Appendix B2 Construction Flora and Fauna Management Sub-plan

M12 Motorway - West Project

Project number:	**N81151**
Document number:	M12WCO-CPBGGJV-ML1-EV -PLN-000003
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Revision:	02

Details of Revision Amendments

Document Control

The Project Director is responsible for ensuring that this plan is reviewed and approved. The Project Director is responsible for updating this plan to reflect changes to construction, legal and other requirements, as required.

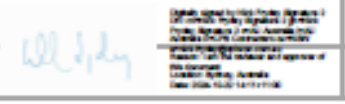
Amendments

Any revisions or amendments must be approved by the Project Director and/or client before being distributed / implemented.

Revision Details

Rev	Date	Reviewed By	Details
A	18/02/2022	L. Cooper	First Draft
B	13/05/2022	C. Douchkov	Second Draft following TfNSW/Arcadis review and comment
C	27/06/2022	A. Zvirzdinas	Third Draft following TfNSW/Arcadis review and comment on Rev B
D	18/07/2022	A. Zvirzdinas	Fourth Draft following TfNSW/Arcadis/ER review and comment on Rev C. New document number.
E	25/07/2022	A. Zvirzdinas	Fifth Draft following ER review and comment on Rev D
00	27/07/2022	A. Zvirzdinas	First Controlled Issue
F	31/01/2023	K. Purkiss	6 monthly review
01	16/05/2023	A. Brajlih	Second Controlled Issue
02	22/10/2024	T. Chezzi	Annual Review

Document Review

Position	Name	Signature	Date
Project Director	Nick Fryday		22/10/2024

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Endorsement

Position	Name	Signature	Date
Ecologist	David Bone		31/01/2023

Table of Contents

Acronyms and Abbreviations

Abbreviations	Expanded text
AFC	Approved for Construction
APVMA	Australian Pesticides and Veterinary Medicines Authority
AR	Amendment Report
Areas of vegetation to be retained	These areas present potential opportunities for the Construction Contractor to avoid and minimise potential vegetation impacts if possible. As vegetation impacts may occur during construction, these impacts have been considered in biodiversity off-set calculations.
ARSR	Amendment Report Submissions Report
BAR	Biodiversity Assessment Report
BC Act	NSW *Biodiversity Conservation Act 2016*
BOS	Biodiversity Offset Strategy
CA	Consistency Assessment
CCS	Community Communication Strategy
CEMP	Construction Environmental Management Plan
CFFMP	Construction Flora and Fauna Management Sub-plan
CoA	Condition of Approval
CPBGG JV	CPB Georgiou Joint Venture
Construction	Includes all activities required to construct the CSSI as described in the documents listed in Condition A1, including commissioning trials of equipment and temporary use of any part of the CSSI, but excluding Low Impact Work which is carried out to complete prior to the approval of the CEMP, works approved under a Site Establishment Management Plan, approved under a Consistency Assessment, demolition of acquired residential houses, structures and sheds, and works approved under an environmental management plan(s) in accordance with Condition A24.
CSSI	Critical State Significant Infrastructure
CSWMP	Construction Soil and Water Management Plan
CWRMP	Construction Waste and Resources Management Plan
DAWE	Former Commonwealth Department of Agriculture, Water and the Environment
DCCEEW	Commonwealth Department of Climate Change, Energy, Environment and Water
DEC	Former NSW Department of Environment and Conservation
DECC	Former NSW Department of Environment and Climate Change
DECCW	Former NSW Department of Environment, Climate Change and Water

DITRDC	Commonwealth Department of Infrastructure, Transport, Regional Development and Communications
Division 5.2 Approval	Approval issued by the NSW Minister for Planning and Public Spaces for the M12 Motorway
DPE	Former NSW Department of Planning and Environment
DPI	NSW Department of Primary Industries
DPHI	NSW Department of Planning, Housing and Infrastructure (formerly NSW DPE which has now been split into NSW DCCEEW and NSW DPHI, with all planning functions falling to DPHI)
EAD	Environmental Assessment Documentation
EEC	Endangered Ecological Community
EES	Former Environmental, Energy and Science Group (now EHG)
EHG	Environment and Heritage Group (a part of NSW DCCEEW)
EIS	Environmental Impact Statement
EMS	Environmental Management Systems
Environmental Assessment Documentation	The set of documents that comprise the Division 5.2 Approval: • Roads and Maritime Services (October, 2019) M12 Motorway, Environmental Impact Statement (EIS) • Transport for NSW (October, 2020) M12 Motorway, Submissions Report (the Submissions Report) • Transport for NSW (October, 2020) M12 Motorway, Amendment Report (AR) • Transport for NSW (December, 2020) M12 Motorway, Amendment Report submissions report (ARSR) • Transport for NSW (March, 2021) The M12 Motorway Amendment Report Submissions Report – Amendment (ARSR amendment) • WSP (October, 2021) M12 Motorway – West Package Detailed Design Consistency Assessment • GHD (October, 2021) M12 Motorway – Central Package Detailed Design Consistency Assessment • Arcadis (June, 2022) M12 Motorway – Sydney Water Crossings Consistency Assessment • Arcadis (July, 2022) M12 Motorway – Design Boundary Changes Consistency Assessment • Arcadis (August, 2022) M12 Motorway Minor Consistency Assessment for Proposed Change to the M12 Motorway Project (M12 Central) • Arcadis (September, 2023) M12 Motorway – Devonshire Road Temporary Roundabout Consistency Assessment • WSP (September, 2023) M12 Motorway – Elizabeth Drive Connections Consistency Assessment

	• TfNSW (September, 2023) M12 Motorway – Minor Consistency Assessment M12 West demolition of structures as 752 Luddenham Road • TfNSW (October, 2023) M12 Motorway – Minor Consistency Assessment M12 East AF9 Power Supply • TfNSW (October, 2023) M12 Motorway – Minor Consistency Assessment M12 East Cecil Road Laydown Area • TfNSW (October, 2023) M12 Motorway – Minor Consistency Assessment M12 East Temporary Construction Signage • Arcadis (December, 2023) M12 Motorway Project (M12 East) Sites 48, 50 and 51 • Arcadis (January, 2024) M12 Motorway – Minor Consistency Assessment M12 Central Water Tower Access Road • The documents that comprise the EPBC referral: • Submission #3486 – The M12 Motorway Project between the M7 Motorway, Cecil Hills and The Northern Road, Luddenham, NSW • Notification of referral decision and designated proponent - controlled action; date of decision 19 October 2018; ID: 2018-8286.
EP&A Act	*NSW Environmental Planning and Assessment Act* 1979
EPA	NSW Environment Protection Authority
EPBC Act	*Environmental Protection and Biodiversity Conservation Act* 1999
EPBC Referral	A Proponent must refer a proposed action to the Australian Government Minister for the Environment (the Minister) for assessment, if it has, will have, or is likely to have a significant impact on the world heritage values of a declared World Heritage property, or is likely to have a significant impact on the National Heritage values of a National Heritage place.
EPL	Environment Protection Licence
ER	Environmental Representative
ESM	Environment and Sustainability Manager (TfNSW)
ESR	Environmental Site Representative (CPBGG JV)
EWMS	Environmental Work Method Statements
Exclusion zones	Exclusion zones are areas of environmental importance (e.g. threatened vegetation or heritage items) that need to be protected. These exclusion zones are defined as no-go areas and are to be protected for the duration of construction in that particular footprint area.
FBA	NSW Framework for Biodiversity Assessment 2014
Federal Approval	Approval (EPBC 2018/8286) for carrying out the M12 Project under Part 8 of the *Environmental Protection and Biodiversity Conservation Act 1999* subject to specific CoA as detailed in Annexure A of the approval.

Final construction footprint	The area shown in the map(s) submitted under Commonwealth CoA 2, determined by TfNSW in accordance with a consistency assessment(s) or a modification assessment under the *NSW Environmental Planning and Assessment Act 1979* where no new significant impacts to protected matters are identified.
FM Act	NSW *Fisheries Management Act 1994*
HCP	Habitat Compensation Plan
Infrastructure Approval	Approval (SSI 9364) for carrying out of the M12 Project under Section 5.19 of the *Environmental Planning and Assessment Act* 1979 subject to specific CoA as detailed in Schedule 2 of the approval.
KFH	Key Fish Habitats
KTP	Key Threatening Processes
M7 Motorway (MOD 6 Widening)	Refers to the State Significant Infrastructure project (SSI-663-MOD 6) to construct and operate an additional lane in both directions within the existing median of the M7 Motorway, south of the Kurrajong Road overhead bridge at Prestons to the M7 Motorway bridge at Richmond. This project interacts with the M12 East stage at the M7 interchange.
M7 Widening	Shorthand term for M7 Motorway (MOD 6 Widening)
M7-M12 Integration Project	The M7-M12 Integration project incorporates the following: • M7 Motorway (Mod 6 Widening) (SSI 663 Mod 6) – modification (mod) to the M7 Motorway approved on 17 February 2023 under Division 5.2 of the Environmental Planning and Assessment Act 1979 (EP&A Act) M12 Motorway (CSSI 9364) – approved on 23 April 2021 under Division 5.2 of the EP&A Act and split into separate stages or packages of work (West, Central (main construction), Central (temporary roundabout) and East). The M12 Motorway is also subject to a federal approval under the *Environment Protection and Biodiversity Conservation Act 1999*. The M7-M12 Integration project incorporates the M12 East package only.
NASF	National Airports Safeguarding Framework
NPW Act	NSW *National Parks and Wildlife Act 1974*
NSW CoA	NSW Conditions of Approval
NSW DCCEEW	NSW Department of Climate Change, Energy, the Environment and Water (formerly NSW DPE which has now been split into NSW DCCEEW and NSW DPHI)
OCEMP	Overarching Construction Environmental Management Plan
OEH	NSW Office of Environment and Heritage, now Environment Energy and Science
PBFD	Psittacine beak and feather disease
Pesticide Act	NSW *Pesticides Act 1999*
PCT	Plant Community Type
PDLP	Place, Design and Landscape Plan
PMST	Protected Matters Search Tool
POEO Act	NSW *Protection of the Environment Operations Act 1997*

Primary CoA/REMM	CoA or REMM that is specific to the development of this Plan
Project, the	M12 Motorway West Project
REMM	Revised Environmental Management Measures
RIAR Group	NSW Regions, Industry, Agriculture and Resources Group (a part of DPIE)
Roads and Maritime	Former NSW Roads and Maritime Services. Now Transport for NSW
RTA	Roads & Traffic Authority. Former NSW Roads and Maritime Services, now Transport for NSW
SEARs	Secretary Environmental Assessment Requirements
Secondary CoA/REMM	CoA or REMM that is related to, but not specific to, the development of this Plan
TEC	Threatened Ecological Communities
TfNSW	Transport for New South Wales
TSC Act	*Threatened Species Conservation Act 1995* (NSW) (repealed) but relevant for this assessment due to being assessed under the Biodiversity Conservation Transitional arrangements.
WSIA	Western Sydney International Airport
WSP	Western Sydney Parklands
WSA Co	Western Sydney Airport Corporation
WSPT	Western Sydney Parklands Trust

1 Introduction

1.1 Context

This Construction Flora and Fauna Management Sub-plan (CFFMP or Plan) forms part of the Construction Environmental Management Plan (CEMP) for the M12 Motorway (West project (the Project). The CPB Contractors and Georgiou Group Joint Venture (CPBGG JV) has been awarded the M12 West stage which is a construct only contract between The Northern Road, Luddenham and about 250 metres east of Badgerys Creek.

An Overarching Construction Environmental Management Plan (OCEMP) has been prepared by TfNSW to address to address the requirements of the NSW Minister's Conditions of Approval (CoA), Commonwealth Conditions of Approval, the environmental management measures detailed in the M12 Motorway Environmental Impact Statement (EIS), Revised Environmental Management Measures (REMMs) detailed in the Amendment Report (AR), all subsequent Consistency Assessments (CA) and all applicable legislation and Transport for New South Wales (TfNSW) Quality Assurance (QA) specifications. The OCEMP was approved by DPIE on 21/12/2021.

This CFFMP has been prepared by CPBGG JV to address the requirements of the OCEMP, all relevant TfNSW specifications, Environment Protection Licence (EPL) conditions and legislation.

1.2 Background and project description

An EIS was prepared to describe and assess the Project and recommend management measures to address impacts.

Additional assessments have since been undertaken:

- M12 West Minor Consistency Assessment for the demolition of structures as 752 Luddenham Road required to address the need for the demolition of structures within Ancillary Facility 11. Whilst this ancillary facility is already located within the construction footprint and was previously assessed in the M12 Motorway Amendment Report, the demolition and disposal of structures in this location required assessment; approved in September 2023.
- M12 West Minor Consistency Assessment for the temporary amendment to the construction footprint to facilitate the construction of Variable Message Sign (VMS) infrastructure scope on The Northern Road (TNR), Luddenham NSW. While the VMS scope had been previously assessed in the M12 Motorway Amendment Report, the works area had not been included as a part of the M12 West construction footprint and required inclusion; approved in August 2024.

The Project must be carried out generally in accordance with the EIS, Submissions Report, AR, ARSR and the ARSR – Amendment, M12 West and Central CA, M12 West Demolition of Structures as 752 Luddenham Road CA. These documents are collectively referred to as the Environmental Assessment Documentation (EAD). The CSSI must also be carried out in accordance with all procedures, commitments, preventative actions, performance outcomes and mitigation measures set out in the EAD as required by NSW CoA A2.

The Project EIS assessed the impacts of construction of the Project on flora and fauna. As part of EIS development, a detailed Biodiversity Assessment Report (BAR) was prepared to address the Secretary's Environmental Assessment Requirements (SEARs) issued by the DPIE and the Commonwealth EIS Guidelines issued by the Commonwealth Department of Climate Change, Energy, Environment and Water (DCCEEW) (was DAWE). The BAR including a Biodiversity Offset Strategy (BOS) was included in the EIS as Appendix E.Further assessment of flora and fauna impacts was undertaken subsequent to exhibition of the EIS and incorporated into a Biodiversity Supplementary Technical Report. The additional assessment considered the impacts on flora and fauna due to refinements in the Project design, including changes in the Project footprint, and the results of additional flora and fauna surveys which could be undertaken as property access was available during the spring survey time. The Biodiversity Supplementary Technical Report was included in the Amendment Report as Appendix A. Revised Environmental Management Measures (REMMs) were provided within the Amendment Report. Where applicable, the REMMs from the Amendment Report have been included in this CFFMP.

Revised areas of native vegetation impacted by the Project were identified for the 80% detailed design for the West and Central stages of the Project. The M12 Detailed Design – 80% Vegetation Clearing Report (GHD, 2021) completed for Central stage identified minor revisions to native vegetation directly impacted by the Project. The Biodiversity Consistency Assessment Memo for M12 Motorway - West Package Detailed Design (WSP, 2021), M12 Motorway – Central Package Detailed Design (GHD, 2021), M12 Motorway – Sydney Water Crossings (Arcadis, 2022a), M12 Motorway – Design Boundary Changes (Arcadis, 2022b) and M12 Motorway – Minor Design Boundary Changes and Temporary Signage Areas determined that the revised area of impact does not prevent the Project from being carried out generally in accordance with NSW CoA A1. The applicable components of these revisions have been included within this CFFMP.

A summary of the biodiversity offset credits required for the Project based on the refined design is presented in Appendix E of the EIS and revised in Section 8 of the Biodiversity Supplementary Technical Report.

The M12 West Project will involve building 7.5 km of motorway from east of Badgerys Creek (M12 West) to the Water Tower Access Road within Western Sydney Parklands and will provide a dual carriageway with a wide median to allow for future widening to six lanes. A detailed project description is outlined in Section 2 of the CEMP.

1.3 Scope of the Plan

The scope of this CFFMP is to describe how the CPBGG JV propose to manage potential flora and fauna impacts during construction of the Project.

Operational flora and fauna impacts and operation measures do not fall within the scope of this CFFMP and therefore are not included within the processes contained within the CFFMP.

1.4 Environmental Management System overview

The overall Environmental Management System for the Project is described in Section 1.5 of the Construction Environmental Management Plan (CEMP).

The CFFMP forms part of CPBGG JV's environmental management framework for the Project, as described in Section 1.5 of the CEMP.

Management measures identified in this CFFMP may also be incorporated into site or activity specific Environmental Work Method Statements (EWMS). EWMS incorporate appropriate mitigation measures and controls and identify key procedures to be used concurrently with the CFFMP. EWMS will be prepared for activities outlined in Table 3-5, Section 3.2.5 of the CEMP.

EWMS will be prepared for:

- Activities that impact on or are carried out in proximity to:
  - Threatened ecological communities, including identified areas of:
- Cumberland Plain Woodland in the Sydney Basin Bioregion (critically endangered)
- River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions (endangered)
- Swamp oak floodplain forest of the NSW North Coast, Sydney Basin and South East Corner bioregions (endangered)
  - Threatened flora species, including *Dillwynia tenuifolia* and *Pultenaea parviflora*
  - Identified areas of occupied and potential habitat for the Cumberland Plain Land Snail, Southern Myotis and the White-bellied Sea-Eagle
  - Waterways, including Cosgroves Creek (M12 West), Badgerys Creek (M12 West),
- Vegetation clearing and grubbing
- Activities with high environmental risk
- Pre-construction activities including the delineation of sensitive areas
- Dewatering activities including activities where construction water may be discharged into natural waterways

- All works associated with rehabilitation of farm dams including but not limited to dewatering and filling.

EWMS will be prepared by the CPBGG JV Environmental Site Representative (ESR) and reviewed by the TfNSW Project Manager and TfNSW Environment and Sustainability Manager (ESM) (or delegate) and independent Environmental Representative (ER) prior to the commencement of the construction activities to which they apply. Construction personnel undertaking a task governed by an EWMS will undertake the activity in accordance with the mitigation and management measures identified in the EWMS.

Used together, the CEMP, strategies, procedures and EWMS form management guides that clearly identify required environmental management actions for reference by CPBGG JV personnel and subcontractors. The review and document control processes for this CFFMP are described in Section 3.11 and 3.13 of the CEMP.

1.4.1 CFFMP preparation, endorsement and approval

The CEMP and Sub-Plans will go through a review and update process as described in section 3.1 of TfNSW Specification G36 to ensure the CEMP and associated documents have been developed in accordance with the OCEMP. TfNSW will provide the CEMP to the ER for approval.

A hold point shall be submitted in accordance with G36 Section 3.1 - Preparation and submission of CEMP. TfNSW shall consider the documents prior to authorising the release of the Hold Point. TfNSW may request additional information for inclusion in the CEMP before authorising the release of the Hold Point. Construction must not commence until the CEMP, CEMP Sub-plans and monitoring programs have been approved by the ER.

Other hold points are contained in Table 3-6 of the CEMP (including those contained in TfNSW QA Specifications G36 and G40 which are relevant to this CFFMP, e.g., clause 3.2.4).

This CFFMP will be updated to include the requirements of the Western Sydney Airport Plan and the WSIA Construction Environmental Management Framework at a later date which will require approval from the WSIA Environmental Manager prior to commencement of any works on WSIA land.

Construction of the M12W Package did not commence prior to the approval of this Sub-Plan, as part of the M12W CEMP.

1.4.2 Interactions with other management plans

This Plan has the following interrelationships with other management plans and documents:

- Vegetation Management Plan including Vegetation Clearing Procedure outlining all the requirements for clearing activities, including pre-clearing and post clearing surveys and monitoring.
- A Habitat Compensation Management Plan, which will include a Nest Box Strategy will be developed and implemented
- Vegetation to be retained within construction worksites will be detailed on the CPBGG JV Sensitive Area Plans detailed in the CEMP
- Any fauna and /or flora management required in the establishment of ancillary facilities detailed in the Site Establishment Management Plan(s) will be in accordance with this CFFMP
- The Construction Soil and Water Management Plan (CSWMP) addresses the erosion and sedimentation impacts associated with vegetation clearing. Additionally, it addresses requirements for erosion management around permanent and temporary waterway crossings and water quality aspects associated with dewatering/discharge activities
- The Construction Waste and Resources Management Sub-plan (CWRMP) addresses the management of waste and provides a framework for waste management
- The Sustainability Management Framework addresses the requirement to enhance biodiversity conservation where reasonable and feasible
- Consultation between TfNSW and its CPBGG JV, stakeholders, the community and relevant agencies will be undertaken in accordance with the Overarching Communication Strategy (OCS) prepared by TfNSW to address the requirements of NSW CoA B1 and B2

- The CPBGG JV WHS Management Plan will address the safety requirements associated with the use of herbicides and pesticides. Safety Data Sheets (SDS) and product labels will also be referenced prior to application of herbicides and pesticides. The Weed Management Procedure identifies all record keeping requirements associated with the use of herbicides and pesticides.

1.5 Consultation

Section 1.9 .2 (Table 1-5) of the OCEMP outlines consultation undertaken during the development of the CEMP as required by the CoA and Revised Environmental Management Measures (REMMs).

A copy of the CEMP Sub-Plans (including this CFFMP) will be provided to the relevant government agencies for their information once these documents have been approved by the Independent Environmental Representative (ER).

1.5.1 Ongoing consultation during Construction

Consultation between TfNSW and its CPBGG JV, stakeholders, the community and relevant agencies regarding the management of flora and fauna within the Project area will be undertaken during the construction of the Project as required. The process for the consultation is documented in the OCS. Consultation as detailed by the State Infrastructure Approval is identified in Table 1-1.

Table 1-1 Consultation requirements

Reference	Description	Consultee	Responsibility
G36	Consultation with the appropriate specialists to assess the significance of the unexpected flora/fauna find and development of management options	Technical specialists/Project Ecologist	CPBGG JV
NSW CoA E11	Impacts to Key Fish Habitat	DPI Fisheries	TfNSW
NSW CoA E15	Potential reuse of all removed native trees and vegetation including hollows, tree trunks, mulch, bush rock, root balls, coarse woody debris, collected plant material seeds and/or propagated plants	Council, Western Sydney Parklands, Landcare groups and relevant government agencies including NSW National Parks & Wildlife Service (Scheyville Office), Greater Sydney Local Land Services and DPI Fisheries.	TfNSW

2 Purpose and objectives

2.1 Purpose

The purpose of this Plan is to describe how construction impacts on flora and fauna will be minimised and managed during the construction of the Project.

2.2 Objectives

The objective of the CFFMP is to ensure that all avoidance, mitigation and management measures relevant to the protection of native flora and fauna including threatened species and endangered ecological communities are described, scheduled and assigned responsibility as outlined in:

- Environmental Assessment Documentation
- NSW CoA granted to the Project on 23 April 2021
- Commonwealth CoA granted to the Project on 3 June 2021
- Applicable requirements within the TfNSW Specifications G36, G38, G40, R178 and R179.

2.3 Targets

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

- Achieve compliance with the relevant legislative requirements, CEMP, CoA and TfNSW specifications
- Ensure controls and procedures are implemented during construction activities to avoid, minimise or manage potential adverse impacts to flora and fauna within and adjacent to the Project corridor
- No increase in distribution of weeds currently existing within the Project areas
- No new weeds introduced to the Project areas
- No transfer of plant diseases or pathogens to or from the Project work areas
- Effective rehabilitation / revegetation that meets its ecological and landscaping objectives
- All fauna species encountered during construction are handled humanely in accordance with industry standards
- No pollution or siltation of aquatic ecosystems, wetlands, endangered ecological communities or threatened species habitat
- Minimise barriers to fauna movement and fish passage.

3 Environmental requirements

3.1 Relevant legislation and guidelines

3.1.1 Legislation

All legislation relevant to the Project is included in Appendix A1 of the CEMP. Legislation considered during the development of this Plan includes:

- *Environmental Planning and Assessment Act 1979*
- *Environment Protection and Biodiversity Conservation Act 1999*
- *National Parks and Wildlife Act 1974*
- *Biodiversity Conservation Act 2016 (Under Part 7 (Clause 27) of the Threatened Species Conservation Act (TSC Act))* [1]
- *Biosecurity Act 2015*
- *Pesticides Act 1999*
- *Fisheries Management Act 1994*
- *Protection of the Environment Operations Act 1997.*

3.1.2 Additional approvals, licences, permits and requirements

Refer to Appendix A2 of the CEMP.

3.1.3 Guidelines and standards

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

- TfNSW Specification G36 – Environmental Protection (Management System)
- TfNSW Specification G38 – Environmental Protection (Management System)
- TfNSW Specification G40 – Clearing and Grubbing
- TfNSW Specification R178 – Vegetation
- TfNSW Specification R179 – Landscape Planting
- TfNSW Biodiversity Guidelines (September 2011)
- NSW Biodiversity Offsets Policy for Major Projects (OEH, 2014b)
- Department of Primary Industries 'Policy and Guidelines for Fish Habitat Conservation and Management (DPI 2013)
- Hygiene protocol for the control of disease in frogs (DECCW, 2008).
- Australian Standard AS 4373 Pruning of Amenity Trees
- Roads and Maritime Environmental Direction No.25 - Management of Tannins from Vegetation Mulch (Roads and Maritime, 2012)
- Wildlife Connectivity Guidelines for Road Projects (Roads and Maritime, draft, November 2011)
- Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities – Working Draft (NSW Department of Environment and Conservation, 2004)
- Threatened Species Survey and Assessment Guidelines: Field Survey Methods for Fauna - Amphibians (NSW Department of Environment and Climate Change (DECC), 2009)
- Framework for Biodiversity Assessment (OEH, 2014)
- Policy and Guidelines for Fish Habitat Conservation and Management (NSW Department of Primary Industries (DPI), 2013)

[1] An application was granted on 5 April 2018 to save the Project under Part 7 (Clause 27) of the BC Act therefore, allowing it to be assessed under the TSC Act and in accordance with the NSW Biodiversity Offsets Policy for Major Projects (2014). This is underpinned by the *Framework for Biodiversity Assessment 2014* (FBA). Further detail can be found in Section 1.4 of the Biodiversity Assessment Report (BAR) for the Project.

- Policy and Guidelines for Fish Friendly Waterway Crossings (DPI, 2004)
- Fish Passage Requirements for Waterway Crossings (Fairfull and Witheridge, 2003)
- NSW Guide to Surveying Threatened Plants (OEH, 2016)
- Noxious and Environmental Weed Control Handbook, 4th Edition, NSW Industry & Investment Management Guide
- Australian Standard 4970 – 2009 Protection of Trees.
- PS311
- Consistency Assessments:
  - Biodiversity Consistency Assessment Memo for M12 Motorway – Sydney Water Crossings (Arcadis, 2022a)
  - Biodiversity Consistency Assessment Memo for M12 Motorway – Design boundary changes (Arcadis, 2022b)
  - Minor Biodiversity Consistency Assessment Memo for M12 Motorway – Design boundary changes and temporary signage areas (Arcadis, 2022c)

3.2 Ministers Conditions of Approval

The primary NSW CoA relevant to the development of this Plan are listed in Table 3-1. A cross reference is also included to indicate where the CoA is addressed in this Plan or other Project management documents.

Table 3-1 Primary CoA

CoA No.	Condition Requirements	Document Reference
A5	Where the terms of this approval require a document or monitoring program to be prepared or a review to be undertaken and submitted to the Planning Secretary, and the terms of this approval require the document, monitoring program or review to be prepared/undertaken in consultation with identified parties, evidence of the consultation must be submitted to the Planning Secretary with the relevant document, monitoring program or review. The evidence must include:	Section 1.5
	(a) documentation of the engagement with the party identified in the condition of approval that has occurred before submitting the document for approval;	
	(b) a log of the dates of engagement or attempted engagement with the identified party;	
	(c) documentation of the follow-up with the identified party where engagement has not occurred to confirm that they do not wish to engage or have not attempted to engage after repeated invitations;	
	(d) outline of the issues raised by the identified party and how they have been addressed; and	
	(e) a description of the outstanding issues raised by the identified party and the reasons why they have not been addressed.	
C2	The CEMP must provide: (h) a list of all the CEMP Sub-plans required in respect of construction, as set out in Condition C4. Where staged construction of the CSSI is proposed, the CEMP must also identify which CEMP Sub-plan applies to each of the proposed stages of construction;	CEMP This CFFMP
	(k) for periodic review and update of the CEMP and all associated plans and programs.	CEMP Section 3.1.3 Section 8.2
C4	The following CEMP Sub-plans must be prepared in consultation with the relevant agencies identified for each CEMP Sub-plan. Details of all information requested by an agency during consultation must be provided to the Planning Secretary as part of any submission of the relevant CEMP Sub-plan, including copies of all correspondence from those agencies as required by Condition A5. (c) Flora and Fauna – DPI Fisheries, EES, DAWE (now DCCEEW) and relevant Council(s)	Section 1.5.1
C5	The **CEMP Sub-plans** must state how: (a) the environmental performance outcomes identified in the documents listed in **Condition A1** will be achieved;	Section 2.2 Section 2.3 Section 3.2 Section 3.3 Section 6
	(b) the mitigation measures identified in the documents listed in **Condition A1** will be implemented;	Section 3.2

CoA No.	Condition Requirements	Document Reference
		Section 3.3 Section 3.4 Section 6 Table 6-2
	(c) the relevant terms of this approval will be complied with; and	Section 3.2 Section 3.3 Section 6 Table 6-2
	(d) issues requiring management during construction (including cumulative impacts), as identified through ongoing environmental risk analysis, will be managed through SMART (Specific, Measurable, Achievable, Realistic and Timely) principles.	Section 5.3 Section 8 CEMP Section 4.1
C8	The Flora and Fauna CEMP Sub-plan must be endorsed by a suitably qualified and experienced ecologist and include, but not be limited to:	Document Control page
	(a) details of the measures to avoid and minimise disturbance to native vegetation, and other habitat of native flora and fauna species;	Table 6-2
	(b) procedures for undertaking pre-clearing surveys for native fauna, including surveys by a suitably qualified and experienced ecologist to determine the presence of native fauna in the area impacted by the CSSI, and procedures and measures to manage their relocation;	Appendix A (Section 2) Appendix A (Section 2.6) Appendix A (Appendix A – Vegetation Clearing Procedure)
	(c) pre-clearing measures for Cumberland Plain Land Snail known and potential habitat and measures to protect the White-bellied Sea Eagle nest;	Appendix A (Section 2.2.3; Section 2.2.5)
	(d) a Habitat Compensation Plan and Snag Management Plan as committed to in the document listed in Condition A1(d);	Appendix D Appendix E
	(e) details of proposed management and mitigation measures for each threatened species listed in Table 3 and *Pimelea spicata* (Spiked Rice-flower) if recorded in the surveys carried out under Condition E8;	Section 6.4 Section 4.1.2
	(f) a weed, pest and pathogen management plan, including measures to minimise the spread of Phytophthora cinnamomic;	Section 5.2.5 Section 5.2.6 Appendix C

CoA No.	Condition Requirements	Document Reference
	(g) procedures for the dewatering of farm dams, including the relocation of aquatic fauna; and	Section 6.6 Appendix F Appendix G
	(h) protocols for incidental finds of threatened species and ecological communities within the construction boundary.	Section 6.8 Appendix B
C9	Any of the CEMP Sub-plans may be submitted to the Planning Secretary for approval along with, or subsequent to, the submission of the CEMP but in any event, no later than one (1) month before the commencement of construction	Table 1-1 CEMP
C10	Construction must not commence until the CEMP and all CEMP Sub-plans have been approved, unless otherwise agreed by the Planning Secretary. The CEMP and CEMP Sub-plans, as approved by the Planning Secretary, including any minor amendments approved by the ER must be implemented for the duration of construction. Where construction of the CSSI is staged, construction of a stage must not commence until the CEMP and sub-plans for that stage have been endorsed by the ER and approved by the Planning Secretary.	Section 1.4.1 Overarching CEMP and FFMP approved by DPE 21/12/2021

3.3 EPBC Conditions of Approval

The primary Federal CoA relevant to the development of this Plan are listed in Table 3-2.

Table 3-2 Commonwealth CoA

CoA No.	Condition Requirements	Document Reference
3	The approval holder must not clear protected matters outside the final construction footprint.	Section 5.2.1
4	To minimise the impacts of the action on protected matters the approval holder must not clear more than the following specified amounts, or another specified amount determined in consultation with the Department in accordance with condition E4 of the State Infrastructure approval within the final construction footprint:	Section 5.2.1
4(a)	42.89 hectares of known Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest threatened ecological community;	Section 5.2.1
4(b)	0.44 hectares of known Western Sydney Dry Rainforest and Moist Woodland on Shale threatened ecological community;	Section 5.2.1
4(c)	100 known *Pultenaea parviflora* individuals;	Section 5.2.1
4(d)	The number of *Pimelea spicata* individuals identified in the additional surveys required by condition E8 of the State Infrastructure approval;	Section 5.2.1
4(e)	62.71 hectares of known foraging habitat for Grey-headed Flying Fox (*Pteropus poliocephalus*);	Section 5.2.1
4(f)	80.21 hectares of known foraging habitat for Swift Parrot (*Lathamus discolor*).	Section 5.2.1

3.4 Revised Environmental Management Measures

The primary REMMs relevant to the development of this Plan are listed in Table 3-3 below. A cross reference is also included to indicate where the REMM is addressed in this Plan or other Project management documents.

Table 3-3 Primary REMMs

ID	Measure/requirement	Timing	CFFMP Reference
B1	A CFFMP will be prepared. The measures in the CFFMP will include:	Prior to construction	This CFFMP
	• A site-specific induction		Section **Error! Reference source not found.** CEMP Section 5.3.1
	• Identification of clearing limits and exclusion fencing		Section 6.4
	• Pre-clearance surveys		Section 6.1
	• Vegetation clearing procedures		Appendix A (Appendix A – Vegetation Clearing Procedure)
	• An unexpected finds procedure		Appendix B
	• Procedures for weed management and monitoring		Section 6.8 Appendix C
	• A process for de-watering farm dams and the relocation of aquatic fauna		Section 6.7 Appendix F
	• Provision of supplementary fauna habitat (e.g. nest boxes).		Section 6.3 Appendix D

3.5 TfNSW Specifications

The TfNSW Specifications set out the minimum requirements for the detailed outcomes in terms of quality or performance expected in the finished product for construction projects and are relevant to various construction activities on work sites to minimise impacts to the environment.

TfNSW specifications are a key source of environmental protection management processes relevant to this CFFMP. The specifications set out environmental protection requirements, including Hold Points that must be complied with by the CPBGG JV during construction of the Project. A Hold Point is a point beyond which a work process must not proceed without express written authorisation from TfNSW.

TfNSW Specifications relevant to this CFFMP are outlined in Section 3.1.3.

4 Existing Environment

The key reference documents are Section 6.1 and Appendix A of the M12 Motorway Amendment Report (AR), Section 7.1 and Appendix E of the M12 Motorway EIS, the Amendment Report Submissions Report (ARSR) the ARSR Amendment.

The Project boundary and relevant ecological data is shown on the Sensitive Area Plans included in Appendix A6 of the CEMP.

Key components of the Biodiversity Assessment Report (BAR) methodology included:

- Desktop review of:
  - NSW BioNet Species Sightings data collection, managed by the EHG
  - Protected Matters Search Tool, managed by DCCEEW
  - BioNet Vegetation Classification data collection managed by EHG
  - BioNet Threatened Species data collection, managed by EHG
  - NSW WeedWise, managed by DPI
  - RIAR Spatial Data Portal
  - Other relevant environmental and strategic planning documents.
- Undertaking a likelihood of occurrence assessment involving determining the likelihood of a particular species occurring within the Project study area. A likelihood ranking was assigned to species, including 'recorded', 'high', 'moderate', 'low' and 'none'. The likelihood of occurrence assessment was used to guide and inform the field surveys carried out for the Project
- Field surveys to identify the biodiversity values within the Project area prior to Project approval in accordance with requirements of the Framework for Biodiversity Assessment, including:
  - Vegetation surveys over 13 days between May and November 2017, August and September 2018 and in February 2019
  - Targeted flora surveys over 16 days during October, November 2017 and August 2018
  - Terrestrial fauna habitat assessments at 43 sites across the Project study area
  - Targeted fauna surveys for species with a moderate to high likelihood of occurrence carried out over 34 days between May 2017 and October 2018
  - Aquatic habitat assessments carried out on 18 and 19 June 2018 and 11 March 2019 at 14 waterway locations across the Project study area
  - Three additional days of field survey between 16 January and 29 January 2020 for the amended construction footprint.
- Additional field surveys were undertaken following Project approval, including:
  - Targeted *Pimelea spicata* surveys over three days between 2 February and 7 May 2021
  - Threatened species spring surveys for 12 threatened species over 11 days between 28 September and 16 December 2021 as required by NSW CoA E4, E5, and E6. Of the 12 species, *Dilwynia tenufolia* and *Pultenaea parviflora* were identified.
  - Several biodiversity surveys for consistency assessments were undertaken to address detailed design boundary changes, including:
    - Targeted flora and fauna surveys carried out on 17 June 2021 for M12 West Detailed Design Biodiversity Assessment (WSP, 2021).
    - Targeted flora and fauna surveys carried out in June 2021 for M12 Central Detailed Design Biodiversity Assessment (GHD, 2021).
    - Targeted flora and fauna surveys carried out on 3 February and 14 February 2022 for M12 Sydney Water Crossings Biodiversity Assessment (Arcadis, 2022a).
    - Targeted flora and fauna surveys carried out on 12 April 2022 for M12 Design Boundary Changes Biodiversity Assessment (Arcadis, 2022b).
    - Targeted flora and fauna surveys carried out in August 2022 for M12 Minor Boundary Changes and Temporary Signage Areas Consistency Assessment (Arcadis, 2022c).
- Identification and assessment of likely impacts on biodiversity arising from the project

- Mitigation measures for avoiding, managing or reducing impacts on biodiversity values during detailed design, construction and operation
- Identification of any residual impacts that cannot be avoided, minimised or mitigated which must be offset.

The following sections summarise existing flora and fauna within and adjacent to the Project area including species, communities and habitats.

4.1 Environmental aspects

4.1.1 Threatened ecological communities (NSW)

Threatened Ecological Communities (TECs) listed in NSW under the BC Act have been located in the study area and are listed below (the corresponding Plant Community Type (PCT)) and area of impact are detailed within Table 5 1:

- River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions (endangered)
- Cumberland Plain Woodland in the Sydney Basin Bioregion (critically endangered)
- Swamp oak floodplain forest of the NSW North Coast, Sydney Basin and South East Corner bioregions (endangered).

Commonwealth listed EPBC Act listed TECs have been located in the Project study area and are listed below:

- Cumberland Plain Shale Woodlands (critically endangered)

The location of these TEC's in relation to the Project are depicted in

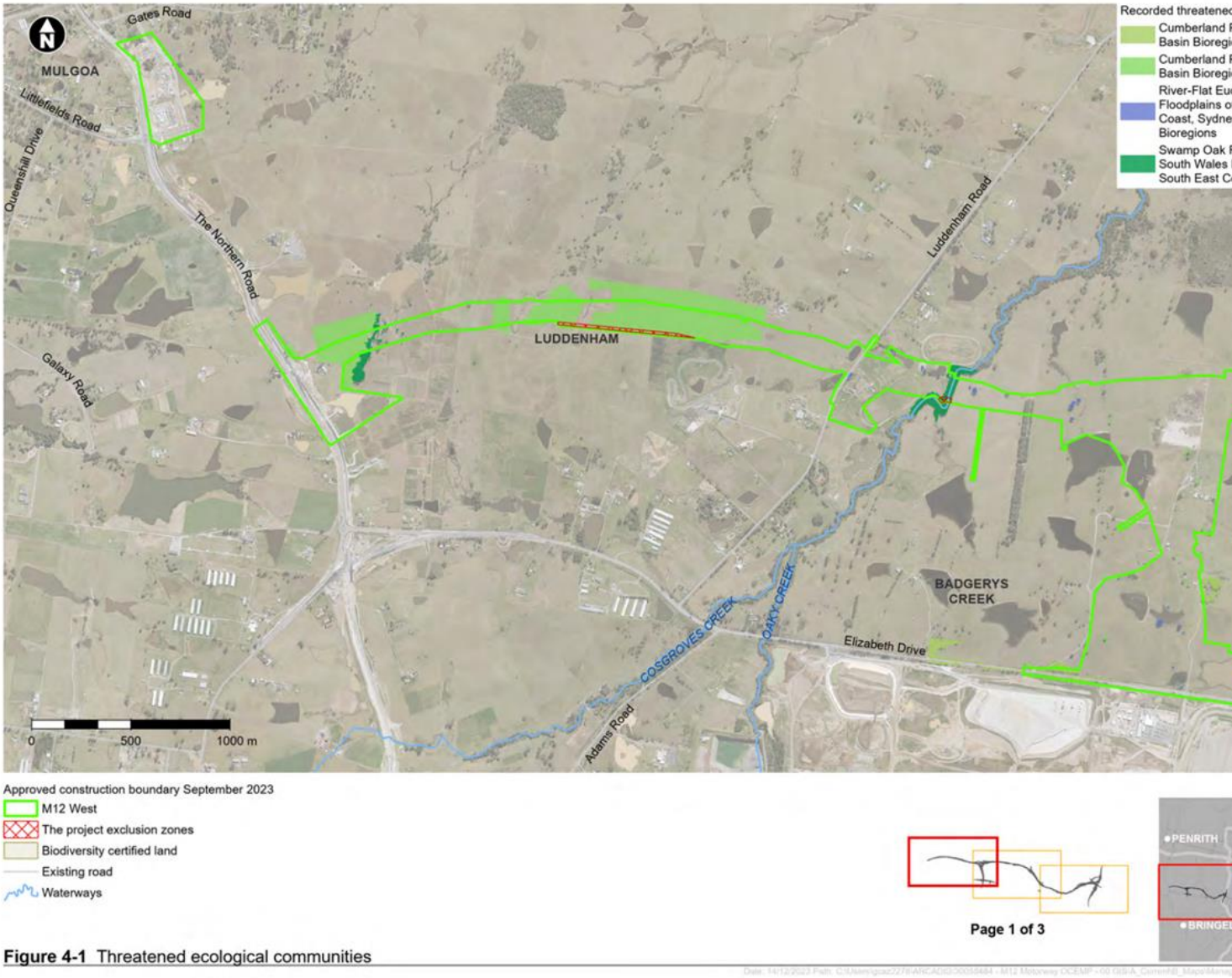

Figure 4-1 Threatened ecological communities

Figure 4-1 and in the Sensitive Area Plans included at Appendix A6 of the CEMP.

