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18 November 2021

Ref: CFFMP Rev G

Dear Deanne,

**RE: Endorsement of M12 Motorway – Construction Flora and Fauna
Management Sub-plan Revision G**

Thank you for providing the following document for Environmental Representative (ER) review and endorsement as required by the Condition of Approval A34(d)(i) of the M12 Motorway approval (SSI 9364):

- M12 Motorway – Construction Flora and Fauna Management Sub-plan Revision G November 2021

I have reviewed the Overarching Construction Environmental Management Plan (OCEMP) and associated Sub-plans, which have been prepared by Transport for NSW. Previous versions of the subject document have been reviewed and updated following comments from the ER.

As an approved ER for the M12 Motorway project, I consider this OCEMP Sub-plan is consistent with the requirements under the project approval and may be submitted to the Planning Secretary for approval.

This endorsement is limited to the requirements of the Condition of Approval C4 and C5 relating to this plan. The OCEMP and associated Sub-plans are not part of this endorsement, as these endorsements will be provided separately.

The endorsement of this Sub-plan by a suitably qualified and experienced ecologist as per Condition of Approval C8 has been provided, the details of which are included on the Document Control page at the front of this plan.

Yours sincerely



George Kollias
Environmental Representative – M12 Motorway



Appendix B2

Construction Flora and Fauna Management Sub-plan

M12 Motorway

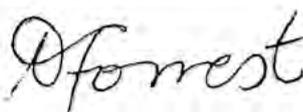
November 2021

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Document control

File Name	M12PPW-ADAP-ALL-EV-PLN-000001_E_S3_CFFMP
Title	M12 Motorway OCEMP Appendix B2 – Construction Flora and Fauna Management Sub-plan
Document Number (Teambinder)	M12PPW-ADAP-ALL-EV-PLN-000001

Approval and authorisation

Plan reviewed by:	Plan reviewed by:
Suzette Graham	Deanne Forrest
TfNSW Environment and Sustainability Manager	TfNSW Project Director, M12
16/11/2021	17/11/2021
	

Revision history

Revision	Date	Description
A	02/09/2020	First draft for TfNSW review
B	18/09/2020	Response to TfNSW comments
C	21/10/2020	Response to TfNSW comments
D	22/07/2021	Updated with Final State and Commonwealth CoAs
E	16/08/2021	Response to TfNSW and ER comments
F	02/09/2021	Response to TfNSW and ER comments
G	12/11/2021	Response to comments received during consultation



Ecologist endorsement

Plan reviewed by:	Qualifications and experience
Elvira Lanham	<p>PhD Reptile Ecology - Flinders University of South Australia B(Env)Sc(Life Sciences) (Hons) – University of Wollongong</p> <p>Elvira has over 25 years of experience as an ecologist, including recent biodiversity lead roles on the M12 Motorway, including development of the EPBC referral and amendment. Elvira has also managed and undertaken construction Project Ecologist duties on a diverse range of projects. Tasks have included; threatened species translocations, nest box installation and monitoring, clearing supervision etc.</p>
Signature:	 <p>Date: 17/12/2021</p>



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Appendix A	Consultation Correspondence
Appendix B	Secondary CoA and REMMs



Appendix C	Vegetation Clearing Procedure
Appendix D Finds Procedure	Unexpected Threatened Species and Threatened Ecological Communities (TECs)
Appendix E	Weed, Pest and Pathogen Plan
Appendix F	Habitat Compensation Plan
Appendix G	Snag Management Plan
Appendix H	Farm Dam Dewatering Procedure

Glossary/Abbreviations

Abbreviations	Expanded text
APVMA	Australian Pesticides and Veterinary Medicines Authority
AR	Amendment Report
ARSR	Amendment Report Submissions Report
BAR	Biodiversity Assessment Report
BC Act	<i>NSW Biodiversity Conservation Act 2016</i>
Best practice	A procedure or management measure that has been shown through experience, at the time of writing, to minimise environmental impact and that is established or proposed as a standard suitable for widespread adoption.
BOS	Biodiversity Offset Strategy
CCS	Community Communication Strategy
CEMP	Construction Environmental Management Plan
CFFMP	Construction Flora and Fauna Management Sub-plan
CoA	Condition of Approval
Commonwealth CoA	Federal Conditions of Approval under the EPBC Act
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, demolition of acquired residential houses, structures and sheds, and works specified in Appendix B and approved under an environmental management plan(s) in accordance with Condition A24
CSSI	Critical State Significant Infrastructure
CSWMP	Construction Soil and Water Management Plan
DAWE	Commonwealth Department of Agriculture, Water and the Environment
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
DPI	NSW Department of Primary Industries
DPIE	NSW Department of Planning, Industry and Environment

Abbreviations	Expanded text
EEC	Endangered Ecological Community
EES	Environmental, Energy and Science (a part of NSW DPIE)
EIS	Environmental Impact Statement
EMS	Environmental Management Systems
Environmental Assessment Documentation	Collective reference to the M12 EIS (Oct 2019), Submissions Report (Oct 2020), Amendment Report (Oct 2020), Amendment Report-Submissions Report (Dec 2020) and supplementary reports as detailed in NSW CoA A1
EP&A Act	<i>NSW Environmental Planning and Assessment Act 1979</i>
EPA	NSW Environment Protection Authority
EPBC Act	<i>Environmental Protection and Biodiversity Conservation Act 1999</i>
EPL	Environment Protection Licence
ER	Environmental Representative
ESM	Environment and Sustainability Manager
EWMS	Environmental Work Method Statements
FBA	<i>NSW Framework for Biodiversity Assessment 2014</i>
Federal Approval	Approval (EPBC 2018/8286) for carrying out the M12 Project under Part 8 of the <i>Environmental Protection and Biodiversity Conservation Act 1999</i> 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 <i>NSW Environmental Planning and Assessment Act 1979</i> where no new significant impacts to protected matters are identified.
FM Act	<i>NSW Fisheries Management Act 1994</i>
HCP	Habitat Compensation Plan
Infrastructure Approval	Approval (SSI 9364) for carrying out of the M12 Project under Section 5.19 of the <i>Environmental Planning and Assessment Act 1979</i> subject to specific CoA as detailed in Schedule 2 of the approval.
KFH	Key Fish Habitats
KTP	Key Threatening Processes
NASF	National Airports Safeguarding Framework
NPW Act	<i>NSW National Parks and Wildlife Act 1974</i>
NSW CoA	NSW Conditions of Approval
OCEMP	Overarching Construction Environmental Management Plan

Abbreviations	Expanded text
OEH	NSW Office of Environment and Heritage, now Environment Energy and Science
PBFD	Psittacine beak and feather disease
Pesticide Act	<i>NSW Pesticides Act 1999</i>
PCT	Plant Community Type
PDLP	Place, Design and Landscape Plan
PMST	Protected Matters Search Tool
POEO Act	<i>NSW Protection of the Environment Operations Act 1997</i>
Primary CoA/REMM	CoA or REMM that is specific to the development of this Plan
Project, the	M12 Motorway 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	<i>NSW Threatened Species Conservation Act 1995</i>
WSIA	Western Sydney International Airport
WSP	Western Sydney Parklands
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 Overarching Construction Environmental Management Plan (OCEMP) for the M12 Motorway (the Project).

This CFFMP has been prepared 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 applicable legislation and TfNSW Specifications.

1.2 Background and project description

Transport for New South Wales (TfNSW) is planning to construct and operate the M12 Motorway (the Project) to provide direct access between the Western Sydney International Airport (WSIA) at Badgerys Creek and Sydney's motorway network. The M12 Motorway would run between the M7 Motorway at Cecil Hills and The Northern Road at Luddenham for about 16 kilometres and is expected to be opened to traffic prior to opening of the Western Sydney International Airport.

The Project will be constructed in three separate stages under four separate construction contracts:

- M12 West (construct only contract) – between The Northern Road, Luddenham and about 250 metres east of Badgerys Creek
- M12 Central (construct only contract) – between about 500 metres west of South Creek and the Western Sydney Parklands at Cecil Road, Cecil Park
- M12 East (construct only contract) Elizabeth Drive connections south of Cecil Park
- M12 East (design and construct contract) – the M7/M12 interchange.

The Project is subject to an approval under Division 5.2 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) as Critical State Significant Infrastructure (CSSI). The Project is also a controlled action under Section 75 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), requiring a separate approval from the Australian Minister for the Environment.

An Environmental Impact Statement (EIS) was prepared to describe and assess the Project and recommend management measures to address impacts. The EIS was exhibited by the NSW Department of Planning, Industry and Environment (DPIE) for 34 days from 16 October 2019 to 18 November 2019 to give the community and stakeholders the opportunity to provide comment.

In accordance with Section 5.17 of the EP&A Act, the Secretary requested TfNSW to provide a response to submissions on 29 November 2019 to address the identified issues. Due to design developments since the exhibition of the EIS an Amendment Report has been developed to assess the impacts of these amendments. The Amendment Report was exhibited by DPIE 14 days from 21 October 2020 to 4 November 2020. Following exhibition of the Amendment Report, an Amendment Report to the Submissions Report (ARSR) was developed December 2020 to address the identified issues. This was followed by the ARSR – Amendment on 8 March 2021. Collectively the EIS,



Submission Report, Amendment Report, ARSR and ARSR amendment, which addressed biodiversity matters, only are herein referred to as Environmental Assessment Documentation.

The Project must be carried out generally in accordance with the EIS, Submissions Report, Amendment Report, Amendment Report-Submissions Report and the Amendment Report – Submissions Report (amendment) in accordance with NSW CoA A1. These documents are collectively referred to as the Environmental Assessment Documentation. The CSSI must also be carried out in accordance with all procedures, commitments, preventative actions, performance outcomes and mitigation measures set out in the Environmental Assessment Documentation as required by NSW CoA A2.

Approval for the Project under the EP&A Act was granted by the Minister for Planning on 23 April 2021 (SSI 9364). Approval for the Project under the EPBC Act was granted by the Commonwealth Minister for the Environment on 3 June 2021 (EPBC 2018/8286). The Project must be carried out in accordance with the terms of the NSW and Federal Approvals.

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 the Water, Agriculture and Environment (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 (Section 4 and Appendix B).

Revised areas of native vegetation impacted by the Project were identified for the detailed design for the West and Central stages of the Project. The M12 Detailed Design – Vegetation Clearing Report (GHD, 2021) completed for Central stage identified minor revisions to native vegetation directly impacted by the Project. The Biodiversity Consistency Assessment Memos for M12 Motorway - West Package Detailed Design (WSP, 2021) and M12 Motorway – Central Package Detailed Design (GHD, 2021) determined that the revised area of impact does not prevent the Project from being carried out generally in accordance with NSW CoA A1.

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.

Section 2 of the Project Overarching Construction Environmental Management Plan (OCEMP) provides a detailed project description.

1.3 Scope of the Plan

The OCEMP and Sub-plans are related to the construction phase only. Early Works, as defined in Appendix B of the State Infrastructure Approval and OCEMP Section 2.4 are not within the scope of the OCEMP and Sub-plans. Notwithstanding, where Early Works activities are undertaken during the construction phase, they will be governed by the approved OCEMP and Sub-plans.

The scope of this CFFMP is to describe how the Construction Contractors propose to manage potential flora and fauna impacts during construction of the Project. The Construction Contractor responsible for each stage of the Project (M12 West, M12 Central, both M12 East (Elizabeth Drive connections) and M12 East (M7/M12 interchange)) must use this CFFMP as the basis for their section specific CFFMP.

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 overarching Environmental Management System (EMS) for the Project is described in Section 3 of the OCEMP. The Construction Contractor delivering the Project will have certified EMSs consistent with the overarching EMS described in the OCEMP. The Construction Contractor will develop stage-specific CFFMPs in accordance with the OCEMP and their EMS.

This overarching CFFMP forms part of the environmental management framework for the Project, as described in Section 3.3 of the OCEMP.

The Construction Contractor will be required to develop, as part of their stage-specific CFFMPs, detailed procedures and plans to address specific requirements of the Conditions of Approval (CoA) and REMMs identified in this overarching CFFMP. The purpose of these environmental management documents in regard to minimisation and management of impacts on flora and fauna associated with the Project is outlined in Section 6 of this CFFMP.

Management Plans and guidance information for the environmental documentation to be prepared by the Construction Contractor are provided in the following to this overarching CFFMP include:

- Appendix A: Consultation correspondence
- Appendix B: Secondary CoA and REMMs
- Appendix C: Vegetation Clearing Procedure
- Appendix D: Unexpected Threatened Species and Threatened Ecological Communities (TECs) Finds Procedure
- Appendix E: Weed and Pathogen Management Plan
- Appendix F: Habitat Compensation Plan
- Appendix G: Snag Management Plan
- Appendix H: Farm Dam Dewatering Procedure.

The Construction Contractor will complete the preparation of the documentation contained in the appendices with stage specific information and include the updated appendices in their CFFMPs.

Where appropriate, the Construction Contractor may provide TfNSW with an alternative equivalent procedure or plan that meets the requirements identified in this CFFMP and the relevant TfNSW specifications. Should this occur the same or greater mitigation outcomes should be achieved. TfNSW will review the Construction Contractors documentation to confirm consistency with the requirements of this CFFMP and specifications.

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. A template EWMS for use by the Construction Contractor is provided in Appendix A8 of the OCEMP.

EWMS will be prepared for:

- Activities that impact on or are carried out in proximity to:
 - Threatened ecological communities, including identified areas of:
 - Shale Gravel Transition Forest in the Sydney Basin Bioregion
 - 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, Badgerys Creek, South Creek, Kemps Creek, Hinchinbrook Creek and Doujon Lake.
- 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 Construction Contractors Environmental Site Representative 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 OCEMP, strategies, procedures and EWMS form management guides that clearly identify required environmental management actions for reference by TfNSW and its Construction Contractor.

The review and document control processes for this CFFMP are described in Section 7 of the OCEMP.

1.4.1 CFFMP preparation, endorsement and approval

This overarching CFFMP has been prepared to satisfy the NSW and Commonwealth CoA's in relation to flora and fauna management during construction of the Project.

This CFFMP has been reviewed by the TfNSW Project Director and the ESM (or delegate) and endorsed by a suitably qualified and experienced ecologist and the ER prior to submission to the Secretary of DPIE for approval. This CFFMP will be submitted for the approval of the Secretary no later than one month prior to commencement of construction of the Project in accordance with NSW CoA C9.

In accordance with NSW CoA C10, construction of the Project will not commence prior to approval of the CFFMP by the Secretary.

1.4.2 CFFMP Submission

In accordance with Commonwealth CoA 16, the CFFMP will be submitted, with the OCEMP and other Sub-plans, electronically to the DAWE for information. Unless otherwise agreed to in writing by the Minister, each plan must be on the website within 20 business days of the date:

- a) That the plan was approved under the State Infrastructure approval, if the plan requires approval under the State Infrastructure approval; or
- b) That the plan was finalised and provided to the NSW Planning Secretary, if the plan is required for information under the State Infrastructure approval.

The CFFMP will be published on the website for the period for which this approval has effect, or as otherwise agreed by the DAWE in writing. Before the CFFMP is published, it will be edited to exclude or redact sensitive ecological data.

1.4.3 Interactions with other management plans

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

- Pre-clearing and post clearing surveys will be undertaken in accordance with Section 6.1 of this CFFMP
- 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 Construction Contractors Sensitive Area Plans detailed in the OCEMP
- 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 Waste and Resources Management Plan 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 Construction Contractor, 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 Construction Contractors 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.

A Project Biodiversity Offset Strategy has been developed and will be implemented by TfNSW in accordance with NSW CoA E2-E7 and REMM B4 to compensate for the loss of threatened species and Endangered Ecological Communities (EEC), which will be removed as a result of construction activities.

1.5 Consultation

1.5.1 Consultation for preparation of the CFFMP

The following government agencies and stakeholders will be consulted with during the development of this CFFMP, in accordance with NSW CoA C4(c) and Commonwealth CoA 5:

- Department of Primary Industries (DPI) Fisheries
- NSW Environment, Energy and Science (EES)
- Department of Agriculture, Water and Environment (DAWE)
- Penrith City Council (PCC)
- Liverpool City Council (LCC)
- Fairfield City Council (FCC).

In accordance with NSW CoA A5 (b), Table 1-1 provides a log of engagement or attempted engagement with the identified government agencies and stakeholders.

