Appendix B1: Flora and Fauna Management Sub-Plan

CABRAMATTA LOOP PROJECT

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ACKNOWLEDGEMENT TO COUNTRY

Fulton Hogan acknowledges the Cabrogal of the Darug Nation People as the Traditional Owners of the land we are working on, and pay our respect to their Elders past, present and emerging.

We recognise their deep connection to Country and value the contribution to caring for, and managing the land and water.

We are committed to pursuing genuine and lasting partnerships with Traditional Owners to understand their culture and connections to Country in the way we plan for and carry out the delivery of the Works.

Fulton Hogan

Document control

This is an e-copy of the Plan and it interfaces with the other associated plans, which together describe the proposed overall project management system for the project.

The latest revision of this plan is available on the Fulton Hogan server. If any unsigned hard copies of this document are printed, they are valid only on the day of printing.

The revision number is included at the bottom of each page. When revisions occur, the entire document will be issued with the revision number updated accordingly for each owner of a controlled copy.

Attachments/Appendices to this plan are revised independently of this plan.

Revision History

REV	DATE	AUTHOR / REVISED BY	ENDORSED BY	BRIEF DESCRIPTION OF CHANGE
0	13/07/2021	[redacted]	[redacted]	Initial issue for ARTC review
1	02/08/2021	[redacted]	[redacted]	Revised in response to comments from ARTC and initial issue for ER review.
2	30/08/2021	[redacted]	[redacted]	Revised in response to comments from ARTC, ER and Alternate ER.

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Glossary/ Abbreviations

Term/ abbreviation	Definition
ARTC	Australian Rail Track Corporation
CEMP	Construction Environmental Management Plan
CoA	The Minister's conditions of approval for the CSSI.
Construction Boundary	Has the same meaning as the definition of the term in the Project approval: The area required for project construction as described in the documents listed in **Condition A1**.
CSSI	Critical State Significant Infrastructure, as described in Schedule 1 of the project approval, the carrying out of which is approved under the terms of the project approval.
DPI	NSW Department of Primary Industries
DPIE	NSW Department of Planning, Industry and Environment
DPIE EES Group	Environment, Energy and Science Group of DPIE
DPIE Water Group	Water Group of DPIE and the National Resources Access Regulator
Ecologically sustainable development	Using, conserving and enhancing the community's resources so that the ecological processes on which life depends are maintained and the total quality of life now and in the future, can be increased (Council of Australian Governments, 1992).
EIS	Environmental Impact Statement
ENM	Excavated Natural Material, as defined in *The excavated natural material exemption*.
EPA	NSW Environment Protection Authority
EP&A Act	*Environmental Planning and Assessment Act 1979*
EPL	Environment Protection Licence under the POEO Act
ER	Environmental Representative for the CSSI
ESCP	Primary Erosion and Sediment Control Plan
EWMS	Environmental Work Method Statement
FFMP	Flora and Fauna Management Sub-Plan
HP	Hold Point: a point in the construction or verification process beyond which work may not proceed without receiving authorisation from the appropriate party.
Minister, the	NSW Minister for Planning and Public Spaces
NA	Not applicable
Non-compliance	Failure to comply with the requirements of the Project Approval or any applicable license, permit or legal requirements.
Non-conformance	Failure to conform to the requirements of project system documentation including this PCEMP or supporting documentation.
OEH	Office of Environment and Heritage
OEMS	Operational Environmental Management System
Planning Secretary, the	Has the same meaning as the definition of the term in the Project approval: Planning Secretary of DPIE (or nominee, whether nominated before or after the date on which the project approval was granted)

Term/ abbreviation	Definition
Planning Secretary's approval or agreement, the	Has the same meaning as the definition of the term in the Project approval: A written approval or agreement from the Planning Secretary (or nominee)
PCT	Plant Community Type
POEO Act	*Protection of the Environment Operations Act 1997* (NSW)
Project, the	Cabramatta Loop
Project approval, the	The Minister's approval for the CSSI.
Publicly Available	Has the same meaning as the definition of the term in the Project approval: To be made available on the website required under Condition B10 of the project approval.
Relevant council(s)	Has the same meaning as the definition of the term in the Project approval: Any or all as relevant, Fairfield City Council or Liverpool City Council.
RMM	Revised Mitigation Measure
TfNSW	Transport for NSW
UDLP	Urban Design and Landscape Plan
Work	Has the same meaning as the definition of the term in the Project approval: Any physical work for the purpose of the CSSI including construction and low impact work.

1. Introduction

1.1. Purpose

This Flora and Fauna Management Sub-Plan (FFMP) describes how Fulton Hogan will manage construction of the Cabramatta Loop Project (the project) to ensure that impacts on flora and fauna are minimised.

This FFMP has been prepared to detail how Fulton Hogan will comply with the project approval, and implement and achieve relevant performance outcomes, commitments and mitigation measures specified in the EIS as amended by the Submissions Report (also known as 'Revised Mitigation Measures' (RMM)) during *construction* of the project. Additionally, this FFMP has been prepared to address the requirements of ARTC Technical Specification and Works Description (TSWD) Appendix 04 Additional Environmental Requirements and Environment Protection Licence (EPL) Number 3142 (held by ARTC for railway activities – railway infrastructure operations) to the extent that it applies to Fulton Hogan's activities.

For the avoidance of doubt, the CEMP (including this FFMP) relates to the construction phase only. Detailed design environmental requirements will be addressed as part of the detailed design phase, separate to the CEMP approvals process. Detailed design is generally completed about six months after CEMP approval. In addition, operational environmental requirements will be met during the operational phase (upon the completion of construction) and addressed in the Operational Environmental Management System (OEMS) required under CoA D1.

1.2. Background

Chapter 11 of the EIS assessed the extent and magnitude of potential impacts of construction and operation of the project on biodiversity. As part of this, a detailed biodiversity assessment was undertaken and included in the EIS as:

- EIS Volume 3 – Technical Report 4 – Cabramatta Loop Project: Biodiversity Development Assessment Report, prepared by GHD for ARTC, dated August 2019.

1.3. Structure of FFMP

This FFMP is part of Fulton Hogan's environmental management framework for the project and is supported by other documents, such as Environmental Work Method Statements. The review and document control processes for this FFMP are described in Chapters 11 and 12 respectively of the CEMP.

1.4. Consultation for Preparation of the FFMP

In accordance with CoA C4, no government agency or council consultation is required during the preparation of this FFMP.

Ongoing consultation will be undertaken during detailed design and construction of the project as required by the environmental documents. This will be subject to a separate consultation process to that required for preparation of this FFMP.

2. Objectives, Targets and Environmental Performance Outcomes

2.1. Objectives

The key objective of the FFMP is to ensure that impacts to flora and fauna are minimised and within the scope permitted by the project approval. To achieve this objective, Fulton Hogan will undertake the following:

- Ensure appropriate controls and procedures are implemented during construction activities to avoid or minimise potential adverse impacts to flora and fauna along the Project corridor
- Ensure appropriate measures are implemented to address the relevant CoA and RMM outlined in Table 2 and Table 3 respectively.
- Ensure appropriate measures are implemented to comply with all relevant legislation and other requirements as described in Chapter 3 of this FFMP.

2.2. Targets

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

- Ensure full compliance with the relevant legislative requirements, CoA and RMM outlined in Table 2 and Table 3 respectively.
- Minimise or avoid impacts on native flora and fauna
- Ensure notification of any unexpected threatened species/ TECs during construction.

2.3. Environmental Performance Outcomes

The construction-related environmental performance outcomes relevant to this FFMP are listed in Table 1. A cross reference is also included to indicate where the environmental performance outcome is addressed in this FFMP in terms of how it will be implemented and achieved.

Table 1: Environmental Performance Outcomes Relevant to Flora and Fauna Management

Key Issue (as listed in Table 22.5 of the EIS)	Environmental Performance Outcome	Document Reference
5. Biodiversity	The project is designed to minimise impacts on biodiversity. Where practicable, the design minimises the need to clear vegetation.	Detailed Design
	The project would minimise further impacts on biodiversity through the implementation of relevant mitigation measures.	Chapter 6 mitigation measures
	Potential impacts on biodiversity are managed in accordance with relevant legislation.	Section 3.1
	No offsets are required for the project.	Section 4.2

3. Legal and Other Requirements

3.1. Legislation

Legislation relevant to flora and fauna management includes:

- *Environmental Planning and Assessment Act 1979* (EP&A Act)
- *National Parks and Wildlife Act 1974* (NPW Act)
- *Fisheries Management Act 1994* (FM Act)
- *Pesticides Act 1999*
- *Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)* (EPBC Act)
- *Biosecurity Act 2015*
- *Native Vegetation Act 2003.*

Relevant provisions of the above legislation are explained in the Register of Legal and Other Requirements included in Appendix A1 of the CEMP.

3.2. Guidelines and Standards

The main guidelines, standards and policy documents relevant to this FFMP include:

- Australian Standard (AS) 4373–2007, Pruning of Amenity Trees
- AS 4970-2009, Protection of trees on development sites
- NSW Department of Primary Industries, Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings, Fairfull and Witheridge, 2003
- Fishnote – Policy and Guidelines for Fish Friendly Waterway Crossings – November 2003.

3.3. Conditions of Approval

The CoA relevant to this FFMP are listed in Table 2. A cross reference is also included to indicate where the condition is addressed in this FFMP or other project management documents.

Table 2: Conditions of Approval Relevant to FFMP

CoA No.	Condition Requirements	Document Reference
PART C - CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN		
C5 (a)	The **CEMP Sub-Plans** must state how: the environmental performance outcomes identified in the documents listed in **Condition A1** as modified by these conditions will be achieved;	 Section 2.3
(b)	the mitigation measures identified in the documents listed in **Condition A1** as modified by these conditions will be implemented;	Through the implementation of this FFMP (in particular refer to Section 3.4).
(c)	the relevant terms of this approval will be complied with; and	Through the implementation of this FFMP

CoA No.	Condition Requirements	Document Reference
(d)	issues requiring management during construction (including cumulative impacts), as identified through ongoing environmental risk analysis, will be managed.	Chapter 5, second paragraph Chapter 6
C6	Details of all information requested by an agency to be included in a **CEMP Sub-plan** as a result of consultation, including copies of all correspondence from those agencies, must be provided with the relevant **CEMP Sub-Plan**.	Section 1.4
C7	Construction must not commence until the **CEMP** and all **CEMP Sub-Plans** have been approved by the ER and 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 approved by the **ER**.	CEMP (main section) Sections 1.4 and 2.2

3.4. Revised Mitigation Measures

Relevant construction-related RMM from the Submissions Report are listed in Table 3. A cross reference is also included to indicate where the measure is addressed in this FFMP or other project management documents.