4.1.2 Threatened or otherwise significant flora species

Threatened flora species identified, or with the potential to occur within the Project corridor, and their conservation status, are listed in Table 4-1.

Table 4-1 Threatened or otherwise significant flora species

Common name	Scientific name	EPBC Act	BC Act	Occurrence
	Dillwynia tenuifolia	-	Vulnerable	-
Juniper-leaved Grevillea	*Grevillea juniperina subsp. juniperina*	-	Vulnerable	-
	Marsdenia viridiflora subsp. viridiflora	-	Endangered population	-
Spiked Rice-flower	*Pimelea spicata*	Endangered	Endangered	-
Sydney Bush Pea	*Pultenaea parviflora*	Vulnerable	Endangered	-

The location of these flora species in relation to the Project are shown in Figure 4-1 and the Sensitive Area Plans included at Appendix A6 of the CEMP. In accordance with NSW CoA E8 and Commonwealth CoA 1, additional surveys for the Spiked Rice-flower (*Pimelea Spicata*) were undertaken between

February to May in 2021 in potential habitat for this species within the construction footprint to the north of Elizabeth Drive and west of the existing Wallgrove Road. No plants of Spiked Rice-flower were recorded during these surveys as per Commonwealth CoA 1. Documentation can be found at: https://roadswaterways.transport.nsw.gov.au/projects/01documents/m12-motorway/m12-pimelea-spicatasurvey-report-07-2021.pdf

Additional spring surveys were also undertaken for 12 threatened flora species in accordance NSW CoA E4, E5 and E6 between 28 September and 16 December 2021, based on the presence of previous records or potential habitat within and adjoining the Project footprint. Of the 12 targeted species, two threatened flora species were recorded east of Badgerys Creek: *Dillwynia tenuifolia* and Sydney Bush Pea (*Pultenaea parviflora).* A total of 660 of *Dillwynia tenuifolia* and 300 *Pultenaea parviflora* will be impacted by the Project. This has been further refined since the development of several consistency assessments for the Project .

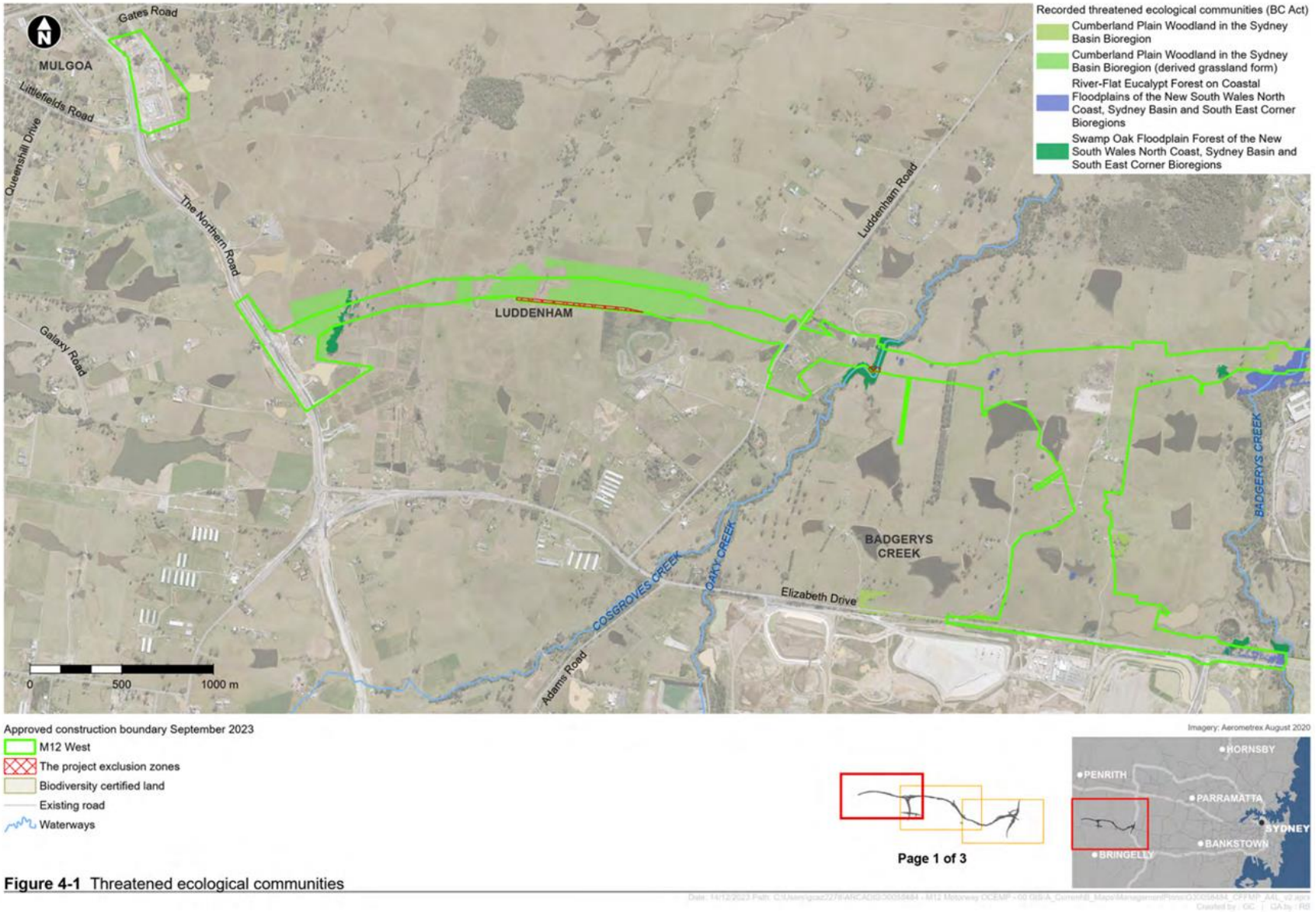

Figure 4-1 Threatened ecological communities

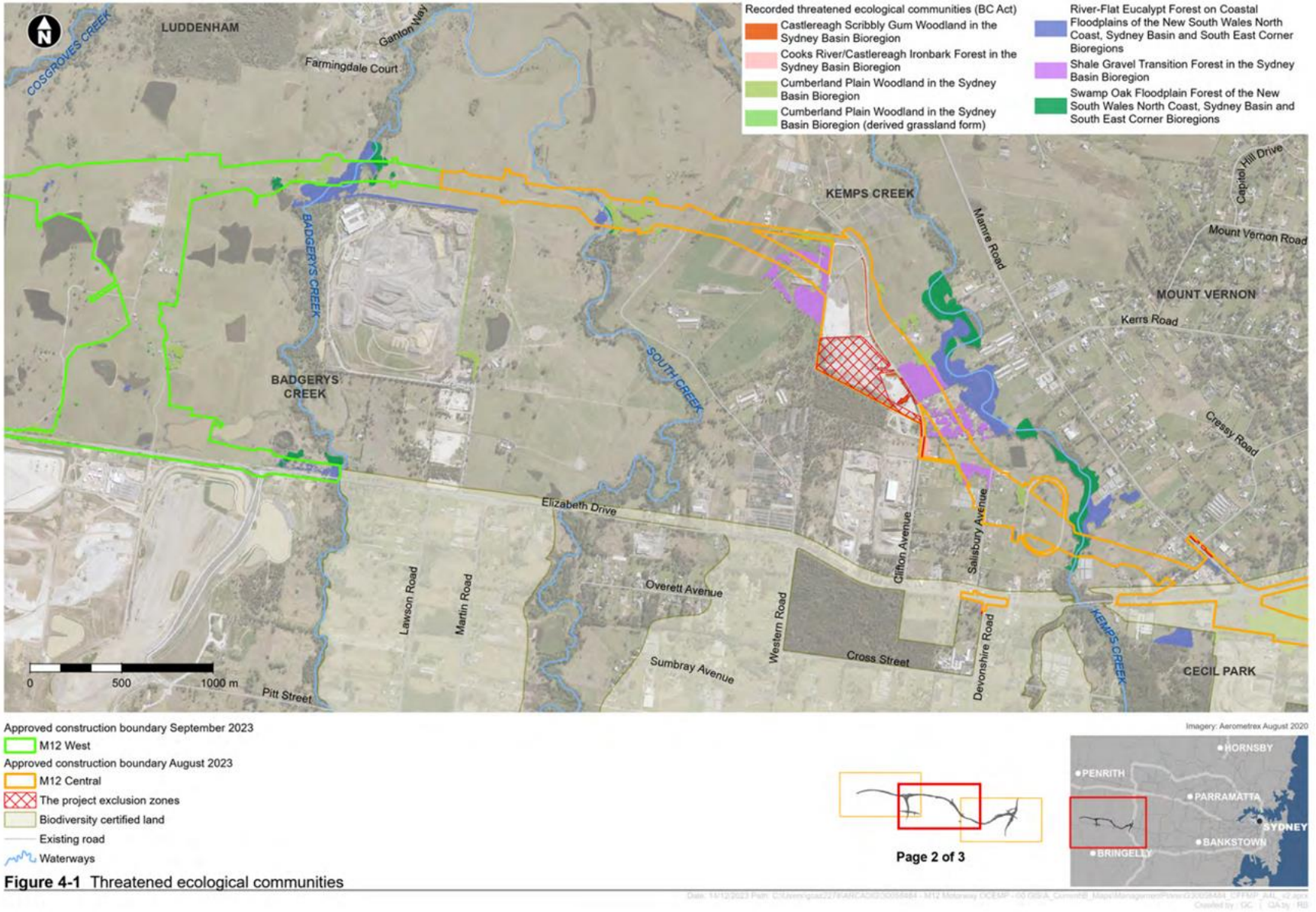

Figure 4-1 Threatened ecological communities

4.1.3 Fauna habitat

Four fauna habitat types were identified within the Project study area. These are listed in Table 4-2 and shown in Figure 4-2 and on the Sensitive Area Plans included at Appendix A6 of the CEMP. Only information relating to M12 West has been provided in the below section.

Table 4-2 Fauna habitat types

Name	Habitat description
Woodland	Dense understorey grasses, coarse woody debris and leaf litter provide shelter habitat for small terrestrial amphibians and reptiles. Large living or dead hollow-bearing trees are relatively scarce. Canopy trees in woodland habitat provide blossom resources for common nectivorous birds, small gliders and flying-foxes.
Riparian forest	This habitat typically occurs as linear strips of native vegetation surrounded by largely cleared grazing land. Wider patches of riparian forest (e.g. along some sections of Badgerys Creek (M12 West) support large mature Eucalyptus trees (some with small or medium sized hollows) and dense understorey vegetation able to support hollow-dependent fauna.
Grassland	This habitat is comprised almost entirely of land cleared of native forest or woodland for grazing, cropping and more recently for residential and industrial development. Large, scattered paddock trees and stags occur within grassland habitat in some sections of the Project study area, some supporting small, medium and large hollows. Hollows within the grasslands of the Project study area are likely to provide roosting habitat for common, adaptable microbats and were observed to provide nesting habitat for bird species including Little Corella, Long-billed Corella, Eastern Rosella and Red-rumped Parrot. Native fauna most frequently recorded from grassland habitat during surveys were highly adaptable species typically associated with cleared landscapes.
Wetlands and watercourses	Most dams are located within cleared grazing lands and provide limited habitat value for most wetland dependent fauna (e.g. Australasian Bittern). Some of these dams support emergent and/or submerged aquatic vegetation. Very few provide dense bankside vegetation and/or shelter habitat such as rocks and coarse woody debris. Dams may provide a water resource for woodland fauna such as birds, macropods and microbats. Most watercourses within the Project study area were heavily altered by earthworks, construction, pollution, vegetation clearing, erosion and sedimentation. Further detail regarding the watercourses and aquatic habitat present within the Project study area is provided in 'Aquatic habitat' below.

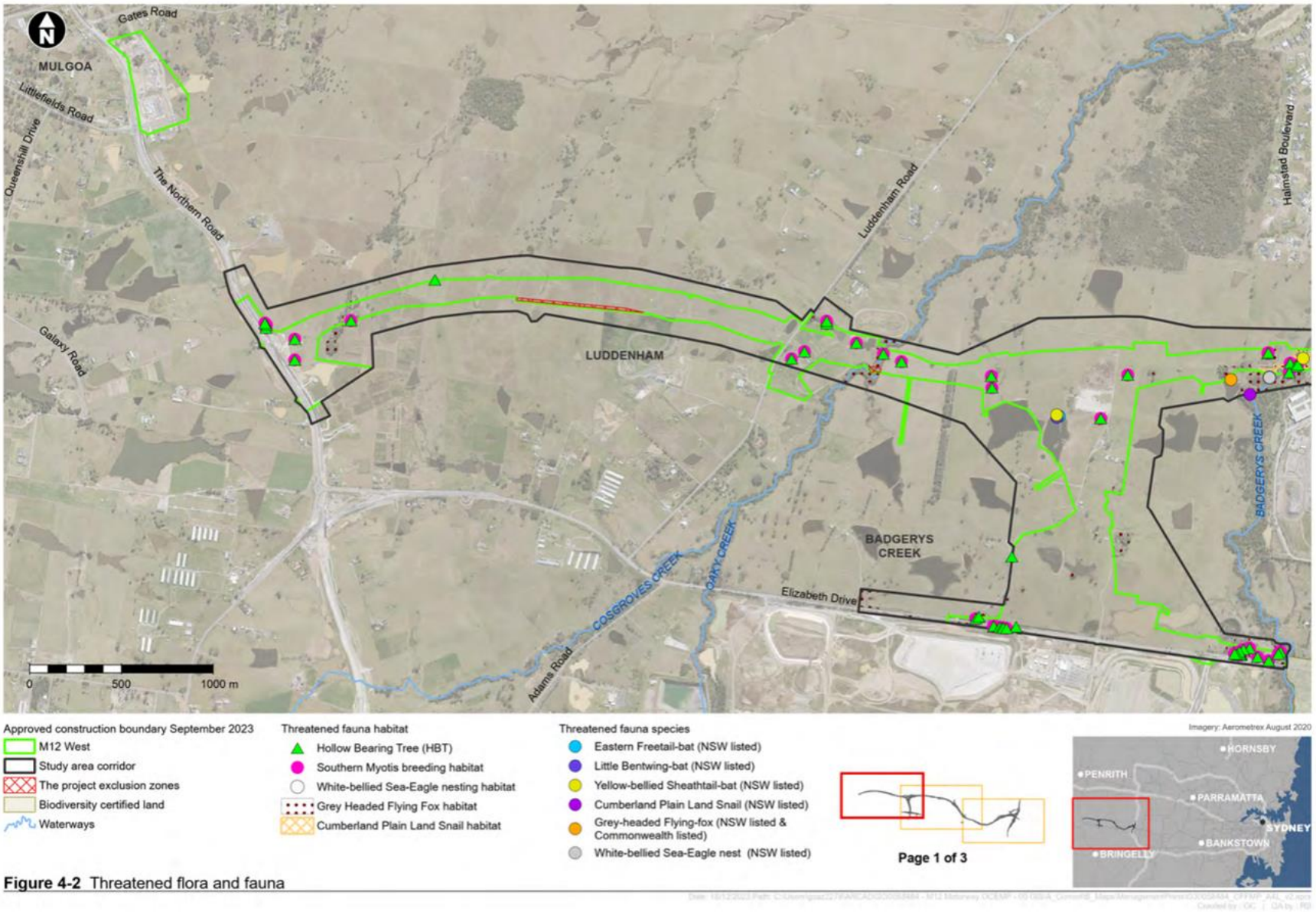

Figure 4-2 Threatened habitat features (Source: EIS/Amendment report)

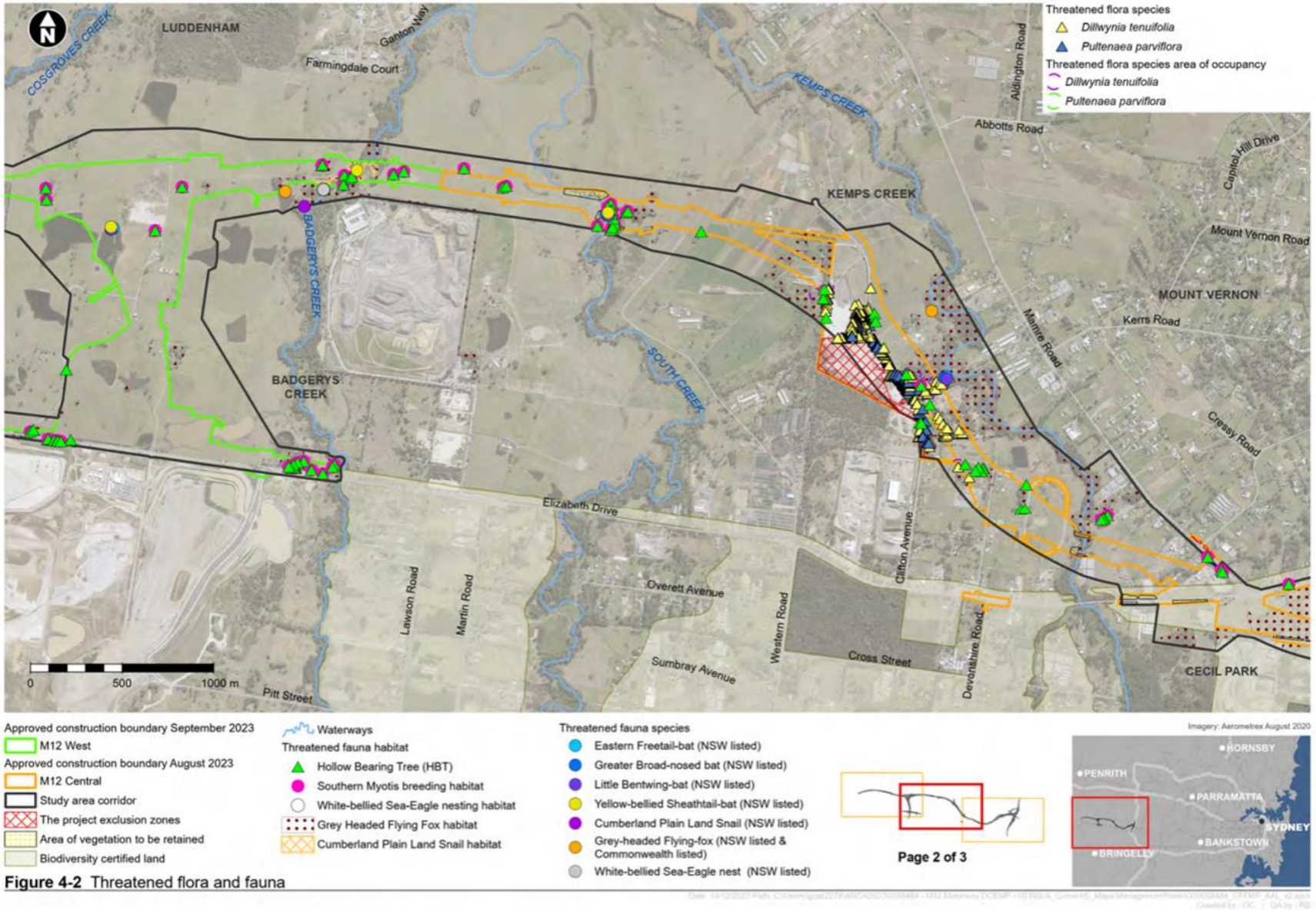

Figure 4-2 Threatened flora and fauna

Figure 4-3 Threatened habitat features (Source: EIS/Amendment report)

4.1.4 Threatened fauna

Threatened fauna species identified during survey (confirmed) and those which have been previously recorded in the M12 West area are listed in Table 4-3.

Table 4-3 Threatened fauna

Common name	Scientific name	EPBC Act	BC Act	Occurrence likelihood
Eastern Coastal Free-tailed Bat (formerly Eastern Freetail-bat)	*Micronomus norfolkensis*	-	Vulnerable	Recorded
Large Bent-winged Bat (formerly Eastern Bentwing-bat)	*Miniopterus orianae oceanensis*	-	Vulnerable	Recorded
Little Bent-winged Bat (formerly Little Bentwing-bat)	*Miniopterus australis*	-	Vulnerable	Recorded
White-bellied Sea-Eagle	*Haliaeetus leucogaster*	-	Vulnerable	Recorded
Yellow-bellied Sheathtail-bat	*Saccolaimus flaviventris*	-	Vulnerable	Recorded
Cumberland Plain Land Snail	*Meridolum corneovirens*	-	Endangered	Recorded
Eastern False Pipistrelle	*Falsistrellus tasmaniensis*	-	Vulnerable	Moderate
Southern Myotis (breeding)	*Myotis macropus*	-	Vulnerable	Moderate Potential breeding habitat recorded
Southern Myotis (forage habitat)				Moderate

4.1.5 Aquatic habitat

Aquatic habitat values for each waterway within the M12 West area are shown in Table 4-4. No potential habitat for threatened fish listed under the FM Act and EPBC Act occurs within the Project study area. Therefore, no threatened fish species are anticipated to occur within the Project study area.

DPI Fisheries defines 'Key Fish Habitats' (KFH) as those aquatic habitats that are important to the sustainability of the recreational and commercial fishing industries, the maintenance of fish populations generally and the survival and recovery of threatened aquatic species. KFH includes all marine and estuarine habitats up to highest astronomical tide level (that reached by 'king' tides) and most permanent and semi-permanent freshwater habitats including rivers, creeks, lakes, lagoons most permanent and semi-permanent freshwater habitats including rivers, creeks, lakes, lagoons, billabongs, weir pools and impoundments up to the top of the bank. Small headwater creeks and gullies (first and second order streams), that only flow for a short period after rain are generally excluded, as are farm dams constructed on such systems. Wholly artificial waterbodies such as irrigation channels, urban drains and ponds, salt and evaporation ponds are also excluded except where they are known to support populations of threatened fish or invertebrates.

DPI Fisheries has prepared mapping of KFH based on this definition. The location of key fish habitat is provided in

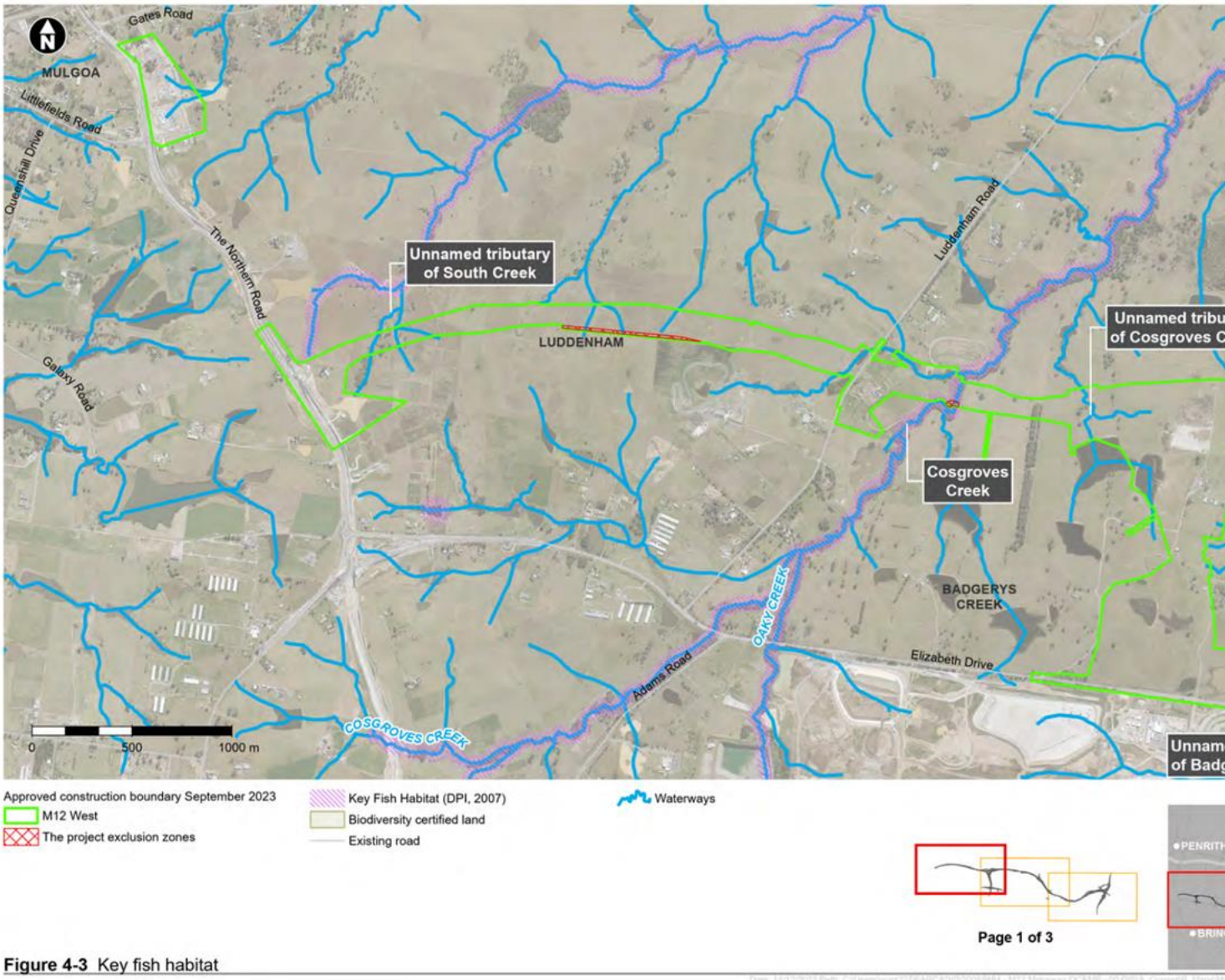

Figure 4-3 Key fish habitat

Figure 4-4.

Fish habitats were also assessed using the fisheries habitat classification set out in *Fish Passage Requirements for Waterway Crossings* (Fairfull and Witheridge, 2003):

- **Class 1 – major fish habitat:** major permanently or intermittently flowing waterway (e.g., river or major creek), habitat of a threatened fish species.
- **Class 2 – moderate fish habitat:** named permanent or intermittent stream, creek or waterway with clearly defined bed and banks with semi-permanent to permanent waters in pools or in connected wetland areas. Marine or freshwater aquatic vegetation is present. Known fish habitat and/or fish observed inhabiting the area.
- **Class 3 – minimal fish habitat:** named or unnamed waterway with intermittent flow and potential refuge, breeding or feeding areas for some aquatic fauna. Semi-permanent pools form within the waterway or adjacent wetlands after a rain event. Otherwise, any minor waterway that interconnects with wetlands or recognised aquatic habitats.
- **Class 4 – unlikely fish habitat:** named or unnamed waterway with intermittent flow following rain events only, little or no defined drainage channel, little or no flow or free-standing water or pools after rain events.

Table 4-4 Aquatic habitat values for each waterway within the Project study area

Waterway	Stream order	Waterway class (Fairfull and Witheridge)	Key fish habitat (DPI Fisheries)	Sensitive receiving environment
Cosgroves Creek	4th	2 – moderate fish habitat	Key fish habitat (Type 2) - moderately sensitive key fish habitat. The creek is also currently mapped by DPI as key fish habitat (DPI, 2018).	Yes
Unnamed tributary of Cosgroves Creek	2nd	4 – unlikely fish habitat	Not mapped as key fish habitat.	No
Unnamed tributary of Badgerys Creek	3rd	4 – unlikely fish habitat	Not mapped as key fish habitat.	No
Badgerys Creek	4th	2 – moderate fish habitat	Key fish habitat (Type 2) - moderately sensitive key fish habitat. The creek is also currently mapped by DPI as key fish habitat (DPI, 2018).	Yes

Based on the aquatic habitat value above, the following sites are considered sensitive receiving environments:

- Cosgroves Creek (M12 West)
- Badgerys Creek (M12 West)

4.1.6 Listed migratory species

The Protected Matters Search Tool (PMST) report identified 16 listed migratory species with the potential to occur within 10 kilometres of the Project study area. Preliminary desktop assessments identified eight of the 16 species to have a moderate likelihood of occurrence and eight to have a low likelihood of occurrence in the Project study area. Subsequent habitat assessments and field surveys assessed that all 16 species have a low likelihood of occurrence in the Project study area.

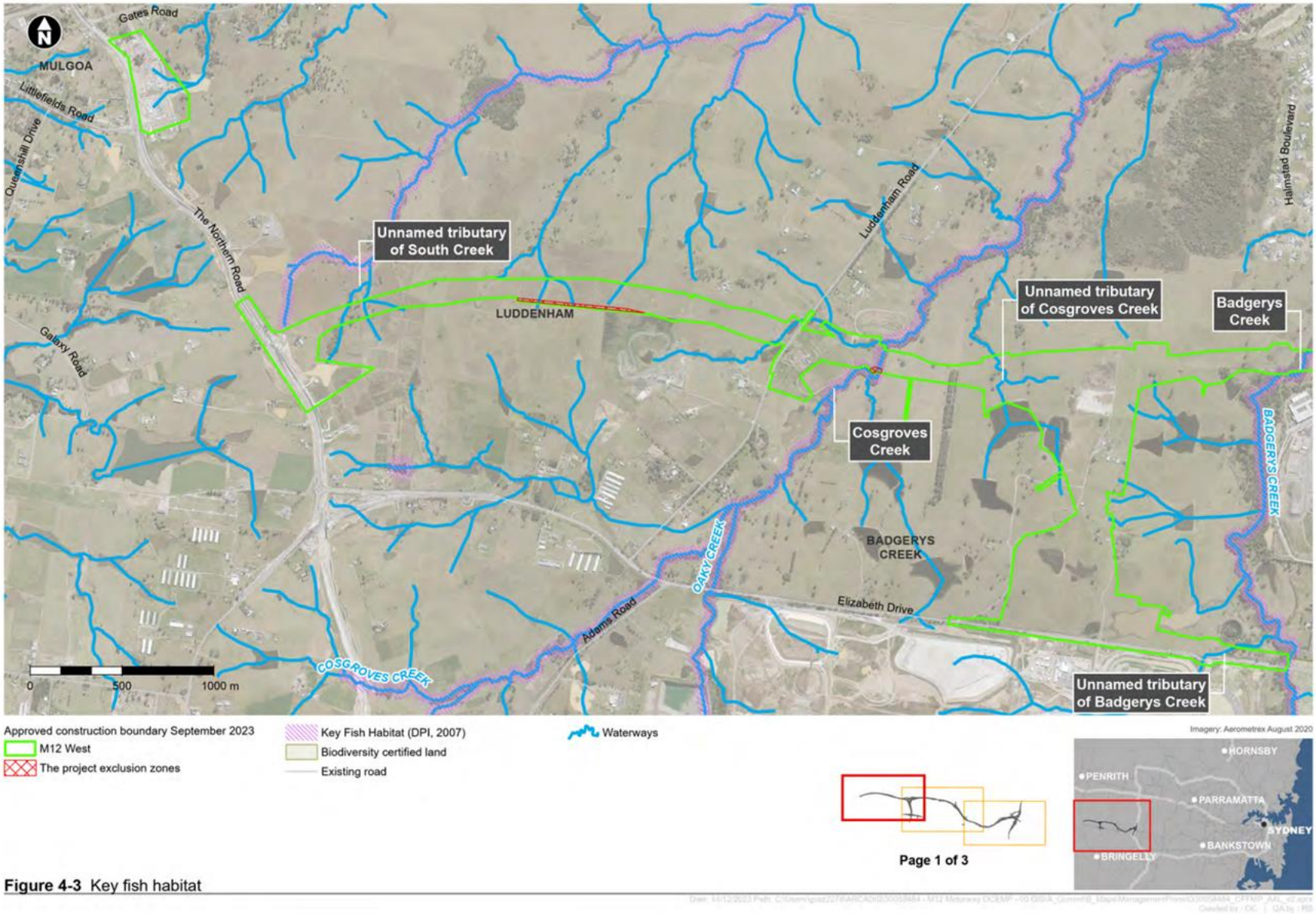

Figure 4-3 Key fish habitat

Figure 4-4 Key fish habitat (Source: EIS/Amendment report)

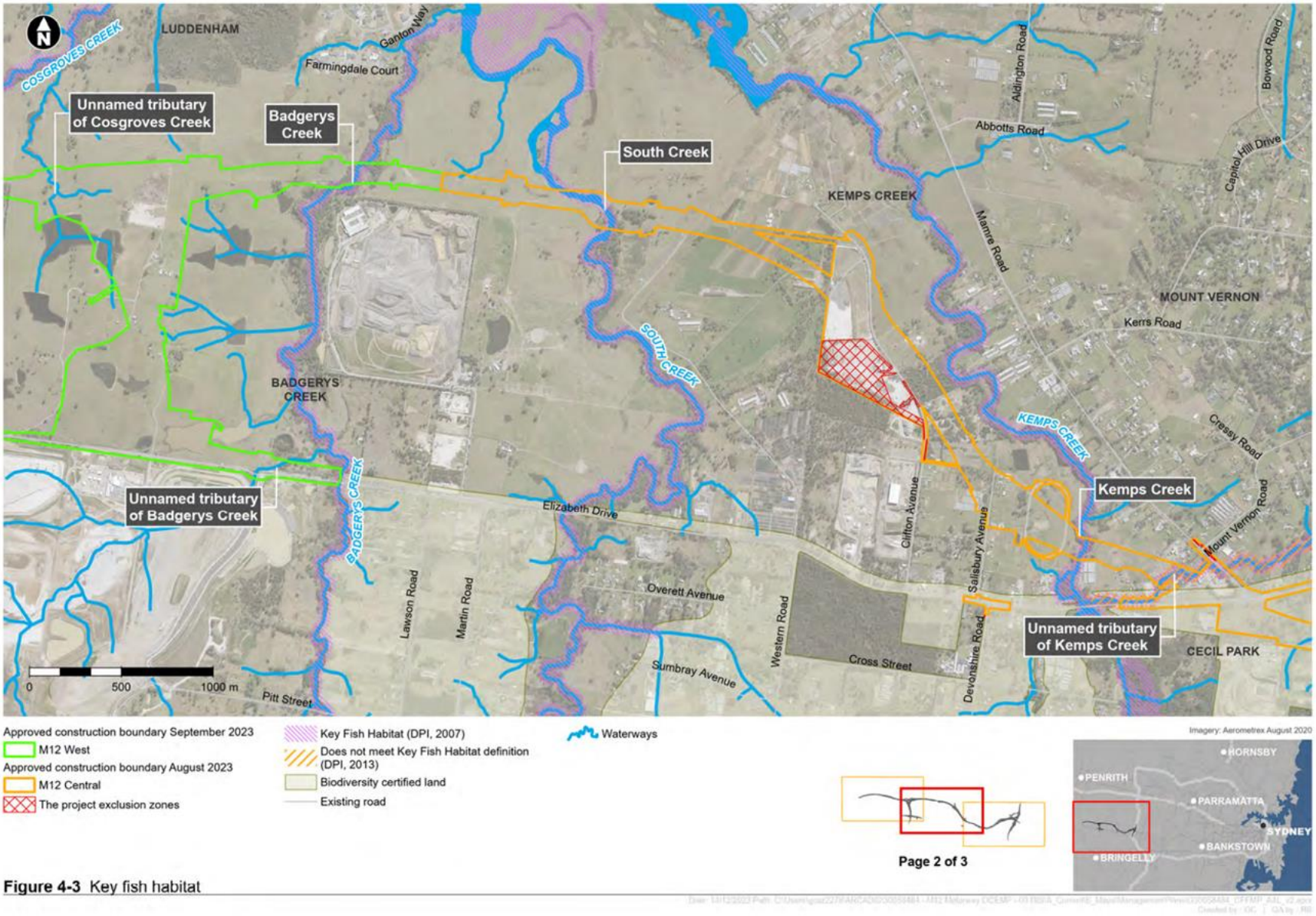

Figure 4-3 Key fish habitat

Figure 4-5 Key fish habitat (Source: EIS/Amendment report)

4.2 Matters of National Environmental Significance

4.2.1 Threatened species and ecological communities

One EPBC Act listed Threatened Ecological Community (TEC) has been located in the Project area and are listed below:

- Cumberland Plain Shale Woodlands (critically endangered)

As stated in Section 4.1.2 of this CFFMP, two EPBC listed threatened flora species are located within or in the immediate vicinity of the Project study area, the Sydney Bush Pea (*Pultenaea parviflora*) and Spiked Rice flower (*Pimelea spicata*). In accordance with NSW CoA E8 and Commonwealth CoA 1, additional surveys for the Spiked Rice-flower (*Pimelea Spicata*) were undertaken within the construction footprint to the north of Elizabeth Drive and west of the existing Wallgrove Road. No plants of Spiked Rice-flower were recorded during these surveys.

One EPBC listed fauna species, the Grey-headed Flying-fox (*Pteropus poliocephalus*), listed as Vulnerable, was recorded foraging within the Project area.

4.2.2 Migratory species

The Project study area does not contain any areas of important habitat for any of the listed migratory species.

4.2.3 Wetlands of international importance

There are no wetlands of international importance within 10 kilometres of the Project study area.

4.2.4 World and natural heritage

There is one world heritage locations within 10 kilometres of the Project study area. The Greater Blue Mountains Area is located approximately seven kilometres from the western most point of the Project study area. It is highly unlikely that this area will be impacted by the project.

4.2.5 National heritage

There is one national heritage locations within 10 kilometres of the Project study area. The Greater Blue Mountains Area is located approximately seven kilometres from the western most point of the Project study area. It is highly unlikely that this area will be impacted by the project.

5 Environmental aspects and impacts

The following section details ecological impacts to date incorporating results of the additional environmental assessments (i.e., consistency assessments) undertaken due to detailed design changes. Section 4 details the environmental assessment undertaken.

5.1 Construction activities

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

- Clearing of native vegetation (including habitat) and grubbing
- Works around and within watercourses
- Dewatering activities including activities where construction water may be discharged into natural waterways Noise, vibration and light impacts
- General earthworks near vegetation, resulting in disturbance of soils, consequential erosion and the mobilisation of sediment
- Establishment of ancillary facilities
- Demolition of built structures
- Vehicle movements
- Excavation works
- Drainage works
- Use of chemicals / fuels (potential for spills).

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

5.2 Ecological impacts

Construction of the Project will result in direct and indirect impacts to biodiversity, including:

- Loss of native vegetation, including threatened ecological communities
- Loss of habitat, including threatened and listed migratory fauna species habitat
- Loss of threatened flora species
- Direct and indirect impacts to terrestrial and aquatic fauna, including threatened species
- Changes in water quality, aquatic habitat loss and instream barriers to movement of fauna
- Direct injury and mortality of fauna (including vehicle strike)
- Edge effects on adjacent native vegetation and habitat
- Fragmentation of habitats and wildlife corridors
- Invasion and spread of weeds and pests
- Invasion and spread of pathogens and disease
- Noise, vibration, dust, light and contaminants
- Cumulative impacts in association with nearby projects

Further detail of these impacts is provided in the following sections.

The aim of the environmental management measures provided in Section 6 is to minimise the potential impacts on flora and fauna of the project.

5.2.1 Clearing of native vegetation

Clearing of native vegetation for the Project will be in accordance with the impacts approved under the State Infrastructure Approval. The Environmental Assessment Documentation identified 23.25 hectares of native vegetation within the refined west construction footprint. This native vegetation is located within 6 vegetation zones. representing four PCTs (corresponding to four TEC).

The potential area of loss of vegetation and habitat due to construction of the Project is summarised in Table 5-1.

Table 5-2 presents the area of EPBC listed TECs impacted by the Project. It should be noted that these impacts are not additional to those listed in Table 5-1 but form an area within areas identified in Table 5-1.

The area of impact to native vegetation may be subject to change to reflect the final construction footprint. Consistency assessments will be undertaken by TfNSW to ensure impacts are generally consistent with the Environmental Assessment Documentation and in accordance with the Infrastructure Approval. Additional Consistency Assessments and associated threatened species surveys have been undertaken, the outcomes of these are detailed in Section 4.

Any changes of impact will be managed in accordance with NSW CoA E4 and the process outlined in Section 6.12 as required. No clearing will be undertaken outside the final construction footprint. In accordance with Commonwealth CoA 2, the final construction footprint, as outlined within the Federal Approval, of each stage will be submitted to DAWE (now DCCEEW) within six months of the final construction footprint for that stage being determined. Protected matters outside of the final construction footprint will not be cleared in accordance with Commonwealth CoA 3.

TfNSW with the assistance of the CPBGG JV are also required to undertake additional surveys. TfNSW will provide the results to DCCEEW as required by Commonwealth CoA 1 and NSW CoA E8.

Table 5-1 Approved area of impact to native vegetation

PCT No	Plant community type (PCT)	Veg zone code	Vegetation zone code within construction footprint	BC Act Status	Area directly impacted by Project (ha)[2]
835	Forest Red Gum – Rough - barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion	5	835 – Moderate/Good_Poor	Endangered	2.94
849	Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion				
		7	849 - Moderate/Good_Poor	Critically endangered	0.74
		8	849 - Moderate/Good_Other (Derived Shrubland)	Critically endangered	0.90
850	Grey Box - Forest Red Gum grassy woodland on shale of the southern Cumberland Plain, Sydney Basin Bioregion				
		10	850 - Moderate/Good_Medium	Critically endangered	0.62
		13	850 - Low	Critically endangered	16.37
1800	Swamp Oak open forest on riverflats of the Cumberland Plain and Hunter valley	15	1800 – Moderate/Good_Poor	Endangered	1.68
				TOTAL	**23.25**

[2] Figures to be updated once the TfNSW consistency assessments are approved where required.