Table 1-1: Log of engagement with government agencies and stakeholders

Agency	Date	Person Contacted	Comment	Consultation Status
Department of Agriculture Water and the Environment	7 September 2021	DAWE Representative	TfNSW emailed CFFMP to DAWE requesting comment.	Open
	27 September 2021	TfNSW Representative	DAWE provided comment on the CFFMP via email.	Open
	October 2021	TfNSW Representative	TfNSW provided responses to DAWE comments and updated CFFMP	Closed

Agency	Date	Person Contacted	Comment	Consultation Status
DPI Fisheries	7 September 2021	DPI Fisheries Representative	TfNSW emailed CFFMP to DPI Fisheries requesting comment.	Open
	12 October 2021	TfNSW Representative	DPI Fisheries indicated that they have no comment on the CFFMP and that consultation requirements have been satisfied	Closed
NSW Environment, Energy and Science	7 September 2021	EES Representative	TfNSW emailed CFFMP to EES requesting comment.	Open
	15 September 2021	TfNSW Representative	EES emailed TfNSW stating that they would aim to send comments on the CFFMP by the 22/09/2021 and that they would be in touch if it looked unlikely that they would meet this deadline.	Open
	15 September 2021	EES Representative	TfNSW emailed EES requesting that EES keep them informed on how they are progressing with their comments on the CFFMP	Open
	23 September 2021	TfNSW Representative	EES notified TfNSW via email that they anticipated to complete their review of the CFFMP by the 28/09/2021 and requested confirmation on whether this date was acceptable.	Open
	24 September 2021	EES Representative	TfNSW confirmed that the extension to the 28/09/2021 was acceptable.	Open
	30 September 2021	TfNSW Representative	EES provided comment on the CFFMP via email.	Open
	October 2021	EES Representative	Updated plan and response table emailed to EES to demonstrate how comments have been addressed.	Closed
Fairfield City Council	7 September 2021	FCC Representative	TfNSW emailed CFFMP to FCC requesting comment.	Open
	22 September 2021	TfNSW Representative	FCC emailed comments regarding CFFMP to TfNSW. FCC found the CFFMP to be very comprehensive and that they had no further comments.	Closed

Agency	Date	Person Contacted	Comment	Consultation Status
Penrith City Council	7 September 2021	PCC Representative	TfNSW emailed CFFMP to PCC requesting comment.	Open
	22 September 2021	PCC Representative	TfNSW attempted to call PCC. Left a voicemail. Received no response.	Open
	29 September 2021	PCC Representative	TfNSW attempted to call Ari Fernando and Adam Wilkinson from PCC. Left a voicemail. Received a call back from Adam Wilkinson confirming that Ari was correct contact and that he had asked her to call TfNSW. No call was received.	Open
	7 October 2021	PCC Representative	TfNSW attempted to call PCC as they had yet to receive comments of CFFMP. Left voicemail.	Open
	7 October 2021	PCC Representative	TfNSW sent email to PCC informing that they had yet to receive any comments from them and that TfNSW would now be moving onto finalising the plans.	Closed
Liverpool City Council	7 September 2021	LCC Representative	TfNSW emailed CFFMP to LCC requesting comment.	Open
	22 September 2021	LCC Representative	TfNSW attempted to call LCC. Left a voicemail. Received no response.	Open
	29 September 2021	LCC Representative	TfNSW contacted LCC via phone to follow up. LCC requested that plan be resent.	Open
	29 September 2021	LCC Representative	TfNSW resent the CFFMP via teambinder and emailed LCC requesting confirmation on whether comments would be provided.	Open
	7 October 2021	LCC Representative	TfNSW called LCC representative as they had not yet received comment from them. LCC representative confirmed that comments would be sent through the following week. No comments received.	Closed

In accordance with NSW CoA A5, the consolidated evidence of the consultation undertaken for the preparation of the OCEMP is provided in Appendix A and the relevant comments are also appended to the applicable Sub-plan. Appendix A includes:

- Documentation of the engagement with the parties identified above that occurred prior to submitting the document to the Secretary for approval
- Documentation of the follow-up with the identified parties where feedback has not been provided to confirm that they have no feedback or have failed to provide feedback after repeated requests
- An outline of the issues raised by the identified parties, a summary of how they have been addressed and a cross reference to the section or Sub-plan of the OCEMP where the issue has been addressed
- A description of the outstanding issues raised by the identified parties and the reasons why they have not been addressed.

1.5.2 Ongoing consultation during Construction

Consultation between TfNSW and its Construction Contractor, 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 1-2.

Table 1-2: 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	Construction Contractor
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 implemented and referred to in:

- Environmental Assessment Documentation
- NSW CoA granted to the Project on 23 April 2021
- Commonwealth CoA granted to the Project on 3 June 2021
- TfNSW QA 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:

- Ensure full compliance with the relevant legislative requirements, CoA and environmental management measures
- 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 OCEMP. 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 A1 of the OCEMP.

3.1.3 Guidelines and standards

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

- TfNSW QA Specification G36 – Environmental Protection (Management System)
- TfNSW QA Specification G38 – Environmental Protection (Management System)
- TfNSW QA Specification G40 – Clearing and Grubbing
- TfNSW QA Specification R178 – Vegetation
- TfNSW QA 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).

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.

- 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)
- 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.
- WSPT lease agreement (AQ120616)
- PS311 – Environmental Design and Compliance, specifically:
 - M12 Detailed Design – 80% Vegetation Clearing Report (GHD, 2021)
 - M12 West (80% Vegetation Clearing Report) (WSP, 2021)
 - Biodiversity Consistency Assessment Memo for M12 Motorway - West Package Detailed Design (WSP, 2021)
 - Biodiversity Consistency Assessment Memo for M12 Motorway – Central Package Detailed Design (GHD, 2021)

3.2 Ministers Conditions of Approval

The primary NSW CoA relevant to the development of this Plan are listed in Table 3-1. Secondary conditions relevant to this Plan have been listed in Appendix B. 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	Applicability			Document Reference
		M12 West	M12 Central	M12 East	
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 1.5.1 Appendix A
	(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;	✓	✓	✓	OCEMP This CFFMP
	(k) for periodic review and update of the CEMP and all associated plans and programs.	✓	✓	✓	OCEMP Section 6.6

CoA No.	Condition Requirements	Applicability			Document Reference
		M12 West	M12 Central	M12 East	
C4	<p>The following CEMP Sub-plans must be prepared in consultation with the relevant agencies and other 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.</p> <p>(c) Flora and Fauna – DPI Fisheries, EES, DAWE and relevant Council(s)</p>	✓	✓	✓	Section 1.5.1 Appendix A
C5	<p>The CEMP Sub-plans must state how:</p> <p>(a) the environmental performance outcomes identified in the documents listed in Condition A1 will be achieved;</p>	✓	✓	✓	Section 2.2 Section 2.3 Section 3.2 Section 3.3 Section 6
	<p>(b) the mitigation measures identified in the documents listed in Condition A1 will be implemented;</p>	✓	✓	✓	Section 3.2 Section 3.3 Section 3.4 Section 6 Table 6-2
	<p>(c) the relevant terms of this approval will be complied with; and</p>	✓	✓	✓	Section 3.2 Section 3.3 Section 6 Table 6-2

CoA No.	Condition Requirements	Applicability			Document Reference
		M12 West	M12 Central	M12 East	
	(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 8 OCEMP Section 4.1 Section 5.3
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 C (Section 2.2)
	(c) pre-clearing measures for Cumberland Plain Land Snail known and potential habitat and measures to protect the White-bellied Sea Eagle nest;	✓	✓	✓	Appendix C (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 F Appendix G
	(e) details of proposed management and mitigation measures for each threatened species listed in Table 3 and <i>Pimelea spicata</i> (Spiked Rice-flower) if recorded in the surveys carried out under Condition E8;	✓	✓	✓	Section 6.3 Section 4.1.2
	(f) a weed, pest and pathogen management plan, including measures to minimise the spread of <i>Phytophthora cinnamomic</i> ;	✓	✓	✓	Appendix E
	(g) procedures for the dewatering of farm dams, including the relocation of aquatic fauna; and	✓	✓	✓	Appendix H
(h) protocols for incidental finds of threatened species and ecological communities within the construction boundary.	✓	✓	✓	Appendix D	

CoA No.	Condition Requirements	Applicability			Document Reference
		M12 West	M12 Central	M12 East	
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	✓	✓	✓	Section 1.4.1
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

3.3 EPBC Conditions of Approval

Table 3-2: Commonwealth CoA

CoA No.	Condition Requirements	Applicability			Document Reference
		M12 West	M12 Central	M12 East	
1	The approval holder must not clear in the locations identified in condition E8 of the State Infrastructure approval, until it has completed the additional surveys and provided the results to the Department as required by condition E8 of the State Infrastructure approval.		✓	✓	Section 4.1.2
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 <i>Pultenaea parviflora</i> individuals;	✓	✓	✓	Section 5.2.1
4(d)	The number of <i>Pimelea spicata</i> 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 (<i>Pteropus poliocephalus</i>);	✓	✓	✓	Section 5.2.1
4(f)	80.21 hectares of known foraging habitat for Swift Parrot (<i>Lathamus discolor</i>).	✓	✓	✓	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. Secondary REMMs relevant to this Plan are listed in Appendix B. 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	Applicability			CFFMP Reference
			M12 West	M12 Central	M12 East	
B01	A CFFMP will be prepared. The measures in the CFFMP will include:	Prior to construction	✓	✓	✓	This CFFMP
	• A site-specific induction		✓	✓	✓	OCEMP Section 5.3.1
	• Identification of clearing limits and exclusion fencing		✓	✓	✓	Section 6.3
	• Pre-clearance surveys		✓	✓	✓	Section 6.1
	• Vegetation clearing procedures		✓	✓	✓	Appendix C
	• An unexpected finds procedure		✓	✓	✓	Appendix D
	• Procedures for weed management and monitoring		✓	✓	✓	Section 6.7 Appendix E
	• A process for de-watering farm dams and the relocation of aquatic fauna		✓	✓	✓	Section 6.6 Appendix H
	• Provision of supplementary fauna habitat (e.g. nest boxes).		✓	✓	✓	Section 6.2 Appendix F



3.5 TfNSW QA Specifications

The TfNSW QA 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 Construction Contractors 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.

The Construction Contractor will incorporate the appropriate M12 TfNSW QA Specifications into the stage specific CFFMPs.

3.6 Western Sydney Parklands Trust (WSPT) Lease Agreement

Land within M12 Central and M12 East that is owned or adjacent to land owned by the WSPT is subject to requirements associated with lease agreement AQ120616. The WSPT lease agreement provides environmental protection management processes relevant to this CFFMP for land owned by WSPT.

The Land subject to the lease agreement must be managed in accordance with the agreed works requirements established within Annexure A of the agreement.

The Construction Contractor will incorporate the relevant agreed works requirements into the stage-specific CFFMP for M12 Central and M12 East where required. During construction, the Construction Contractor will liaise with TfNSW to ensure compliance with the terms of the lease agreement.

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) and the ARSR Amendment.

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

Key components of the Biodiversity Assessment Report methodology included:

- Desktop review of:
 - NSW BioNet Species Sightings data collection, managed by the EES
 - Protected Matters Search Tool, managed by DAWE
 - BioNet Vegetation Classification data collection managed by EES
 - BioNet Threatened Species data collection, managed by EES
 - 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 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 study area 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 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 study area
 - Three additional days of field survey between 16 January and 29 January 2020 for the amended construction footprint.
- 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

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:

- Shale Gravel Transition Forest in the Sydney Basin Bioregion (endangered)
- Cooks River/Castlereagh Ironbark Forest in the Sydney Basin Bioregion (endangered)
- Moist Shale Woodland in the Sydney Basin Bioregion (endangered)
- 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 study area and are listed below:

- Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest (critically endangered)
- Western Sydney Dry Rainforest and Moist Woodland on Shale (critically endangered).

The location of these TEC's in relation to the Project are depicted in Figure 4-1 and in the Sensitive Area Plans included at Appendix A6 of the OCEMP.

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
	<i>Dillwynia tenuifolia</i>	-	Vulnerable	Recorded
Juniper-leaved Grevillea	<i>Grevillea juniperina</i> subsp. <i>juniperina</i>	-	Vulnerable	-
	<i>Marsdenia viridiflora</i> subsp. <i>viridiflora</i>	-	Endangered population	-
Spiked Rice-flower	<i>Pimelea spicata</i>	Endangered	Endangered	-
Sydney Bush Pea	<i>Pultenaea parviflora</i>	Vulnerable	Endangered	Recorded

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 OCEMP. In accordance with NSW CoA E8 and Commonwealth CoA 1, additional surveys for the Spiked Rice-flower (*Pimelea Spicata*) were undertaken in potential habitat for this species 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. Both DPIE and DAWE have been notified of the results of these additional surveys



as per Commonwealth CoA 1. Documentation can be found at: <https://roads-waterways.transport.nsw.gov.au/projects/01documents/m12-motorway/m12-pimelea-spicata-survey-report-07-2021.pdf>.



Project construction boundary (CA for West and Central, Jul 2021; ARSR for East, Dec 2020)

- M12 West
- The amended project exclusion zones
- ~ Waterways

- Biodiversity certified land
- Threatened ecological communities (BC Act)**
- Cumberland Plain Woodland in the Sydney Basin Bioregion
- Cumberland Plain Woodland in the Sydney Basin Bioregion (derived grassland form)

- River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions
- Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions

Imagery: Aerometrex August 2020

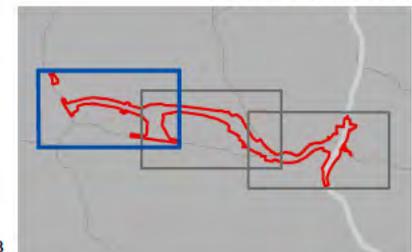
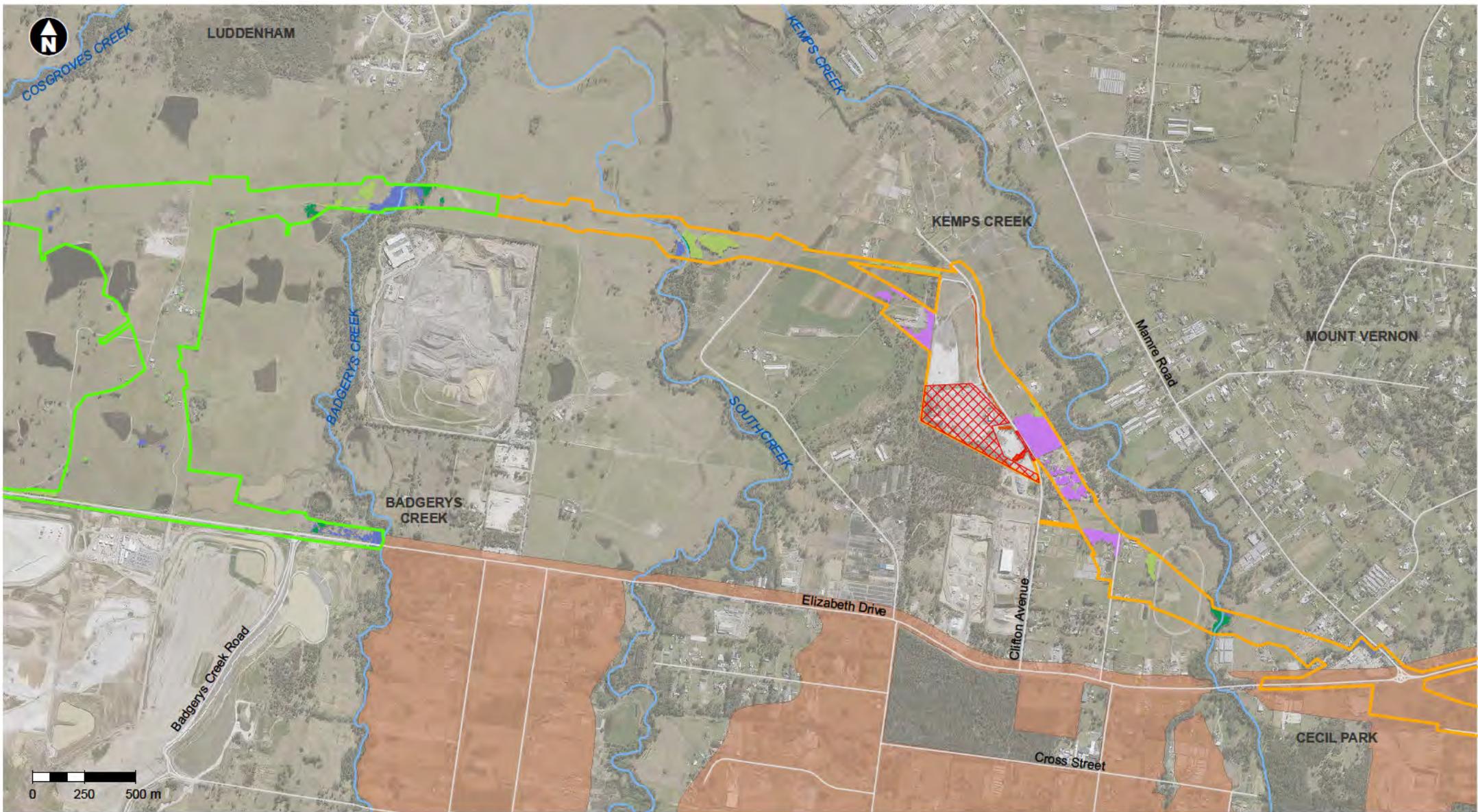


Figure 4-1 Threatened ecological communities

*The information illustrated is from the EIS/Amendment Report Page 1 of 3



Project construction boundary (CA for West and Central, Jul 2021; ARSR for East, Dec 2020)

