	Records
	Potential impacts on biodiversity would be managed in accordance with relevant legislation, including the <i>Environmental Planning and Assessment Act 1979</i>, <i>Biodiversity Conservation Act 2016</i>, and the <i>Environment Protection and Biodiversity Conservation Act 1999</i> • This FFMP has been prepared in accordance with relevant legislation and guidelines where applicable. • List of relevant legislation is detailed in Section 3.1.1.	Compliance Tracking and Environmental Auditing

2.3 Targets

The following targets have been established for the management of flora and fauna impacts during the Project construction activities:

- Ensure full compliance with the relevant legislative requirements, MCoA and revised environmental management measures (REMMs).
- Ensure training is provided in the form of inductions to relevant Project personnel relating to flora and fauna issues before they begin work onsite
- Offsets are secured and/or supplementary measures implemented which are equivalent to any remaining impacts of project construction following the implementation of mitigation measures.
- Vegetation clearance will be minimised and be confined to the approved footprint for construction and associated access tracks and site compounds, as identified under the WHT CEMP and this plan.
- Weeds and pathogens will be controlled and managed in accordance with the Weed Management Protocol and relevant legislative requirements and guidelines.
- All fauna species encountered during construction are handled in accordance with relevant legislative requirements and industry standards per Section 7.4 of this plan.
- Potential pollution and siltation impacts will be managed in accordance with relevant legislative requirements and guidelines to protect aquatic and marine ecosystems, wetlands, endangered ecological communities or threatened species habitat that has not been assessed and approved as part of the EIS and MCoA.

3 Environmental requirements

3.1 Relevant legislation and guidelines

3.1.1 Legislation

Key legislation relevant to this Plan includes:

- *Environmental Planning & Assessment Act 1979* (NSW) (EP&A Act)
- *Biodiversity Conservation Act 2016* (NSW) (BC Act)
- *Fisheries Management Act 2016* (NSW) (FM Act)
- *Pesticides Act 1999* (NSW)
- *Biosecurity Act 2015* (NSW)
- *Biosecurity Act 2015* (Commonwealth)
- *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth) (EPBC Act).

Legislation relevant to this FFMP is included in Appendix A1 of the CEMP.

3.1.2 Additional approvals, licences, permits and requirements

Refer to Appendix A1 of the CEMP.

3.1.3 Guidelines

The main guidelines, specifications and policy documents relevant to this Plan include:

- Australian Standard 4373 – 2007 Pruning of Amenity Trees
- Australian Standard 4970 – 2009 Protection of Trees on Development Sites
- Department of Environment and Conservation (DEC): NSW Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities – Working Draft, 2004
- Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA, 2011)
- Fauna Management Guideline (Transport for NSW, 2015)
- Policy and Guidelines for Fish Habitat Conservation and Management – Update 2013 (DPI, 2013)
- DPI Risk Assessment Guidelines for Groundwater Dependent Ecosystems, 2012
- Roads and Maritime QA Specification G36–Environmental Protection (Management System)
- Roads and Maritime QA Specification G40 – Clearing and Grubbing.
- Vegetation Offset Guide (Transport for NSW, 2019)
- Weed Management and Disposal Guideline (Transport for NSW, 2019)
- Code of Practice for the Amenity Tree Industry (1998)

3.2 Minister's Conditions of Approval

The MCoA relevant to this Plan are listed in Table 3-1. A cross reference is also included to indicate where and how the conditions are addressed in this Plan or other Project management documents.

3.3 Revised Environmental Management Measures

Relevant revised environmental management measures (REMMs), as identified in Appendix B2 of the MOD2 report, are listed in Table 3-2 below. This includes reference to required outcomes, how the commitment applies, and where it has been addressed in the FFMP.

Table 3-1: Minister's Conditions of Approval relevant to this Plan

MCoA No.	Condition Requirements	Document Reference	How Addressed
General			
A5	Where the terms of this approval require a document or monitoring program to be prepared or a review to be undertaken in consultation with identified parties, evidence of the consultation undertaken must be submitted to the Planning Secretary with the document. The evidence must include: (a) documentation of the engagement with the party identified in the condition of approval that has occurred before submitting the document for approval; (b) a log of the dates of engagement or attempted engagement with the identified party; (c) documentation of the follow-up with the identified party where engagement has not occurred to confirm that they do not wish to engage or have not attempted to engage after repeated invitations; (d) outline of the issues raised by the identified party and how they have been addressed; and (e) a description of the outstanding issues raised by the identified party and the reasons why they have not been addressed.	Section 4	Evidence of consultation will be submitted to the Planning Secretary with this document.
Construction Environmental Management Plan			
C4	CEMP Sub-plans must be prepared in consultation with the relevant government agencies identified for each CEMP Sub-plan. Details of all information requested by an agency during consultation must be provided to the Planning Secretary as part of any submission of the relevant CEMP Sub-plan, including copies of all correspondence from those agencies as required by Condition A5.	Section 4	This FFMP has been prepared in consultation with the relevant agencies identified in this condition. Evidence of consultation will be submitted to the Planning Secretary with this document.

MCoA No.	Condition Requirements			Document Reference	How Addressed
		Required CEMP Sub-plan	Relevant government agencies to be consulted for each CEMP Sub-plan		
	(c)	Flora and fauna	DPI Fisheries, DPE Water, EESG, and relevant council(s)		
C5	The CEMP Sub-plans must state how:				
	(a) the environmental performance outcomes identified in the documents listed in Condition A1 will be achieved;			Section 2.2	This FFMP was prepared in accordance with the environmental performance outcomes identified in the EIS and MOD2 REMMs as outlined in Section 2.2.
	(b) the mitigation measures identified in the documents listed in Condition A1 will be implemented;			Table 3-2 Table 7-1	Relevant environmental management measures are detailed in Table 3-2 including where and how they are addressed in this Plan. Measures to achieve these requirements are detailed in Section 7 of this Plan.
	(c) the relevant terms of this approval will be complied with; and			Table 3-1	Details of how ACCIONA will comply with the relevant terms of approval are listed in this Table, including references to the relevant sections of this FFMP.

MCoA No.	Condition Requirements	Document Reference	How Addressed
	(d) issues requiring management during construction (including cumulative impacts), as identified through ongoing environmental risk analysis, will be managed through SMART principles.	Section 6 Table 7-1 Environmental Risk Assessment Workshop (Section 5.1 of the CEMP)	Flora and fauna issues requiring management during construction of the Project have been identified through the EIS, RtS, MOD2 and Environmental Risk Assessment Workshop. These issues, including cumulative impacts, have been outlined in Appendix A2 of the CEMP. Environmental risk analysis will be ongoing and regularly reviewed in accordance with Section 5.1 of the CEMP. Flora and fauna issues, including marine ecology and cumulative impacts, are detailed in Section 6 of this FFMP. Management measures identified in Table 7-1 of this FFMP have been developed with consideration of SMART principles.
C6	The Flora and Fauna Management CEMP Sub-Plan must include, but not be limited to: (a) details of the measures to minimise disturbance to marine vegetation and rocky reefs to the minimum extent necessary; (b) details of the measures to minimise disturbance to habitat associated with White's seahorse (<i>Hippocampus whitei</i>);	Section 7.2 Table 7-1 Noting that C6 (f) and (h) are not applicable to Stage 3B or	Details of management measures to minimise impacts to Large Bent-winged Bat (<i>Miniopterus orianae oceanensis</i>) roosting site at Waverton will be addressed in the Microbat Monitoring Program required under Condition E41.

MCoA No.	Condition Requirements	Document Reference	How Addressed
	(c) details of the measures to minimise disturbance to the Large Bent-winged Bat (<i>Miniopterus orianae oceanensis</i>) roosting site at Waverton, including the requirements of Condition E41; (d) details and measures to identify Little Penguins (<i>Eudyptula minor</i>) near maritime construction sites including employing qualified spotters, and the stop work procedure upon sighting of the species; (e) details for undertaking pre-clearing/demolition inspections for native fauna including threatened species by a suitably qualified ecologist, of any vegetation to be cleared and any buildings or structures identified as potential roosting habitat for microbats that are to be demolished or refurbished; methods and procedures for welfare and relocation of displaced fauna; and management/offset measures; and (f) details of a dewatering plan of the stormwater harvesting storage facility / dam at Cammeray Golf Course including: (i) a methodology of relocating native fauna species known to inhabit and/or use the dam; (ii) the location and suitability of the proposed relocation sites; and (iii) any potential impacts of relocating the fauna to the relocation sites; and (g) details of the measures to minimise disturbance to and monitor the Powerful Owl (<i>Ninox strenua</i>) in Lane Cove National Park during construction and operation of the proposed Wicks Road Construction Support Site (Mod 1), as described in Condition A1. The measures and monitoring requirements must be developed by an appropriately qualified ecologist with experience in Powerful Owl in consultation with BirdLife Australia, EHG and NPWS, and monitoring data shared with BirdLife Australia, EHG and NPWS and the Planning Secretary when requested.	Stage 3C works.	The Microbat Monitoring Program will be prepared to prior work that impacts microbats. Pre-clearing/demolition inspections for native fauna will be undertaken by a suitably qualified ecologist in accordance with the <i>Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (RTA, 2011). Noting that C6 (f) and (g) are not applicable to Stage 3B or Stage 3C works.C6 (a), (b), (c) and (d) were removed as part of the approval of MOD2.

MCoA No.	Condition Requirements	Document Reference	How Addressed						
C9	The CEMP Sub-plans must be submitted to the Planning Secretary for approval along with, or subsequent to, the submission of the CEMP but in any event, no later than one month before construction.	Section 2 of the CEMP	The CEMP Sub-plans will be submitted for approval to DPHI with or subsequent to the final submissions of the CEMP for DPHI approval no later than one month before construction.						
C10	Construction must not commence until the CEMP and all CEMP Sub-plans have been approved, unless otherwise agreed by the Planning Secretary. The CEMP and CEMP Sub-plans, as approved by the Planning Secretary, including any minor amendments approved by the Environmental Representative (ER) must be implemented for the duration of construction. Where construction of the CSSI is staged, construction of a stage must not commence until the CEMP and sub-plans for that stage have been endorsed by the ER and approved by the Planning Secretary.	Section 2 of the CEMP	Construction of the Project will not commence until the CEMP and applicable Sub-plans have been approved, unless it is otherwise agreed by the Planning Secretary. The CEMP and CEMP Sub-plans will be implemented for the duration of construction.						
Biodiversity – Species Credits									
E38	Prior to clearing of <i>Acacia terminalis</i> subsp. <i>terminalis</i> (Sunshine Wattle), the species credits in Table 8 must be retired. The retirement of credits must be carried out in accordance with the offset rules of the Biodiversity Conservation Act 2016 (BC Act). Table 8: Species credits <table><tr><th>Species (only for the below)</th><th>Number of credits</th><th>In the below IBRA subregions</th></tr><tr><td><i>Acacia terminalis</i> subsp. <i>terminalis</i> (Sunshine Wattle)</td><td>2</td><td>SYB07, Pittwater</td></tr></table>	Species (only for the below)	Number of credits	In the below IBRA subregions	<i>Acacia terminalis</i> subsp. <i>terminalis</i> (Sunshine Wattle)	2	SYB07, Pittwater	Not applicable to Stage 3B and Stage 3C works	Not applicable to Stage 3B and Stage 3C works
Species (only for the below)	Number of credits	In the below IBRA subregions							
<i>Acacia terminalis</i> subsp. <i>terminalis</i> (Sunshine Wattle)	2	SYB07, Pittwater							

MCoA No.	Condition Requirements	Document Reference	How Addressed												
E38A	Prior to clearing PCT 4023 at the Emu Plains Ancillary Facility (WHT13), the species credits in Table 8A must be retired. The retirement of credits must be carried out in accordance with the offset rules of the Biodiversity Conservation Act 2016 (BC Act). Table 8A: Ecosystem and species credits for the Emu Plains construction support site <table><tr><th>Plant Community Type (PCT)</th><th>Number of credits</th><th>In the below IBRA subregions</th></tr><tr><td><i>PCT 4023: Coastal Valleys Swamp Oak Riparian Forest</i></td><td>9</td><td>Cumberland</td></tr><tr><th>Species (only for the below)</th><th>Number of credits</th><th>In the below IBRA subregions</th></tr><tr><td><i>Myotis Macropus</i> (Southern Myotis)</td><td>11</td><td>Cumberland</td></tr></table>	Plant Community Type (PCT)	Number of credits	In the below IBRA subregions	<i>PCT 4023: Coastal Valleys Swamp Oak Riparian Forest</i>	9	Cumberland	Species (only for the below)	Number of credits	In the below IBRA subregions	<i>Myotis Macropus</i> (Southern Myotis)	11	Cumberland	Section 7.5 Section 6.2.1	Clearing of the ecosystem and species credit in Table 8A will not commence until the relevant credits have been retired, or payment into the Biodiversity Conservation Fund have been made.
Plant Community Type (PCT)	Number of credits	In the below IBRA subregions													
<i>PCT 4023: Coastal Valleys Swamp Oak Riparian Forest</i>	9	Cumberland													
Species (only for the below)	Number of credits	In the below IBRA subregions													
<i>Myotis Macropus</i> (Southern Myotis)	11	Cumberland													
E39	The requirement to retire credits in Condition E38 and E38A above may be satisfied by payment to the Biodiversity Conservation Fund of an amount equivalent to the class and number of species credits, as calculated by the Biodiversity Offsets Payment Calculator.	Section 7.5 Section 6.2.1	Clearing of the ecosystem and species credit in Table 8A will not commence until the relevant credits have been retired, or payment into the Biodiversity Conservation Fund have been made.												
E40	Evidence of the retirement of credits or payment to the Biodiversity Conservation Fund in satisfaction of Condition E38 must be provided to the Planning Secretary prior to the clearing of the <i>Acacia terminalis</i> subsp. <i>terminalis</i> (Sunshine Wattle).	Not applicable to Stage 3B and Stage 3C works	Not applicable to Stage 3B and Stage 3C works												

MCoA No.	Condition Requirements	Document Reference	How Addressed
E40A	Evidence of the retirement of credits or payment to the Biodiversity Conservation Fund in satisfaction of Condition E38A must be provided to the Planning Secretary prior to clearing.	Section 7.5 Section 6.2.1	Evidence of species credit retirement will be provided to the Planning Secretary prior to clearing of the relevant species.
E41	A Microbat Monitoring Program must be prepared to address impacts, detail mitigation measures and monitoring of the Large Bent-winged Bat (<i>Miniopterus orianae oceanensis</i>) identified at Balls Head Coal Loader. The Monitoring Program must include: (a) all reasonable measures to avoid potential impacts from construction; (b) details of monitoring techniques, timing, duration and frequency/intensity to be used; (c) ongoing monitoring and reporting requirements during construction; and (d) contingency measures to address impacts attributable to the construction of the CSSI. The plan must be developed in consultation with an independent and appropriately qualified expert in microbat biology and behaviour, EESG, North Sydney Council and be submitted to the Planning Secretary for approval prior to work that impacts microbats. The approved plan must be implemented during construction of the CSSI.	Microbat Monitoring Program Table 7-1	A Microbat Monitoring Program will be prepared in accordance with this MCoA and will be provided for Planning Secretary approval prior to work that impacts microbats.
E42	The Proponent must monitor microbats for the period specified in the Microbat Monitoring Program, or until it is demonstrated, to the satisfaction of the Coordinator General EHG, that all potential impacts on the Large Bent-winged Bat (<i>Miniopterus orianae oceanensis</i>) have ceased.	Microbat Monitoring Program Table 7-1	A Microbat Monitoring Program will be prepared in accordance with this MCoA. Monitoring of Microbats will be carried out in accordance with the Microbat Monitoring Program.