Table 5-2 Area EPBC Act listed TECs impacted by the Project

PCT No	PCT Name	EPBC Act TEC	EPBC Status	Area directly impacted by Project (ha)
835	Forest Red Gum – Rough - barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion	Cumberland Plain Woodland in the Sydney Basin Bioregion	Critically Endangered	2.94
849	Grey Box – Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion	Cumberland Plain Woodland in the Sydney Basin Bioregion	Critically Endangered	2.26
850	Grey Box – Forest Red Gum grassy woodland on shale of the southern Cumberland Plain, Sydney Basin Bioregion	Cumberland Plain Woodland in the Sydney Basin Bioregion	Critically Endangered	16.37
1800	Swamp Oak open forest on riverflats of the Cumberland Plain and Hunter valley	Swamp Oak open forest of the NSW North Coast, Sydney Basin and South East Corner bioregions	Endangered	1.68
			TOTAL	**23.25**

5.2.1.1 Removal of threatened plants

No threatened plants were recorded within the proposed vegetation clearing zones associated with the Project. Impacts to threatened plants from vegetation clearing activities for the Project are therefore considered unlikely.

In the event that additional individual plants of listed species or populations are discovered during Pre-construction surveys or during construction, the Unexpected Threatened Species or EEC Finds Procedure will be followed (refer Appendix D). The procedure includes provisions for implementing exclusion zones to ensure plants are protected during clearing activities and construction.

5.2.1.2 Removal of threatened fauna species habitat and habitat features

Clearing for construction of the Project will have indirect impacts on fauna due to removal of foraging and/or breeding habitat. The predicted impact to species credit threatened fauna due to removal of habitat is outlined in Table 5-3, as assessed in the EAD.

The BC Act listed endangered Cumberland Plain Land Snail has been recorded within the Project construction boundary; clearing of native vegetation will remove approximately 1.74 ha of suitable habitat for this species. Clearing of native vegetation would also remove approximately 0.34 ha of breeding habitat for the BC Act listed Southern Myotis.

The removal of about 6.88 hectares of Woodland and Riparian Forest would also remove habitat for seven 'ecosystem credit' threatened bat species including:

- Grey-headed Flying-fox (forage habitat only) (M12 West and Central)
- Eastern Bentwing-bat (forage habitat only)
- Little Bentwing-bat (forage habitat only)
- Eastern Freetail-bat
- Eastern False Pipistrelle
- Greater Broad-nosed Bat
- Yellow-bellied Sheathtail-bat.

Table 5-3 Impacts to species credit threatened fauna

Threatened species	Status		Habitat area impacted by Project (ha)[3]
	BC Act	EPBC Act	
Cumberland Plain Land Snail	Endangered	Not listed	1.74
Southern Myotis	Vulnerable	Not listed	0.34 (breeding habitat)

The Woodland and Riparian Forest habitats of the Project study area were also considered to provide potential foraging habitat for the Swift Parrot (*Lathamus discolor*) given the occurrence of preferred blossom trees Spotted Gum and Forest Red Gum.

Initial habitat assessments were performed throughout the Project study area to identify key foraging trees and identity blossoming events. The Swift Parrot was not recorded within the Project study area during the surveys.

The foraging habitat available in the Project study area is disturbed, fragmented and often immature and is unlikely to provide a valuable resource for the Swift Parrot. Although the Project will result in the removal of this marginal habitat (see Table 5-4). it is not considered likely to impact the species significantly. The Federal Approval has provided a definition of foraging habitat for both the Swift Parrot and the Grey-headed Flying-fox which are outlined in Table 5-4.

[3] Figures to be updated once the TfNSW consistency assessments are approved where required.

Table 5-4 Foraging habitat as defined by the Federal Approval and specified amounts for clearing

Threatened species	Foraging habitat as per by the Federal Approval	Specified Amount (ha)[4]
Swift Parrot	The PCTs,835,849,850 and 1800 within the meaning of the NSW Bionet Vegetation Information Systems classification database.	23.26[2]
Grey headed Flying Fox	The PCTs724, 830, 835, 849, 850 and 1800 within the meaning of the NSW Bionet Vegetation Information Systems classification database.	5.20

[2] it is noted that the Environmental Assessment Documentation states that removal of the Swift Parrot habitat equates to 62.71 ha. However, as the Federal Approval has identified a larger area of habitat (80.21 ha), this number has been adopted for the entire M12 Project.

CPBGG JV will not clear more than the specified amount, or another specified amount determined in consultation with TfNSW.

5.2.2 Impacts to aquatic biodiversity

Construction of the Project would involve the following activities relevant to aquatic habitat:

- Construction of bridges: Cosgroves Creek (M12 West), Badgerys Creek (M12 West),
- Installation of pipe culverts at three waterways which were assessed as unlikely fish habitat, these being unnamed tributaries of Cosgroves Creek (M12 West)
- Installation of temporary waterway crossings for some or all waterways traversed by the Project
- Temporary working platforms at bridge sites
- Minor redirection of localised drainage lines.

Impacts on aquatic habitats may occur during construction as a result of the following:

- Instream works, including bridge and culvert construction
- Removal of aquatic vegetation and snags during bridge and culvert works
- Increased flow velocities in the local area and altered timing of water flows reaching creeks due to minor redirection of localised drainage lines
- Temporary work platforms could disrupt flow, detain water and increase inundation and disturb creek beds resulting in sedimentation downstream
- Changes in shading regime and temperature
- Potential for sedimentation and spills to affect water quality in the waterways.

5.2.3 Habitat fragmentation

The Project has the potential to impact habitat corridors as follows:

- Reduce the area of vegetation comprising habitat corridors
- Reduce the width of habitat corridors
- Increase the width of existing gaps in habitat corridors
- Create new gaps in habitat corridors
- Introduce or move edge effects in corridors.

Two areas mapped as regional corridors would be impacted by the Project:

- Woodland habitat along the eastern and western sides of the M7 Motorway
- Riparian Forest and adjacent Woodland habitat associated with Badgerys Creek (M12 West).

Only one threatened fauna species, Cumberland Plain Land Snail, may be affected by further fragmentation of the riparian corridor along Badgerys Creek (M12 West). Other threatened fauna recorded or assumed present within the Project study area are highly mobile flying species. Therefore,

[4] Figures to be updated once the TfNSW consistency assessments are approved where required.

the Project is not anticipated to result in impacts on movement and/ or dispersal pathways for any threatened species or population.

5.2.4 Injury and mortality of fauna

Fauna injury and mortality during the construction stage of the Project would be related to vegetation clearing prior to construction and also potentially vehicle strikes during construction activities.

5.2.5 Invasion and spread of weeds and pests

Large areas of the Project study area have a high abundance of exotic species. Typically, weed invasion and spread is an indirect impact of projects, often generated during construction by clearing vegetation and moving plant throughout the Project study area. Other Project activities, including earthworks and movement of soil, can also result in the dispersal and introduction of weeds throughout the Project study area.

A total of 14 introduced vertebrate fauna species were recorded within the Project study area during surveys. In addition to the 14 exotic fauna species, two additional native species recorded within the Project study area, Noisy Miner (*Manorina melanocephala*) and Bell Miner (*Manorina melanophrys*), are also considered pest species.

Project activities (e.g., vegetation clearing, habitat removal, increased noise and human presence) have the potential to disperse pest species across the surrounding landscape and increase the ability of such species to utilise habitats during construction and operation phases due to vegetation clearing, habitat removal, increased noise and human presence. While the pest species listed above are likely to capitalise on the disturbance associated with construction and development activities, the Project is unlikely to significantly increase the overall impact of pest species within the Project study area.

The aggressive exclusion of birds from potential woodland and forest habitat by over-abundant Noisy Miners was listed as a Key Threatening Process (KTP) under the EPBC Act. As Project activities would increase fragmentation in the Project study area, it is likely that the Project would increase the abundance of Noisy Miner in the Project study area and exacerbate this KTP.

Within the Project study area and construction footprint, there is also evidence of Bell Miner Associated Dieback (BMAD). This is caused by an overabundance of psyllids (sap-sucking insects that create a sugary excretion known as a lerp) in conjunction with Bell Miners (who feed on both the psyllids and lerp). As the Project would result in further vegetation clearing and localised fragmentation, it could increase the prevalence and severity of BMAD in the locality. However, impacts are likely to be insignificant when compared to the broad-scale clearing that has occurred in the past as a result of agriculture and urban development.

In addition to the above, there is a current NSW Biosecurity (Fire Ant) Emergency Order (No. 10) 2024 (https://www.dpi.nsw.gov.au/dpi/bfs/insect-pests/rifa/biosecurity-duties/emergency-order) in place regarding red imported fire ants (fire ants), which are invasive introduced ants that cause serious social, economic and environmental harm. A copy of the TfNSW Red Imported Fire Ant Alert Factsheet has been included in Appendix J, which details the actions required in regard to fire ant awareness training and management.

Weeds will be managed as per Appendix C.

5.2.6 Invasion and spread of pathogens and disease

Project construction has the potential to increase the spread of pathogens that threaten native biodiversity values. Pathogens specific to the project include:

- Soil-borne pathogen *Phytophthora cinnamomi* (Phytophthora)
- *Austropuccinia psidii* which causes the disease Myrtle rust
- *Batrachochytrium dendrobatidis* (Chytrid fungus)
- Psittacine beak and feather disease (PBFD).

All four of these pathogens are listed as KTPs under the BC Act. The Project may increase the risk of dispersal of Phytophthora and Myrtle rust, from soil disturbance and plant movement during construction. Chytrid fungus causes the infectious disease Chytridiomycosis (amphibian chytrid fungus disease) which affects amphibians. No threatened frogs are considered likely to occur within the Project study area, and chytrid fungus is therefore considered unlikely to have a significant impact within the Project study area.

As there are no threatened parrot species likely to occur within the Project study area, PBFD is unlikely to have a major impact within the Project study area.

5.2.7 Pathogens will be managed as per Appendix C.Water pollution

There is potential for sedimentation and spills to affect water quality in the waterways during the construction phase which could also affect native fish and frogs, including downstream of the construction footprint.

Water pollution may also result from hydrocarbon leaks or spills from vehicles or equipment used during construction adjacent to waterways.

5.2.8 Noise, vibration, dust, light and contaminants

Impacts from noise and vibration are likely to be localised to the construction footprint, existing roads and new roads. Construction noise is likely to create short term impacts on fauna, however remaining vegetation would provide refuges for fauna to retreat to, and impacts would be reduced after construction. These impacts are not considered to have a significant, long-term impact on fauna, including threatened fauna.

During night-time works there would be an increase in artificial lighting within the Project study area and surrounds. As such, the Project may potentially affect nocturnal fauna by interrupting their life cycle or impacting on species that can be more vulnerable to predation (e.g., some small mammals).

Roads within the locality are currently lit and the existing M7 Motorway and Elizabeth Drive experience increased photo-pollution due to heavy traffic and regular roadworks. Fauna within the area would already be adapted to photo pollution (on the M7 Motorway and Elizabeth Drive) and the increased artificial lighting associated with the Project is unlikely to have a significant effect on fauna in the locality of the project. Shading impacts of bridge and culvert structures will be minimised through detailed design.

Dust emitted during earthworks, vegetation clearing and due to vehicle movements may deposit on plant foliage, however the impact of dust pollution is likely to be localised, intermittent, and temporary in nature.

Adverse impacts to flora and fauna due to accidental release of contaminants to the environment may occur.

5.3 Cumulative impacts

The multitude of other projects in the area including the M7 Widening, The Northern Road, the Western Sydney International Airport, work associated with the Aerotropolis, Sydney Metro – Western Sydney Airport and other residential and retail developments may lead to increased ecological impacts. Cumulative impacts identified in the Environmental Assessment Documentation during construction of the Project included the clearing of large amounts of TECs, native vegetation and fauna habitat.

Interagency communication between government departments undertaking work in the area is required to manage the cumulative impacts of the extensive work that will be happening in the area with the aim of combining messages when possible and minimising impacts to the local community.

Consultation will be undertaken with neighbouring properties and with personnel who will be undertaking work on other projects within the vicinity of the M12 Motorway construction to ensure they are aware of any exclusion zones or sensitive areas identified for the Project.

6 Environmental mitigation and management measures

6.1 Pre-clearing process

Pre-clearing processes will be carried out in accordance with Guide 1 of the Biodiversity Guidelines (RTA, 2011).

The Vegetation Clearing Procedure provided in Appendix A has been prepared in accordance with the requirements of Guide 1 of the *Biodiversity Guidelines* (RTA, 2011) and TfNSW specifications. The purpose of the Procedure is to:

- Outline environmental control measures to minimise clearing of vegetation
- Identify management measures to minimise impacts on biodiversity and the surrounding environment
- Provide a framework for the management of vegetation to be retained or removed
- Outline steps for the minimisation of loss of habitat and harm to associated fauna.

The Procedure will include, but not be limited to:

- Flora and fauna management strategies for pre-clearing, clearing and post-clearing construction activities including environmental control measures
- Pre-clearing survey form
- Delineation methods for clearing
- Measures to minimise clearing of native vegetation
- Measure to protect vegetation and habitat during clearing activities
- Measures to identify where it is practicable to reuse native trees and vegetation, including a process for consulting with community groups, Council, Western Sydney Parklands Trust, Landcare groups and relevant government agencies to determine if hollows, tree trunks, mulch, root balls collected plant material, seeds and/or propagated plants could be used for habitat enhancement, beneficial re-use and rehabilitation work, before pursuing other disposal options (refer also Appendix D)
- Specific procedures to protect threatened flora species and populations, including:
  - White-bellied Sea-Eagle
  - Cumberland Plain Land Snail
  - Southern Myotis
  - Grey-headed Flying-fox
- Specific reporting requirements associated with additional survey work and control of clearing activities.

The CPBGG JV will update the Vegetation Clearing Procedure as required prior to the commencement of any pre-clearing activities.

The CPBGG JV will also prepare a stage-specific Clearing and Grubbing Plan in accordance with Specification TfNSW G40 and its associated annexures, which must include, but not be limited to, the following information:

- 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
- Procedure for identifying and removing trees, stumps and logs above the specified size and within the hazard line.

Furthermore, a site-specific Clearing and Grubbing EWMS will be prepared by the CPBGG JV in accordance with Specification TfNSW G36 within the Clearing and Grubbing Plan, as required.

The CPBGG JV will document the results of pre-clearing surveys and will update their Sensitive Area Plans accordingly.

The pre-clearing process will include a pre-clearing survey which will identify the quantity, quality and size of the tree hollows to be removed and the hollow-dependent fauna species inhabiting the area. The survey will identify habitat trees to be felled in a staged approach.

An inventory of hollow bearing trees will be developed as part of the pre-clearing surveys to inform the Habitat Compensation Plan (HCP). The inventory will include details of the location of each hollow bearing tree and their characteristics such as species, height and diameter at breast height (DBH), number of hollows on the tree, their position and size.

Fauna identified using hollows during surveys will further inform the CPBGG JV's HCP.

6.2 Post-Clearing Report

At the completion of clearing, the CPBGG JV's Project Ecologist will complete post-clearing surveys and prepare a Post-Clearing Report. The report will confirm the final area cleared, the number and identity of all vegetation removed, and specifically, the post-clearance abundance and density count of hollow-bearing trees. The Post-Clearing Report will also identify if any fauna, nests or other fauna habitats were impacted by clearing works and provide fauna capture and relocation data. Any reuse, relocation or disposal of snags, hollows or coarse woody debris will be included within the post-clearing report.

Further details regarding responsibilities, timing and other requirements for preparation of Post-Clearing Reports is provided in Section 7.1 and Appendix A, Appendix D and Appendix E of this CFFMP.

The CPBGG JV Vegetation Clearing Procedures will be reviewed by TfNSW for consistency with the requirements of this overarching CFFMP, the CoA and the REMMS and appended to the CPBGG JV CFFMPs.

6.3 Hollow Replacement

Clearing activities for the Project may result in the removal of hollow bearing trees that provide shelter and nesting sites for fauna. To compensate for the loss of habitat trees within the cleared area, the CPBGG JV will include measures for the installation of hollow replacements within the Habitat Compensation Plan (Appendix D) to outline the specific measures to be implemented to mitigate the impacts of vegetation clearing on hollow-dependent fauna.

Hollow replacement will be based on the results of the pre-clearing survey (Section 6.1) and prepared in consultation with the Project Ecologist. The strategy will include:

- Target species
- Design and quantity of hollow replacement i.e. fabricated nest boxes, bored hollows etc. according to the target species and number of hollows removed (the hollows: nest box ratio replacement ratio will be 1:1)
- Types and location for installation of replacement hollows
- Timing for installation - up to one month prior to clearing, where possible, to provide alternative shelter for hollow-dependent fauna displaced during clearing and following clearing once the abundance/density of tree hollows removed is confirmed
- A monitoring program to coincide with nesting seasons for target species every six months.
- Inspections of hollow replacements for maintenance requirements and replacement where required.

6.4 Exclusion zones

The CPBGG JV will install exclusion zones and fencing or other means to demarcate vegetation to be retained. Exclusion zones will be set up at the limit of clearing in accordance with Biodiversity Guidelines (RTA, 2011) (Guide 2: Exclusion zones). Exclusion zones will be mapped out by a qualified surveyor in accordance with the Flagging Protocol in Section 2.2.7 of the Vegetation Clearing Procedure (Appendix A) and Specification TfNSW G40.

The CPBGG JV will install environmental protection area signage on exclusion zone fencing at regular intervals agreed to by the TfNSW Environment and Sustainability Manager (or delegate). The fencing will only be removed following agreement by the TfNSW Environment and Sustainability Manager (or delegate). The exclusion zones are shown on Figure *6-1* and will also be clearly illustrated on Sensitive Area Plans.

Connectivity measures will be implemented in accordance with *Wildlife Connectivity Guidelines for Road Projects* (TfNSW, under preparation). Where practicable, exclusion zones will be maintained below the Badgerys Creek and Cosgroves Creek bridges to maintain fauna passage. Fencing will be located to reduce roadkill of fauna species and funnel animals to creek crossings where safe passage will be available.

Permanent fencing will be installed in accordance with the requirements of R021.

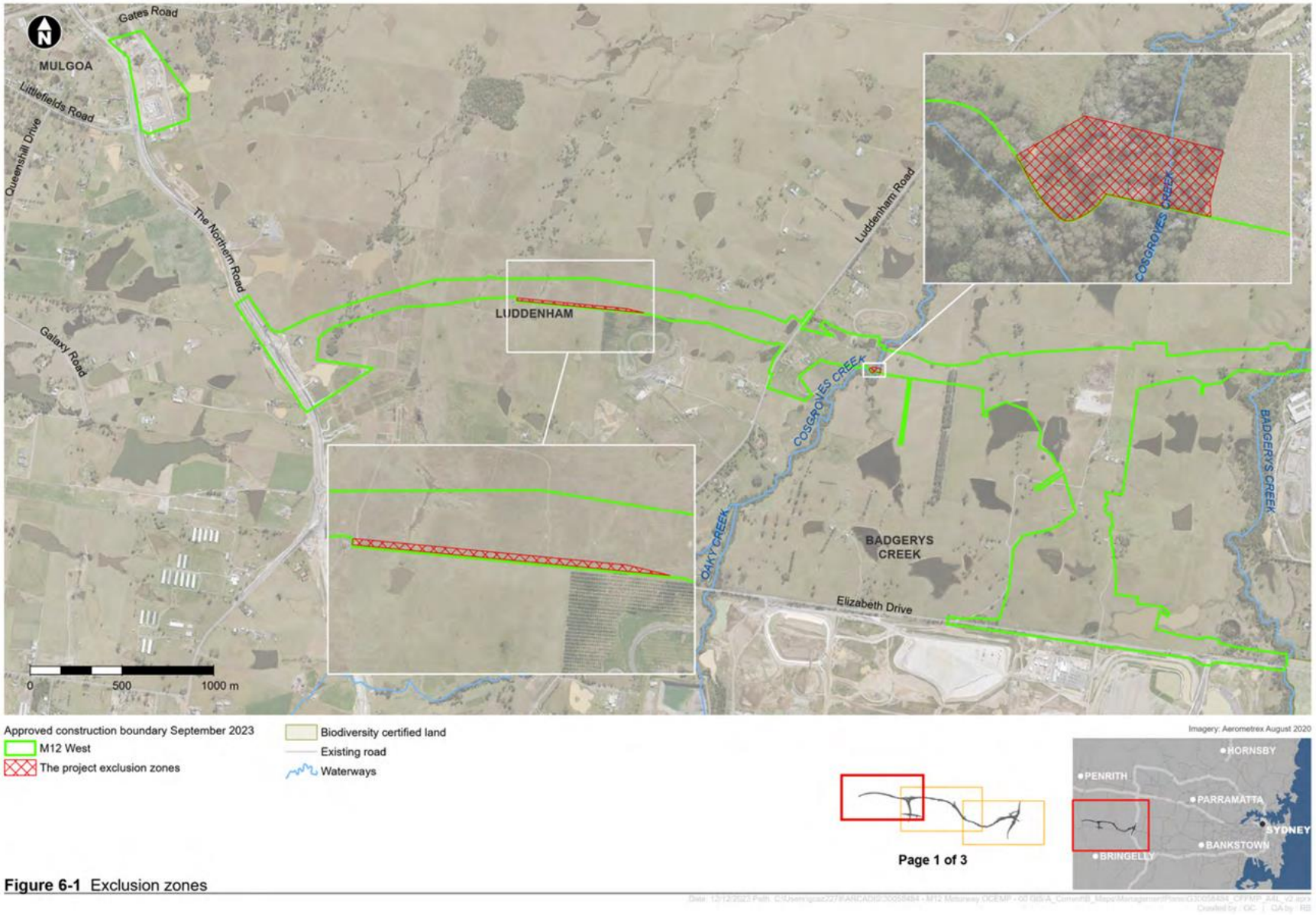

Figure 6-1 Exclusion zones

Figure 6-1 Exclusion zones

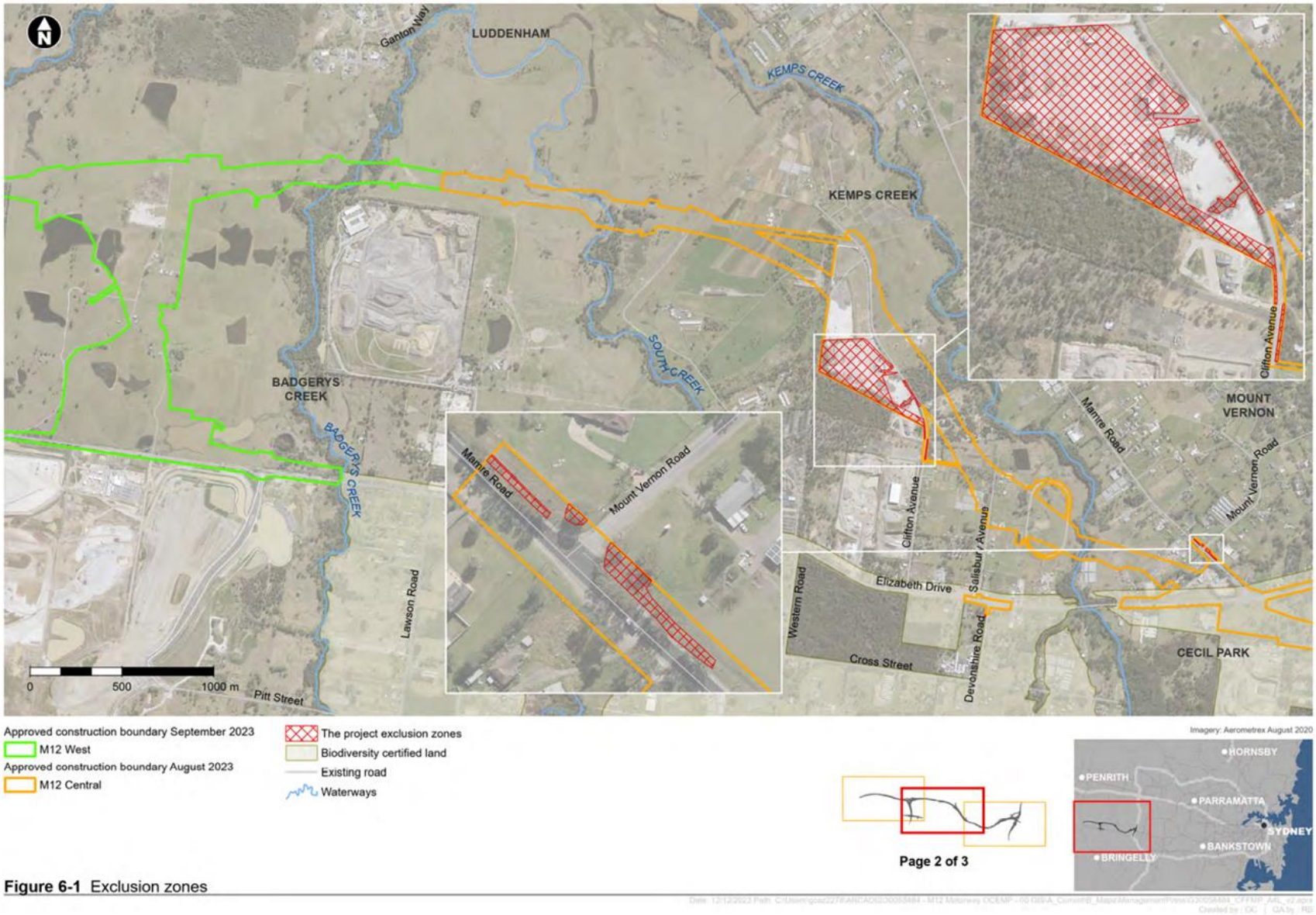

Figure 6-1 Exclusion zones

Figure 6-2 Exclusion zones

6.5 Habitat and Timber Reuse (including coarse woody debris and snags

Vegetation to be cleared, woody debris and snags (branches, root balls, trunks and whole trees that fall into rivers and streams) provide important potential habitat for aquatic and terrestrial flora and fauna. Construction activities adjacent to watercourses may result in the need to remove or relocate woody debris or snags. Snag removal and relocation at Badgerys Creek (M12 West) will be in accordance with the Snag Management Plan (Appendix E) and the *Policy and guidelines for fish habitat conservation and management* (DPIE, 2013) and REMM B12. The management plan provides details of the snags to be relocated (such as numbers and locations) and relocation methods. Coarse woody debris will be managed in accordance with Guide 5 of the Biodiversity Guidelines (RTA, 2011) and the Habitat Compensation Plan (Appendix D).

During clearing activities, the CPBGG JV in liaison with the Project Ecologist will ensure that:

- All woody debris is reused in a manner that enhances habitat for native fauna
- Avoid creating conditions where the distribution, total volume, age, species or size class, exceeds the benchmark values for that PCT
- Snags are relocated from one location in the waterway to another location within the waterway to minimise disturbance to the riparian bed or nearby sensitive aquatic habitats.
- Removal, stockpiling, transportation and relocation of woody debris and/or snags will be carried out in a manner that minimises disturbance to native vegetation

The CPBGG JV may consult with DPI Fisheries prior to vegetation clearing to identify any trees proposed to be removed that could potentially be used for re-snagging of a waterway.

Coarse woody debris will be retained where felled for construction and reused as described in Table 6-1.

Table 6-1 Classification of woody debris and proposed uses

Woody debris size	Use
Logs > 500 mm diameter	Re-snagging of creeks
Logs 250-500 mm diameter Logs up to 2000 mm length[3] (preferred for habitat enhancement)	Priority to use as habitat for Cumberland Plain Land snail. Alternatively, used as habitat for other native fauna
Logs 100-250 mm diameter	Habitat improvement/replacement, erosion and sediment control, fauna furniture for culverts
Debris <100 mm diameter	Mulched/chipped and re-used on site for revegetation or erosion and sediment control

[3] *It should be noted that logs greater than 2000mm in length are preferred for habitat enhancement based on the logistical and financial benefits of moving and installing shorter logs. However, logs greater than 2000mm may still be used where appropriate, especially where felled trees can be reused on the same site.*

Prior to the commencement of vegetation clearing, if it is not possible to reuse all removed native trees and vegetation onsite, TfNSW have initially consulted with the relevant council(s), Western Sydney Parklands Trust, Landcare groups and relevant government agencies to determine possible off-site reuse in accordance with NSW CoA E15. CPBGG JV will continue to consult with these groups on potential reuse options.

6.6 Aquatic and riparian habitat

The CPBGG JV will manage aquatic and riparian habitat in accordance with Guide 10 of the Biodiversity Guidelines (RTA, 2011) and Section 3.3.2 of the *Policy and Guidelines for Fish Habitat Conservation and Management Update* (DPI, 2013) including:

- Consideration of timing of clearing to avoid flooding risks
- Retaining of tree roots or staged removal on the bank of a waterway in order to maintain bank stability
- Existing trees, grasses and other ground cover will be retained within 15 metres of rivers, creeks and watercourses and in all drainage lines until immediately before construction commences in the area

- Maintaining minimum flows and preventing barriers to fish passage
- Developing a process for de-watering farm dams and the relocation of aquatic fauna
- Progressive stabilisation of banks in accordance with Specifications TfNSW R178 and TfNSW R179
- Avoidance of activities in aquatic habitats and riparian zones as much as practicable
- Establishment of exclusion zones for vehicles, plant and equipment, and provision of exclusion fencing around sensitive areas
- Keeping vehicles and machinery away from the banks of a waterway where possible
- Preventing refuelling of vehicles and plant, and chemical storage and decanting within 50 metres of aquatic habitats
- Temporary application of mulch will be managed to avoid the potential for material and tannin run-off into waterways, including limiting the application of mulch near waterways where practicable
- Removal of all temporary works, flow diversion barriers and sediment control barriers within aquatic habitats as soon as practicable and in a manner that does not promote future channel erosion.

Works on waterfront land will be carried out in accordance with controlled activity guidelines.

Where work is required within waterways, an EWMS for the work(s) will be prepared. The EWMS will detail the control measures to avoid or minimise erosion and any adverse impact on water quality and riparian fauna and flora as detailed in the CSWMP.

Discharged water quality will be managed in accordance with the CSWMP. The Project will be subject to EPL No. 21595 which requires that any water discharged from site must align with the following discharge water criteria:

- Oil and Grease: Not visible
- pH:6.5-8.5
- Turbidity: 50 NTU

Furthermore, impacts to KFH as defined in Policy and Guidelines for Fish Habitat Conservation and Management (DPI, 2013 update) must be minimised; residual impacts will be offset at a ratio of 2:1 habitat offset requirement and in consultation with DPI Fisheries.

Bridge designs were altered during detailed design to avoid creek realignments. The CPBGG JV will implement the detailed design to retain fauna passage at all two main creek lines, Cosgroves and Badgery's Creeks.

Clearing within riparian corridors impacted by the Project will be undertaken in accordance with the Vegetation Clearing Procedure (refer to Section 6.1 and Appendix A). Furthermore, revegetation of the riparian corridor and banks of watercourses impacted by the Project will occur in accordance with NSW CoA E109 (refer to Section 6.10). Additionally, the Snag Management Plan (Appendix E) prepared to minimise the impacts of snag relocation activities on riparian and aquatic habitat must be implemented.

A dewatering procedure outlining methods for aquatic fauna relocation is provided in Appendix F. The dewatering procedure also includes measures to prevent potential release and potential disposal of exotic aquatic fauna/ flora and pathogens during dewatering into waterbodies in accordance with G38.

No works will be undertaken in KFH until payment of habitat offset requirements have been made to the DPI Fish Conservation Trust Fund. TfNSW will be responsible for the payment of habitat offset requirements. TfNSW will submit to the Planning Secretary a receipt confirming payment to the DPI Fish Conservation Trust Fund within one month of making the payment as per NSW CoA E13.

6.6.1 Permanent and temporary waterway crossings

Temporary waterway crossings will be required for the Project. The CPBGG JV will design, construct and maintain temporary waterway crossings consistent with *Managing Urban Stormwater: Soils and Construction* (Landcom, 2004) and maintain fish passage in accordance with DPI Fisheries guideline *"Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings.*

The design of temporary waterway crossings, stream diversions, drainage swales and depressions in key fish habitat will be carried out by a suitably qualified and experienced professional in consultation with DPI Fisheries.

During construction of permanent waterway crossings, the CPBGG JV will ensure that all reasonable and practicable measures are taken to prevent or minimise environmental harm including:

- Minimising restrictions of fish passage
- Minimising the release of sediment into the stream
- Minimising damage to, or the removal of, bank vegetation, particularly vegetation that shades the low-flow channel.

Where practical, construction works across the bed of a waterway should be staged to minimise the total disturbance at any given time and to allow the full bypassing of stream flows around the works to maintain fish passage.

6.7 Weed and pathogen control

Weed and pathogen management and control practices will be implemented throughout construction to minimise the risk of spread into and out of the Project and between construction sites during construction of the Project.

The CPBGG JV has prepared a Weed and Pathogen Management Plan in accordance with the requirements of Guides 6 and 7 of the *Biodiversity Guidelines* (RTA, 2011), TfNSW specifications, and the Weed and Pathogen Management Plan provided in Appendix C of this CFFMP. The purpose of the Plan is to:

- Identify the pathogens and key weed species and their distribution across the Project sites
- Prevent the introduction and spread of weeds and pathogens throughout the construction of the Project and in particular onto, and adjacent to, the Defence Establishment Orchard Hills site
- Establish an inspection and reporting framework for weeds and pathogens
- Set out performance criteria for the management of weeds and pathogens for the Project.

The Plan will include, but not be limited to:

- Identification and mapping of weeds and pathogens at each site
- Site assessment process
- Measures to prevent the introduction and spreading of weeds and pathogens caused by the Project using a precautionary approach
- Hygiene protocols including vehicle and footwear wash down facilities and requirements for all vehicles and footwear to be washed down before entering or of exiting the site
- Weed and pathogen control methods
- Disposal methods
- Arrangements for monitoring.

The Weed and Pathogen Management Plan will be updated throughout construction of the Project to include any new weed or pathogen findings and subsequent management measures required. The Weed and Pathogen Management Plan will be reviewed annually, or as required in accordance with the continuous improvement process described in Section 8 of this CFFMP and Section 3.12 and 3.13 of the CEMP.

6.8 Unexpected threatened species finds

The CPBGG JV will implement the Unexpected Threatened Species or TEC Finds Procedures in Appendix B of this CFFMP, it has been developed in accordance with Guide 1 of the *Biodiversity Guidelines* (RTA, 2011), TfNSW specifications, and the Procedure provided in Appendix D of this CFFMP. The purpose of the Procedure is to outline the process to follow in the event of an unexpected species or EEC find during construction. The Procedure will include, but not be limited to:

- Stop work arrangements in the immediate area of the threatened species
- A notification and communication protocol
- The consultation process with appropriate specialists to assess the significance of the find and to develop management options
- Notification process for EES, DPI, DPHI and NSW DCCEEW and DCCEEW as appropriate

- A procedure to obtain approvals, licences or permits prior to recommencement of works
- Requirement for impact assessment and calculation of additional off-sets will be calculated to account for the impact.

The Unexpected Threatened Species and TECs Finds Procedure will be updated by the CPBGG JV ESR in consultation with the Project Ecologist and reviewed by the TfNSW ESM (or delegate) prior to commencement of construction of the Project.

The Unexpected Threatened Species and TECs Finds Procedure will be reviewed annually, or as required in accordance with the continuous improvement process described in Section 8 of this CFFMP.

6.9 Fauna rescue and release procedure

Handling of fauna during the Project may be required if fauna is encountered during construction and is required to be relocated or transported to a vet or wildlife carer in the case of injury.

The CPBGG JV will prepare a stage-specific Fauna Handling and Rescue Procedure prior to commencement of construction in accordance with the requirements of Guide 9 the *Biodiversity Guidelines* (RTA, 2011) and TfNSW specifications.

The purpose of the Procedure is to detail the actions to be implemented in the event that fauna (including injured, shocked, dependent juvenile or other) is discovered that requires handling during construction of the Project.

The Procedure will include, but not be limited to:

- Steps to be followed when rescue or relocation of fauna is required
- A process to ensure that, if native fauna is captured during vegetation clearing or other construction activities, it is released into a suitable nearby habitat that has been identified as such by an ecologist
- Fauna rescue and release management measures for aquatic fauna and fish
- A procedure for handling of fauna by a licensed fauna handler such as a fauna spotter/catcher, fauna ecologist or wildlife carer with specific animal handling experience
- The responsibilities of the Project Ecologist
- A process to keep records of fauna captured and relocated
- A process to report any injury or death of threatened species.

The Fauna Rescue and Release Procedure will be updated by the Environmental Site Representative and reviewed by the TfNSW Environment and Sustainability Manager (or delegate) prior to commencement of Construction of the Project.

The Fauna Rescue and Release Procedure will be updated throughout Construction of the Project to include any new fauna findings and subsequent management measures required. This Procedure will be reviewed annually, or as required in accordance with the continuous improvement process described in Section 8 of this CFFMP.

The Fauna Handling and Rescue Procedure can be found in Appendix G.

6.10 Fauna mortality monitoring

Vehicle strikes are a major cause of fauna injury and mortality during construction, therefore mortality video surveys on the Project's haulage roads (public and internal) will be required. Data captured from the surveys will be maintained in a fauna mortality register and provided to TfNSW.

The purpose of the surveys is to undertake rapid assessment of fauna mortality on the Project's haulage roads to inform adaptive management strategies where practicable to reduce the incidence of native fauna mortality in proximity to the Project.

The CPBGG JV will prepare a methodology for carrying out the native fauna mortality video surveys in accordance with TfNSW specifications. The methodology will include, but not limited to:

- A safe process to undertake the surveys
- Frequency of surveys
- Roles and responsibilities
- A process to keep records of the surveys

- A process to report on the findings of the surveys.

The survey methodology will be prepared in consultation with TfNSW and implemented throughout Construction. A draft has been provided in Appendix I. Surveys will be required regularly following rainfall events, as well as during and following high risk activities such as vegetation clearing and dam dewatering.

6.11 Vegetation rehabilitation

Revegetation will be carried out in accordance with Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA, 2011) (Guide 3: Re-establishment of native vegetation) and the Place, Design and Landscape Plan (PDLP) prepared for the Project. In accordance with NSW CoA E71, revegetation and the provision of replacement trees will be informed by the Tree Survey which has been undertaken for the Project. Habitat trees have been identified in the Tree Survey and are included in the Sensitive Area Plan provided in Appendix A6 of the CEMP. Where practicable, local provenance native species from the relevant native vegetation community (or communities) that occur, or once occurred in these locations will be used. Where trees are to be removed, they will be replaced at a ratio of 2:1, except trees that are offset under NSW CoA E3.

Revegetation for the Project will consider the land use requirements of the National Airports Safeguarding Framework (NASF) (National Airports Safeguarding Advisory Group, n.d.) to minimise the risk of wildlife strikes at the Western Sydney International Airport.

As required by NSW CoA E109, rehabilitation and revegetation of the riparian corridor and banks of watercourses impacted by the Project will be commenced within three (3) months of the completion of any construction activity required in these areas. Creek corridors will be revegetated with locally native riparian vegetation, in accordance with the requirements of the Policy and guidelines for fish habitat conservation and management (DPI, 2013) and in consideration of the Guidelines for instream works on waterfront land (DPI, 2012). The creek channels will be rehabilitated to preconstruction conditions or better.

The CPBGG JV will engage a landscape subcontractor to carry out all landscape planting and maintenance work until completion. Landscaping work will be carried out by qualified personnel in accordance with TfNSW Specification R179 (Landscape Planting). The CPBGG JV landscape subcontractor will undertake the revegetation and landscaping for the Project in accordance with the Landscape Drawings, which identify the locations of areas to be revegetated.

The Landscape Drawings identify the locations for planting, the species, planting mixes, plant sizes, quantities and densities to be adopted.

During revegetation, the CPBGG JV will comply with the requirements of TfNSW Specifications R178 (Vegetation) and R179 (Landscape Planting), including implementation of measures to avoid compaction of soils in revegetation areas and ensuring suitable moisture requirements are maintained. The CPBGG JV will regularly inspect, monitor and maintain revegetated areas in accordance with the requirements of R178 and R4.

Habitat vegetation will also be reinstated in accordance with the Habitat Compensation Plan in Appendix D.

6.12 Tree management strategy

In accordance with the requirements of REMM LVIA15, CPBGG JV have prepared a tree management strategy. The strategy is outlined in the following sections.

6.12.1.1 Tree Management

The Project will be constructed to retain as many existing trees as possible. The following procedure will be implemented to ensure this occurs:

- A qualified ecologist, as part of the pre-clearing assessment will assess the location of all trees within the project area with potential to be impacted by the project. This assessment will also include those trees to be retained, or those with the potential to be retained. This assessment will be documented in the pre-clearance survey report.
- A qualified arborist will undertake an assessment of existing trees within the road reserve that are to be retained and identify techniques to maximise tree health and longevity.

- Trees to be retained within the construction footprint are to be protected in accordance with AS4970-2009 Protection of trees on development sites
- A suitably qualified person will prune any trees requiring pruning in accordance with AS 4373-2007 Pruning of amenity trees. Any pruning will be carried out by an arborist using only the appropriate tools.
- The Project Ecologist will supervise vegetation clearing (and capture and relocate fauna), as required

TfNSW have carried out a Tree Survey as required by NSW CoA E71 identifying the number, type and location of trees to be removed as part of the project. This survey will be used as the basis for the creation of a tree register, which will be maintained to record the fate of the trees within and adjacent to the Project area.