- M12 West
- M12 Central
- The amended project exclusion zones
- Waterways

- Biodiversity certified land
- Threatened ecological communities (BC Act)**
- Cas Iereagh Scribbly Gum Woodland in the Sydney Basin Bioregion
- Cumberland Plain Woodland in the Sydney Basin Bioregion
- Cumberland Plain Woodland in the Sydney Basin Bioregion (derived grassland form)

- River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions
- Shale Gravel Transition Forest in the Sydney Basin Bioregion
- Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions

Imagery: Aerometrex August 2020

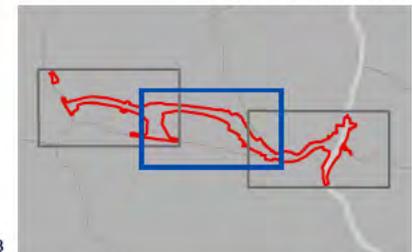
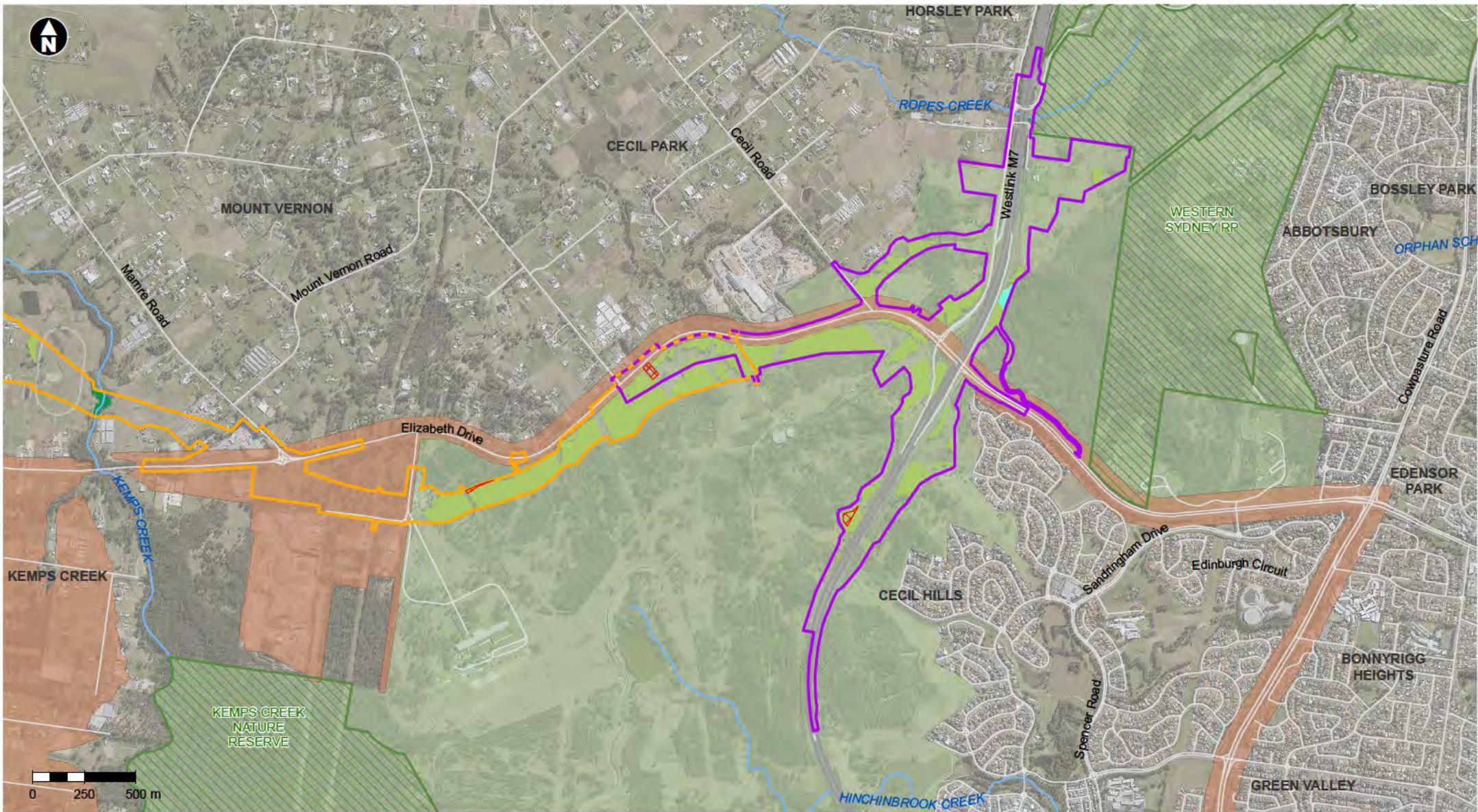


Figure 4-1 Threatened ecological communities

*The information illustrated is from the EIS/Amendment Report Page 2 of 3



Project construction boundary (CA for West and Central, Jul 2021; ARSR for East, Dec 2020)

- M12 Central
- M12 East
- The amended project exclusion zones
- Waterways

- Biodiversity certified land
- NPWS Reserves
- Western Sydney Parklands
- Threatened ecological communities (BC Act)**
 - Cumberland Plain Woodland in the Sydney Basin Bioregion
 - Moist Shale Woodland in the Sydney Basin Bioregion

- River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions
- Shale Gravel Transition Forest in the Sydney Basin Bioregion
- Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions

Imagery: Aerometrex August 2020

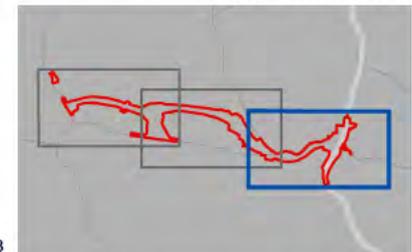


Figure 4-1 Threatened ecological communities

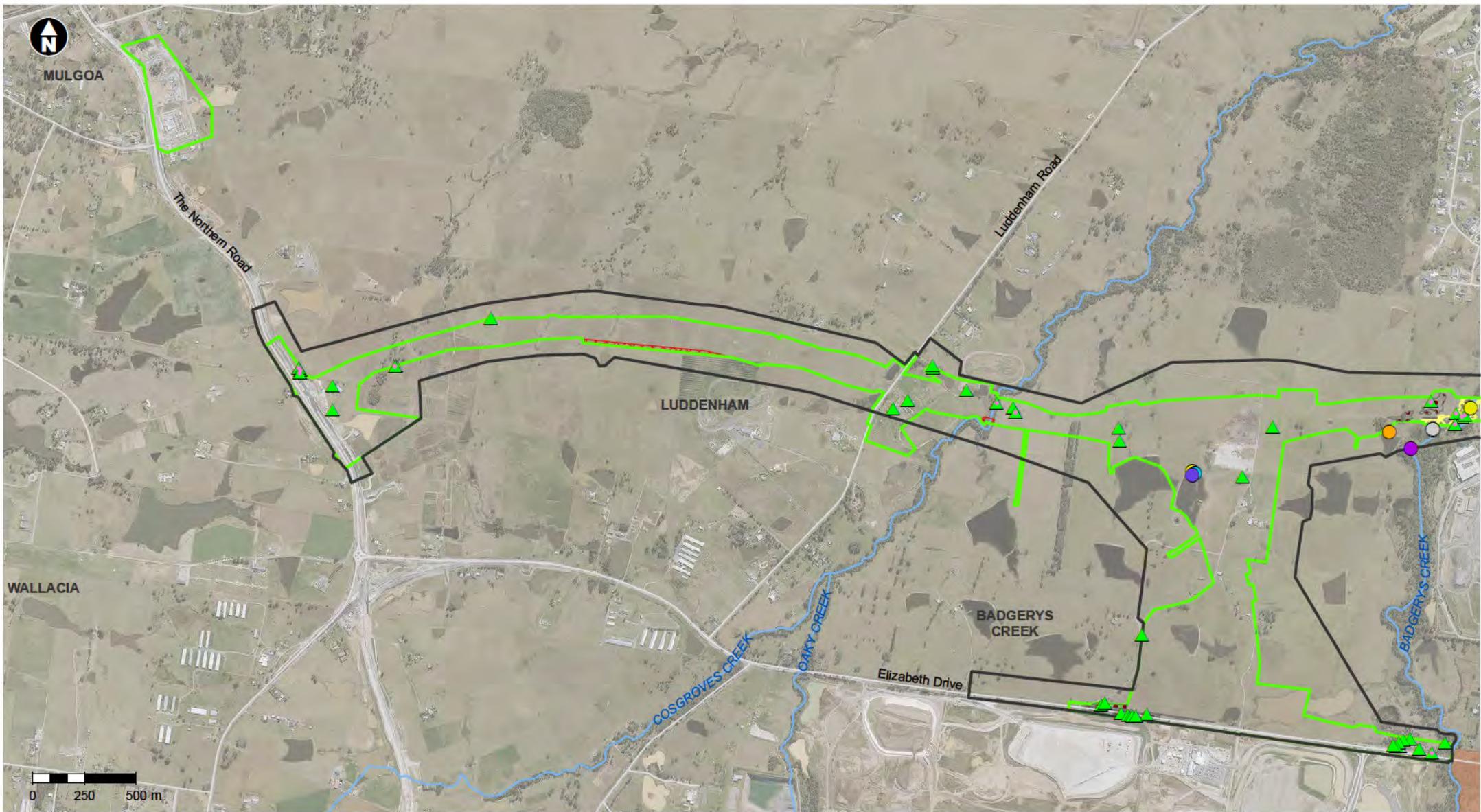
*The information illustrated is from the EIS/Amendment Report Page 3 of 3

4.1.3 Fauna habitat

Four fauna habitat types were identified within the 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 OCEMP.

Table 4-2: Fauna habitat types

Name	Habitat description
Woodland	<p>Dense understorey grasses, coarse woody debris and leaf litter provide shelter habitat for small terrestrial amphibians and reptiles.</p> <p>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.</p>
Riparian forest	<p>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 Kemps Creek and Badgerys Creek) support large mature Eucalyptus trees (some with small or medium sized hollows) and dense understorey vegetation able to support hollow-dependent fauna.</p>
Grassland	<p>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.</p> <p>Large, scattered paddock trees and stags occur within grassland habitat in some sections of the study area, some supporting small, medium and large hollows.</p> <p>Hollows within the grasslands of the 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.</p>
Wetlands and watercourses	<p>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.</p> <p>Most watercourses within the 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 study area is provided in 'Aquatic habitat' below.</p>



Project construction boundary (CA for West and Central, Jul 2021; ARSR for East, Dec 2020)