Table 3: Revised Mitigation Measures Relevant to FFMP

ID No.	Revised Mitigation Measure	Document Reference
C4 Biodiversity		
Vegetation Clearance		
C4.1	Impacts to *Acacia pubescens* will be avoided. The locations of *Acacia pubescens* will be marked on plans, outlined in the CEMP, fenced on site, and avoided. Signage will be placed on relevant fencing to inform of prohibited activities in that area as part of the works.	Chapter 6 mitigation measure ID FFMM1, FFMM2, FFMM9.
C4.2	Disturbance of vegetation will be limited to the minimum necessary to construct works. Micro-siting of infrastructure will be undertaken during detailed design where practicable to minimise or avoid impacts on planted native species.	Chapter 6 mitigation measure ID FFMM7. Detailed Design
C4.3	Where the project site adjoins native vegetation, the limits of clearing will be marked and temporary fencing or flagging tape installed around the vegetated area prior to the commencement of construction activities to avoid unnecessary vegetation and habitat removal or damage.	Chapter 6 mitigation measure ID FFMM1, FFMM2, FFMM9.
C4.4	Equipment storage and stockpiling of resources will be restricted to designated areas within compound sites in cleared land.	Chapter 6 mitigation measure ID FFMM10, FFMM17.

ID No.	Revised Mitigation Measure	Document Reference
C4.5	The design and placement of any associated ancillary works such as utilities or signalling outside of the project site will avoid impacts to *Acacia pubescens* or other biodiversity values. These works will affect only cleared land or exotic vegetation.	Detailed Design Chapter 6 mitigation measure ID FFMM1, FFMM2, FFMM9.
Revegetation		
C4.6	Following removal of the temporary shared path between Sussex Street and Cabramatta Creek, revegetation will be undertaken to stabilise the site. Opportunities to work with local groups such as the Fairfield Creeks and Wetlands Group will be explored where possible. Revegetation will aim to be consistent with the pre-existing vegetation and surrounding vegetation.	Chapter 6 mitigation measure ID FFMM11.
Weeds		
C4.7	Weed management actions will be included in the CEMP to manage weeds in accordance with the NSW Weed Control Handbook (DPI, 2018). This will include the management and disposal of the weeds that were recorded within the project site including priority weeds in accordance with the biosecurity duties under the *Biosecurity Act 2015*.	Chapter 6 mitigation measure ID FFMM2, FFMM17, FFMM18, FFMM19, FMM20, FFMM21.
C4.8	Vehicles and other equipment to be used within the rail corridor will be cleaned to minimise seeds and plant material entering the project site to prevent the introduction of further exotic plant species or disease. This will include the use of vehicle wash bays or portable vehicle wash equipment such as high pressure wash units, shovels, crow bars or stiff brushes.	Chapter 6 mitigation measure ID FFMM21.
Fauna Habitat		
C4.9	The CEMP will include the locations of potential roost sites as identified in this report (eg. hollow-bearing trees, disused buildings, bridges and culverts). The CEMP will include measures to manage potential impacts to roost sites such as: ▪ Any potential roost sites that will be removed or modified will be checked for roosting bats immediately prior to work.	Section 4.5 Chapter 6 mitigation measure ID FFMM2.
	▪ Culverts are to remain open on at least one side at all times to allow any roosting bats to fly in or out.	Chapter 6 mitigation measure ID FFMM2, FFMM15. Appendix B Clearing Procedure, point 4.
	▪ Habitat to be identified for the release of mibrobats or any fauna encountered during clearing surveys	Chapter 6 mitigation measure ID FFMM2. Appendix B Clearing Procedure, points 4 and 7.

ID No.	Revised Mitigation Measure	Document Reference
	▪ Habitat trees will be felled using equipment that allows the trees to be lowered wo the ground with minimal impact (eg claw extension)	Chapter 6 mitigation measure ID FFMM2, FFMM15. Appendix B Clearing Procedure, point 6.
	▪ Animals that emerge from felled trees will be captured, inspected for injury, then relocated to pre-determined habitat identified for fauna release.	Chapter 6 mitigation measure ID FFMM2, FFMM15 Appendix B Clearing Procedure, point 7.
	▪ Where the presence or potential presence of roosting bats is noted then management actions for managing bats will be implemented in accordance with the CEMP.	Chapter 6 mitigation measure ID FFMM2, FFMM15. Appendix B Clearing Procedure, points 4 and 7.
C4.10	An unexpected finds procedure will be developed specifying measures for the management of any threatened biota or habitat resources identified during construction. The unexpected finds procedure will include the requirement for work to stop immediately if any threatened fauna is encountered and the Construction Environmental Manager to be notified. Work will recommence only once relevant approvals have been obtained as required. The species will be included in subsequent toolbox talks.	Chapter 6 mitigation measure ID FFMM3, FFMM4, FFMM5. Appendix D Unexpected Threatened Species/ TECs Procedure
C4.11	Protocols to prevent introduction or spread of chytrid fungus will be implemented following OEH Hygiene protocol for the control of disease in frogs (DECC, 2008b).	Chapter 6 mitigation measure ID FFMM15, FFMM17-FFMM21. Appendix B Fauna Handling Procedure, point 9.
C4.12	A suitably qualified person will be present during the removal of potential fauna habitat (ie the hollow-bearing tree in Jacqui Osmond Reserve and areas of planted native species) to avoid impacts on resident fauna and to salvage habitat resources as far as is practicable. Clearing surveys will include: ▪ inspections of vegetation for resident fauna and/or nests or other signs of fauna occupancy	Chapter 6 mitigation measure ID FFMM2.
	▪ capture and relocation or captive rearing of less mobile fauna (such as nestling birds) by a trained fauna handler and with assistance from Wildlife Information Rescue and Education Service (WIRES) as required	Chapter 6 mitigation measure ID FFMM15.

ID No.	Revised Mitigation Measure	Document Reference
	▪ inspection and identification/marking of hollow-bearing trees or other habitat resources adjacent to the project site to help ensure against accidental impacts	Chapter 6 mitigation measure ID FFMM2.
	▪ salvage of habitat features such as mature tree trunks and woody debris within the project site and placement within revegetation areas as far as is practicable (eg if vegetated areas are not separated by fences).	Chapter 6 mitigation measure ID FFMM2.
Land use and visual amenity		
C10.2	Temporary light spill Temporary lighting required during the construction period will be sited and designed to avoid light spill into residential properties along Broomfield Street and surrounding residential streets and ecologically sensitive areas along Cabramatta Creek.	Chapter 6 mitigation measure ID FFMM25
C10.3	Existing vegetation will be protected and retained where possible, particularly mature canopy trees. Tree removal and protection measures for trees to be retained, will be carried out as stated in the Arboricultural assessment provided in Appendix B of Technical Report 10 – Landscape and visual impact assessment.	Chapter 6 mitigation measure ID FFMM7, FFMM14.

4. Existing Environment

This Chapter provides a brief summary of what is known about flora and fauna within and adjacent to the project based on information provided in Chapter 11 of the EIS.

4.1. Threatened Flora Species

One threatened flora species, Downy Wattle (*Acacia pubescens*) was recorded in the study area during EIS field survey; a single (1) stem in slashed open space in the rail corridor just north of Warwick Farm station, and a patch of six (6) individuals in an exotic grassland on the outside edge of the rail corridor, south of Warwick Farm station. Refer to Figure 1. This species is endemic to the Cumberland Plain and is possibly a naturally occurring or regenerating population within the rail corridor in the study area. No Downy Wattle (*Acacia pubescens*) were recorded in the project site (EIS, p11.5).

A Narrow-leaved Black Peppermint (*Eucalyptus nicholii*) listed as a vulnerable species under the BC and EPBC Acts was recorded in the project site. This species naturally occurs only in the New England Tablelands from Nundle to north of Tenterfield but is widely planted as an urban street tree. The project site is well outside the species' natural distribution and the individual at the project site and other record in the locality are clearly of planted individuals of uncertain provenance and outside of natural habitat. In this context, the Narrow-leaved Black Peppermint (*Eucalyptus nicholii*) at the project site has not been treated as a threatened species requiring assessment under the Biodiversity Assessment Method (OEH, 2017) (BAM).