MCoA No.	Condition Requirements	Document Reference	How Addressed
E43	If by the end of the period of monitoring an unacceptable impact has occurred, and an assessment has determined that offsets are required, the Proponent must offset the impacts on the Large Bent-winged Bat. Offsets must be achieved by retirement of biodiversity credits, payment to the Biodiversity Conservation Fund or the undertaking of other biodiversity conservation actions, as determined in consultation with and to the satisfaction of the Coordinator General EHG.	Microbat Monitoring Program Table 7-1	In the event that an unacceptable impact threshold has been reached, then Transport for NSW will offset the impacts on the Large Bent-winged Bat through the process outlined in the Microbat Monitoring Program. Any offsetting would be undertaken in consultation with and to the satisfaction of the Coordinator General EESG.
E44	The Proponent must prepare and submit to the Planning Secretary for information: (a) evidence confirming the class and number of biodiversity credits or other biodiversity conservation action required by Condition E43 within one month of receiving the notification of the satisfaction of the Coordinator General EESG a copy of the Credit Retirement Report; and (b) evidence of the retirement of credits (or payment to the Biodiversity Conservation Fund), or the transfer of funds to EESG for the purposes of undertaking the biodiversity action(s), required by Condition E43, within six months of receiving the notification of the satisfaction of the Coordinator General EESG.	Microbat Monitoring Program Table 7-1	Where the requirements of MCoA E43 are triggered, a copy of the Credit Retirement Report and evidence of fulfilment of the credit obligation will be submitted to the Planning Secretary for information in accordance with the requirements in this condition.
Habitat Enhancement			
E48	Within three months of the removal of any native trees, the Proponent must consult with local community restoration/rehabilitation groups, Landcare groups, relevant councils, DPI Fisheries and any relevant public authorities to determine if there is an interest in the reuse of suitable timber and root balls for habitat enhancement and rehabilitation work. If there is an interest, native trees that are removed for the construction of the CSSI and that are greater than 25-30 centimetres in diameter	Table 7-1	Consultation with relevant community groups and public authorities will be undertaken within three months of removing any native trees, to determine if there is an interest in the reuse of

MCoA No.	Condition Requirements	Document Reference	How Addressed
	and three metres in length must be salvaged and stored for a period of at least six weeks to enable collection by interested parties.		suitable timber and root balls for habitat enhancement and rehabilitation work. Where there is such interest, native trees removed during construction that are greater than 25-30 centimetres in diameter and three metres in length will be salvaged and stored for at least six weeks to enable collection by the interested parties.
Tree Removal, Replacement Plantings and Rehabilitation			
E184	The CSSI must be designed to retain as many existing trees as possible. Replacement trees and plantings must be provided at a ratio of 2:1 and deliver an increase in tree canopy and aim to enhance the relevant council's position in respect of the Sydney Green Grid, unless otherwise agreed by the Planning Secretary.	Section 7.6 Table 7-1	By minimising the number of surface sites required throughout construction, the Project can maintain as many existing trees and plantings as possible – this will be demonstrated via Design Report compliance tables. The Landscape Strategy Report (LSR) will detail the location, type, size, and number of new plantings. The LSR would demonstrate how the CSSI will enhance the relevant council's position in respect of the Sydney Green Grid, unless otherwise

MCoA No.	Condition Requirements	Document Reference	How Addressed
			agreed by the Planning Secretary.
E185	Replacement trees must: a) be located on public land and prioritised within 500 metres of the Construction Boundary, that delivers increased shading to footpaths, pedestrian and cycle paths; b) be of a species suitable to the location, having regard for local ecology and existing street trees; c) meet the requirements for quality tree stock specified in the AS2303:2018: Tree Stock for Landscape Use; d) be provided no later than six months following the commencement of operation; and e) have a minimum pot size consistent with the relevant council's plans / programs / strategies for vegetation management, street planting, or open space landscaping, or as agreed by the relevant council(s).	Section 7.6 Table 7-1	The LSR will detail the how the location, species, and quality of trees would be consistent with Condition E185, and relevant council requirements. Additionally, the LSR would provide indicative timings of plantings.
E186	Replacement and enhancement of vegetative screening along the project corridor must be undertaken in a progressive manner during construction to allow for the early establishment of vegetative screening.	Section 7.6 Table 7-1	Replacement planting will be prioritised as areas of construction are completed.
E187	A Landscape Strategy Report must be prepared which details the type, size, number and location of replacement trees. The report must demonstrate how any replacement plantings are consistent with the requirements of Condition E184 and Condition E185. The report must be submitted to the Planning Secretary for information no later than nine months following the commencement of operation.	Section 7.7 Table 7-1	A LSR will be prepared and submitted to the Planning Secretary which will demonstrate how the Project will be consistent with Conditions E184, E185 and E186.

Table 3-2: Revised environmental management measures relevant to FFMP

Ref #	Commitment	Document Reference	How Addressed
B1	Vegetation removal including the clearing of native vegetation and fauna habitat will be further minimised, where feasible and reasonable.	Section 7.6 Table 7-1	Vegetation removal will be minimised where feasible and reasonable through the implementation of this FFMP. Vegetation removal will be minimised through the reduction, where feasible and reasonable, of the footprint of construction support sites.
B2	Vegetation removal will be carried out in accordance with <i>Guide 4: Clearing of vegetation and removal of bushrock of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (RTA, 2011).	Section 7.2 Table 7-1	The removal of vegetation will be carried out in accordance with this guideline.
B3	The unexpected species find procedure included in <i>Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (RTA, 2011) will be followed if threatened ecological communities, flora or fauna species, not assessed in the biodiversity assessment, are identified in the construction footprint.	Section 7.3 Table 7-1	The unexpected finds procedure is included in Section 7.3 and will be implemented in the event threatened species are identified in the construction footprint.
B4	Vegetation will be re-established within the project footprint where feasible, in accordance with <i>Guide 3: Re-establishment of native vegetation of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (RTA, 2011). Where replacement trees cannot be accommodated within the project footprint, locations outside the project footprint will be identified for compensatory plantings. Trees removed by the project will be replaced at a ratio equal to or greater than 1:1. The replacement trees will consist of local native provenance species from the vegetation community that once occurred	Section 7.5 Place, Design and Landscape Plan	This some aspects of this management measure (REMM B4) is not consistent with Condition E184 and therefore Condition E184 takes priority under Condition A3. Trees removed during construction will be replaced at a ratio of 2:1. The Place, Design and Landscape Plan for the Project will include

Ref #	Commitment	Document Reference	How Addressed
	in the locality (rather than plant exotic or non-local native trees) where available and subject to the urban design and landscape plan.		details of vegetation re-establishment.
B5	Pre-clearing surveys for threatened flora species will be carried out in accordance with <i>Guide 1: Pre-clearing process</i> of the <i>Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (RTA, 2011).	Section 7.2 Table 7-1	Pre-clearing surveys will be carried out in accordance with this guideline.
B6	Carry out inspections of Large Bentwing-bat roosting sites in the surrounding locality (e.g. concrete box culverts, jetties) prior to construction, to determine the roosting capacity of each site at times roosting numbers are expected to be high.	Microbat Monitoring Program Table 7-1	Inspections will be carried out per this requirement.
B8	Monitoring of Large Bentwing-bats in the Coal Loader tunnel prior to potential impact and during tunnelling beneath the Coal Loader (in the months of March to September) will be carried out. The frequency and methods of the monitoring will be provided in an adaptive monitoring program developed prior to the impact and in consultation with the Department of Planning and Environment (Environment, Energy and Science and the Regions, Industry, Agriculture and Resources divisions), North Sydney Council and an appropriately qualified expert in microbat biology and behaviour.	Microbat Monitoring Program Table 7-1	Pre-construction monitoring of microbats in the Coal Loader tunnel and surrounding area has been carried out by TfNSW. No additional pre-construction data is required. Construction phase monitoring will be described in the Microbat Monitoring Program – which will be prepared prior to work that impacts microbats (in accordance with MCoA E41). The Microbat Monitoring Program will be prepared in consultation Department of Planning and Environment (Environment, Energy and Science and the Regions, Industry, Agriculture and Resources divisions), North Sydney Council

Ref #	Commitment	Document Reference	How Addressed
			and an appropriately qualified expert in microbat biology and behaviour.
B9	Prior to the excavation of the mainline tunnel works within close proximity to the Coal loader roosting site, adaptive management measures to minimise impacts on the Large Bent-winged bat will be developed in consultation with Department of Planning and Environment (Environment, Energy and Science and the Regions, Industry, Agriculture and Resources divisions), North Sydney Council and an appropriately qualified expert in microbat biology and behaviour. These measures, including the timing of their implementation, will be detailed in an adaptive monitoring program.	Microbat Monitoring Program	The Microbat Monitoring Program will include adaptive management measures to minimise impacts on the Large Bent-winged bat from activities associated with excavation of the mainline tunnel and any marine works within close proximity to the Coal loader roosting site. The Microbat Monitoring Program will be prepared in consultation Department of Planning and Environment (Environment, Energy and Science and the Regions, Industry, Agriculture and Resources divisions), North Sydney Council and an appropriately qualified expert.
B10	Fauna will be managed in accordance with <i>Guide 9: Fauna handling of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (RTA, 2011).	Section 7.4 Table 7-1	Fauna handling as a result of clearing or subsequent construction activities will be carried out in accordance with this guideline as detailed in Section 7.4.

Ref #	Commitment	Document Reference	How Addressed
B11	Pre-clearing surveys will be carried out in accordance with <i>Guide 1: Pre-clearing process</i> of the <i>Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (RTA, 2011).	Section 7.2 Table 7-1	Pre-clearing surveys will be carried out in accordance with this guideline.
B12	Pre-clearing surveys for microbat roosts will be carried out by a suitably qualified person on all buildings or structures with potential roosting habitat that are to be demolished or refurbished. If microbats are identified roosting in these structures, individuals will be excluded from this roosting habitat.	Microbat Monitoring Program Table 7-1	Pre-clearing surveys for microbat roosts will be carried out in line with this management measure and FFMP05 outlined in Table 7-1.
B14	Weed species will be managed in accordance with <i>Guide 6: Weed management</i> of the <i>Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (RTA, 2011).	Table 7-1 Appendix C1	The requirements of this guideline have been incorporated into the project's weed control protocol attached as Appendix C1 of this Plan.
B15	Pathogens will be managed in accordance with <i>Guide 2: Exclusion zones</i> of the <i>Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (RTA, 2011).	Table 7-1 Appendix C1	Pathogens will be managed in accordance with the Weed Management Protocol attached to this Plan.
B18	The velocity of wastewater treatment plant discharge will be minimised to avoid scour impacts on the marine environment.	Groundwater Management Plan	Wastewater treatment plants will be designed with consideration to minimising scour impacts as detailed in the Groundwater Management Sub-plan
B33	If by the end of the period of monitoring an unacceptable impact threshold has been identified, the Project will offset the impacts on the Powerful Owl by the retirement of biodiversity credits or payment to the Biodiversity Conservation Fund or the undertaking of other biodiversity conservation actions, as	Not applicable to Stage 3B or Stage 3C works	Not applicable to Stage 3B or Stage 3C works

Ref #	Commitment	Document Reference	How Addressed
	determined in consultation with and to the satisfaction of the Coordinator General EHG.		
B34	Prior to construction commencing, a further survey will be carried out to establish whether the Penrith Flying Fox camp is within 300 metres of the Emu Plains construction support site (WHT13). If the survey indicates that the Penrith Grey-headed Flying-fox camp boundary is identified as having moved or expanded to within 300m of the Emu Plains construction support site (WHT13), a Grey-headed Flying-Fox Management Plan would be prepared by an experienced and appropriately qualified ecologist to manage noise, vibration and lighting impacts generated by the proposed modification.	Table 7-1	Prior to construction commencing, a further survey will be carried out. If the Penrith Grey-headed Flying-fox camp boundary as identified in the BDAR has moved or expanded to within 300m of the Emu Plains (WHT13) construction support site, a Grey-headed Flying-Fox Management Plan will be prepared by an experienced and appropriate qualified ecologist to manage noise, vibration and lighting impacts generated by site establishment activities.
B35	A Fauna Relocation Procedure will be prepared in consultation with a suitably qualified and experienced ecologist in line with the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA, 2011), prior to dewatering of swales/waterbodies mapped by the BDAR within WHT13. The project ecologist will provide oversight during the implementation of this Procedure. The Procedure must include details on, but not be limited to, the following: - the native fauna species known to inhabit and/or use the waterbodies which require transfer - the methodology proposed to transfer the fauna - the location and suitability of the proposed relocation sites	Fauna Relocation Procedure	Fauna Relocation Procedure have been prepared in consultation with a suitably qualified and experienced ecologist to manage dewatering of swales/waterbodies mapped by the BDAR within WHT13.

