

JHCPB Joint Venture

Flora and Fauna Management Plan

RIC-ARC-MPL-00-PL-280-001

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Glossary/ Abbreviations

Abbreviation	Expanded text
BC Act	<i>Biodiversity Conservation Act 2016</i>
BS Act	<i>Biosecurity Act 2015</i>
CEMP	Construction Environmental Management Plan
CoA	Conditions of Approval
DPIE	Department of Planning, Industry and Environment
DPI	Department of Primary Industries
EEC	Endangered Ecological Community
EIS	WestConnex M4-M5 Link Environmental Impact Statement
EMS	Environmental Management System
EPA	NSW Environment Protection Authority
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EPL	Environment Protection Licence
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
ER	Environmental Representative
EWMS	Environmental Work Method Statements
ESCP	Erosion and sediment control plan
FFMP	Flora and Fauna Management Plan (this document)
FM Act	<i>Fisheries Management Act 1994</i>
GDE	Groundwater Dependent Ecosystem
HBT	Hollow Bearing Tree
NPW Act	<i>National Parks and Wildlife Act 1974</i>
NW Act	<i>Noxious Weeds Act 1993 (repealed)</i>
OEH	NSW Office of Environment and Heritage
PCT	Plant community type
REMM	Revised Environmental Management Measures
Roads and Maritime	NSW Roads and Maritime Services
SPIR	WestConnex M4-M5 Link Submissions and Preferred Infrastructure Report
TEC	Threatened Ecological Community
Tree	As defined in Australian Standard AS 4970-2009
TSC Act	<i>Threatened Species Conservation Act 1995 (repealed)</i>

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 Rozelle Interchange Project (the Project).

This FFMP has been prepared to address the requirements of the Minister's Conditions of Approval (CoA), Project Approvals and all applicable guidance and legislation.

1.2. Background and project description

The Rozelle Interchange project is part of the M4-M5 Link and will provide a new underground motorway interchange with access via City West Link and provide a tunnel connection between Anzac Bridge and Victoria Road, east of Iron Cove Bridge, with links to the future Western Harbour Tunnel. The WestConnex M4-M5 Link EIS (AECOM 2017) assessed impacts from construction of the Project on flora and fauna.

As part of the EIS development, a detailed biodiversity assessment was prepared to address the Environmental Assessment Requirements issued by the Department of Planning, Industry and Environment (DPIE). The biodiversity assessment was included in the EIS, within Chapter 18 and the Biodiversity Technical Working Paper (Appendix S of the EIS).

The EIS identified the potential for direct and indirect impacts on the limited biodiversity values that occur in the Project but concluded that provided the proposed mitigation and management measures are implemented, no significant long-term impacts would be expected.

Approval for the construction and operation of this project was granted on 17 April 2018 by the former NSW Minister for Planning (application number SSI 7485). Following this approval, a contractor was appointed to construct Stage 2 of the approved project on behalf of Roads and Maritime (now Transport for NSW). The Contractor (John Holland CPB Joint Venture) reviewed the concept design for the Approved Project and together in discussions with Roads and Maritime (now Transport for NSW) identified a number of design and constructability improvements. These changes aim to improve intersection performance and optimise active transport connections. A description of each modification is presented below.

1.2.1. MOD 2 Modification – The Crescent overpass and active transport links

The main elements of this Modification include key components such as a new elevated vehicular overpass at The Crescent, a new ancillary facility, modifications to the eastbound lanes of the City West Link and The Crescent, upgrades to the intersection of The Crescent/Johnston Street/Chapman Road and the realignment of the pedestrian and cycling green link to the west of The Crescent.

1.2.2. MOD 3 Modification – Iron Cove ventilation undergrounding

The Modification involves changes at Iron Cove to facilitate the relocation of the Iron Cove Motorway Operations Complex (MOC4), the electrical substation and the ventilation facilities. This Modification would see these elements primarily undergrounded. Relocation would be made possible by excavating a ventilation tunnel and two caverns to house the facilities.

1.2.3. MOD 4 Modification – Glebe Island construction ancillary facility

The Modification relates to the establishment and use of a temporary construction ancillary facility upon a 4,000 square metre area of NSW Port Authority of NSW land on Glebe Island for the purpose of receiving and assembling equipment required for the Rozelle Interchange project.

1.3. Scope of the sub-plan

The scope of this Plan is to describe how John Holland CPB Joint Venture (JHCPB) proposes to manage and protect flora and fauna during construction of the Project. Operational flora and fauna and operation measures do not fall within the scope of this Plan and therefore are not included within the processes contained within this Plan.

1.4. Environmental management systems overview

The environmental management system overview is described in Section 1.5 of the CEMP.

2. Purpose and objectives

2.1. Purpose

The purpose of this Plan is to describe how JHCBP will manage and minimise construction impacts of the Project on flora and fauna.

2.2. Objectives

The key objective of this FFMP is to ensure that project impacts on flora and fauna are minimised and within the scope permitted by the Instrument of Approval. To achieve this objective, JHCPB will ensure that appropriate controls and procedures are implemented during construction activities in accordance with:

- The Conditions of Approval granted to the project on 17 April 2018 and as subsequently modified,
- The Revised Environmental Management Measures (REMM) from the EIS as amended by the SPIR,
- Roads and Maritime QA Specifications G36 and G40,
- The Project's Environment Protection Licence (EPL), and
- All relevant legislation and other requirements described in Section 3.1 of this Plan.

2.3. Environmental Performance Outcomes and Targets

The desired environmental performance outcome for flora and fauna management, as outlined and addressed in the EIS is that:

- 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.

To achieve this outcome, JHCPB will undertake the Project outcomes in Table 1.

Table 1 Performance outcomes

No.	Performance Outcome	How addressed	Records	Source
1	Minimise impacts on aquatic environments	Implement Table 11 FFMP17 – FFMP28. Implement the Soil and Surface Water Management Plan (SSWMP).	Erosion and Sediment Control Plans Inspection records Monitoring records	EIS, Appendix A
2	Minimise removal of high retention value trees	Undertake pre-clearing/demolition/construction surveys (refer to Section 6.1). Prepare and implement clearing and grubbing plans, as required (refer to Section 6.2). Implement Table 11 FFMP3, FFMP7, FFMP11.	Inspection records Clearing and grubbing plans	EIS, Appendix A
3	Full compliance with relevant legislative requirements, CoA and REMM and Roads and Maritime QA Specifications G36 and G40	Implement the management and mitigation measures identified in Section 7. Undertake training, monitoring and inspections, auditing and recording (refer to Section 8).	Inspection records Monitoring records Audit reports	Best Practice

No.	Performance Outcome	How addressed	Records	Source
4	Avoid disturbance to flora and fauna outside of the project	Undertake pre-clearing/demolition/construction surveys (refer to Section 6.1). Prepare and implement clearing and grubbing plans, as required (refer to Section 6.2). Implement Table 11 FFMP3, FFMP4, FFMP7, FFMP8, and FFMP11	Inspection records Clearing and grubbing plans	Best Practice
5	Prevent and minimise the risk of injury and mortality of fauna	Undertake pre-clearing/demolition/construction surveys (refer to Section 6.1). Implement Table 11 FFMP1, FFMP2, FFMP6, FFMP7 and FFMP13.	Inspection records	Best Practice
6	Prevent the establishment and spread of weeds within the Project	Implement the Project's weed management protocol (refer to Section 6.4; Annexure C). Implement Table 11 FFMP7 and FFMP29.	Inspection records	Best Practice

3. Environmental requirements

3.1. Relevant legislation

3.1.1. Legislation

Legislation relevant to flora and fauna management for this project includes:

- *Environmental Planning and Assessment Act 1979* (EP&A Act),
- *Biodiversity Conservation Act 2016* (BC Act),
- *National Parks and Wildlife Act 1974* (NPW Act) – Note: The plant and animal provisions have now been repealed by the BC Act,
- *Threatened Species Conservation Act 1995* (TSC Act) – Note: The TSC Act has now been repealed by the BC Act,
- *Native Vegetation Act 2003* (NV Act) – Note: The NV Act has now been repealed by the BC Act,
- *Fisheries Management Act 1994* (FM Act),
- *Biosecurity Act 2015* (BS Act),
- *Noxious Weeds Act 1993* (NW Act) – Note: The NW Act has now been repealed by the BS Act,
- *Pesticides Act 1999*,
- *Animal Research Act 1985*, and
- *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth) (EPBC Act).