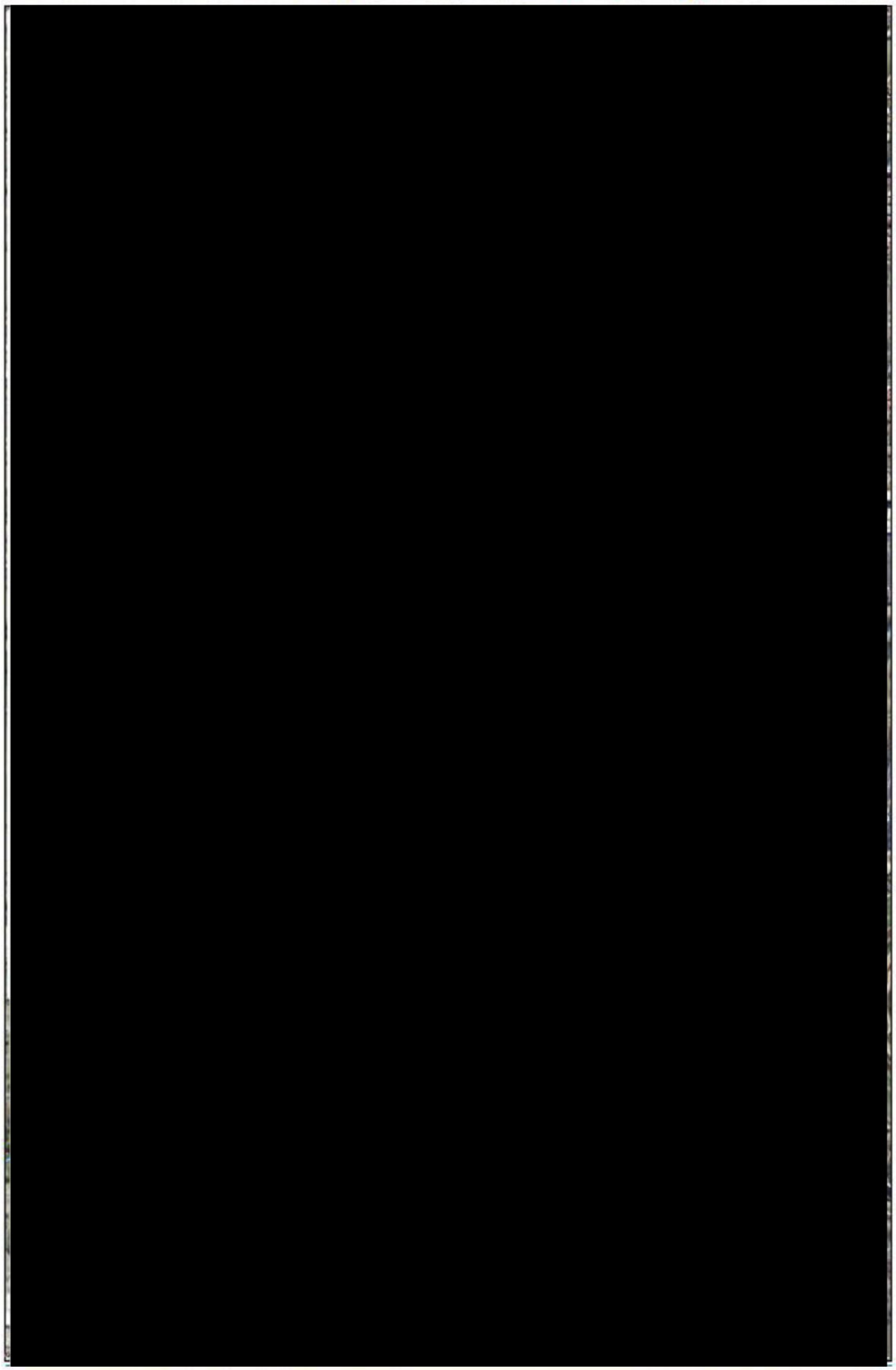

Figure 1: Vegetation and Threatened Species (EIS, p11.6)

4.2. Vegetation Communities

No native vegetation was mapped in the project site (EIS, p11.4). There are three (3) non-native vegetation map units in the project site including:

- Exotic vegetation
- Planted native species, and
- Cleared lands.

The EIS (p11.20) identified that construction of the project would remove 3.5 hectares of non-native vegetation (comprising 3.0 hectares of exotic vegetation and 0.5 hectares of planted vegetation) within an overall disturbance footprint of 6.9 hectares. This vegetation has low biodiversity value given its context and habitat value for threatened species hectares (EIS, p11.20). Much of the project site (3.4 hectares) is cleared land, comprising existing rail infrastructure, concrete paths, bitumen roads and other infrastructure. Impacts on non-native vegetation and cleared land do not require the provision of biodiversity offsets and therefore, no biodiversity offsets are required for the project (EIS, p11.20).

The channel floor and banks of Cabramatta Creek where it intersects the project site have been mapped as non-native vegetation because this reach of the creek is confined by concrete or gabions and has a gravel or concrete bed (EIS, p11.4).

There is native vegetation *outside* of the project site, within the study area, comprising (EIS, p11.4):

- Cumberland River-flat Forest, and
- Coastal Freshwater Wetland.

Table 4 lists the mapped vegetation and their equivalent PCT/ NSW Vegetation Type ID, associated condition, conservation significance and the area of the vegetation located within the project site (EIS, p11.4)

Table 4: Vegetation in the Study Area (EIS, p11.4)

Vegetation m	PCT/NSW Veg. Type ID (OEH, 2016c)	Condition	Conservation significance	Area in project site (hectares)
Cumberland River-flat Forest	835 / HN526	Medium	EEC[2] listed under the BC Act (River-flat Eucalypt Forest on Coastal Floodplains of the NSW North Coast, Sydney basin and South East Corner Bioregion)	0
Coastal Freshwater Wetland	1071 / HN630	Medium	EEC listed under the BC Act (Freshwater wetlands on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions).	0
Planted native species	n/a	Cleared/non-native vegetation		0.5
Exotic vegetation	n/a	Cleared/non-native vegetation		3.0
Cleared land	n/a	Cleared/non-native vegetation		3.4
			Total	**6.9**

4.3. Threatened Ecological Communities (TECs)

The EIS (p11.7) identified that no TECs are located within the project site. However, two listed TECs occur in the study area, including (EIS Volume 3 Technical Report 4, p30, 32):

- River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions (River-Flat Eucalypt Forest), and
- Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions (Freshwater Wetlands on Coastal Floodplains).

These TECs are shown on Figures 2 and 3 as their equivalent vegetation types/ Plant Community Types (PCTs) provided in Table 4.

Cumberland River-flat Forest in the riparian corridor of Cabramatta creek comprises a local occurrence of the TEC River-Flat Eucalypt Forest. This TEC is listed as Endangered under the BC Act and Critically Endangered under the EPBC Act. The EIS (p11.7) identified that the boundary of the project site has been set to avoid direct impacts to the River-Flat Eucalypt Forest TEC.

The Freshwater Wetlands on Coastal Floodplains TEC is listed as Endangered under the BC Act and is not listed under the EPBC Act.

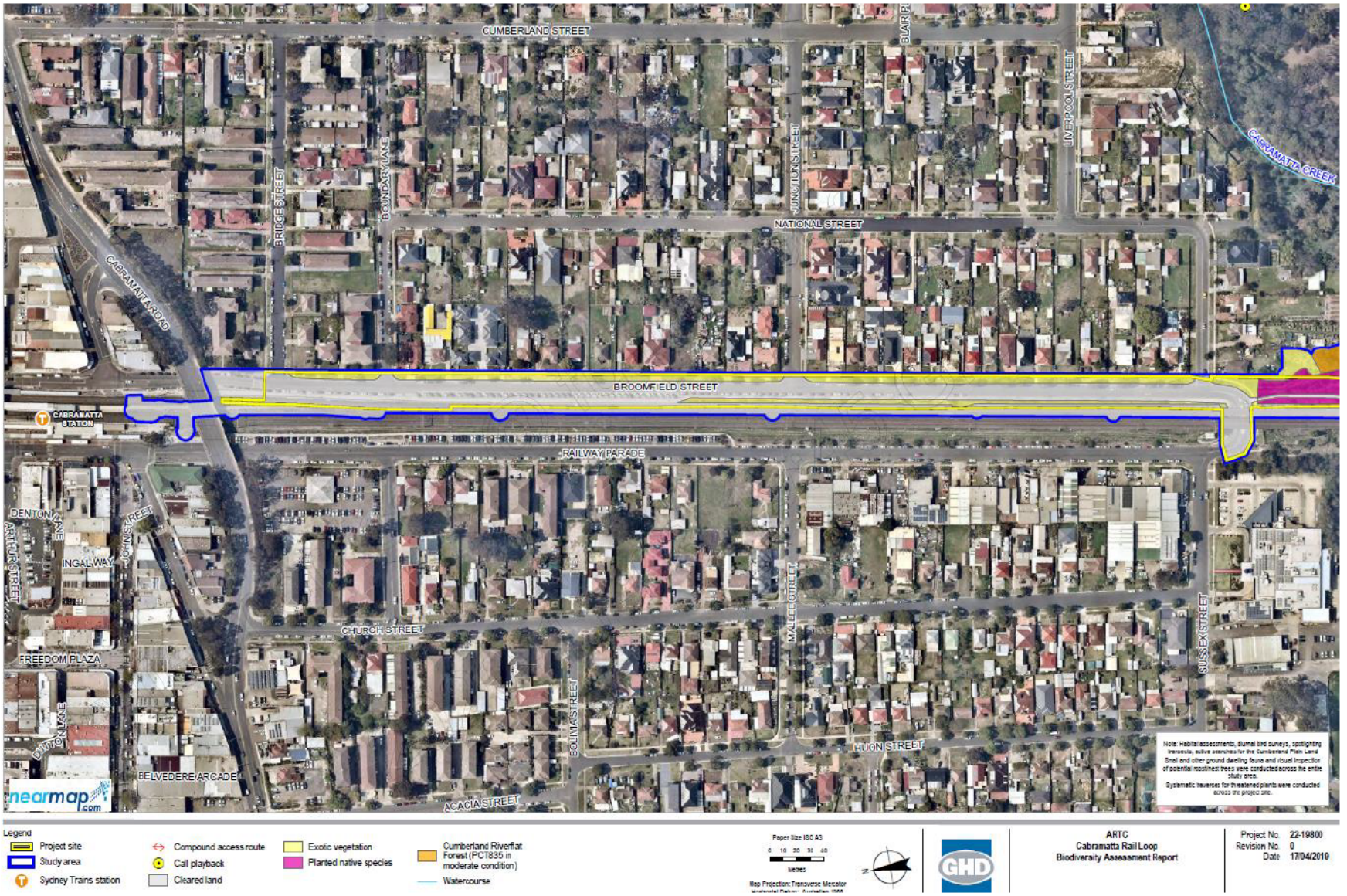

Figure 2: TECs - Sheet 1 of 3 (EIS Volume 3 Technical Report 4, p35)