Ref #	Commitment	Document Reference	How Addressed
	any potential impacts of relocating the fauna to the relocation sites.		
V8	Existing trees adjacent to the works will be retained and protected where possible to screen construction support sites, minimising clearing where possible.	Section 7.6 Table 7-1	Trees will be retained as far as practical to screen construction support sites.
V9	Where possible, trees will be trimmed rather than removed. Works will be carried out by a qualified arborist.	Section 7.6 Section 7.2 Table 7-1	Where possible, trees will be trimmed rather than removed. Trees will be removed only as a last resort and will be carried out by a qualified personnel.
V10	All areas disturbed by construction and not required for operation of the project will be restored to existing condition or in accordance with the urban design and landscape plan where applicable (environmental management measure V12).	Section 7.6 Table 7-1	The Place Design and Landscape Plan (MCoA E177) will be implemented for the restoration of disturbed construction footprint.
V11	Early planting works will be considered to provide a screening buffer that has time to mature before the project is fully operational.	Section 7.6 Table 7-1	Opportunities for early planting will be considered during construction.

4 Consultation

4.1 Consultation for Plan Preparation

This Plan has been developed and finalised in consultation with NSW Department of Planning, Housing and Infrastructure (DPHI), DPI Fisheries, DPE Water, EHG, Inner West Council, North Sydney Council and Penrith City Council in accordance with CoA C4, and in accordance with MCoA A5. Consultation with each agency, including responses received and how any issues raised were addressed in the development of this Plan will be provided to the Planning Secretary along with this Plan.

4.2 Ongoing consultation

Any ongoing consultation with agencies, where required, will be undertaken in accordance with Section 7 of this Plan. Community feedback and complaints relating to flora and fauna, including marine ecology, will be managed in accordance with the Community Communication Strategy and Complaints Management System.

In accordance with MCoA E48, within three months of the removal of any native trees, consultation will occur with local community restoration/rehabilitation groups, Landcare groups, relevant councils, DPI Fisheries and any relevant public authorities to determine if there is an interest in the reuse of suitable timber and root balls for habitat enhancement and rehabilitation work. If there is an interest, native trees that are removed for the construction of the CSSI and that are greater than 25-30 centimetres in diameter and three metres in length must be salvaged and stored for a period of at least six weeks to enable collection by interested parties.

5 Existing environment

The following sections summarise existing flora and fauna within and adjacent to the Project Area including species, communities and habitats. The key reference document is Chapter 19 (Biodiversity), Appendix S (Technical working paper: Biodiversity Development Assessment Report) and Appendix T (Technical working paper: Marine ecology) of the EIS and the MOD2 report and the Appendix M Biodiversity Development Assessment Report – Emu Plain.

The Project Area and relevant ecological data is shown on the Sensitive Area Maps included as Appendix A4 of the CEMP.

5.1 Threatened ecological communities

No Commonwealth EPBC Act or BC Act listed threatened ecological communities (TEC) were identified in the Project Area of North Sydney and Inner West council. The closest area of TEC to the subject land as mapped by OEH (2016) is a small area of Swamp Oak Floodplain Forest on the southern shoreline of Balls Head, around 300 metres south of the Project Area at Berrys Bay.

A field investigation was carried out for the Emu Plains construction support site (WHT13) as part of the MOD2 report. Approximately 1.31 hectares of Coastal Valleys Swamp Oak Riparian Forest (PCT 4023) was identified. Refer to Figure 5-1. The vegetation was represented by two condition classes as follows:

- Vegetation Zone 1: Poor Condition (about 0.60 hectares)
- Vegetation Zone 2: Moderate Condition (about 0.71 hectares)

It was assessed in the MOD2 report that despite the poor condition of 0.6 hectares of vegetation on site and 0.71 hectares was of moderate condition, the total 1.31 hectares of PCT 4023 is likely to conform with the requirements under the BC Act as Swamp Oak Floodplain Forest of the NSW North Coast, Sydney Basin and South East Corner bioregions and accordingly would be considered an endangered ecological community listing.

The vegetation does not conform to the EPBC Act listed Endangered Ecological Community as it fails to meet the condition thresholds.



Figure 5-1 Field validated existing Plant Community Types at Emu Plains construction support site (WHT13)

5.2 Threatened or otherwise significant flora species

Threatened flora species identified in the BDAR near the Project Area, and their conservation status, are listed in Table 5-1. Whist recordings of threatened species were identified in the

Western Harbour Tunnel and Warringah Freeway EIS requiring offset, none were identified within the Project Area. Except for the *Acacia terminalis* subsp. *terminalis* specimen identified alongside the Warringah Freeway, the remaining species were recorded as planted in the EIS. No threatened flora were identified in the MOD2 report.

Table 5-1: Threatened or otherwise significant flora species

Common name	Scientific name	EPBC Act	BC Act	Occurrence
Magenta Lilly Pilly	<i>Syzygium paniculatum</i>	Vulnerable	Endangered	Planted specimens were recorded outside the Western Harbour Tunnel construction footprint Unlikely to occur naturally as the construction footprint does not represent suitable habitat for the species
Narrow-leaved Black Peppermint	<i>Eucalyptus nicholii</i>	Vulnerable	Vulnerable	Planted specimens were recorded outside the Western Harbour Tunnel construction footprint Unlikely to occur naturally as the construction footprint is outside the known naturally occurring distribution of the species
Wallangarra White Gum	<i>Eucalyptus scoparia</i>	Vulnerable	Endangered	Planted specimens were recorded outside the Western Harbour Tunnel construction footprint Unlikely to occur naturally as the construction footprint is outside the known naturally occurring distribution of the species
Sunshine Wattle	<i>Acacia terminalis</i> subsp. <i>terminalis</i>	Endangered	Endangered	One individual specimen in disturbed, landscaped vegetation adjoining the Warringah Freeway, but outside the Western Harbour Tunnel construction footprint

The location these flora species in relation to the Project is shown on the Sensitive Area Plans included at Appendix A5 of the CEMP.

5.3 Terrestrial fauna habitat

Terrestrial fauna habitat types that have the potential to be impacted by the Project were identified by the EIS. These are listed below in Table 5-2 and shown on the Sensitive Area Maps included at Appendix A4 of the CEMP. No breeding habitat for any species will be impacted by the Project.

Table 5-2: Fauna habitat types

Name	Habitat features
Vegetated habitats	- Vegetation within the subject land is typically highly modified, consisting of trees and shrubs in landscaped parks and reserves, private residential gardens and road verges - Flowering and fruiting trees and shrubs throughout the construction footprint may offer foraging, nesting and roosting habitat to bats, birds and arboreal mammals - Landscaped areas and garden beds may offer marginal foraging habitat for birds, small mammals and reptiles - Some threatened fauna species have been recorded in recent years flying over the Project Area. White-bellied Sea Eagle (<i>Haliaeetus leucogaster</i>); Large Bentwing-bat (<i>Miniopterus orianae oceanensis</i>); and Grey-headed Flying-fox (<i>Pteropus poliocephalus</i>) were all recorded flying over the Project Area during surveys carried out for the Project in 2018, or during other assessments (approximately between 2016-2019)
Man-made structures and built environments	A roost habitat known to be occupied during autumn and winter by hibernating Large Bentwing-bats (<i>Miniopterus orianae oceanensis</i>) is located within one of the four coal loader tunnels on the western side of Waverton peninsula, near Sydney Harbour.

5.4 Threatened fauna and endangered populations

Threatened fauna species identified during survey (confirmed) and those which have been previously recorded in the vicinity of the Project area are listed in Table 5-3. One endangered population is located in the vicinity of the Project, being the population of Little Penguins (*Eudyptula minor*) and located approximately 10 kilometres north-east of the Project in the Manly Point Area.

Table 5-3: Threatened fauna

Common name	Scientific name	EPBC Act	BC Act	Likelihood of occurrence in Project Area of North Sydney and Inner West	Likelihood of occurrence near the Emu Plains construction support site (WHT13)
Large Bent-winged Bat	<i>Miniopterus orianae oceanensis</i>	Not listed	Vulnerable	Confirmed	None
Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	Vulnerable	Vulnerable	Confirmed	Confirmed
White-bellied Sea Eagle	<i>Haliaeetus leucogaster</i>	Migratory	Vulnerable	Confirmed	None

Common name	Scientific name	EPBC Act	BC Act	Likelihood of occurrence in Project Area of North Sydney and Inner West	Likelihood of occurrence near the Emu Plains construction support site (WHT13)
Eastern Freetail-bat	<i>Mormopterus norfolkensis</i>	Not listed	Vulnerable	High	None
Little Bentwing-Bat	<i>Miniopterus australis</i>	Not listed	Vulnerable	High	None
Powerful Owl	<i>Ninox strenua</i>	Not listed	Vulnerable	High	None
Southern Myotis	<i>Myotis macropus</i>	Not listed	Vulnerable	High	Assumed to be present at WHT13 in the absence of a targeted survey
Little Penguin	<i>Eudyptula minor</i>	Marine	Endangered population	High	None
Eastern Osprey	<i>Pandion cristatus</i>	Migratory	Vulnerable	Moderate	None

The Biodiversity Development Assessment Report (BDAR) that forms Appendix M of the MOD2 assessment has identified a camp of Grey-headed Flying-fox (GHFF) located approximately 500m north of Emu Plains construction support site (WHT13). The GHFF camp is located on the opposite side of the Nepean River to the existing operational footprint of the Boral Quarry. Refer to Figure 5-2.

The BDAR found that it is considered unlikely that the establishment of the Emu Plains site would result in an increase of indirect impacts to the camp. Mitigation measures to limit impacts to the GHFF camp during breeding season should be considered if the camp boundary is later identified as having moved or expanded to within the 300m. Refer to Table 7-1.

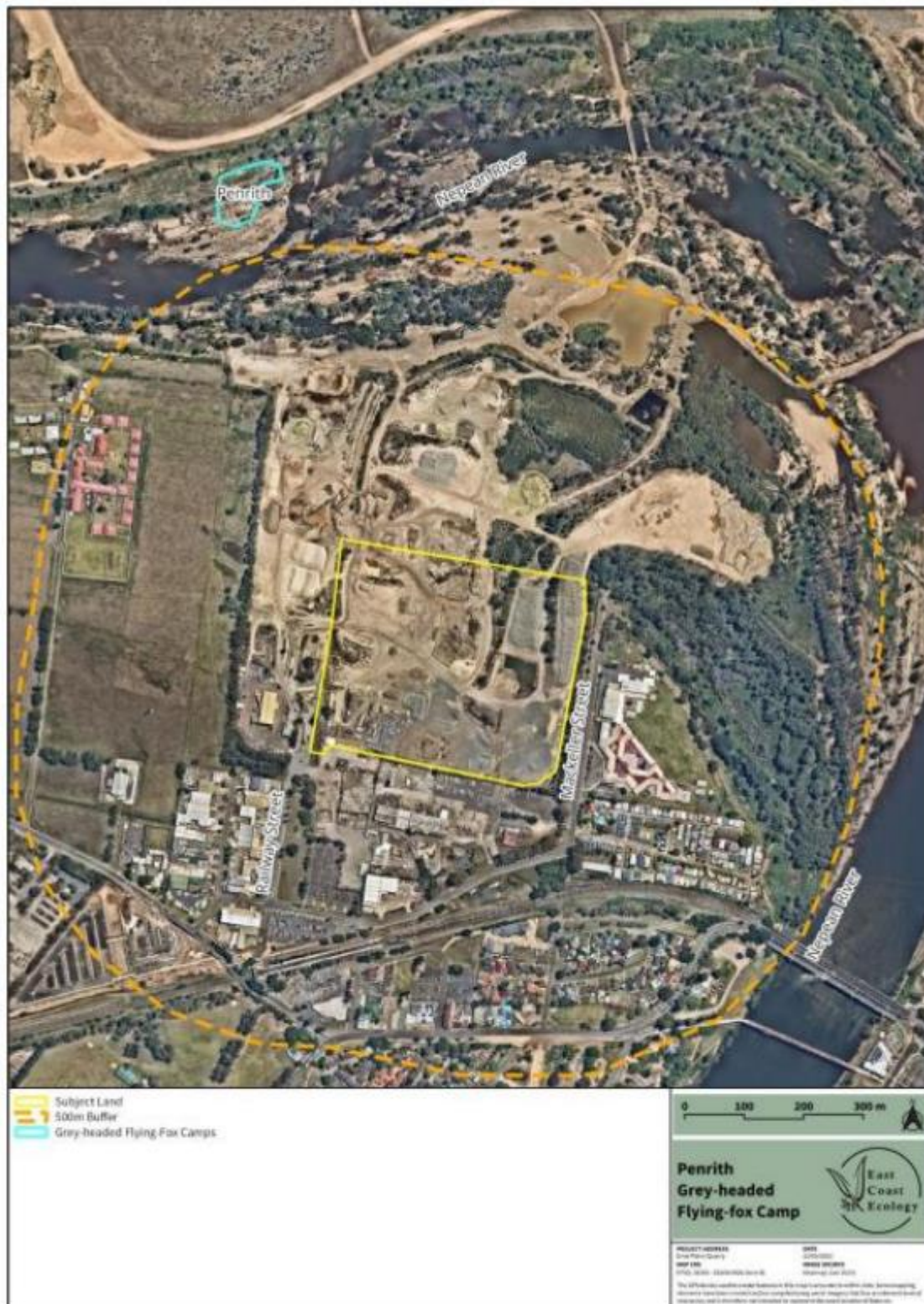


Figure 5-2: Approximate location of the Grey-headed Flying-Fox camp in relation to the Emu Plains Construction Support Site (WHT13). (Source: MOD2 report Appendix M – BDAR)

During the consultation undertaken as part of the preparation of this Plan, Penrith City Council provided another location of the GHFF camp further west, as shown on Figure 5-3. This location is located almost 2km from the Emu Plains (WHT13) construction support site .



Figure 5-3: Known GHFF camp (image provided by Penrith City Council).

5.5 Aquatic fauna

No fish or macroinvertebrate sampling was carried out as part of the aquatic assessment in the EIS, however the waterways within and downstream of the construction footprint are considered suitable for the majority of common and exotic fish species typically found in the Sydney region. Desktop searches were undertaken for Emu Plains construction support site (WHT13) as part of the MOD2 report.

Common native fish species typically found in Sydney waterways include short- finned and long- finned eels (*Anguilla Australia* and *A. reinhardtii*), common jollytails (*Galaxias brevipinnis*), Australian bass (*Macquaria novemaculeata*) and a number of gudgeon species. Exotic fish species are also widespread across the Sydney region. The waterways are likely to support an array of macroinvertebrates including the Sydney crayfish (*Euastacus australasiensis*) as well as smaller insects and freshwater mussels.