- M12 West
- Study area corridor
- The amended project exclusion zones
- ~~~~~ Waterways

- Biodiversity certified land
- Threatened fauna habitat**
- ▲ Hollow Bearing Tree (HBT)
- Southern Myotis breeding habitat
- Cumberland Plain Land Snail habitat
- Grey Headed Flying Fox habitat

- Threatened fauna species**
- Eastern Freetail-bat (NSW listed)
- Little Bentwing-bat (NSW listed)
- Yellow-bellied Sheath-tail-bat (NSW listed)
- Grey-headed Flying-fox (NSW listed & Commonwealth listed)
- White-bellied Sea-Eagle nest (NSW listed)
- Cumberland Plain Land Snail (NSW listed)
- White-bellied Sea-Eagle nesting habitat

Imagery: Aerometrex August 2020

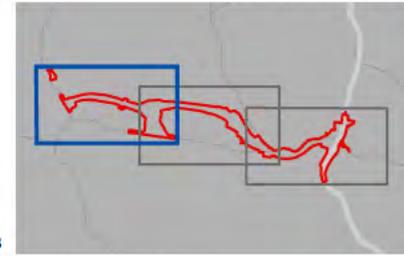
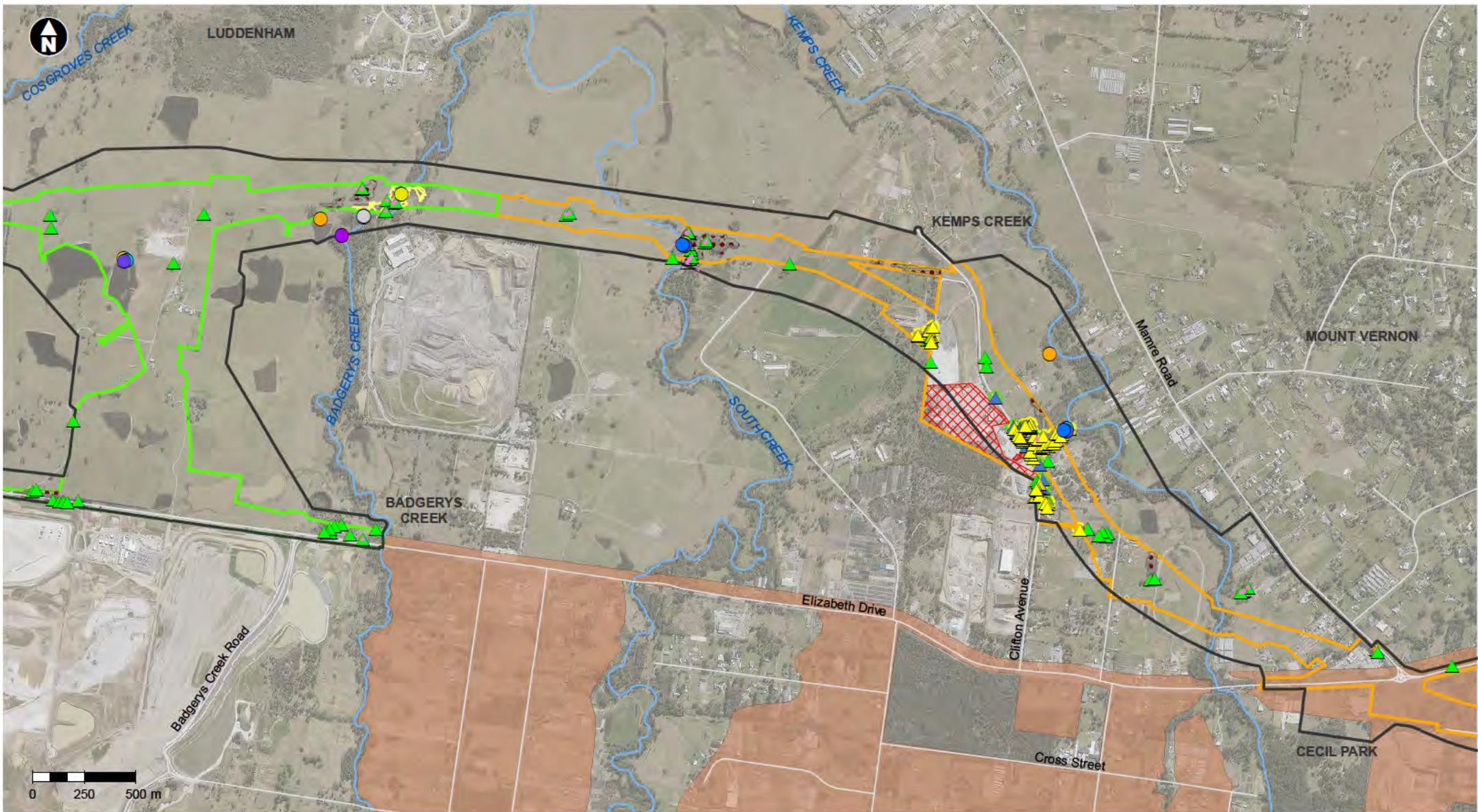


Figure 4-2 Threatened flora and fauna

*The information illustrated is from the EIS/Amendment Report Page 1 of 3



Project construction boundary (CA for West and Central, Jul 2021; ARSR for East, Dec 2020)

- M12 West
- M12 Central
- Study area corridor
- The amended project exclusion zones
- Waterways

- Biodiversity certified land
- Threatened fauna habitat**
- ▲ Hollow Bearing Tree (HBT)
- Southern Myotis breeding habitat
- Cumberland Plain Land Snail habitat
- Grey Headed Flying Fox habitat

- Threatened fauna species**
- Eastern Freetail-bat (NSW listed)
- Greater Broad-nosed bat (NSW listed)
- Little Bentwing-bat (NSW listed)
- Yellow-bellied Sheathtail-bat (NSW listed)
- Grey-headed Flying-fox (NSW listed & Commonwealth listed)
- White-bellied Sea-Eagle nest (NSW listed)
- Cumberland Plain Land Snail (NSW listed)
- White-bellied Sea-Eagle nesting habitat

- Threatened flora species**
- Pultenaea parviflora* area of occupancy
- Dillwynia tenuifolia* area of occupancy
- ▲ *Dillwynia tenuifolia*
- ▲ *Pultenaea parviflora*

*The information illustrated is from the EIS/Amendment Report Page 2 of 3

Imagery: Aerometrex August 2020

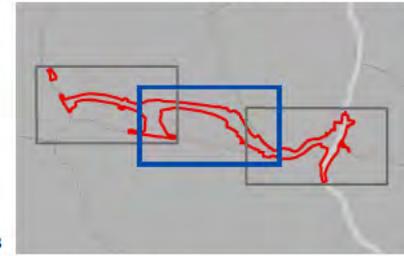
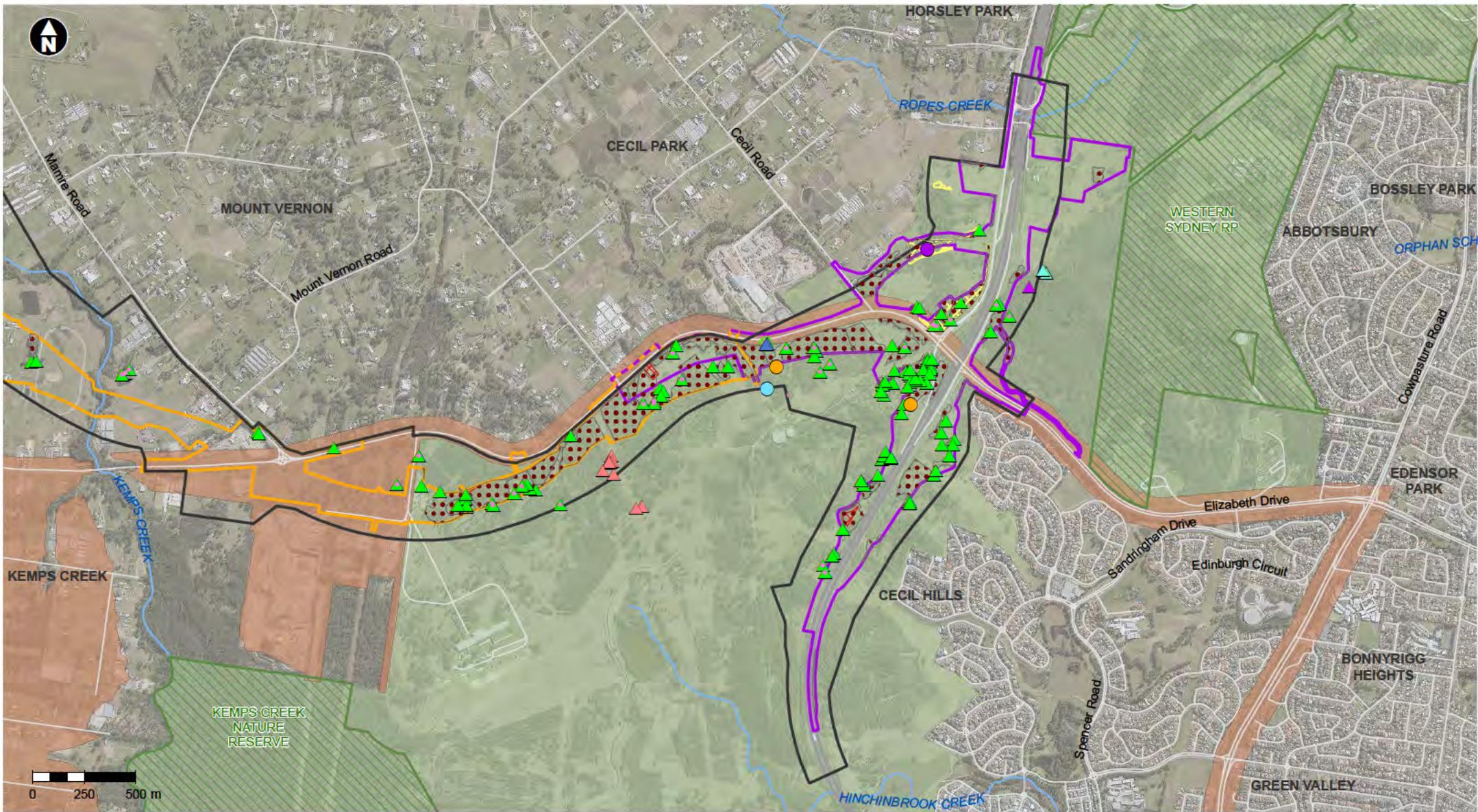


Figure 4-2 Threatened flora and fauna



Project construction boundary (CA for West and Central, Jul 2021; ARSR for East, Dec 2020)

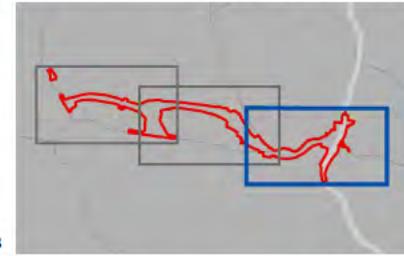
- M12 Central
- M12 East
- Study area corridor
- The amended project exclusion zones
- ~ Waterways

- Biodiversity certified land
- Western Sydney Parklands
- NPWS Reserves
- Threatened fauna habitat**
- ▲ Hollow Bearing Tree (HBT)
- Southern Myotis breeding habitat
- Cumberland Plain Land Snail habitat
- Grey Headed Flying Fox habitat

- Threatened fauna species**
- Eastern Bentwing-bat (NSW listed)
 - Grey-headed Flying-fox (NSW listed & Commonwealth listed)
 - Cumberland Plain Land Snail (NSW listed)

- Threatened flora species**
- Pultanea parviflora* area of occupancy
 - ▲ *Grevillea junipera* subsp. *junipera*
 - ▲ *Marsdenia viridiflora* subsp. *viridiflora*
 - ▲ *Pimelea spicata*
 - ▲ *Pultanea parviflora*

Imagery: Aerometrex August 2020



*The information illustrated is from the EIS/Amendment Report Page 3 of 3

Figure 4-2 Threatened flora and fauna

4.1.4 Threatened fauna

Threatened fauna species identified during survey (confirmed) and those which have been previously recorded in the 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)	<i>Micronomus norfolkensis</i>	-	Vulnerable	Recorded
Greater Broad-nosed Bat	<i>Scoteanax rueppellii</i>	-	Vulnerable	Recorded
Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	Vulnerable	Vulnerable	Recorded
Large Bent-winged Bat (formerly Eastern Bentwing-bat)	<i>Miniopterus orianae oceanensis</i>	-	Vulnerable	Recorded
Little Bent-winged Bat (formerly Little Bentwing-bat)	<i>Miniopterus australis</i>	-	Vulnerable	Recorded
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	-	Vulnerable	Recorded
Yellow-bellied Sheath-tail-bat	<i>Saccolaimus flaviventris</i>	-	Vulnerable	Recorded
Cumberland Plain Land Snail	<i>Meridolum corneovirens</i>	-	Endangered	Recorded
Eastern False Pipistrelle	<i>Falsistrellus tasmaniensis</i>	-	Vulnerable	Moderate
Southern Myotis (breeding)	<i>Myotis macropus</i>	-	Vulnerable	Moderate Potential breeding habitat recorded
Southern Myotis (forage habitat)				Moderate

4.1.5 Aquatic habitat

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

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 study area

Waterway	Stream order	Waterway class (Fairfull and Witheridge)	Key fish habitat (DPI Fisheries)	Sensitive receiving environment
Unnamed tributary of South Creek	1st	4 – unlikely fish habitat	Not mapped as key fish habitat.	No
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

Waterway	Stream order	Waterway class (Fairfull and Witheridge)	Key fish habitat (DPI Fisheries)	Sensitive receiving environment
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
South Creek	4th	2 – moderate fish habitat	Key fish habitat (Type 1) - highly sensitive key fish habitat. The creek is also currently mapped by DPI as key fish habitat (DPI, 2018).	Yes
Kemps Creek	4th	2 – moderate fish habitat	Key fish habitat (Type 1) - highly sensitive key fish habitat. The creek is also currently mapped by DPI as key fish habitat (DPI, 2018).	Yes
Unnamed tributary of Kemps Creek	3rd	4 – unlikely fish habitat	The creek is classified as key fish habitat based on DPI mapping (DPI, 2018). However, field assessments found that the waterway had limited aquatic habitat, and therefore this waterway was identified as key fish habitat (DPI, 2013).	No
Ropes Creek	1st	4 – unlikely fish habitat	Not mapped as key fish habitat.	No
Unnamed tributary of Ropes Creek	1st	4 – unlikely fish habitat	The creek is classified as key fish habitat based on DPI mapping (DPI, 2018). However, field assessments found that the waterway had limited aquatic habitat, and therefore this was waterway has not been identified as key fish habitat (DPI, 2013).	No
Unnamed tributary of Hinchinbrook Creek	2 nd	3 – minimal fish habitat	Key fish habitat (Type 3) – minimally sensitive key fish habitat. The creek is also mapped by DPI as key fish habitat (DPI, 2018).	Yes

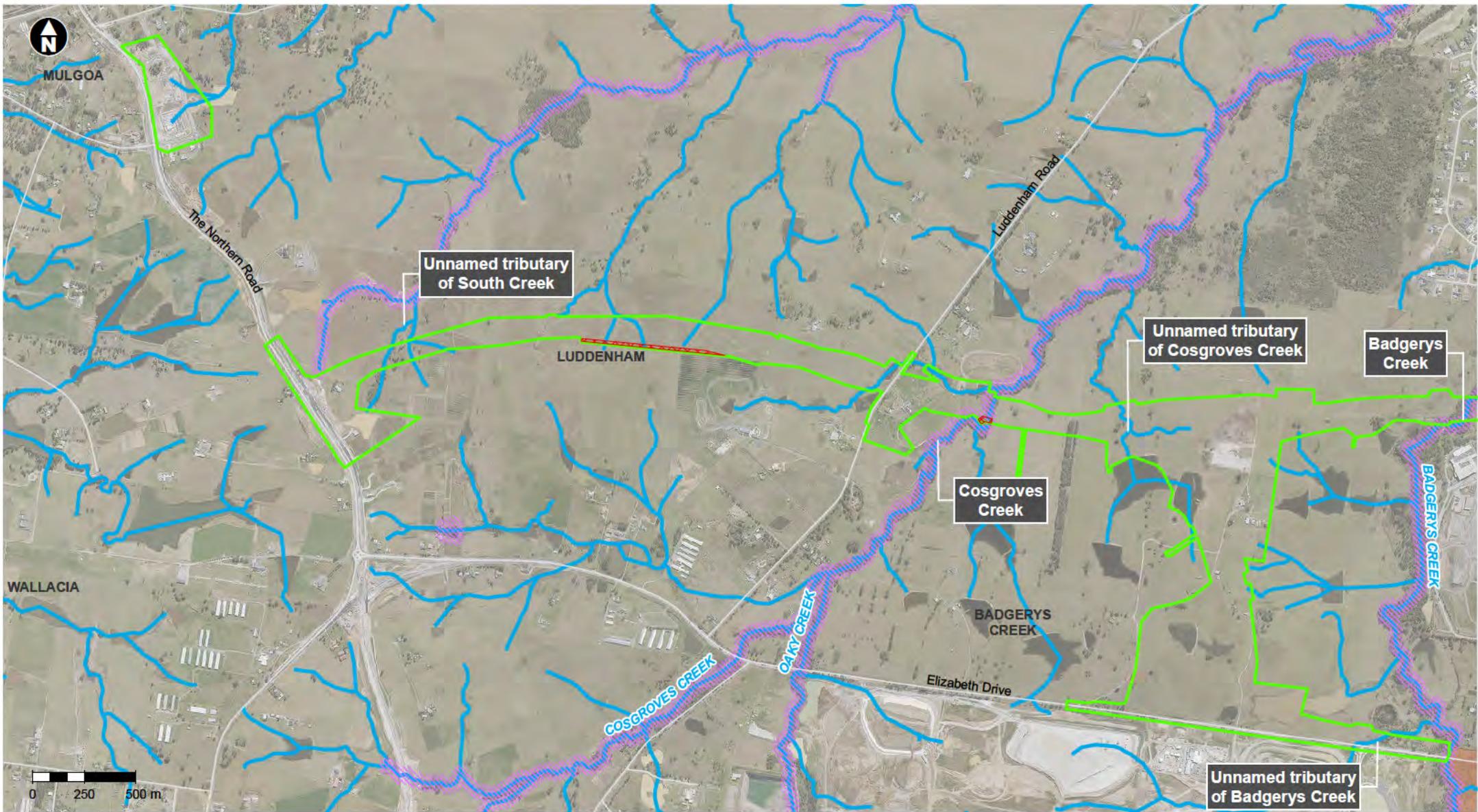
Waterway	Stream order	Waterway class (Fairfull and Witheridge)	Key fish habitat (DPI Fisheries)	Sensitive receiving environment
Doujon Lake	N/A (Lake)	2 – moderate fish habitat	Key fish habitat (Type 2) – moderate sensitive key fish habitat. Provides fish refuge and a variety of aquatic habitats (DPI, 2013).	Yes
Hinchinbrook Creek	4 th	2 – moderate fish habitat	Key fish habitat (Type 1) – highly sensitive key fish habitat. The creek is also mapped by DPI as key fish habitat (DPI, 2018).	Yes
Hinchinbrook Creek downstream of SEPP Coastal Wetland	4 th	1 – key fish habitat	Key fish habitat (Type 1) – highly sensitive key fish habitat. The creek is also 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
- Badgerys Creek
- South Creek
- Kemps Creek
- Unnamed tributary of Hinchinbrook Creek
- Doujon Lake
- Hinchinbrook Creek
- Hinchinbrook Creek downstream of SEPP Coastal Wetland.

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 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 study area. Subsequent habitat assessments and field surveys assessed that all 16 species have a low likelihood of occurrence in the study area.



Project construction boundary (CA for West and Central, Jul 2021; ARSR for East, Dec 2020)

- M12 West
- The amended project exclusion zones
- Biodiversity certified land

- Key Fish Habitat (DPI, 2007)
- ~ Waterways

Imagery: Aerometrex August 2020

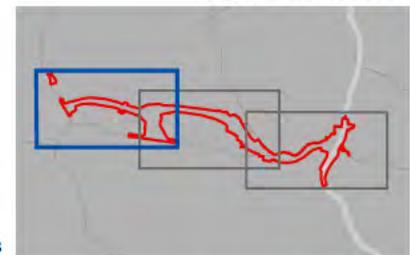
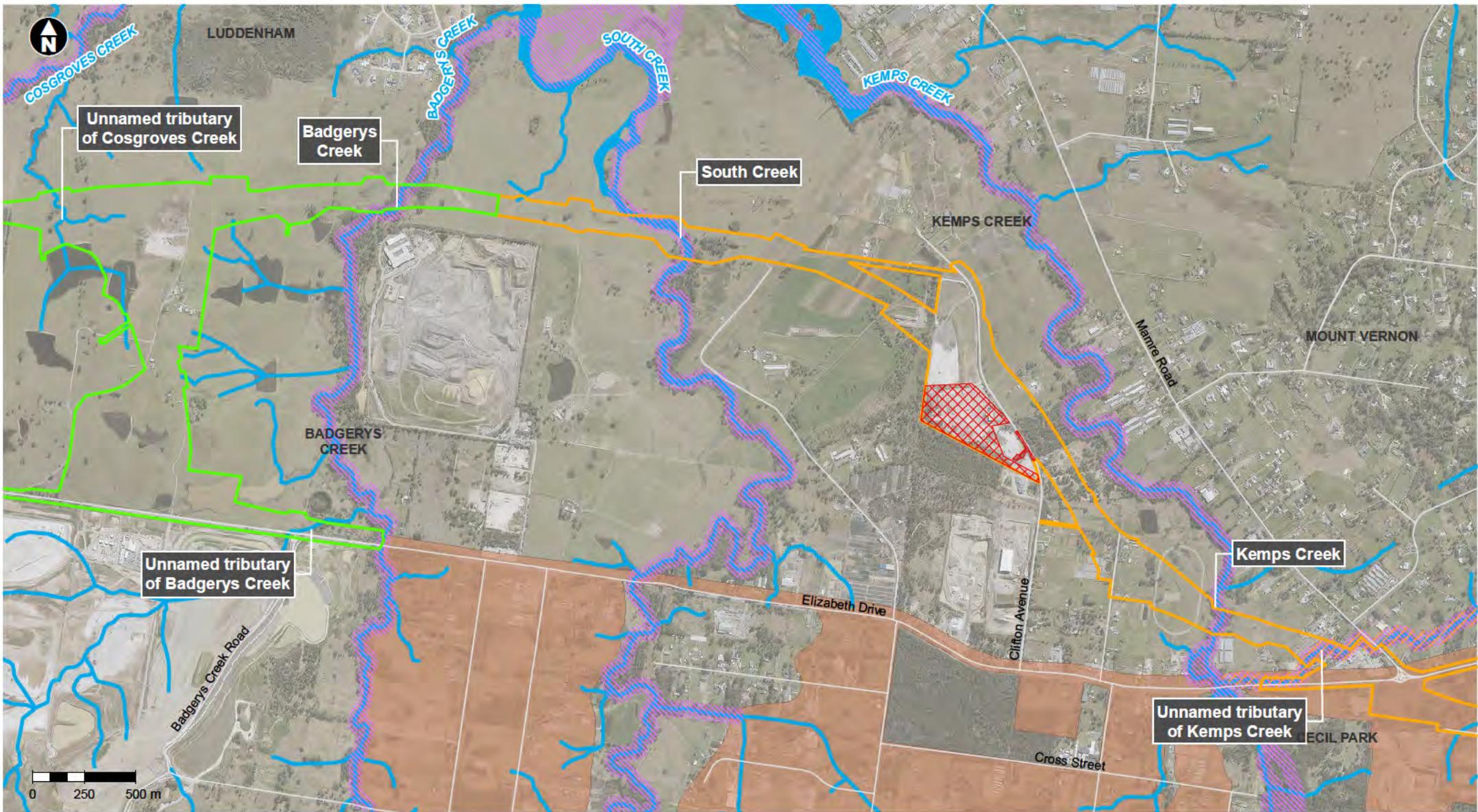


Figure 4-3 Key fish habitat



Project construction boundary (CA for West and Central, Jul 2021; ARSR for East, Dec 2020)

- █ M12 West
- █ M12 Central
- █ The amended project exclusion zones
- █ Biodiversity certified land

- █ Key Fish Habitat (DPI, 2007)
- █ Does not meet Key Fish Habitat definition (DPI, 2013)
- █ Waterways

Imagery: Aerometrex August 2020

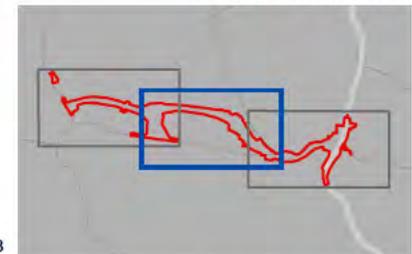
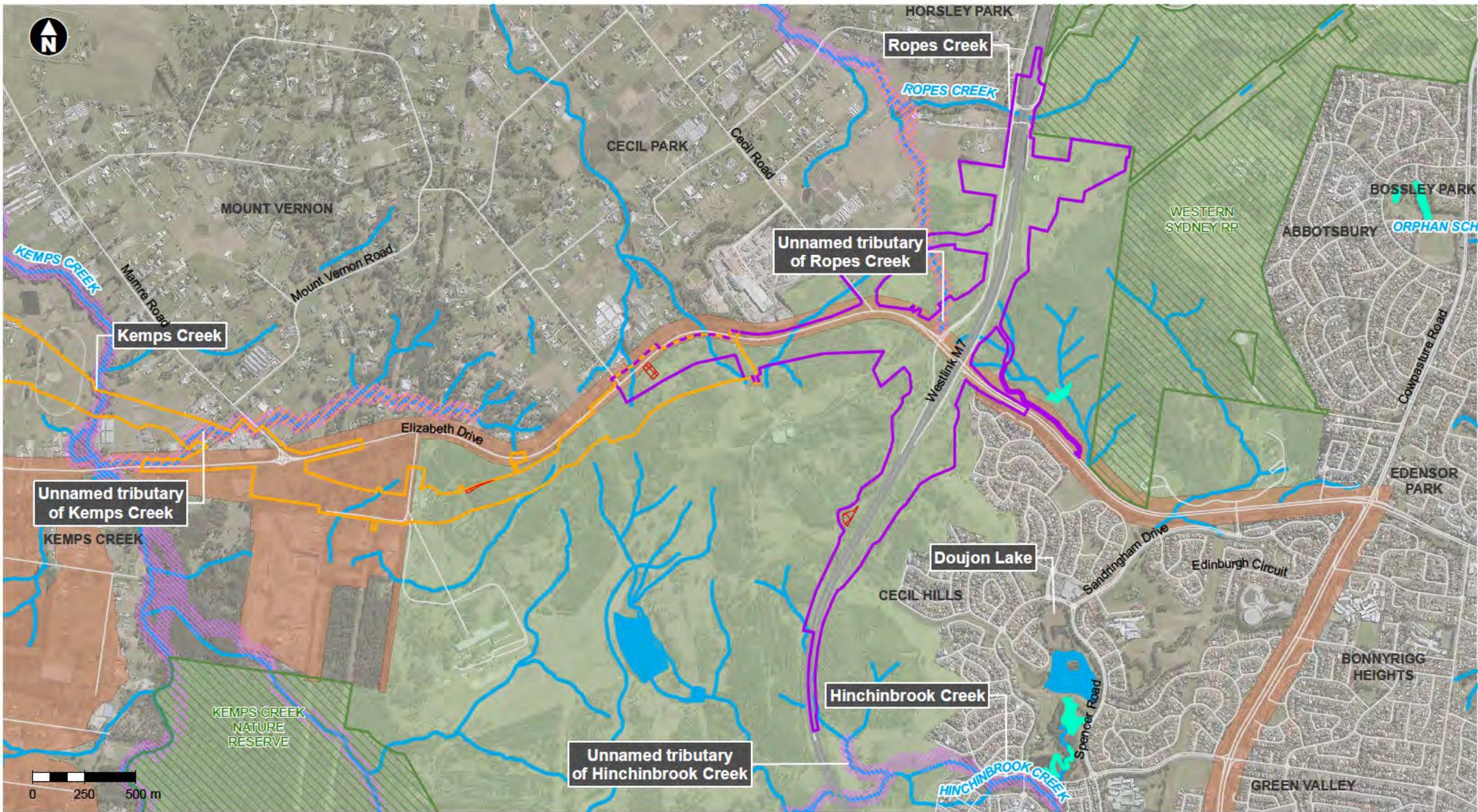


Figure 4-3 Key fish habitat



Project construction boundary (CA for West and Central, Jul 2021; ARSR for East, Dec 2020)

- M12 Central
- M12 East
- The amended project exclusion zones
- Biodiversity certified land
- Western Sydney Parklands

- Key Fish Habitat (DPI, 2007)
- Does not meet Key Fish Habitat definition (DPI, 2013)
- Coastal wetland
- NPWS Reserves
- ~ Waterways

Imagery: Aerometrex August 2020

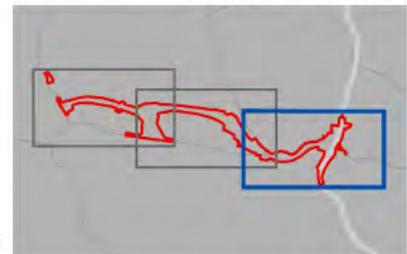


Figure 4-3 Key fish habitat

4.2 Matters of National Environmental Significance

4.2.1 Threatened species and ecological communities

Two TECs listed under the EPBC Act would be removed for the Project, Cumberland Plain Woodland and Western Sydney Dry Rainforest and Moist Woodland on Shale.

As stated in Section 4.1.2, two EPBC listed threatened flora species are located within or in the immediate vicinity of the study area, the Sydney Bush Pea (*Pultenaea parviflora*) and Spiked Rice flower (*Pimelea spicata*).

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

4.2.2 Migratory species

The 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 study area.

4.2.4 World and natural heritage

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

5 Environmental aspects and impacts

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)
- Works around and within watercourses
- Dewatering of dams
- 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 OCEMP.

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 80.78 hectares of native vegetation within the refined construction footprint. This native vegetation is located within 15 vegetation zones representing seven PCTs (corresponding to five 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.

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 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.

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)	Indirect impacts (ha)
724	Broad-leaved Ironbark - Grey Box - Melaleuca decora grassy open forest on clay/gravel soils of the Cumberland Plain, Sydney Basin Bioregion	1	724 - Moderate/ Good_High	Endangered	3.50	0.45
		2	724 - Moderate/ Good_Medium	Endangered	2.96	-
		3	724 - Moderate/ Good_Poor	Endangered	0.45	-
830	Forest Red Gum - Grey Box shrubby woodland on shale of the southern Cumberland Plain, Sydney Basin Bioregion	4	830 - Moderate/ Good_Poor	Endangered	0.44	0.61
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	3.18	-
849	Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion	6	849 - Moderate/ Good_Medium	Critically Endangered	3.64	0.57
		7	849 - Moderate/ Good_Poor	Critically Endangered	2.22	-
		8	849 - Moderate/ Good_Other (Derived Shrubland)	Critically Endangered	0.48	-
850	Grey Box - Forest Red Gum grassy woodland on shale of the southern Cumberland Plain, Sydney Basin Bioregion	9	850 - Moderate/ Good_High	Critically Endangered	3.29	1.61
		10	850 - Moderate/ Good_Medium	Critically Endangered	13.33	3.55

PCT No	Plant community type (PCT)	Veg zone code	Vegetation zone code within construction footprint	BC Act Status	Area directly impacted by Project (ha)	Indirect impacts (ha)
		11	850 - Moderate/ Good_Other (Revegetation)	Critically Endangered	24.58	5.95
		12	850 -Moderate/ Good_Poor	Critically Endangered	1.25	0.56
		13	850 - Low	Critically Endangered	18.07	-
883	Hard-leaved Scribbly Gum - Parramatta Red Gum heathy woodland of the Cumberland Plain, Sydney Basin Bioregion	14	883 - Poor	-	0.57	-
1800	Swamp Oak open forest on riverflats of the Cumberland Plain and Hunter valley	15	1800 - Moderate/ Good_Poor	Endangered	2.82	-
				TOTAL	80.78	13.30

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)	Indirect impact (ha)
724	Broad-leaved Ironbark - Grey Box - Melaleuca decora grassy open forest on clay/gravel soils of the Cumberland Plain, Sydney Basin Bioregion	Cumberland Plain Woodland in the Sydney Basin Bioregion	Critically Endangered	4.87	0.45
830	Forest Red Gum - Grey Box shrubby woodland on shale of the southern Cumberland Plain, Sydney Basin Bioregion	Western Sydney Dry Rainforest and Moist Woodland on Shale	Critically Endangered	0.44	0.61

PCT No.	PCT Name	EPBC Act TEC	EPBC Status	Area directly impacted by Project (ha)	Indirect impact (ha)
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	1.60	0.57
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	36.42	11.11
1800	Swamp Oak open forest on riverflats of the Cumberland Plain and Hunter valley	Swamp oak floodplain forest of the NSW North Coast, Sydney Basin and South East Corner bioregions	Endangered	0	0
			Total	43.33	12.74

Removal of threatened plants

The Project will result in impacts to two threatened plant species *Pultenaea parviflora* (listed as Endangered under the BC Act and Vulnerable under the EPBC Act) and *Dillwynia tenuifolia* (listed as Vulnerable under the BC Act).

Up to 100 individual plants of *Pultenaea parviflora* and 244 individual plants of *Dillwynia tenuifolia* will be removed for construction of the Project. MNES assessments determined that the Project would have a significant impact on *Pultenaea parviflora*.

Exclusion zones will be established around 139 *Pultenaea parviflora* plants and 44 *Dillwynia tenuifolia* plants in the road reserve on the western side of Clifton Avenue.

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.

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.

The BC Act listed endangered Cumberland Plain Land Snail has been recorded within the Project construction boundary; clearing of native vegetation will remove approximately 5.10 ha of suitable habitat for this species. Clearing of native vegetation would also remove approximately 1.05 ha of breeding habitat for the BC Act listed Southern Myotis.

The removal of about 62.71 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)
- 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)
	BC Act	EPBC Act	
Cumberland Plain Land Snail	Endangered	Not listed	5.10
Southern Myotis	Vulnerable	Not listed	1.05 (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 study area to identify key foraging trees and identify blossoming events. The Swift Parrot was not recorded within the Project study area during the surveys.

The foraging habitat available in the 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. These definitions and the specified amount approved for clearing under Federal Approval are outlined in Table 5-4.

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

Threatened Species	Foraging habitat as per the Federal Approval	Specified amount (ha)
Swift Parrot	The PCTs 724, 830, 835, 849, 850 and 1800 within the meaning of the NSW Bionet Vegetation Information System classification database.	80.21 ²
Grey-headed Flying-fox	The PCTs 850, 724, 849, 830, 835 and 1800 within the meaning of the NSW Bionet Vegetation Information System classification database.	62.71