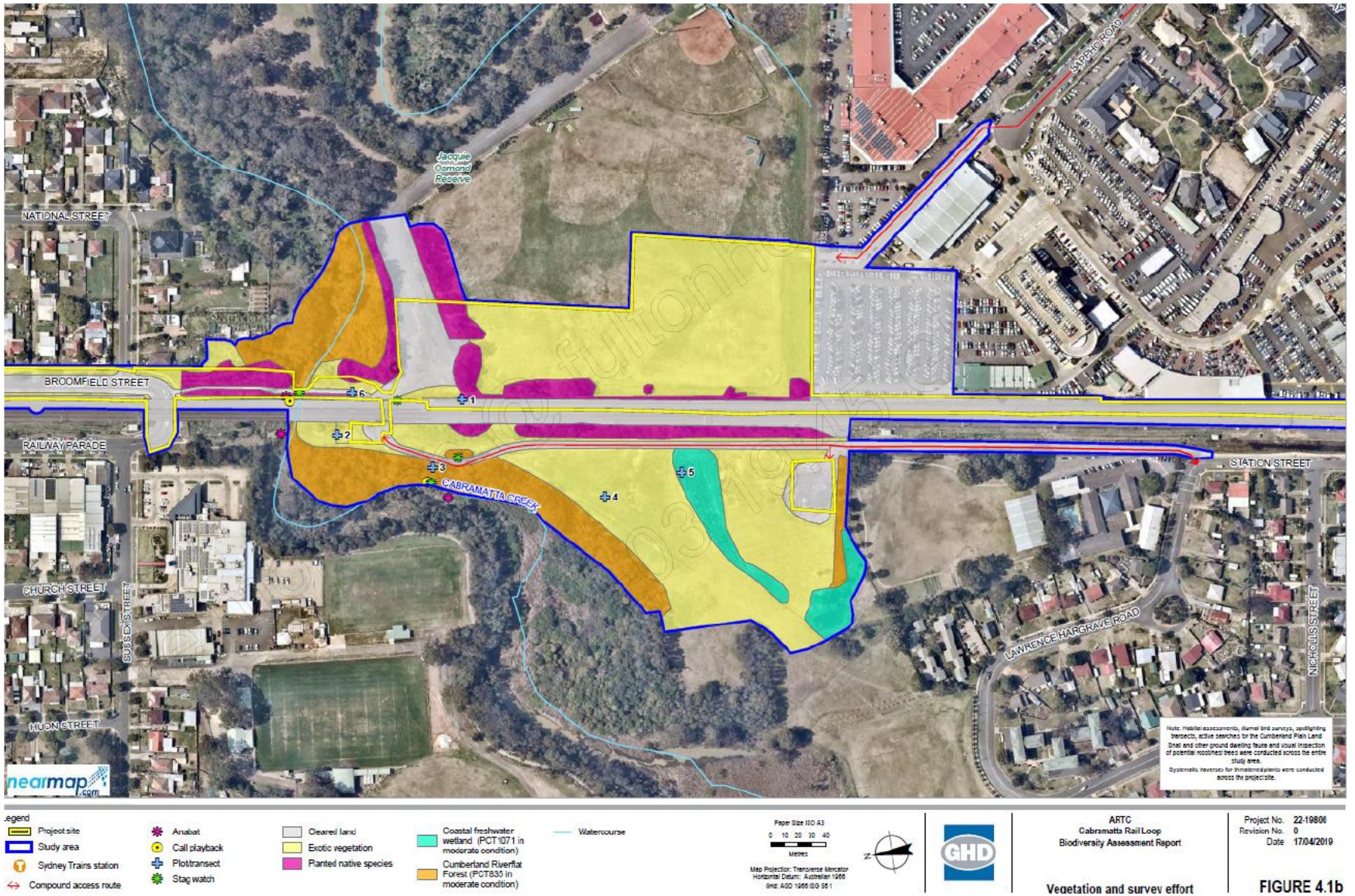

Figure 3: TECs - Sheet 2 of 3 (EIS Volume 3 Technical Report 4, p34)

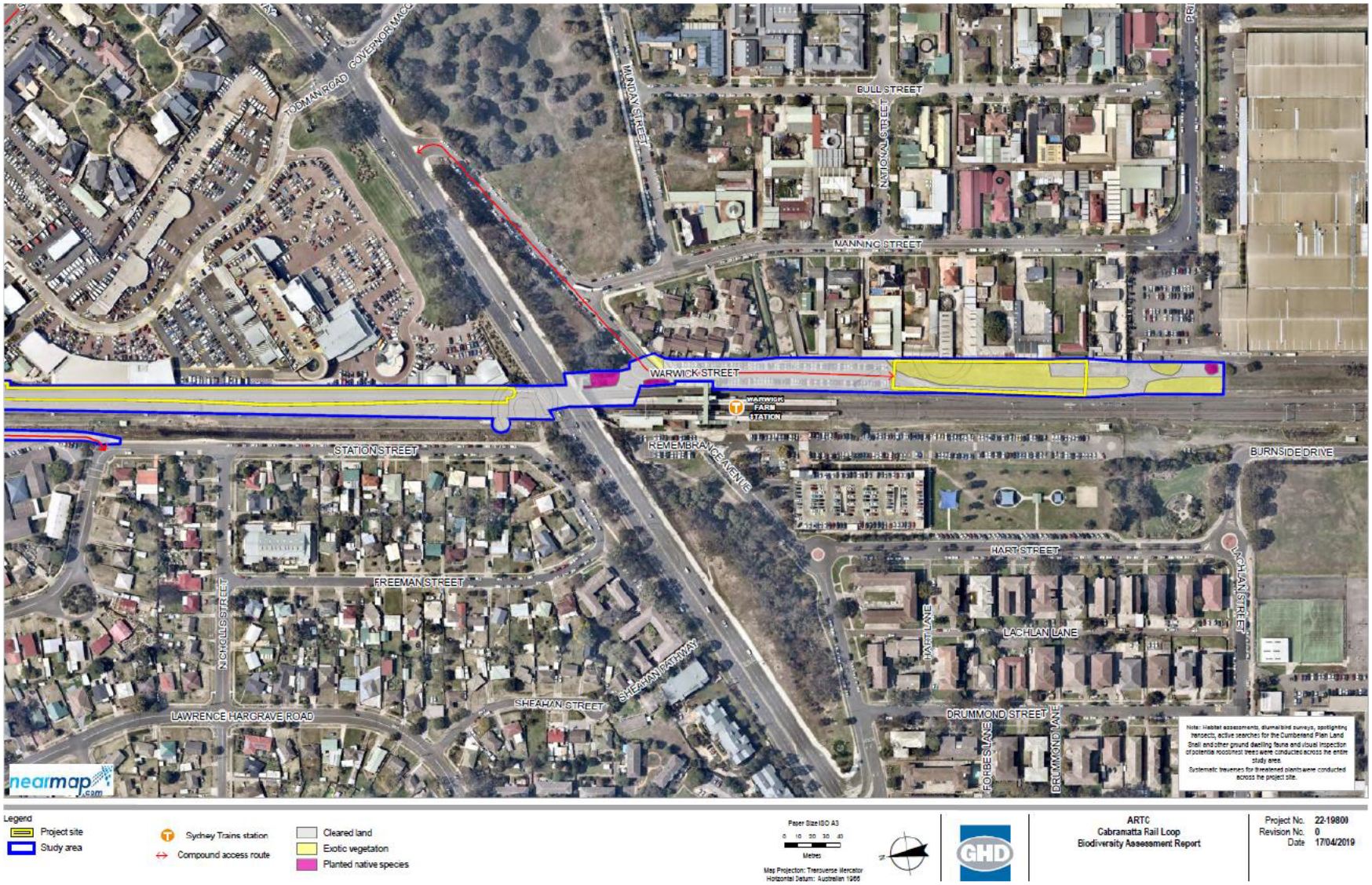

Figure 4: TECs - Sheet 3 of 3 (EIS Volume 3 Technical Report 4, p33)

4.4. High Threat Weeds

High threat weeds predicted to occur in the project site from the desktop study and following site surveys from the EIS (p11.7) are listed in Table 5.

Table 5: High Threat Weeds Related to the Study Area (EIS, p11.7)

Vegetation	Weeds predicted from the desk study
Cumberland River-flat Forest	High threat weeds were recorded in this vegetation map unit and include Kikuyu Grass, Rhodes Grass, Green Cestrum, Moth Vine, Small-leaved Privet, Bridal Creeper (*Asparagus asparagoides*), Fireweed (*Senecio madagascariensis*), Madeira Vine (*Anredera cordifolia*), Wandering Jew, African Lovegrass and Panic Veldt Grass (*Ehrharta erecta*).
Coastal Freshwater Wetland	High threat weeds recorded in this vegetation map unit and include Alligator Weed.
Planted native species	High threat weeds were recorded in this vegetation map unit and include Kikuyu Grass, Rhodes Grass, Green Cestrum, Moth Vine (*Araujia sericifera*) and Small-leaved Privet.
Exotic vegetation	High threat weeds were recorded in this vegetation map unit, including Alligator Weed (*Alternanthera philoxeroides*), Kikuyu Grass, Rhodes Grass, Balloon Vine (*Cardiospermum grandiflorum*) and Green Cestrum.
Cleared land	N/A

4.5. Terrestrial Threatened Fauna Species

While four (4) threatened fauna species were identified during EIS field survey (p11.8), only the Grey-headed Flying-fox was observed within the study area. The location of the Grey-headed Flying-fox to the east of the project is shown in Figure 1.

The EIS (p11.10) identified that the Eastern Freetail-bat, Eastern False Pipistrelle and Southern Myotis may potentially be present in the study area based on identification of recorded calls to 'probable' or 'species group' level. The study area contains aerial foraging habitat and potential roost sites for these and other microbat species in hollow bearing trees, bridges and culverts (EIS, p11.10).

The four (4) threatened fauna species identified during EIS field survey and their protected status are listed in Table 6.

Table 6: Threatened Fauna Species Recorded in the Study Area (EIS, p11.10)

Common name	Scientific name	Observation type	BC Act status	EPBC Act status	Credit type
Grey-headed Flying-fox	*Pteropus poliocephalus*	Seen	V	V	ECS (foraging) / SCS (roosting)
Eastern Freetail-bat	*Mormopterus norfolkensis*	Probable Anabat recording	V	Not listed	ECS
Eastern False Pipistrelle	*Falsistrellus tasmaniensis*	Species group Anabat recording	V	Not listed	ECS
Southern Myotis	*Myotis macropus*	Species group Anabat recording	V	Not listed	SCS

Notes: V – vulnerable species; ECS - ecosystem-credit species; SCS - Species credit species

4.6. Terrestrial Fauna Habitats

Vegetation within the project site is highly modified, fragmented and would have only limited value for migratory species listed under the EPBC Act (EIS, 11.10). As such, potential habitat in the study area is not 'important habitat' for migratory species, as defined in DotE (2013).

Fauna habitat value within the project site is very low, reflecting the highly modified environment in the rail corridor and adjoining land (EIS, p11.10). Habitat value is higher across the study area, despite its surburban context and the presence of human disturbance and edge effects. There are valuable fauna habitat resources associated with Jacquie Osmond Reserve and the riparian corridor of Cabramatta Creek, including permanent water, wetland and aquatic environments and a relatively large patch of mature, productive native vegetation. The project site is connected to a larger patch of habitat in the riparian corridor of Cabramatta Creek (EIS, p11.10).