The outcomes of this procedure will inform the final clearing plans submitted to TfNSW for consideration prior to clearing of trees being undertaken.

6.12.1.2 Tree Register

A tree register will be maintained to record the fate of the trees within and adjacent to the Project area.. The tree register will include as a minimum:

- Number of trees removed
- Tree species
- Tree status (local native/non-local native/weed)

Trees will be retained and protected where possible to minimise clearing and screen construction sites. Trimming will be preferred to tree removal where feasible and will be informed by arborist advice. Early planting works will be considered where feasible to provide a screening buffer

6.12.1.3 Place, Design and Landscape Plan (PDLP)

A Place, Design and Landscape Plan (PDLP) is required to be developed and implemented in accordance with NSW CoA E68-70.

Where tree removal is still required after implementation of the procedures in sections 6.12.1.1 and 6.12.1.2, replacement trees and plantings will be provided at a ratio of 2:1 to increase the tree canopy except trees that are offset under NSW CoA E3. The replacement trees will consist of local native provenance species from the vegetation communities that once occurred in the locality (rather than plant exotic or non-local native trees) where available and subject to the PDLP. Replacement trees will also consider maintenance requirements and safety standards. A progressive rehabilitation program will also be included to allow for the early establishment of landscaping wherever possible.

Replacement trees will:

a) be located on public land and prioritised within 500 metres of the Construction Boundary, that delivers increased shading to constructed areas (e.g., shared user paths);
b) be of a species suitable to the location, having regard for local ecology;
c) meet the requirements for quality tree stock specified in the AS2303:2018: Tree Stock for Landscape Use;
d) be provided no later than six months following the commencement of operation;
e) have a minimum pot size consistent with part 3.2.1 (Rural road reserves) in the TfNSW Landscape Guideline (2018) subject to long-term viability of the plant.

In addition to the above, in the case of any areas that have been disturbed by construction will be restored to their existing condition. As described in Section 6.10 habitat trees have been identified in the Tree Survey and are included in the Sensitive Area Plan provided in Appendix A6 of the CEMP.

6.13 Biodiversity offsets

As required by NSW CoA E3-E7 and REMM B4, biodiversity offsets are proposed and these are documented separately in the Biodiversity Offset Strategy prepared for the Project.

In accordance with NSW CoA E3, TfNSW was required to meet their biodiversity obligations for ecosystem and species credit requirements within 12 months of the commencement of construction. Amendments to the ecosystem and species credit requirements were to be undertaken by TfNSW in consultation with EHG and NSW DCCEEW and submitted to the Planning Secretary for approval within six months of determining the final construction footprint for each stage. Construction for the M12 West Stage of the project commenced on August 18th 2022 and therefore the credits were to be retired by August 18th 2023. However, as the construction footprint was not yet finalised, a letter detailing the final construction footprint for the M12 West and Central stages of the project and a request for an extension of time to retire credits under CoA E4 was sent to DPE on August 10th 2023. An extension of time was granted until February 18th 2024.

Where verification surveys are required, they will be undertaken by TfNSW in consultation with EHG. TfNSW will notify the DCCEEW in writing within two business days of formally proposing any change to the that biodiversity offset obligations as set out in the State Infrastructure Approval. TfNSW will notify DCCEEW in writing of any change to biodiversity offset obligations within five days of the change being finalised.

6.14 Seed collection and propagation

The CPBGG JV will manage seed collection and propagation in accordance with TfNSW Seed Collection Program. The program prioritises the use of Cumberland Plain Woodlands and local native species sourced from locally sourced seed.

Once on-site construction starts TfNSW may request that the CPBGG JV set up a site nursery. If this is case, the CPBGG JV will be required to set up and maintain this site nursery and TfNSW will provide access points for power and water at the site nursery.

During construction plants, rhizomatous material and seeds may be taken from disturbed vegetation within the construction boundary. Collected seeds could be used for direct seeding and hydroseeding as well as be propagated for planting on the Project. The CPBGG JV may choose to utilise seed production areas to increase efficiency in seed collection and will store all seeds and plants until requested by TfNSW.

The CPBGG JV will provide regular reports on seed collection activities, testing and any issues encountered to TfNSW.

6.15 Emergency Response

All environmental emergencies and incidents are to be managed in accordance with section 3.8 of the CEMP.

6.16 Bushfire

Bushfire is an established natural hazard within this landscape and can occur in south-western Sydney frequently during the summer months. Prolonged dry conditions, hot temperatures, and low humidity during spring, summer and early autumn are experienced regularly at the Project site. Along with wind, these climate features contribute significantly to the behaviour of a fire.

A bushfire hazard exists where there is fuel in the form of vegetation, including grass, scrub, bushes and trees. Construction activities have the potential to generate bushfire risk. Activities identified as likely to cause a fire or generate sparks include:

- Smoking
- Plant Maintenance
- Driving on site
- Hot works.

Management measures will include a Permit to perform hot works, minimising smoking occurring on site, the regular turning over of mulch stockpiles to avoid spontaneous combustion and ensuring that works during total fire ban days (TOBAN days) limit any potential ignition sources. Consultation will be undertaken with the local Rural Fire Service (RFS) during TOBAN days. If required, an exemption permit may be sought from the local RFS to undertake hot works. Further management measures are outlined in Table 6-2.

6.17 Management Measures

Management actions prescribed by this CFFMP aim to avoid and minimise impacts on biodiversity and are summarised in Table 6-2.

Table 6-2 Flora and fauna mitigation and management measures

ID	Management Measure	When to implement	Responsibility for implementation	Applicability M12 West	Reference or source	Evidence of implementation
Pre-Construction Management Actions						
FF1	A Clearing and Grubbing Plan will be prepared in accordance with the requirements of Specification TfNSW G40 and TfNSW publication "Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects". A site-specific Clearing and Grubbing EWMS within the Clearing and Grubbing Plan will be prepared if required in accordance with Specification G36.	Prior to clearing	CPBGG JV	✓	G36 G38 G40	Hold Point Release
FF2	Where work is required within waterways, an Environmental Work Method Statement (EWMS) will be prepared for the work(s).	Prior to works in waterways	CPBGG JV	✓	G38	Hold Point Release
FF3	Pre-clearing surveys will be undertaken by a qualified and experienced ecologist prior removal of any vegetation, or the demolition of structures identified as potential roosting sites for microbats in accordance with Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA, 2011) (Guide 1: Pre-clearing process).	Prior to clearing and demolition	Project Ecologist	✓	NSW CoA C8 REMM B05	Pre-clearing report
FF6	**White-bellied Sea-Eagle** Exclusion zones will be established to demarcate the location of the White-bellied Sea-Eagle nest. All site personnel will be informed of the location of the White-bellied Sea-eagle nest location during induction.	Prior to construction	Project Ecologist	✓	NSW CoA C8 REMM B05	Site inspection Report Induction records
FF7	**Cumberland Plain Land Snail** Cumberland Plain Land Snail procedure will be followed in all vegetated areas to be disturbed that are identified as known or potential habitat for Cumberland Plain Land Snail. Pre-clearance surveys and subsequent translocation will be carried out immediately before clearing works by a qualified ecologist in accordance with the procedure.	Prior to clearing known or potential Cumberland Plain Land Snail habitat	Project Ecologist	✓	REMM B05	Ecologist report
FF8	**Southern Myotis** Southern myotis procedure to be followed prior to clearing of habitat trees. Anabat surveys will be undertaken to determine presence of southern myotis. Should they be present, tree removal will be undertaken at night once bats have left the roost. No clearing of habitat will occur during winter torpor and breeding in October to January.	Prior to Southern Myotis Habitat tree removal	Project Ecologist	✓	REMM B05	Ecologist report

ID	Management Measure	When to implement	Responsibility for implementation	Applicability M12 West	Reference or source	Evidence of implementation
FF9	**Grey-headed Flying Fox** If nightworks in foraging habitat is to be undertaken, supervision by an ecologist is required as per standard clearing procedure.	During night works in Grey-headed Flying-fox foraging habitat	Project Ecologist	✓	Best practice	Ecologist report
FF10	The relocation of fauna and associated management/offset measures, will be undertaken under the guidance of a suitably qualified and experienced ecologist.	During Pre-Clearing Surveys and/ or construction	Project Ecologist	✓	NSW CoA C8	Ecologist report
FF11	Prior to the commencement of vegetation clearing, if it is not possible to reuse all removed native trees and vegetation including hollows, tree trunks, mulch, bush rock, root balls, coarse woody debris, collected plant material seeds and/or propagated plants, TfNSW will consult with Council, Western Sydney Parklands, Landcare groups and government agencies (including NSW National Parks & Wildlife Service (Scheyville Office), Greater Sydney Local Land Services and DPI Fisheries) to determine whether this material could be used by others in habitat enhancement, beneficial re-use and rehabilitation work before pursuing other disposal options. Where offsite reuse is proposed, an Ecologist will examine the material prior to clearing, as per the EPA Mulch Order 2016. This will be subject to Section 143 Notice and Biosecurity Assessment, EPA Mulch Order 2016 or any other suitable document to support the Section 143 Notice.	Prior to construction	TfNSW	✓	NSW CoA E15	Consultation records Section 143 Notice Assessment Report
FF12	A report will be developed which: • 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 • identifies all locations of threatened flora species and trees which have been marked or otherwise identified for preservation; and • lists any trees outside the limits of clearing which are unsound and likely to fall upon the roadway or onto private property.	Prior to construction	Project Ecologist/ Arborist	✓	G40	Ecologist report
FF13	Trees outside the limits of clearing which are unsound and likely to fall upon the roadway or onto private property will be marked and identified in the Clearing and Grubbing Plan and whether pruning or removal is recommended. Pruning will be undertaken in accordance with AS 4373-2007 Pruning of amenity trees.	Prior to construction	Arborist	✓	G40	Arborist report

ID	Management Measure	When to implement	Responsibility for implementation	Applicability M12 West	Reference or source	Evidence of implementation
FF14	Areas of weed infestation identified in the ecologist report will be marked in the Clearing and Grubbing Plan.	Prior to construction	Project Ecologist	✓	G40	Ecologist report, Clearing and Grubbing Plan
FF15	Prior to commencing clearing and grubbing all soil erosion and sedimentation controls will be installed in accordance with TfNSW G38 and the Construction Soil and Water Management Plan.	Prior to clearing and grubbing	CPBGG JV	✓	G38	Site inspection report
FF16	Exclusion zones will be set up at the limit of clearing in accordance with Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA, 2011) (Guide 2: Exclusion zones) and Flagging Protocol in Section 2.2.7 of the Vegetation Clearing Procedure (Appendix C).	Prior to clearing	CPBGG JV	✓	NSW CoA E2 REMM B24 G40	Site inspection report
FF17	Prior to clearing, the limits of clearing will be mapped out by a qualified surveyor and identified by clearly visible markers placed at 25 m intervals on each side of the road formation and bridges. Clearing limits will be flagged at least seven working days prior to the proposed commencement of clearing.	Prior to clearing	Site surveyor	✓	REMM B24 G40	Site inspection report
FF18	Environmental protection area signage will be placed on exclusion zone fencing at regular intervals	Prior to clearing	CPBGG JV	✓	Best Practice	Site inspection report
FF19	Clearing limits will be identified on Sensitive Area Plans	Prior to clearing	CPBGG JV	✓	Best Practice	Sensitive Area Plans
FF20	Clearing will be undertaken in accordance with the Vegetation Clearing Procedure (Appendix C)	During Construction	CPBGG JV	✓	REMM B01	Ecologist report
FF21	Existing trees, grasses and other ground cover will be retained within 15 metres of rivers, creeks and watercourses and in all drainage lines until immediately before construction commences in the area. If an access track is required within these areas, it will be constructed on an alignment that will minimise erosion in accordance with Managing Urban Stormwater: Soils and Construction (the Blue Book) (Landcom, 2004). All trees in these areas will be felled manually, leaving grasses and small understorey species wherever possible.	Prior to and During Construction	CPBGG JV	✓	G40 REMM B10	Ecologist Report
FF22	Removal of riparian vegetation at creek crossings will be minimised and vegetation connectivity across the riparian zone will be maintained where possible.	During construction	CPBGG JV	✓	REMM B10 G40	Clearing Reports
FF23	Vegetation and habitat removal will be carried out in accordance with Biodiversity Guidelines: Protecting and managing biodiversity	During construction	CPBGG JV	✓	REMM B07	Ecologist Report

ID	Management Measure	When to implement	Responsibility for implementation	Applicability M12 West	Reference or source	Evidence of implementation
	on RTA projects (RTA, 2011) (Guide 4: Clearing of vegetation and removal of bushrock).					
FF24	All construction activities will be planned and carried out within the Project boundary to ensure that there is no damage to any vegetation outside the specified clearing limits. The clearing limits, project boundary and any exclusion zones are to be clearly delineated and protected.	During construction	CPBGG JV	✓	G40 – Section 2.4	Site inspection report
FF25	Damage or destruction of threatened flora species and trees which have been identified for preservation will be minimised by: (i) installing fencing around trees clear of the canopy line (ii) ensuring no materials are stockpiled and no vehicles are parked under the canopy (iii) avoiding excavation or the placing of fill near any tree without advice from an ecologist (iv) routing haul roads and access tracks clear of the canopy.	During construction	CPBGG JV	✓	G40 – Section 2.4	Site inspection report
FF26	Trees remaining within the road reserve, but outside the limits of clearing, which the Principal has agreed to be unsound and are likely to fall upon the roadway or onto private property, will be cleared or pruned in accordance with AS 4373.	During construction	CPBGG JV	✓	G40	Post clearing report
FF27	Any branch, which overhangs the road formation, will be cut back flush with the tree trunk in accordance with AS 4373.	During construction	CPBGG JV	✓	G40 AS 4373	Post clearing report
FF28	Damage of any kind, including damage to fencing or trees or other vegetation outside the limits of clearing, which occurs during clearing operations, will be rectified.	During construction	CPBGG JV	✓	G40	Post clearing report
FF29	Holes left following the removal of trees and stumps will be backfilled and vegetated as described in Clause 3 of G40.	During construction	CPBGG JV	✓	G40 – Section 2.4	Site diary
FF30	Fauna will be managed in accordance with Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA, 2011) (Guide 9: Fauna handling) and the Fauna Handling and Rescue Procedure.	During construction	CPBGG JV	✓	REMM B25	As built drawings
FF31	Connectivity measures will be implemented in accordance with Wildlife Connectivity Guidelines for Road Projects (TfNSW, under preparation).	During construction	CPBGG JV	✓	REMM B23	Ecologist report
FF32	Fencing will be located to reduce roadkill of fauna species and funnel animals to creek crossings where safe passage will be available.	During construction	CPBGG JV	✓	REMM B23	Arborist report

ID	Management Measure	When to implement	Responsibility for implementation	Applicability M12 West	Reference or source	Evidence of implementation
FF33	The CPBGG JV will implement the detailed design to retain fauna passage at all four main creek lines (Cosgrovesand Badgerys Creek (M12 West). A minimum width of three (3) metres and minimum height of 1.5m must be provided.	During construction	CPBGG JV	✓	REMM B23	Ecologist report, Clearing and Grubbing Plan
FF34	The CPBGG JV will prepare a fauna mortality monitoring methodology in consultation with TfNSW.	Prior to construction, During construction	CPBGG JV	✓	G36	Fauna mortality register
FF35	The CPBGG JV will undertake fauna mortality video surveys on haulage roads (public and internal) regularly during rainfall events and following high risk activities including vegetation clearing and dam dewatering maintain a native fauna mortality register.	During Construction	CPBGG JV	✓	G36	Fauna mortality register
FF36	The results for the native fauna mortality register must be provided to the Principal with the Project Report. Results of the surveys will be recorded in the native fauna mortality register and used to inform adaptive management strategies where practicable to reduce the incidence of native fauna mortality in proximity to the Works Under the Contract.	During Construction	CPBGG JV	✓	G36	Fauna mortality register
FF37	Any injury or death of threatened species will be reported to the Principal.	During construction	CPBGG JV	✓	G36	Incident Report
FF38	Weed species will be managed in accordance with Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA, 2011) (Guide 6: Weed management) and the Weed and Pathogen Management Plan (Appendix D).	During construction	CPBGG JV	✓	REMM B26	Ecologist report
FF39	All staff will be made aware of the Priority Weeds present on-site and requirements	During construction	CPBGG JV	✓	G40	Site induction records
FF40	Weeds will be removed and disposed of in accordance with the requirements of the local Council.	During construction	CPBGG JV	✓	G40	Waste Management Register
FF41	Pathogens will be managed in accordance with Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA, 2011) (Guide 2: Exclusion zones).	During construction	CPBGG JV	✓	REMM B27	Ecologist report
FF42	Works will be carried out such that no noxious weeds are imported to the site or around the site, including the washing of wheels of all plant prior to transportation to site.	During construction	CPBGG JV	✓	G40	Site inspection report and daily diary
FF43	Weeds and topsoil will be treated and disposed of in accordance with their category under the Biosecurity Act.	During construction	CPBGG JV	✓	G40	Waste Management Register

ID	Management Measure	When to implement	Responsibility for implementation	Applicability M12 West	Reference or source	Evidence of implementation
FF44	Where works are undertaken at night, direction lighting will be used and directed away from vegetated areas where practicable.	During construction	CPBGG JV	✓	REMM B28	Site inspection report
FF45	Works to be undertaken in accordance with the Snag Management Plan and Habitat Compensation Plan	During construction	CPBGG JV	✓	REMM B2 and B12	Ecologist report
FF46	Where water abstraction from local waterway is proposed a qualified aquatic ecologist will be engaged to assess if it is suitable for water abstraction and for when pumping should cease.	During construction	CPBGG JV	✓	NSW CoA E121	Ecologist report
FF47	Minimum flows will be maintained to assist in maintaining the viability of aquatic communities and preventing barriers to fish passage.	During construction	CPBGG JV	✓	REMM SWH12	Permit to pump
FF48	Fish passage will be maintained in accordance with DPI Fisheries guideline “Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings”.	During construction	CPBGG JV	✓	G38	As built drawings Design Reports
FF49	Large woody debris will be retained for creek crossing works where practicable. Any large woody debris placed in the realigned waterways will be relocated in consultation with an ecologist and undertaken in accordance with the Snag Management Plan.	During construction	CPBGG JV	✓	REMM B16	Ecologist report
FF50	Stumps in riparian zones and aquatic habitats will be retained, where practicable, to reduce the potential for bank erosion.	During construction	CPBGG JV	✓	G38	Ecologist report
FF51	No works will be undertaken in KFH until payment of habitat offset requirements have been made to the DPI Fish Conservation Trust Fund by TfNSW. Impacts to KFH, as defined in *Policy and Guidelines for Fish Habitat Conservation and Management* (DPI, 2013 update) will be minimised. Residual impacts to KFH will be offset at a ratio of 2:1 habitat offset requirement in accordance with the *Policy and Guidelines for Fish Habitat Conservation and Management* (DPI, 2013 update) and in consultation with DPI Fisheries.	Prior to commencement of work in KFH	CPBGG JV	✓	NSW CoA E11 NSW CoA E12	Consultation records
FF52	Carry out any refuelling of plant and equipment, chemical storage and decanting at least 50 metres away from aquatic habitats unless otherwise approved by the Principal.	During construction	CPBGG JV	✓	G38	Site inspection report
FF53	Boats or other watercraft will be operated in a manner that prevents boat wash which could cause erosion of the banks, and propeller damage to seagrass beds.	During construction	CPBGG JV	✓	G38	Site inspection report

ID	Management Measure	When to implement	Responsibility for implementation	Applicability M12 West	Reference or source	Evidence of implementation
FF54	The use of pesticides will be in accordance with the *Pesticides Act 1999* (NSW), other relevant legislation, label directions and any relevant industry codes of practice. Herbicides and pesticides must be currently registered for their intended use by the Australian Pesticides and Veterinary Medicines Authority (APVMA).	During construction	CPBGG JV	✓	G36 G179	Records Sheet
FF55	A Records Sheet will be completed within 24 hours of applying a pesticide; a copy will be submitted to TfNSW. A Records Sheet is not required when all of the following are satisfied: (a) The pesticide is, or is part of a product that is widely available to the general public at retail outlets. (b) The pesticide is only applied by hand or by using hand-held equipment. (c) If applied outdoors on any single occasion, in quantities of no more than 5 litres/5 kilograms of concentrated product or 20 litres/20 kilograms of the ready-to-use product; or if applied indoors, in quantities of no more than 1 litre/1 kilogram of concentrated product or 5 litres/5 kilograms of the ready-to-use product.	During construction	CPBGG JV	✓	G36	Records Sheet
FF56	All personnel managing and using pesticides will receive appropriate training and hold appropriate licence prior to commencing work. Only pesticides registered for use near water will be used near water.	During construction	CPBGG JV	✓	G36	Records Sheet
FF57	Public notification of pesticide use will be in accordance with Appendix G36/H. Implement the following measures whenever pesticides are to be used adjacent to, or across the road from, a "sensitive place" (refer to Clause 1.3 for definition): • Use of mechanical means of pest control (such as mowing or slashing) where feasible; or • Use of hand-held application of pesticides where mechanical means of pest control are not feasible.	During construction	CPBGG JV	✓	G36	Records Sheet
FF58	Avoid applying pesticide: (i) on hot days when plants are stressed; (ii) after the seed has set; (iii) within 24 hours of rain or when rain is imminent; (iv) when winds will cause drift of pesticides into non-target areas.	During construction	CPBGG JV	✓	G36	Records Sheet

ID	Management Measure	When to implement	Responsibility for implementation	Applicability M12 West	Reference or source	Evidence of implementation
FF59	Stockpiles will be located outside of the tree protection zone of trees or native vegetation identified for retention. Tree protection zones will be delineated in accordance with AS 4970 – Protection of Trees on Development Sites.	During construction	CPBGG JV	✓	G38	Site inspection report
FF60	Stockpiles will be located at least 50 metres from likely areas of concentrated water flows and at least 10 metres from waterways that are classified as Class 1 and Class 2 from the DPI Fisheries guideline “Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings”.	During construction	CPBGG JV	✓	G38	Site inspection report
FF61	Topsoil that is not contaminated by priority weeds will be kept in stockpiles for later spreading on fill batters and other areas. Other stockpiled material will be kept separate from the topsoil stockpiles.	During construction	CPBGG JV	✓	G38	Site inspection report
FF62	Stockpiles will be seeded with a sterile cover crop in accordance with Specification TfNSW R178, to encourage vegetation cover. Seeding will be carried out progressively within seven days of completion of each 500 m^2 of exposed batter face.	During construction	CPBGG JV	✓	R44 G38	Site inspection report
FF63	Stockpiles will be set up in a manner that minimises any damage to natural vegetation and trees such that the stockpiled material is accessible for carting away at any time.	During construction	CPBGG JV	✓	R44	Site inspection report
FF64	Following completion of the Works, restoration of the stockpile areas will be carried out in accordance with Specification TfNSW R178.	Post Construction	CPBGG JV	✓	R44 G40	Site inspection report
FF65	Where the native vegetation is insufficient to provide the quantities of mulch needed during landscape planting, native trees removed during clearing and grubbing, with the exception of logs and rootballs, will be mulched and stockpiled Where possible, woody debris (defined as consisting of trees and wood, whether living or dead, but at least 100 mm in diameter) will be retained to be distributed in suitable nearby vegetation to enhance habitat.	During construction	CPBGG JV	✓	G40	Post clearing report
FF66	Stockpiles will be monitored and turned over as required to avoid spontaneous combustion.	During construction	CPBGG JV	✓	G40	Site inspection report
FF67	Mulch in excess of the quantity required for landscape planting will not be stockpiled on site.	During construction	CPBGG JV	✓	G40	Site inspection report
FF68	The temporary application of mulch during construction will be managed to avoid the potential for material and tannin run-off into waterways. This will include limiting the application of mulch near waterways where practicable.	During construction	CPBGG JV	✓	REMM B18	Site inspection report

ID	Management Measure	When to implement	Responsibility for implementation	Applicability M12 West	Reference or source	Evidence of implementation
	The application of mulch for permanent landscaping will be designed and planned to avoid material and tannin runoff.					
FF69	No smoking (including e-cigarettes) will be allowed on site except at designated areas. Dedicated butt disposals will be located in all designated smoking areas.	During Early Works	CPBGG JV	✓	Best practice	Induction and Toolbox talks records
FF70	All works involving a fire source will have a hot works permit in place with specific controls to prevent fire risk.	During Early Works	CPBGG JV	✓	Best practice	Safe Work Method Statement
FF71	The CPBGG JV will not undertake cutting, welding or grinding on total fire ban days, unless the works takes place in an area at least 50 metres away from an ignition source and appropriate fire controls are in place. Consultation with the local RFS is required.	During Early Works	CPBGG JV	✓	Best practice	Safe Work Method Statement
FF72	Vehicles will not be driven or idled in areas of long grass on fire ban days or after prolonged periods of dry weather.	During Early Works	CPBGG JV	✓	Best practice	Induction and Toolbox Talks records
FF73	All entry points into the site will be kept shut to prevent unauthorised vehicle access and torching.	During Early Works	CPBGG JV	✓	Best practice	Induction and Toolbox Talks records
FF74	A supply of water will be available at all times for firefighting purposes and supply point will be communicated with local firefighting authorities.	During Early Works	CPBGG JV	✓	Best practice	Safe Work Method Statement
FF75	Fire extinguishers will be available on all plant and equipment.	During Early Works	CPBGG JV	✓	Best practice	Safe Work Method Statement
FF76	Revegetation will be carried out in accordance with Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA, 2011) (Guide 3: Re-establishment of native vegetation) and the Landscape Plan prepared for the Project.	During construction	CPBGG JV	✓	REMM B08	Site inspection report
FF77	Habitat will be replaced or re-instated in accordance with Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA, 2011) (Guide 5: Re-use of woody debris and bushrock and Guide 8: Nest boxes) and the Habitat Compensation Plan.	During construction	CPBGG JV	✓	REMM B02 and B09	Post clearing report
FF78	Revegetation and the provision of replacement trees will be informed by the Tree Survey undertaken during detailed design of the Project.	During construction	CPBGG JV	✓	NSW CoA E71	Tree survey report
FF79	Rehabilitation and revegetation of the riparian corridor and banks of watercourses impacted by the Project will be commenced within three months of the completion of watercourse work, bridge works and any other construction work required in the corridor.	During construction	CPBGG JV	✓	NSW CoA E109	Tree survey report

ID	Management Measure	When to implement	Responsibility for implementation	Applicability M12 West	Reference or source	Evidence of implementation
FF80	Creek corridors will be revegetated with locally native riparian vegetation, in accordance with the requirements of the Policy and guidelines for fish habitat conservation and management (DPI, 2013) and in consideration of the Guidelines for instream works on waterfront land (DPI, 2012). The creek channels will be rehabilitated to preconstruction conditions or better.	During construction	CPBGG JV	✓	REMM B14	Fauna mortality register
FF81	Seed collection will be carried out in accordance with Biodiversity Guidelines: Protecting and Managing Biodiversity on RTA projects (RTA, 2011) (Guide 3: Re-establishment of native vegetation) under the Seed Collection Program.	During construction	CPBGG JV	✓	TfNSW	Fauna mortality register
FF82	Local native seedlings will be obtained where available, as per EES guidelines as the main source of revegetation. If unavailable, seeds will be sourced from the local region.	During Construction	TfNSW	✓	Seed Collection Program	Fauna mortality register

7 Compliance management

7.1 Training

All site personnel (including sub-CPBGG JV) will undergo site induction training relating to flora and fauna management issues prior to the commencement of work onsite. The induction training will address elements related to flora and fauna management, including:

- Existence and requirements of this overarching CFFMP, the CPBGG JV CFFMP and all plans and procedures prepared under the CFFMPs
- Relevant legislation, regulations and Environment Protection License (EPL) conditions
- Incident response, management and reporting
- Environmentally sensitive locations and exclusion zones
- Specific species likely to be affected by the construction works and how these species can be recognised
- Mulch stockpile location and management measures
- Site flagging protocol
- Fauna rescue requirements
- Boundaries for vegetation clearing
- Fauna and fauna habitat management
- Weed control measures
- General flora and fauna management measures
- Specific responsibilities for the protection of flora and fauna
- All requirements of Appendices contained within this CFFMP.

Targeted training in the form of toolbox talks or specific training will also be provided to personnel with a key role in flora and fauna management or those undertaking an activity with a high risk of environmental impact. Site personnel will undergo refresher training at not less than six monthly intervals.

The ER will review and approve the induction and training program prior to the commencement of construction and monitor implementation.

Daily pre-start meetings conducted by the CPBGG JV Foreman/ Site Supervisor will inform the site workforce of any environmental issues relevant to flora and fauna that could potentially be impacted by, or impact on, the day's activities.

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

7.2 Roles and responsibilities

The Project organisational structure and overall roles and environmental responsibilities are outlined in Section 3.3 of the CEMP. Specific responsibilities for the implementation of flora and fauna management are detailed in Section 6 of this CFFMP.

The CPBGG JV will engage a Project Ecologist to provide advice throughout construction and to supervise and lead the implementation of processes and management measures for ecologically sensitive activities. These activities will include, but not be limited to;

- Review and input to fauna handling procedures and relevant EWMS;
- Undertaking of pre-clearance surveys and provision of clearing supervision in accordance with TfNSW G40;
- Fauna handling and relocation where required;
- Undertaking of flora and fauna surveys, weed surveys, ecological constraints assessments, monitoring and trapping where required;
- Preparation of detailed pre-clearing and post-clearing reports;
- Review and provision of advice on Clearing and Grubbing Plans;

- Provision of advice on reuse opportunities for hollows, tree trunks, mulch, bush rock and root balls required to be cleared for the project prior to clearing activities;
- Provision of expert advice on biodiversity related issues; and
- Other activities as outlined in Sections 1.4, 2.2.1, and 6.

The Project Ecologist will demonstrate that they hold appropriate qualifications and all licenses relevant to the work being undertaken, in addition to specific experience in working in environmentally sensitive areas of a similar nature to the Project.

The CPBGG JV's Construction Environmental Management Plan must be reviewed and approved by TfNSW and must include details of the role, qualifications and responsibilities of the Project Ecologist and any critical site activities that require the presence of the Project Ecologist

The Project Ecologist will maintain responsibility for tracking the area of native vegetation cleared during construction. This information will be included in the CPBGG JV compliance report.

7.3 Monitoring and inspections

Inspections of sensitive areas and activities with the potential to impact flora and fauna will occur for the duration of the Project. All identified inspections will be undertaken as stated within this FFMP and the Appendices.

Requirements and responsibilities in relation to monitoring and inspections are documented in Section 3.9 and Appendix A8 of the CEMP.

7.4 Auditing

Audits (both internal and external) will be undertaken 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 and Appendix A8 of the CEMP.

7.5 Reporting and identified records

Reporting requirements and responsibilities are documented in Section 3.9.5 and Appendix A8 of the CEMP.

Specific reporting requirements associated with additional survey work and control of clearing activities are outlined in Table 7-1. All other records/reports will be provided as stated within this FFMP and the Appendices.

Table 7-1 Reporting requirements relevant to flora and fauna management

Report	Frequency	Responsibility
Report on the presence of weeds and unsound trees together with written notice that limits of clearing and areas of weed infestation identified in the Ecologist report have been marked	At least seven working days prior to commencement of clearing	Contractor Site Environmental Representative Project Ecologist
Pre-clearing Survey Report Survey methodology, targeted species, habitat trees to be removed, fauna rescue events and relocations	Prior to undertaking clearing	Contractor Site Environmental Representative Project Ecologist
Post Clearing Report Summary of the results of surveys, vegetation cleared, fauna rescues, fauna injury and mortality during clearing activities. Summary of areas of vegetation cleared and areas approved for clearing for the Project to be included in the Construction Compliance Reports. Summary of the reuse, relocation or disposal of hollows, coarse woody debris and snags. Ongoing reporting on nest box inspections and required maintenance.	Weekly, and a final report within 21 days from the completion of substantial clearing Six monthly	Contractor Site Environmental Representative Project Ecologist

Report	Frequency	Responsibility
Compliance Reports Summary of areas of vegetation cleared and areas approved for clearing for the Project.	Three monthly	Contractor Site Environmental Representative Project Ecologist

The CPBGG JV will be required to maintain accurate records substantiating all construction activities associated with the Project or relevant to the conditions of approval, including measures taken to implement this CFFMP. Records will be made available to the DPHI and NSW DCCEEW and Commonwealth DCCEEW upon request, within the timeframe nominated in the request.

In addition, key identified records relevant to this CFFMP as specified by TfNSW G36, G38 and G40 are to be maintained by the CPBGG JV.

8 Review and improvement

8.1 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
- Make comparisons with objectives and targets.

The CPBGG JV will be responsible for ensuring Project environmental risks are identified and included in the risk register and appropriate mitigation measures implemented throughout the construction of the Project as part of the continuous improvement process. The process for ongoing risk identification and management during construction is outlined in Section 3.2.1 of the CEMP.

8.2 FFMP update and amendment

The processes described in Section 3.12 of the CEMP may result in the need to update or revise this Plan. This will occur as needed.

Any revisions to the CFFMP will be in accordance with the process outlined in Section 3.13 of the CEMP. Any revision or amendment to the CEMP or associated sub-plans will be required to be approved by the ER

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 3.1 of the CEMP.

Appendix A – Vegetation Management Plan (including Vegetation Clearing Procedure)

Appendix B – Unexpected Threatened Species and Threatened Ecological Communities (TECs) Finds Procedure

Appendix C – Weed and Pathogen Management Plan

Appendix D – Habitat Compensation Plan

Appendix E – Snag Management Plan

Appendix F – Farm Dam Dewatering Procedure

Appendix G – Fauna Handling and Rescue Procedure

Introduction

Purpose

Handling of fauna during the Project may be required where fauna is encountered during Construction and is required to be relocated or transported to a vet or wildlife carer in the case of injury. This Fauna Handling and Rescue Procedure details the actions to be taken in the event that fauna (including injured, shocked, dependent juvenile or other) is discovered that requires handling during Construction of the Project. This Procedure has been developed in accordance with Guide 9: Fauna handling, Biodiversity Guidelines (RTA, 2011).

Objective

The objective of this Procedure is to minimise impacts on fauna as a result of being handled by humans and to prevent injury to people handling fauna.

Scope

This Procedure is applicable to all activities that may result in site personnel handling or rescuing fauna during Construction of the Project. It is applicable to all native and introduced species that are found in the Project area.

Induction and training

All site personnel (including sub-contractors) will be inducted on this Procedure. Best practice methods for fauna handling will be communicated to site personnel to minimise the risk of injury in the event that unavoidable handling of fauna occurs on site during Construction.

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

Roles and responsibilities

The Environmental Site Representative is responsible for ensuring the effective implementation of, and training of site personnel in, this Procedure. In general, site personnel should avoid the handling of fauna on site, however best practice fauna handling methods will be implemented should fauna handling be unavoidable.

Prior to commencement of Construction, CPBGG JV will contact a suitably qualified and located animal rescue agency/wildlife care group or vet to ensure that they are willing and available to be involved in fauna rescue and assist with injured animals during Construction of the Project. The contact details for the agency, group or vet will be prominently displayed at ancillary facilities, main compounds and offices on site.

CPBGG JV will engage a suitably qualified and experienced fauna ecologist or wildlife carer with specific animal handling experience to carry out any animal handling required by this Procedure. Relevant fauna rescue services and local veterinary surgeries contact details are below.

Fauna rescue contact details

Agency / Business	Contact Number
Project Ecologist (EMM)	TBA
Sydney Wildlife	02 9413 4300
WIRES	1300 094 737
RSPCA Care Centre Rouse Hill	02 8883 0622
Rossmore Veterinary Hospital	02 9606 6984

Review

This Procedure will be updated by the Environmental Site Representative and reviewed by the TfNSW Environment and Sustainability Manager (or delegate) prior to commencement of Construction of the Project.

This Procedure will be updated throughout Construction of the Project to include any new fauna findings and subsequent management measures required. This Procedure will be reviewed annually, or as required in accordance with the continuous improvement process described in Section 8 of this CFFMP.

Procedure

Rescue Procedure

In the event that wildlife is discovered on the site during construction activities that may harm the animal or pose a risk to site personnel, the following procedure should be followed:

1. **Stop all works** in the vicinity of the animal and notify your supervisor or superintendent who is to notify the Project Ecologist or Environmental Site Representative if the Project Ecologist is not present on site.
2. Provide exact location of the animal, clear directions to access the area and contact details for someone at the work front who will be able to meet the Project Ecologist or Wildlife Carer and show them where the animal is.
3. **Establish an exclusion zone around the animal.** Control plant and vehicle movements around this area.
4. **Allow animal to leave the area without handling if the animal is mobile.** Make sure the animal has a clear safe path to leave the project area.
5. If the animal is unable or unwilling to leave the area of its own accord, only a licensed fauna ecologist or wildlife carer with specific animal handling experience should attempt to handle and relocate the animal.
6. If the Project Ecologist or Wildlife Carer is not immediately available, the following may be suitable to reduce stress to fauna and / or reduce the risk of further injury:
    a. Minimise the number of people around the animal;
    b. Cover larger animals with a towel or blanket and place in a cardboard box or hessian bag;
    c. Place smaller animals in a cotton back or shoe box;
    d. Keep animal in a quiet, ventilated and preferably dark location away for construction activities; and
    e. Frogs and aquatic fauna to be placed in a plastic bag or container with sufficient amount of water.
7. If the animal cannot be safely handled (e.g. venomous reptiles);
    a. Maintain exclusion zone;
    b. Supervise the animal until the Project Ecologist or Wildlife Carer arrives.
8. The Project Ecologist or Wildlife Carer will either:
    c. relocate fauna to nearby areas that will not be disturbed by the project construction works that contains similar / suitable habitat for the species;
    d. hold the animal temporarily to release nocturnal animals at dusk or avoid periods of heavy rainfall; or
    e. transport the animal to Veterinary Services for assessment if the animal is injured or stressed
9. If the animal is a threatened species that is **NOT** identified in the CFFMP, the Environmental Site Representative is to notify the following relevant stakeholders;
    1. The DPU and/or the OEH Representative; and
    2. The TfNSW Environment and Sustainability Manager (or delegate)
10. Following consultation with the relevant stakeholders, the Environmental Site Representative or Project Ecologist will implement any corrective actions and additional safeguards required.
11. If the animal is injured, requires veterinarian assessment, requires euthanasia or is killed, an Environmental Incident Report is to be completed in accordance with the Environmental incident classification and reporting procedure.

Fauna Handling Considerations

The table below provides a summary of considerations for general handling and rescue of fauna.

Taxa / Activity	Consideration
Handling of Snakes	Handling of snakes can be unsafe and bites from certain species can result in serious illness, damage to organs or even death. Some monitor species also have anticoagulants that result in excessive bleeding.
Handling of bats / removal of structures (bridges and culverts)	Some species of bats carry the Australian Bat Lyssavirus (ABL) which is a form of rabies. Anyone handling bats should be vaccinated. Bats that are held should be stored in a calico bag or sealed bat nest box. Prior to clearing of existing structures, an assessment for microbats and other fauna residing in the structure shall be completed. If the assessment determines that microbats are likely roosting in the structure, a site specific bat management strategy is to be developed to manage staged exclusion of the bats from the structure prior to removal.
Handling of frogs	Handling of frogs can result in the spread of the Amphibian Chytrid Fungus and shall be undertaken in accordance with the DECC Hygiene Protocol for Control of Disease in Frogs (DECC 2008). Frogs and tadpoles are to be placed into plastic bag (zip lock) or other plastic containers with a small amount of water and vegetation
Handling of mammals and birds	Mammals and birds are capable of causing injury to handlers (e.g. bites, scratches) or themselves if handled incorrectly. Mammals and birds should be placed into a calico/hessian bag or a cardboard box. Possums which can easily rip through calico bags and should be placed within double lined canvas bags.
Nestlings or juveniles	If habitat trees are found to contain nestlings or juveniles prior to felling then it would be preferable to leave trees intact until such a time that juveniles have vacated the nest or den. If, however, construction timing does not permit this then attempts should be made to rescue juveniles for possible captive rearing by a responsible wildlife group (such as WIRES) and subsequent release into translocation sites. The success of this will depend upon the species, their stage of development and their likely chances of survival. Alternatively, and only as a last resort juveniles may be euthanized on-site.
Threatened species	If any habitat tree is found or suspected (based on fresh tree markings or scats) to contain any threatened species, the tree should be left in place for a minimum of two days and, if possible, be re-inspected prior to felling.
Arboreal animals	In the event that arboreal animals do not move or they cannot be captured because the tree hollow is too large, high or its recovery would breach OH&S requirements then the tree will be felled and animals recovered post-felling.
Handling of fish and aquatic species	Ensure that containers for holding aquatic species provide sufficient amount of water and adequate aeration.
Relocation and release of animals general	Animals should only be released at a time and place that is suitable to the species and provides it with a likely chance of survival (i.e. release should not increase the risk of stress or predation to the species). Release should not take place during periods of heavy rainfall.
Release of nocturnal species	Nocturnal animals captured during the day will be immediately taken to adjacent bushland and placed into a relocated tree hollow or nest box or held until the evening and released shortly after dusk (see below for holding of animals).
Temporarily holding animals	Collected animals may be held for a short period of time (preferably less than 24 hours prior to release). Animals kept for any purpose will be secured in a container (see above) and stored in a quiet, ventilated and preferably dark location away for construction activities. Injured animals will require additional care and may need to be nursed on route to care.
Injured Animals	Injured animals will be cared for according to specific animal care and ethics guidelines) and be given appropriate veterinary care, and if available, the services of one of the local animal welfare groups.
Euthanasia	In some instances severely injured and pest animals may need to be euthanized. This is to be done by a veterinarian after being assessed.
Release site selection	During the preliminary pre-clearing assessments, the project ecologist is to identify and assess suitable release sites for fauna adjacent to the project area.