The Construction Contractor will not clear more than the specified amount or another specified amount, determined in consultation with EES and DAWE in accordance with NSW CoA E4, within the final construction footprint.

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, Badgerys Creek, South Creek, Kemps Creek and Ropes Creek. Ropes Creek was assessed as unlikely fish habitat, however the other four provide moderate fish habitat and key fish habitat
- Installation of pipe culverts at three waterways which were assessed as unlikely fish habitat, these being unnamed tributaries of South Creek, Cosgroves Creek and Ropes Creek
- Potential 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

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

- 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 Kemps Creek, South Creek and Badgerys Creek.

Only one threatened fauna species, Cumberland Plain Land Snail, may be affected by further fragmentation of the riparian corridor along Badgerys Creek. Other threatened fauna recorded or assumed present within the study area are highly mobile flying species. Therefore, 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 study area have a high abundance of exotic species. Typically, weed invasion and spread is an indirect impact of projects that is often generated during construction by clearing vegetation and moving plant throughout the study area. Other Project activities, including earthworks and movement of soil, can also result in the dispersal and introduction of weeds throughout the study area.

A total of 14 introduced vertebrate fauna species were recorded within the study area during surveys. In addition to the 14 exotic fauna species, two additional native species recorded within the 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 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 study area, it is likely that the Project would increase the abundance of Noisy Miner in the study area and exacerbate this KTP.

Within the 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.

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 study area, and chytrid fungus is therefore considered unlikely to have a significant impact within the study area. As there are no threatened parrot species likely to occur within the study area, PBFD is unlikely to have a major impact within the study area.

5.2.7 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 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.

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.

5.2.9 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.

5.3 Cumulative impacts

The multitude of other projects in the area including 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 C 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 F)
- 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 Construction Contractor will update the Vegetation Clearing Procedure as required prior to the commencement of any pre-clearing activities. The Construction Contractor's updated Vegetation Clearing Procedure will also outline measures to ensure that clearing in M12 Central and M12 East is undertaken in accordance with the WSPT lease agreement where required.

The Construction Contractor will also prepare a stage-specific Clearing and Grubbing Plan in accordance with Specification TfNSW G40 and the WSPT lease agreement, where relevant, 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 Construction Contractor in accordance with Specification TfNSW G36 within the Clearing and Grubbing Plan, as required.

The Construction Contractor 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. 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 Construction Contractor's HCP.

6.1.1 Post-Clearing Report

At the completion of clearing, the Construction Contractor'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 C, Appendix F and Appendix G of this CFFMP.

The Construction Contractors 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 Construction Contractors CFFMPs.

6.2 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 Construction Contractor will include measures for the installation of hollow replacements within the Habitat Compensation Plan (Appendix F) 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 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 and at least annually
- Inspections of hollow replacements for maintenance requirements and replacement where required.

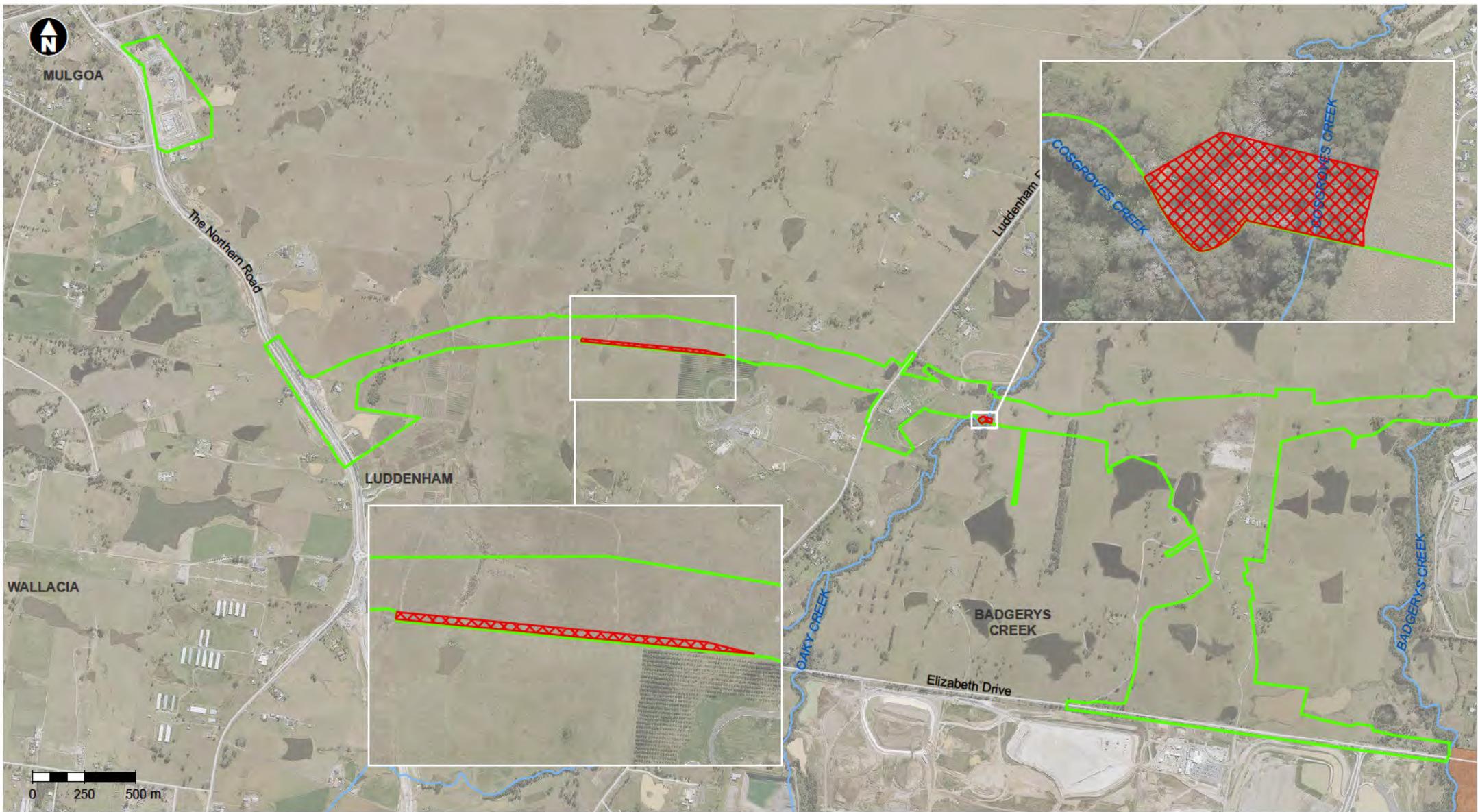
6.3 Exclusion zones

The Construction Contractor 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 C) and Specification TfNSW G40.

The Construction Contractor 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.

Exclusion zones will be established around 139 *Pultenaea parviflora* plants and 44 *Dillwynia tenuifolia* plants in the road reserve on the western side of Clifton Avenue, in accordance with standard TfNSW procedure.

Connectivity measures will be implemented in accordance with *Wildlife Connectivity Guidelines for Road Projects* (TfNSW, under preparation). Exclusion zones will maintain a minimum width of three metres below the Badgerys Creek, Cosgroves Creek, South Creek and Kemps 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.



Project construction boundary (CA for West and Central, Jul 2021; ARSR for East, Dec 2020)

- M12 West
- The amended project exclusion zones
- Biodiversity certified land
- ~ Waterways

Imagery: Aerometrex August 2020



Figure 6-1 Exclusion zones



Project construction boundary (CA for West and Central, Jul 2021; ARSR for East, Dec 2020)

- M12 West
- M12 Central
- The amended project exclusion zones
- Biodiversity certified land
- ~ Waterways

Imagery: Aerometrex August 2020

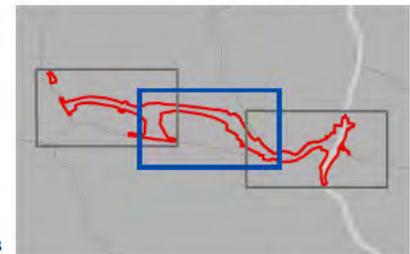
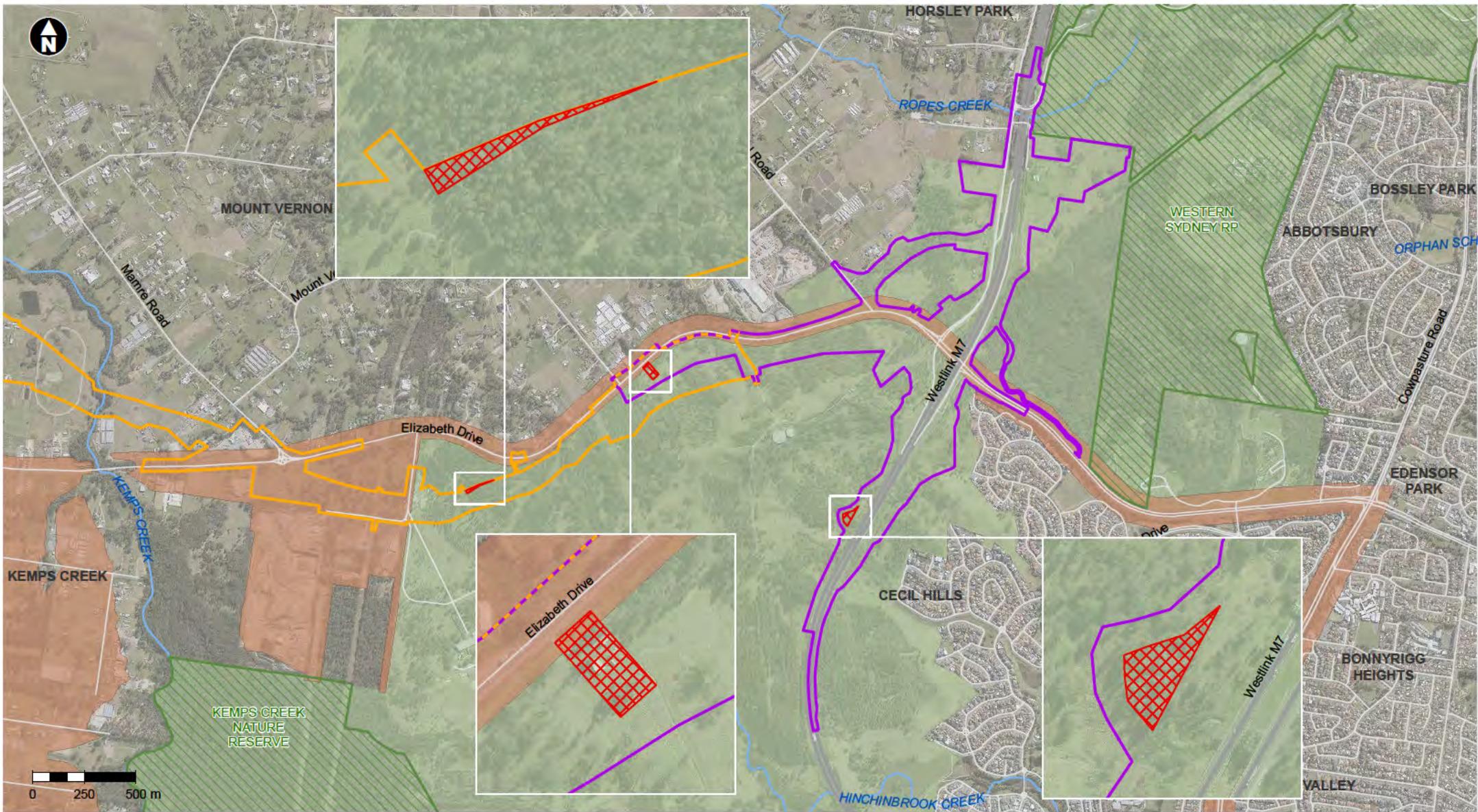


Figure 6-1 Exclusion zones



Project construction boundary (CA for West and Central, Jul 2021; ARSR for East, Dec 2020)

- M12 Central
- M12 East
- The amended project exclusion zones
- Biodiversity certified land

- NPWS Reserves
- Western Sydney Parklands
- Waterways

Imagery: Aerometrex August 2020

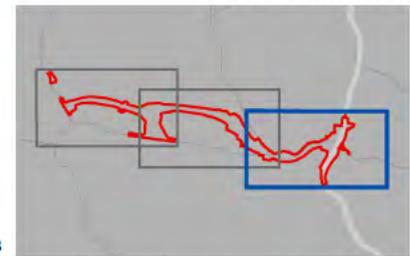


Figure 6-1 Exclusion zones

6.4 Coarse woody debris and snags

Woody debris and snags (branches, trunks and whole trees that fall into rivers and streams) provide important 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, Kemps Creek and South Creek will be in accordance with the Snag Management Plan (Appendix G) 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 F).

During clearing activities, the Construction Contractor 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 Construction Contractor 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

Prior to the commencement of vegetation clearing, if it is not possible to reuse all removed native trees and vegetation onsite, TfNSW will consult with the relevant council(s), Western Sydney

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

Parklands Trust, Landcare groups and relevant government agencies to determine possible off-site reuse in accordance with NSW CoA E15.

6.5 Aquatic and riparian habitat

The Construction Contractor 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 Section 6.8 of the CSWMP.

Discharged water quality will be managed in accordance with Appendix D of the CSWMP. The Project will be subject to EPL/s as a Scheduled Activity for 'road construction, however, in the absence of any specific EPL provision, to avoid causing pollution and breaches of section 120 of the POEO Act, any water discharged from site must align with the following discharge water quality criteria:

- pH: 6.5-8.5
- Total Suspended Solids: 50 mg/L

These values are derived from the ANZECC Guidelines for NSW Lowland Rivers and the Blue Book.

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 Construction Contractor will implement the detailed design to retain fauna passage at all four main creek lines (Cosgroves, South, Kemps and Badgerys 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 C). 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 G) 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 H. 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.

6.5.1 Permanent and temporary waterway crossings

Temporary waterway crossings will be required for the Project. The Construction Contractors 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 will be carried out by a suitably qualified and experienced professional in consultation with DPI Fisheries.

During construction of permanent waterway crossings, the Construction Contractor 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.

6.6 Weed, pest and pathogen control

Weed, pest 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 Construction Contractor will prepare a stage-specific Weed, Pest and Pathogen Management Plan prior to commencement of construction in accordance with the requirements of Guides 6 and 7 of the *Biodiversity Guidelines* (RTA, 2011), TfNSW specifications, and the Weed, Pest and Pathogen Management Plan provided in Appendix E 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, pests 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, pests and pathogens at each site
- Site assessment process
- Measures to prevent the introduction and spreading of weeds, pests 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, pest and pathogen control methods
- Disposal methods
- Arrangements for monitoring.

The Construction Contractors Weed, Pest and Pathogen Management Plans will be reviewed by TfNSW for consistency with the requirements of this overarching CFFMP, the CoA and the REMMS and appended to the Construction Contractors CFFMPs.

6.7 Unexpected threatened species finds

The Construction Contractor will prepare and implement stage-specific Unexpected Threatened Species or TEC Finds Procedures 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 develop management options
- Notification process for EES, DPI, DPIE and DAWE 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 Construction Contractors Unexpected Threatened Species or TEC Finds Procedures will be reviewed by TfNSW for consistency with the requirements of this overarching CFFMP, the CoA and the REMMS and appended to the Construction Contractors CFFMPs.

6.8 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 Construction Contractor 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 Construction Contractors Fauna Handling and Rescue Procedures will be reviewed by TfNSW for consistency with the requirements of this overarching CFFMP, the CoA and the REMMS and appended to the Construction Contractors CFFMPs.

6.9 Fauna mortality monitoring

Vehicle strikes is 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 Construction Contractors 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. Surveys will be required regularly following rainfall events, as well as during and following high risk activities such as vegetation clearing and dam dewatering.

6.10 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 OCEMP. 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 Construction Contractor 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 Construction Contractor 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 Construction Contractor will comply with the requirements of TfNSW Specifications R178 (Vegetation) and R179, including implementation of measures to avoid compaction of soils in revegetation areas and ensuring suitable moisture requirements are

maintained. The Construction Contractor will ensure that revegetation undertaken within land subject to the WSPT lease agreement is done so in accordance with the agreed works requirements. The Construction Contractor will regularly inspect, monitor and maintain revegetated areas in accordance with the requirements of R178 and R179.

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

6.11 Tree management strategy

In accordance with REMM LVIA15, the Construction Contractor will prepare a tree management strategy 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 with AS4970-2009 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 (2018) subject to long-term viability of the plant.

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 OCEMP.

6.12 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.

TfNSW will ensure that biodiversity offset obligations as set out in the State Infrastructure Approval are met within 12 months of construction commencing. Amendments to the ecosystem and species credit requirements will be undertaken by TfNSW in consultation with EES and DAWE and submitted to the Planning Secretary for approval, within six months of determining the final construction footprint for each stage as outlined in NSW CoA E4.

Where verification surveys are required they will be undertaken by TfNSW in consultation with EES. TfNSW will notify the DAWE 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 DAWE in writing of any change to biodiversity offset obligations within five days of the change being finalised.



6.13 Seed collection and propagation

The Construction Contractor 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 Construction Contractor set up a site nursery. If this is the case, the Construction Contractor 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 Construction Contractor 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 Construction Contractor will provide regular reports on seed collection activities, testing and any issues encountered to TfNSW.

6.14 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			Reference or source	Evidence of implementation
				M12 West	M12 Central	M12 East		
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	Construction Contractor	✓	✓	✓	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	Construction Contractor	✓	✓	✓	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.	Prior to construction	Project Ecologist	✓			NSW CoA C8 REMM B05	Site inspection report

ID	Management Measure	When to implement	Responsibility for implementation	Applicability			Reference or source	Evidence of implementation
				M12 West	M12 Central	M12 East		
	All site personnel will be informed of the location of the White-bellied Sea-eagle nest location during induction.	Prior to construction	Project Ecologist	✓			REMM B05	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
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

ID	Management Measure	When to implement	Responsibility for implementation	Applicability			Reference or source	Evidence of implementation
				M12 West	M12 Central	M12 East		
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	<p>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.</p> <p>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.</p>	Prior to construction	TfNSW	✓	✓	✓	NSW CoA E15	Consultation records Section 143 Notice Assessment Report