The study area contains potential habitat for a range of native animals, including threatened fauna and migratory species known or predicted to occur in the locality. In addition to the vegetation types listed in Table 4, the following habitat types provide resources for a range of native fauna, including:

- Scarce woody debris and leaf litter
- Mature canopy trees that provide nectar, fruits, leaves and foraging, roosting or nesting substrates
- Habitat trees with hollows and/or decorticating bark
- Occasional small patches of dense understorey shrubs
- A range of fruiting and flowering small trees and shrubs and grass seeds.

A single hollow-bearing tree is located in the project site (refer to Figure 1) which will be removed as part of the project works. This hollow-bearing tree is within the disturbance footprint for the proposed retaining wall located between the new rail track and sports fields in Jacquie Osmond Reserve (EIS, p11.11).

4.7. Groundwater Dependent Ecosystems

Native vegetation within the study area is not mapped as vegetation with a potential for being reliant on the subsurface presence of groundwater (EIS, p11.11). Groundwater dependent ecosystems were not considered further in the EIS assessment.

4.8. Aquatic Flora and Fauna

Cabramatta Creek is located within the project site and study area (EIS, p11.11). No endangered aquatic communities, aquatic fauna or marine vegetation listed under the FM Act or EPBC Act occur in the project site.

The channel floor and banks of Cabramatta Creek where it intersects the project site have been mapped as non-native vegetation because this reach of the creek is confined by concrete or gabions and has a gravel or concrete bed (EIS, p11.11).

4.9. Pathogens

The EIS (Volume 3 Technical Report 4, p72) identified that there is little available information about the distribution of pathogens, including Phytophthora *(Phytophthora cinnamomi)*, Myrtle Rust *(Uredo rangelii)* and Chytrid fungus (*Batrachochytrium dendrobatidis)* within the locality, and no evidence of these pathogens was observed during EIS field surveys.

5. Environmental Aspects and Impacts

The key construction activities and the associated potential sources of flora and fauna impact are identified through a risk management approach. The consequence and likelihood of each activity's impact on the environment has been assessed to prioritise its significance. The results of this risk assessment are included in Appendix A3 of the CEMP. Activities with the potential to impact on flora and fauna include:

- clearing and grubbing
- earthworks and utilities
- nightworks
- works adjacent to vegetation
- revegetation

In accordance with CEMP (main section) Section 3.2.1, a risk management approach is used to determine the severity and likelihood of an activity's impact on flora and fauna and to prioritise its significance. Ongoing environmental risk analysis will be undertaken during construction through regular inspections, monitoring and auditing as described in Chapter 8. This will ensure that issues requiring management (including cumulative impacts) are appropriately managed.

6. Environmental Mitigation Measures

Specific mitigation measures to address impacts on flora and fauna are outlined in Table 7.

Table 7: Flora and Fauna Mitigation Measures

ID	Mitigation Measure	Timing		Responsibility
		PC[1]	C[2]	
GENERAL				
FFMM1	Manage flora and fauna sites identified to be retained and protected as 'environmentally sensitive areas'. In this regard, erect exclusion fencing and signage to ensure that environmentally sensitive areas are protected and map these sites on the Sensitive Area Plans contained in Appendix A6 of the CEMP. *It is noted that for sites located outside of the project boundary as part of the Sensitive Area Plans, delineation and enforcement of the project boundary is required rather than individual identification of those sites.*	✓	✓	Project/ Site Engineers Foreman Environmental Manager

ID	Mitigation Measure	Timing		Responsibility
		PC[1]	C[2]	
FFMM2	Clear vegetation in accordance with an EWMS for Clearing and Grubbing. This will include requirements to: ▪ identify clearing limits by placing clearly visible markers ▪ complete pre-clearing inspections (under the supervision of the Project Ecologist) to confirm the location of hollow bearing/ habitat trees, the number of trees to be removed, threatened flora and fauna, weeds, riparian vegetation, potential roost sites, and fauna habitat release locations for example. ▪ complete a Pre-clearing Permit (refer to Appendix A) prior to clearing ▪ undertake works in accordance with AS 4373-2007 and AS 4970-2009 ▪ adopt a two-stage approach to clearing (refer to Appendix B Section B3), and ▪ reuse mature tree trunks/ coarse woody debris/ felled habitat trees/ root balls in habitat enhancement and rehabilitation work where practicable. *It is noted that EWMS are prepared progressively throughout construction and prior to the commencement of the relevant activities, separate to the CEMP/ FFMP approval process. Refer to CEMP Section 3.7 for additional details about EWMS.*		✓	Project/ Site Engineers Foreman Environmental Manager
LOSS OF UNEXPECTED TEC/ THREATENED SPECIES				
FFMM3	In the event that a threatened species/ TEC is unexpectedly identified during pre-clearing inspection or construction, follow the *Unexpected Threatened Species/TECs Procedure* provided in Appendix D.	✓	✓	Environmental Manager
FFMM4	In the event that a TEC/ threatened species is unexpectedly identified during pre-clearing survey or construction, incorporate any specific procedures to deal with that species (e.g. re-location, translocation and/or management and protection measures) into this FFMP as required.	✓	✓	Foreman Environmental Coordinator
FFMM5	Where a TEC/ threatened species is unexpectedly identified during pre-clearing inspections or during construction, update Sensitive Area Plans (contained in Appendix A6 of the CEMP) with this new information.	✓	✓	Environmental Manager
LOSS OF NATIVE VEGETATION/ TEC/ FAUNA HABITAT				

ID	Mitigation Measure	Timing		Responsibility
		PC[1]	C[2]	
FFMM6	Complete final landscaping in accordance with the UDLP and Landscape Design Drawings to ensure local native species are used.		✓	Foreman Environmental Manager
FFMM7	Minimise removal of planted native vegetation and mature canopy trees where possible. Also, minimise disturbance to the minimum area necessary to construct the works.	✓	✓	Foreman Environmental Coordinator
FFMM8	Use existing access roads and tracks for site access where possible.	✓	✓	Foreman Environmental Manager
FFMM9	Erect exclusion fencing and signage (or permanent boundary fencing) for the portion of the following sites adjoining the project boundary to avoid inadvertent impacts: ▪ Downy Wattle (*Acacia pubescens*) as shown in Figure 1. ▪ River-Flat Eucalypt Forest TEC (refer to Figures 2 and 3) ▪ Freshwater Wetlands on Coastal Floodplains (refer to Figures 2 and 3).	✓	✓	Foreman Environmental Manager
FFMM10	Restrict equipment storage and stockpiling of resources to designated areas within compound sites in cleared land to minimise potential impacts on native vegetation.	✓	✓	Project / Site Engineers Environmental Coordinator
FFMM11	Document opportunities to work with local groups such as the Fairfield Creeks and Wetlands Group as part of the *Communication Strategy*, including in relation to final landscaping (which will aim to be consistent with the pre-existing vegetation and surrounding vegetation) following removal of the temporary shared path between Sussex Street and Cabramatta Creek.		✓	Project / Site Engineers Environmental Coordinator
FFMM12	Avoid locating stockpiles, heavy plant and equipment or laydown facilities within the drip line of trees.	✓	✓	Superintendent Environmental Coordinator
FFMM13	During vegetation clearing, retain mature tree trunks/ coarse woody debris/ felled habitat trees and root balls for reuse in habitat enhancement and rehabilitation work where practicable.	✓	✓	Project / Site Engineers Environmental Coordinator

ID	Mitigation Measure	Timing		Responsibility
		PC[1]	C[2]	
FFMM14	Ensure that tree removal and protection measures for trees to be retained, is carried out as stated in the Arboricultural assessment provided in Appendix B of Technical Report 10 – Landscape and visual impact assessment of the EIS.		✓	Foreman Environmental Coordinator
TERRESTRIAL FAUNA MORTALITY/ INJURY				
FFMM15	Where fauna is encountered that requires handling or rescue, follow the Fauna Protection Procedure contained in Appendix B.	✓	✓	Foreman Environmental Coordinator
LOSS OF AQUATIC/ MARINE HABITAT/ VEGETATION				
FFMM16	Retain stumps in riparian zones and aquatic habitats where practicable to reduce the potential for bank erosion. Even dead stumps and root systems may act to reduce erosion.	✓	✓	Foreman Project / Site Engineers Environmental Coordinator
INVASION/ SPREAD OF WEEDS/ PATHOGENS				
FFMM17	Restrict equipment storage and stockpiling of resources to designated areas within compound sites in cleared land to minimise potential invasion/ spread of weeds.	✓	✓	Foreman Environmental Coordinator
FFMM18	Progressively revegetate batters and other disturbed areas with temporary cover crop species to control weed invasion during construction.		✓	Superintendent Foreman Environmental Coordinator
FFMM19	Manage weeds in accordance with the Weed Management Plan at Appendix E.		✓	Superintendent Foreman Environmental Coordinator
FFMM20	On or before supplying mulch for land application offsite ensure a 'written risk management protocol' has been prepared in accordance with the requirements of 'the mulch order 2016'.		✓	Superintendent Foreman Environmental Coordinator
FFMM21	Ensure written verification received from Subcontractors that all plant and equipment is clean		✓	Superintendent

ID	Mitigation Measure	Timing		Responsibility
		PC[1]	C[2]	
	prior to arrival to site to minimise the potential for seeds and plant material entering the project site to prevent the introduction of further exotic plant species or disease. Subcontractors are expected to clean plant and equipment using vehicle wash bays or portable vehicle wash equipment such as high pressure wash units, shovels, crow bars or stiff brushes.			Foreman Environmental Coordinator
REDUCED WATER QUALITY AND LOSS OF AQUATIC BIODIVERSITY (E.G. FISH)				
FFMM22	Carry out refuelling of plant and equipment, chemical storage and decanting at least 50 metres away from aquatic habitats unless additional controls are approved by ARTC and implemented to reduce risk of release.	✓	✓	Foreman Project / Site Engineers Environmental Coordinator
FFMM23	Progressively revegetate batters and other disturbed areas with cover crop species to stabilise the soil and provide vegetation cover as a method to minimise sedimentation of waterways and impacts on fish.		✓	Project / Site Engineers Environmental Coordinator
FFMM24	Follow the relevant EWMS and PESCP to minimise the potential of erosion and sedimentation impacts.	✓	✓	Foreman Project / Site Engineers
DISTURBANCE TO HABITAT DUE TO TEMPORARY LIGHT SPILL				
FFMM25	Site temporary lighting to avoid light spill into ecologically sensitive areas along Cabramatta Creek, including the Grey-headed flying fox camp.		✓	Project / Site Engineers Environmental Coordinator

[1] PC means pre-construction; [2] C means construction

7. Compliance Management

7.1. Roles and Responsibilities

Fulton Hogan's Project Team organisational structure and overall roles and responsibilities are outlined in Section 4.1 of the CEMP. Specific responsibilities for the implementation of environmental controls are detailed in Table 7 of this FFMP.