Fauna Likely to be affected by the Works

While some mobile species, such as birds, may be able to move away from the path of clearing, other species that are likely to be direct affected by the works including:

- Less mobile species unable to move rapidly over relatively large distances (e.g. frogs and reptiles, nesting birds and juvenile fauna);

- Arboreal and scansorial mammals (possums);
- Microbats residing in structures (bridges and culverts);
- other species utilising tree hollows (e.g. birds); and
- Fish and aquatic fauna (e.g. fish or eels) in waterways.

For these species, construction activities will result in loss of roosting habitat and potential injury or mortality. Mobile species fleeing clearing areas are also at risk from collision with vehicles.

Relocation procedure

Relocation of fauna will be undertaken by, or under advice from, the Project Ecologist or wildlife carer and records will be maintained in a register. If the animal is not injured or stressed, it will be released nearby in an area that is not to be disturbed by Construction, in accordance with the following procedures:

- sites identified as suitable release points by the Project Ecologist or wildlife rescuer
- sites of similar habitat and located as close to the original capture location as possible
- if the species is nocturnal, release will be carried out at dusk
- avoid release during periods of heavy rainfall where feasible
- hollow-dependent species, particularly those with dependent young, will be released into a temporary nest box.

If the animal has been placed into care due to injury, age (i.e. young) or stress, 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 wildlife rescuer.

Dewatering procedure and aquatic fauna relocation

A number of farm dams and creeks are located within the Project area and there is the potential for fish and other aquatic fauna, including turtles and eels, to be present within these watercourses. CPBGG JV will prepare a Farm Dam Dewatering Plan in consultation with a qualified aquatic ecologist who will advise on measures relevant to relocation of fauna and prevention of transfer of exotic aquatic life (if appropriate).

Aquatic fauna will be relocated in accordance with the following steps:

1. Ensure all aquatic fauna relocation works are supervised by a suitably qualified aquatic ecologist.
2. Prior to the commencement of pumping, advice should be sought from the aquatic ecologist on pumping methods and the extent of drawdown.
3. The water level will 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.
4. A fine mesh screen (≤5 mm) may 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 500 mm is typically required before fish salvage can commence but site-specific advice will be required from the aquatic ecologist.
5. The aquatic ecologist is to establish the presence of native and introduced aquatic fauna and plan the 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.
6. In areas of identified frog habitat, dip-netting for tadpoles will be undertaken prior to substantial water draw-down.
7. Tadpoles will be placed in individual clip-seal bags and acclimatised to the release site (i.e. bag placed in waterbody for 30 minutes) before being released.
8. Separate the native fish and pest species, with native fish placed in tubs full of water from the water body for later relocation and pest fish placed in an ice slurry to be euthanised.
9. Transfer native aquatic fauna species to an aerated transport tank for immediate release downstream in previously identified suitable habitat.

10. Following completion of relocation, a final check will be undertaken to find any remaining fish, or dying/dead fish.
11. All euthanised and dead fish will be transported to a licensed landfill facility for disposal.

Handling procedure

The following handling procedures will be implemented to minimise stress to fauna and/or remove the risk of further injury:

12. If time permits, call ecologist or fauna rescue for advice.
13. Attempt to herd terrestrial fauna into adjoining forest or other vegetated area.
14. If capture is necessary, cover larger animals with a towel or blanket and place in a large cardboard box or hessian bag.
15. Place smaller animals in a cotton/calico bag tied at the top.
16. Keep the animal in a quiet, warm, ventilated and dark place away from noisy Construction activities.
17. Animals such as venomous reptiles and raptors require particular handling and will only be handled by appropriately qualified personnel, i.e. Project Ecologist or wildlife rescuer.
18. If handling bats, the handler must be vaccinated against the Australian Bat Lyssavirus.
19. Aquatic fauna will be placed in plastic aquaria or a plastic bag with sufficient amount of water and aeration.
20. Frogs will be transported in moistened plastic bags (1 frog/bag) with a small amount of leaf litter. Handling and translocation of frogs shall be 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. Recommended measures include:
    - thoroughly cleaning/disinfecting footwear and equipment before entering frog habitat and when moving from one site to another
    - in high risk areas, spraying/flushing vehicle tyres with a disinfecting solution and avoid driving through frog habitat
    - cleaning/disinfecting hands between collecting samples/frogs (preference would be given to using bags, rather than bare hands to handle frogs)
    - limiting one frog or tadpole to a bag. Bags should not be reused.

Recommencement of work

Following consultation with all relevant stakeholders, the Environmental Site Representative and Project Ecologist will implement any corrective actions and additional safeguards identified. Following confirmation by the Environmental Site Representative and Project Ecologist that all appropriate safeguards have been implemented, Construction works can recommence.

Project Ecologist responsibilities for fauna handling and rescue

CPBGG JV's Project Ecologist has the following responsibilities in regard to this Procedure:

- relocation of captured fauna will be undertaken in accordance with Sections 2.2 and 2.3 of this Procedure
- record and provide capture and relocation data in the Post-Clearing Report (refer Appendix A of this CFFMP). Data will include the species, number, and general health of each individual
- in the event that the rescue service and/or local veterinary service cannot be contacted or non-native fauna are captured, 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
- if the fauna species is identified as a threatened species that is not identified in this CFFMP, notify the Environmental Site Representative or TfNSW Environment and Sustainability Manager (or delegate).

Temporary fauna fencing

CPBGG JV will install temporary fauna fencing to minimise the risk of road kill or injury from public road traffic or Construction vehicles, plant or machinery where it is considered that there is a high risk of mobile threatened fauna species entering the Construction area or in existing areas where there is a known history of threatened species roadkill.

Supervision of Clearing

An ecologist or WIRES representative will be present during the clearing of suspected vegetation that may support a habitat for fauna to manage and/or relocate any fauna present.

The objective of the pre-commencement inspections and supervision of clearing is to direct clearing in a manner that either allows for fauna to safely flee the clearing area.

Uninjured animals that are unable to flee the clearing area will be captured and placed in adjacent areas of analogous habitat that contains suitable refuge habitat, to areas of adjoining habitat.

Injured animals will be cared for according to specific animal care and ethics guidelines.

(http://www.animalethics.org.au/reader/arrp-policies-and-guidelines) and be given appropriate veterinary care, and if available, the services of one of the local animal welfare groups. Severely injured and pest animals may need to be euthanized at the assessment of a veterinarian.

Records

CPBGG JV will maintain accurate records of all fauna captured and relocated during the Project. The following details are to be recorded for each event:

- species name
- location and time captured
- location and time released
- behaviour and condition upon release
- details of any injury or death that occurred
- contact details and location of licensed wildlife carer or vet if the animal was transferred into their care.

Reporting

The Project Ecologist will record fauna finds, relocations and euthanised animals in the TfNSW Incident Report.

CPBGG JV will immediately report any injury or death of a threatened species to the TfNSW Project Manager and Environment and Sustainability Manager (or delegate).

Appendix H – Fauna Mortality Monitoring Methodology

Introduction

Fauna mortality on haulage routes is a potential risk during construction, particularly when fauna habitat is being removed. The removal of habitat can result in an increased likelihood that fauna dispossessed by construction activities disperse into the surrounding areas of the project seeking refuge or in search of food resulting in entry onto roads and haulage routes.

Scope

TfNSW QA Specification G36 clause 4.8 requires CPBGG JV to undertake fauna mortality video surveys on project haulage routes both on public roads surrounding the project (ie. Elizabeth Drive, Luddenham Road, The Northern Road) and on internal haul roads. Figure 8-1 below in white shows the extent to which the Fauna mortality monitoring will be undertaken over. Fauna mortalities are to be maintained in the project fauna mortality register. This monitoring methodology is to fully implemented during construction and be further developed in conjunction with TfNSW.

Figure 8-1: Fauna Mortality Monitoring extents along Elizabeth Drive, The Northern Road and Luddenham Road illustrated in white

Methodology

Inspections will be undertaken when hauling activities are occurring as part of the daily site inspection utilising a dashcam device or equivalent (e.g., GoPro camera) mounted in the inspecting site vehicle. These inspections will typically be undertaken by supervisory staff as per frequency outlined in dot points below. Inspections will be recorded in the supervisor's daily diaries (and by way of the video footage).

Inspections of haul routes will be undertaken:

- Once daily during 'normal' work operations
- Twice daily (morning and afternoon) whilst conducting high-risk activities likely to result in an increased likelihood of fauna movement (e.g., such as vegetation clearing and dam dewatering)

- Following rainfall events (defined as per CSWMP as 10 mm or more of rain forecast within 24 hour period)

Initial analysis of data will be undertaken by CPBGG JV to determine if any immediate mitigation measures are required to be implemented.

Equipment to be used during the monitoring includes:

- Light Vehicle
- Dashcam device (e.g., GoPro camera or equivalent)

The location of any fauna mortality noted during the inspection will be documented in the foreman diaries and also the fauna mortality register.

Reporting

All fauna mortalities will be reported immediately to the project ESR. Any fauna mortalities observed during the inspections will be maintained on the fauna mortality register (including details on fauna species and location) with subsequent video footage retained in the site files. Results of the fauna mortality register will be included in the monthly project reports including any raw video data. The results of the fauna mortality monitoring will be used to inform adaptive management strategies to reduce the incident of native fauna mortality in close proximity to the project.

Continual Improvement

This methodology may be updated based on findings from the monitoring and any identified improvements throughout construction.

Appendix I – Secondary CoA and REMMs

Secondary CoAs

CoA No.	Condition Requirement	Document reference
E2	The clearing of native vegetation must be minimised with the objective of reducing impacts to threatened ecological communities and threatened species habitat.	Section 6.1
E14	A minimum width of three (3) metres and a minimum height of 1.5 metres must be provided to maintain fauna passage below the Badgerys Creek, Cosgroves Creek, South Creek and Kemps Creek bridges. The three metre wide passage must consist of a natural substrate or other surface type that will not hinder fauna movement.	Section 6.4
E15	Prior to vegetation clearing, the Proponent must identify where it is practicable for the CSSI to reuse native trees and vegetation that are to be removed. If it is not possible for the CSSI to reuse all removed native trees and vegetation, the Proponent must consult with the relevant council(s), Western Sydney Parklands Trust and Landcare groups and relevant government agencies to determine if: (a) hollows, tree trunks, mulch, bush rock and root balls salvaged from native vegetation impacted by the CSSI; and (b) collected plant material, seeds and/or propagated plants from native vegetation impacted by the CSSI, could be used by others in habitat enhancement, beneficial re-use and rehabilitation work, before pursuing other disposal options.	Section 6.1
E65	Landscaping must improve parkland, open space and native vegetation and fauna connectivity, including between areas of existing parkland and open space adjacent to and intersecting the CSSI, and through the revegetation of areas with local provenance species, where practicable, between adjoining areas of remnant Cumberland Plain Woodland to re-link them. In implementing these requirements, the Proponent must have regard to wildlife strike risk in proximity to the Western Sydney International Airport.	Section 6.11

E71	Revegetation and the provision of replacement trees must be informed by a Tree Survey undertaken during detailed design. The Tree Survey must identify the number, type and location of any trees to be removed. The Tree Survey must be submitted to the Planning Secretary for information with the Place, Design and Landscape Plan. Where trees are to be removed, the Proponent must provide a net increase in the number of replacement trees at a ratio of 2:1, except trees that are offset under Condition E3. Replacement trees must have a minimum pot size consistent with the relevant authority's plans / programs / strategies for vegetation management, street planting, or open space landscaping, or as agreed by the relevant authority(ies). Note: For the purposes of this condition, the relevant authority is that State or local government authority that owns or manages the land on which the replacement trees will be planted.	Section 6.11
E105	The CSSI must be designed, constructed and operated so as to maintain the NSW Water Quality Objectives where they are being achieved as at the date of this approval, and contribute towards achievement of the NSW Water Quality Objectives over time where they are not being achieved as at the date of this approval, unless an EPL in force in respect of the CSSI contains different requirements in relation to the NSW Water Quality Objectives, in which case those requirements must be complied with. Note: If it is proposed to discharge construction stormwater to waterways, a Water Pollution Impact Assessment will be required to inform licensing, consistent with section 45 of the POEO Act. Any such assessment must be prepared in consultation with the EPA and be consistent with the National Water Quality Guidelines, with the level of detail commensurate with the potential water pollution risk.	Section 6.6 CSWMP
E106	Drainage feature crossings (permanent and temporary watercourse crossings and diversions) and drainage swales and depressions must be carried out in accordance with relevant guidelines and designed by a suitably qualified and experienced person.	Section 6.6.1
E107	Work on waterfront land must have regard to the *Guidelines for controlled activities on waterfront land – Riparian Corridors (NRAR, 2018), Controlled activities on waterfront land – Guidelines for watercourse crossings on waterfront land (NSW Office of Water, 2012) and Policy and Guidelines for Fish Habitat Conservation and Management (DPI Fisheries, 2013).*	Section 6.6
E108	The Proponent must consult DPI Fisheries and EES during the detailed design of the watercourse crossings. The consultation must include: (a) design of bridges; (b) design of scour protection; and (c) details of riparian revegetation.	Section 6.6

E109	Rehabilitation and revegetation of the riparian corridor and banks of watercourses impacted by the CSSI must be commenced within three (3) months of the completion of the watercourse work, bridge works (sub-structure, super-structure and pavement) and any other construction work required in the riparian corridor.	Section 6.11

Secondary REMMs

ID	Revised environmental management measure	Timing	Document Reference
B02	A Habitat Compensation Plan (HCP) will be prepared and implemented as part of the CFFMP for the project. The HCP will target those species that will be impacted by the loss of hollows. Measures will include: nest boxes, reuse of salvaged hollows and/or new technologies eg chainsaw hollows), as well as replacement of woody debris and bushrock with consideration to Guide 5 and Guide 8 of Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA, 2011).	Prior to construction	Appendix D
B05	Pre-clearing surveys will be carried out in accordance with Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA, 2011) (Guide 1: Pre-clearing process). The following species identified on or near the study area will require particular attention: •White-bellied Sea-Eagle If design cannot avoid the White-bellied Sea-Eagle nest, then pre-clearing measures to avoid impact on the nest will be implemented. This will include pre-clearing survey to establish if it is currently being used and removal of the nest by an ecologist experienced in similar procedures. The potential impacts of habitat removal will be minimised by removing the nest outside of the nesting period (typically lays between June and September, with young remaining in the nest for 70 days). An initial pre-clearing inspection will be carried out at least 21 days prior to commencement of clearing, to give the ecologist time to check the nest and then relocate if needed. •Cumberland Plain Land Snail Pre-clearance surveys will be carried out immediately before clearing works by a qualified ecologist in all vegetated areas to be disturbed that were identified as known or potential habitat for Cumberland Plain Land Snail (see Figure 6-6 in amendment report). As identified in the CFFMP, all individual Cumberland Plain Land Snails found during pre-clearance surveys will be translocated to adjacent areas of suitable habitat.	Prior to construction	Appendix A Section 2.2

ID	Revised environmental management measure	Timing	Document Reference
B06	An unexpected threatened species finds procedure will be developed as part of the CFFMP and based on Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA, 2011) (Guide 1: Pre-clearing process). The procedure will include requirements for workers to be made aware of the potential flora and fauna species that may be encountered during construction (including training staff on species identification) and outline the process for the identification and management of unexpected flora and fauna. In the event that any threatened species are identified during construction, the following steps would be carried out: 1. Stop work immediately in the location of the unexpected find to avoid any potential impacts. 2. Notify the environmental manager. 3. Environmental manager will arrange for an ecologist to conduct an assessment of significance of the likely impact, develop management options, and notify DPIE, EESG,and DoEE DAWE as appropriate. 4. If a significant impact is unlikely to occur, re-begin work and maintain regular site inspections. 5. If a significant impact is likely to occur: a.Consult with DPIE, EESG and DoEE DAWE as appropriate. b.Obtain approvals, licenses or permits as required. c.Re-begin work once advice is sought and necessary approvals, licenses and permits are obtained. 6. Include species in subsequent inductions, toolbox talks and update the CEMP.	During construction	Appendix B
B07	Vegetation and habitat removal will be carried out in accordance with Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA, 2011) (Guide 4: Clearing of vegetation and removal of bushrock).	During construction	Appendix A

ID	Revised environmental management measure	Timing	Document Reference
B09	Habitat will be replaced or re-instated in accordance with Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA, 2011) (Guide 5: Re-use of woody debris and bushrock and Guide 8: Nest boxes). A Habitat Compensation Plan, as described in B02 will include this measure.	During construction	Appendix D
B10	Removal of riparian vegetation at creek crossings will be minimised and vegetation connectivity across the riparian zone will be maintained where possible.	During construction	Section 6.6
B11	Measures to protect aquatic and riparian habitat will be outlined in the CFFMP and protected in accordance with Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA, 2011) (Guide 10: Aquatic habitats and riparian zones) and Section 3.3.2 Standard precautions and mitigation measures of the Policy and guidelines for fish habitat conservation and management (DPI, 2013).	Prior to Construction	Section 6.6
B12	A snag management plan would be prepared as part of the CFFMP for the project for snag removal and relocation at Badgerys Creek, Kemps Creek and South Creek in accordance with the Policy and guidelines for fish habitat conservation and management (DPI, 2013). The management plan will be informed by additional field work which will provide details of the snags to be relocated (such as numbers and locations) and relocation methods. In accordance with Section 3.2.5.2 of the Policy and guidelines for fish habitat conservation and management (DPI, 2013), the snag management plan will: • Clearly outline the objectives to be achieved • Document the actions to be taken for each individual snag • Detail the methods and machinery to be use • Specify the season or time period over which the works will be carried out.	Prior to Construction	Appendix E
B14	Creek corridors will be revegetated with locally native riparian vegetation, in accordance with the requirements of the Policy and guidelines for fish habitat conservation and management (DPI, 2013) and in consideration of the Guidelines for instream works on waterfront land (DPI, 2012). The creek channels will be rehabilitated to preconstruction conditions or better.	During Construction	Section 6.11

ID	Revised environmental management measure	Timing	Document Reference
B16	Large woody debris will be retained for creek crossing works where practicable. Any large woody debris placed in the realigned waterways will be relocated in consultation with an ecologist.	During Construction	Section 6.5
B17	Permanent and temporary waterway crossings will be designed and constructed to maintain fish passage in accordance with Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings (Fairfull and Witheridge, 2003). Crossing types should be matched to waterway type as per Table 1 in Fairfull and Witheridge (2003).	During Construction	Section 6.6.1
B19	Emergency response protocols and procedures will be included in the Project CEMP and implemented in the event of a contaminant spill or leak.	As required during construction	Section 6.15
B24	Exclusion zones will be set up at the limit of clearing in accordance with Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA, 2011) (Guide 2: Exclusion zones). Exclusion zones will be set up to protect potential indirect impacts to threatened flora in accordance with the areas identified in the EIS and the amendment report (including Figure 1-2 of Appendix A of the amendment report).	During Construction	Appendix A – Section 2.2.6
B25	Fauna will be managed in accordance with Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA, 2011) (Guide 9: Fauna handling).	During Construction	Appendix A – Section 2.4
B26	Weed species will be managed in accordance with Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA, 2011) (Guide 6: Weed management).	During Construction	Appendix C – Section 3 Appendix C – attachment 1
B27	Pathogens will be managed in accordance with Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA, 2011) (Guide 2: Exclusion zones).	During Construction	Appendix C – Section 4 Appendix C – attachment 2
B28	Shading impacts will be minimised through detailed design of bridge and culvert structures. The need for artificial lighting during construction and operation will be minimised through detailed design where feasible, including directing lighting away from vegetated areas where practicable.	Detailed Design and During Construction	Section 5.2.8

ID	Revised environmental management measure	Timing	Document Reference
LVIA15	A tree management strategy will be prepared for the project, outlining: •Measures to minimise tree removal to retain and protect as many trees within the construction footprint as reasonable and feasible •Measures to avoid damage to trees that are to be retained within the construction footprint to ensure the maintenance of health and stability of the trees in accordance withAS4970-2009 Protection of trees on development sites •Requirements for the pruning of trees to be carried out by a suitably qualified person in accordance with AS 4373-2007 Pruning of amenity trees •Consideration of maintenance requirements and safety standards •Requirements for the replacement trees where removal cannot be avoided including: −Net increase in the number of trees (not identified as within an EEC) −Where it is not practicable to plant trees in the operational footprint an alternative location will be identified in consultation with relevant councils and in consideration of future development in the local area - Minimum pot size in accordance with part 3.2.1 (Rural road reserves) in the TfNSW Landscape Guideline (Roads and Maritime, 2018b) subject to long-term viability of the plant.	Detailed design and prior to construction	Section 6.12
LVIA16	Revegetation for the project will consider the land use requirements of the National Airports Safeguarding Framework (NASF) (National Airports Safeguarding Advisory Group, n.d.) to minimise the risk of wildlife strikes at the Western Sydney Airport.	Detailed design	Section 6.11
GG03	Vegetation removal will be minimised where practicable.	Detailed design and construction	Appendix A – Section 2.3

Appendix J – TfNSW Red Imported Fire Ant Alert Factsheet

Appendix A Construction Flora and Fauna Management Sub-plan

Vegetation Management Plan

M12 Motorway West

Project number:	N00160
Document number:	M12WCO-CPBGGJV-ML1-EV-PLN-000003_App A
Revision date:	22/10/2024
Revision:	01

Details of Revision Amendments

Document Control

The Project Director is responsible for ensuring that this plan is reviewed and approved. The Project Director is responsible for updating this plan to reflect changes to construction, legal and other requirements, as required.

Amendments

Any revisions or amendments must be approved by the Project Director and/or client before being distributed / implemented.

Revision Details

Rev	Date	Reviewed By	Details
A	01/06/2022	A. Zvirzdinas	First Draft
B	14/07/2022	A. Zvirzdinas	Second draft following TfNSW/Arcadis/ER review of Rev A
00	27/07/2022	A. Zvirzdinas	First Controlled Issue
C	31/01/2023	K. Purkiss	6-Monthly Review
01	22/10/2024	T. Chezzi	Annual Review

Document Review

Position	Name	Signature	Date
Project Director	Nick Fryday		22/10/2024

Distribution of controlled copies

Copy no.	Issued to	Version

Table of Contents

Acronyms and Abbreviations

Abbreviations	Expanded text
AR	Amendment Report
Areas of vegetation to be retained	These areas present potential opportunities for the Construction Contractor to avoid and minimise potential vegetation impacts if possible. As vegetation impacts may occur during construction, these impacts have been considered in biodiversity off-set calculations.
ARSR	Amendment Report Submissions Report
BC Act	*Biodiversity Conservation Act 2016*
CEEC	Critically Endangered Ecological Community
CFFMP	Construction Flora and Fauna Management Plan
CoA	Conditions of Approval
CPBGG JV	CPB Contractors and Georgiou Group Joint Venture
Construction	Includes all activities required to construct the CSSI as described in the documents listed in Condition A1, including commissioning trials of equipment and temporary use of any part of the CSSI, but excluding Low Impact Work which is carried out to complete prior to the approval of the CEMP, works approved under a Site Establishment Management Plan, approved under a Consistency Assessment, demolition of acquired residential houses, structures and sheds, and works approved under an environmental management plan(s) in accordance with Condition A24.
CSEP	Community and Stakeholder Engagement Plan
DAWE	Former Commonwealth Department of Agriculture, Water and the Environment (now Commonwealth Department of Climate Change, Energy, Environment and Water (DCCEEW))
DBH	Diameter at Breast Height
DCCEEW	Commonwealth Department of Climate Change, Energy, Environment and Water
DPE	Former NSW Department of Planning and Environment
DPIE	Former NSW Department of Planning, Industry and Environment
DPHI	NSW Department of Planning, Housing and Infrastructure (formerly NSW DPE which has now been split into NSW DCCEEW and NSW DPHI, with all planning functions falling to DPHI)
EAD	Environmental Assessment Documentation
EEC	Endangered Ecological Community
EES	NSW Environment, Energy and Science Group (a part of DPIE)
EHG	NSW Environment and Heritage Group
Environmental Assessment Documentation	The set of documents that comprise the Division 5.2 Approval: • Roads and Maritime Services (October, 2019) M12 Motorway, Environmental Impact Statement (EIS)

	• Transport for NSW (October, 2020) M12 Motorway, Submissions Report (the Submissions Report) • Transport for NSW (October, 2020) M12 Motorway, Amendment Report (AR) • Transport for NSW (December, 2020) M12 Motorway, Amendment Report submissions report (ARSR) • Transport for NSW (March, 2021) The M12 Motorway Amendment Report Submissions Report – Amendment (ARSR amendment) • WSP (October, 2021) M12 Motorway – West Package Detailed Design Consistency Assessment • GHD (October, 2021) M12 Motorway – Central Package Detailed Design Consistency Assessment • Arcadis (June, 2022) M12 Motorway – Sydney Water Crossings Consistency Assessment • Arcadis (July, 2022) M12 Motorway – Design Boundary Changes Consistency Assessment • Arcadis (August, 2022) M12 Motorway Minor Consistency Assessment for Proposed Change to the M12 Motorway Project (M12 Central) • Arcadis (September, 2023) M12 Motorway – Devonshire Road Temporary Roundabout Consistency Assessment • WSP (September, 2023) M12 Motorway – Elizabeth Drive Connections Consistency Assessment • TfNSW (September, 2023) M12 Motorway – Minor Consistency Assessment M12 West demolition of structures as 752 Luddenham Road • TfNSW (October, 2023) M12 Motorway – Minor Consistency Assessment M12 East AF9 Power Supply • TfNSW (October, 2023) M12 Motorway – Minor Consistency Assessment M12 East Cecil Road Laydown Area • TfNSW (October, 2023) M12 Motorway – Minor Consistency Assessment M12 East Temporary Construction Signage • Arcadis (December, 2023) M12 Motorway – East Site 48, 50 and 51 Boundary Changes Minor Consistency Assessment • Arcadis (December, 2023) M12 Motorway Project (M12 East) Sites 48, 50 and 51 • Arcadis (January, 2024) M12 Motorway – Minor Consistency Assessment M12 Central Water Tower Access Road The documents that comprise the EPBC referral: • Submission #3486 – The M12 Motorway Project between the M7 Motorway, Cecil Hills and The Northern Road, Luddenham, NSW Notification of referral decision and designated proponent - controlled action; date of decision 19 October 2018; ID: 2018-8286.
EPBC Act	*Environmental Protection and Biodiversity Conservation Act* 1999

EPBC Referral	A Proponent must refer a proposed action to the Australian Government Minister for the Environment (the Minister) for assessment, if it has, will have, or is likely to have a significant impact on the world heritage values of a declared World Heritage property, or is likely to have a significant impact on the National Heritage values of a National Heritage place.
EWMS	Environmental Work Method Statements
Exclusion zones	Exclusion zones are areas of environmental importance (e.g. threatened vegetation or heritage items) that need to be protected. These exclusion zones are defined as no-go areas and are to be protected for the duration of construction in that particular footprint area.
Infrastructure Approval	Approval (SSI 9364) for carrying out of the M12 Project under Section 5.19 of the *Environmental Planning and Assessment Act* 1979 subject to specific CoA as detailed in Schedule 2 of the approval.
NSW CoA	NSW Conditions of Approval
NSW DCCEEW	NSW Department of Climate Change, Energy, the Environment and Water (formerly NSW DPE which has now been split into NSW DCCEEW and NSW DPHI)
OCEMP	Overarching Construction Environmental Management Plan
OCS	Overarching Communication Strategy
PCT	Plant Community Type
Project, the	M12 Motorway Project
RTA	Roads & Traffic Authority. Former NSW Roads and Maritime Services. Now Transport for NSW
TEC	Threatened Ecological Community
TfNSW	Transport for New South Wales
Tree	Long-lived woody perennial plant with one or relatively few main stems, with a trunk size of 300 mm or more at 1.5 metres from ground AND/OR a height of 3 metres or more
WIRES	NSW Wildlife Information Rescue and Education Service

1 Introduction

1.1 Purpose

Clearing associated with construction of the M12 Motorway West Project (the Project) will result in the loss of vegetation and fauna habitat, with impacts on native flora and fauna, including threatened species and Endangered Ecological Communities (EEC). This Vegetation Management Plan (This Plan) has been prepared to address the required procedures and mitigation measures to be followed prior to, during and following vegetation clearing activities throughout the project.

This Plan is also referred to as the VMP, or Clearing and Grubbing Plan with reference to the TfNSW G40 Specification.

This plan forms Appendix A of the Construction Flora and Fauna Management Sub-Plan (CFFMP) for the project. It has been prepared to address the requirements of:

- TfNSW QA Specification G36 Environmental Protection
- TfNSW QA Specification G40 Clearing and Grubbing
- TfNSW Biodiversity Guidelines (September 2011)

1.2 Scope

This Plan applies to all activities associated with the clearing of vegetation, including clearing within the riparian corridor, throughout the construction phase of the project.

1.3 Induction/training

All site personnel (including sub-contractors) will be inducted on the potential threatened species and EEC and sensitive environmental areas occurring within the Project, and this Procedure. Training will include inductions, toolbox talks, pre-starts and targeted training as required.

All site personnel working in the Project area will be informed of exclusion zones as illustrated on the Sensitive Area Plans and where they are located.

1.4 Roles and Responsibilities

This Plan will be updated by CPBGG JV and reviewed by the TfNSW Environment and Sustainability Manager (or delegate) prior to commencement of any pre-clearing activities.

The following specialised roles are required for Project clearing activities:

- The Project Ecologist will undertake pre-clearing surveys, where required, including targeted surveys for the Cumberland Land Snail, Grey-headed Flying-fox and Southern Myotis.
- A qualified arborist will undertake an assessment of existing trees within the road reserve that are to be retained and identify techniques to maximise tree health and longevity. Any pruning will be carried out by an arborist using only the appropriate tools
- The Project Ecologist will supervise vegetation clearing and capture and relocate fauna, as required
- Any injured animals will be taken to a wildlife carer or wildlife vet (details of these organisations to be provided to the Project Ecologist undertaking clearing supervision and printed on the EWMS for clearing).

1.5 Consultation

A copy of the CFFMP will be provided to the relevant government agencies for their information once these documents have been approved by the Independent Environmental Representative (ER).

Consultation between TfNSW and CPBGG JV and its stakeholders, the community and relevant agencies regarding the management of flora and fauna within the Project area will be undertaken during the construction of the Project as required. The process for the consultation is documented in the Overarching Communication Strategy (OCS) and Community and Stakeholder Engagement Plan (CSEP). Consultation as detailed by the State Infrastructure Approval is included in Table 1-1 and was undertaken by TfNSW through the development of the Overarching Construction Environmental Management Plan (OCEMP).

Table 1-1 Consultation requirements

Reference	Description	Consultee	Responsibility
G36	Consultation with the appropriate specialists to assess the significance of the unexpected flora/fauna find and development of management options	Technical specialists/Project Ecologist	CPBGG JV
NSW CoA E12	Impacts to Key Fish Habitat	DPI Fisheries	TfNSW
NSW CoA E15	Potential reuse of all removed native trees and vegetation including hollows, tree trunks, mulch, bush rock, root balls, coarse woody debris, collected plant material seeds and/or propagated plants	Council, Western Sydney Parklands, Landcare groups and relevant government agencies including NSW National Parks & Wildlife Service (Scheyville Office), Greater Sydney Local Land Services and DPI Fisheries.	TfNSW initial consultation CPBGG JV ongoing consultation

1.6 Objectives and Targets

The key objectives of this VMP are to:

- minimize harm to flora and fauna;
- minimize soil loss, erosion and sedimentation;
- prevent the spread of weeds and disease;
- protect retained sensitive areas;
- support beneficial reuse to minimize woody waste and relocate habitat structures;
- identify the Project riparian corridor widths, riparian areas to be impacted by the Project, areas to be rehabilitated and offset areas;
- provide a stable watercourse and riparian corridor that emulates local native vegetation communities where possible; and
- minimise impacts to aquatic habitats and riparian zones.

The following targets for vegetation clearing activities are:

- full compliance with TfNSW Specifications and relevant legislative requirements;
- no unapproved disturbance to flora and fauna outside the approved Construction footprint, clearing limit and associated access tracks and site compounds;
- all suitable hollow logs and tree nesting hollows, cleared from the Construction area will be reused in adjacent areas to provide habitat resources;
- retained timber and rootball is reused for local rehabilitation projects or other uses;
- retention of fauna connectivity where possible;
- no fauna injury or mortality during Construction;
- avoidance of activities in aquatic habitats and riparian zones as much as practicable; and
- avoidance of clearing within the riparian zone during periods when flooding is likely to occur.

1.7 Hold Points

This plan contains hold points for those items in Table 1-2 as per G40 specification.

Table 1-2 TfNSW G40 Hold Points

TfNSW Hold and Witness Point References	Hold or Witness Point Details	Submission Details
G40 cl2.4.2	Hold Point: Submission of Clearing and Grubbing Plan and other required documents prior to clearing any area.	Clearing and Grubbing Plan, Environmental Work Method Statement (Annexure G40/D) and report on your Ecologists pre-clearing survey, Toolijooa clearance, all locations of environmentally sensitive areas, measures to reduce clearing in

TfNSW Hold and Witness Point References	Hold or Witness Point Details	Submission Details
		environmentally sensitive areas, the presence of weeds and unsound trees together with written notice that limits of clearing and areas of weed infestation identified in the ecologist report (Clause 2.4 (a)) are marked), at least fifteen working days before starting any clearing.
G40 cl6.1	Hold Point: Submission of Weed, Pest and Pathogen Management Plan prior to clearing in any area.	Weed, Pest and Pathogen Management Plan together with written notice that areas of weed infestation identified in the Ecologist's report (Clause 2.4.1) are marked, at least 15 working days before starting any clearing.

2 Clearing Requirements

2.1 Vegetation Clearing Procedure

A Vegetation Clearing Procedure (Appendix A) has been prepared by CPBGG JV. The purpose of the Vegetation Clearing Procedure is to outline environmental control measures during and following vegetation clearing throughout the Construction phase of the Project. It provides a framework for the management of vegetation to be retained or removed and the minimisation of loss of habitat and harm to associated fauna.

The following sections supplement and should be read in conjunction with, the Vegetation Clearing Procedure.

2.2 Vegetation Clearing

Flora and fauna impacted by the Project includes:

Threatened Ecological Communities (TEC):

- BC Act
  - River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions (endangered)
  - Cumberland Plain Woodland in the Sydney Basin Bioregion (critically endangered)
  - Swamp oak floodplain forest of the NSW North Coast, Sydney Basin and South East Corner bioregions (endangered).
- EPBC Act
  - Cumberland Plain Shale Woodlands (critically endangered)

Plant Communities

- Broad-leaved Ironbark - Grey Box - Melaleuca decora grassy open forest on clay/gravel soils of the Cumberland Plain, Sydney Basin Bioregion
- Forest Red Gum - Grey Box shrubby woodland on shale of the southern Cumberland Plain, Sydney Basin Bioregion
- Forest Red Gum – Rough - barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion
- Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion
- Grey Box - Forest Red Gum grassy woodland on shale of the southern Cumberland Plain, Sydney Basin Bioregion
- Hard-leaved Scribbly Gum - Parramatta Red Gum heathy woodland of the Cumberland Plain, Sydney Basin Bioregion
- Swamp Oak open forest on riverflats of the Cumberland Plain and Hunter valley

Recorded threatened fauna species:

- Eastern Coastal Free-tailed bat (*Micronomus norfolkensis*)
- Large Bent-winged bat (*Miniopterus orianae oceanensis*)
- Little Bent-winged bat (*Miniopterus australis*)
- White-bellied Sea-Eagle (*Haliaeetus leucogaster*)
- Yellow-bellied Sheathtail bat (*Saccolaimus flaviventris*)
- Cumberland Plain Land Snail (*Meridolum corneovirens*)
- Eastern False Pipistrelle (*Falsistrellus tasmaniensis*)
- Southern Myotis (*Myotis Macropus*)

Further details are found in the section 4 of the CFFMP and on the Sensitive Area Plans (SAPs).

2.3 Clearing Limits

The Limits of Clearing (LoC) boundary, cadastral boundaries and construction site boundary have been mapped and included in the design documentation.

These maps will be integrated into the SAPs. SAPs provide a broad overview of sensitive environments. SAPs will be attached to the Permit to Clear Land and Vegetation (Appendix C), and copies will be held by the on-site ecologist/s and clearing supervisor. SAP's are also included in the Work Packs.

The clearing limits are based on the area that will be occupied by the completed formation plus:

- a clearance of 4 m beyond tops of cuts and toes of embankments where the natural fall of the ground is towards the roadway; and
- a clearance of 2 m beyond the tops of cuts and toes of embankments where the natural fall of the ground either slopes away from the roadway or is level.

Areas that will be occupied by ancillary earth features including sediment basins and traps, open drains and diversion banks have also been included in the clearing limits.

All stockpiles, compounds and ancillary facilities will be situated within the approved Project boundary, within cleared areas, or the road footprint. The location of stockpiles, compounds, temporary buildings, main site compound, laydown areas, hardstand car parking and access roads and other ancillary facilities will be shown on the Erosion and Sedimentation Control Plans and included in the relevant Work Packs.

A Site Establishment Management Plan (SEMP) has been prepared for all ancillary facilities on the project.

2.4 Clearing outside the clearing limit

All areas outside the clearing limits will be managed as "Environmental Protection Area" zones.

Areas outside of the clearing limits will not be cleared unless a TfNSW Representative has approved clearing for one of the following:

- a site for the Contractor's facilities, TfNSW accommodation, stockpiles, borrow pits, areas for landscaping planting where required outside the formation and up to the construction boundary, , utility adjustments, or any other purpose connected with the contract;
- removal of trees, stumps and logs of the size defined in Table 2-1 below that are outside of the clearing limits however considered by TfNSW to be a potential traffic hazard;
- trees remaining within the road reserve, but outside the limits of clearing, which TfNSW has agreed are unsound and likely to fall upon the roadway; or
- any branch, which overhangs the road formation (including those outside of the clearing limits), will be cut back flush with the tree trunk in accordance with AS 4373.

Removal of trees, stumps, logs and lopping of overhanging branches from outside of the clearing limits which are considered by TfNSW to be a potential traffic hazard will be trimmed or removed with a minimum of disturbance to adjacent trees and other vegetation. Criteria for determining removal of trees, stumps and logs are as per below Table 2-1 following inspections and advice from the Project Ecologist.

Table 2-1 Trees, Stumps and Logs to be removed

Item	Size	Action
Tree	Trunk diameter 100 mm or more at a point 1.5 m above the adjacent ground level	Remove tree and stump for disposal
Stump projecting 1.5 m or more above the adjacent ground level	Trunk diameter 100 mm or more at a point 1.5 m above the adjacent ground level	Remove stump for disposal
Stump projecting less than 1.5 m above the adjacent ground level	Trunk diameter 100 mm or more at the top of the remaining trunk	Remove stump for disposal
Log	Diameter 100 mm or more at any point	Remove entire log for disposal

2.5 Protection of Vegetation

Protective measures will be applied during the operations of clearing and road construction to avoid damaging or destroying threatened flora species and trees, and threatened fauna habitat that have been marked or otherwise identified for preservation.

Controls for protection of vegetation and fauna are outlined in Section 2.4 and 2.5 of the Vegetation Clearing Procedure (Appendix A).

2.6 Specialist roles for clearing operations

Ecologist – A suitably qualified and experienced Project Ecologist will be engaged by CPBGG JV to:

- Undertake preliminary ground-truthing survey, field marking and mapping to allow for comprehensive planning of clearing operations and assist with the development of the pre-clearing survey report. The ecologist will help determine where an arborist may be required for removal or pruning of hazardous trees;
- Develop a pre-clearing survey report which describes the survey methodology and targeted species (defined in G40 2.4.2, Table G40.2). The report with nominated action may recommend measures to be implemented to identify and protect clearing limits, habitat features and no-go areas;
- Undertake a pre-clearing survey to identify and mark any habitat trees (i.e. hollow bearing trees and other trees occupied by fauna) within the clearing footprint and advise on the presence of any fauna;
- Prior to clearing, the ecologist will prepare a report regarding weeds within the clearing limits to be cleared and grubbed and identify accepted weed control treatments;
- 24hrs prior to clearing an experienced licenced wildlife carer or ecologist will capture and/or remove fauna that have the potential to be disturbed as a result of clearing;
- During clearing an experienced licenced wildlife carer or ecologist will be present to supervise vegetation clearing and capture, then relocate, fauna in accordance with the Fauna Handling and Rescue Procedure, Appendix G of CFFMP;
- The ecologist will keep records of fauna captured and relocated and report any injury or death of threatened species to TfNSW; and
- The ecologist will provide advice on the reuse of coarse woody debris and bushrock.

2.7 Pre-clearing, clearing and post clearing process

The pre-clearing, clearing and post-clearing processes are outlined in the Vegetation Clearing Procedure (Appendix A). This includes the methods for identifying, marking and pruning or removing unsound trees.

2.8 Weed Survey and Control

2.8.1 Weed assessment

The Project Ecologist will undertake a meandering foot-based traverse of the Project corridor, boundary to boundary, searching for noxious and horticultural weeds. Any noxious weed species with potential to occur in the alignment will be targeted during the traverse. The list of high threat weeds is included in Table 2-1 of the CFFMP.

Section 3.2 of the Weed and Pathogen Plan contains the details of the site weed and pest assessment.