No threatened freshwater fauna, flora species or ecological communities or endangered populations listed under the FM Act and/or EPBC Act have been identified as likely to occur within the Project Area.

No freshwater migratory species listed under the EPBC Act are considered likely to occur within the construction footprint.

The fisheries habitat classification for each of the waterways within the construction footprint is provided in Table 5-4.

Table 5-4: Fisheries habitat within the construction footprint

Waterway	Classification (Key fish habitat type and class) #
Whites Creek at Rozelle, located about 30 metres south-east of the Rozelle Tunnel Portal construction support site (WHT12)	Not a key fish habitat
Willoughby Creek at Cammeray, located about 60 metres east of the Cammeray Golf Course construction support site (WHT10)	Type 3 minimally sensitive key fish habitat Class 3 minimal key fish habitat for fish passage.
Flat Rock Creek at Naremburn, located about one kilometre north of the Cammeray Golf Course construction support site (WHT10)	Type 1 highly sensitive key fish habitat Class 2 moderate key fish habitat for fish passage (upstream of Quarry Creek) Class 1 major key fish habitat for fish passage (downstream of Quarry Creek)
Quarry Creek at Cammeray, located about 800 metres north of the Cammeray Golf Course construction support site (WHT10)	Type 1 highly sensitive key fish habitat Class 2 moderate key fish habitat for fish passage
#Classification in accordance with NSW DPI Fisheries Guidelines	

5.6 Groundwater dependent ecosystems

No groundwater dependent ecosystems were identified within the construction footprint, or within the range of potential impact.

5.7 Wetlands and conservation areas

No RAMSAR or coastal wetlands (*State Environmental Planning Policy (Coastal Management) 2018*) occur along the waterways within the Project Area.

The closest RAMSAR wetland to the Project Area is Towra Point Nature Reserve at Kurnell around 24 kilometres south of the Project Area. The closest coastal wetland identified in the *State Environmental Planning Policy (Coastal Management) 2018* to the Project is along Johnsons Creek about 400 metres south-east of Whites Creek.

6 Environmental aspects and impacts

6.1 Construction activities

Key aspects of the Project that could result in impacts to terrestrial flora and fauna include:

- Clearing of native vegetation (including habitat)
- General construction activities (noise, vibration, light spill, disturbance of soils)
- Use of chemicals / fuels (potential for spills)
- Discharge velocity and subsequent scour impacts on marine environment from wastewater treatment plants

Refer also to the Aspects and Impacts Register included in Appendix A2 of the CEMP.

6.2 Ecological impacts arising from construction

Potential impacts associated with construction of the Project are discussed in Chapter 19 of the EIS and in the MOD2 report. The impacts are summarised below.

6.2.1 Removal of vegetation

Construction of the Project would require some removal of vegetation, primarily at construction support sites, which comprise native plantings, non-native species or weeds.

With the exception of some vegetation within the footprint of the Emu Plains construction support site, no native vegetation (vegetation consistent with any plant community type or threatened ecological community) would be removed as part of the construction of the project.

The establishment and operation of the Emu Plains construction support site will require the removal of 1.31 ha of vegetation identified as Coastal Valleys Swamp Oak Riparian Forest (PCT 4023). Clearing of this vegetation will require offsetting in accordance with condition 38A of the approval. Prior to any clearing of this community, ecosystem credits will be retired, or a payment made to the Biodiversity Conservation Fund as required by the conditions of approval.

6.2.2 Invasion and spread of weeds, pathogens and disease

An increase in the movement of people, vehicles, machinery, vegetation waste and soil during and following construction activities may facilitate the introduction or spread of exotic grasses and other weeds that currently occur. Disturbed areas, such as those in which earthworks are to be carried out, would be particularly susceptible to weed establishment. The majority of the Project Area is largely underground, and where surface disturbance occurs (such as construction support sites) little to no terrestrial native vegetation is present, reducing the threat of weeds to terrestrial biodiversity.

Two priority weeds, Lantana (*Lantana camara*) and Pampas Grass (*Cortaderia selloana*) were identified within the boundary of the Emu Plains construction support site (WHT13). These will be managed in accordance with Appendix C1 - Weed Management Protocol.

In addition, the project has the potential to increase the spread of pathogens that threaten native biodiversity values, such as the soil-borne pathogen *Phytophthora cinnamomi* (*Phytophthora*). This pathogen is associated with damage and death to native plants. Construction of the project has the potential to increase the spread of this pathogen which could be dispersed by vehicles, animals, walkers and the movement of soil, or over large distances in flowing water, such as storm runoff.

6.2.3 Removal of fauna habitat

The removal of flowering and fruiting trees, shrubs and ground layer vegetation would result in the loss of potential foraging and sheltering habitat to a number of threatened fauna species known or considered likely to occur in the Project Area. However, these impacts would be negligible since the habitat to be removed does not comprise a significant proportion of habitat available to species in the surrounding terrestrial biodiversity locality or wider bioregion.

Further to this, the limited extent of vegetated fauna habitat within the construction footprint that does exist, occurs in isolated patches with limited habitat connectivity to larger areas of native vegetation in the wider locality. Much of the vegetation which would be removed is currently subject to regular and on-going disturbance and maintenance (i.e. pruning and mowing).

The value of disturbed land as still providing habitat function is acknowledged, and the revegetation requirements as described in this document will be implemented for all vegetation removal.

6.2.4 Fauna injury and mortality

The majority of fauna species recorded within the construction footprint are highly mobile bird and mammal species that are likely to be able to move away from these types of activities quite readily.

If unmanaged there is potential that terrestrial fauna injury or mortality would occur as a result of construction activities such as vegetation clearing (particularly during the felling of trees), or may result from collisions with work vehicles or plant, or accidental entrapment in plant, trenches or other works.

6.2.5 Noise and vibration

Construction activities would result in localised and temporary noise and vibration impacts; however, as construction areas occur in highly urbanised areas that are subject to high levels of ambient noise, any increase in noise and vibration is not expected to have a significant impact on terrestrial fauna.

Noise and vibration would potentially impact the Large Bent-winged Bat population (*Miniopterus orianae oceanensis*) known to roost within one of the coal loader tunnels at Waverton during autumn and winter. This would include potential impacts during construction of the tunnels for the Project, located below the floor of the coal loader tunnels. Adverse impacts during summer and spring are unlikely, given that the roost has not been known to be occupied during these seasons.

6.2.6 Loss of aquatic habitat and water quality impacts

No riparian vegetation would be removed as part of the project and no instream works would be carried out in the waterways traversed by the Project. Accordingly, there would be no direct impacts to these waterways.

Typically, the highest risk construction activity would be earthworks. If unmanaged, construction activities could increase levels of turbidity and sediment deposition, decrease dissolved oxygen and change pH levels in downstream waterways. Accidental fuel and chemical spills and contaminated runoff from construction vehicles, plant, equipment or chemical storage areas have the potential to reach downstream waterways. Most sites to be utilised during the Stage 3B and 3C works have already been established and, in some cases, hardstand has been placed to minimise impact.

During construction of the Project, treated wastewater and site water runoff from the main tunnel excavation and the surrounding construction support sites would be discharged to Rozelle Bay and Willoughby Creek. Discharges from the wastewater treatment plants during construction would be designed to improve or maintain water quality in the receiving environment.

Except for a small portion of the site used for laydown and stockpiles, the majority of the Emu Plains construction support site (WHT13) would be hardstand and therefore would not pose a risk to water quality. The areas of the site that will be exposed have the potential to increase the level of turbidity, sediment deposition, decreased dissolved oxygen levels and change pH levels in downstream waterways. Water from the site, however, will be managed through its discharge to the existing surface water management system operated on the wider site by Boral. This semi-closed system captures water from surrounding stormwater and reuses it on site. Further information regarding this system is provided in the Soil and Water Management Sub-plan (Appendix E of the CEMP).

6.2.7 Cumulative impacts

Potential cumulative impacts associated with the construction of the Western Harbour Tunnel and Warringah Freeway Upgrade project were presented and assessed in Chapter 27 (Cumulative impacts) of the EIS. The assessment concluded that in all locations associated with the construction of the Project, cumulative impacts to biodiversity was considered to be negligible.

The impact of vegetation removal of disturbed land on listed and locally significant (common) fauna species is acknowledged, and the revegetation requirements as described in this document will be implemented for all vegetation removal.

7 Environmental mitigation and management measures

Construction associated with the Project has the potential to impact flora and fauna within and adjacent to the construction footprint. In order to avoid, mitigate and/or minimise these potential impacts, a range of environmental requirements and control measures are identified in the various environmental documents, including the EIS and other Transport for NSW guidance documents. These specific measures and requirements, along with additional measures identified as best practice, are outlined in Table 7-1.

This chapter has been developed in consideration of the 'SMART Principles' – Specific, Measurable, Achievable, Relevant and Time-based.

7.1 Demolition inspections

Pre-clearing surveys for microbat roosts will be carried out by a suitably qualified ecologist on all buildings and structures with potential habitat that are to be demolished or refurbished. If microbats are identified roosting in these structures, individuals will be excluded from this roosting habitat.

Areas requiring demolition inspection will be identified by the Environment Manager, or delegate, in consultation with the Project Engineer or Site Supervisor and any specialist ecology consultants required.

Any findings from those pre-demolition inspections will inform the Sensitive Area Plans (Appendix A5 of the CEMP) and identify additional management measures beyond those detailed in this Plan in consultation with the Project ecologist.

7.2 Clearing Procedure

Clearing procedures will be undertaken in accordance with Guide 4: Clearing of vegetation and removal of bushrock of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA 2011). These will be finalised with the Project Ecologist during the pre-clearing surveys.

A detailed clearing and grubbing Environmental Work Method Statement (EWMS) is to be prepared for any activities identified (using the Project Sensitive Area Maps) as including or being in proximity of threatened species or habitat, to ensure that all required mitigation and management measures are captured and effectively communicated to personnel involved. This is a separate document to the Clearing and Grubbing Plan (described in Section 7.2.2)

7.2.1 Initial pre-clearing inspection

The pre-clearing process provides a final check of native vegetation for any threatened flora or fauna species not identified or that has moved into the area since undertaking previous surveys. This is particularly important where the season or prevailing weather conditions influence whether a species is found in an area.

Prior to commencement of clearing an initial pre-clearing inspection shall be undertaken to:

- identify any habitat trees and record tree details (i.e., species, type and size of hollows, species present, GPS location (UTM), diameter at breast height (DBH) and notes on removal),
- inspect the area for the presence of endangered, threatened species, and any native fauna species which may require relocation.
- identify and mark potential unsound trees,
- survey and map weeds listed under the Biosecurity Act 2015,

- identify possible pathogens present within the area inspected,
- mark threatened flora within 5m outside the Limit of Clearing boundary and
- ensure that the clearing boundary, any protected/restricted areas, and any areas of weeds identified is clearly delineated.

Immediately prior to the commencement of clearing operations (i.e. the morning of clearing), preclearing surveys will be undertaken in accordance with Guide 1: Pre-clearing Process of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA 2011). The surveys are to be undertaken by the Project Ecologist and are to involve a search of all habitat and animal breeding places within areas where vegetation clearing is to occur. The Project Ecologist is to confirm the location of exclusion zones and proposed clearing methods, such as staged clearing, to ensure the protection of any threatened flora and fauna that may be encountered. Where necessary, the ecologist will record the location of any fauna to be relocated and identify suitable habitats within proximity for release.

7.2.2 Clearing Hold Point

Prior to clearing, in accordance with G40 a Clearing and Grubbing Plan and report on the presence of weeds and unsound trees, together with a written notice that limits of clearing and areas of weed infestation identified in the ecologist report are marked, will be prepared and submitted to TfNSW at least 7 days before starting any clearing.

This information will be subject to release as a **Hold Point** by TfNSW prior to clearing progressing.

7.2.3 Clearing Process

A Pre-Clearing Permit is to be prepared by the delivery team in consultation with the Project Ecologist and approved by the Environment Manager (or delegate).

Clearing of vegetation and habitat features will be undertaken in a two-stage process following the completion of the pre-clearing surveys. Under scrubbing and the removal of non-habitat trees would be undertaken first. Habitat trees (including hollow-bearing trees) would then be removed at least 24 hours after the removal of non-habitat trees, to enable resident hollow-dependent fauna to evacuate the tree prior to felling. Canopy separation between habitat trees and non-habitat trees is required before the 24hr timeframe commences. The Project Ecologist must be present to supervise the removal of each habitat tree.

7.2.4 Salvage of Habitat Features

Suitable habitat features including hollow logs, large woody debris and bushrock are to be salvaged and stockpiled during construction for later use for habitat restoration activities. This must be undertaken in the manner as described in MCoA E48.

Reuse of coarse woody debris and bushrock is to be maximised in order to reinstate habitat features that have been removed from vegetation clearing areas. Salvage and placement of bushrock and coarse woody debris is to be undertaken in accordance with Biodiversity Guidelines Guide 5 – Re-use of woody debris and bushrock and in consultation with the Project Ecologist.

7.3 Unexpected Threatened Species Protocol

There is potential to come across unexpected threatened flora and fauna within and adjacent to the construction footprint during works associated with the Project.

In accordance with REMM B3, the unexpected species find procedure included in Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA 2011b) will be followed if threatened ecological communities, flora or fauna species, not assessed in the biodiversity assessment, are identified in the construction footprint.

In the event protected species of fauna or flora, or threatened ecological communities (TEC) that have not been previously identified within or adjacent to the Project boundary, or are found in new location not identified within the Project approval documents, are unexpectedly encountered during the Project all works in the vicinity of the find will cease and immediate guidance will be sought from the Project Ecologist to confirm whether the species or community is listed.

The following steps will be implemented in all cases, until or unless confirmation is received from the Project Ecologist that the species or community is not considered threatened.

Stop all physical works likely to impact on the species in that location, and isolate the area to prevent further stress if dealing with an unexpected fauna species.

Notify the Supervisor and Environment Manager

The Environment Manager (or delegate) will arrange for the Project Ecologist to confirm identification and, once confirmed, conduct an assessment of the nature and severity of the likely impact, and advise immediate management recommendations to prevent impact.