Relevant provisions of the above legislation are explained in the legal and compliance tracking register included in Annexure A of the CEMP.

3.1.2. Additional approvals, licences, permits and requirements

As the project has been declared Critical State Significant Infrastructure, the following permits and approvals are not required:

- A permit to carry out dredging or reclamation (from DPI Fisheries),
- A permit to harm mangroves, seagrass or other marine vegetation (from DPI Fisheries),
- A permit to obstruct fish passage (from DPI Fisheries),
- Water use approval (under water management act) (from DPI Water),
- Approval to construct and use a specified water supply work at a specified location (from DPI Water),
- Approval to construct and use a specified drainage work at a specified location (from DPI Water),
- Approval to construct and use a specified flood work at a specified location (from DPI Water), and
- Approval to carry out a controlled activity (e.g. carrying out of building work, such as erecting buildings and other structures, and the installation of infrastructure) at a specified location in, on or under waterfront land (from DPI Water).

3.1.3. Guidelines and standards

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

- Australian Standard AS4373-2007 Pruning of amenity trees,
- Australian Standard AS4970-2009 Protection of Trees on development sites,
- NSW WorkCover Code of Practice for the Amenity Tree Industry (1998),
- Hygiene protocol for the control of disease in frogs (DECCW, 2008),
- Department of Primary Industries 'Policy and Guidelines for Fish Habitat Conservation and Management (DPI 2013),
- Fishnote – Policy and Guidelines for Fish Friendly Waterway Crossings – November 2003,
- Roads and Maritime QA Specification G36 – Environmental Protection (Management System),
- Roads and Maritime QA Specification G40– Clearing and Grubbing, and
- Roads and Maritime Biodiversity Guidelines: Protecting and Managing Biodiversity on RMS Projects (September 2011).

3.2. Ministers Conditions of Approval

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

Table 2 Ministers Conditions of Approval relevant to this Plan

CoA No.	Condition Requirement	Document Reference	How addressed			
C4	The following CEMP Sub-plans must be prepared in consultation with the relevant authorities identified for each CEMP Sub-plan and be consistent with the CEMP referred to in the EIS:	Section 3.4	This FFMP has been prepared in accordance with this condition and describes how JHCPB propose to manage flora and fauna during construction of the Project.			
	<table border="1"> <thead> <tr> <th></th> <th>Required CEMP Sub-plan</th> <th>Relevant authority(s) and council(s) to be consulted for each CEMP and Sub-plan</th> </tr> </thead> <tbody> <tr> <td>c)</td> <td>Flora and Fauna</td> <td>OEH and relevant council(s)</td> </tr> </tbody> </table>				Required CEMP Sub-plan	Relevant authority(s) and council(s) to be consulted for each CEMP and Sub-plan
	Required CEMP Sub-plan	Relevant authority(s) and council(s) to be consulted for each CEMP and Sub-plan				
c)	Flora and Fauna	OEH and relevant council(s)				
C5	The CEMP Sub-plans must state how:					
	a) the environmental performance outcomes identified in e documents listed in Condition A1 as modified by these conditions will be achieved;	Section 2.3	This Sub-plan was prepared in accordance with the environmental performance outcomes identified in the EIS and SPIR and is evidenced primarily in Section 2.3 and Table 1.			
	(b) the mitigation measures identified in the documents listed in Condition A1as modified by these conditions will be implemented;	Section 7	The implementation of flora and fauna management and mitigation measures identified in the EIS and SPIR are listed in Table 11.			
(c) the relevant terms of this approval will be complied with; and	Section 3.2 Annexure A	Details regarding how JHCPB propose to comply with the relevant terms of approval are listed in this Table and in Annexure A.				

CoA No.	Condition Requirement	Document Reference	How addressed
	(d) issues requiring management during construction (including cumulative impacts), as identified through ongoing environmental risk analysis, will be managed.	<p>Section 5 for flora and fauna issues</p> <p>Refer to Section 6 and 7 (Table 11) for details on how issues will be managed</p> <p>Refer to Section 3.2.1, Section 3.12 and Annexure B of the CEMP for details on environmental risk analysis</p>	<p>Flora and fauna issues requiring management during construction of the Project have been identified through the EIS, SPIR and Environmental Risk Assessment Workshop (refer to Section 3.2.1 and Annexure B of the CEMP). Environmental risk analysis will be ongoing and regularly reviewed in accordance with Section 3.12 of the CEMP to ensure effective management of flora and fauna impacts.</p> <p>These issues including cumulative impacts have been detailed in Section 5 of this Sub-plan. Vegetation, fauna and habitat management is discussed in Section 6 and mitigation and management measures for identified issues are listed in Table 11 of this plan.</p>
C6	The CEMP Sub-plans must be endorsed by the ER and then submitted to the Secretary for approval no later than one (1) month prior to the commencement of the construction activities to which they apply.	Refer to Section 2.2 of the CEMP	<p>The FFMP has been endorsed by the ER, in a letter dated 06 June 2019.</p> <p>The FFMP has been submitted to DPIE for approval no later than one month prior to the commencement of the construction activities.</p>
C7	Any of the CEMP Sub-plans may be submitted to the Secretary along with, or subsequent to, the submission of the CEMP.	Refer to Section 2.2 of the CEMP	This Sub-plan has been submitted for approval to DPIE subsequent to the submission of the CEMP for DPIE approval.
C8	Construction must not commence until the CEMP and all CEMP Sub-plans have been approved by the Secretary. The CEMP and CEMP Sub-plans, as approved by the Secretary, including any minor amendments approved by the ER, must be implemented for the duration of construction. Where the CSSI is being staged, construction of that stage is not to commence until the relevant CEMP and CEMP Sub-plans have been endorsed by the ER and approved by the Secretary.	Refer to Section 2.2 of the CEMP	Construction will not commence until the CEMP and all CEMP Sub-plans have been approved by DPIE. The CEMP and CEMP Sub-plans will be implemented for the duration of construction.

3.3. Revised Environmental Management Measures

Refer to Annexure A for all REMMs relevant to the development of this Plan.

3.4. Consultation

This plan was provided to NSW Office of Environment and Heritage (OEH), City of Sydney Council and Inner West Council in accordance with CoA C4 (c) (refer to Table 2).

Table 3 details a summary of the consultation undertaken for this plan and the key issues identified by the relevant stakeholders.

Table 3 Summary of consultation for development of the FFMP

Agency	Contact with agency	Response received	Key issues	Where addressed
City of Sydney	Via email from the Project: <ul style="list-style-type: none"> ▪ 04/04/2019 ▪ 05/04/2019 ▪ 17/04/2019 	Attendance at the Rozelle Interchange Regulator Briefing Session: <ul style="list-style-type: none"> ▪ 06/03/2019 Via email to the Project: <ul style="list-style-type: none"> ▪ 18/04/19 – City of Sydney provided comments on the FFMP. 	<ul style="list-style-type: none"> ▪ Disturbing microbat roosts/ habitat on site ▪ Impacts to biodiversity values ▪ Loss of urban/exotic and low value vegetation has on the ecological value on local wildlife 	<ul style="list-style-type: none"> ▪ Table 11 FFMP5 and FFMP6 ▪ Section 5 ▪ Table 11 FFMP3
Inner West City Council (IWC)	Via email from the Project: <ul style="list-style-type: none"> ▪ 04/04/2019 ▪ 05/04/2019 ▪ 17/04/2019 ▪ 23/04/2019 	Attendance at the Rozelle Interchange Regulator Briefing Session: <ul style="list-style-type: none"> ▪ 06/03/2019 Via email to the Project: <ul style="list-style-type: none"> ▪ 08/04/19 – IWC confirmed receipt of the FFMP. ▪ 23/04/19 – IWC provided comments on the FFMP, noting further comments may be provided. ▪ 26/04/19 – IWC provided a further comment from another officer. 	<ul style="list-style-type: none"> ▪ Staging of works to minimise impacts on fauna ▪ Exotic weed species as areas of native habitat ▪ Replacement of vegetation and offsets ▪ Potential loss of aquatic biodiversity ▪ Biodiversity and ecological value at compound sites ▪ Relocation of microbats and threatened species 	<ul style="list-style-type: none"> ▪ Table 11 7FFMP1, FFMP2, FFMP6, FFMP7 and FFMP13 ▪ Section 4, Section 6 and Table 11 FFMP29 ▪ Section 6 and Table 11 FFMP12, FFMP30, FFMP31 ▪ Section 4.1.4 and Table 11 FFMP17-28 ▪ Section 4 ▪ Section 6 and Table 11 FFMP5 - FFMP7
Office of Environment and Heritage (OEH)	Via email from the Project: <ul style="list-style-type: none"> ▪ 04/04/2019 ▪ 05/04/2019 ▪ 17/04/2019 ▪ 23/04/2019 	Via email to the Project: <ul style="list-style-type: none"> ▪ 24/04/19 – OEH confirmed they had no comments on the FFMP. 	N/A	N/A
Port Authority of NSW	Via email from the Project: <ul style="list-style-type: none"> ▪ 05/04/2019 	Via email to the Project: <ul style="list-style-type: none"> ▪ 16/04/19 – Port Authority responded that they had no significant issues with the plan. 	N/A	N/A