ID	Management Measure	When to implement	Responsibility for implementation	Applicability			Reference or source	Evidence of implementation
				M12 West	M12 Central	M12 East		
FF12	A report will be developed which: (a) includes a statement from an Ecologist that identifies the species and location of any weeds growing anywhere in the road reserve over the length to be cleared and grubbed (b) identifies all locations of threatened flora species and trees which have been marked or otherwise identified for preservation; and (c) lists any trees outside the limits of clearing which are unsound and likely to fall upon the roadway or onto private property.	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
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	Construction Contractor	✓	✓	✓	G40	Site inspection report

ID	Management Measure	When to implement	Responsibility for implementation	Applicability			Reference or source	Evidence of implementation
				M12 West	M12 Central	M12 East		
Exclusion Zones								
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	Construction Contractor	✓	✓	✓	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	Construction Contractor	✓	✓	✓	Best Practice	Site inspection report
FF19	Clearing limits will be identified on Sensitive Area Plans	Prior to clearing	Construction Contractor	✓	✓	✓	Best Practice	Sensitive Area Plans
Vegetation Clearing								
FF20	Clearing will be undertaken in accordance with the Vegetation Clearing Procedure (Appendix C)	During Construction	Construction Contractor	✓	✓	✓	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	Prior to and During Construction	Construction Contractor	✓	✓	✓	G40 REMM B10	Ecologist Report

ID	Management Measure	When to implement	Responsibility for implementation	Applicability			Reference or source	Evidence of implementation
				M12 West	M12 Central	M12 East		
	<p>immediately before construction commences in the area.</p> <p>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).</p> <p>All trees in these areas will be felled manually, leaving grasses and small understorey species wherever possible.</p>							
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	Construction Contractor	✓	✓	✓	REMM B10 G40	Clearing Reports
FF23	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	Construction Contractor	✓	✓	✓	REMM B07	Ecologist Report
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.	During construction	Construction Contractor	✓	✓	✓	G40 – Section 2.4	Site inspection report

ID	Management Measure	When to implement	Responsibility for implementation	Applicability			Reference or source	Evidence of implementation
				M12 West	M12 Central	M12 East		
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	Construction Contractor	✓	✓	✓	G40 – Section 2.4	Site inspection report
FF26	Trees remaining within the road reserve, but outside the limits of clearing, which the Principal and an arborist (diploma qualified) 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. The Project Ecologist will be consulted if any of these trees contain habitat features.	During construction	Construction Contractor	✓	✓	✓	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	Construction Contractor	✓	✓	✓	G40	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	Construction Contractor	✓	✓	✓	G40	Post clearing report

ID	Management Measure	When to implement	Responsibility for implementation	Applicability			Reference or source	Evidence of implementation
				M12 West	M12 Central	M12 East		
FF29	Holes left following the removal of trees and stumps will be backfilled and vegetated as described in Clause 3 of G40.	During construction	Construction Contractor	✓	✓	✓	G40 – Section 2.4	Site diary
Fauna Management								
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	Construction Contractor	✓	✓	✓	REMM B25	As built drawings Ecologist Report
FF31	Connectivity measures will be implemented in accordance with Wildlife Connectivity Guidelines for Road Projects (TfNSW, under preparation).	During construction	Construction Contractor	✓	✓	✓	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 subject to construction activities and staging.	During construction	Construction Contractor	✓	✓	✓	REMM B23	Arborist report Ecologist Report
FF33	The Construction Contractor will implement the detailed design to retain fauna passage at all four main creek lines (Cosgroves, South, Kemps and Badgerys Creeks).	During construction	Construction Contractor	✓	✓	✓	REMM B23	Ecologist report, Clearing and Grubbing Plan
FF34	The Construction Contractor will prepare a fauna mortality monitoring methodology in consultation with TfNSW.	Prior to construction, During construction	Construction Contractor	✓	✓	✓	G36	Fauna mortality register

ID	Management Measure	When to implement	Responsibility for implementation	Applicability			Reference or source	Evidence of implementation
				M12 West	M12 Central	M12 East		
FF35	The Construction Contractor 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	Construction Contractor	✓	✓	✓	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	Construction Contractor	✓	✓	✓	G36	Fauna mortality register
FF37	Any injury or death of threatened species will be reported to the Principal.	During construction	Construction Contractor	✓	✓	✓	G36	Incident Report
Weeds and Pathogens								
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	Construction Contractor	✓	✓	✓	REMM B26	Ecologist report
FF39	All staff will be made aware of the Priority Weeds present on-site and requirements	During construction	Construction Contractor	✓	✓	✓	G40	Site induction records

ID	Management Measure	When to implement	Responsibility for implementation	Applicability			Reference or source	Evidence of implementation
				M12 West	M12 Central	M12 East		
FF40	Weeds will be removed and disposed of in accordance with the requirements of the local Council.	During construction	Construction Contractor	✓	✓	✓	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	Construction Contractor	✓	✓	✓	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	Construction contractor	✓	✓	✓	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	Construction contractor	✓	✓	✓	G40	Waste Management Register
Lighting								
FF44	Where works are undertaken at night, direction lighting will be used and directed away from vegetated areas where practicable.	During construction	Construction Contractor	✓	✓	✓	REMM B28	Site inspection report
FF45	Works to be undertaken in accordance with the Snag Management Plan and Habitat Compensation Plan	During construction	Construction Contractor	✓	✓	✓	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	Construction Contractor	✓	✓	✓	NSW CoA E121	Ecologist report

ID	Management Measure	When to implement	Responsibility for implementation	Applicability			Reference or source	Evidence of implementation
				M12 West	M12 Central	M12 East		
FF47	Minimum flows will be maintained to assist in maintaining the viability of aquatic communities and preventing barriers to fish passage.	During construction	Construction Contractor	✓	✓	✓	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	Construction Contractor	✓	✓	✓	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	Construction Contractor	✓	✓	✓	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	Construction Contractor	✓	✓	✓	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 <i>Policy and Guidelines for Fish Habitat Conservation and Management</i> (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 <i>Policy and Guidelines for Fish Habitat</i>	Prior to commencement of work in KFH	Construction contractor	✓	✓	✓	NSW CoA E11 NSW CoA E12	Consultation records

ID	Management Measure	When to implement	Responsibility for implementation	Applicability			Reference or source	Evidence of implementation
				M12 West	M12 Central	M12 East		
	<i>Conservation and Management</i> (DPI, 2013 update) and in consultation with DPI Fisheries.							
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	Construction Contractor	✓	✓	✓	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	Construction Contractor	✓	✓	✓	G38	Site inspection report
Pesticide Use								
FF54	The use of pesticides will be in accordance with the <i>Pesticides Act 1999</i> (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	Construction Contractor	✓	✓	✓	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:	During construction	Construction Contractor	✓	✓	✓	G36	Records Sheet

ID	Management Measure	When to implement	Responsibility for implementation	Applicability			Reference or source	Evidence of implementation
				M12 West	M12 Central	M12 East		
	<p>(a) The pesticide is, or is part of a product that is widely available to the general public at retail outlets.</p> <p>(b) The pesticide is only applied by hand or by using hand-held equipment.</p> <p>(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.</p>							
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	Construction Contractor	✓	✓	✓	G36	Records Sheet
FF57	<p>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):</p> <ul style="list-style-type: none"> • Use of mechanical means of pest control (such as mowing or slashing) where feasible; or 	During construction	Construction Contractor	✓	✓	✓	G36	Records Sheet

ID	Management Measure	When to implement	Responsibility for implementation	Applicability			Reference or source	Evidence of implementation
				M12 West	M12 Central	M12 East		
	<ul style="list-style-type: none"> Use of hand-held application of pesticides where mechanical means of pest control are not feasible. 							
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	Construction Contractor	✓	✓	✓	G36	Records Sheet
Stockpile Management								
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	Construction Contractor	✓	✓	✓	G38	Site inspection report
FF60	Stockpiles will be located at least 5 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	Construction Contractor	✓	✓	✓	G38	Site inspection report
FF61	Topsoil that is not contaminated by priority weeds will be kept in stockpiles for later spreading on fill	During construction	Construction Contractor	✓	✓	✓	G38	Site inspection report

ID	Management Measure	When to implement	Responsibility for implementation	Applicability			Reference or source	Evidence of implementation
				M12 West	M12 Central	M12 East		
	batters and other areas. Other stockpiled material will be kept separate from the topsoil stockpiles.							
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	Construction Contractor	✓	✓	✓	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	Construction Contractor	✓	✓	✓	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	Construction Contractor	✓	✓	✓	R44 G40	Site inspection report
Mulch								
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	Construction Contractor	✓	✓	✓	G40	Post clearing report

ID	Management Measure	When to implement	Responsibility for implementation	Applicability			Reference or source	Evidence of implementation
				M12 West	M12 Central	M12 East		
FF66	Stockpiles will be monitored and turned over as required to avoid spontaneous combustion.	During construction	Construction Contractor	✓	✓	✓	G40	Site inspection report
FF67	Mulch in excess of the quantity required for landscape planting will not be stockpiled on site.	During construction	Construction Contractor	✓	✓	✓	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. The application of mulch for permanent landscaping will be designed and planned to avoid material and tannin runoff.	During construction	Construction Contractor	✓	✓	✓	REMM B18	Site inspection report
Bushfire								
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	Construction Contractor	✓	✓	✓	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	Construction Contractor	✓	✓	✓	Best practice	Safe Work Method Statement
FF71	The Construction Contractor 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.	During Early Works	Construction Contractor	✓	✓	✓	Best practice	Safe Work Method Statement

ID	Management Measure	When to implement	Responsibility for implementation	Applicability			Reference or source	Evidence of implementation
				M12 West	M12 Central	M12 East		
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	Construction Contractor	✓	✓	✓	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	Construction Contractor	✓	✓	✓	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	Construction Contractor	✓	✓	✓	Best practice	Safe Work Method Statement
FF75	Fire extinguishers will be available on all plant and equipment.	During Early Works	Construction Contractor	✓	✓	✓	Best practice	Safe Work Method Statement
Revegetation								
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	Construction Contractor	✓	✓	✓	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	Construction Contractor	✓	✓	✓	REMM B02 and B09	Post clearing report

ID	Management Measure	When to implement	Responsibility for implementation	Applicability			Reference or source	Evidence of implementation
				M12 West	M12 Central	M12 East		
FF78	Revegetation and the provision of replacement trees will be informed by the Tree Survey undertaken during detailed design of the Project.	During construction	Construction Contractor	✓	✓	✓	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	Construction contractor	✓	✓	✓	NSW CoA E109	Tree survey report
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	Construction Contractor	✓	✓	✓	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	Construction Contractor	✓	✓	✓	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 Roles and responsibilities

The Project organisational structure and overall roles and environmental responsibilities are outlined in Section 5.1 of the OCEMP. Specific responsibilities for the implementation of flora and fauna management are detailed in Section 6 of this CFFMP.

The Construction Contractor 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, pre-clearing processes, weed and pathogen management, fauna relocation and handling, and work in riparian zones, as outlined in Section 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 Construction Contractor's stage specific Construction Environmental Management Plan must to 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 Construction Contractors compliance report.

7.2 Training

All site personnel (including sub-Construction Contractor) 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 Construction Contractors CFFMP and all plans and procedures prepared under the CFFMPs
- Relevant legislation, regulations and Environment Protection Licence (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 Construction Contractor 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 5.3 of the OCEMP.