7.2. Training

All employees, subcontractors and utility staff working on site will undergo site induction training relating to flora and fauna management issues, including:

- requirements of this FFMP
- relevant legislation
- Sensitive Area Plans and specific location of threatened species/TECs
- identification of potential threatened flora and fauna species (refer to Appendix F)
- discovery of any unexpected threatened species/ TECs and any specific procedures to deal with that species/ TEC (refer to Appendix D)
- roles and responsibilities for flora and fauna management.
- roles and responsibilities for weed management

Further details regarding staff induction and training including tool box talks are outlined in Chapter 5 of the CEMP.

7.3. Complaints

Complaints will be recorded and addressed in accordance with Section 6.2.3 of the CEMP and the Communication Strategy (CS).

7.4. Inspections and Monitoring

Regular inspections and monitoring specific to flora and fauna will be undertaken during construction in accordance with Table 8. General requirements and responsibilities in relation to inspections and monitoring are documented in in Sections 8.1 and 8.2 of the CEMP respectively, which includes weekly inspections incorporating flagging and signage.

Table 8: Inspections and Monitoring

Monitoring Details	Record	Responsibility	Frequency
Inspection of weeds; exclusion fencing; exclusion signage; and adherence to exclusion zones when works are being undertaken in the vicinity.	Environmental Inspection Checklist	Environmental Manager or delegate	Weekly
Pre-clearing Inspection	Pre-clearing Permit Project Ecologist's Pre-clearing Inspection Report	Environmental Manager or delegate	Prior to commencement of clearing

Monitoring Details	Record	Responsibility	Frequency
Threatened Species/ TEC	Written notification to ARTC	Environmental Manager or delegate	As discovered
Fauna rescue and handling	Fauna Rescue Event Record	Environmental Manager or delegate	As discovered
Inspection of all plant and equipment for absence of soil and debris to minimise the potential for seeds and plant material entering the project site and the introduction of further exotic plant species or disease.	Written verification from Subcontractors that all plant and equipment is clean prior to arrival to site. Mobile plant inspection check	Foreman Environmental Manager or delegate	Prior to mobilisation

7.5. Auditing

Auditing (both internal and external) will be undertaken to assess the effectiveness of environmental mitigation measures, compliance with this FFMP, ARTC specifications and other relevant approvals, permits and licences. Auditing requirements are detailed in Section 8.4 of the CEMP.

7.6. Reporting

General reporting requirements and responsibilities are documented in Chapter 9 of the CEMP.

7.7. Non-conformances

Non-conformances will be dealt with and documented in accordance with Chapter 10 of the CEMP.

8. Review and Improvement of FFMP

The FFMP will be reviewed to ensure compliance with legislative requirements and its suitability and effectiveness for the project.

The review may be in the form of:

- A formal management review
- A second party audit, and/or
- An inclusion as a separate item at a site meeting.

The Environmental Manager may review and update the FFMP more regularly where:

- Significant changes in construction activities occur
- Where targets are not being achieved, or
- In response to audits and non-conformance reports.

Any changes to the FFMP will be approved by the ER and made in accordance with the process outlined in Section 1.6 of the CEMP.

Appendix A: Pre-clearing Permit

[Note - The Pre-clearing Permit will be updated during construction as required, separate to this FFMP/ CEMP]

Pre-clearing Permit

PROJECT ECOLOGIST CONTACT DETAILS
Name:
Company:
Phone number:

General Instructions

1. This copy is to be retained by the relevant persons authorised to supervise work crews and/or contractors.
2. Management must retain a copy.
3. Standard work method statements apply where relevant.
4. Additional environmental controls must be implemented as listed in Part C of this permit.
5. Managers and supervisors are responsible for advising their crew members of the additional environmental controls applicable to the works as listed in Part C of this permit.

PART A. DESCRIPTION OF WORKS	To be completed by Permit Recipient
Date: / /	Project: Cabramatta Loop Project
Location:	
Company/ Organisation conducting the work:	
Name of Permit Recipient:	
Date Clearing is to Commence: / /	
Brief Description of Work:	
Is house demolition involved? (circle as appropriate) Yes / No	
Machinery to be used:	
Do the works involve clearance of a Threatened Ecological Community (TEC)? If yes, confirm that removal of the TEC has been approved. *[It is noted that The EIS (p11.7) identified that the boundary of the project site has been set to avoid direct impacts to the River-Flat Eucalypt Forest TEC].*	
Sensitive Area Plans for work area attached:	

PART B. PLANNING CHECKLIST	Yes	No	N/A	Comments include any details discussed with other parties
Are the limits of clearing identified by clearly visible markers?	☐	☐	☐	
Has the Project Ecologist completed pre-clearing inspections for:				
1. the presence or otherwise or evidence of the presence (including fresh scats, scratches and remains of prey) or otherwise of fauna, including threatened species?	☐	☐	☐	
2. hollow bearing trees, potential hollow bearing trees and all other fauna containing habitat trees (including trees with nests, dreys and termitaria likely to be occupied by fauna) within the clearing zone?	☐	☐	☐	
3. the presence of native fauna, including bats that may be present in gaps in bridges (e.g. scuppers), disused buildings, culverts and associated structures that are to be demolished or removed?	☐	☐	☐	
4. the presence of TECs (e.g. River-Flat Eucalypt Forest TEC or Coastal Freshwater Wetland TEC)?	☐	☐	☐	
5. the presence of weeds?	☐	☐	☐	
Is there a specific EWMS in place that covers these works (e.g. Clearing and Grubbing EWMS)?	☐	☐	☐	
Have all necessary approvals and permits for the works been obtained from the following organisations (where applicable)? • Council • EPA • Other (specify)	☐ ☐ ☐	☐ ☐ ☐	☐ ☐ ☐	
Have all necessary erosion and sediment controls been installed as per Progressive ESCP?	☐	☐	☐	
Will access to private properties be maintained during the works (If no, refer to the Communication Strategy)?	☐	☐	☐	
Have arrangements been made for the Project Ecologist to be present as required e.g. during Stage 2 clearing of habitat trees.	☐	☐	☐	

PART C. ADDITIONAL ENVIRONMENTAL CONTROLS
(as per Project Ecologist's recommendations or other environmental assessments)

List relevant additional environmental controls here. Include all additional environmental controls and communicate these at the toolbox meeting, to the crew members, subcontractors and any other relevant parties, prior to the commencement of the works. Ensure crews and subcontractors know the locations of the exclusion zones as shown on the Sensitive Area Plans.

Activity	Environmental Controls	Reference (i.e. Ecologist's report, consultation with ARTC, community or other)

PART D. APPROVAL

PERMIT HOLDER

I understand and accept all conditions stated in this permit and any associated permits. I will ensure that all conditions are strictly adhered to by myself and colleagues.

Name of Permit Holder…….Signature: .....Date: .....Time:……..

ENVIRONMENTAL COORDINATOR

Approval is granted for the work listed above by the Environmental Coordinator. All conditions of this permit and any associated permits have been fully explained to the permit holder.

Name of approver…….....Signature: .....Date: ..... Time: .....

PROJECT ECOLOGIST

Name of Project Ecologist.....Signature: .....Date: ..... Time: .....

Appendix B: Fauna Protection Procedure (including procedures for clearing, fauna rescue and handling)

B1 Purpose

This procedure details the actions to be taken during construction activities to:

- control clearing operations to minimise impacts on terrestrial flora and fauna
- minimise impacts on fauna (including injured, shocked, juvenile or other animal encountered within the project boundary) as a result of being handled by humans, and to prevent injury to people handling fauna.

B2 Scope

This procedure is applicable where:

- Hollow-bearing trees, including standing dead trees with hollows are to be removed.
- Substantial stands of vegetation providing potential threatened fauna habitats are to be impacted.
- Bushrock is to be removed.
- Removal of potential fauna habitat results in the need to capture and relocation or captive rear less mobile fauna.
- Trees are to be removed, to ensure the project delivers a net increase in trees
- Potential roosting habitat for microbats (e.g. hollow-bearing trees, disused buildings, bridges and culverts) is to be disturbed or removed.
- Native and introduced species are found on the project site.

B3 Clearing Procedure

The Project Ecologist will undertake the following steps:

1. Prior to undertaking clearing at any location or time, a pre-clearing assessment must be undertaken by the Project Ecologist to identify the presence or otherwise or evidence of the presence (including fresh scats, scratches and remains of prey) or otherwise of fauna, including threatened species. The assessment must be documented and include processes and actions taken to protect or rescue any identified fauna.
2. The pre-clearing assessment must also include the identification and assessment of habitat trees and roosting habitats (e.g. hollow-bearing trees, disused buildings, bridges and culverts) that are to be removed or demolished for the presence of native fauna, including details of the checks by the Project Ecologist on trees for fauna, nests and the like.
3. The pre-clearing assessment must also assess opportunities for improvement of vegetation connectivity and a net increase in trees. The Project Ecologist will record the number of trees to be removed.
4. If bats (including microbats) are identified as roosting in or under a structure (e.g. culvert) to be demolished or modified substantially, comprehensive roost exclusion will be undertaken. This will include the identification of alternative roost sites by the Project Ecologist. Once the alternative roost sites/habitat are identified, the natural roost sites will be sealed, leaving only the alternative roost sites. Where a structure (e.g. culvert) will not be demolished or modified substantially, it will remain open on at least one side at all times to allow any roosting bats to fly in or out.
5. All hollow-bearing trees, potential hollow-bearing trees and all other fauna containing habitat trees, including trees with nests, dreys and termitaria likely to be occupied by fauna, must be marked prior to the commencement of clearing in a manner which clearly identifies and demarcates the trees.
6. Implement a two-stage approach to clearing:

   Stage 1 - Non-habitat tree removal

   - Remove non-habitat trees at least 24 hours before habitat trees are removed, to allow fauna an opportunity to move from habitat trees and allow time to concentrate rescue efforts on the trees that are most likely to be inhabited.
   - Mechanically agitate habitat trees under the supervision of the Environmental Manager (EM) or Environmental Coordinator (EC) at least 24 hours before felling.