Ongoing consultation with relevant councils and other stakeholders, including any unique local receivers, may be undertaken for particular issues pertaining to the Project's impact on flora and fauna. Community feedback and complaints relating to flora and fauna will be dealt with in accordance with the Communication Strategy and Complaints Management System.

4. Existing Environment

The following sections summarise existing flora and fauna within and adjacent to the Project area including species, communities and habitats, identified during investigations and surveys carried out for the EIS. The key reference documents for this section are the EIS Biodiversity Chapter (Chapter 18) and the Biodiversity Assessment Report (Biodiversity Technical Paper S).

The Project boundary and relevant ecological data is shown on the Sensitive Area Plans included in Annexure F of the CEMP.

A summary of biodiversity values present within each construction site for the Project is provided in Table 4.

Table 4 Biodiversity values recorded at construction sites

Construction site	Biodiversity values
Rozelle civil and tunnel site (C5)	<p>No Plant Community Types (PCTs) were recorded, thus no native vegetation is considered to be present.</p> <p>All vegetation present was classified as 'Urban Exotic and Native Cover'* and is of 'Low Condition'.</p> <p>Eastern Bentwing-bat (listed as a Vulnerable species under the BC Act) was recorded within the Rozelle civil and tunnel site (C5) and may be roosting in the cavities under the Victoria Road bridge or using it as a flyway.</p> <p>A possible call of Yellow-bellied Sheattail bat (listed as a Vulnerable species under the BC Act) was recorded, and the species may be using the site to forage.</p> <p>Several Grey-headed Flying-fox were observed feeding on fig trees immediately adjacent to the site</p> <p>The foreshore of Rozelle Bay, in proximity to the southern boundary of the site, is highly modified. Banks are either rock revetment batters with twin pipe culverts, gabion baskets, weed-invaded fill or dilapidated seawalls. Few marine molluscs and oysters occupy the intertidal base of the batter.</p>
The Crescent civil site (C6)	<p>No PCTs were recorded, thus no native vegetation is considered to be present.</p> <p>All vegetation present was classified as 'Urban Exotic and Native Cover*', and is of 'Low Condition'</p> <p>Whites Creek, adjacent to the site, is a highly modified environment, consisting of a concrete channel with vertical walls and concrete base. This channel does not meet the definition of a river. Adjoining riparian vegetation provides low ecological value and is of limited habitat for fauna species. No seagrass occurs near the outlet, and no marine alga is attached to the gabion wall.</p> <p>The foreshore of adjacent Rozelle Bay, along the northern boundary of the site, is highly modified. Banks are either rock revetment batters with twin pipe culverts, gabion baskets, weed-invaded fill or dilapidated seawalls. Few marine molluscs and oysters occupy the intertidal base of the batter.</p>
Victoria Road civil site (C7)	<p>No PCTs were recorded, thus no native vegetation is considered to be present.</p> <p>All vegetation present was classified as 'Urban Exotic and Native Cover'* and is of 'Low Condition'.</p>
Iron Cove Link civil site (C8)	<p>No PCTs were recorded, thus no native vegetation is considered to be present.</p> <p>All vegetation present was classified as 'Urban Exotic and Native Cover'* and is of 'Low Condition'.</p> <p>The foreshore of Iron Cove is heavily developed with extensive areas of habitat lost to reclamation and seawalls.</p>

* Note: Although not identified in the EIS, consultation received during development of this FFMP suggests that 'urban exotic and native cover' may provide ecological value for local fauna species.

A summary of biodiversity values present within each modification for the Project is provided in Table 4.

Table 5 Biodiversity values recorded at the modification areas

Modification	Biodiversity values
MOD 2 – The Crescent overpass and active transport links	This Modification would be generally consistent with the EIS and does not require further assessment. This issue would be managed with the existing environmental management measures as summarised in Part E of the SPIR and relevant Conditions of Approval for the Project.
MOD 3 – Iron Cove ventilation undergrounding	The surface activities required to construct the Modification are located within the footprint assessed in the EIS. No additional impacts on biodiversity are expected a result of the Modification. As such, biodiversity impacts under the Modification are considered to be generally consistent with the EIS and therefore do not require further assessment.
MOD 4 – Glebe Island construction ancillary facility	The Glebe Island site comprises a hardstand concrete area which is void of vegetation and no vegetation removal is proposed as part of the Modification. Glebe Island is an active industrial port facility with limited vegetation and is not considered to provide suitable habitat for diverse fauna populations. Indirect impacts to fauna species (e.g. birds) as a result of temporary construction activities are considered to be minor and consistent with existing industrial activities at the site. As such, no additional biodiversity impacts are expected as a result of the Modification.

4.1. Environmental aspects

4.1.1. Threatened Ecological Communities

No threatened ecological communities (TEC) were recorded within the Project.

TECs listed in NSW under the TSC Act previously mapped within two kilometres of the Project are listed below:

- Coastal Saltmarsh in the NSW North Coast, Sydney Basin and South East Corner bioregions (TSC Act listing: Endangered),
- Sydney Turpentine Ironbark Forest (TSC Act listing: Endangered), and
- Swamp oak floodplain forest of the NSW North Coast, Sydney Basin and South East Corner bioregions (TSC Act listing: Endangered).

Commonwealth listed EPBC Act listed TECs previously mapped within two kilometres of the project footprint are listed below:

- Subtropical and Temperate Coastal Saltmarsh (EPBC act listing: Vulnerable), and
- Turpentine Ironbark Forest in the Sydney Basin Bioregion (EPBC act listing: Critically endangered).

These TECs would not be impacted by the Project.

4.1.2. Threatened or otherwise significant flora species

No threatened terrestrial flora were identified within the Project, nor were considered likely to occur in the Project.

4.1.3. Threatened fauna

Three threatened fauna species have been identified in the Project as detailed in Table 6.

Table 6 Threatened fauna species recorded in the project

Common Name	Scientific Name	EPBC Act	BC Act	Likelihood of occurrence
Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	Vulnerable	Vulnerable	High (recorded adjacent to the Rozelle civil and tunnel site (C5)).
Eastern Bentwing-bat	<i>Miniopterus schreibersii oceanensis</i>	-	Vulnerable	Known (call recorded in Rozelle civil and tunnel site (C5)).
Yellow-bellied Sheathtail-bat	<i>Saccolaimus flaviventris</i>	-	Vulnerable	Known (possible recorded in Rozelle civil and tunnel site (C5)).

4.1.4. Aquatic biodiversity

Table 7 details the freshwater and estuarine habitats recorded during investigations for the EIS, their waterway classification (where relevant) and whether they comprise fish habitat.