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.

Requirements and responsibilities in relation to monitoring and inspections are documented in Section 7.1 and Section 7.2 of the OCEMP.

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 7.4 of the OCEMP.

7.5 Reporting and identified records

Reporting requirements and responsibilities are documented in Section 7.5 of the OCEMP.

Specific reporting requirements associated with additional survey work and control of clearing activities are outlined in Table 7-1.

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

Report	Frequency	Responsibility
<p>Post Clearing Report</p> <p>Summary of the results of surveys, vegetation cleared, fauna rescues, fauna injury and mortality during clearing activities.</p> <p>Summary of areas of vegetation cleared and areas approved for clearing for the Project to be included in the Construction Compliance Reports.</p> <p>Summary of the reuse, relocation or disposal of hollows, coarse woody debris and snags.</p>	<p>Weekly, and a final report within 21 days from the completion of substantial clearing</p> <p>Six monthly</p>	<p>Contractor Site Environmental Representative Project Ecologist</p>
<p>Compliance Reports</p> <p>Summary of areas of vegetation cleared and areas approved for clearing for the Project.</p>	<p>Three monthly</p>	<p>Contractor Site Environmental Representative Project Ecologist</p>

The Construction Contractor 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 DPIE and DAWE upon request, within the timeframe nominated in the request.

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

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 Construction Contractor 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 4.1 of the OCEMP.

8.2 FFMP update and amendment

The processes described in Section 7.7 of the OCEMP 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 1.12 of the OCEMP.

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 7.6.2 of the OCEMP.

Appendix A

Consultation Correspondence

M12 Motorway

November 2021



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1 Introduction

As detailed in Section 1.5 of the CFFMP, in accordance with NSW CoA C4(c), consultation has been undertaken with the following government agencies and stakeholders during the preparation of the CFFMP:

- Department of Agriculture, Water and Environment (DAWE)
- Department of Primary Industries (DPI) Fisheries
- NSW Environment, Energy and Science (EES)
- Penrith City Council
- Liverpool City Council
- Fairfield City Council.

A log of the dates of engagement or attempted engagement with the parties identified above has been included in Section 1.5.1 of the CFFMP in accordance with NSW CoA A5(b). Section 2 details the evidence of engagement with each party and responses.

2 Agency and Stakeholder Responses

This section provides consultation documentation undertaken during the consultation period with parties including:

- Engagement with parties identified in NSW CoA C4(c) that occurred prior to the submission of the CFFMP for approval by the Planning Secretary as required by NSW CoA A5(a)
- A copy of the responses provided during consultation with the required parties
- A summary of the issues raised during consultation and how they have been addressed as required by NSW CoA A5(d). A description of the outstanding issues raised during consultation and why they have not been addressed has also been included where required as per NSW CoA A5(e).

2.1 Department of Agriculture, Water and Environment (DAWE)

This section details the engagement and response from DAWE regarding the CFFMP prior to submission for approval and a summary of how the issues have been addressed.

2.1.1 Evidence of correspondence and DAWE response

Evidence of correspondence between TfNSW and DAWE is provided in this section. It should be noted that DAWE's comments are contained within the email evidence provided below.

From: [Emily Wheatley](#)
To: [Suzette Graham](#)
Cc: [Alexi Williams](#)
Subject: RE: M12 Motorway (EPBC 2018/8286) - Overarching Construction Flora and Fauna Management Plan (Rev F) - for review [SEC=OFFICIAL]
Date: Monday, 27 September 2021 2:24:45 PM
Attachments: [image001.jpg](#)
[image002.jpg](#)

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Good afternoon Suzette,

Thank you for providing us the opportunity to comment on the Construction Flora and Fauna Management Plan (Rev F) for the M12 Motorway project. Apologies for the delay in our response. I was unsure how to correctly fill out the excel document attached, however our comments are minor so I have outlined them below:

- Include the EPBC referral number (EPBC 2018/8286) at Table 3-2 and where appropriate in the plan. Without the referral number, it is unclear what EPBC approval the plan relates to.
- Define what best practice is in relation to the management measures listed at Table 6-2.
- Where is pest management detailed in the plan? Will there be a separate Pest Management Plan drafted? (required under SSI 9364, C8 (f))

If you have any questions, please don't hesitate to contact me.

Regards,

Emily Wheatley

Assessment Officer | Post Approvals Section | [REDACTED]
Department of Agriculture, Water and the Environment
Environment Assessments (Vic, Tas) and Post Approvals Branch | Environment Approvals Division
GPO Box 858, CANBERRA ACT 2601
awe.gov.au



From: Suzette Graham via InEight Document [REDACTED]
Sent: Tuesday, 7 September 2021 2:53 PM
To: Post Approval [REDACTED]
Subject: M12 Motorway (EPBC 2018/8286) - Overarching Construction Flora and Fauna

Document Transmittal



Transmittal No: M12PPW-TFNSW-TX-000422

Date: 07 September 2021 02:52 PM

Reason for Issue: Issued For Review

Subject: M12 Motorway (EPBC 2018/8286) - Overarching Construction Flora and Fauna Management Plan (Rev F) - for review

Contract No: M12PPW - M12 - Project Wide

Message:

Hi,

As you are aware, Transport for NSW (TfNSW) is delivering the M12 Motorway Project (EPBC 2018/8286) between the M7 Motorway and The Northern Road.

The M12 Motorway is to be open by 2026 prior to the opening of the Western Sydney International Airport.

An overarching Construction Environmental Management Plan has been drafted and is ready for stakeholder feedback.

As required by Condition of Approval (CoA) C4(c) in the M12 Motorway Infrastructure Approval (23 April 2021), TfNSW is required to consult with DAWE in relation to the following construction environmental management sub-plans:

- Construction Flora and Fauna Management Plan (Rev F)

Please provide your comments using the attached MS Excel spreadsheet by **22/09/2021**.

If you have any questions in relation to this email, please contact me on the details below.

Kind regards,

Suzette Graham
Environment and Sustainability Manager

Sydney Infrastructure Development | Safety, Environment and Regulation

Transport for NSW
27 Argyle Street, Parramatta NSW 2150

I work flexibly. Unless it suits you, I don't expect you to read or respond to my emails outside of your normal work hours.

OFFICIAL

Your Response is required by 22 September 2021

Transmitted to:

Company	Name
Department of Agriculture, Water and the Environment	Post Approval

Transmitted cc:

Company	Name
Transport for NSW	Suzette Graham

[Click here to download all Transmittal files.](#)

Click on Document Nos to download them individually.

Item	Document No	Rev	Sts	Title	Contract No	Design Package No
1	M12PPW-TFNSW-ALL-EN-PLN-000014	F.01	S3	M12 Motorway Construction Flora and Fauna Management Plan (Rev F) - draft for consultation	M12PPW	

Transmitted by: Suzette Graham, Transport for NSW

TeamBinder Transmittal Reference: {61147C0A-3878-4650-A14E-53C8B67F22CC}

2.1.2 How issues raised have been addressed

The table below provides a summary of the issues raised by DAWE during consultation and how they were addressed.

Table 2-1: DAWE comments and TfNSW response

Section of comment	Comments	TfNSW Response	Section Amended
Table 3-2	Include the EPBC referral number (EPBC 2018/8286) at Table 3-2 and where appropriate in the plan. Without the referral number, it is unclear what EPBC approval the plan relates to.	<p>Section 1.2 of the CFFMP has been updated to state:</p> <p><i>“Approval for the Project under the EPBC Act was granted by the Commonwealth Minister for the Environment on 3 June 2021 (EPBC 2018/8286). The Project must be carried out in accordance with the terms of the NSW and Federal Approvals.”</i></p> <p>Additionally, the glossary has been updated to include two additional terms:</p> <ul style="list-style-type: none"> <i><u>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.</u></i> <i><u>Commonwealth CoA: Federal Conditions of Approval under the EPBC Act</u></i> <p>Table 3-2 is labelled as ‘Commonwealth CoA’ thus, the updates outlined above should clarify which EPBC approval the plan relates to.</p>	Section 1.2 Glossary
Table 6-2	Define what best practice is in relation to the management measures listed at Table 6-2.	<p>A definition for ‘best practice’ has been added to the glossary.</p> <p><i><u>“A procedure or management measure that has been shown through experience, at the time of writing, to minimise environmental impact and that is established or proposed as a standard suitable for widespread adoption.”</u></i></p>	Glossary
Appendix E	Where is pest management detailed in the plan? Will there be a separate Pest Management Plan drafted? (required under SSI 9364, C8 (f))	<p>Appendix E has been updated to include pest management.</p> <p>Updates have also been made to Section 2.2.1 of Appendix C to include requirements to <i><u>“survey for the presence of any weed and pest species within the construction site and adjacent areas”</u></i> during pre-clearing surveys.</p> <p>Additionally, Section 3.1 of Appendix C has been updated to require the inclusion of <i><u>the “identification of any pest animal species and measures to be employed to manage”</u></i> within the Pre-Clearing Survey Report.</p>	Appendix E Appendix C (Section 2.2.1, Section 3.1)

2.2 Department of Primary Industries (DPI) Fisheries

This section details the engagement and response from DPI Fisheries regarding the CFFMP prior to submission for approval and a summary of how the issues have been addressed.

2.2.1 Evidence of correspondence

Evidence of correspondence between TfNSW and DAWE is provided in this section. It should be noted that DAWE's comments are contained within the email evidence provided below.

From: [Josi Hollywood](#)
To: [Suzette Graham](#)
Subject: DPI Fisheries - Consultation for M12 Motorway - Overarching CEMP
Date: Tuesday, 12 October 2021 3:05:58 PM
Attachments: [image001.png](#)
[C21-591 M12 Motorway - SSI-9364 - Request for Consultation on Conditions.pdf](#)

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Good afternoon Ms Graham,
Please find attached DPI Fisheries response to your request for consultation regarding the overarching Flora & Fauna Management Plan for the M12 Motorway.
If I can be further assistance, please contact me.
Regards,
Josi

Josi Hollywood | Fisheries Manager – Coastal Systems Unit
NSW Department of Primary Industries | Fisheries
Block E, Level 3, 84 Crown Street, Wollongong NSW 2500
ALL MAIL TO: DPI Fisheries, Attn: R. Philips, 1243 Bruxner Hwy, Wollongbar NSW [REDACTED]



Click on Document Nos to download them individually.

Item	Document No	Rev	Sts	Title	Contract No	Design Package No
1	M12PPW-TFNSW-ALL-EN-PLN-000014	F.01	S3	M12 Motorway Construction Flora and Fauna Management Plan (Rev F) - draft for consultation	M12PPW	

Transmitted by: Suzette Graham, Transport for NSW

Attachments:

M12 - Feedback on Document Comments or Responses.xlsx(41KB)

2.2.2 DPI Fisheries response

Comments from EES regarding the CFFMP are provided below.

Our Ref: C21/591

6 October 2021

Your Ref: CSSI-9364

Transport for NSW
Ms Suzette Graham
Environment and Sustainability Manager
Sydney Infrastructure Development
Safety, Environment and Regulation
27 Argyle Street
Parramatta NSW 2150
[REDACTED]

Ms Graham,

Consultation for M12 Motorway Overarching Construction Environment Management Plan (OCEMP) Appendix B2 – Construction Flora and Fauna Management Sub-plan

Thank you for your referral seeking comment on the *M12 Motorway Overarching Construction Environment Management Plan (OCEMP) Appendix B2 – Construction Flora and Fauna Management Sub-plan* from DPI Fisheries, a division of NSW Department of Primary Industries on the proposed works stated above.

DPI Fisheries is responsible for ensuring that fish stocks are conserved and that there is no net loss of key fish habitats upon which they depend. To achieve this, DPI Fisheries ensures that developments comply with the requirements of the *Fisheries Management Act 1994* (FM Act) (namely the aquatic habitat protection and threatened species conservation provisions in Parts 7 and 7A of the Act, respectively), and the associated *Policy and Guidelines for Fish Habitat Conservation and Management (2013)*. DPI Fisheries is also responsible for ensuring the sustainable management of commercial, recreational and Aboriginal cultural fishing, aquaculture, marine parks and aquatic reserves within NSW.

DPI Fisheries has reviewed the *M12 Motorway Overarching Construction Environment Management Plan (OCEMP) Appendix B2 – Construction Flora and Fauna Management Sub-plan* (the Plan) and makes the following comments:

- DPI Fisheries makes no further comment on the Plan.
- This correspondence confirms that consultation has been sought by Transport for NSW regarding the Plan.
- This meets the requirements of Condition of Approval C4(c) made by the Minister for Planning and Public Spaces for CSSI-9364 on 23/04/2021.
- DPI Fisheries expects further consultation regarding Conditions of Approval E11, E12 and E13 regarding Key Fish Habitat later.

If you require any further information, please contact Josi Hollywood on [REDACTED]
[REDACTED]

Yours sincerely,



Scott Carter
Senior Fisheries Manager, Coastal Systems Unit

2.2.3 How issues raised have been addressed

The table below provides a summary of the issues raised by DPI Fisheries during consultation and how they were addressed.

Table 2-2: DPI Fisheries comments and TfNSW response

Section of comment	Comments	TfNSW Response	Section Amended
CFFMP	DPI Fisheries confirmed that they have no further comment.	No action required	N/A

2.3 NSW Environment, Energy and Science (EES)

This section details the engagement and response from EES regarding the CFFMP prior to submission for approval and a summary of how the issues have been addressed.

2.3.1 Evidence of correspondence

Evidence of correspondence between EES and TfNSW is provided below.

From: [Shaun Hunt](#)
To: [Suzette Graham](#)
Subject: RE: HPE CM: M12 Motorway