Stage 2 - Habitat tree removal

- Fell habitat trees under the supervision of the Project Ecologist at least 24 hours after Stage 1. Fell habitat trees using equipment that allows the trees to be lowered to the ground with minimal impact (e.g. claw extension) in accordance with RMM C4.9.
- Leave felled trees for a short period of time on the ground, as determined by the Project Ecologist, to give the ecologist a chance to check hollows or for any fauna trapped in the trees an opportunity to escape
- Assess habitat trees (Project Ecologist)
- Stop work where a threatened species is detected during vegetation clearing and follow the Unexpected Threatened Species/TECs Procedure (refer to Appendix D).

7. All fauna captured will be relocated into areas of suitable habitat adjacent to the project site in accordance with the Fauna Rescue Procedure detailed in Section B4 below. Records will also be kept of the fauna captured and relocated in the Fauna Rescue Event Record (refer to Appendix C).

B4 Fauna Rescue Procedure

If wildlife is discovered on the project site during site construction activities, including clearing (refer Section B3 above) that may harm, or has resulted in harm, to the animal or poses a risk to site personnel, the following steps will be taken:

1. Stop all work in the vicinity of the fauna and immediately notify the Foreman who will notify the Environmental Manager (EM) or Environmental Coordinator (EC). The EM/ EC will then notify the Project Ecologist.
2. Preferably allow fauna to leave the area without intervention if it is not injured or in shock and if safe to do so (i.e. no machinery in the immediate vicinity).
3. Use a licensed fauna ecologist or wildlife carer with specific animal handling experience/licence to carry out any fauna handling.
4. Where necessary, to minimise stress to fauna and/or remove the risk of further injury before the fauna handler arrives onsite, the Environmental Coordinator shall implement the Fauna Handling Procedure detailed in Section B5 below.
5. If the animal cannot be handled (e.g. venomous reptiles):
   a. exclude all personnel from the vicinity with fencing and/or signage, and
   b. record the exact location of the animal and provide this information to the Project Ecologist.
6. Call the appropriate rescue agency (i.e. wildlife carer with specific animal handling experience/ animal rescue agency such as WIRES) immediately and follow any advice provided by the agency. Once the rescue agency arrives at the site, they are responsible for the animal. Any decisions regarding the care of the animal will be made by the rescue agency. Contact details for the Project Ecologist, rescue agencies and local veterinary service are provided in Table B-1.

Table B-1 Fauna Rescue Contact Details

Agency/ business	Contact number
Project Ecologist	Eco Logical Australia Pty Ltd
Wildlife Rescue (WIRES)	1300 094 737
Sydney Wildlife	(02) 9413 4300
Canley Heights Veterinary Clinic	(02) 9604 9792

Note - The contact details for the Project Ecologist will be kept at a convenient location on the project site and be available to the Contractor's personnel at all locations where clearing is being undertaken, to enable quick contact and access to the Project Ecologist.

In the event the rescue agency or local vet cannot be contacted, the injured animal will be delivered to the rescue agency as soon as practically possible.

In the event the rescue agency cannot be contacted, if required, the most appropriate euthanasia will be administered by the Project Ecologist (i.e. cervical dislocation for small vertebrates, ice slurry for introduced fish). This is to occur in accordance with applicable guidelines and legislative requirements.

7. If the fauna species is identified as a threatened species not previously identified in the FFMP/ EIS as amended by the Submissions Report (and hence is 'unexpected'), the Environmental Manager must:
   a. immediately cease all work likely to affect the threatened species
   b. follow the Unexpected Threatened Species/TECs Procedure (refer to Appendix D).
8. Relocation of fauna captured during construction works, including clearing and associated works, will be undertaken by the Project Ecologist or rescue agency. If the animal is not injured or stressed, it should be released to an area that is not to be disturbed by the project construction works, in accordance with the following:
   a. sites identified as suitable release points by the Project Ecologist or rescue agency
   b. release site will contain similar habitat and occur as close to the original capture location as possible.
   c. if the species is nocturnal, release will be carried out at dusk
   d. release would generally not be undertaken during periods of heavy rainfall, and
   e. non-native fauna will not be translocated and will be euthanised.
9. If the animal has been placed into care due to injury, age (i.e. young) or shock, upon its rehabilitation it will be released in an area that is not to be disturbed by the project construction works, at the discretion of the Project Ecologist or rescue agency.
10. Following consultation with all relevant stakeholders, the Project Ecologist/ Environmental Manager will implement any corrective actions and additional safeguards.
11. Following confirmation by the Project Ecologist/ Environmental Manager that all appropriate safeguards have been implemented, construction works can recommence.
12. Project Ecologist/ Environmental Manager to record find/ translocation in the Fauna Rescue Event Record. All relevant characteristics of the fauna find should be recorded to the extent practicable (i.e. visual signs of behaviour; habitat; health signs; sex, time date, weather etc.), and capture and relocation data.

B5 Fauna Handling Procedure

The Project Ecologist will:

1. Cover larger terrestrial animals with a towel or blanket and place in a cardboard box and/ or hessian bag
2. Place smaller terrestrial animals in a cotton bag, tied at the top
3. Keep terrestrial fauna quiet, warm, ventilated and in a dark location away from noisy construction activities
4. Relocate aquatic fauna in accordance with the following steps:
   a. Ensure all aquatic fauna relocation works are supervised by a suitably qualified aquatic ecologist.
   b. Prior to the commencement of pumping, advice should be sought from the aquatic ecologist on pumping methods and the extent of drawdown.
   c. The water level should be pumped down to a level that will allow the safe and effective implementation of capture methods, such as seine nets, dip nets and electrofishing.

d. A fine mesh screen with not >5mm mesh must be installed on the inlet of the pump or a fish basket used to remove the risk of native aquatic fauna being transferred through pump. A maximum depth of 500mm is typically required before fish salvage can commence but site-specific advice will be required from the aquatic ecologist.

e. Aquatic ecologist is to establish the presence of native and introduced aquatic fauna and plan relocation. Access to adjoining properties may be required for relocation, particularly when dewatering dams. The aquatic ecologist will ensure that native aquatic fauna species are released into suitable habitat as close to the original location as possible.

f. Native fish will be placed in tubs full of water sourced from the salvage site where they will be housed for brief periods before being transferred to the release site. Pest fish will be euthanased using an ice slurry.

g. Following completion of relocation, a final check shall be undertaken to find any remaining fish, or dying/dead fish.

h. All euthanised and dead fish will be transported to a licensed landfill facility for disposal.

i. Records will be kept on habitat type, method of water extraction, species, number of individuals and reproductive status of fish encountered.

j. Aquatic ecologist will prepare a report on the relocation, detail the source of the fish, the number and species of fish released and euthanased.

5. Transport frogs without water or debris in recognition of the risk of transporting disease and the minimal transport time.

6. Animals such as venomous reptiles and raptors require particular handling and will only be handled by appropriately qualified personnel i.e. Project Ecologist or rescue agency.

7. If the animal cannot be handled (e.g. venomous reptiles):

   a. exclude all personnel from the vicinity with fencing and/or signage, and

   b. record the exact location of the animal and provide this information to the Project Ecologist.

8. If handling bats (including microbats), the handler must be vaccinated against the Australian Bat Lyssavirus (ABL), which is a form of rabies.

9. Any frog handling will be undertaken in accordance with the Hygiene Protocol for the Control of Disease in Frogs (DECC 2008). This protocol recommends onsite hygiene precautions be undertaken to minimise the transfer of disease between and within wild frog populations. Measures recommended include:

   a. thorough cleaning/ disinfecting of footwear and equipment when moving from one site to another

   b. spraying/ flushing vehicle tyres with a disinfecting solution where necessary in high risk areas

   c. cleaning/disinfecting hands between collecting samples/frogs (gloves, not bare hands, will be used to handle frogs), and

   d. limiting one frog or tadpole to a bag. Bags will not be reused.

Appendix C: Fauna Rescue Event Record

[Note - The Fauna Rescue Event Record will be updated during construction as required, separate to this FFMP/ CEMP]

Fauna Rescue Event Record

Item	Detail
Date fauna located	
Time fauna located	
Weather	
Location (i.e. chainage, habitat (in tree hollow, under stockpile, in open grass, near culvert etc.)	
Fauna type (e.g. possum, bird, snake etc.)	
Visual signs of fauna behaviour	
Species (if known)	
Is the fauna injured? (yes or no)	
If the fauna is injured complete this section	
What time was the fauna specialist called?	
What time did the fauna specialist arrive?	
Fauna specialist name and contact	
What was the outcome of calling the fauna specialist?	
If the fauna is not injured complete this section	
Where was the fauna relocated?	
Name and qualification of fauna handler	
Any other comments:	

Note: Fauna specialist - Project Ecologist/ wildlife carer with specific animal handling experience/ animal rescue agency such as WIRES/ Vet.

Completed by:

Date: / /

Appendix D: Unexpected Threatened Species/ TECs Procedure

D1 Purpose

This procedure details the actions to be taken when a threatened flora or fauna species / TEC is unexpectedly encountered during excavation/ construction activities.

D2 Scope

This procedure is applicable to all activities conducted by personnel that have the potential to come into contact with threatened species/ TECs.

Where threatened fauna is unexpectedly encountered that requires rescue or handling refer to the Fauna Protection Procedure (Appendix B of this FFMP).

Refer to Figure D-1 for the Unexpected Threatened Species/ TECs procedure flow chart.

D3 Procedure

The Environmental Manager (EM) is responsible for implementing this procedure.

1. Threatened species/ TEC unexpectedly encountered during excavation/ construction activities

If a threatened species/ TEC is unexpectedly encountered during excavation/ construction activities:

STOP ALL WORK in the vicinity of the find. Set up an exclusion area to prevent further impacts as required.