Table 7 Aquatic habitats within or in proximity to the project

Aquatic habitat	Description	Classification
Whites Creek	Concrete channel conveying stormwater to Rozelle Bay. A low horizontal intertidal zone prevents establishment of mangroves and saltmarsh. Does not support aquatic habitat for threatened aquatic species (including fish and birds).	Not applicable to concrete channels
Rozelle Bay	Foreshore of Rozelle Bay adjacent to The Crescent consists of reclaimed land, vertical seawalls, jetty structures, riprap embankment and gentle sloping intertidal land. Unlikely to support aquatic habitat for threatened aquatic/estuarine species (including fish, sharks, rays, aquatic mammals and birds).	Estuarine area Mapped as key fish habitat (DPI 2018)
Iron Cove	A narrow arm of Sydney Harbour, with a heavily developed foreshore that supports extensive areas of habitat lost to reclamation and seawalls. Unlikely to support aquatic habitat for threatened aquatic/estuarine species (including fish, sharks, rays, aquatic mammals and birds).	Estuarine area Mapped as key fish habitat (DPI 2018)

4.1.5. Groundwater Dependent Ecosystems

No priority Groundwater Dependent Ecosystems (GDEs) were identified within the Greater Metropolitan Water Sharing Plan within five kilometres of the project. Consequently, no GDEs are likely to be impacted by a potential groundwater level decline associated with the long-term impacts of the project. There may be a reduction in the amount of groundwater available for non-GDE shallow rooted plants.

4.1.6. Weed species

A number of weed species were identified in the project (refer to Table 8) and were particularly abundant within the Rozelle civil and tunnel site (C5).

Table 8 Weed species recorded in the project

Common name	Scientific name	Biosecurity Act Duty	Weed of National Significance
Madeira Vine	<i>Anredera cordifolia</i>	General Biosecurity Duty Prohibition on dealings	Yes
Bridal Creeper	<i>Asparagus asparagoides</i>	General Biosecurity Duty Prohibition on dealings	Yes
Spiny Burr Grass	<i>Cenchrus echinatus</i>	General Biosecurity Duty	
Green Cestrum	<i>Cestrum parqui</i>	General Biosecurity Duty Regional Recommended Measure	
Pampas Grass	<i>Cortaderia selloana</i>	Regional Recommended Measure	
Lantana	<i>Lantana camara</i>	Prohibition on dealings	Yes
Broad-leaved Privet	<i>Ligustrum lucidum</i>	General Biosecurity Duty	
Small-leaved Privet	<i>Ligustrum sinense</i>	General Biosecurity Duty	
Oxalis	<i>Oxalis sp.</i>	General Biosecurity Duty	
Pellitory	<i>Parietaria Judaica</i>	General Biosecurity Duty	
Castor Oil Plant	<i>Ricinus communis</i>	General Biosecurity Duty	
Blackberry	<i>Rubus fruticosus</i>	Prohibition on dealings	Yes

4.1.7. Pests and pathogens

The following exotic fauna species (pest species) have been identified in the project:

- European Red Fox (*Vulpes vulpes*),
- European Rabbit (*Oryctolagus cuniculus*),
- Feral Cat (*Felis catus*), and
- Common Myna (*Acridotheres tristis*).

The main pathogens of concern that have the potential to impact on native flora and fauna are:

- Myrtle Rust (*Uredo rangellii*),
- Chytrid Fungus (*Batrachochytrium dendrobatidis*), and
- Phytophthora (*Phytophthora cinnamomi*).

However, no sign of pathogen infection was identified in the project area.

5. Environmental aspects and impacts

Key aspects of the Project that could result in impacts to terrestrial and aquatic biodiversity, if such impacts are unmanaged and unmitigated, are summarised in Table 9. Refer also to the Aspects and Impact Register included in Annexure B of the CEMP.

In the absence of appropriate mitigation measures, there is potential for impacts to terrestrial and aquatic flora and fauna.

The project footprint and surrounding area is largely disturbed and considered to have little ecological value, as identified in the EIS. The EIS and the Project's environmental risk assessment (refer to CEMP Annexure B) indicate the project's anticipated ecological impact is minimal. Mitigation and management measures provided in Section 7 of this Plan aim to minimise these potential impacts.

Ongoing environmental risk assessments will be undertaken through quarterly management reviews as described in Section 3.12 of the CEMP.

Table 9 Construction activities and potential impacts

Construction activity	Potential impact on biodiversity
Demolition of structures (e.g. bridges, culverts and buildings)	<ul style="list-style-type: none"> ▪ Potential injury or stress for the Eastern Bentwing-bat due to noise, dust or light while roosting (non-breeding / maternal roost) in cavities of Victoria Road bridge ▪ Dust, litter and pollutants associated with building materials and demolition waste being mobilised by wind and stormwater runoff into waterways.
Site establishment activities, including vegetation clearing, earthworks, construction of hardstand areas, access roads and site offices	<ul style="list-style-type: none"> ▪ Loss of vegetation (classified as Urban Exotic and Native Cover) ▪ Loss of marginal fauna habitat ▪ Loss of potential foraging habitat of the Grey-Headed Flying-fox, Eastern Bentwing-bat and Yellow-bellied Sheathtail-bat ▪ Sediment-laden runoff transported offsite into stormwater systems and the receiving environment ▪ Mobilisation of dust and particulates ▪ Exposure of contaminated soils which if mobilised via stormwater runoff could acidify or pollute waterways ▪ Ecological impacts due to the disturbance of actual or potential acid sulfate soil and/or acid drainage discharge.
Construction of surface works, including realignment, modification or replacement of surface roads and footpaths	<ul style="list-style-type: none"> ▪ Sediment-laden runoff transported offsite into stormwater systems and the receiving environment ▪ Temporary obstruct fish passage during the use of a floating boom and silt curtain near the Whites Creek outlet across Rozelle Bay ▪ Construction noise and vibration affecting fauna behaviour, including the Grey-headed Flying-fox ▪ Mobilisation of dust and particulates ▪ Light spill during night works.
Utilities works	<ul style="list-style-type: none"> ▪ Loss and or/pruning of vegetation (classified as Urban Exotic and Native Cover) ▪ Loss of marginal fauna habitat ▪ Loss of potential foraging habitat of the Grey-Headed Flying-fox, Eastern Bentwing-bat and Yellow-bellied Sheathtail-bat ▪ Construction noise and vibration affecting fauna behaviour ▪ Mobilisation of dust and particulates ▪ Light spill during night works.

Construction activity	Potential impact on biodiversity
Operation of construction vehicles, plant and equipment, including haulage of spoil generated during tunnelling	<ul style="list-style-type: none"> ▪ Vehicles transferring soil, pathogens and/or weed propagules (e.g. <i>Phytophthora cinnamomi</i>, Exotic Rust Fungi, exotic vines and scramblers, and <i>Lantana camara</i>) to and from site, or to adjacent roads and stormwater networks ▪ Fauna injury or mortality caused by vehicle strike ▪ Leakage / spills of hydrocarbons or other chemicals from machinery with pollutants conveyed by stormwater runoff into waterways.
Construction of road tunnels	<ul style="list-style-type: none"> ▪ Groundwater drawdown reducing the amount of groundwater available for shallow rooted plants ▪ Ecological impacts due to the disturbance of actual or potential acid sulfate soil and/or acid drainage discharge.
Realignment, modification or replacement bridges, culverts and stormwater outlets	<ul style="list-style-type: none"> ▪ Mobilisation of sediments and contaminants at outlet locations, which may impact on aquatic habitat in Whites Creek and Rozelle Bay ▪ Scouring of sediments at outlet locations.

6. Vegetation, fauna and habitat management

6.1. Pre-construction surveys

6.1.1. Pre-clearing/demolition/construction

A survey will be carried out by the Project Ecologist to confirm the vegetation to be cleared as part of the Project, identify the presence and location of any habitat features (including tree hollows and/or potential bat roosts) and identify any unexpected threatened flora and fauna species.

Initially, areas requiring a pre-clearing/demolition/construction survey would be identified by the Environment and Sustainability Manager or their delegate, in consultation with the Project Engineer or Foreman. Prior to any vegetation clearing or demolition, as included in the Environmental Work Method Statements (EWMS), the Environment and Sustainability Manager or their delegate would accompany the Project Ecologist to site to carry out a meander survey, inspecting the area for the presence of endangered or threatened species, or habitat features. Limits of clearing and environmentally sensitive areas would be delineated and demarcated. Any subsequent relocation of species would be carried out under the guidance of the Project Ecologist, which would be documented in the Project Ecologist's pre-clearing report, along with recommended management measures.