Depending on the outcomes of the assessment, undertake notification of the find (as described below) and obtain further approvals if required (may include a Consistency Assessment or Project Modification depending on its significance)

Implement the Project Ecologist's recommendations, and once approvals are given, continue physical works. Following determination of threatened species identification, notification will be made to TfNSW, the ER and the following stakeholders under the guidance of TfNSW and the Project Ecologist:

- Environment and Heritage Group (EHG) Biodiversity and Conservation Division (BCD)
- Department of Climate Change, Energy, the Environment and Water in the case of a federally listed threatened entity

Development of further management actions will occur in consultation with TfNSW and EHG BCD once it has been determined that an impact is unavoidable.

A record of the unexpected finds will be maintained by the contractor for inclusion in subsequent inductions, toolbox talks and CEMP revisions. Records will include the following details:

- Date, time and location of unexpected find,
- Details regarding assessment by the Environment and Sustainability Manager (and advice from suitably qualified ecologist or specialist), and
- Actions undertaken before work recommenced.

The Environment and Sustainability Manager must ensure that the details on any threatened flora and fauna species found are entered into BioNet.

This process is shown in Figure 7-1.

Procedure

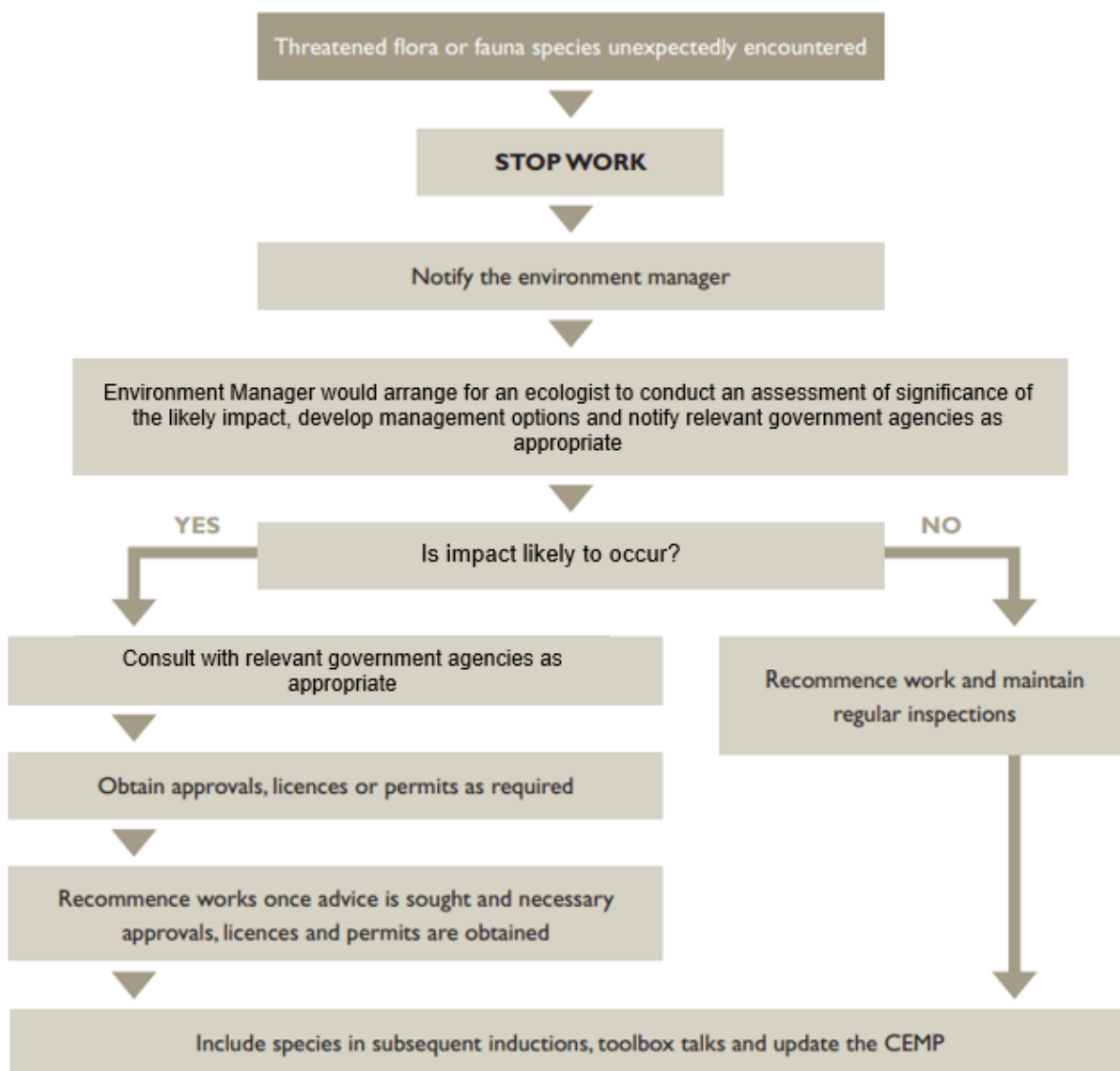


Figure 7-1 Unexpected Finds Procedure from *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA, 2011).

7.4 Fauna Handling

There is potential to come across fauna within and adjacent to the construction footprint during works associated with the Project. If fauna is found during pre-clearing or on-going construction, Fauna Rescue and Release should follow *Guide 9: Fauna handling of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA, 2011), Fauna Management Guideline (Transport for NSW, 2015) and applicable legislation. Fauna rescue will be undertaken by a suitably qualified person to reduce the risk of injury to both animal and worker. Fauna will only be handled when necessary; it is preferable to avoid fauna handling unless the life of the animal is at risk.

The Project Ecologist will be present on site during all vegetation clearing and habitat removal activities to capture and relocate any fauna species that may be encountered. Identified habitat (including hollow bearing trees) will be left for at least 24 hours after clearing the surrounding vegetation to allow fauna to relocate naturally. If necessary, fauna may need to be trapped or captured and relocated to nearby suitable habitat for release. The trapping and relocating of fauna

will be undertaken in accordance with Guide 9: Fauna Handling of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA 2011) and the NSW Code of Practice for Injured, Sick or Orphaned Protected Fauna (OEH 2011).

All adverse events or incidents involving fauna mortality that occur due to construction will be recorded including details of the fauna, location of the incident, the date and time of the incident or find, the reason for the mortality (if known) and measures taken to address the issue. Injured fauna will be transported to the nearest veterinary surgery or wildlife carer for treatment and contact made with Wildlife Information Rescue Service (WIRES) as necessary. The ecologist or wildlife carer will be responsible for the relocation and release of displaced fauna upon their recovery. Release sites for fauna are to be within close proximity to the site where the fauna were originally captured, if possible. The GPS location of release sites are to be recorded and provided to TfNSW.

7.4.1 Fauna Handling during dewatering of waterbodies at WHT13

A fauna relocation procedure has been prepared to address REMM B5 and d describes how the Contractor proposes to dewater from swales/waterbodies at the Emu Plains (WHT13) construction support site where native fauna species may inhabit.

The procedure only applies in the event dewatering is required from swales/waterbodies within the Emu Plains (WHT13) construction support site, as identified in Figure 7-2.

Refer to Appendix C3 – Fauna Relocation Procedure for further details.

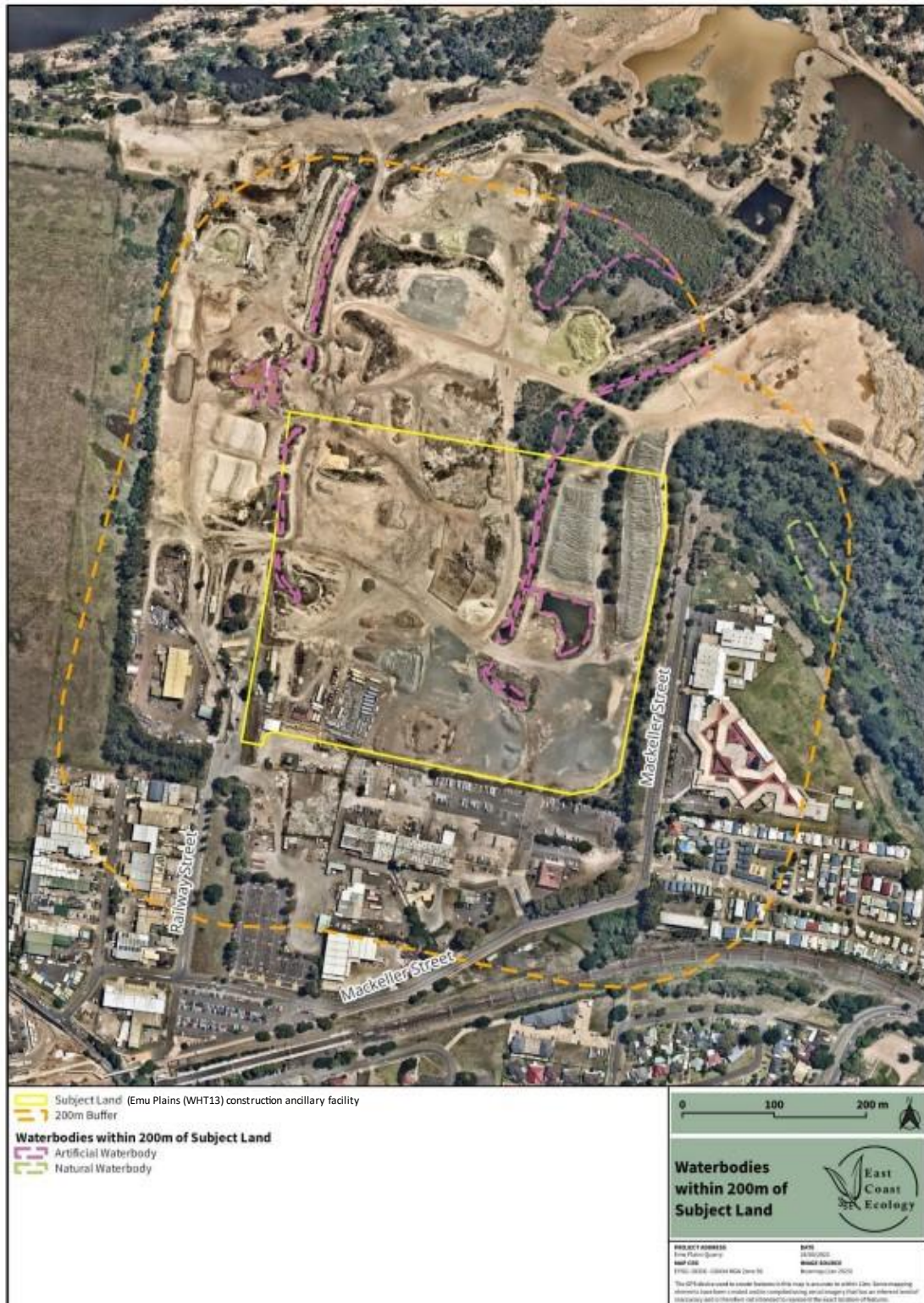


Figure 7-2: Waterbodies within the Emu Plains (WHT13) site (Source: Figure 14 of the WHT MOD2 BDAR).

7.5 Biodiversity offsets

To compensate for the removal of vegetation during construction of the Project, vegetation will be re-established within the Project Area where feasible in accordance with Guide 3: Re-establishment of native vegetation of the *Biodiversity Guidelines: Protecting and managing*

biodiversity on RTA projects (RTA, 2011) and the Vegetation Offset Guide (Transport for NSW, 2019). Where replacement trees cannot be accommodated within the Project Area, suitable locations will be identified outside the Project Area for planting. Trees removed during construction will be replaced at a ratio of 2:1 as per MCoA E184. Revegetation will occur progressively during the project, with endemic species chosen for planting where available. This process will be described in the Place, Design and Landscape Plan required under MCoA E177/178.

The Emu Plains construction support site (WHT13) will require the removal of 1.31ha of Coastal Valleys Swamp Oak Riparian Forest (PCT 4023) as shown in Figure 5-1. Of the 1.31ha, 0.6ha is in poor condition and 0.71ha is in moderate condition. Nine ecosystem credits will be required to offset the vegetation in moderate condition, while no offsets are required for the vegetation in poor condition.

One threatened species, *Myotis macropus* (Southern Myotis), has been assumed present within PCT 4023 areas identified in the Emu Plains construction support site (WHT13). Eleven species credits are required to be offset. Prior to clearing the ecosystem and species credits will be retired, or payment into the Biodiversity Conservation Fund will be made.

Any offsets required for Large Bent-winged Bats as per MCoA E43 and E44 will be fulfilled through the process described in the Microbat Management Plan to be prepared prior to impact on this species.

7.6 Replacement Planting

The Project has been designed to maintain as many existing trees and plantings as possible, and opportunities to retain vegetation will be implemented wherever possible. Existing trees adjacent to the works will be retained and protected to screen construction support sites, minimising clearing where possible, including trimming rather than removing vegetation.

All areas disturbed by construction and not required for operation of the project will be restored to in accordance with the Place Design and Landscape Plan (MCoA E177) where applicable.

Replacement planting will be prioritised as areas of construction are completed, with opportunities to providing a screening buffer that has time to mature before the project is fully operational. Replacement planting location, species, quality, timing and sizing will be as per MCoA E185 and will be detailed in the Landscape Strategy Report (LSR). Replacement planting is also required to deliver an increase in tree canopy and aim to enhance the relevant council's position in relation to the Sydney Green Grid

7.7 Landscape Strategy Report

In line with CoA E187 a LSR will be prepared which details the type, size, number and location of replacement trees. The report will demonstrate how any replacement plantings are consistent with the requirements of Condition E184 and Condition E185.

The report must be submitted to the Planning Secretary for information no later than nine months following the commencement of operation.

The LSR will be used to identify where landscape plantings have occurred to demonstrate compliance with the relevant conditions of approval .

7.8 Management and mitigation measures

Management and mitigation measures relevant to the Project are outlined in Table 7-1. These will be implemented to minimise impacts to flora and fauna, and ensure all commitments and requirements of the project approval are met. These specific management and mitigation measures have been developed to address the requirements of applicable legislation, the MCoA and commitments of the REMMs.