Immediately notify the Environmental Manager (EM) or Environmental Coordinator (EC) who will notify the Project Ecologist, ARTC and OEH (as required). ARTC will be notified both verbally and in writing.

2. Assessment of Impact

An assessment is to be undertaken by the EM and the Project Ecologist to determine the likely impact to the threatened species/ TEC and appropriate management options, such as relocation measures, developed in consultation with ARTC.

If a significant impact is likely to occur, consultation will be undertaken with OEH as appropriate.

3. Approvals

Obtain any relevant licences, permits or approvals required if the threatened species/ TEC is likely to be significantly impacted.

4. Recommencement of Works

Construction works will recommence in the immediate vicinity once the Environmental Manager has:

- obtained approvals as required
- confirmed all corrective actions and additional mitigation measures have been implemented.

The Environmental Manager must also:

- Ensure that the threatened species/ TEC is included in subsequent Sensitive Area Plans, Project Inductions and Toolbox Talks,
- Any new mitigation measures are added to the FFMP and
- Provide information to ARTC to enable update of biodiversity offset requirements if applicable.

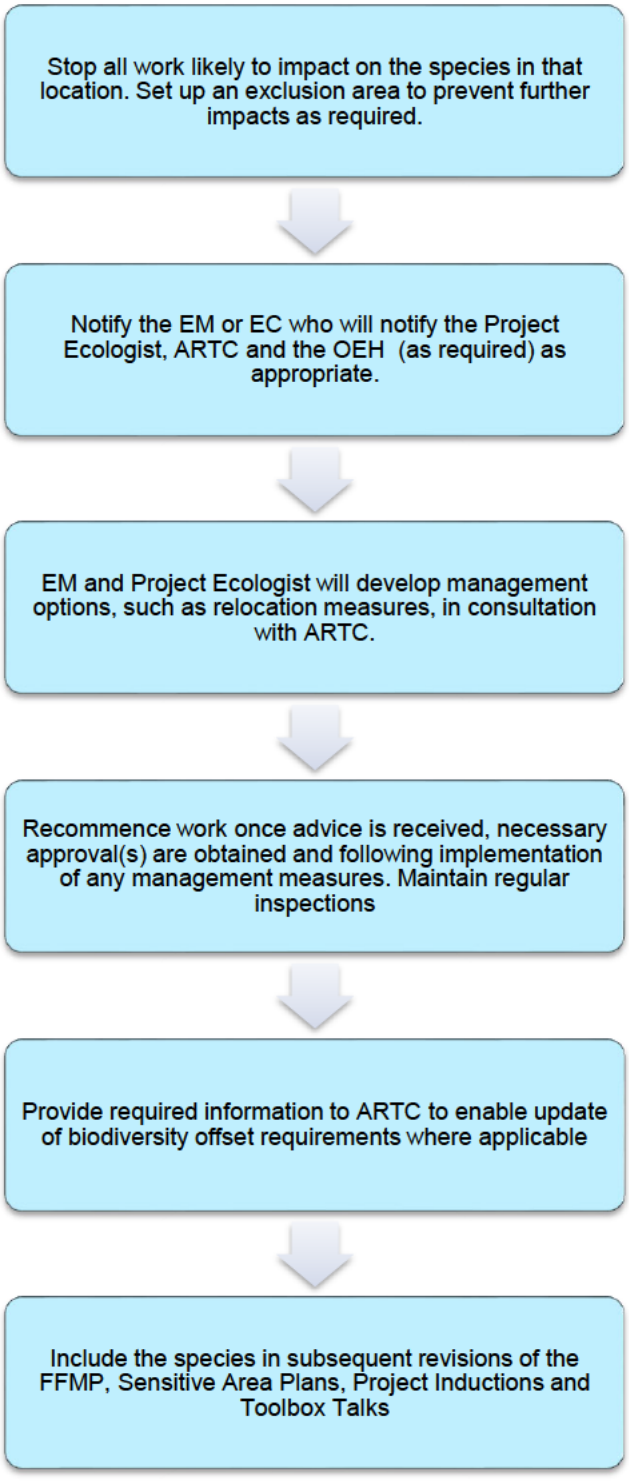

Figure D-1 Unexpected Threatened Species/ TECs Procedure Flow Chart

Appendix E: Weed Management Plan

E1 Purpose

The purpose of this Weed Management Plan (WMP) is to detail how Fulton Hogan will manage and control weeds throughout construction of the project to minimise the threat to remnant vegetation, native flora and fauna habitats and waterways within the local area.

E2 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 weeds in the existing road corridor, construction areas and ancillary facility areas will be controlled in accordance with NSW Weed Control Handbook (DPI, 2018). Weed control, generally, will have a strong focus on:

- restricting the area of native vegetation disturbed during construction works by application of exclusion zones
- 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
- 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 Clearing and Grubbing Environmental Work Method Statement.

E3 Weeds Overview

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 procedure is on priority weeds, which are discussed below, followed by the weed control procedure.

Priority Weeds

The EIS identified five priority weed species listed for the Greater Sydney (DPI 2021) under the Biosecurity Act 2015 in the study area. The class and duty associated with all plants and specific duties for the weed species identified in the study area are outlined in Table E-1.

Table E-1 Priority weeds listed for Greater Sydney identified within the study area

Weed	Duty
All plants	General biosecurity duty: ▪ All plants are regulated with a general biosecurity duty to prevent, eliminate or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable.
Alligator Weed (*Alternanthera philoxeroides*)	Mandatory measure: ▪ Prohibition on dealings - Must not be imported into the State or sold.
Bridal Creeper (*Asparagus asparagoides*)	Mandatory measure: ▪ Prohibition on dealings - Must not be imported into the State or sold.
Fireweed (*Senecio madagascariensis*)	Mandatory measure: ▪ Prohibition on dealings - Must not be imported into the State or sold.

Weed	Duty
Green Cestrum (*Cestrum parqui*)	Mandatory measure: ▪ Land managers should mitigate the risk of new weeds being introduced to land used for grazing livestock. Land managers should mitigate spread from their land. Plant should not be bought, sold, grown, carried or released into the environment.
Madeira Vine (*Anredera cordifolia*)	Mandatory measure: ▪ Prohibition on dealings - Must not be imported into the State or sold.

E4 Weed Control Procedure

To control weed infestations pre and during construction the Environmental Manager or Environmental Coordinator will ensure that the following procedure is implemented:

1. Weed inspection

The Environmental Manager/ Environmental 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, and
- 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 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 Record

The Environmental Manger/ EC will follow the Fulton Hogan Pesticide Use Procedure and ensure that a Pesticide Application Record is completed and public notifications made in accordance with relevant legislation, where pesticides are to be used in areas that could be accessed by members of the public. Pesticide application must also be aligned with ARTC's ENV-PR-003 Pesticide Application.

Only pesticides registered for use near water may be used near any waterways.

5. Follow-up inspection

The Environmental Manger/ EC 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/ EC.

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 (PESCPs) 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. Subcontractors are expected to clean plant and equipment using vehicle wash bays or portable vehicle wash equipment such as high pressure wash units, shovels, crow bars or stiff brushes. 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 also be disposed of appropriately at a licensed facility in accordance with the *Biosecurity Act 2015* and *Waste Classification Guidelines*.

E5 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 F: Potential Threatened Flora and Fauna Species Identification Guide

Common name	Scientific name	BC Act	EPBC Act	Description	Photo
Flora					
Downy Wattle	Acacia pubescens	Vulnerable	Vulnerable	A spreading shrub, 1 - 5 m high with brilliant yellow flowers, bipinnate leaves (divided twice pinnately) and conspicuously hairy branchlets.	 Source: environment.nsw.gov.au

Common name	Scientific name	BC Act	EPBC Act	Description	Photo
Narrow-leaved Black Pepermint	*Eucalyptus nicholii*	Vulnerable	Vulnerable	A medium-sized tree 10-20 m tall with rough, thick, grey-brown bark which extends to the larger branches. Adult leaves are slightly broader than the juvenile leaves, and are a dull grey-green, 6-12 cm long and 5-10 mm wide and have a strong peppermint smell when crushed. The gumnuts are hemispherical or cone shaped, 2-5 mm long and 3-4 mm wide, and grow in groups of seven. Easily confused with *Eucalyptus acaciiformis*.	 Source: environment.nsw.gov.au

Common name	Scientific name	BC Act	EPBC Act	Description	Photo
Fauna					
Eastern Coastal Free-tailed Bat	*Micronomus norfolkensis*	Vulnerable	-	The Eastern Freetail-bat has dark brown to reddish brown fur on the back and is slightly paler below. Like other freetail-bats it has a long (3 - 4 cm) bare tail protruding from the tail membrane. Freetail-bats are also known as mastiff-bats, having hairless faces with wrinkled lips and triangular ears. They weigh up to 10 grams.	 Source: environment.nsw.gov.au

Common name	Scientific name	BC Act	EPBC Act	Description	Photo
Eastern False Pipistrelle	*Falsistrellus tasmaniensis*	Vulnerable	-	The Eastern False Pipistrelle is relatively large with a head-body length of about 65 mm. It weighs up to 28 grams. It is dark to reddish-brown above and paler grey on its underside. It has long slender ears set well back on the head and some sparse hair on the nose.	 Source: environment.nsw.gov.au

Common name	Scientific name	BC Act	EPBC Act	Description	Photo
Grey-headed Flying-fox	*Pteropus poliocephalus*	Vulnerable	Vulnerable	The Grey-headed Flying-fox is the largest Australian bat, with a head and body length of 23 - 29 cm. It has dark grey fur on the body, lighter grey fur on the head and a russet collar encircling the neck. The wing membranes are black and the wingspan can be up to 1 m. It can be distinguished from other flying-foxes by the leg fur, which extends to the ankle.	 Source: environment.nsw.gov.au

Common name	Scientific name	BC Act	EPBC Act	Description	Photo
Southern Myotis	*Myotis macropus*	Vulnerable	-	This species is now most often referred to as *Myotis macropus* or the Southern Myotis, but has previously been called the Large-footed Myotis (*M. adversus*). It has disproportionately large feet; more than 8 mm long, with widely-spaced toes which are distinctly hairy and with long, curved claws. It has dark-grey to reddish brown fur above and is paler below. It weighs up to 15 grams and has a wingspan of about 28 cm.	 Source: environment.nsw.gov.au