In accordance with Roads and Maritime G40 Section 2.4, a pre-clearing report will be developed which:

- a) Includes a statement from an Ecologist that identifies the species and location of any weeds growing anywhere in the road reserve over the length to be cleared and grubbed;
- b) Identifies all locations of threatened flora species and trees which have been marked or otherwise identified for preservation; and
- c) Lists any trees outside the limits of clearing which are unsound and likely to fall upon the roadway or onto private property.

In the event that clearing/demolition/construction is to occur within the tree protection zone of high retention value trees (refer to Section 18.3.1 of the EIS) or heritage trees (refer to Section 20.2.4 of the EIS), an arborist/Project ecologist is to provide recommendations regarding sensitive construction methods and any necessary monitoring to be undertaken during the course of the works.

6.1.2. Microbat Surveys

In accordance with CoA E175, pre-clearing/demolition inspections for microbats and threatened species must be undertaken. The inspections, and any subsequent relocation of species and associated management/offset measures, must be undertaken under the guidance of a suitably qualified and experienced ecologist. Surveys for the presence of microbat roosting must be undertaken to cover the period of roosting, under guidance of a suitably qualified and experienced ecologist.

The inspections will be undertaken by an experienced bat ecologist and will involve diurnal inspections of the nominated sites to assess the potential for structures to support roosting bats. Microbat surveys will also record any potential habitat features that may require further targeted inspection, including any evidence of microbats and/or microbat use. Microbat surveys may also require dusk surveys to check for emerging bats, carried out for a minimum of one hour following sunset using ultrasonic bat detectors and spotlights at locations nominated by the ecologist.

All surveys would be carried out during favourable weather conditions and cover the period of roosting. Table 10 outlines the roosting behaviour of threatened microbat species recorded adjacent to the Project footprint during the EIS surveys.

Table 10 Roosting behaviour of recorded threatened microbat species

Common name	Scientific name	Roosting behaviour
Eastern Bentwing-bat	<i>Miniopterus schreibersii oceanensis</i>	Mating occurs in May to June. Females congregate in October into maternity colonies to give birth in December to Mid-January. Mothers return to winter roosts in March, with the maternity roosts deserted by April. Roost structures include caves and cave like structures (culverts, cellars etc).
Yellow-bellied Sheath-tail-bat	<i>Saccolaimus flaviventris</i>	Roosts in tree hollows and buildings in treeless areas. Mating occurs in August and young are born between December and March.

In the event that microbats or evidence of roosting are identified within the Project area during pre-construction surveys, JHCPB will prepare a Microbat Management Strategy in accordance with CoA E176. The strategy will detail short and long-term measures to avoid, minimise and mitigate impacts to identified species.

6.2. Clearing and Grubbing Plan

Work to be executed under the Roads and Maritime Specification G40 Clearing and Grubbing consists of the clearing of all vegetation both living and dead, all minor built structures (such as fences), all rubbish and other materials which are unsuitable for use in the Project Works, and the grubbing of trees and stumps from the area. A clearing and grubbing plan must be prepared in accordance with the Roads and Maritime Specification G40 Clearing and Grubbing. The clearing and grubbing plan is required to identify weeds, a procedure for weed removal, the location of habitat trees or threatened flora and a procedure for staged habitat removal. The Clearing and Grubbing Plan is to include where relevant:

- Methods used to identify and mark areas of weeds to be removed and methods for their removal,
- Procedure for the disposal of weeds and exotics,
- Procedure for protecting threatened flora species and trees marked for preservation,
- Methods used for identifying, marking and removing or pruning unsound trees likely to fall upon the roadway or onto private property, and
- Procedure for identifying and removing trees, stumps and logs above the specified size and within the area to be cleared.

6.3. Unexpected threatened species finds

In the event that a newly discovered threatened species or Endangered Ecological Communities are unexpectedly encountered during construction, the Unexpected Threatened Species Finds Procedure will be followed (refer to Annexure B).

6.4. Weed Management Protocol

Weeds within the construction footprint would be managed in accordance with the Weed Management Protocol for the Project (refer Annexure C).

7. Environmental mitigation and management measures

A range of environmental requirements and control measures are identified in the various environmental documents, including the EIS, SPIR, Conditions of Approval and other Roads and Maritime documents. Specific management measures to address these requirements and impacts on biodiversity are outlined in Table 11.

Table 11 Flora and fauna mitigation and management measures

ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Reference	Evidence
General						
FFMP1	Training will be provided to relevant Project personnel, including relevant sub- contractors on flora and fauna requirements from this plan through the induction.	Training materials	Prior to construction	Environment and Sustainability Manager	Best practice	Training resources
FFMP2	An appropriately qualified and experienced Ecologist will be appointed.	This plan	Prior to construction	Environment and Sustainability Manager	CoA E175 Best practice	Letter of engagement
FFMP3	Clearing of vegetation will be minimised to the greatest extent practicable (e.g. through detailed design, 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.	Detailed design to consider relevant CoA (CoAE174 & E177)	Prior to construction Construction	Environment and Sustainability Manager Design Director	CoA E174 CoA E177 REMM B6	Clearing and Grubbing Plans Tree Report Design Reports
Pre-clearing / Pre-demolition						
FFMP4	Erect exclusion fencing and signage to delineate the limits of clearing in accordance with Biodiversity Guidelines Protecting and managing biodiversity on RTA projects (RTA 2011).	SAPs	Prior to construction	Environmental Advisor	Best practice	Pre-clearing inspection
FFMP5	Prior to removing/clearing any vegetation, or demolition of structures identified as potential roosting sites for microbats (such as Victoria Road bridge), pre-clearing/demolition inspections for microbats, microbat roosting habitats and threatened species must be undertaken under the guidance of a suitably qualified and experienced ecologist.	This plan	Prior to construction	Environmental Advisor	CoA E175 REMM B2	Pre-clearing / demolition inspection

ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Reference	Evidence
FFMP6	<p>If microbats or evidence of roosting microbats are identified during pre-clearing/demolition surveys, the Microbat Management Strategy must be implemented.</p> <p>This will be developed in consultation with an appropriate microbat expert and included in this plan prior to commencement of work with the potential to disturb the roosting locations (as confirmed by the microbat expert).</p>	Microbat Management Strategy	Prior to construction	Environmental Advisor	CoA E176 REMM B2	Pre-clearing / demolition inspection
FFMP7	<p>Pre-clearing surveys will be carried out by the Project Ecologist to identify or confirm the location of:</p> <ul style="list-style-type: none"> ▪ Threatened flora and provide guidance ▪ Threatened fauna and provide guidance on subsequent relocation if required ▪ Hollow bearing trees or nest bearing trees ▪ Any trees which may be retained ▪ Pathogens and provide subsequent guidance on mitigation measures to be implemented ▪ Noxious and priority weeds present within the Project area. 	This plan	Prior to construction	Environment and Sustainability Manager	REMM B1 RMS Spec G40	Pre-clearing inspection
Vegetation Clearing and Management						
FFMP8	A clearing and grubbing plan will be developed for any clearing of vegetation works and will be submitted to RMS for approval before the commencement of the works.	This plan	Construction	Environmental Advisor	RMS Spec G40	Clearing and Grubbing Plans
FFMP9	Tree removal, pruning and maintenance work will be carried out by an arborist with a minimum 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)	This plan	Construction	Environmental Advisor Project Arborist	REMM B8	Arborist letter / report

ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Reference	Evidence
FFMP10	Advice provided by an arborist, with regard to tree removal, pruning and maintenance, must have a minimum of AQF Level 5 qualification in Arboriculture (or equivalent).	This plan	Construction	Environmental Advisor Project Arborist	REMM B8, B7	Arborist letter / report
FFMP11	Tree management plans will be prepared in accordance with the requirements of AS 4970-2009, where required for specific trees. Protection of trees will be carried out in consultation with an arborist with a minimum Australian Qualifications Framework (AQF) Level 5 qualification in arboriculture for each tree proposed for retention where works associated with the project have the potential to impact on the tree root zone. Tree Protections Zones must be delineated around any trees to be retained during construction, consistent with AS 4970-2009 Protection of trees on development sites.	EWMS	Construction	Environmental Advisor Project Arborist	REMM B1, B5, B7	Weekly Environmental Inspections Arborist letter / report
FFMP12	In the event that tree removal cannot be avoided, the tree removed will be accounted for in the tree report required in accordance with E179.	Detailed design	Pre-construction Construction	Environment and Sustainability Manager	CoA E177, E179 REMM B6	Tree Report
FFMP13	In the event that threatened species or TEC are unexpectedly identified during pre-clearing inspections or during construction, follow the Threatened Species Unexpected Find Procedure and update Sensitive Area Plans with this new information.	Threatened Species Unexpected Find Procedure	Pre-construction Construction	Environmental Advisor Project Arborist	REMM B1	SAPs
FFMP14	No materials are to be stockpiled or vehicles parked under the canopy line of trees identified to be retained; all stockpiling is to be managed in accordance with the SSWMP.	EWMS	Construction	Environmental Advisor	REMM B5 RMS Spec G40	Weekly Environmental Inspections

ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Reference	Evidence
FFMP15	No excavation, placing of fill or construction of access tracks within the canopy line of trees identified to be retained without ecologist/arborist assessment that confirms no detrimental effect, resulting in death or long term damage to the tree's health is likely to occur. This assessment will consider the value of the tree e.g. heritage / retention value and recommend mitigations and limits accordingly.	EWMS	Construction	Environmental Advisor	REMM B5 RMS Spec G40	Weekly Environmental Inspections
FFMP16	Stabilise all surfaces disturbed as a result of the project as soon as possible following the disturbance to prevent erosion and to minimise sedimentation in adjacent aquatic environments.	ErSed Plans	Construction	Environmental Advisor	REMM B4 ESCPs	Weekly Environmental Inspections
Aquatic Biodiversity Management						
FFMP17	Ensure soil and water management measures are implemented and maintained in accordance with the Construction Soil and Surface Water Management Plan (SSWMP), and as shown on each site-specific Erosion and Sediment Control Plans (ESCP).	ESCP	Pre-construction Construction	Environmental Advisor	CoA C4 (e) REMM SW01, SW03	ESCP
FFMP18	Any temporary crossing points at waterways (e.g. across western or eastern channel within Rozelle tunnel and civil site) will be stabilised to minimise the risk of scour and will be constructed of clean rock.	EWMS	Pre-construction Construction	Environmental Advisor	CoA C4 (e) REMM SW01, SW03	Weekly Environmental Inspections
FFMP19	Construction activities on waterfront land (e.g. drainage outlet works within 40 metres of the mean high water mark of Rozelle Bay or Iron Cove) must be undertaken in accordance with DPI controlled activity guideline, including Guidelines for outlet structures on waterfront land (NSW Office of Water 2012)	EWMS	Construction	Environmental Advisor	REMM SW08	Weekly Environmental Inspections

ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Reference	Evidence
FFMP20	Deploy silt curtains, booms or other in-water controls prior to construction activities in estuaries, in accordance with the Soil and Surface Water Management Plan and relevant Erosion and Sediment Control Plans	ESCP	Pre-construction	Environmental Advisor	CoA C4 (e) REMM SW01, SW03	Weekly Environmental Inspections
FFMP21	The proposed road bridge at Whites Creek will be designed with consideration of Policy and Guidelines for Fish Habitat Conservation Update 2013 (DPI-Fisheries 2013) and Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings (NSW-Fisheries 2003).	Detailed design	Construction	Environment and Sustainability Manager	REMM B1, B3	Detailed design
FFMP22	Programming of work will ensure work takes place during low flow periods (freshwater habitats) or during the lower half of the tidal cycle (tidal waterways).	Detailed design	Pre-Construction Construction	Environment and Sustainability Manager	REMM B1	Detailed design
FFMP23	Provisions to protect fish during the dewatering process of any coffer dams of clearing of screens will include: <ul style="list-style-type: none"> ▪ Discharging water into a bunded or screened site to allow fish to be rescued ▪ Immediately releasing upstream any fish caught ▪ Using pumped and screens of a suitable capacity and size, and pump velocities slow enough to allow fish to escape 	EWMS	Construction	Environmental Advisor	REMM B1	Weekly Environmental Inspections
FFMP24	Coffer dams will be used to keep disturbance to the substrate and blockages to fish passage to a minimum. Materials such as sheet piling will be used to reduce the impacts. Coarse rock confined by gabion baskets or mattresses will be used in preference to sand or soil.	EWMS	Construction	Environmental Advisor	REMM B1	Weekly Environmental Inspections
FFMP25	Foreshore works in Iron Cove estuary will be restricted to calm weather conditions.	EWMS	Construction	Environmental Advisor	REMM B1	Weekly Environmental Inspections

ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Reference	Evidence
FFMP26	Where stockpiles are located on flood prone land, they will be situated either above the highest astronomical tide, or from a 1 in 10 year flood.	Detailed design	Construction	Environment and Sustainability Manager	REMM B1	Weekly Environmental Inspections
FFMP27	Only natural material will be used as fill during reclamation works.	Detailed design	Construction	Environment and Sustainability Manager	REMM B1	Detailed design
FFMP28	Rehabilitation of land in waterways will be completed in accordance with a NSW DPI approved method.	Detailed design	Construction	Environment and Sustainability Manager	REMM B1	Detailed design
Weeds, Pest and Pathogens						
FFMP29	Manage weeds within the construction footprint in accordance with the Weed Management Protocol.	Weed Management Protocol	Pre-construction Construction	Environmental Advisor Project Ecologist	REMM B1	Weekly Environmental Inspections
Rehabilitation / Revegetation						
FFMP30	Progressively rehabilitate, regenerate and/or revegetate disturbed areas in accordance with the Urban Design and Landscape Plan	UDLP	Post-construction	Environmental Advisor Project Landscape Architect	CoA E134	Weekly Environmental Inspections
FFMP31	A Tree Report will be prepared that details the type, size, number and location of replacement trees. The report will demonstrate how any plantings with a pot size less than 75 L are consistent with the requirements of CoA E178.	Detailed Design	Post-construction	Environment and Sustainability Manager	CoA E178, E179	Tree Report

8. Compliance management

8.1. Roles and responsibilities

The JHCPB Project Team's organisational structure and overall roles and responsibilities are outlined in Section 3.3 of the CEMP. Specific responsibilities for the implementation of environmental controls are detailed in Section 6 of this Plan.

8.2. Training

All personnel, including employees, contractors, sub-contractors and utility staff working on site will undergo site induction training relating to flora and fauna management issues. The induction training will address elements related to flora and fauna management including:

- Existence and requirements of this sub-plan,
- Relevant legislation,
- Specific species likely to be affected by the construction work and how these species can be recognised,
- Fauna rescue requirements,
- Weed control measures,
- General flora and fauna management measures, and
- Specific responsibilities for the protection of flora and fauna.

Further details regarding staff induction and training are outlined in Section 3.5 of the CEMP.

8.3. Monitoring and inspections

Inspections of areas and activities with the potential to impact flora and fauna will occur for the duration of the Project.

Requirements and responsibilities in relation to monitoring and inspections are documented in Section 3.8.1 and 3.8.2 of the CEMP.

8.4. Auditing

Audits (both internal and external) will be carried out to assess the effectiveness of environmental controls, compliance with this sub plan, CoA and other relevant approvals, licenses and guidelines.

Audit requirements are detailed in Section 3.9.3 of the CEMP.

8.5. Reporting

Reporting requirements and responsibilities are documented in Section 3.9.5 of the CEMP. There are specific reporting requirements associated with additional survey work and monitoring including the results of pre-clearing surveys.

9. Review and improvement

9.1. Continuous improvement

Continuous improvement of this plan will be achieved by the ongoing evaluation of environmental management performance against 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, and
- Make comparisons with objectives and targets.

9.2. Update and amendment

The processes described in Section 2 of the CEMP may result in the need to update or revise this Plan. This will occur as needed.

Any revisions to this Plan will be in accordance with the process outlined in Section 2 of the CEMP and as required, be provided to Transport for NSW, the Environmental Representative, the Secretary of DPIE, and other relevant stakeholders for review, comment and approval as required.

A copy of the updated Plan and changes will be distributed to all relevant stakeholders in accordance with the approved document control procedure (refer to Section 3.11.2 of the CEMP).