Table 7-1: Flora and fauna management and mitigation measures

ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Source	Evidence
General						
FFMP01	Training will be provided to all personnel involved in clearing activities, including relevant sub-contractors on flora and fauna requirements from this plan through site inductions, toolbox talks and training sessions. The training will cover (as a minimum): • Featured biodiversity conservation significance • Sensitive Area Plans • Pre-clearing and fauna translocation protocols • Clearing protocols • Unexpected finds protocols.	Training materials	Prior to construction During construction	Environment Manager Site Supervisor	Best practice	Training records
FFMP02	An appropriately qualified and experienced Project Ecologist will be appointed prior to the commencement of construction.	This plan Project Ecologist	Prior to construction	Contractor Environment Manager	MCoA C6(e)	Ecologist qualifications Proof of engagement

ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Source	Evidence
Pre-clearing/pre-demolition						
FFMP03	Clear delineation of the project construction footprint shall be established prior to construction to minimise impacts on adjacent vegetation. Erect exclusion fencing and signage to delineate the limits of clearing in accordance with <i>Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (RTA, 2011).	Sensitive Area Maps Construction Work Plans	Prior to clearing	Contractor Project Ecologist	Best practice	Daily pre-start inspections
FFMP04	Pre-clearing surveys will be carried out in accordance with <i>Guide 1: Pre-clearing process</i> of the <i>Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (RTA, 2011) by the Project Ecologist to identify or confirm the location of the following within and immediately adjacent to the Project Areas: • Threatened flora • Threatened fauna and associated habitat features • Hollow bearing trees or nest bearing trees • Trees to be considered for retention • Areas of vegetation that could be affected by pathogens • Priority weeds	This plan Project Ecologist	Prior to clearing	Environment Manager Project Ecologist	MCoA C6(e) REMM B5, B11	Pre-clearing survey reports

ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Source	Evidence
	Possible pathogens present Refer to FFMP Section 7.2.1					
FFMP05	Pre-clearing surveys will be carried out by a suitably qualified person to identify any microbat roosts or potential habitat within or on any buildings or structures identified to be demolished or refurbished. If roosting microbats or habitat is identified, then individuals are to be excluded from the roosting habitat to be disturbed or demolished.	Suitably qualified person	Prior to clearing	Environment Manager Project Ecologist	MCoA C6(e) REMM B12	Pre-clearing survey reports
Vegetation clearing and management						
FFMP06	A Clearing and Grubbing Plan will be developed for any clearing of vegetation works and will be submitted to Transport for NSW for approval [HOLD POINT] before the commencement of the works. An EWMS will be prepared for any activities identified (using the Project Sensitive Area Maps) as including or being in proximity of threatened species or habitat.	This plan	During construction	Contractor	Transport for NSW Specification G40 – Clearing and grubbing	Clearing and Grubbing Plan EWMS
FFMP07	Clearing of vegetation, including the clearing of native vegetation and fauna habitat, will be minimised where feasible and reasonable (e.g. through detailed design, adjusting construction footprints,	Detailed design to consider EIS and MCoA C6	Design	Environment Manager Design Manager D&C Director	REMM B1 REMM B2	Clearing and grubbing plan Design Reports

ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Source	Evidence
	selecting plant to avoid impact on retained trees, retaining perimeter vegetation where possible and not in conflict with other mitigation measures or works). This includes the retention of trees through the reduction of the construction site footprints where feasible. Clearing will be undertaken in accordance with <i>Guide 4: Clearing of vegetation and removal of bushrock</i> of the <i>Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (RTA, 2011)					Temporary works designs
FFMP08	The unexpected threatened species finds procedure within this document will be implemented to ensure that if flora or fauna are identified within an area to be cleared, the procedure would minimise the potential for impacts.	Unexpected threatened species finds procedure	Prior to construction	Environment Manager Project Ecologist	REMM B3	Records of unexpected finds
FFMP09	Tree removal and pruning will be carried out by an arborist with a minimum Australian Qualification Framework (AQF) Level 3 qualification in accordance with AS 4373-2007 Pruning of Amenity Trees and the NSW WorkCover Code of Practice for the Amenity Tree Industry (1998).	Appropriately qualified arborist	During construction	Environment Manager Contractor	Best practice	Engagement of arborist Clearing records
FFMP10	Advice provided by an arborist, regarding tree removal, pruning and maintenance,	Appropriately qualified arborist	Prior to construction	Contractor	Best practice	Engagement of arborist

ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Source	Evidence
	must have a minimum of AQF Level 5 qualification in Arboriculture (or equivalent).		During construction			
FFMP11	Tree Protection Zones must be delineated around any trees (including root zone) to be retained within or adjoining the project footprint during construction in consultation with the Project Arborist, consistent with AS 4970-2009 <i>Protection of trees on development sites</i> .	Appropriately qualified arborist	Prior to construction During construction	Contractor	Best practice	Engagement of arborist
FFMP12	In the event native vegetation removal cannot be avoided, within three months of the removal of any native trees, local community restoration/rehabilitation groups, Landcare groups, relevant councils, DPI Fisheries and any relevant public authorities will be consulted with to determine if there is an interest in the reuse of suitable timber and root balls for habitat enhancement and rehabilitation work. If there is an interest, native trees that are removed for the construction of the Project and that are greater than 25-30 centimetres in diameter and three metres in length must be salvaged and stored for a period of at least six weeks to enable collection by interested parties.	Salvage and appropriate storage of removed native trees	Construction	Contractor	MCoA E48	Evidence of consultation with relevant stakeholders

ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Source	Evidence
Impacts to terrestrial fauna						
FFMP13	Implement the Project Fauna Rescue and Release Procedure detailed in Section 7.4 of this Plan.	Fauna Rescue and Release Procedure	Prior to construction	Contractor Environment Manager	REMM B10	Project records Implementation of Rescue and Release Procedure
FFMP14	A Microbat Monitoring Program will be developed to address impacts, detail mitigation measures and monitoring of the Large Bent-winged Bat identified at Balls Head Coal Loader.	Microbat Monitoring Program	Prior to construction with potential impacts on microbat roost at the Coal Loader tunnel at Waverton	Contractor	MCoA C6(c) and E41-E44 REMM B6, B8-B10, B12, B30	Preparation and implementation of a Microbat Monitoring Program
FFMP15	Undertake monitoring of Large Bent-winged Bats in the Coal Loader as described in the Microbat Monitoring Program for work that impacts microbats.	Microbat Monitoring Program	During construction	Contractor	MCoA E42 REMM B8	Monitoring reporting as described in the Microbat Monitoring Program
FFMP16	Prior to construction commencing, a further survey will be carried out. If the Penrith Grey-headed Flying-fox camp boundary as identified in the BDAR has moved or expanded to within 300m of the Emu Plains (WHT13) construction support site, a Grey-headed Flying-Fox Management Plan will	Appropriately qualified ecologist	During construction	Environment Manager	REMM B34	Grey-headed Flying-Fox Management Plan if required

ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Source	Evidence
	be prepared by an experienced and appropriate qualified ecologist to manage noise, vibration and lighting impacts generated by site establishment activities.					
Invasion and spread of weeds, pests, pathogens and disease						
FFMP17	The weed management protocol contained within this Plan will be implemented throughout construction.	Weed Control Protocol	During construction and during regenerative activities	Contractor	REMM B14 REMM B15	Implementati on of Weed Control Protocol Site records
Landscape Strategy						
FFMP18	A Landscape Strategy Report will be prepared which details the type, size, number and location of replacement trees. The report will demonstrate how any replacement plantings are consistent with the requirements of Condition E184 and Condition E185. The report must be submitted to the Planning Secretary for information no later than nine months following the commencement of operation.	Landscape Strategy Report	During and Post Construction and regenerative activities	Contractor	MCoA E187 MCoA E184 MCoA E185	Preparation of the Landscape Strategy Report
Replacement Planting						

ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Source	Evidence
FFMP19	Existing trees adjacent to the works will be retained and protected where possible to screen construction support sites, prioritising trimming over clearing where possible.	Detail design Sensitive Area Maps Exclusion fencing	During and Post Construction	Contractor Environment Manager	REMM V8 REMM V9	Site Records Landscape Strategy Report
FFMP20	All areas disturbed by construction and not required for operation of the project will be restored to existing condition or in accordance with the urban design and landscape plan where applicable (environmental management measure V12).	Urban Design and Landscape Plan	During and Post Construction and regenerative activities	Contractor	REMM V10	UDLP
FFMP21	Replacement and enhancement of vegetative screening along the project corridor must be undertaken in a progressive manner during construction to allow for the early establishment of vegetative screening.	Landscape Strategy Report	During and Post Construction and regenerative activities	Contractor	REMM V11 MCoA E186	Site Records Landscape Strategy Report

8 Compliance management

Compliance with this Plan will be measured against the targets outlined in Section 2.3 of this plan through ongoing monitoring throughout the construction of the Project.

8.1 Roles and responsibilities

The ACCIONA Project Team's organisational structure and overall roles and responsibilities as well as the Environmental Representative and required specialists are outlined in Section 5.7 of the CEMP. Specific responsibilities for the implementation of environmental controls are detailed in Section 7 of this Plan.

8.2 Training

All employees, contractors and utility staff will undergo site induction training relating to flora and fauna management issues. The induction training will address site and/or construction activity specific impacts relating to flora and fauna management, including:

- Existence and requirements of this Plan
- Management of unexpected finds
- Relevant legislation and guidelines
- Specific species likely to be affected by the construction works and how these species can be recognised
- Fauna rescue requirements
- General flora and fauna management measures
- Specific responsibilities for the protection of flora and fauna.

Further details regarding staff induction and training are outlined in Section 5.9 of the CEMP.

8.3 Monitoring and inspections

Inspections of sensitive areas and activities with the potential to impact flora and fauna will occur as part of weekly environmental inspections for the duration of the project. General monitoring and inspection requirements relevant to this Plan are listed in Table 8-1.

Additional requirements and responsibilities in relation to monitoring and inspections are documented in Section 5.12.1 and 5.12.3 of the CEMP.

Table 8-1: General monitoring requirements relating to flora and fauna

Monitoring activity	Requirement
Pre-clearance survey (terrestrial)	Surveys conducted as required prior to clearing or disturbance in accordance with Section 7.2
Inspection and maintenance of exclusion zones	Inspection and maintenance of exclusion zones within or adjoining the construction footprint.
Specific monitoring programs	As required by the: • Microbat Monitoring Program

8.4 Auditing

Audits (both internal and external) will be undertaken to assess the effectiveness of environmental controls, compliance with this Plan, MCoA and other relevant approvals, licences and guidelines.

Audit requirements are detailed in Section 5.13 of the CEMP.

8.5 Incidents and Non-compliances

All incidents will be managed in accordance with Section 5.11 of the CEMP.

All non-compliances will be managed in accordance with Section 5.15.1 of the CEMP.

8.6 Reporting

Reporting requirements and responsibilities are documented in Section 5.14 of the CEMP.

Specific reporting requirements associated with additional survey work and monitoring will include:

- Results of pre-clearing surveys
- Reporting on any unexpected threatened species finds
- Large Bent-winged Bat monitoring.

Incident response reporting will be carried out in accordance with Section 5.11 of the CEMP.

9 Review and improvement

9.1 Continuous improvement

As outlined in Section 5.16.1 of the CEMP, management reviews will be undertaken as part of the continual improvement process. The reviews will be initiated by the Environmental Manager and include relevant project team members and stakeholders. Continuous improvement of this plan and of monitoring requirements detailed in Section 8.3 of this Plan will be achieved by the ongoing evaluation of environmental management performance against planning approval requirements, environmental policies, objectives and targets for the purpose of identifying opportunities for improvement.

The continuous improvement process will be designed to:

- Identify areas of opportunity for improvement of environmental management and performance
- Determine the cause or causes of non-conformances and deficiencies
- Develop and implement a plan of corrective and preventative action to address any non-conformances and deficiencies
- Verify the effectiveness of the corrective and preventative actions
- Document any changes in procedures resulting from process improvement
- Make comparisons with objectives and targets outlined in Section 2.2 and 2.3 of this Plan.

9.2 Plan update and amendment

The auditing and review processes described in Section 5.13 of the CEMP may result in the need to update or revise this Plan. This will occur whenever there is a change to the construction scope or methodology that may increase the potential impacts upon biodiversity or to address relevant updates to a related Sub-plan or monitoring program (as identified in Table 1-1).

Only the Environment Manager can amend this Plan. Any update of this Plan will require endorsement by the Environmental Representative and depending on the change, process outlined in Section 5.17 of the CEMP must be followed where approval from the Planning Secretary prior to implementation of the update is required.

Appendix C1 - Weed Management Protocol

Weed Management Protocol

Western Harbour Tunnel

December 2022

1. Purpose

The purpose of this Weed Management Protocol (WMP) is to detail how ACCIONA will manage and control weeds throughout pre-construction, construction and for a period of the maintenance phase of the Project to minimise the threat to remnant vegetation, native flora and fauna habitats and waterways within the local area.

This WMP does not detail weed management of permanently landscaped areas as this will be addressed in the Place Design and Landscape Plan and Landscape Design Drawings.

2. Scope

Weed management will be implemented to control weed infestation on the Project and to limit the introduction and/or spread of weed species during construction activities. Priority and environmental weeds in the existing road corridor, construction areas and ancillary facility areas will be controlled in accordance with *Roads and Maritime Biodiversity Guidelines: Guide 6 – Weed management and Guide 10 – Aquatic habitats and riparian zones (RTA, 2011)*. Weed control, generally, will have a strong focus on:

- Restricting the area of native vegetation disturbed during construction works by application of *Roads and Maritime Biodiversity Guidelines: Guide 2 Exclusion zones (RTA 2011)*
- Restricting stockpiling to areas already cleared of vegetation.
- Controlling drainage that may contain weed propagules
- Weed hygiene protocols including inspecting and cleaning light and heavy plant and equipment; inspecting materials brought to site, especially topsoil, turf and mulch to ensure that these are weed free
- Weed hygiene protocols for marine weeds, including the inspection of all marine based vessels and equipment prior to use within Project areas
- Removing weeds prior to clearing (where practicable), in order to reduce the potential for any future weed infestation
- Revegetating disturbed sites with locally indigenous plant species to stabilise the soil and provide native vegetation cover as a method of ongoing weed control.

This WMP must be read in conjunction with the Project-specific Clearing and Grubbing Environmental Work Method Statement.

3. Induction and training

Where work is scheduled in an area that contains weeds, personnel will be advised of this in toolbox talks. The controls that are required to be implemented to minimise weed spread (i.e. weed hygiene protocols) will be implemented prior to clearing and grubbing or ground disturbance. All site personnel will be made aware of the limits of clearing and the importance of threatened species and any vegetation of significant value.