2.8.2 Weed control

All weed infestations will be marked in the field and their locations and extents mapped. Maps will be included in the pre-clearing assessment report. The report will include details on priority weed control areas, priority species, and control methods. This report will supplement the Weed and Pathogen Management Plan (Appendix C of the CFFMP). In addition to the control methods specified below, noxious weeds known to occur on-site and their legislative status and control requirements will be included in the Project induction.

Weeds will be controlled in accordance with accepted best practice with specific reference to Department of Primary Industries (DPI) NSW WeedWise profiles (https://weeds.dpi.nsw.gov.au/).

Further details on weed and pathogen control are included in the Weed and Pathogen Management Plan.

2.9 Pathogen Management

Section 4 of the Weed and Pathogen Management Plan (Appendix C of the CFFMP) outlines the procedures for the management of pathogens by CPBGG JV for the project.

2.10 Timber Reuse

Prior to undertaking any general clearing and grubbing activities, CPBGG JV will consult with community groups, Western Sydney Parklands, Penrith and Liverpool City Councils, Landcare groups and relevant government agencies (eg. NPWS, Greater Sydney Local Land Services and DPI Fisheries) to determine if retained timber and root balls could be used for environmental rehabilitation projects, before disposal options are pursued. Timber, coarse woody debris and root balls will be retained where practicable for reuse in habitat enhancement and rehabilitation work, or included in creek lines downstream of structures.

Where the timber is of commercial value, i.e. millable timber, mill operators or timber merchants will be consulted.

Hollow logs and some woody debris with a diameter greater than 200mm will be placed in the road corridor outside the Limit of Clearing to create fauna habitat. Placement and material selection will be determined by the ecologist and agreed with TfNSW.

Other hardwood timber will be provided to appropriate contractor/s for firewood, fence posts etc.

2.11 Mulching

All attempts will be made to ensure that only tree heads and undergrowth are mulched and that the volume of mulch generated will be used onsite for landscaping or erosion and sediment control. This requirement is subject to the following constraints:

- Prior to clearing operations commencing the ecologist shall identify areas of weed infestation and demarcate those areas. Material cleared from those areas will be mulched, stockpiled and quarantined until it has been pasteurised. Under no circumstances should this material be mixed with clean raw mulch prior to undergoing pasteurization.
- Mulch for use in vegetation must be coarse mulch with minimal fines, providing material that minimises the establishment of weed growth. Size of mulch particles produced should be 5-10mm diameter and maximum length must not exceed 50mm, achieved by adjustment of machinery screens at output. Mulch must be produced by shredding. Shredded woodchip mulch must be in accordance with TfNSW R179 clause 2.2.
- Shredded mulch must be free of soil, weeds, stones, vermin, insects or other foreign material.
- Mulch stockpiles are to be a maximum of 2m high, unless otherwise agreed with TfNSW and the ER. They are to be located away from drainage lines and watercourses, and located for ease of access and to minimize damage to natural vegetation and trees.
- Mulch stockpiles to be inspected regularly and turned over as required to avoid spontaneous combustion of the stockpile.
- Mulch stockpile sites following completion of the works must be restored in accordance with R178.
- Where the native vegetation on site is insufficient to provide the quantities of mulch needed during landscape planting, all native trees removed during clearing and grubbing must be mulched and stockpiled. Under no circumstances must the extent of clearing and grubbing be extended or weeds or exotic species used to make up any shortfall of mulch.
- Where the quantity of mulch produced would exceed the quantity required under the contract the excess mulch shall be removed from site and disposed of at a facility legally able to accept it. Mulch may also be classified under the EPA Mulch Exemption and the Mulch Order for reuse or disposal as an exempt waste.
- Where mulch is required to be stockpiled it must be in done in strict accordance with G38 and RMS Environmental Direction: management of Tannins from Vegetation Mulch (2012). This will involve:
  - establishing mulch stockpile sites with appropriate controls in place before the main site clearing activities commence, including as a minimum:

- end of shift earth bunding; and downstream sumps with impermeable bunds (min 300mm height);
- limited clearing may be required for establishment of stockpile areas, environmental controls and access;
- staging the mulching of cleared vegetation to ensure that mulch can be progressively moved to elevated, or otherwise suitable, stockpile locations.

3 Riparian corridor vegetation management

Section 6.5 of the CFFMP outlines the mitigation and management measures CPBGG JV propose to implement to manage works within the riparian corridor, aquatic and riparian habitat.

4 Reporting

Pre-clearing, clearing and post-clearing reporting requirements are detailed in section 7.5 of the CFFMP and Section 3 of the Vegetation Clearing Procedure (Appendix A).

5 Review and Improvement

This Procedure will be reviewed annually, or as required in accordance with the continuous improvement process described in Section 8 of the CFFMP.

5.1 Continuous improvement

As per section 8.1 of the CFFMP, 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 (including incidents)
- Develop and implement a plan of corrective and preventative action to address any non-conformances and deficiencies
- Verify the effectiveness of the corrective and preventative actions
- Document any changes in procedures resulting from process improvement
- Make comparisons with objectives and targets.

The CPBGG JV will be responsible for ensuring Project environmental risks are identified and included in the risk register and appropriate mitigation measures implemented throughout the construction of the Project as part of the continuous improvement process. The process for ongoing risk identification and management during construction is outlined in Section 3.2.1 of the CEMP.

5.2 VMP update and amendment

As per section 8.2 of CFFMP, the processes described in Section 3.12 of the CEMP may result in the need to update or revise this Plan. This will occur as needed.

Any revisions to the VMP will be in accordance with the process outlined in Section 3.13 of the CEMP. Any revision or amendment to the CEMP or associated sub-plans will be required to be approved by the ER.

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 3.1 of the CEMP.

Appendix A – Vegetation Clearing Procedure

Appendix B – Vegetation Clearing Maps

Appendix C – Permit to clear land or vegetation

Appendix B Construction Flora and Fauna Management Sub-plan

Unexpected Threatened Species and Threatened Ecological Communities (TECs) Finds Procedure

M12 Motorway West

Project number:	**N81150**
Document number:	M12WCO-CPBGGJV-ML1-EV-PLN-000003_AppC
Revision date:	22/10/2024
Revision:	02

Details of Revision Amendments

Document Control

The Project Director is responsible for ensuring that this plan is reviewed and approved. The Project Director is responsible for updating this plan to reflect changes to construction, legal and other requirements, as required.

Amendments

Any revisions or amendments must be approved by the Project Director and/or client before being distributed / implemented.

Revision Details

Rev	Date	Reviewed By	Details
A	18/02/2022	L. Cooper	First Draft
B	27/06/2022	A. Zvirzdinas	Second Draft – Minor updates
C	14/07/2022	A. Zvirzdinas	Third Draft – Minor updates. New document number
00	27/07/2022	A. Zvirzdinas	First Controlled Issue
D	31/01/2023	K. Purkiss	6-Monthly Review Updates
01	31/01/2023	K. Purkiss	Second Controlled Issue
02	22/10/2024	T. Chezzi	Annual Review

Document Review

Position	Name	Signature	Date
Project Director	Nick Fryday		22/10/2024

Distribution of controlled copies

Copy no.	Issued to	Version

Table of Contents

Acronyms and Abbreviations

Abbreviations	Expanded text
CFFMP	Construction Flora and Fauna Management Plan
CoA	Conditions of Approval
CPBGG JV	CPB Contractors and Georgiou Group Joint Venture
DAWE	Former Commonwealth Department of Agriculture, Water and Environment (now Commonwealth Department of Climate Change, Energy, Environment and Water)
DCCEEW	Commonwealth Department of Climate Change, Energy, Environment and Water
DPHI	NSW Department of Planning, Housing and Infrastructure (formerly NSW DPE which has now been split into NSW DCCEEW and NSW DPHI, with all planning functions falling to DPHI)
DPI Fisheries	NSW Department of Primary Industries - Fisheries
DPIE	Former NSW Department of Planning, Industry and Environment
EAD	Environmental Assessment Documentation
EEC	Endangered Ecological Community
EES	NSW Environment, Energy and Science group (a part of DPE)
EHG	Environment and Heritage Group
Environmental Assessment Documentation	The set of documents that comprise the Division 5.2 Approval: • Roads and Maritime Services (October, 2019) M12 Motorway, Environmental Impact Statement (EIS) • Transport for NSW (October, 2020) M12 Motorway, Submissions Report (the Submissions Report) • Transport for NSW (October, 2020) M12 Motorway, Amendment Report (AR) • Transport for NSW (December, 2020) M12 Motorway, Amendment Report submissions report (ARSR) • Transport for NSW (March, 2021) The M12 Motorway Amendment Report Submissions Report – Amendment (ARSR amendment) • WSP (October, 2021) M12 Motorway – West Package Detailed Design Consistency Assessment • GHD (October, 2021) M12 Motorway – Central Package Detailed Design Consistency Assessment • Arcadis (June, 2022) M12 Motorway – Sydney Water Crossings Consistency Assessment • Arcadis (July, 2022) M12 Motorway – Design Boundary Changes Consistency Assessment • Arcadis (August, 2022) M12 Motorway Minor Consistency Assessment for Proposed Change to the M12 Motorway Project (M12 Central) • Arcadis (September, 2023) M12 Motorway – Devonshire Road Temporary Roundabout Consistency Assessment

	• WSP (September, 2023) M12 Motorway – Elizabeth Drive Connections Consistency Assessment • TfNSW (September, 2023) M12 Motorway – Minor Consistency Assessment M12 West demolition of structures as 752 Luddenham Road • TfNSW (October, 2023) M12 Motorway – Minor Consistency Assessment M12 East AF9 Power Supply • TfNSW (October, 2023) M12 Motorway – Minor Consistency Assessment M12 East Cecil Road Laydown Area • TfNSW (October, 2023) M12 Motorway – Minor Consistency Assessment M12 East Temporary Construction Signage • Arcadis (December, 2023) M12 Motorway – East Site 48, 50 and 51 Boundary Changes Minor Consistency Assessment • Arcadis (January, 2024) M12 Motorway – Minor Consistency Assessment M12 Central Water Tower Access Road The documents that comprise the EPBC referral: • Submission #3486 – The M12 Motorway Project between the M7 Motorway, Cecil Hills and The Northern Road, Luddenham, NSW Notification of referral decision and designated proponent - controlled action; date of decision 19 October 2018; ID: 2018-8286.
EPBC Act	Environmental Protection and Biodiversity Conservation Act 1999
EPBC referral	A Proponent must refer a proposed action to the Australian Government Minister for the Environment (the Minister) for assessment, if it has, will have, or is likely to have a significant impact on the world heritage values of a declared World Heritage property, or is likely to have a significant impact on the National Heritage values of a National Heritage place.
Exclusion zones	Exclusion zones are areas of environmental importance (e.g. threatened vegetation or heritage items) that need to be protected. These exclusion zones are defined as no-go areas and are to be protected for the duration of construction in that particular footprint area.
ER	Environmental Representative
ESM	Environment and Sustainability Manager (TfNSW)
ESR	Environmental Site Representative (CPBGG JV)
Federal Approval	Approval (EPBC 2018/8286) for carrying out the M12 Project under Part 8 of the Environmental Protection and Biodiversity Conservation Act 1999 subject to specific CoA as detailed in Annexure A of the approval.
NSW DCCEEW	NSW Department of Climate Change, Energy, the Environment and Water (formerly NSW DPE which has now been split into NSW DCCEEW and NSW DPHI)
OCEMP	Overarching Construction Environmental Management Plan
RTA	Former Roads & Traffic Authority, now Transport for New South Wales
Project, the	M12 Motorway West Project
TEC	Threatened Ecological Community
TfNSW	Transport for New South Wales

1 Introduction

1.1 Purpose

This Unexpected Threatened Species and Threatened Ecological Community (TEC) Finds Procedure details the actions to be taken when a threatened flora or fauna species or TEC is unexpectedly encountered during construction of the M12 Motorway Project (the Project). This Procedure has been developed in accordance with *Guide 1: Pre-clearing process, Biodiversity Guidelines* (RTA, 2011).

1.2 Scope

This Procedure is applicable to all activities conducted by site personnel that have the potential to come into contact with threatened flora and fauna species and TECs during construction of the Project.

Where threatened fauna is unexpectedly encountered, the Fauna Handling and Rescue Procedure (Appendix G of the CFFMP) will be followed.

1.3 Induction / training

All site personnel (including sub-contractors) will be inducted on the potential threatened species and TEC occurring, or likely to occur, within the Project area and the requirements of this Procedure. Training will include inductions, toolbox talks, pre-starts and targeted training as required, to be approved by TfNSW Environment and Sustainability Manager (ESM) for the Project. CPBGG JV will include photos and descriptions of threatened species and TECs occurring or likely to occur within the Project area in the Procedure and communicate the information to all site personnel.

1.4 Roles and responsibilities

CPBGG JV Environmental Site Representative (ESR) will be notified in the event of an unexpected threatened species or TEC find on site during construction of the Project. CPBGG JV ESR is the key contact point for the TfNSW ESM (or delegate) in regard to this Procedure. A Project Ecologist will be engaged by the CPBGG JV if required for the implementation of this Procedure.

The TfNSW ESM (or delegate) will act as the liaison between the CPBGG JV and relevant government agencies in the event that a significant impact to a threatened species or TEC is likely to occur.

All site personnel are responsible for reporting any unexpected species or TEC finds for the duration of the Project.

1.5 Review

This Procedure will be updated by the CPBGG JV ESR in consultation with the Project Ecologist and reviewed by the TfNSW ESM (or delegate) prior to commencement of construction of the Project.

This Procedure will be reviewed annually, or as required in accordance with the continuous improvement process described in Section 8 of the Construction Flora and Fauna Management Sub-plan (CFFMP).

2 Threatened species and communities likely to occur in the Project area

The threatened flora and fauna species and TECs which may be impacted by the Project are identified in Section 4 of the overarching CFFMP and listed in Table 2-1 below. In the event that these species or TECs (or other threatened species or TECs) not considered in the Environmental Assessment Documentation or Section 4 of the CFFMP, are encountered on site, works must stop and this Procedure must be implemented.

Table 2-1 Potential threatened species

Species	Photo
Cumberland Plain Land Snail The species primarily inhabits the Critically Endangered Ecological Community (CEEC) Cumberland Plain Woodland. It is also known from Shale Gravel Transition Forests, Castlereagh Swamp Woodlands and the margins of River-flat Eucalypt Forest. The Cumberland Plain Land Snail lives under litter of bark, leaves and logs, or shelters in loose soil around grass clumps. Occasionally shelters under rubbish	
Southern Myotis The species is rarely found more than 100 km inland, except along major rivers. The species generally roosts in groups of 10 - 15 close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, under bridges and in dense foliage. It has disproportionately large feet; more than 8 mm long, with widely-spaced toes which are distinctly hairy and with long, curved claws.	
Grey-headed Flying-fox In times of natural resource shortages, the species can occur in unusual locations including urban gardens and cultivated fruit crops. Roosting camps are generally located within 20 km of regular food sources, and are commonly found in gullies, close to water, in vegetation with a dense canopy. Site fidelity to camps are high, and the species travels up to 50 km from these camps to forage, typically commuting distances up to 20 km from the camp site. This species is a nocturnal species.	

Species	Photo
Eastern Coastal Free-tailed Bat (formerly Eastern Freetail-bat) The species occurs in dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range. The Eastern Freetail-bat roosts mainly in tree hollows but has also been recorded roosting under bark or in man-made structures. This species is a nocturnal species.	
Greater Broad-nosed Bat In NSW, the Greater Broad-nosed Bat does not occur at altitudes above 500 m. The species utilises a variety of habitats from woodland through to moist and dry eucalypt forest and rainforest, though it is most commonly found in tall wet forest. Although the species predominantly roosts in tree hollows, it has also been recorded roosting in buildings. This species is a nocturnal species.	
Large Bent-winged Bat (formerly Eastern Bentwing-bat) These bats will live in tall timbered forest to open grasslands. In forested areas, they are known to forage well above the canopy but in grasslands they stay to within a few metres above the ground. Their primary roosting habitat are caves, but the species is also known to use derelict mines, stormwater tunnels, buildings and other manmade structures. This species is a nocturnal species.	
Little Bent-winged Bat (formerly Little Bentwing-bat) The Little Bent-winged Bat is generally found in well-timbered areas, and roosts in caves, tunnels, tree hollows, abandoned mines, stormwater drains, culverts, bridges and sometimes buildings. This species is a nocturnal species.	

Species	Photo
White-bellied Sea-Eagle Widespread along the east coast, and along all major inland rivers and waterways. Habitats are characterised by the presence of large areas of open water including larger rivers, swamps and lakes, as well as the ocean. The species occurs at sites near the sea or seashore, or in the vicinity of freshwater swamps, lakes, reservoirs, billabongs and saltmarshes. Terrestrial habitats include coastal dunes, tidal flats, grassland, heathland, woodland and forests (including rainforest). Nest trees are typically large emergent eucalypts and often have dead emergent branches or large dead trees nearby which are used as guard roosts.	
Yellow-bellied Sheathtail-bat The species roosts in tree hollows and buildings. In treeless areas, they are known to utilise mammal burrows. This species is a nocturnal species.	
Eastern False Pipistrelle The species prefers moist habitats, with trees over 20 m tall. The Eastern False Pipistrelle generally roosts in eucalypt hollows but has also been found under loose bark on trees, or in buildings. This species is a nocturnal species	
Dillwynia tenuifolia In western Sydney, may be locally abundant particularly within scrubby/dry heath areas within Castlereagh Ironbark Forest and Shale Gravel Transition Forest.	

Species	Photo
Grevillea juniperina subsp. Juniperina Endemic to Western Sydney, centred on an area bounded by Blacktown, Erskine Park, Londonderry and Windsor with outlier populations at Kemps Creek and Pitt Town. Recorded from Cumberland Plain Woodland, Castlereagh Ironbark Woodland, Castlereagh Scribbly Gum Woodland and Shale/Gravel Transition Forest.	
Marsdenia viridiflora subsp. Viridiflora Grows in vine thickets and open shale woodland.	
Pimelea spicata Associated with Grey Box communities (particularly Cumberland Plain Woodland variants and Moist Shale Woodland) and in areas of ironbark.	
Pultenaea parviflora May be locally abundant, particularly within scrubby/dry heath areas within Castlereagh Ironbark Forest and Shale Gravel Transition Forest	

3 Procedure

3.1 Overview

An overview of the steps to be followed in the event that a threatened flora or fauna species or TEC is unexpectedly discovered on site is outlined in Figure 3-1, with further detail provided below.

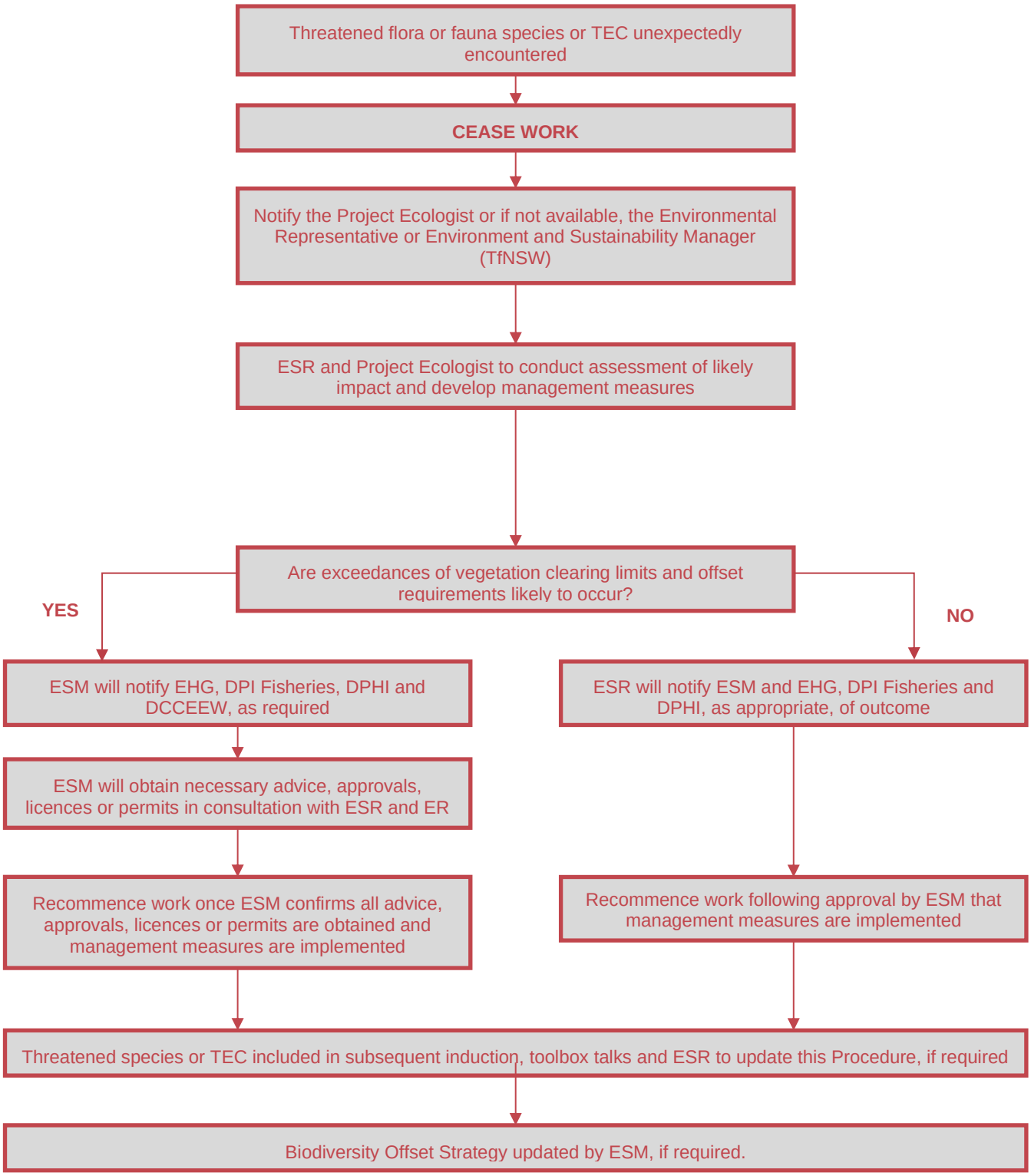

Figure 3-1 Unexpected threatened species or TECs finds procedure flow chart

3.2 Detailed procedure

- **Step 1 Threatened flora or fauna species or TEC unexpectedly encountered during construction activities**

1. If a new threatened flora or fauna species or TEC is unexpectedly encountered:
2. **Cease work in the vicinity of the unexpected find.**
3. Immediately notify the Project Ecologist who will notify CPBGG JV ESR and the TfNSW ESM (or delegate) and the ER. On instruction from the Project Ecologist, The Contractor Environmental Site Representative will notify NSW Department of Planning, Housing and Infrastructure (DPHI), Commonwealth Climate Change, Energy, Environment and Water (DCCEEW), NSW Environment and Heritage Group (EHG) and NSW Department of Primary Industries (DPI) Fisheries, if required.

- **Step 2. Assessment of impact**

4. The CPBGG JV ESR and Project Ecologist will conduct an assessment of the likely impact to the threatened species or TEC, organise calculation of additional off-sets if needed, and develop management measures, as required.
5. The CPBGG JV ESR will notify the TfNSW ESM (or delegate) and the ER, EES, DPI Fisheries and DPE, as appropriate, of the outcome of the assessment, including any management measures to be implemented.
6. If the Project Ecologist's assessment determines that exceedances of the vegetation clearing limits and offset requirements in the CoA is likely to occur, the TfNSW ESM (or delegate) will notify EHG, DPI, DPE and DCCEEW as appropriate. Management measures will be developed in consultation with the appropriate authorities who will also confirm any necessary approvals, licences or permits required. If practical, CPBGG JV may reduce vegetation clearing in another area to compensate.
7. DAWE will be notified and consulted if the threatened species or TEC encountered is listed under the *Commonwealth Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act).

- **Step 3 Approvals**

1. Any approvals, licences or permits required will be obtained by the TfNSW ESM (or delegate) in consultation with the CPBGG JV ESR and the Environment Representative (ER).

- **Step 4. Recommencement of works**

1. Where impact is likely to occur, work will not recommence prior to confirmation by the TfNSW ESM (or delegate) in consultation with the ER, that appropriate advice has been received, relevant approvals, licences and permits have been obtained, and the approved management measures have been implemented.
2. Regular inspections by the Project Ecologist will be conducted to ensure that management measures have been effectively implemented.

- **Step 5. Review and update of environmental management documentation**

1. The Project Ecologist will include the threatened species or TEC in subsequent inductions and toolbox talks and will update the listed species or TECs in this Procedure, if required.

   The TfNSW ESM (or delegate) will update the Biodiversity Offset Strategy to account for any impacts to threatened flora and/or fauna, where required.

4 Records

CPBGG JV will maintain accurate records of all unexpected threatened species or EEC finds for the duration of the Project.

Environment and Sustainability

transport.nsw.gov.au

Red Imported Fire Ants *(Solenopsis invicta)*

NSW Biosecurity (Fire Ant) Emergency Order (No 1) 2024

Alert

January 2024

Audience

All Transport for NSW (TfNSW) staff, contractors, and operators (excluding NSW Trainlink)

Background

Red imported fire ants (fire ants) are invasive introduced ants that cause serious social, economic, and environmental harm. They are aggressive and have a severe, burning sting.

NSW Department of Primary Industries (DPI) has declared the entire state of NSW an 'Emergency Zone'.

A new NSW Biosecurity (Fire Ant) Emergency Order (No 1) 2024 (the Order) and Biosecurity (Fire Ant) Emergency Amendment Order 2024 (Amendment Order)have been issued, superseding all previous Orders. The control provisions relevant to TfNSW remain the same as all previous Orders with the addition of a new Fire Ant Movement Control Area around Wardell in Ballina Shire.

This Alert supersedes the EMF-BP-AL-0197 'Red Imported Fire Ant Alert' December 2023.

This Alert:

- Expands previous advice relating to Tweed Shire to include the entire North Coast Region of NSW.
- Adds the Ballina Resource Recovery Centre as the relevant waste facility for Ballina Shire.

Restrictions apply on the movement of fire ant carriers :

- into NSW from the fire ant infested area of Queensland
- from the fire ant movement control area* in South Murwillumbah and Wardell, NSW

A fire ant carrier means any of the following potential carriers of fire ants:

- organic mulch or compost or growing media or manure
- soil and anything with soil on it
- hay, chaff, and silage
- potted plants
- agricultural equipment
- earth moving equipment
- mining and quarrying materials
- turf or grass, or vegetation and clippings.

*** No** restrictions apply to the movement of a fire ant carrier **into and within** the fire ant movement control area.

** Requirements relating to movement declarations from a fire ant movement control area only apply to certain businesses and councils (Cl 30) and these include TfNSW.

Actions required – North Coast Region NSW

- All TfNSW activities within the North Coast Region must be checked for whether these are occurring within the fire ant movement control area
- Any movement of a fire ant carrier from the fire ant movement control area to the rest of NSW must follow the treatment requirements set out in the Order.
- Specific treatment requirements include organic mulch and soil (Cl31), soil samples (Cl32), earth moving equipment (Cl40), grass, vegetation or clippings (Cl41) and mining and quarrying materials (Cl42).
- A record of movement declaration form** is required to move all 'fire ant carriers' except for:
  a) new and unused agricultural and earth moving equipment or used agricultural and earth moving equipment **provided it has been cleaned and is free from soil** and any other fire ant carrier and **checked visually** and found to be free of fire ants (Cl30,40)
  b) grass, vegetation and clippings provided it is managed in a way that would prevent fire ants crawling into or landing on it and is moved directly to the Stotts Creek Resource Recovery Centre or Ballina Resource Recovery Centre (Cl41**).

Actions required – Materials from Queensland

- A person who initiates the movement of fire ant carrier materials into the Emergency Zone **must** (Cl12):
  a) Provide details of the movement and, where required, a copy of the approved biosecurity certificate to DPI by completing and submitting the record of movement declaration form before the fire ant carrier is moved, and
  b) Retain details of the movement for 4 years.

  The Order provides for specific treatment requirements for fire ant carriers coming from Qld including organic mulch, soil, compost and manure (Cl15) and dump trucks and bins (Cl25), as well as provisions for transiting through fire ant infested areas (Cl27)

  A person who receives a fire ant carrier that was moved into the Emergency Zone **must** (Cl13):
  a) produce the approved biosecurity certificate that accompanied the fire ant carrier for inspection when requested by an authorised officer, and
  b) retain the approved biosecurity certificate for 4 years.

Penalties apply for failure to follow the Order

Ongoing management actions

The following actions support our ongoing management of the risks associated with fire ants in NSW:

- Contact NSW DPI and their local environment partner if suspected fire ant or nests are found.
- All staff to familiarise themselves with the Good Vehicle Hygiene Practices and implement them as required.
- All TfNSW fleet vehicle logbooks must have this updated Alert placed in the folder.
- Environment managers working on construction and maintenance projects include fire ant information in site inductions, toolbox talks and ensure both sides of this updated Alert are visible on safety and environment notice boards.
- First aid officers become familiar with the first aid treatment requirements for fire ant stings.
- Develop strategies for management of fire ants should they be found in your work environments.

Training

Free online fire ant awareness training for workplaces is available under the National Fire Ant Eradication program. The training is not intended to address the requirements of the Order and provides information on nest treatment which is not applicable to NSW (see section below) but nevertheless provides important information about how to identify fire ants and nests.

All environment and sustainability officers and TfNSW field-based staff **must** undertake this free fire ant awareness training by 28 February 2024 or within 1 month of commencing.

It is recommended that all other staff, contractors, and operators working in Northern NSW also undertake this training.

Fire ant nests

Fire ant nests can appear as dome-shaped mounds or be flat and look like a small patch of disturbed soil. All nests have no obvious entry or exit holes. The shape and size of the nest depends on soil type and ant colony size.

Figure 1: Examples of fire ant nest. Photo NSW DPI

Do not attempt to treat fire ant nests yourself. Nests must be treated under the **direct supervision of NSW Department of Primary Industries** by professionals with the correct baiting and treatment systems.

Fire ant identification

- 2 to 6 mm long, found in a variety of sizes within one nest
- dark reddish-brown in colour
- darker brown-black abdomen
- aggressive behaviour - hundreds of ants will come out of the nest if disturbed, trying to sting repeatedly
- new queens can fly up to 5km from a nest.

Figure 2: Image showing colour and size of fire ant. Image courtesy of Peter Green

First aid

If stung, most people do not need medical treatment. Wash with soap and then apply a cold compress to relieve swellingand pain. Take an antihistamine to manage minor, localised reactions and itching. Complete report in your work health andsafety system. Monitor for allergic reaction. Contact 000 for severe reaction. Report a suspected nest as below.

When to report fire ant sightings

If you suspect a nest of fire ants, take photos if safe and immediately:

- contact NSW DPI 1800 680 244
  or Report a Biosecurity Concern (nsw.gov.au)
- contact your local environment and sustainability partner if you identify fire ants whilst at work.

Contact and information

For more information visit Red imported fire ants (nsw.gov.au). The Order and a plain English guide to the Order can be found on this page.

Additional resources to help the construction industry understand fire ant requirements can be found at the National Fire Ant Eradication Program website.

For more information contact your local TfNSW Environmentand Sustainability partner or email:

E: environmentandsustainability@transport.nsw.gov.au
Environment & Sustainability Management Framework

Appendix C Construction Flora and Fauna Management Sub-plan

Weed and Pathogen Plan

M12 Motorway West

Project number:	N81150
Document number:	M12WCO-CPBGGJV-ML1-EV-PLN-000003_AppC
Revision date:	22/10/2024
Revision:	02

Details of Revision Amendments

Document Control

The Project Director is responsible for ensuring that this plan is reviewed and approved. The Project Director is responsible for updating this plan to reflect changes to construction, legal and other requirements, as required.

Amendments

Any revisions or amendments must be approved by the Project Director and/or client before being distributed / implemented.

Revision Details

Rev	Date	Reviewed By	Details
A	18/02/2022	L. Cooper	First Draft
B	13/05/2022	C. Douchkov	Second draft following TfNSW/Arcadis review and comment
C	27/06/2022	A. Zvirzdinas	Third draft. Minor update
D	14/07/2022	A. Zvirzdinas	Fourth draft. New Document Number
00	27/07/2022	A. Zvirzdinas	First Controlled Issue
F	31/01/2023	J. Ibrahim	Additional design change updates
01	31/01/2023	J. Ibrahim	Second Controlled Issue
02	22/10/2024	A. Brajlih	Annual Review

Document Review

Position	Name	Signature	Date
Project Director	Nick Fryday		22/10/2024

Distribution of controlled copies

Copy no.	Issued to	Version

Table of Contents

Acronyms and Abbreviations

Abbreviations	Expanded text
BC Act	*Biosecurity Act 2015*
CPBGG JV	CPB Contractors and Georgiou Group Joint Venture
CFFMP	Construction Flora and Fauna Management Plan
DAWE	Former Commonwealth Department of Agriculture, Water and the Environment
DCCEEW	Commonwealth Department of Climate Change, Energy, Environment and Water
DPHI	NSW Department of Planning, Housing and Infrastructure (formerly NSW DPE which has now been split into NSW DCCEEW and NSW DPHI, with all planning functions falling to DPHI)
DPI Fisheries	NSW Department of Primary Industries - Fisheries
DPIE	Former NSW Department of Planning, Industry and Environment
EAD	Environmental Assessment Documentation
EEC	Endangered Ecological Community
EES	NSW Environment, Energy and Science Group (a part of DPE)
Environmental Assessment Documentation	The set of documents that comprise the Division 5.2 Approval: • Roads and Maritime Services (October, 2019) M12 Motorway, Environmental Impact Statement (EIS) • Transport for NSW (October, 2020) M12 Motorway, Submissions Report (the Submissions Report) • Transport for NSW (October, 2020) M12 Motorway, Amendment Report (AR) • Transport for NSW (December, 2020) M12 Motorway, Amendment Report submissions report (ARSR) • Transport for NSW (March, 2021) The M12 Motorway Amendment Report Submissions Report – Amendment (ARSR amendment) • WSP (October, 2021) M12 Motorway – West Package Detailed Design Consistency Assessment • GHD (October, 2021) M12 Motorway – Central Package Detailed Design Consistency Assessment • Arcadis (June, 2022) M12 Motorway – Sydney Water Crossings Consistency Assessment • Arcadis (July, 2022) M12 Motorway – Design Boundary Changes Consistency Assessment • Arcadis (August, 2022) M12 Motorway Minor Consistency Assessment for Proposed Change to the M12 Motorway Project (M12 Central)) • Arcadis (September, 2023) M12 Motorway – Devonshire Road Temporary Roundabout Consistency Assessment • WSP (September, 2023) M12 Motorway – Elizabeth Drive Connections Consistency Assessment • TfNSW (September, 2023) M12 Motorway – Minor Consistency Assessment M12 West demolition of structures as 752 Luddenham Road

	• TfNSW (October, 2023) M12 Motorway – Minor Consistency Assessment M12 East AF9 Power Supply • TfNSW (October, 2023) M12 Motorway – Minor Consistency Assessment M12 East Cecil Road Laydown Area • TfNSW (October, 2023) M12 Motorway – Minor Consistency Assessment M12 East Temporary Construction Signage • Arcadis (December, 2023) M12 Motorway Project (M12 East) Sites 48, 50 and 51 • Arcadis (January, 2024) M12 Motorway – Minor Consistency Assessment M12 Central Water Tower Access Road The documents that comprise the EPBC referral: • Submission #3486 – The M12 Motorway Project between the M7 Motorway, Cecil Hills and The Northern Road, Luddenham, NSW Notification of referral decision and designated proponent - controlled action; date of decision 19 October 2018; ID: 2018-8286.
EPBC Referral	A Proponent must refer a proposed action to the Australian Government Minister for the Environment (the Minister) for assessment, if it has, will have, or is likely to have a significant impact on the world heritage values of a declared World Heritage property, or is likely to have a significant impact on the National Heritage values of a National Heritage place
ER	Environmental Representative
Exclusion Zones	Exclusion zones are areas of environmental importance (e.g. threatened vegetation or heritage items) that need to be protected. These exclusion zones are defined as no-go areas and are to be protected for the duration of construction in that particular footprint area
Federal Approval	Approval (EPBC 2018/8286) for carrying out the M12 Project under Part 8 of the Environmental Protection and Biodiversity Conservation Act 1999 subject to specific CoA as detailed in Annexure A of the approval
LGA	Local Government Area
NATA	National Association of Testing Authorities
NSW DCCEEW	NSW Department of Climate Change, Energy, the Environment and Water (formerly NSW DPE which has now been split into NSW DCCEEW and NSW DPHI)
PBFD	Psittacine beak and feather disease
Pesticide Act	*Pesticides Act 1999*
Project, the	M12 Motorway West Project
RTA	Former Roads & Traffic Authority, now Transport for New South Wales
TfNSW	Transport for New South Wales

1 Introduction

1.1 Purpose

Construction of the M12 Motorway Project (the Project) has the potential to cause the spread or importation of weeds and pathogens. Activities including vegetation clearing, soil disturbance, erosion and sediment control, vehicle movements, inadequate rehabilitation/ revegetation of disturbed areas and inappropriate topsoil management have been identified as potential risks in weed and pathogen management.

This Weed and Pathogen Management Plan has been prepared to identify the presence and management of pathogens and key weed species and their distribution across the Project area, and to outline the processes required to control and prevent the spread of weeds and pathogens. It has been prepared in consultation with a qualified Ecologist and in accordance with *the Biosecurity Act 2015, Guide 6: Weed management and Guide 7: Pathogen management, Biodiversity Guidelines (RTA, 2011) and the Greater Sydney Regional Strategic Weed Management Plan 2017 - 2022.* The overviews from Guide 6 and Guide 7 of the Biodiversity Guidelines are attached to this Weed and Pathogen Management Plan (Attachment 1 and Attachment 2). Priority weeds and other weeds of regional concern are also attached to this Plan.

The purpose of this Plan is to:

- Identify the pathogens and key weed species and their distribution across the Project sites
- Prevent the introduction and spread of weeds and pathogens throughout the construction of the Project
- Establish an inspection and reporting framework for weeds and pathogens
- Set out performance criteria for the management of weeds and pathogens for the Project.

1.2 Scope

This Plan details control measures to be implemented throughout the construction of the Project. This Plan focuses on weed control prior to vegetation clearance, weed management during clearing, and progressive weed control throughout the construction of the Project.

1.3 Induction / training

All site personnel (including sub-contractors) will be inducted in this Plan and the existence of priority and other weeds in the Project area. Training will also include requirements to inspect machinery and clean construction footwear to prevent the spread of weeds, and measures to identify and prevent the introduction or spread of *Phytophthora cinnamomi* (Root Rot).

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

1.4 Roles and responsibilities

The CPBGG JV Environmental Site Representative (ESR) is responsible for ensuring the effective implementation of this Plan and training of site personnel in the requirements of this Plan.

The Project Ecologist will advise on appropriate weed removal and control techniques for each weed species and for pathogens.

All persons entering the Project construction sites are responsible for preventing the spread of weeds and pathogens within the Project area and offsite.

1.5 Review

Environment and Sustainability Manager (ESM) (or delegate) prior to commencement of construction of the Project.

This Plan will be updated throughout construction of the Project to include any new weed or pathogen findings and subsequent management measures required. This Plan will be reviewed annually, or as required in accordance with the continuous improvement process described in Section 8 of the Construction Flora and Fauna Management Sub-plan (CFFMP) and Section 3.12 and 3.13 of the CEMP.

2 Weeds and pathogens in the Project area

2.1 Weeds

2.1.1 Weeds within the project area

The Environmental Assessment Documentation identified large areas of the Project study area as having a high abundance of exotic species. Seventy-three exotic species were identified in the Project study area. Eleven of these are declared as Priority Weeds for the Greater Sydney region under the *Biosecurity Act 2015*. Of these species, nine are also included on the Commonwealth list of 32 Weeds of National Significance (WoNS). High threat weed species identified in the Environmental Assessment Documentation are provided in Table 2 1.