Annexure A Other Conditions of Approval and Revised Environmental Management Measures relevant to this plan

Table 12 Other Conditions of Approval relevant to the development of this Plan

CoA No.	Condition Requirements	Document Reference
E174	The clearing of native vegetation must be minimised with the objective of reducing impacts to any threatened species, populations and ecological communities to the greatest extent practicable. Impacted vegetation must be rehabilitated with endemic species (in the first instance) and locally native species to the greatest extent practicable.	Table 11 FFMP3
E175	Prior to removing/clearing any vegetation, or demolition of structures identified as potential roosting sites for microbats, pre-clearing/demolition inspections for microbats and threatened species must be undertaken. The inspections, and any subsequent relocation of species and associated management/offset measures, must be undertaken under the guidance of a suitably qualified and experienced ecologist. Surveys for the presence of microbat roosting must be undertaken to cover the period of roosting, under guidance of a suitably qualified and experienced. Survey methodologies must be incorporated into the Construction Flora and Fauna Management Sub-plan required under Condition C4 and Site Establishment Management Plan required under Condition C22 , as relevant.	Table 11 FFMP2, FFMP5
E176	The Proponent must prepare a Microbat Management Strategy in the case that microbats or evidence of roosting are identified during pre-clearing/demolition surveys. The strategy must detail short- and long-term measures to avoid, minimise and mitigate impacts to these species.	Table 11 FFMP6
E177	The CSSI must be designed to retain as many trees as possible. Where trees are to be removed, the Proponent must provide a net increase in the number of replacement trees. Replacement trees must be planted within, and on public land up to 500 metres from the CSSI boundary. Replacement tree plantings can be undertaken beyond 500 metres on public land within the local government areas to which the CSSI approval applies if no more plantings are practicable within and up to 500 metres from the CSSI boundary. The location of the trees must be determined in consultation with the relevant authority(s).	Table 11 FFMP3, FFMP12
E178	Replacement trees are to have a minimum pot size of 75 litres except where the plantings are consistent with the pot sizes specified in a relevant authority's plans / programs / strategies for vegetation management, street planting, or open space landscaping, or as agreed by the relevant authority(s).	Table 11 FFMP24
E179	The Proponent must submit to the Secretary a report which details the type, size, number and location of replacement trees. The report must demonstrate how any replacement plantings with a pot size less than 75 litres are consistent with the requirements of Condition E178 . The report must be submitted to the Secretary one (1) month prior to operation.	Table 11 FFMP24

Table 13 Revised Environmental Management Measures relevant to the development of this Plan

Outcome	REMM No.	Commitment	Timing	Document Reference
Biodiversity				
Impact on biodiversity values	B1	<p>A Construction Flora and Fauna Management Plan (CFFMP) will be developed and implemented during construction. The CFFMP will include the following:</p> <ul style="list-style-type: none"> ▪ Identification of guidelines relevant to construction, the matters they apply to and what is required to ensure compliance ▪ Pre-disturbance inspection requirements to identify features of biodiversity conservation significance and select appropriate management measures and environmental controls ▪ Management measures and environmental controls to be implemented before and during construction including: <ul style="list-style-type: none"> ▸ An unexpected threatened species finds procedure ▸ Section 3.3.2 Standard precautions and mitigation measures of the Policy and Guidelines for Fish Habitat Conservation and Management Update 2013 (DPI-Fisheries 2013) ▸ Tree assessment and management protocols consistent with AS 4970-2009 Protection of trees on development sites ▸ Weed management protocols. <p>The plan will include management measures outlined in Appendix S (Technical paper: Biodiversity) and from any additional assessments carried out during detailed design and project delivery as relevant.</p>	Construction	<p>Section 3.1</p> <p>Annexure B Unexpected Threatened Finds Procedure</p> <p>Table 11 FFMP7, FFMP11, FFMP13, FFMP21, FFMP22 – 28, FFMP29</p>
Disturbance of threatened microbats	B2	<p>Prior to the commencement of any works associated with the modification of the Victoria Road bridge, an inspection will be carried out by a suitably qualified and experienced ecologist to confirm the presence of roosting microbats. If roosting microbats are identified, measures to manage potential impacts will be developed in consultation with an appropriate microbat expert and included in the CFFMP prior to the commencement of any work with the potential to disturb the roosting locations (as confirmed by the microbat expert).</p>	Construction	Table 11 FFMP5
Aquatic impacts	B3	<p>The proposed road bridge at Whites Creek will be designed with consideration of Policy and Guidelines for Fish Habitat Conservation Update 2013 (DPI-Fisheries 2013) and Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings (NSW-Fisheries 2003).</p>	Construction	Table 11 FFMP21

Outcome	REMM No.	Commitment	Timing	Document Reference
	B4	Site-specific Erosion and Sediment Control Plans (ESCPs) will be prepared for each work location associated with or in the vicinity of waterways and culverts that will be modified as part of the project. The ESCPs will contain measures to stabilise all surfaces disturbed as a result of the project as soon as possible following the disturbance to prevent erosion and to minimise sedimentation in adjacent aquatic environments.	Construction	Table 11 FFMP16 SSWMP
Loss of trees	B5	The CFFMP will include measures to manage potential impacts on trees. Measures will include: <ul style="list-style-type: none"> ▪ The establishment of tree protection zones ▪ Ground protection measures for trees to be retained. 	Construction	Table 11 FFMP11, FFMP14, FFMP15
	B6	As many trees as possible will be retained during construction. In the event that tree removal cannot be avoided, a tree replacement strategy will be prepared. Replacement trees will be included in the relevant UDLP. Opportunities for the provision of replacement trees outside the project boundary will be investigated in consultation with local councils.	Construction	Table 11 FFMP3, FFMP12
	B7	The CFFMP will include tree management protocols and provision for the development of tree management plans (in accordance with the requirements of AS 4970-2009) where required for specific trees. Protection of trees on development sites will be carried out in consultation with an arborist with a minimum Australian Qualifications Framework (AQF) Level 5 qualification in arboriculture for each tree proposed for retention where works associated with the project have the potential to impact on the tree root zone.	Construction	Table 11 FFMP10, FFMP11
	B8	Tree removal, pruning and maintenance work will be carried out by an arborist with a minimum 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) and advice provided by an arborist with a minimum AQF Level 5 qualification in arboriculture (or equivalent).	Construction	Table 11 FFMP9, FFMP10

Annexure B Unexpected Threatened Species Finds Procedure

1. Introduction

This procedure describes how to manage unexpected encounters of threatened flora species and/or Threatened Ecological Community (TEC) during construction.

This procedure has been prepared to meet the requirements of the Conditions of Approval and the Biodiversity Guidelines (Protecting and Managing Biodiversity on RTA Projects).

1.1. Sub-Plans

Further information regarding the Unexpected Threatened Species Finds Procedure can be found in the following sub-plans of the CEMP;

- Flora and Fauna Management Plan.