4. Weed management

Weeds are often classed in broad groups depending on their characteristics and impacts. The main groups of weeds are priority weeds (in accordance with the *Biosecurity Act 2015*), Weeds of National Significance (WoNS), National Environmental Alert List weeds, environmental weeds and agricultural weeds. The focus of this protocol is on the first four weed groups. These are discussed below, followed by the weed control protocol.

4.1 Environmental weeds and Weeds of National Significance

Environmental weeds are plants that invade native ecosystems and adversely affect the survival of indigenous flora and fauna. Environmental weeds can be foreign plants accidentally or intentionally introduced into Australia, or they can be native plants that have become weedy due to inappropriate management or because they are outside of their normal range (Source: <http://www.dpi.nsw.gov.au>).

Environmental weeds may have significant economic and social impacts, as well as environmental impacts, including:

- Reduction of biodiversity
- Cost of control
- Loss of ecotourism opportunities
- Impacts on recreational activities
- Impacts on landscape
- Degradation of water quality
- Increased risk of fire.

DECCW (2010) lists 19 species of major environmental weeds invading the habitat of *Acacia terminalis subsp. terminalis*; of these, only one, *Ligustrum lucidum*, was recorded in the vicinity of the *Acacia terminalis subsp. terminalis* in the subject land.

Weeds and/or exotic species were found in one location in the subject lands: east of the Warringah Freeway, to the south of the southbound on ramp exiting High Street. This area includes planted exotic trees such as *Populus deltoides* (Eastern Cottonwood), *Cinnamomum camphora* (Camphor laurel) and *Schinus molle* (Pepper Tree).

Two priority weeds, Lantana (*Lantana camara*) and Pampas Grass (*Cortaderia selloana*), for the Greater Sydney region (DPI, 2023c) were identified at Emu Plains (WHT13) construction support site. The MOD2 report identified the existence of weeds within the vegetation along the elevated mound between the Emu Plains site and Mackellar Street.

Table 1 provides a list of environmental weeds and weeds of national significance, the weed class to which they belong, a picture, and the DPI website where additional up-to-date information can be found on control and management methods. Further reference can be made to Noxious and environmental weed control handbook: A guide to weed control in non-crop, aquatic and bushland situations, 5th Edition. (DPI 2011) for the following and any additional priority weed species.

Table 1 Weed species and control and management details

Weed Species	WoNS	Image	Controls and management details
<i>Lantana camara</i> (Lantana)	YES	Source: Weeds profiles - Weeds Australia 	Mechanical removal or herbicide application – cut stump method, basal bark application or foliar spray
<i>Populus deltoides</i> (Eastern Cottonwood),	NO	Source: Populus deltoides – Eastern Cottonwood Blerick Trees Buy Online Trees Advanced Trees, Screening Plants, Fruit Trees	Mechanical removal or herbicide application – cut stump method, basal bark application or foliar spray

Weed Species	WoNS	Image	Controls and management details
			

Weed Species	WoNS	Image	Controls and management details
<i>Cinnamomum camphora</i> (Camphor laurel)	YES	Source: Weeds profiles – Weeds Australia 	Mechanical removal or herbicide application – cut stump method, basal bark application or foliar spray
<i>Schinus molle</i> (Peppercorn Tree).	NO	Source: Peppercorn tree (Schinus molle) VRO Agriculture Victoria	Mechanical removal or herbicide application – cut stump method, basal bark application or foliar spray

Weed Species	WoNS	Image	Controls and management details
			
<i>Ligustrum lucidum</i> (Broad leaf Privet)	NO	Source: NSW WeedWise	Mechanical removal or herbicide application – cut stump method, basal bark application or foliar spray

Weed Species	WoNS	Image	Controls and management details
			
<i>Cortaderia</i> species (Pampas grass)	NO		Physical/mechanical removal or herbicide application

5. Pathogens

In the case that pathogens are identified, these will be managed in consultation with the Project ecologist, and in accordance with *Guide 2: Exclusion zones* of the *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA, 2011).

6. Weed control

To control weed infestations pre and during construction the Environmental Manager or Environmental Advisors and Coordinators will ensure that the following steps are implemented:

1. Weed inspection

The Environmental Manager/Environmental Adviser/Coordinator will undertake an inspection with the Project Ecologist to inspect the area for weeds:

- Prior to clearing and grubbing (i.e. as part of the Pre-clearing inspection)
- When a potential weed infestation has been identified
- Before spring (around August) to identify weeds before they go to flower and seed.

Infestations of priority weeds and WoNS will be mapped with GPS by the Project Ecologist during the inspection. The Project Ecologist will closely note the specie(s) degree of infestation and capture an image of the weed for monitoring purposes.

2. Exclusion zones

The Project Ecologist will identify areas of weed infestation and exclusion zones will be established around these areas (as required) to prevent the distribution of weeds.

3. Weed treatment methodology

The Project Ecologist will advise the appropriate weed control methods, and timing for each area of works.

4. Pesticide application and record

The Environmental Manager/Environmental Adviser/Coordinator will follow the ACCIONA Pesticide Use Procedure and ensure that a Pesticide Application Record is completed and public notifications made in accordance with relevant legislation and G36, where pesticides are to be used in areas that could be accessed by members of the public. Only pesticides registered for use near water may be used near any waterways.

5. Follow-up inspection

The Environmental Manager/Adviser/Coordinator will ensure that a follow-up inspection is undertaken of identified weed infestation sites to verify the success of treatment. Where weeds cannot be effectively destroyed prior to topsoil stripping, weed-contaminated topsoil will be isolated and either encapsulated by deep burying, or disposed of at an approved offsite licensed facility as directed by the Environment Manager/Adviser/Coordinator.

6. Vehicle, plant and equipment movement plan

Site specific vehicle, plant and equipment movement plans will be prepared for each worksite that contains priority weeds. The plans will be incorporated into Progressive Erosion and Sediment Control Plans and include identification of vehicles, plant, equipment, turning and parking areas. To prevent the spread of weeds throughout the construction site and surrounding areas, the movement of weed-contaminated plant and equipment will be monitored by Foreman. The Foreman will ensure that all plant and machinery entering the site is inspected and free of weeds

applying standard weed hygiene protocols. Plant and equipment will be checked and cleaned before leaving a worksite that contains priority weeds.

Records of all construction plant screening checks will be recorded on the Mobile Plant Inspection Checklist and monitored by the Foreman.

7. Weed disposal

Where priority weed areas are disturbed by the construction activities, weeds and topsoil potentially containing weed propagules will be removed and disposed of as required by the Biosecurity Act 2015. Any weeds physically removed (particularly those bearing seeds) will be disposed of appropriately at a licensed facility in accordance with the *Biosecurity Act 2015*.

7. Ongoing management and monitoring

Monitoring of weed infestations will occur as part of the routine weekly inspections to determine the effectiveness of management controls. The presence of any weeds and the necessary management actions will be noted on the Environmental Inspection Checklist.

Appendix C2 – WHT Surface Sites



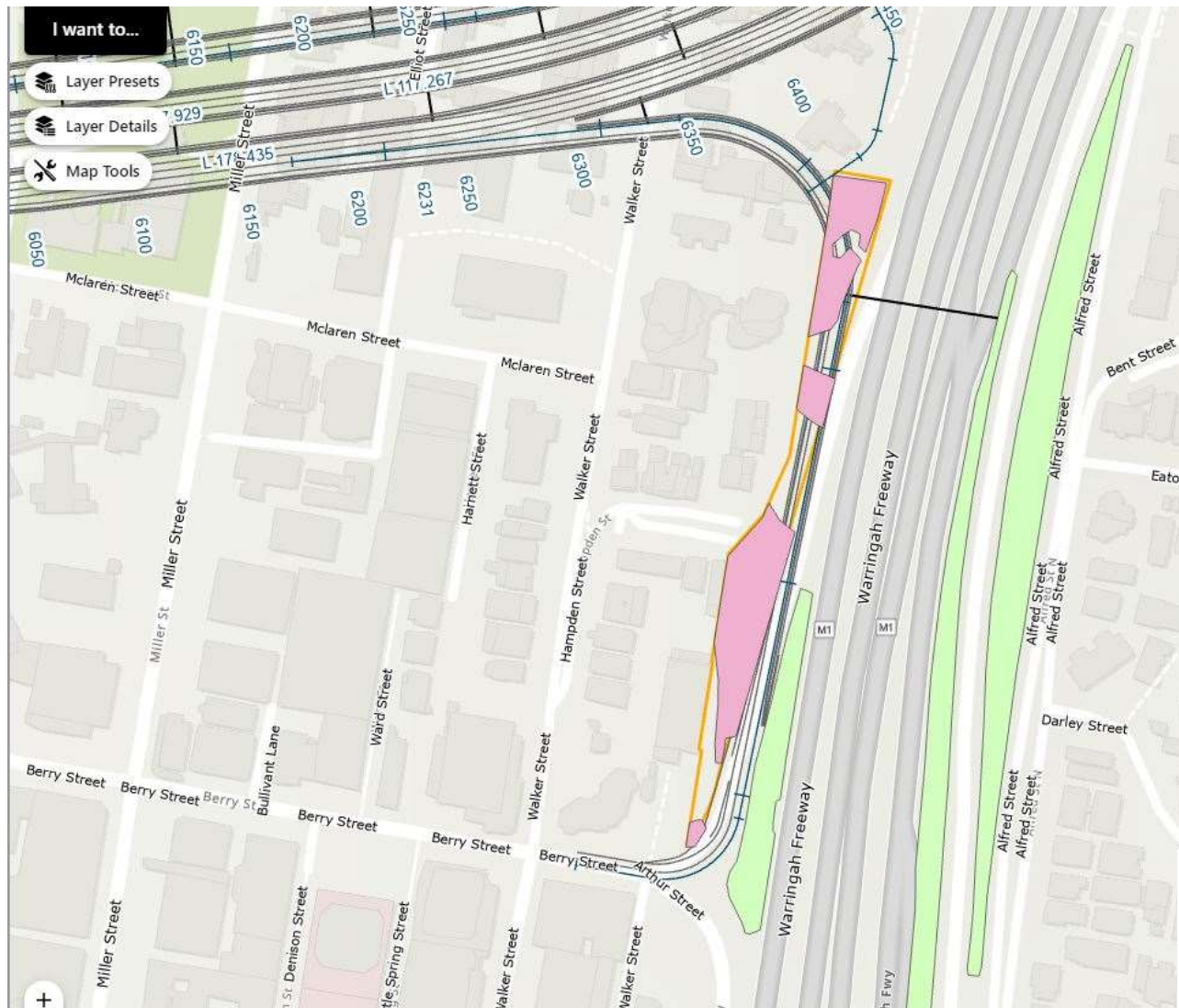


Western Harbour Tunnel – WHT Ridge Street north (WHT9) Construction Support Site

- WHT surface premise area
- Native Plantings
- Urban Exotic/Native
- Threatened Flora Species (Nov17 – 01/11/2017)

16/06/2023





Western Harbour Tunnel – WHT Berry Street north (WHT8) Construction ancillary facility

- WHT surface premise area
- Planted median
- Urban Exotic/Native

16/08/2023





Western Harbour Tunnel – WHT Glebe Island (WHT3) Construction Ancillary Facility

 WHT surface premise area

16/08/2023





Western Harbour Tunnel – WHT Emu Plains (WHT13) Construction Ancillary Facility

- PCT 4023: Coastal Valleys
- Swamp Oak Riparian Forest
- MOD2 Approved Area

- Swamp Oak Floodplain Forest of the NSW Coast Sydney Basin and South East Corner Bioregions
- Exotic Vegetation

Appendix C3 – Fauna Relocation Procedure

Fauna Relocation Procedure

Emu Plains (WHT13) construction support
site

Western Harbour Tunnel

May 2024

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Contents

Contents..... i

 Figures i

 Tables i

Glossary/ Abbreviations iii

1 Introduction 4

 1.1 Context 4

 1.2 Background 4

2 Environmental Requirements 6

 2.1 Regulatory requirements 6

 2.2 Minister’s Conditions of Approval 6

 2.3 Revised environmental mitigation measures 6

3 Procedure 8

 3.1 Known native aquatic fauna 8

 3.2 Methodology for relocation 8

 3.3 Preparation for dewatering 8

 3.4 Aquatic fauna capture 9

 3.5 Method to prevent injury to native aquatic fauna during capture and relocation 10

 3.6 Management of pest species and pathogens 10

 3.7 Relocation sites 11

4 Compliance management 13

 4.1 Roles and responsibilities 13

 4.2 Training 13

 4.3 Records 13

Figures

Figure 1-1: Waterbodies within the Emu Plains (WHT13) site (Source: Figure 14 of the WHT MOD2 BDAR). 5

Figure 3-1: Example photos of Plague Minnow and Goldfish 11

Figure 3-2: Potential receiving sites. 12

Tables

Table 2-1: REMM relevant to this procedure..... 6

Document control

Document status

Revision	Date	Description	Approval
Draft A	17/11/2023	For Project Ecologist’s review	E. Woodward
Draft B	22/11/2023	For TfNSW review	E. Woodward
Rev 00	11/12/2023	For ER Review	E. Woodward
Rev 01	09/05/2024	Updated following DPHI review	C. Weller / M. Lee

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Glossary/ Abbreviations

Abbreviations	Expanded text
BDAR	Biodiversity Development Assessment Report
CEMP	Construction Environmental Management Plan
DPE	New South Wales Department of Planning and Environment
DPI	Department of Primary Industries
EHG	Environment and Heritage Group
Environmental Representative (ER)	The Environmental Representative(s) for the CSSI approved by the Planning Secretary
EWMS	Environmental Work Method Statements
FRP or Procedure	Fauna Relocation Procedure
MCoA	Minister's Conditions of Approval
MOD2	Western Harbour Tunnel and Warringah Freeway Upgrade TBM solution of crossing Sydney Harbour – Modification 2
Project, the	Western Harbour Tunnel project
REMM	Revised Environmental Management Measures
RtS	Response to Submissions Report
TfNSW	Transport for New South Wales (formerly Roads and Maritime)
WHT	Western Harbour Tunnel

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1 Introduction

1.1 Context

This Fauna Relocation Procedure (FRP or Procedure) has been prepared for the Western Harbour Tunnel (WHT) (the Project) component of the Western Harbour Tunnel and Warringah Freeway Upgrade project (SSI #8863).