Table 2-1 High threat weeds identified in the Environmental Assessment Documentation

Species	Common name	WoNS?	Biosecurity Act 2015	Legal Requirement
Alternanthera philoxeroides	Alligator weed	Yes	Prohibition on dealings	Must not be imported into the State or sold
			Biosecurity Zone	Within the Biosecurity Zone this weed must be eradicated where practicable, or as much of the weed destroyed as practicable, and any remaining weed suppressed. The local control authority must be notified of any new infestations of this weed within the Biosecurity Zone
			Regional Recommended Measure	Whole region: Land managers prevent spread from their land where feasible. Core infestation area: Land managers mitigate the risk of new weeds being introduced to their land. Land managers reduce the impact on priority assets
Anredera cordifolia	Madeira vine	Yes	Prohibition on dealings	Must not be imported into the State or sold
Acetosa sagittata	Turkey rhubarb	No	N/A	N/A
Acetosella vulgaris	Sheep sorrel	No	N/A	N/A
Ageratina adenophora	Crofton weed	No	N/A	N/A
Araujia sericifera	Moth vine, Moth plant	No	N/A	N/A
Asparagus asparagoides	Bridal keeper	Yes	Prohibition on dealings	Must not be imported into the State or sold
Axonopus fissifolius	Common carpetgrass	No	N/A	N/A
Bidens Pilosa	Black-jack	No	N/A	N/A
Briza subaristata	Fairy bells	No	N/A	N/A
Cardiospermum grandiflorum	Balloon vine	No	N/A	N/A
Cestrum parqui	Green cestrum	No	Regional Recommended 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

Species	Common name	WoNS?	Biosecurity Act 2015	Legal Requirement
Chloris gayana	Rhodes grass	No	N/A	N/A
Cyperus eragrostis	Tall flatsedge	No	N/A	N/A
Ehrharta erecta	Panic veldtgrass	No	N/A	N/A
Eragrostis curvula	African lovegrass	No	N/A	N/A
Hypericum perforatum	St John's wort	No	N/A	N/A
Juncus acutus	Spiny rush, Spike rush, Sharp rush	No	N/A	N/A
Lantana camara	Lantana	Yes	Prohibition on dealings	Must not be imported into the State or sold
Ligustrum lucidum	Privet spp.	No	N/A	N/A
Ligustrum sinense	Privet spp.	No	N/A	N/A
Lycium ferocissimum	African boxthorn	Yes	Prohibition on dealings	Must not be imported into the State or sold
Nassella neesiana	Chilean needle grass	Yes	Prohibition on dealings	Must not be imported into the State or sold
Olea europaea subsp. cuspidata	African olive	No	Regional Recommended Measure	Whole region: The plant or parts of the plant are not traded, carried, grown or released into the environment. Core infestation area: Land managers prevent spread from their land where feasible. Land managers reduce impacts from the plant on priority assets
Opuntia stricta	Common prickly pear	Yes	Prohibition on dealings	Must not be imported into the State or sold
Paspalum dilatatum	Dallas grass	No	N/A	N/A
Romulea rosea	Onion grass	No	N/A	N/A
Rubus fruticosus (sp. agg)	Blackberry	Yes	Prohibition on dealings	Must not be imported into the State or sold
Senecio madagascariensis	Fireweed	Yes	Prohibition on dealings	Must not be imported into the State or sold
Tradescantia fluminensis	Trad	No	N/A	N/A

2.1.2 Priority weeds in the Greater Sydney Region

The *Greater Sydney Regional Strategic Weed Management Plan 2017 – 2022* identifies priority weeds and other regional weeds of concern for the Greater Sydney Region, including the Liverpool, Fairfield and Penrith Local Government Areas (LGAs) within which the Project is located. The WeedWise website and associated app (https://weeds.dpi.nsw.gov.au//) also provides details on weed identification, control options and biosecurity duty. This website and app will be utilised during Early Works to inform identification and management options.

State level determined priority weeds, as identified in the *Greater Sydney Regional Strategic Weed Management Plan 2017 – 2022*, are provided in Attachment 3 of this Plan. Management requirements for weeds, whether that be specific regulatory measures (state level priorities) or outcomes to demonstrate compliance with the General Biosecurity Duty (regional priority weeds), are also detailed in Attachment 1 of the *Greater Sydney Regional Strategic Weed Management Plan 2017 – 2022*.

The outcomes applied to a particular weed depend on factors such as the biology and ecology of the weed, the land use(s) in which it occurs, the distribution in the region and size of the infestation, potential pathways for infestation and others. These factors were considered in determining the suite of outcomes to demonstrate compliance with the General Biosecurity Duty and strategic responses. These obligations apply to all private and public landholders in the region.

2.1.3 Other regional weeds of concern list

Attachment 2 of the *Greater Sydney Regional Strategic Weed Management Plan 2017 – 2022* outlines other priority weeds identified by the Greater Sydney Regional Weed Committee in consultation with the community. These are species for which a consistent and/or collaborative approach to management will provide the best outcome across the region. Weeds identified within Attachment 2 of the *Greater Sydney Regional Strategic Weed Management Plan 2017 – 2022* are also subject to the General Biosecurity Duty and may be a focus for local management plans and coordinated campaigns by the community and other stakeholder groups in the region. Regionally determined priority weeds are provided in Attachment 4 of this Plan.

2.1.4 Pest Species

The Environmental Assessment Documentation noted that a total of 14 introduced vertebrae fauna species were recorded within the study area during surveys. These are:

- Cat (Felis catus)
- Common Myna (Acridotheres tristis)
- Common Starling (Sturnus vulgaris)
- Dog Canis (lupus familiaris)
- European Hare (Lepus europaeus)
- European Rabbit (Oryctolagus cuniculus)
- European Red Fox (Vulpes)
- Goat (Capra hircus)
- Horse (Equus caballus)
- House Sparrow (Passer domesticus)
- Red-whiskered Bulbul (Pycnonotus jocosus)
- Rock Dove (Columba livia domestica)
- Rooster (Gallus)
- Sheep (Ovis aries)

2.1.5 Priority pests in the Greater Sydney Region

The *Greater Sydney Regional Strategic Pest Animal Plan 2018-2023* identifies priority pests within the region selected based on their level of risk and feasibility of control and their required management. Priority pests identified in the *Greater Sydney Regional Strategic Pest Animal Plan 2018-2023* and their management categories (Table 3 1) are outlined in Table 2-2).

Table 2-2 Priority Pests

Pest Animal	Management Category	Objective
Wild Dog	Asset protection	Reduce impacts on agricultural production, domestic pets, public safety and biodiversity
Feral Pig	Eradicate/Contain/Asset based protection	Reduce impacts on agricultural production. Eradicate/contain new or localised populations. Maintain absence in pig free areas.
Red Fox	Asset Protection	Reduce negative impacts on agricultural production, domestic pets and poultry and conserve biodiversity including threatened species
Wild Rabbit	Asset Protection	Reduce negative impacts on grazing land, public amenity and environmental assets
Wild Deer (all species)	Asset Protection/ Eradicate/Contain	Reduce negative impacts on agriculture production, public safety and high priority environmental assets including threatened species. Contain/eradicate in areas where deer are absent or populations are small and isolated
Cats	Asset protection	Reduce the impacts to threatened species in urban/peri urban communities and sites of importance ecological value

Pest Animal	Management Category	Objective
Feral goats	Asset protection/Eradicate	Reduce the impacts on agricultural production and the environment and cultural heritage sites. Contain or eradicate localise populations
Indian myna (common myna)	Limited Action	Support coordinated control and development of new control techniques (where needed)
Common Carp	Limited Action	Support coordinated biological control programs
Non-Indigenous animal	Surveillance as requested by NSW DPI, contain and eradicate where feasible	Environmental and economic values

2.1.6 Weed and pest species identification and mapping

Detailed weed identification and mapping of construction sites and adjacent areas will be undertaken by the Project Ecologist during pre-clearing surveys, and/or personnel trained in weed management prior to the commencement of construction. Specific control measures will be based on level of infestation and required level of control and this plan will be updated with that information.

The CPBGG JV will update this Weed and Pathogen Management Plan with a detailed list of all weed species identified during the pre-clearing surveys as part of the CFFMP. The CPBGG JV will include details of the weed species including photographs, detailed descriptions and known locations. The detail to be provided will also include the weed status in accordance with Attachments 1 and 2 of the *Greater Sydney Regional Strategic Weed Management Plan 2017 – 2022* and Table 2-2.

This information will be disseminated to site personnel during training and induction.

2.1.7 Red imported fire ants

Red imported fire ants (*Solenopsis invicta*) are regulated as prohibited matter under the *Biosecurity Act 2015.* The potential spread of fire ants in fire ant carrier material is regulated under the *Biosecurity (Fire Ant) Emergency Order 2023.* Carrier material includes soil, sand, quarry material, organic waste, potted plants, mulch, manure, earth moving equipment, hay, turf. The movement of carrier materials from Queensland and Fire Ant Movement Control Areas is subject to requirements as per the Order.

Fire Ants have not been identified within the study areas during surveys. However, management measures do apply for the movement of fire ant carrier materials from Queensland and Fire Movement Control Areas that may enter construction sites and adjacent areas. Further information can be found here on DPI's website (https://www.dpi.nsw.gov.au/biosecurity/insect-pests/fire-ants).

2.2 Pathogens

As part of ecological surveys for the approval of the project, the following four pathogens have the potential to occur within the Project area:

- Soil-borne pathogen *Phytophthora cinnamomi* (Phytophthora)
- *Austropuccinia psidii* which causes the disease Myrtle rust
- *Batrochytridium dendrobatidis* (Chytrid (Frog) fungus)
- Psittacine beak and feather disease (PBFD).

The CPBGG JV's ESR with input from Project Ecologist will prepare identification and/or fact sheets on each pathogen identified as having the potential to occur within the Project area or with the potential to be introduced to the area.

3 Weed management procedure

3.1 Approach to weed management

In NSW, all plants are regulated with a general biosecurity duty under the *Biosecurity Act 2015* 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.

Figure 3-1, from the *Greater Sydney Regional Strategic Weed Management Plan 2017 – 2022*, illustrates the invasion process for weeds from arrival to widespread establishment and shows that the effort and resources required to control a weed rise with time and area occupied. Managing weeds earlier rather than later is more effective. The asset protection phase shown in Figure 3-1 illustrates the shift in the focus from controlling a weed species to limiting the impact it may have on important assets.

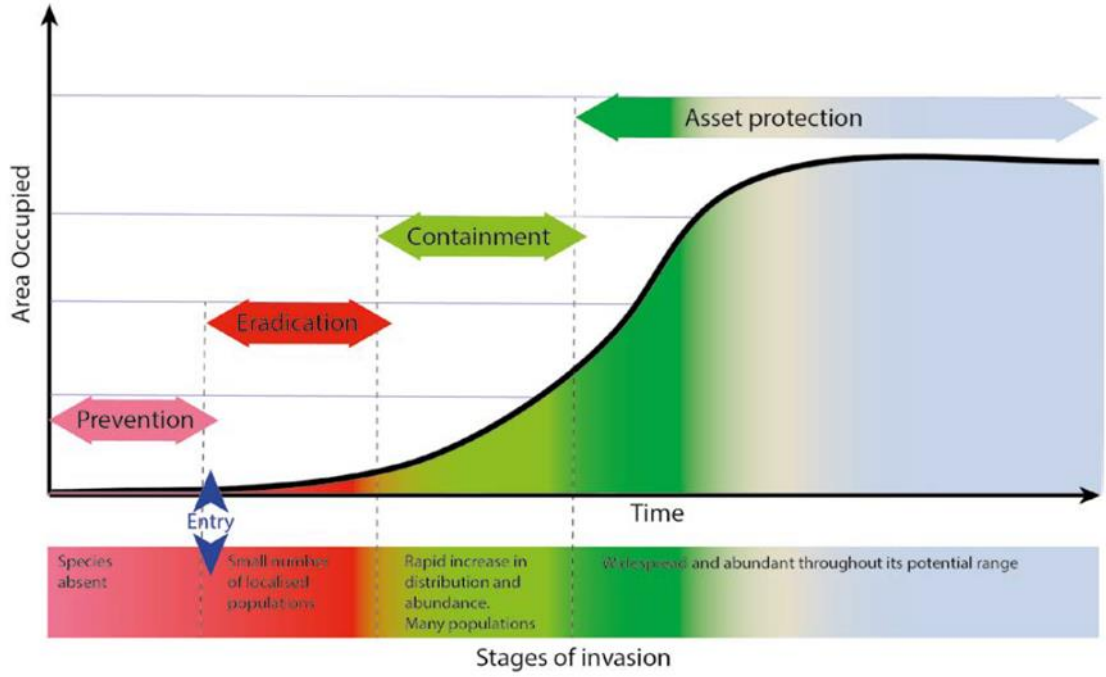

Figure 3-1 Weed invasion curve

Source: Greater Sydney Regional Strategic Weed Management Plan 2017 – 2022[1]

Further detail of the management categories identified in Figure 3-1 is provided in Table 3-1.

Table 3-1 Regional weed and pest management categories

Category	Objective
Prevention	To prevent the species arriving and establishing in the region.
Eradication	To permanently remove the species and its propagules from the region OR to destroy infestations to reduce the extent of the weed in the region with the aim of local eradication.

[1] State of New South Wales through Local Land Services (2019), *Greater Sydney Regional Strategic Weed Management Plan 2017 – 2022*, Greater Sydney Local Land Services

Category	Objective
Containment	To prevent the ongoing spread of the species in all or part of the region.
Asset Protection	To prevent the spread of weeds to key sites/ assets of high economic, environmental and social value, or to reduce their impact on these sites if spread has already occurred.
Limited Action	Applies only to species that have a low to negligible risk in the region or for which further investigation is required on effective control techniques and strategies for management.

3.2 Site weed and pest assessment

The Project Ecologist will be responsible for organising a weed and pest assessment and detailed weed and pest mapping, prior to construction, and to update these documents during the course of the project Weed and pest assessments will occur:

- As part of the pre-clearing survey, to inform weed mapping
- Prior to drainage works
- During regular site inspections during construction
- When a potential weed infestation has been identified
- Before spring to identify weeds before they go to flower and seed.

The weed assessment will involve the following activities:

- Identify and describe or map weed and/or pest infested areas
- Include photographic guide to identifying common weed and pest species within the Project area, add this to induction and toolbox education materials for all site personnel
- Identify surrounding land uses and sensitive environmental areas
- Determine weed and pest management priorities and objectives in accordance with Attachments 1 and 2 of the *Greater Sydney Regional Strategic Weed Management Plan 2017 – 2022*.
- Describe the weed disposal procedure.

3.3 Establish weed control measures

3.3.1 Prevention of weed and pest spread / importation

Environmental controls will be implemented by the CPBGG JV in consultation with the Project Ecologist to prevent the spread or introduction of weeds and pests to the Project area. Controls will include:

- Map and mark areas that are infested with weeds and pests as an exclusion zone with fencing and signage to limit access by personnel and vehicles
- Install wheel wash and rumble grids at construction sites
- Provide boot wash down facilities at construction sites and educate personnel on when and how to use both vehicle and boot wash down facilities
- Program works from least to most weed infested areas, where possible.

3.3.2 Determine weed and pest control / removal methods

Weed control methods include mechanical, physical and chemical techniques. The suitability of control techniques will vary depending on the target weed species and the desired outcomes. The Project Ecologist will advise on the most appropriate weed treatment methodology and timing.

3.3.3 Implement weed control / removal methods

Weed control methods will be implemented under guidance from the Project Ecologist. Methods will include:

- Use of mechanical weed control methods such as slashing or mowing
- Controlled use of herbicides to avoid the development of herbicide resistance
- Mowing/slashing of areas infested with weeds before they seed to reduce the propagation of new plants
- Separate weeds from native vegetation where native vegetation is to be used for mulch
- Topsoil recovered from areas of low weed infestation will be stockpiled separately
- Remove weeds immediately onto suitable trucks and dispose of without stockpiling
- Following weed removal, any exposed areas will be stabilised and/or rehabilitated to reduce erosion and minimise the potential for further weed invasion.

3.3.4 Pesticide use

The use of pesticides must be in accordance with the NSW Pesticides Act 1999, other relevant legislation, label directions, any relevant industry codes of practice and the requirements of TfNSW Specification G36.

The CPBGG JV Environmental Site Representatives will ensure that a Pesticide Application Record is completed and public notifications made in accordance with relevant legislation and TfNSW specifications, where pesticides are to be used in areas that could be accessed by members of the public. The CPBGG JV Environmental Site Representatives will complete a Pesticides Application Record Sheet (provided in TfNSW Specification G36/G) within 24 hours of applying the pesticide and submit a copy to the TfNSW Environment and Sustainability Manager (or delegate).

The Records Sheet does not need to be completed if all of the following are satisfied:

- The pesticide is, or is part of a product that is widely available to the general public at retail outlets
- The pesticide is only applied by hand or by using hand-held equipment
- If applied outdoors on any single occasion, in quantities of no more than 5 L/5 kg of concentrated product or 20 L/20 kg of the ready-to-use product or, if applied indoors, in quantities of no more than 1 L/1 kg of concentrated product or 5 L/5 kg of the ready-to-use product.

Public notification of pesticide use will be in accordance with TfNSW specification G36/H whenever pesticides are used adjacent to, or across the road from a public place or private property. Appropriate environmental management measures will be implemented where pesticides are proposed during construction to avoid or minimise impacts on adjoining properties.

Any spraying of priority weeds must avoid damage to adjacent native vegetation and to prevent overspray entering waterways or adjoining properties. Only pesticides registered for use near water may be used near any waterways.

The following measures will be implemented whenever pesticides are to be used adjacent to, or across the road from, a “sensitive place”:

- Use of mechanical means of pest control (such as mowing or slashing) where feasible or
- Use of hand-held application of pesticides where mechanical means of pest control are not feasible.

Pesticide application will be appropriately scheduled. Pesticides will not be applied:

- On hot days when plants are stressed
- After seed has set
- Within 24 hours of rain or when rain is imminent
- When winds will cause drift of pesticides into non-target areas.

All personnel managing and using pesticides must receive appropriate training and hold an appropriate licence prior to commencing work. Appropriate PPE must be worn.

3.3.5 Implement pest animal control/removal methods

Pest animal control methods will be implemented under guidance of the Project Ecologist. Methods may include:

- Chemical control including baiting, fumigation or spraying
- Physical control including trapping, hunting/shooting and fencing/netting.

All pest control practices will comply with the Model Codes of Practice (COPs) and Standard Operating procedures (SOPs) for the humane control of key pest animal species: https://www.pestsmart.org.au/animalwelfare/humane-codes/.

3.3.6 Ongoing management of weeds and pests

Measures for the ongoing management of weeds will be implemented, including the following:

- Minimise soil disturbance within weed infested areas
- Topsoil imported onto site is certified as weed free
- Regularly inspect and clean machinery, vehicles and footwear using installed facilities
- Wash down the wheels of all construction plant before transportation to the site
- Keep records of all screening checks and subsequent actions taken
- Securely cover loads of weed-contaminated material during transportation
- Avoid use of weeds as mulch
- Avoid re-use vegetation or topsoil containing weed material on site unless appropriately treated
- Ensure all Project related food and putrescible waste that can supplement the diet and/or support populations of pest animals is disposed of appropriately
- Monitor disturbed and rehabilitated sites for presence of weeds.

3.4 Weed disposal

Weeds and topsoil potentially containing weed propagules disturbed by construction activities will be removed and disposed of at a suitable landfill location in accordance with the requirements of the relevant local Council and *Biosecurity Act 2015*. Exotic plant species will be removed, bagged and disposed offsite to a licensed landfill facility.

4 Pathogen management procedure

4.1 Site pathogen assessment

A detailed site assessment for potential risk of pathogens in the Project area will be undertaken by the Project Ecologist during pre-clearing surveys. The site assessment will identify and describe or map potential pathogen-containing vegetation areas. The CPBGG JV will refer to the Department of Primary Industries (DPI) guidelines for the most up-to-date hygiene protocols for each pathogen and for the most recent locations of contamination.

Testing from a National Association of Testing Authorities (NATA) approved laboratory may be required to confirm the presence of pathogens in the soil and/or water as determined by the Project.

Ecologist during Pre-clearing surveys. In the areas where such testing is required, clearing activities will not proceed until the results of any such tests are confirmed and suitable prevention and control measures have been implemented if necessary.

4.2 Establish pathogen control measures

4.2.1 Prevention of introduction or spread of pathogens

Pathogens can be spread during construction on footwear, vehicles and machinery, particularly during wet weather or in wet conditions. Controlling the introduction and spread of pathogens that have the potential to harm the environment in the Project area is a high priority. Environmental controls will be implemented by CPBGG JV in consultation with the Project Ecologist to prevent the spread or introduction of pathogens to the Project area. Controls will include:

- Map and mark areas that are infested with pathogens as an exclusion zone with fencing and signage to limit access by personnel and vehicles
- Install wheel wash and rumble grids at construction sites
- Provide boot wash down facilities at construction sites
- Program works from uninfected areas to infected areas, where possible.

4.2.2 Determine pathogen prevention / control methods

Management measures for pathogens can include planning or awareness measures, exclusion measures and containment measures. The suitability of control techniques will vary depending on the pathogen and will be determined on advice from the Project Ecologist and best practice guidelines. Best practice protocols include:

- Minimise work during excessively wet or muddy conditions
- Provide parking and turn-around points on hard, well-drained surfaces
- Restrict vehicles to designated tracks, trails and parking areas
- Restrict personnel to designated tracks and trails
- Personnel working in an infected site should shower and launder clothes before moving to another vegetated site
- Use disinfectant or gloves when handling frogs and only handle frogs when necessary
- Ensure vehicles and footwear are free of soil before entering or exiting the site (i.e. directed to wash down area before entering or exiting the site)
- Use a certified supply of plants and soil that is disease-free
- Hygiene protocols, such as use of disposable suits, will be used where site personnel are required to work in areas identified as containing pathogens that are located in the vicinity of threatened flora or fauna or Endangered Ecological Communities (EECs)
- Removed infected vegetation will be securely wrapped in bags prior to disposal.

4.3 Material disposal

Disposal of infected material will vary depending on the pathogen in the affected material.

Where materials are known or suspected to be affected by *Phytophthora*, the material will be retained within the contaminated area. Stockpiles of mulch, topsoil and fill material will be separated to avoid potential contamination and spread.

Plant material infected with Myrtle Rust will be buried on site if possible and will not be disposed of at another vegetated site. Buried material sites will be recorded on maps to prevent re-exposure. Where material is unable to be buried, advice will be sought by the CPBGG JV from NSW Environment, Energy and Science (EES).

To avoid cross contamination of frogs with *Chytrid*, the CPBGG JV will avoid, where possible, transferring water between two or more separate waterbodies.

5 Inspection, monitoring, and reporting

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

CPBGG JV will also prepare a weed and pathogen monitoring program that includes:

- Inspection of the general condition of the Project area including identification of additional weeds and pathogens or reduction in the occurrence of weeds and pathogens
- Measures to assess the effectiveness of weed and pathogen treatments
- Modifications to weed and pathogen treatments
- Schedule to re-apply treatments if previous treatments are not fully effective
- Measures to improve the quality of habitat in retained vegetation
- Site visits, mapping and fixed-point photographs of the construction corridor and adjoining impacted areas.

Dedicated inspections will be carried out on a monthly basis for a period of six months (or as necessary responding to seasonal and climatic conditions), then at least every three months for the remainder of construction of the Project. The Project Ecologist will undertake all monitoring and inspections. The CPBGG JV ESR will report the results of each monitoring inspection against the weed and pathogen management objectives to the TfNSW Project Manager and the TfNSW ESM (or delegate).

The CPBGG JV will prepare and implement an action plan to manage any ongoing weed and pathogen problems.

Attachment 1 Biodiversity Guide 6 Overview

Attachment 2 Biodiversity Guide 7 Overview

Attachment 3 Priority Weeds

Attachment 4 Other Weeds of Regional Concern

Appendix D Construction Flora and Fauna Management Sub-plan

Habitat Compensation Plan

M12 Motorway West

Project number:	N81150
Document number:	M12WCO-CPBGGJV-ML1-EV-PLN-000003_App D
Revision date:	22/10/2024
Revision:	02

Details of Revision Amendments

Document Control

The Project Director is responsible for ensuring that this plan is reviewed and approved. The Project Director is responsible for updating this plan to reflect changes to construction, legal and other requirements, as required.

Amendments

Any revisions or amendments must be approved by the Project Director and/or client before being distributed / implemented.

Revision Details

Rev	Date	Reviewed By	Details
A	18/02/2022	L. Cooper	First Draft
B	13/05/2022	C. Douchkov	Second Draft following TfNSW/Arcadis review and comment
C	28/06/2022	A. Zvirzdinas	Third Draft. Minor edits.
D	14/07/2022	A. Zvirzdinas	Fourth Draft following TfNSW/Arcadis/ER Review of Rev C. New document number.
E	25/07/2022	A. Zvirzdinas	Fifth Draft following ER Review of Rev D.
00	27/07/2022	A. Zvirzdinas	First Controlled Issue
F	31/01/2023	K. Purkiss	6-Monthly Review Updates
01	31/01/2023	K. Purkiss	Second Controlled Issue
02	22/10/2024	A. Brajlih	Annual Review

Document Review

Position	Name	Signature	Date
Project Director	Nick Fryday		22/10/2024

Distribution of controlled copies

Copy no.	Issued to	Version

Table of Contents

Acronyms and Abbreviations

Abbreviations	Expanded text
BC Act	*Biodiversity Conservation Act 2016*
CEMP	Construction Environmental Management Plan
CFFMP	Flora and Fauna Management Sub-plan
CoA	Conditions of Approval
CPBGG JV	CPB Georgiou Joint Venture
DAWE	Former Commonwealth Department of Agriculture, Water and Environment (now Commonwealth Department of Climate Change, Energy, Environment and Water)
DCCEEW	Commonwealth Department of Climate Change, Energy, Environment and Water
DECCW	Former NSW Department of Environment, Climate Change and Water
DPHI	NSW Department of Planning, Housing and Infrastructure (formerly NSW DPE which has now been split into NSW DCCEEW and NSW DPHI, with all planning functions falling to DPHI)
DPI	NSW Department of Primary Industries
DPIE	Former NSW Department of Planning, Industry and Environment
EAD	Environmental Assessment Documentation
EEC	Endangered Ecological Community
EES	NSW Environment, Energy and Science group (a part of DPE)
Environmental Assessment Documentation	The set of documents that comprise the Division 5.2 Approval: • Roads and Maritime Services (October, 2019) M12 Motorway, Environmental Impact Statement (EIS) • Transport for NSW (October, 2020) M12 Motorway, Submissions Report (the Submissions Report) • Transport for NSW (October, 2020) M12 Motorway, Amendment Report (AR) • Transport for NSW (December, 2020) M12 Motorway, Amendment Report submissions report (ARSR) • Transport for NSW (March, 2021) The M12 Motorway Amendment Report Submissions Report – Amendment (ARSR amendment) • WSP (October, 2021) M12 Motorway – West Package Detailed Design Consistency Assessment • GHD (October, 2021) M12 Motorway – Central Package Detailed Design Consistency Assessment • Arcadis (June, 2022) M12 Motorway – Sydney Water Crossings Consistency Assessment • Arcadis (July, 2022) M12 Motorway – Design Boundary Changes Consistency Assessment

	• Arcadis (August, 2022) M12 Motorway Minor Consistency Assessment for Proposed Change to the M12 Motorway Project (M12 Central) • Arcadis (September, 2023) M12 Motorway – Devonshire Road Temporary Roundabout Consistency Assessment • WSP (September, 2023) M12 Motorway – Elizabeth Drive Connections Consistency Assessment • TfNSW (September, 2023) M12 Motorway – Minor Consistency Assessment M12 West demolition of structures as 752 Luddenham Road • TfNSW (October, 2023) M12 Motorway – Minor Consistency Assessment M12 East AF9 Power Supply • TfNSW (October, 2023) M12 Motorway – Minor Consistency Assessment M12 East Cecil Road Laydown Area • TfNSW (October, 2023) M12 Motorway – Minor Consistency Assessment M12 East Temporary Construction Signage • Arcadis (December, 2023) M12 Motorway – East Site 48, 50 and 51 Boundary Changes Minor Consistency Assessment • Arcadis (January, 2024) M12 Motorway – Minor Consistency Assessment M12 Central Water Tower Access Road The documents that comprise the EPBC referral: • Submission #3486 – The M12 Motorway Project between the M7 Motorway, Cecil Hills and The Northern Road, Luddenham, NSW Notification of referral decision and designated proponent - controlled action; date of decision 19 October 2018; ID: 2018-8286.
EPBC Act	*Environmental Protection and Biodiversity Conservation Act 1999*
EPBC referral	A Proponent must refer a proposed action to the Australian Government Minister for the Environment (the Minister) for assessment, if it has, will have, or is likely to have a significant impact on the world heritage values of a declared World Heritage property, or is likely to have a significant impact on the National Heritage values of a National Heritage place.
Exclusion zones	Exclusion zones are areas of environmental importance (e.g. threatened vegetation or heritage items) that need to be protected. These exclusion zones are defined as no-go areas and are to be protected for the duration of construction in that particular footprint area.
EWMS	Environmental Work Method Statements
Federal Approval	Approval (EPBC 2018/8286) for carrying out the M12 Project under Part 8 of the Environmental Protection and Biodiversity Conservation Act 1999 subject to specific CoA as detailed in Annexure A of the approval.
HCP	Habitat Compensation Plan
Project, the	M12 Motorway Project
NSW DCCEEW	NSW Department of Climate Change, Energy, the Environment and Water (formerly NSW DPE which has now been split into NSW DCCEEW and NSW DPHI)
REMMs	Revised Environmental Management Measures
RTA	Former Roads & Traffic Authority, now Transport for New South Wales

TEC	Threatened Ecological Community
TfNSW	Transport for New South Wales

1 Introduction

1.1 Context

This Habitat Compensation Plan (HCP) is part of the Construction Flora and Fauna Management Sub-plan (CFFMP) which forms part of the Construction Environmental Management Plan (CEMP) for the M12 Motorway West Project (the Project).

This HCP has been prepared to detail the requirements for replacement and compensation for habitat loss on the Project and incorporates both a Hollow Replacement Strategy and a Terrestrial Coarse Woody Debris Plan.

1.2 Background and project description

Refer to Section 2 of the CEMP for Project background and description.

1.3 Importance of hollows to fauna

The Project Environmental Assessment Documentation identified that 30 hollow bearing trees would be removed during the construction of the Project. Hollow bearing trees in Woodland and Riparian Forest provide important habitat for fauna. Four threatened hollow-dependent microbat species were detected during surveys for approval of the project. They were:

- Eastern Freetail-bat (*Mormopterus norfolkensis*)
- Eastern False Pipistrelle (*Falsistrellus tasmaniensis*)
- Greater Broad-nosed Bat (*Scoteanax rueppellii*)
- Yellow-bellied Sheathtail-bat (*Saccolaimus flaviventris*)

Additionally, the common species that utilise hollows for habitat were identified in the Environmental Assessment Documentation including a range of cockatoos, gliders and bats. The Southern Myotis (*Myotis macropus*) was also assumed to depend on hollows within the Project Area.

Threatened owls that rely on hollows for breeding have been detected within 10 kilometres of the project and common mammals and birds would also depend on these hollows within the project area.

1.4 Importance of coarse woody debris to fauna

Course woody debris provide important shelter and habitat for small terrestrial amphibians and reptiles within woodland habitats. Within wetland and watercourse habitats coarse woody debris provides shelter and habitat for birds, macropods and microbats.

2 Purpose and objectives

2.1 Purpose and scope

The purpose of this Plan is to describe how habitat loss will be compensated for, particularly with regard to the loss of hollow-bearing trees and coarse woody debris for the Project. This HCP makes up Appendix D of the CFFMP for the Project.

This HCP forms part of the CEMP and will be informed by pre-clearing surveys undertaken by the Project Ecologist.

2.2 Objectives

The removal of hollow-bearing trees is listed as a key threatening process pursuant to the NSW *Biodiversity Conservation Act 2016* (BC Act). The Project has the potential to remove hollow-bearing trees and therefore impact on threatened and non-threatened fauna species through:

- Increased inter- and intra-specific competition for roosting and nesting sites
- Increased predation on some species due to lack of suitable shelter
- Decreased breeding rates amongst hollow-dependent breeders.

The implementation of this HCP within adjacent habitat can help to reduce the impact to hollow-dependent fauna in the proximity of the Project.

3 Environmental requirements

3.1 Relevant legislation and guidelines

3.1.1 Legislation

All legislation relevant to this HCP is included in Appendix A1 of the CEMP.

3.1.2 Additional approvals, licences, permits and requirements

Refer to Appendix A1 of the CEMP.

3.1.3 Guidelines

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

- Biodiversity Guidelines: Protection and Managing Biodiversity on RTA projects (Roads and Traffic Authority (RTA), September 2011)
- Department of Primary Industries 'Policy and Guidelines for Fish Habitat Conservation and Management (DPI 2013)
- DECCW. 2008. Hygiene protocol for the control of disease in frogs
- Australian Standard AS 4373 Pruning of Amenity Trees
- Australian Standard 4970 – 2009 Protection of Trees.

3.2 Revised Environmental Management Measures

This HCP has been prepared to meet the following requirements of the Revised Environmental Management Measures (REMMs) developed during the preparation of the Environmental Assessment Documentation.

Table 3-1 REMMS relevant to the preparation of this HCP

REMM No.	Requirement	Reference
B2	A Habitat Compensation Plan (HCP) will be prepared and implemented as part of the CFFMP for the project.	This HCP
	The HCP will target those species that will be impacted by the loss of hollows.	Section 4
	Measures will include: nest boxes, reuse of salvaged hollows and/or new technologies e.g. chainsaw hollows), as well as replacement of woody debris and bushrock with consideration to Guide 5 and Guide 8 of Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA, 2011).	Section 6 Section 7

4 Existing Environment

4.1 Threatened Fauna

Threatened fauna identified within and in proximity to the Project construction boundary are outlined in Section 4.1.4 of the CFFMP.

The Project Ecologist will undertake pre-clearing surveys in accordance with the procedure outlined in Appendix A of the CFFMP. Threatened fauna species identified during the pre-clearing surveys will be recorded and included in the Ecologist Report.

4.1.1 Hollow-dependent fauna

Hollow-bearing trees in Woodland and Riparian Forest habitats are assumed to provide roosting habitat for Eastern Freetail-bat, Eastern False Pipistrelle, Greater Broad-nosed Bat and Yellow-bellied Sheathtail-bat.

The Southern Myotis is known to occasionally use tree hollows as roosting habitat. All hollow-bearing trees within 200 metres of riparian zones within and in proximity to the construction boundary to provide potential ‘breeding’ habitat for the Southern Myotis.

The presence of these species is to be determined by the Project Ecologist during pre-clearing surveys and recorded in the Ecologist Report.

4.1.2 Surveys of hollow-bearing trees within the Project boundary

During the pre-clearing surveys, the following information will be collected on hollow-bearing trees within the project boundary and recorded in the pre-clearing report:

- Tree species
- Condition (alive or dead)
- Approximate height (metres)
- Approximate diameter at breast height (DBH)
- Location of the hollows (limbs, trunk or both)
- Total number of hollows
- Number of each hollow class (small <5 cm, medium 5-15 cm, large 15-30 cm and extra-large > 30 cm).

4.1.3 Inventory of hollows within the project boundary

The Project Ecologist will develop an inventory of hollows within the Project boundary based on the findings of the pre-clearing survey and the Tree Survey undertaken by TfNSW prior to the commencement of the construction phase of the Project. Details to be included within the inventory include:

- Chainage from
- Chainage to
- Plant Community Type
- Area of PCT to be removed
- Number of hollow-bearing trees within the Project boundary
- Number of hollows within the Project boundary
- Hollow-bearing tree density/hectare
- Hollow density/hectare.

4.1.4 Suitability of tree hollows

The Project Ecologist will determine the number of hollows present and their suitability for each species group.

4.1.5 Surveys of coarse woody debris within the Project boundary

The Project Ecologist will determine the presence and location of coarse woody debris within the Project boundary during pre-clearing surveys. Findings will be recorded and included within the Ecologist Report. The Ecologist Report will include maps demonstrating areas of low, medium and high density coarse woody debris within the Project boundary.

4.1.6 Location and density

During pre-clearing surveys, the Project Ecologist will sample three sites within the clearing footprint to develop a benchmark of what needs to be replaced, establishing the compensatory requirements for coarse woody debris. The same process to establish receiving sites current density and type of coarse woody debris would be undertaken. The areas surveyed will be selected to ensure that the benchmark measures compensate as much as possible, like for like habitat.

4.1.7 Identification of suitable habitat compensation sites

During pre-clearing surveys, the Project Ecologist will assess possible receiving sites in addition to areas of suitable vegetation remaining within the future road reserve and private property locations adjoining the Project footprint. At each location to be sampled a plot of 50 metres x 20 metres will be assessed for potential fauna habitat including:

- PCT – identify it and determine the condition.
- Dominant canopy species.
- Dominant mid-storey species.
- Dominant ground species.
- % canopy cover.
- % mid storey cover.
- % ground storey cover.
- Number of hollow bearing trees.
- Number of hollows (of each size class).
- Number of trees over 30 cm DBH.
- Abundance of logs.
- Abundance of dense grasses.
- Abundance of rocks.
- Abundance of leaf litter.
- Abundance of fruiting plants.
- Abundance of nectar producing plants.
- Abundance of seeding grasses.
- Presence of water.
- Presence of weeds.
- Density of coarse woody debris
- Presence of disturbances (e.g. logging, fire, grazing etc.).

Ideally, hollow replacements and coarse woody debris will be placed in suitable areas as close as is safe to the areas being cleared. To do this, some hollow replacements and coarse woody debris may need to be placed in private property (with prior agreement of the landowner) or in areas of non-cleared road reserve. In the case of private property, it is important that agreements with stakeholders are made for the long-term protection of the hollow replacements. It is also important to select receiving sites for coarse woody debris that are depauperate in this resource, and will therefore benefit from additional material. The Project Ecologist will be able to determine this, based on knowledge of the suite of fauna species that are, or should be present within a benchmark community for that PCT. Collection of data on the above attributes will inform this decision.

5 Compensatory Requirements

5.1 Hollow-bearing trees

A ratio of 1:1 (hollows to hollow replacements) will be implemented however, if required, the compensatory requirements will be updated in consultation with the Project Ecologist to meet the specific objectives and needs for the target species and location.

When the availability of natural hollows is limited, the addition of hollow replacement has been identified as a management action to provide supplementary habitat for a range of different hollow-dependent species, such as bats, birds and marsupials. It should be noted however, that scientific evidence indicates some hollow dependent species do not, or rarely use hollow replacements. The CPBGG JV will prioritise the relocation of suitable hollows. If this approach is deemed unsuitable by the Project Ecologist, the installation of hollow replacements is to be implemented; trunk/bored hollows are to be prioritised over nest boxes.

5.2 Coarse woody debris

Coarse woody debris will be relocated within receiving sites determined to be suitable by the Project Ecologist during pre-clearing surveys.

Where possible, the Project Ecologist will select a minimum of three reference sites within each PCT. Reference sites should be representative of the variety of condition within that PCT. These reference sites will not be located proximally, to account for potential geographic variation.

Coarse woody debris (CWD), for the purpose of the pre-clearing surveys, refers to logs or dead timber on the ground that are >10 cm diameter and >0.5 metres in length (and more than 80 per cent in contact with the ground).

Note that branches that are attached to the log, are measured if they meet the size thresholds, regardless of whether they are touching the ground. All coarse woody debris within the survey area are measured to the boundary of a 50 metre x 20 metres plot (i.e. 0.1 hectare). The total measured value is multiplied by 10 to generate the benchmark and is expressed as total length in metres per hectare.

5.3 Micro-bat habitat compensation

Micro-bat habitat compensation for Bridges 02 (BR02 at Cosgroves Creek) and 05 (BR05 at Badgerys Creek) for the over water spans require installation of eight (8) HDPE strips under the parapet for micro-bat habitat, and treatment of the side of deck and parapet with two coats of Xypex and broom during construction to roughen the surface to a 1-2 mm thickness. This type of micro-bat habitat does not have any specific maintenance requirements.

6 Hollow replacement requirements

In order to provide established homes for displaced hollow-dependent fauna, 70 per cent of hollow replacement will be established in receiving sites at least one month before the start of any clearing. The remainder of hollow replacement will be installed once the actual abundance and density of tree hollows removed has been confirmed, and before completion of the Project.

6.1 Hollows to be replaced – pre-clearance surveys

As part of pre-clearing surveys for each section, a detailed inventory of all hollows, and hollow-bearing trees to be removed will be undertaken. This information will then be used to inform the requirements for hollow replacement. It will also include mapping of suitable trees and areas for hollow replacements to be located in.

6.2 Reuse of salvaged hollows

Felled timber with naturally formed hollows provide a ready-made alternative to standard nest boxes. As natural hollows, they are more likely to produce favourable conditions for target species and provide a better 'feel' when installed in the host tree compared to manufactured nest boxes (BCT, 2020).

6.2.1 Design

Ideally, a salvaged hollow will include a pre-formed entrance and can be cut above and below the hollow to provide a natural lid and base. However, many natural hollows would simply provide the 'shell' and require a cap to be installed at either end, and an entrance hole to be created. Salvaged hollows can also be combined with a constructed hollow. Any requirements to modify the salvaged hollows should incorporate design specifications for target species

As per manufactured nest boxes, salvaged hollows should be hardwood of an appropriate thickness (>18 mm). Any capping requirements should use marine grade plywood as a minimum and be sealed with waterproofing to reduce warping and splitting (BCT, 2020).

6.2.2 Installation

The Project Ecologist will be present on site during the installation of salvaged hollows. The Project Ecologist would provide advice on attaching salvaged hollows to trees, height, density, location and aspect of salvaged hollows and the timing of installation.

6.3 Trunk hollows

As an alternative way to mimic natural hollows, recent techniques to create hollows within existing trees have been developed. Studies have found that 'chainsaw hollows' cut directly into live trees regulate temperature more effectively than nest boxes, log hollows or salvaged hollows (Griffiths et al. 2018), and high utilisation of the hollows by local native species have been recorded. These hollows are also more likely to provide long-term habitat with potentially lower maintenance requirements compared to standard nest boxes or salvaged hollows.

6.3.1 Design

Given the nature of the practice, chainsaw hollows are most appropriate for targeting small to medium sized species including microbats, gliders, and small parrots (e.g. lorikeets, rosellas). The Project Ecologist will provide input regarding specific hollow specifications.

Chainsaw hollows requires the removal of a section of a healthy, mature tree, with either the entrance left open (for parrots) or a small section re-attached (the 'entrance' plate or 'face' plate) to leave a small entrance for gliders or microbats. Hard wood will be used for the entrance plate.

An alternate to 'chainsaw hollows' is the technique of boring holes into the tree creating a cavity. A limb from the same tree is removed, hollowed and used as the entrance into the cavity.

No construction materials are necessary. Trees will be selected that allow for created hollows to meet spatial requirements for targeted species whilst not risking the health or structural integrity of the tree.

6.3.2 Installation

To prevent tree failures and for safety considerations, trunk hollows will only to be created by adequately qualified arborists (Australian Qualifications Framework (AQF) Level 5 or equivalent) and only mature trees >40cm trunk diameter will be deemed suitable. An initial tree health assessment will be conducted by an arborist. Figure 6-1 provides a visual representation of the procedure for making trunk hollows using the chain saw method. Figure 6-2 illustrates hollows created using the bored method.