2. Reporting

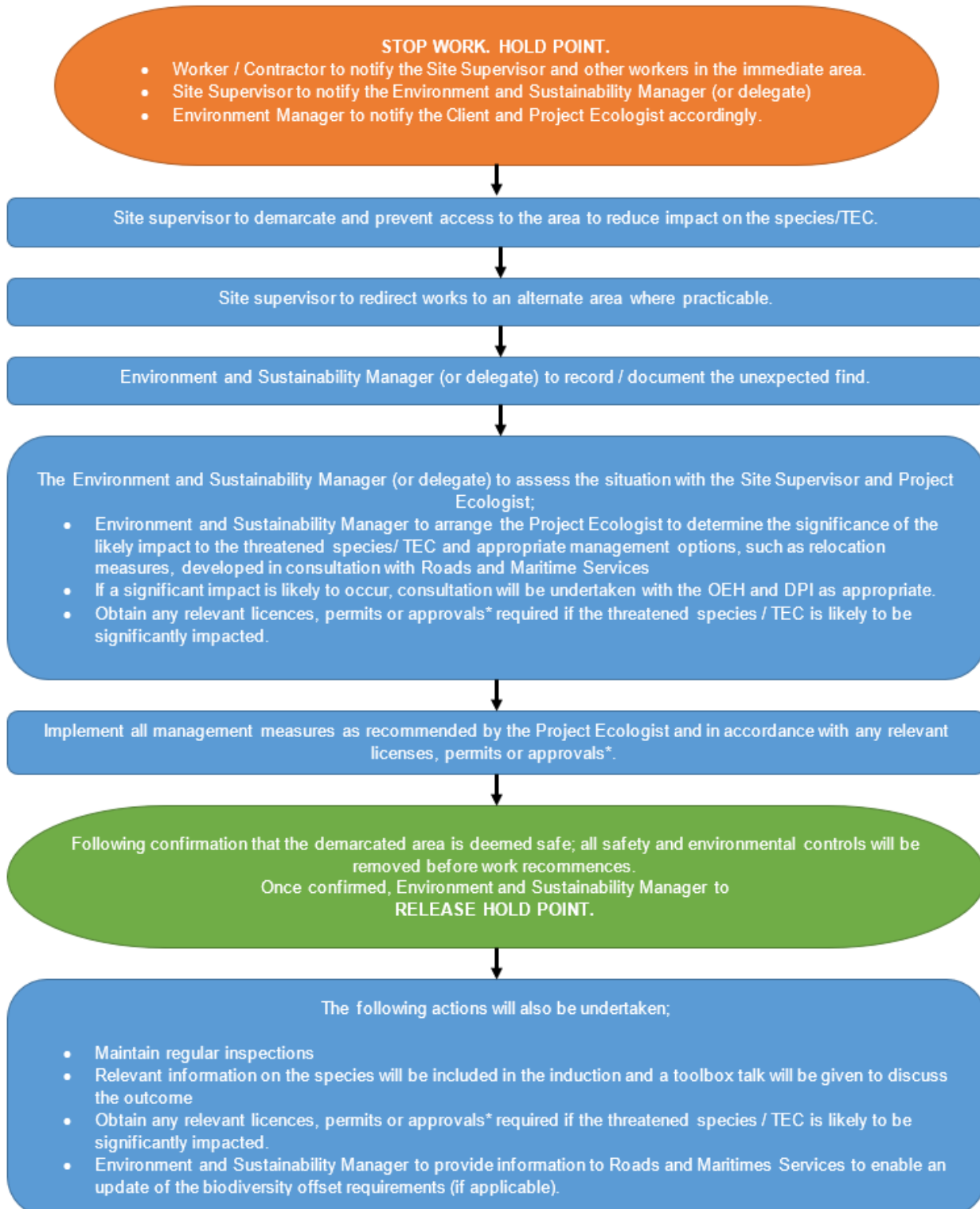
A record of the unexpected finds should be maintained by the contractor and should include the following details:

- 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.

3. Unexpected Threatened Species Finds Flow Chart

In the event an unexpected threatened species is encountered during site works, the following procedure must be followed.

Figure 1 Unexpected Threatened Species Finds Procedure Flow Chart



* Approvals may include, but may not be limited to, approval under the EPBC Act, approval of a Consistency Assessment, and/or Project modification from DPIE. It should be noted that consultation with RMS and OEH shall identify the applicable approvals required for the impacts identified.

Annexure C Weed Management Protocol

1. Introduction

This procedure describes the weed management and control practices to be implemented during construction.

This protocol has been prepared to meet the requirements of the Conditions of Approval and the Biodiversity Guidelines (Protecting and Managing Biodiversity on RTA Projects) and has been developed in accordance with:

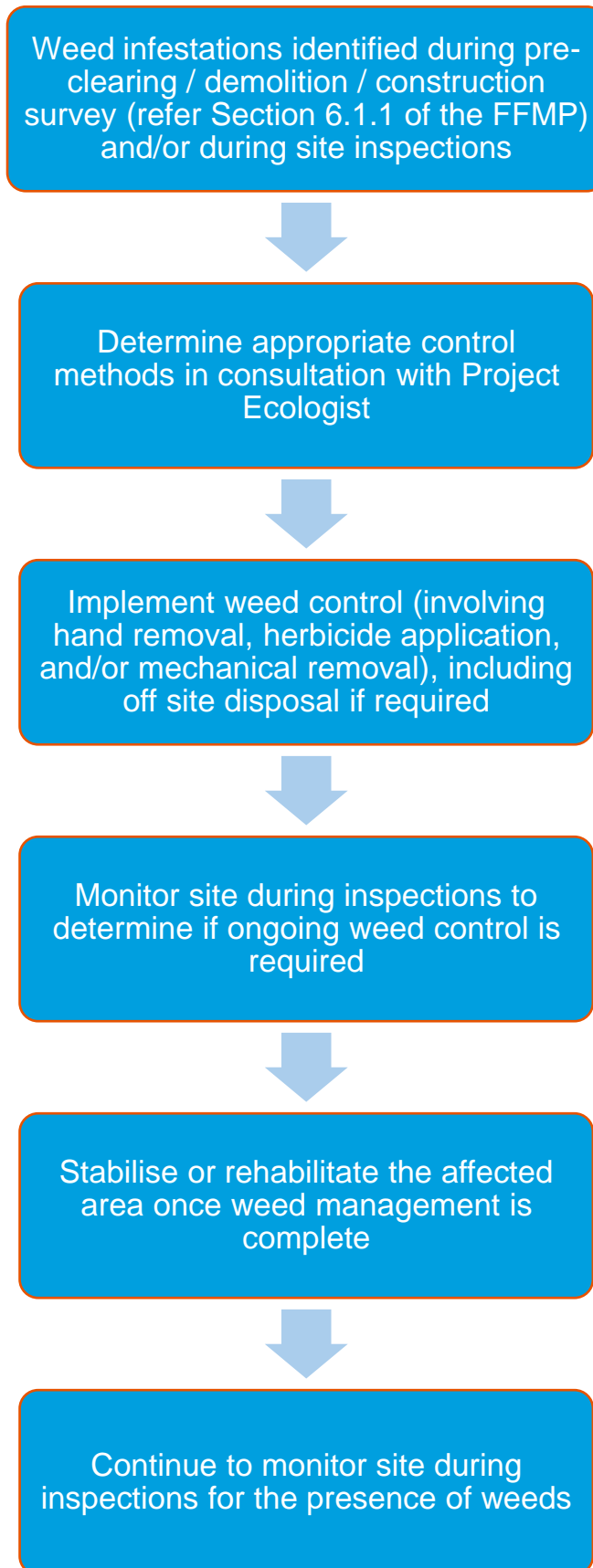
- Roads and Maritime Biodiversity Guidelines: Guide 6 - Weed management.
- Roads and Maritime Specification D&C G36 Environmental Protection.

1.1. Sub-Plans

Further information regarding the Weed Management Protocol can be found in the following sub-plans of the CEMP;

- Flora and Fauna Management Plan.

2. Procedure



3. Weed Control Methodology

3.1.1. Manual control

- Weeds requiring hand or mechanical removal, including contaminated topsoil, would require disposal by encapsulation (deep burying) or to an approved waste management facility
- Carry out mechanical means of control (such as mowing or slashing) where feasible in proximity to waterways and aquatic environments, such as Rozelle Bay, Whites Creek, Iron Cove and drainage lines within Rozelle civil and tunnel site (C5).
- Machinery involved in weed management activities would be thoroughly cleaned to remove any plant material or soil, prior to the commencement of construction.

3.1.2. Chemical (pesticide) control

- Public notification of pesticide use must be in accordance with Roads and Maritime Specification G36 Annexure G36/H.
- Only pesticides registered for use near water may be used near waterways and aquatic environments.
- Avoid applying pesticides:
 - › On hot days when plants are stressed,
 - › After the seed has set,
 - › Within 24 hours of rain or when rain is imminent, and/or
 - › When winds will cause drift of herbicides into non-target areas.
- Complete a Records Sheet within 48 hours of applying pesticide and a copy submitted to the Environment and Sustainability Manager and Roads and Maritime representative, which includes the following information:
 - › Who applied the pesticide,
 - › Date of pesticide application,
 - › Details of pesticide used (full product names),
 - › Where the pesticide was applied (to what weed and in what location),
 - › Amount of pesticide used (total amount use, rate of application, area covered), and
 - › Weather conditions during pesticide application.

3.1.3. Minimising spread and disposal of weeds

- Clean machinery, vehicles and footwear used in weed control before moving to a new location within the site.
- All weed plant material and topsoil containing weed plant material should be disposed of at an offsite licensed facility as directed by the Environment and Sustainability Manager.
- Securely cover loads of weed-contaminated material to prevent weed plant material falling or blowing off vehicles between site and the disposal location.