This procedure has been prepared to address the requirement of revised environmental mitigation measure (REMM) B35 and describes how the Contractor proposes to dewater from swales/waterbodies at the Emu Plains (WHT13) construction support site where native fauna species may inhabit.

This procedure has been prepared in consultation with a suitably qualified and experienced ecologist and in line with the *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA, 2011).

1.2 Background

A biodiversity survey was conducted during April 2023 as part of the preparation of the Biodiversity Development Assessment Report (BDAR) for MOD2. The survey identified numerous unmapped waterbodies occurred within and surrounding the Emu Plains (WHT13) construction support site . Refer to Figure 1-1. The water quality was extremely degraded (sediment laden) and unlikely to provide habitat for aquatic fauna

Most of these waterbodies are located within the site and have been constructed for the purpose of stormwater management as part of Boral's quarry operation. The waterbodies within the Emu Plains site are constantly changing, per the ongoing needs of the quarry operations.

The MOD2 Response to Submission clarified that all waterbodies within the boundary of Emu Plains (WHT13) construction support site will be dewatered. Noting that these waterbodies were constructed for the existing Boral Quarry operations and the potential for the waterbodies to provide habitat for aquatic fauna would be intermittent only and dependent on the water quality at the time of dewatering. However, in response to EHG's request, REMM B35 was added to prepare a fauna handling procedure prior to the dewatering of swales/waterbodies mapped by the BDAR (i.e. Figure 1-1 below) within Emu Plains (WHT13) construction support site .

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Figure 1-1: Waterbodies within the Emu Plains (WHT13) site (Source: Figure 14 of the WHT MOD2 BDAR).

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2 Environmental Requirements

2.1 Regulatory requirements

2.1.1 Legislation

A register of legal and other requirements for the Project is contained in Appendix A1 of the CEMP. The register will be maintained by the ACCIONA Environment Manager. This register is a live document and will be reviewed as part of Management Reviews (Section 5.17 of the CEMP). Any updates to the legal requirements register will be communicated to the wider project team, including subcontractors where necessary.

2.2 Minister's Conditions of Approval

There are no MCoA applicable to the preparation of this procedure.

2.3 Revised environmental mitigation measures

The REMM relevant to the preparation of this procedure are listed in Table 2-1 below.

Table 2-1: REMM relevant to this procedure

REMM	Condition Requirements	Document Reference	How Addressed
B35	A Fauna Relocation Procedure will be prepared in consultation with a suitably qualified and experienced ecologist in line with the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA, 2011), prior to dewatering of swales/waterbodies mapped by the BDAR within WHT13. The project ecologist will provide oversight during the implementation of this Procedure. The Procedure must include details on, but not be limited to, the following:	Section 1.1 Section 4.1	This procedure has been prepared in consultation with a suitably qualified and experienced ecologist and in line with the <i>Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (RTA, 2011). The Project Ecologist will provide oversight during the implementation of this procedure.
	the native fauna species known to inhabit and/or use the waterbodies which require transfer	Section 3.1	Known native fauna species are described in Section 3.1.
	the methodology proposed to transfer the fauna	Section 3.2 to Section 3.4.	Methodology proposed to transfer and relocate fauna is described in Section 3.2 to Section 3.4.
	the location and suitability of the proposed relocation sites	Section 3.7	Captured fauna will be relocated to new sites determined by the project ecologist that are suitable for the species.

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REMM	Condition Requirements	Document Reference	How Addressed
	any potential impacts of relocating the fauna to the relocation sites.	Section 3.5 Section 3.7	Potential impacts to aquatic fauna to the relocation site will be minimised through the measures described in Section 3.5.

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3 Procedure

This procedure only applies in the event dewatering is required for waterbodies within the Emu Plains (WHT13) construction support site, as identified in Figure 1-1.

3.1 Known native aquatic fauna

Searches using the Freshwater Threatened Species Distributions Maps (DPI, 2023a) were undertaken as part of the BDAR for MOD2 application to produce a list of threatened freshwater fish species that may occur within the Emu Plains (WHT13) construction support site. No threatened freshwater fish species were identified or considered likely to occur.

A survey was conducted during the preparation of the BDAR for the MOD2 application, which identified numerous unmapped waterbodies occurred within and surrounding the Emu Plains (WHT13) construction support site. Refer to Figure 1-1. The water quality was extremely degraded (sediment laden) and is unlikely to provide habitat for aquatic fauna.

The Response to Submission for MOD2 noted that these waterbodies were constructed for the existing Boral Quarry operations and the potential for the waterbodies to provide habitat for aquatic fauna would be intermittent only and dependent on the water quality at the time of dewatering."

No native fauna are known to occur, however depending on the water quality at the time of dewatering, protected species may be present e.g. Short and Long-finned Eels, Eastern Long-necked Turtles and several amphibian species.

3.2 Methodology for relocation

3.2.1 Environmental Work Method Statement

Relevant Environmental Work Method Statement (EWMS) will be prepared with reference to this procedure, drawing from this Plan and other relevant information from the CEMP. The EWMS will incorporate the appropriate mitigation measures and controls, including those identified in relevant CEMP Sub-plans.

3.3 Preparation for dewatering

The following is required, prior to commencing dewatering:

- The waterbody would be surveyed by the project ecologist prior to dewatering to determine the actual or likely aquatic species composition within the waterbody to be dewatered.
- The project ecologist would identify and assess receiving sites taking into consideration current aquatic fauna species inhabiting the receiving water body, as well as assessment of risks to both resident and relocated aquatic fauna.
- If required, additional approvals to be obtained prior to dewatering commencement such as property access if the proposed relocation site is on private property.
- Set up of measures to minimise harm to aquatic fauna (e.g. sediment fences to direct aquatic fauna to suitable locations for relocation (e.g. turtles, frogs etc that may be disturbed during dewatering and attempt to escape, potentially increasing their risk of mortality by getting onto roads etc
- Obtain and set up approximately sized mesh to cover the inlets on dewatering pumps that will prevent small aquatic fauna being injured or killed during the pumping process, mesh must still allow sediment to pass through.

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- License requirements – the Project Ecologist to notify NSW Fisheries prior to fish relocation (unless an agreement is in place), including locations of dewatered and receiving sites (Nearest office is Mosman 02 4982 1232, refer to <https://www.dpi.nsw.gov.au/contact-us/local-office> for other office contacts). Fisheries require permits to be carried by the licensed ecologist; who should also display a sign clearly showing licence number (if working in public areas, especially when releasing fauna to local creeks).

Note, all dewatering will require relevant permits as described in the Soil and Water Management Plan, which forms part of the Construction Environment Management Plan.

3.4 Aquatic fauna capture

Management of aquatic fauna during dewatering will be directed by the Project Ecologist. The general methods used for aquatic fauna capture will include but not be limited to:

- Check and if required, change mitigation measures to reduce aquatic fauna mortality during preparation works.
- Suitably qualified aquatic ecologists to enter the partially dewatered dam and search for remaining fauna.
- The dewatering schedule will allow time for fish rescue, especially during the final 0.3–0.5m water depth (to be advised by Project Ecologist), and include regular checks of the hose inlet to prevent pump clogging from sediment (i.e. checking and clearing of sediment and aquatic debris from the mesh inlet to ensure proper pump function).
- Native fauna will be collected by hand nets during the final phase of dewatering. This is most effective when the water is less than 0.3 metres deep. Larger fish should be targeted first due to the rapid decrease of dissolved oxygen concentration as the water volume decreases. Refer to Section 3.4.1 for further details on the transferral of native fauna.
- Holding tanks will be kept shaded to prevent harmful increases in temperature. Care will be taken as to not overcrowd water containers to limit the spread of diseases and predation.

3.4.1 Aquatic fauna relocation

During dewatering, the type and number of aquatic/semi-aquatic fauna captured and relocated will be recorded including species identification, health of individual upon release. Any deaths to native fauna during dewatering or relocation should also be recorded. Refer to Section 4.3 for further details.

Native Fish

The following methods should be applied during relocation of native fish if encountered:

- Native fish are to be transported in aerated containers of water from the origin waterbody to the release location.
- The number of fish per container should be managed to avoid depletion of water oxygen levels and fish should aim to be released within 30 minutes of capture.
- Fish should not be stored in containers for long periods of time due to fluctuations in water temperatures due to differing ambient temperatures.
- Containers should be carefully transported between the waterbody and the receiving locations.
- Prior to releasing fish at release locations, water from release location should be added to the holding container to allow some acclimatisation.

Following this, the containers should be submerged, opened and allowed to remain in the water until fish self-relocate to their new environment. Native fish should not be swiftly poured out of holding containers at the receiving site.

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Native Eels

The following methods should be applied during relocation of native eels if encountered:

- Eels should be stored separately from fish in containers of water from the origin waterbody.
- If large numbers of eels are captured during de-watering activities, they should be spread across several release locations to avoid increases in predation pressures at a single release location.
- Eels can be readily removed from holding containers and released at receiving locations.

Native Frogs

The following methods should be applied during relocation of native frogs if encountered:

- Frogs should be transported as individuals in aerated plastic bags between the origin waterbody and the recipient site.
- Frogs will be released into dense aquatic and pond side vegetation to provide shelter against predators.
- Release will also preferably be undertaken after sunset.
- Frogs will be captured in aerated plastic bags (with the use of gloves) and kept as one per bag for release. This will be in accordance with the *Hygiene guidelines Protocols to protect priority biodiversity areas in NSW from Phytophthora cinnamomi, myrtle rust, amphibian chytrid fungus and invasive plants* (DPIE Environment, Energy and Science, 2020).

Native turtles

The following methods should be applied during relocation of native turtles if encountered:

- Turtles should be transported in dry containers from the origin waterbody to the release location.
- Turtles should be released at the water's edge at the release locations.

3.5 Method to prevent injury to native aquatic fauna during capture and relocation

The Project Ecologist will have oversight during the implementation of this procedure. A number of methods which should be applied to prevent injury to fauna during de-watering include:

- A mesh guard will be secured at the pump intake to limit aquatic fauna being sucked into the pump.
- Working slowly and methodically through the waterway to limit trampling of aquatic fauna.
- The use of gloves to limit the spread of disease.
- Limit holding time in aerated containers to half an hour.
- Shading of holding containers.
- By having a release point nearby to minimise transportation time and stress to aquatic fauna.
- The water will be released slowly and in a controlled manner to allow recovery of aquatic fauna, specifically fish, before the water level becomes too low.

3.6 Management of pest species and pathogens

Non-native species such as Plague Minnow (*Gambusia holbrooki*) and Goldfish (*Carassius auratus*) may occupy the waterbodies to be dewatered. Refer to Figure 3-1 below. These species

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cannot be released into receiving waterways and will be euthanized, by the Project Ecologist, who has been trained in humane methods for all aquatic non-native species. Records of all animals that are euthanised will be kept and made available to the Environmental Representative.



Figure 3-1: Example photos of Plague Minnow and Goldfish

To minimise the potential spread of pathogens, all personnel undertaking fauna handling and relocation work will ensure that decontamination processes are followed in accordance with relevant guidelines. Equipment that comes in contact with the aquatic fauna, water or potentially contaminated sediments, such as boots, will be cleaned with an appropriate cleaning solution and/or disinfectant. Disposable gloves will be worn when handling aquatic fauna. New disposable gloves should be used between the waterbody to be dewatered and the receival site.

Further information on basic hygiene protocols to prevent the spread of disease and weeds in NSW can be found in *Hygiene guidelines Protocols to protect priority biodiversity areas in NSW from Phytophthora cinnamomi, myrtle rust, amphibian chytrid fungus and invasive plants* (DPIE 2020).

3.7 Relocation sites

Captured aquatic fauna will be relocated either further downstream within the same stream complex or to new sites that are suitable for the species, in consultation with the Project ecologist. Relocation into the same stream complex may have advantages to finding alternative sites, including:

- Minimise the potential for aquatic fauna competition or predation; and
- Minimise risk of disease transfer.

The Project anticipates relocating any captured aquatic fauna to nearby natural and artificial waterbodies. Refer to Figure 3-2 below for several examples of potential receiving sites. The current proposed relocation sites are within the Boral property, however, should additional receiving sites on private property be required or preferred by the Project Ecologist, relevant property owner permissions will be sought. In these cases, consultation with the property owner will also be undertaken as required, including the current and/or proposed future use of the waterbody.

Prior to relocation of captured aquatic fauna, the Project Ecologist should be satisfied that new habitat and water quality are suitable for the species to be relocated.

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Figure 3-2: Potential receiving sites.

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4 Compliance management

4.1 Roles and responsibilities

The Project Team's organisational structure and overall roles and responsibilities as well as the Environmental Representative and required specialists are outlined in the CEMP.

ACCIONA's Environmental Manager is responsible for ensuring the effective implementation of this procedure and the training of site personnel in the requirements of this procedure. This responsibility may be delegated to the Project Environmental Adviser and Project Ecologist.

The Project Ecologist will provide oversight during the implementation of this procedure.

4.2 Training

All employees and contractors will undergo site induction training relating environmental management issues. The induction training will address site and/or construction activity specific impacts, including:

- Existence and requirements of the CEMP and CEMP Sub-plan
- Relevant legislation
- Roles and responsibilities
- Procedures to be implemented in the event of an unexpected discovery of potential heritage find, unexpected discovery of contaminated land and unexpected threatened species find.
- Soil and water quality management and protection measures

Further details regarding staff induction and training are outlined in the CEMP.

All site personnel involved in the dewatering of waterbodies within the Emu Plains (WHT13) construction support site, as identified in Figure 1-1, will be trained and made aware of this procedure.

An Environmental Work Method Statement (EWMS) for the Emu Plains (WHT13) Site Establishment phase will refer to this procedure and how to manage and control dewatering activities in a manner that does not cause harm to the environment.

Training will include inductions, toolbox talks, pre-starts and targeted training as required.

4.3 Records

Records of relevant data, including records of species captured and relocated during the dewatering process will be maintained by the Project Ecologist and summary report provided outlining:

- Date and time of fauna capture
- Type and number of species captured (including species identification number)
- Health of individual species upon release
- Location of release for each species
- Date and time of release
- Details of personnel carrying out fauna capture and release and their qualifications and licenses to carry out the work
- Details of exotic fauna euthanised will also be kept

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- Details of any deaths to native fauna during dewatering or relocation should also be recorded.

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