Figure 6-1 Procedure for the installation of trunk hollows (The University of Melbourne, 2013)

Figure 6-2 Hollow replacement using the bored method

6.4 Nest boxes

Nest boxes can be used to augment hollow replacement, after the above strategies (salvaged and trunk hollows) have been investigated.

6.4.1 Types of nest boxes

The type of nest box used will depend on the target species and the hollows to be replaced, which will be determined during the pre-clearing survey. The entrance size should be no bigger than that required for the target species. These requirements will be determined by the Project Ecologist upon the completion of the pre-clearing survey. Nest box requirements for different fauna groups are provided in Appendix A.

6.4.2 Installation

The Project Ecologist will be present on site during the installation of nest boxes. The Project Ecologist would provide advice on attaching nest boxes to trees, height, density, location and aspect of nest boxes and the timing of nest box installation.

6.5 Distribution and position of hollow replacements

6.5.1 Height

The location of hollow replacements will be determined according to the recommended height for the target species and as high as possible to avoid predation but low enough to allow monitoring and maintenance. Nest boxes can be placed at varying heights within an area of habitat.

6.5.2 Density

The density and quantity of each replacement hollow type will reflect the proportion of tree hollow types being removed, the proportion of tree hollow types to be retained in adjacent habitat, the availability of adjacent food resources and the assemblage of hollow-dependant fauna known or likely to occur in the Project area. This information will be collected during pre-clearing surveys.

The spacing of hollow replacements is usually determined by the hollow use and home range size of the target species, however the Project Ecologist will provide specific advice for the Project with consideration to available habitat within the area.

6.5.3 Location

The Project Ecologist will consider the following when determining the location of the hollow replacements:

- Install the hollow replacement as close as possible to the location of the original hollow-bearing tree, but safe from impacts and noise of construction
- Install the hollow replacement in close proximity to potential food resources of the target species
- Install hollow replacements for microbats near water sources and within or adjacent to potential flyways
- Do not install hollow replacements on trees with existing hollows (as the presence of other hollow-dependent fauna may act as a deterrent)
- Do not install hollow replacement in areas with a high density of Common Mynas (*Acridotheres tristis*) if practical. Mynas nest high in the canopy so consideration should be given to installing hollow replacements lower in the canopy
- Hollow replacements must be monitored and maintained, a schedule for this should be determined.

6.5.4 Aspect

Hollow replacements will be orientated between northwest and east to avoid hot afternoon sun and the dominant direction of severe storms. Additionally, hollow replacements will be placed so they are not facing lights from adjacent development.

6.6 Identification

Aluminium identification tags will be placed just above eye level on the recipient tree to ensure it is possible to identify nest boxes without using a ladder.

Following installation of each hollow replacement, the following information will be recorded by the CPBGG JV:

- Hollow replacements identification number
- Hollow replacement type
- GPS location
- Species and diameter at breast height of the host tree
- Hollow replacement height and orientation.

7 Coarse woody debris requirements

7.1 Re-use of coarse woody debris

Coarse woody debris and bushrock will be reused on site where possible. Table 7-1 shows how woody debris is classified and suggests possible uses.

Table 7-1 Classification of woody debris and proposed uses

Woody debris size	Usage
Logs > 500 mm diameter	Use within re-snagging of creeks
Logs 250-500 mm diameter Logs up to 2000 mm length[1] (preferred for habitat enhancement)	Priority to use as habitat for Cumberland Plain Land snail. Alternatively, used as habitat for other native fauna
Logs 100-250 mm diameter	Habitat improvement/replacement, erosion and sediment control, fauna furniture for culverts
Debris <100 mm diameter	Mulched/chipped and re-used on site for revegetation or erosion and sediment control

[1] It should be noted that logs greater than 2000mm in length are preferred for habitat enhancement based on the logistical and financial benefits of moving and installing shorter logs. However, logs greater than 2000mm may still be used where appropriate, especially where felled trees can be reused on the same site.

Prior to the commencement of vegetation clearing, if it is not possible to reuse all removed native trees and vegetation including hollows, tree trunks, mulch, bush rock, root balls, coarse woody debris, collected plant material seeds and/or propagated plants, TfNSW will consult with Council, Western Sydney Parklands, Landcare groups and government agencies (including NSW National Parks & Wildlife Service (Scheyville Office), Greater Sydney Local Land Services and DPI Fisheries) to determine whether this material could be used by others in habitat enhancement, beneficial re-use and rehabilitation work before pursuing other disposal options.

Where offsite reuse is proposed, the Project Ecologist will examine the material prior to clearing, as per the EPA Mulch Order 2016. This will be subject to Section 143 Notice and Biosecurity Assessment, EPA Mulch Order 2016 or any other suitable document to support the Section 143 Notice.

7.2 Introduction of coarse woody debris

Where the off-site reuse of coarse woody debris is required, the Project Ecologist is to consider the following:

- Same or similar PCT to that being cleared in the project area, therefore providing habitat for similar fauna species
- Avoid creating conditions where the distribution, total volume, age, species or size class, exceeds the benchmark values for that PCT
- Avoid the spread of any weeds or pathogens that may be in the soil is avoided when relocating woody debris and bushrock from stockpiles
- Arrange the coarse woody debris to maximize its natural habitat attributes (e.g. orient cavities so they collect water deliberately or to create shelters from rain or wind, etc.).

8 Compliance management

8.1 Roles and responsibilities

The CPBGG JV's 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 7.1 of the CFFMP.

8.2 Training

Induction training on this HCP is addressed in Section 3.5 of the CEMP and Section 7.2 of the CFFMP.

8.3 Monitoring and inspections

8.3.1 Overview

CPBGG JV will be responsible for ensuring that monitoring of all compensatory habitat (hollows and coarse woody debris locations) is undertaken.

Hollows will require maintenance and monitoring. Coarse woody debris sites should be checked and verified as similar to benchmarks, but then do not require further monitoring after this.

8.3.2 Hollows

Each hollow replacement will be monitored for a period of times that reflects the overall objective of the artificial hollow placement as determined by the Project Ecologist upon the completion of pre-clearing surveys.

CPBGG JV will ensure that hollow replacements are checked by the Project Ecologist every six months during the construction phase of the Project. However, the timeframe shall be updated and informed by Ecologist advice following pre-clearing surveys and an understanding of the target species nesting seasons.

Monitoring of hollow replacements will coincide with nesting seasons for target species. For each recorded nest box, the monitoring data will include:

- The name of the observer
- Date
- Prevailing weather conditions
- Assessment of hollow replacement condition (e.g., structural integrity, evidence of rot or termite activity, condition of fastenings etc.)
- Evidence of fauna activity and presence of pest activity such as European Honey Bees (*Apis mellifera*), Common Mynas (*Acridotheres tristis*), Common Starlings (*Sternus vulgaris*), ants, termites etc.

8.4 Maintenance

Maintenance inspections will be carried out in conjunction with monitoring events. Maintenance works may include:

- Repairing hollow replacements
- Reattaching hollow replacements to trees
- Removing pests

Appropriate pest management techniques should be applied where required. This may include modification to the artificial hollow design to exclude pest species or relocation of hollow replacements to alternative sites in adjacent habitat. May require the assistance of a specialist, such as an apiarist to permanently remove honey bee nests. Alternatively, given the loss of honey bees world-wide, another box could replace that one in suitable habitat for the target fauna species.

If a hollow replacement should need to be removed from the site for repair, then an alternative nest box will be installed in the same location upon removal of the damaged replacement hollow.

8.5 Reporting

8.5.1 Pre-clearing survey report

The CPBGG JV is to report the findings of the pre-clearing surveys in the pre-clearing survey report outlined in Section 3.1 of the Vegetation Clearing Procedure (Appendix A of the CFFMP). The pre-clearing survey report will also include the following details in relation to habitat compensation:

- Attributes of the sites to be cleared (as outlined in Section 4 and 5.2)
- Attributes of the receiving sites (as outlined in Section 4 and 5.2)
- Species identified during pre-clearing surveys.

The pre-clearing survey report will inform the CPBGG JV stage specific HCP.

8.5.2 Post-clearing report

CPBGG JV will include the findings from the monitoring and inspection of hollow replacements within the post-clearing report outlined in Section 3.2 of the Vegetation Clearing Procedure (Appendix A of the CFFMP). The post-clearing report will include the following details in relation to habitat compensation:

- Number of hollow replacements installed and their location
- Any maintenance carried out
- Presence of pest species and the method of removal
- Species of fauna currently occupying the box (if any)
- Species possibly using the box based on signs (scats or scratches).
- Coarse woody debris density at receiving sites before and after relocation of woody debris.
- Ongoing reporting on nest box inspections and required maintenance.

9 Review and improvement

9.1 Performance Measures

9.1.1 Hollow replacement

The effectiveness of the hollow replacement program should be assessed against the performance criteria listed in Table 9-1.

Table 9-1 Performance objectives and criteria for assessing the effectiveness of hollow replacements

Performance objective	Performance criteria	Contingency measures
Utilisation of the hollow replacements by a range of native fauna species	At least 50% of hollow replacements being used by a variety of native fauna.	Investigate artificial hollow numbers, type and locations to determine the possible cause of low uptakes.
Species-specific hollow replacements being used by the target species	At least 50% of the species-specific hollow replacements being utilised by the target species.	Consider location of the nest boxes; consider moving species-specific hollow replacements to other suitable habitat areas.
Minimise the number of hollow replacements being utilised by pest species e.g. bees, common myna	Less than 5% of the hollow replacements being utilised by pest fauna.	Consider installing deterrents to deter pests e.g. buffalo fly ear tag to discourage bees. Consider artificial hollow design to discourage mynas.
Minimise maintenance costs	Less than 5% of the hollow replacements requiring maintenance, removal or disposal.	Ensure all hollow replacements are installed correctly and in the right location. Talk to manufacturer about maintenance issues.

9.1.2 Coarse woody debris

The Project Ecologist will ensure that receiving sites identified for each PCT cleared achieve a less than 5 per cent variance in coarse woody debris densities in comparison to the pre-cleared reference sites.

To ensure that the coarse woody debris density at the receiving sites are the result of improvement, CPBGG JV will provide coarse woody debris densities for each receiving site prior to the introduction of reused coarse woody debris.

9.2 Continuous improvement

Continuous improvement of this HCP 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
- Make comparisons with objectives and targets.

For further details on continuous improvement of this HCP refer to Section 1.5.3 of the CEMP and Section 8.1 of the CFFMP.

References

Griffiths, S.R., Lentini, P.E., Semmens, K., Watson, S.J., Lumsden, L.F. and Robert, K.A. (2018), Chainsaw-carved Cavities Better Mimic the Thermal Properties of Natural Tree Hollows than Nest Boxes and Log Hollows. Forests. 9(5): 235.

NSW Biodiversity Conservation Trust (BCT). (2020), Guideline for Artificial Hollows. NSW Biodiversity Conservation Trust. Sydney

The University of Melbourne. (2013), A practical solution for habitat creation. https://blogs.unimelb.edu.au/sciencecommunication/2013/10/27/a-practical-solution-for-habitat-creation/ . Accessed 21 July 2021

Appendix A – Fauna Group Nest Box Requirements

The nest box requirements for each fauna group are provided below. Table 9-2 shows the dimensions of each of the boxes, their recommended installation height and other installation instructions. The CPBGG JV will provide species specific requirements upon the completion of pre-clearing surveys.

Table 9-2 Nest box dimensions for each fauna group (Frank and Frank, 2003)

Size hollow	Group	Hollow entrance requirement (mm)	Preferred depth (mm)	Inner dimensions (mm)	Placement height (m)	Comments
Small	Small Mammals (antechinus, phascogales)	30 - 50	200 - 300	150 x 200	2 – 6	Choose location without nearby branches to reduce predation. Consider flap or carpet to reduce draft
Small	Micro-bats	Horizontal slit with bottom opening	400		3 – 5	Wedge shaped
Small	Small gliders	30 - 45	300	150 x 250	3 – 6	
Medium	Large gliders	90	400	250 x 250	6 – 10	Rear entry design will reduce uptake by birds, prefers a jagged spout entrance
Medium	Possums	85 - 100	300	250 x 250	2 – 4	
Large	Small owls	100	500	250 x 300	4 – 6	Prefers a horizontal entrance spout
Extra large	Large owls	200	800	550 x 550	12 – 20	
Large	Large parrots	200	1200	300 x 400	8 – 10	
Medium	Small parrots	55 - 100	400	200 x 200	5 – 8	

Appendix E Construction Flora and Fauna Management Sub-plan

Snag Management Plan

M12 Motorway West

Project number:	N81150
Document number:	M12WCO-CPBGGJV-ML1-EV-PLN-000003_App E
Revision date:	22/10/2024
Revision:	02

Details of Revision Amendments

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C	18/07/2022	A. Zvirzdinas	Third Draft following ER review of Rev B. New document number
00	27/07/2022	A. Zvirzdinas	First Controlled Issue
F	31/01/2023	J. Ibrahim	Additional design change updates
01	31/01/2023	J. Ibrahim	Second Controlled Issue
02	22/10/2024	T. Chezzi	Annual review

Document Review

Position	Name	Signature	Date
Project Director	Nick Fryday		22/10/2024

Distribution of controlled copies

Copy no.	Issued to	Version

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Acronyms and Abbreviations

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BC Act	Biodiversity Conservation Act 2016
CEMP	Construction Environmental Management Plan
CFFMP	Construction Flora and Fauna Management Plan
CoA	Conditions of Approval
CPBGG JV	CPB Contractors and Georgiou Group Joint Venture
DAWE	Former Commonwealth Department of Agriculture, Water and the Environment (now Commonwealth Department of Climate Change, Energy, Environment and Water)
DCCEEW	Commonwealth Department of Climate Change, Energy, Environment and Water
DPHI	NSW Department of Planning, Housing and Infrastructure (formerly NSW DPE which has now been split into NSW DCCEEW and NSW DPHI, with all planning functions falling to DPHI)
DPIE	Former NSW Department of Planning, Industry and Environment
EES	NSW Environment, Energy and Science Group (a part of DPIE)
EHG	Environment and Heritage Group
Environmental Assessment Documentation	The set of documents that comprise the Division 5.2 Approval: • Roads and Maritime Services (October, 2019) M12 Motorway, Environmental Impact Statement (EIS) • Transport for NSW (October, 2020) M12 Motorway, Submissions Report (the Submissions Report) • Transport for NSW (October, 2020) M12 Motorway, Amendment Report (AR) • Transport for NSW (December, 2020) M12 Motorway, Amendment Report submissions report (ARSR) • Transport for NSW (March, 2021) The M12 Motorway Amendment Report Submissions Report – Amendment (ARSR amendment) • WSP (October, 2021) M12 Motorway – West Package Detailed Design Consistency Assessment • GHD (October, 2021) M12 Motorway – Central Package Detailed Design Consistency Assessment • Arcadis (June, 2022) M12 Motorway – Sydney Water Crossings Consistency Assessment • Arcadis (July, 2022) M12 Motorway – Design Boundary Changes Consistency Assessment • Arcadis (August, 2022) M12 Motorway Minor Consistency Assessment for Proposed Change to the M12 Motorway Project (M12 Central) • Arcadis (September, 2023) M12 Motorway – Devonshire Road Temporary Roundabout Consistency Assessment

	• WSP (September, 2023) M12 Motorway – Elizabeth Drive Connections Consistency Assessment • TfNSW (September, 2023) M12 Motorway – Minor Consistency Assessment M12 West demolition of structures as 752 Luddenham Road • TfNSW (October, 2023) M12 Motorway – Minor Consistency Assessment M12 East AF9 Power Supply • TfNSW (October, 2023) M12 Motorway – Minor Consistency Assessment M12 East Cecil Road Laydown Area • TfNSW (October, 2023) M12 Motorway – Minor Consistency Assessment M12 East Temporary Construction Signage • Arcadis (December, 2023) M12 Motorway Project (M12 East) Sites 48, 50 and 51 • Arcadis (January, 2024) M12 Motorway – Minor Consistency Assessment M12 Central Water Tower Access Road • The documents that comprise the EPBC referral: • Submission #3486 – The M12 Motorway Project between the M7 Motorway, Cecil Hills and The Northern Road, Luddenham, NSW Notification of referral decision and designated proponent - controlled action; date of decision 19 October 2018; ID: 2018-8286.
EPBC Act	Environmental Protection and Biodiversity Conservation Act 1999
EPBC Referral	A Proponent must refer a proposed action to the Australian Government Minister for the Environment (the Minister) for assessment, if it has, will have, or is likely to have a significant impact on the world heritage values of a declared World Heritage property, or is likely to have a significant impact on the National Heritage values of a National Heritage place
EWMS	Environmental Work Method Statements
Federal Approval	Approval (EPBC 2018/8286) for carrying out the M12 Project under Part 8 of the Environmental Protection and Biodiversity Conservation Act 1999 subject to specific CoA as detailed in Annexure A of the approval
FM Act	Fisheries Management Act 1994
NSW DCCEEW	NSW Department of Climate Change, Energy, the Environment and Water (formerly NSW DPE which has now been split into NSW DCCEEW and NSW DPHI)
OCEMP	Overarching Construction Environmental Management Plan
Project, the	M12 Motorway Project
Snag(s)	A snag is considered to be any piece of woody debris that is both greater than 3 metres in length and 300 mm in diameter, or any rock larger than 500 mm in two dimensions, that is located within a waterway (either fresh, estuarine or marine) and is, or would be, wholly or partly submerged at a 'bank-full' flow level or highest astronomical tide level.
TfNSW	Transport for New South Wales
WIRES	NSW Wildlife Information Rescue and Education Service

1 Introduction

1.1 Purpose

Snag removal associated with construction of the M12 Motorway Project (the Project) will result in impacts to aquatic and terrestrial fauna. This Snag Management Plan has been prepared for snag removal and relocation at Badgerys Creek in accordance the *Policy and guidelines for fish habitat conservation and management* (DPI Fisheries, 2013).

The purpose of this Plan is to outline environmental control measures for the relocation of snags and identify suitable locations for reuse of snags to be removed.

1.2 Importance of snags to fauna

Snags are trees, branches and root masses that are found in waterways. They are the equivalent of aquatic coarse woody debris and are a significant ecological and structural component of streams and rivers, forming important habitat for aquatic and terrestrial organisms. Snags provide:

- Habitat for benthic plants, algae, invertebrates, and microorganisms
- Hiding places (refuges) to avoid predators
- Foraging resources for aquatic birds
- Resting places out of the main river flow
- Assistance in developing scour pools, which provide important shelter for fish during hot weather and droughts
- Spawning sites essential for successful reproduction
- Organic enrichment by capturing fallen leaves and other detritus, and by their own decay
- Assistance in preventing erosion by stabilising stream banks and stream beds.

1.3 Scope

This Plan details control measures to minimise impacts of snag removal and relocation at Badgerys Creek to be implemented throughout the construction of the Project.

This Snag Management Plan forms part of the CFFMP and will continue to be informed by ongoing field work undertaken by the Project Ecologist when managing snags. It is related to the coarse woody debris guidelines within the Habitat Compensation Plan (HCP) (refer Appendix D of the CFFMP) for the project, but relates to coarse woody debris in the aquatic environment.

1.4 Objectives

Removal of large woody debris (also referred to as snags) is listed as a Key Threatening Process under the *Fisheries Management Act 1994*. The Project has the potential to require the removal of snags and therefore has the potential to impact habitat for aquatic and semi-aquatic organisms. The implementation of this Snag Management Plan is to ensure that the Project does not result in an overall loss of habitat features within Cosgroves and Badgerys Creeks.

1.5 Roles and Responsibilities

This Plan will be updated by the CPBGG JV and reviewed by the TfNSW Environment and Sustainability Manager (ESM) (or delegate) prior to commencement of any de-snagging or re-snagging activities.

The following specialised roles are required for the management of snags during construction of the Project:

- The Project Ecologist will undertake additional field work in conjunction with pre-clearing surveys to ascertain snags to be removed and relocated
- CPBGG JV, advised by the Project Ecologist, will be responsible for updating this stage specific Snag Management Plan if required and the implementation of monitoring and reporting requirements during the construction phase
- TfNSW will maintain responsibility for any additional monitoring and reporting requirements upon the completion of construction of the Project.

1.6 Consultation

The CPBGG JV will consult with DPI Fisheries where the removal or relocation of a snag has been identified as the appropriate method of management by the Project Ecologist.

The CPBGG JV will consult with DPI Fisheries prior to vegetation clearing to identify any trees proposed to be removed that could potentially be used for re-snagging of a waterway.

1.7 Review

This Plan will be reviewed annually, or as required in accordance with the continuous improvement process described in Section 8 of this CFFMP.

2 Environmental requirements

2.1 Legislation and guidelines

This Plan has been developed with consideration of the following key legislation and guidelines:

- *Environmental Protection and Biodiversity Act 1999* (EPBC Act)
- *Fisheries Management Act 1994* (FM Act)
- *Biodiversity Conservation Act 2016* (BC Act)
- NSW DPI *Policy and Guidelines for Fish Habitat Conservation and Management* 2013

The removal of woody debris and snags or work that involves the removal of any other material from water land that disturbs, moves or harms woody debris and snags is considered “dredging” under the FM Act.

2.2 Snag management

NSW DPI’s Policy and Guidelines for Fish Habitat Conservation and Management separates snag management into four categories ranging from low impact to high impact:

- Lopping – whereby protruding limbs of in-stream woody habitat are sawn-off and allowed to sink to the river bed
- Realignment – whereby a snag is rotated from its existing position
- Relocation – whereby a snag is physically moved from one location in the waterway to another location
- Removal – the snag is completely pulled from the water (i.e. de-snagging).

As a general principle for timber snags, lopping should be considered as the first choice for the management of snags. Where lopping will not solve the immediate problem, re-alignment should be considered as the next possibility, followed by relocation. Removal of a snag is the least desirable option and should only be adopted as a last resort.

In general, snags that extend for a distance of less than 25 per cent of the total stream width from the bank towards the stream centre should not be interfered with. Exceptions may be made for those snags which are causing deflection of water onto the riverbank and causing accelerated erosion. In these cases the snag should be realigned or relocated in preference to being removed.

When deciding on the appropriate management method, the Project Ecologist will need to determine how each individual snag contributes to providing appropriate habitat for aquatic and terrestrial fauna, the waterways flow regime, and bank stabilisation and erosion processes.

3 Methodology

3.1 Additional field work

In accordance with REMM B12, the Project Ecologist will undertake additional field work to provide details of the snags to be relocated (such as numbers and locations) and relocation methods. The additional field work will be undertaken in conjunction with pre-clearing surveys.

Upon the completion of additional field work, the Project Ecologist will record the following information:

- Location of snag
- Method of management
- Wood type
- Size classes (diameter, length)
- Species utilising snag.

Where removal of the snag is the identified method of management, the Project Ecologist must identify the intended reuse or disposal method for the individual snag.

This information will be recorded during pre-clearing surveys and included in an updated CPBGG JV Snag Management Plan.

3.1.1 Re-snagging

In the event that re-snagging needs to occur, an appropriately qualified and experienced ecologist is to advise on the appropriate sourcing of snags. The ecologist should prioritise the reuse of removed snags where appropriate.

The most suitable timber for re-snagging are large hardwood native trees, which have been recently felled. Ideally the timber should be of the same species or type as found naturally in the stream.

CPBGG JV will provide the following information regarding the introduction of new snag in an updated Snag Management Plan:

- Source
- Wood type
- Size classes
- Location of placement
- Orientation
- Method of installation.

The site selection process for re-snagging will take into account the existing woody habitat amount, complexity and location within the channel, to identify key sites where the woody habitat load should be enhanced, and connectivity improved. Where possible, root balls and timbers will be kept intact as maintaining tree complexity can assist in enhancing micro habitat.

When considering the placement of snags, the Project Ecologist will also need to consider the following:

- Location and orientation of the snag does not change the flow regime and increase erosion
- The snag must not trample existing aquatic vegetation
- Whether the location of the snag will improve habitat for aquatic and terrestrial fauna
- The placement of the snag in an area that has a low abundance of existing snags.

3.1.2 Site access and potential constraints

Prior to selecting a site for re-snagging, consideration will be given to the access requirements for a potential site. Re-snagging projects require heavy machinery to achieve the projects objectives. Poor access may limit what sites can feasibly be re-snagged. Considerations will address a variety of factors to ensure that equipment will have suitable access to the river including:

- infrastructure load limits
- appropriate road access
- laydown area (materials and equipment area) and truck turn-around,

- vegetation type and abundance
- protruding branches.

Where possible sites that have established access tracks will be selected to ensure minimal disturbance and to reduce site rehabilitation requirements. Sites where the riparian vegetation is already highly disturbed should be preferenced to avoid additional clearing of native vegetation.

To ensure safety and to reduce liability from injury, re-snagging activities should be focussed along the bank, not in the middle of the waterway and far away from high use public swimming and boating areas such as those around townships and public parks. Additionally, the Project Ecologist will need to consider installation methods that decrease the risk of sediment pluming.

3.1.3 Preparation of a stage specific Snag Management Plan

Upon the completion of additional field work by the Project Ecologist, this CPBGG JV Snag Management Plan will be updated to identify and document actions to be taken for each individual snag.

The updated Snag Management Plan will be developed on the advice of the Project Ecologist and sent to TfNSW for approval. De-snagging/re-snagging activities cannot commence until the updatedSnag Management Plan has been approved by TfNSW.

3.2 Commencement of de-snagging or re-snagging activities

3.2.1 Environmental Works Method Statement

The CPBGG JV will develop an Environmental Works Method Statement (EWMS) to manage and control de-snagging and/or re-snagging activities in a manner that does not cause harm to the environment.

The EWMS will be prepared by the CPBGG JV Environmental Site Representatives (ESR) and reviewed by the TfNSW Project Manager, TfNSW Environment and Sustainability Manager (ESM) (or delegate) and Environmental Representative (ER) before commencement of the de-snagging and/or re-snagging activity.

EWMS incorporate appropriate mitigation measures and controls, including those identified in relevant Sub-plans. They also identify key procedures to be used concurrently with the EWMS. EWMS are specifically designed to communicate requirements, actions, processes and controls to Construction personnel using plans, diagrams and simply written instructions.

3.2.2 Methods and machinery

Installation of snags can be done either through a land-based approach or a water based approach and with a variety of equipment and methods. Three methods that could be considered for the Project are discussed below. The CPBGG JV will determine the appropriate method for installation based on the finding of additional field surveys and the advice of the Project Ecologist, methods that have minimal impacts on the waterways or surrounding areas will be preferred. Safety of operators, current water levels and safety of site personnel will also need to be considered.

- **Land based with excavator, long reach excavator or crane**: This approach will require the use of an excavator or crane with various attachments including a log grab, a bucket and a hydraulic pile driving hammer. An appropriately sized excavator or crane will be used as determined by the CPBGG JV (with advice from the Project Ecologist) and care will be taken to ensure there is no risk of the machine tipping over
- **A water based approach with a barge and excavator:** A water based approach can be useful for sites which are highly vegetated and/or where high, unstable banks prevents resnagging to occur from the bank. This approach will require the use of a barge as well as an excavator with various attachments to move and position the trees including a log grab and a hydraulic pile driving hammer. As above, the CPBGG JV will determine the appropriate sized machinery for moving and positioning the trees
- **Land based cable dragging:** This is a land-based approach that uses a cable and a winch to drag trees into the final position. The technique first requires logs to be placed at the top of the bank (e.g with a front end loader fitted with forks). Logs are then dragged into place via cables; a method based on retrieval methods used in forest harvesting.

3.2.3 Protection of riparian vegetation

CPBGG JVs will implement protective measures during the removal and installation of snags to avoid damaging or destroying vegetation and habitat which have been marked or otherwise identified for preservation. General measures for the protection of vegetation are outlined in Section 2.5 of the Vegetation Clearing Procedure (refer Appendix A of the CFFMP).

3.2.4 Controls for the protection of fauna

The Project Ecologist or suitably qualified delegate will be present during relocation works and will direct works in a manner that encourages and allows fauna to safely flee the clearing area. Where animals are unable to flee as a result of injury or otherwise, they will be captured and placed in adjacent areas of equivalent habitat, if uninjured. If injured or behaving abnormally, the advice of a wildlife carer will be sought. In the event that fauna handling is required, a Fauna Handling and Rescue Procedure will be implemented.

If fauna is encountered during snag management activities, a stop work procedure will be implemented in accordance with the Unexpected Threatened Species or Threatened Ecological Community (TEC) Finds Procedure (refer Appendix B of the CFFMP).

The following steps will be taken:

- Cease work in the vicinity of the fauna and immediately notify the CPBGG JV ESR
- Allow the animal to relocate by itself, however if it is injured (or suspected to be injured), contact a licenced fauna handler or rescuer (e.g. WIRES) or the Project Ecologist
- Injured fauna will be transferred to a local vet for treatment
- Non-injured fauna will be relocated to appropriate pre-determined nearby habitat.

3.2.5 Time period over which the works will be carried out

Although possible throughout the year, land based re-snagging is best carried out during low flows (generally late autumn – early spring) while banks and bed are exposed and to provide for better access to sites. Water based re-snagging is possible during most flow scenarios.

3.3 Post snag relocation

3.3.1 Post relocation

Upon the completion of the removal or installation of snags, surveys will be undertaken by CPBGG JV.

While all care will be taken to minimise disturbance to the riparian zone during de-snagging and re-snagging activities (e.g. preferred use of rubber tyred front end loader rather than excavator where possible and /or use of barge in sensitive areas), some disturbance through heavy machinery access is inevitable.

As required by NSW CoA E109, rehabilitation and revegetation of the riparian corridor and banks of watercourses impacted by the Project will be commenced within three (3) months of the completion of any construction activity required in these areas. Creek corridors will be revegetated with locally native riparian vegetation, in accordance with the requirements of the Policy and guidelines for fish habitat conservation and management (DPI, 2013) and in consideration of the Guidelines for instream works on waterfront land (DPI, 2012). The creek channels will be rehabilitated to preconstruction conditions or better.

4 Reporting and performance monitoring

4.1 Pre-clearing survey report

The CPBGG JV is to report the findings of the additional field surveys in the pre-clearing survey report outlined in Section 3.1 of the Vegetation Clearing Procedure (Appendix A of the CFFMP). The pre-clearing survey report will the following details in relation to snag management:

- Details of snags to be removed/relocated: no snags were identified in the pre-clearing surveys. This will be updated with any relevant information if any further need to work in waterways arises for the duration of the construction of the Project.
- Details on receiving sites identified for snag relocation: none

4.2 Post-clearing report

The CPBGG JV will include the findings of the post-relocation surveys within the post-clearing report outlined in Section 3.2 of the Vegetation Clearing Procedure (refer Appendix A of the CFFMP). The post-clearing report will also include the following details in relation to relocation activities:

- Name and qualifications of the Ecologist or wildlife carer present during clearing
- Assessment of the habitat and handling of fauna
- Information on clearing operations, dates, procedures, areas
- Number of snags removed
- Number of snags installed
- Number of snags reused
- Type of snag management method used (ie. lopping, realignment, relocation and/or removal)
- Live fauna sightings, captures, any releases or injured/shocked wildlife
- Any damage to trees to be retained, nests or other fauna habitat features
- Injury or mortality of fauna
- Photographs of rescued fauna
- Records of all fauna rescue events, including locations to where fauna has been relocated.

4.3 Performance Monitoring

Monitoring for the effectiveness of the relocation of snags in providing appropriate habitat for aquatic and terrestrial fauna will be undertaken by the Project Ecologist throughout construction of the Project. Upon completion of construction TfNSW will assume responsibility for monitoring the performance of relocated snags.

The Project Ecologist will devise an appropriate performance monitoring and reporting regime based on the context within which the snag will be relocated.

Appendix F Construction Flora and Fauna Management Sub-plan

Farm Dam Dewatering Procedure

M12 Motorway West

Project number:	N81150
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CSWMP	Construction Soil and Water Management Plan
EPBC Act	Environmental Protection and Biodiversity Act 1999
ER	Environmental Representative
EWMS	Environmental Work Method Statement
FM Act	Fisheries Management Act 1994
OCEMP	Overarching Construction Environmental Management Plan
POEO Act	*Protection of the Environment Operations Act 1997*
Project, the	M12 Motorway West Project
REMM	Revised Environmental Management Measures
TfNSW	Transport for NSW

1 Introduction

1.1 Purpose

Construction of the M12 Motorway West Project (the Project) will involve the dewatering of farm dams. The purpose of the Farm Dam Dewatering Procedure (this Procedure) is to provide guidance to ensure that site dewatering activities are completed in a manner that does not cause harm to any aquatic fauna.

1.2 Objective

The objectives of this Procedure include:

- Ensure compliance with environmental requirements of the Project
- Ensure invasive species are not translocated and are humanely disposed of
- Provide a clear methodology for the protection and relocation of aquatic fauna for the duration of farm dam dewatering activities.

1.3 Scope

This Procedure applies to the dewatering of farm dams associated with the Project.

Water quality and potential reuse of discharged water will be managed in accordance with Appendix D of the Construction Soil and Water Management Plan (CSWMP) and the CPBGG JVs Water Reuse Strategy.

1.4 Induction / training

All site personnel involved in the dewatering activities will be trained and inducted in this Procedure.

The CPBGG JVs will prepare Environmental Work Method Statement (EWMS) to manage and control dewatering activities in a manner that does not cause harm to the environment.

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

1.5 Roles and responsibilities

The CPBGG JV Environmental Site Representative is responsible for ensuring the effective implementation of this Procedure and training of site personnel in the requirements of this Procedure.

1.6 Review

This Procedure will be updated by the CPBGG JV and reviewed by the Project Ecologist and Transport for NSW (TfNSW) Environment and Sustainability Manager (or delegate) prior to commencement of construction.

This Procedure will be reviewed annually or as required in accordance with the continuous improvement process described in Section 8 of the CFFMP.

2 Environmental Requirements

2.1 Legislation and guidelines

This Plan has been developed with consideration of the following key legislation and guidelines:

- *Protection of the Environment Operations Act 1997* (POEO Act)
- *Environmental Protection and Biodiversity Act 1999* (EPBC Act)
- *Fisheries Management Act 1994* (FM Act)
- *Biodiversity Conservation Act 2016* (BC Act)
- Biodiversity Conservation Regulation 2017
- TfNSW Technical Guideline EMS-TG-011: Environmental Management of Construction Site Dewatering (RTA, 2011)

No threatened species, populations or communities listed under BC Act, FM Act, or EPBC Act will be impacted by the dewatering process.

The dewatering will not contribute to key threatening processes listed under the BC Act, FM Act or EPBC Act, including spread of invasive species.

2.2 Requirements

The NSW Conditions of Approval (CoA), the Revised Environmental Management Measures (REMMs) and TfNSW specifications clauses specific to dewatering are identified in the CSWMP.

An Environmental Protection Licence (EPL#21595) also exists for the project.

3 Procedure

3.1 Environmental Work Method Statement

The CPBGG JV will develop an EWMS to manage and control dewatering activities in a manner that does not cause harm to the environment in cases where farms dams require partial or full dewatering.

The EWMS will be prepared by the CPBGG JV Environmental Site Representatives and reviewed by the TfNSW Project Manager, TfNSW Environment and Sustainability Manager (or delegate) and Environmental Representative (ER) before commencement of the dewatering activity.

EWMS incorporate appropriate mitigation measures and controls, including those identified in relevant Sub-plans. They also identify key procedures to be used concurrently with the EWMS. EWMS are specifically designed to communicate requirements, actions, processes and controls to Construction personnel using plans, diagrams and simply written instructions.

3.2 Farm dam dewatering

In addition to the discharge requirements outlined in the CSWMP for the discharge of water, the dewatering of waters from farm dams will require:

- Preparing the dam for dewatering
- Aquatic fauna capture
- Relocation of captured aquatic fauna
- Management of pest species and pathogens.

3.2.1 Preparing the dam for dewatering

Prior to dewatering of the dam, the following steps will be undertaken:

- Consultation with landowner to:
  - Establish if any fish have been stocked in the dam and/or if they are aware of any fish present in the dam
- Identification of suitable habitats near the dam for translocation of native fauna by the Project Ecologist
- Installation of measures to minimise aquatic fauna being injured. This may include sediment controls to direct aquatic fauna towards suitable alternative habitat during the dewatering process
- Obtaining and setting up pumping screens to ensure native aquatic fauna are not harmed during the pumping process or pest species are not transferred during the pumping operations
- To allow rapid fauna rescue, the pump inlet will be large enough to allow sediment to pass but would include the use of an appropriate mesh to cover the pump but prevent macroinvertebrates, fish, tadpoles and frogs from being pumped out.

3.2.2 Aquatic Fauna capture

The method for translocating as many native fauna living in the dam as possible will be directed by the Project Ecologist. A work method statement will be submitted by the Project Ecologist prior to dewatering activities for review and approval as part of the dewatering EWMS. The general methodology used for aquatic capture will include but not be limited to:

- Trapping of native fauna. The use of floating traps to remove native turtles from the dams prior to dewatering, deployed by suitably experienced and licensed ecologist
- For the surrounding vegetation, manual searching of suitable cover such as hollows, fallen timber, burrows, discarded tins etc.
- Dewatering over several days to allow native fauna to relocate. Measures to direct aquatic fauna away from dangerous areas (i.e. roads) and towards suitable alternative locations will be included
- Manually entering (where safe to do so) the partially dewatered dam and searching manually for remaining fauna
- The dewatering schedule will allow time for fauna rescue, especially during the final 0.3– 0.5 metre water depth (to be advised by Project Ecologist). Fauna will be captured in one day, so pumps need

to be of an adequate size and placed in an area free from mud and debris (e.g. inside excavator bucket or screened sump pit)

- Fauna will be collected by hand nets during the final day of dewatering. This is most effective when the water is less than 0.3 metres deep. Larger fauna will be targeted first due to the rapid decrease of dissolved oxygen concentration as the water volume decreases.
- Native fauna will be transferred to aerated holding containers (fish) or where possible transferred directly to the release area (reptiles/amphibians). It is preferable if frogs are released at night to disadvantage predators, however if this is not feasible they should be released into dense pool/pond side vegetation. The holding tanks will be kept shaded to prevent harmful increases in temperature. Care will be taken as to not overcrowd water containers to limit the spread of diseases and predation. Frogs will be captured in aerated plastic bags (used as a glove) and kept as one per bag for release. Reptiles will be captured using gloves and placed in a plastic tub for transport
- As the water level drops, the dam wall will be partially and progressively removed and stabilised to prevent refilling. A ramp will be graded as the wall is removed to allow any fauna in the bottom sediment to escape. This ramp will be left in place for two nights.

3.2.3 Relocation of captured fauna

The ecology team will nominate a suitable release site based on species and quantity of captured aquatic fauna.

Native fish are to be transported in aerated containers of dam water and gradually mixed with stream water to allow acclimatisation of fauna to the new environment. The host location will be large enough to accommodate additional fish, especially predatory eels.

Water from the receiving waterbody will be mixed slowly over 5 – 10 minutes with the tank water to allow fish to acclimatise to the new water quality.

Frogs will be released into dense aquatic and pond side vegetation to provide shelter against predators. Release will also preferably be undertaken after sunset.

All details of aquatic fauna captured and relocated will be recorded in a report after dam dewatering has occurred. Consent of the landholder will be required prior to the relocation into a dam or waterway outside of the Project boundary.

3.2.4 Methods to prevent injury to fauna

Methods to prevent injury to fauna include:

- The use of gloves to limit the spread of disease
- Working slowly and methodically through the waterway to limit trampling of aquatic fauna
- Limit holding time in aerated containers to half an hour
- One frog per bag to minimise disease spread and possible toxin impact of one species on another
- Continually monitor holding tanks for sign of deterioration of health of aquatic fauna
- Shading of holding containers
- By having a release point nearby to minimise transportation time and stress to aquatic fauna
- The water will be released slowly and a mesh guard at the pump intake will limit intake of aquatic fauna.

3.2.5 Management of pest species and pathogens

Exotic aquatic life may inhabit the dams. Any pest non-native species will be euthanized, by the Aquatic Ecologist, who has been trained in humane methods for all aquatic non-native species.

To minimise the potential spread of pathogens, all personnel undertaking in-water work will ensure that decontamination processes are followed in accordance with relevant guidelines including Guide 7 of the *Biodiversity Guidelines* (RTA. 2011). Equipment that comes in contact with dam water or potentially contaminated sediments, such as boots and vehicle tyres, will be cleaned with an appropriate cleaning solution and/or disinfectant. Disposable gloves will be worn when handling aquatic flora and fauna.

3.3 Reuse and discharge of farm dam water

Water quality discharge criteria for reuse, for discharge to land and discharge to water are outlined in Section 3.3 of Appendix D of the CSWMP.

The reuse of farm dam water onsite or discharge of farm dam water to land or to water must be authorised by the CPBGG JV Environmental Site Representative who will confirm that the water quality criteria outlined in Section 3.3 of Appendix D of the CSWMP are met prior to reusing or discharging.

4 Records

The CPBGG JV will maintain records of relevant data, including records of species captured and relocated during the farm dam dewatering process.

4.1 Pre-dewatering report

The Project Ecologist or suitably qualified delegate will report the findings of the pre-dewatering survey within a pre-dewatering report. The CPBGG JV will include:

- Consultation with landowners to identify any fish species that may be present
- Presence of any fauna in habitats near the farm dam and their species
- Identify suitable translocation sites for each species
- Identify suitable methods of transport for each species.

4.2 Post-dewatering report

A record will be maintained for each dam to be dewatered that will include:

- Date and time of fauna capture
- Species captured
- Location of release for each species
- Date and time of release
- Details of personnel carrying out fauna capture and release and their qualifications and licenses to carry out the work.

The CPBGG JV will include this information within a post-dewatering report.