Date: Thursday, 30 September 2021 8:21:32 AM
Attachments: [image001.jpg](#)
[image002.jpg](#)
[image003.jpg](#)
[image004.jpg](#)
[EES response - CFFMP consultation.pdf](#)
[Copy of M12 - spreadsheet for Feedback on Document Comments or Responses\(3\).xlsx](#)

CAUTION: This email is sent from an external source. Do not click any links or open attachments unless you recognise the sender and know the content is safe.

Hi Suzette,

Please find attached response from EES on the draft CFFMP. I have copied the points raised into the spreadsheet provided.

If you wish to discuss any of our comments please don't hesitate to contact me.

Kind Regards,

Shaun Hunt
Senior Conservation Planning Officer

Biodiversity and Conservation | Department of Planning, Industry and Environment

[REDACTED] 2150 | Locked Bag 5022

www.dpie.nsw.gov.au



Our Vision: Together, we create thriving environments, communities and economies.

The Department of Planning, Industry and Environment acknowledges that it stands on Aboriginal land. We acknowledge the traditional custodians of the land and we show our respect for elders past, present and emerging through thoughtful and collaborative approaches to our work, seeking to demonstrate our ongoing commitment to providing places in which Aboriginal people are included socially, culturally and economically.

From: Suzette Graham [REDACTED]
Sent: Friday, 24 September 2021 11:36 AM
To: Shaun Hunt [REDACTED]
Subject: RE: HPE CM: M12 Motorway

Hi Shaun,

Thanks for getting in touch. Confirming the extension for comments is ok.

Thank you,

Kind regards,
Suzette Graham
Environment and Sustainability Manager
Sydney Infrastructure Development | Safety, Environment and Regulation

Transport for NSW
27 Argyle Street, Parramatta NSW 2150

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From: Shaun Hunt [REDACTED]
Sent: Thursday, 23 September 2021 3:11 PM
To: Suzette Graham [REDACTED]
Subject: RE: HPE CM: M12 Motorway

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Hi Suzette,

Further to my previous email, we expect to finish our review of the CFFMP by 28/9/21. As we are now past your anticipated deadline can you please confirm this slight extension is acceptable?

Kind Regards
Shaun Hunt
Senior Conservation Planning Officer

Biodiversity and Conservation | Department of Planning, Industry and Environment
[REDACTED]
Level 6, 12 Darcy St, 4 Parramatta Square, Parramatta NSW 2150 | Locked Bag 5022
www.dpie.nsw.gov.au



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From: Suzette Graham [REDACTED]
Sent: Wednesday, 15 September 2021 1:57 PM
To: Shaun Hunt <[REDACTED]>
Subject: RE: HPE CM: M12 Motorway

Hi Shaun,

Thanks for getting in touch and letting us know about a potential issue with the deadline.
Happy to stay in touch in regards to how EES is progressing.

Thanks,

Kind regards,
Suzette Graham
Environment and Sustainability Manager
Sydney Infrastructure Development | Safety, Environment and Regulation

Transport for NSW
27 Argyle Street, Parramatta NSW 2150

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From: Shaun Hunt [REDACTED]
Sent: Wednesday, 15 September 2021 1:14 PM
To: Suzette Graham [REDACTED]
Subject: RE: HPE CM: M12 Motorway

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Hello Suzette,

Thank you for consulting with EES on the Construction Flora and Fauna Management Plan for the M12 Motorway.

We will aim to have comments back to you by 22/9/21 however I will be in touch prior if it looks unlikely that we will meet this deadline for any reason.

Please don't hesitate to contact me if you need to discuss further.

Kind Regards,

Shaun Hunt
Senior Conservation Planning Officer

Biodiversity and Conservation | Department of Planning, Industry and Environment
[REDACTED]
Level 6, 12 Darcy St, 4 Parramatta Square, Parramatta NSW 2150 | Locked Bag 5022
www.dpie.nsw.gov.au



Our Vision: Together, we create thriving environments, communities and economies. *The Department of Planning, Industry and Environment acknowledges that it stands on Aboriginal land. We acknowledge the traditional custodians of the land and we show our respect for elders past, present and emerging through thoughtful and collaborative approaches to our work, seeking to demonstrate our ongoing commitment to providing places in which Aboriginal people are included socially, culturally and economically.*

From: Suzette Graham via InEight Document [REDACTED]

Sent: Tuesday, 7 September 2021 2:31 PM

To: Shaun Hunt [REDACTED]

Subject: HPE CM: M12 Motorway

Document Transmittal



Transmittal No: M12PPW-TFNSW-TX-000421

Date: 07 September 2021 02:30 PM

Reason for Issue: Issued For Review

Subject: M12 Motorway

Contract No: M12PPW - M12 - Project Wide

Message:

Dear Janne and Shaun,

As you are aware, Transport for NSW (TfNSW) is delivering the M12 Motorway Project between the M7 Motorway and The Northern Road.

The M12 Motorway is to be open by 2026 prior to the opening of the Western Sydney International Airport.

An overarching Construction Environmental Management Plan has been drafted and is ready for stakeholder feedback.

As required by Condition of Approval (CoA) C4(c) in the M12 Motorway Infrastructure Approval (23 April 2021), TfNSW is required to consult with EES in relation to the following construction environmental management sub-plans:

- Construction Flora and Fauna Management Plan

Please provide your comments using the attached MS Excel spreadsheet by **22/09/2021**.

If you have any questions in relation to this email, please contact me on the details below.

Kind regards,

Suzette Graham
Environment and Sustainability Manager

Sydney Infrastructure Development | Safety, Environment and Regulation

Transport for NSW
27 Argyle Street, Parramatta NSW 2150

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Please submit your comments by 22 September 2021

Transmitted to:

Company	Name
Environment Energy and Science Group	Janne Grosse
NSW Office of Environment & Heritage	Shaun Hunt

Transmitted cc:

Company	Name
Transport for NSW	Suzette Graham

[Click here to download all Transmittal files.](#)

Click on Document Nos to download them individually.

Item	Document No	Rev	Sts	Title	Contract No	Design Package No
1	M12PPW-TFNSW-ALL-EN-PLN-000014	F.01	S3	M12 Motorway Construction Flora and Fauna Management Plan (Rev F) - draft for consultation	M12PPW	

Transmitted by: Suzette Graham, Transport for NSW

TeamBinder Transmittal Reference: {FE285225-39BF-44C4-B562-70A64D42C359}

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2.3.2 EES response

Comments from EES regarding the CFFMP are provided below.



Suzette Graham
Senior Environment Officer
Sydney Infrastructure Development
Transport for NSW
27 Argyle Street
Parramatta NSW 2150

Subject: M12 Motorway - Consultation on Draft Construction Flora and Fauna Management Sub-plan

Thank you for your email received 7 September 2021 requesting comments from Environment Energy and Science (EES) on the Draft Construction Flora and Fauna Management Sub-plan prepared in accordance with Conditions of Approval for the M12 Motorway (SSI 9364).

EES has reviewed the plan and provides comment at Attachment A.

Should you have any queries regarding this matter, please contact Shaun Hunt, Senior Conservation Planning Officer via [REDACTED]

Yours sincerely

A handwritten signature in black ink that reads 'S. Harrison'.

29/09/21

Susan Harrison

Senior Team Leader Planning
Greater Sydney Branch
Biodiversity and Conservation

Attachment A – EES comments on Draft Construction Flora and Fauna Management Sub-plan for the M12 Motorway

EES notes that the sub-plan states in various locations that *'Where appropriate, the Construction Contractor may provide TfNSW with an alternative equivalent procedure or plan that meets the requirements identified in this CFFMP and the relevant TfNSW specifications.'* Should this occur the same or greater mitigations outcomes should be achieved.

Further to the above, the following comments are provided in relation to the plan.

- Section 6.10 states *'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.'* Offsetting impacts through the purchase and retirement of biodiversity credits is not intended as a supplement for the implementation of mitigation measures such as vegetation management and rehabilitation. Whilst a replacement ratio of 2:1 does not need to be achieved for those trees which are captured by biodiversity offsetting requirements, efforts should still be made to mitigate the loss of this canopy from within the project corridor.
- Table 6-1 and Appendix F Table 7-1: Classification of woody debris and proposed uses identifies that logs up to 2m in length will be prioritised for reuse as habitat for Cumberland Plain Land Snail. Whilst this is acceptable, it is noted that 2m lengths have previously been suggested based on the logistical and financial benefits of moving and installing shorter logs. Logs greater than 2m may still be used where appropriate, especially where felled trees can be reused on the same site.
- In relation to Table 6-2: Flora and fauna mitigation and management measures, the following comments are provided:
 - Management Measure FF25 *'(iii) avoiding excavation or the placing of fill near any tree without advice from an ecologist'* should be amended to require advice from an arborist (diploma qualified) in place of an ecologist.
 - Management Measure FF26 states that trees *'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'* should be amended to include Principal and arborist (diploma qualified). The project ecologist should also be consulted if any of these trees contain habitat features.
 - Evidence of implementation for FF 30 and 32 should be documented in an Ecologist report.
- Section 2.3 of Appendix C outlines the proposed clearing methods including *'Separate woody vegetation into millable timber, secondary re-use or exotic vegetation'*. Prior to this occurring, hollows, tree trunks, mulch, bush rock, root balls and collected plant material must be considered for reuse on site in habitat enhancement and rehabilitation. Where onsite reuse is not possible or necessary, consultation with relevant local councils, Western Sydney Parklands Trust, Landcare groups and relevant Government agencies (including NSW National Parks and Wildlife Service (Scheyville Office), Greater Sydney Local Land Services and DPI Fisheries) should occur to determine if they can utilise any of these resources.

- Section 3.1 of Appendix C states that a Pre-clearing Survey Report will be provided including the *Identification of targeted species 'including, as a minimum, the Cumberland Plain Land Snail and the White-bellied Sea-Eagle.'* This should also include Southern Myotis. Section 2.2.5 states pre-clearing surveys will not be undertaken for the *White-bellied Sea-Eagle*.
- Section 4.1 of Appendix E notes that '*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.*' It should be further noted that 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.
- Section 6 of Appendix F outlines hollow replacement requirements. Options identified include the reuse of salvaged hollows, trunk hollows and nest boxes. The reuse of salvaged hollows and trunk hollows is to be prioritized over the use of nest boxes.

End of Submission

2.3.3 How issues raised have been addressed

The table below provides a summary of the issues raised by EES during consultation and how they were addressed.

Table 2-3: EES comments and TfNSW response

Section of comment	Comments	TfNSW Response	Section Amended
Section 1.4	<p>EES notes that the sub-plan states in various locations that ‘Where appropriate, the Construction Contractor may provide TfNSW with an alternative equivalent procedure or plan that meets the requirements identified in this CFFMP and the relevant TfNSW specifications.’ Should this occur the same or greater mitigations outcomes should be achieved.</p>	<p>This CFFMP forms part of the Overarching CEMP (OCEMP) framework within which all stage-specific plans must remain consistent. All stage specific plans will be reviewed and approved by TfNSW to ensure that the environmental outcomes of the plan are consistent with this CFFMP. Nonetheless, Section 1.4 has been updated as follows:</p> <p><i>“Where appropriate, the Construction Contractor may provide TfNSW with an alternative equivalent procedure or plan that meets the requirements identified in this CFFMP and the relevant TfNSW specifications. <u>Should this occur the same or greater mitigation outcomes should be achieved.</u>”</i></p>	Section 1.4

Section of comment	Comments	TfNSW Response	Section Amended
Section 6.10	<p>Section 6.10 states <i>'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.'</i></p> <p>Offsetting impacts through the purchase and retirement of biodiversity credits is not intended as a supplement for the implementation of mitigation measures such as vegetation management and rehabilitation.</p> <p>Whilst a replacement ratio of 2:1 does not need to be achieved for those trees which are captured by biodiversity offsetting requirements, efforts should still be made to mitigate the loss of this canopy from within the project corridor.</p>	<p>This statement within Section 6.10 is required to be included to demonstrate that trees offset under NSW CoA E3 do not need to be replaced at a 2:1 ratio.</p> <p>Additional exclusion zones have been included within M12 West along the southern boundary (west of Luddenham Road) and M12 Central to minimise impacts to vegetation.</p> <p>Furthermore, efforts will be made to mitigate the loss of canopy within the Project corridor. As outlined in Section 6.10 a tree management strategy will be prepared by the Construction Contractor that will include <i>"measures to minimise tree removal to retain and protect as many trees within the construction footprint as reasonable and feasible"</i>. Furthermore, the tree management strategy will include requirements for the replacement trees where removal cannot be avoided such as:</p> <ul style="list-style-type: none"> • <i>Net increase in the number of trees (not identified as within an EEC)</i> • <i>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.</i> <p>Landscape plans will show the level of vegetation cover and will be made available through the People, Design and Landscape Plan required under NSW CoA E69. This will be on public exhibition in November 2021.</p>	N/A

Section of comment	Comments	TfNSW Response	Section Amended
Table 6-1 Appendix F (Table 7-1)	Classification of woody debris and proposed uses identifies that logs up to 2m in length will be prioritised for reuse as habitat for Cumberland Plain Land Snail. Whilst this is acceptable, it is noted that 2m lengths have previously been suggested based on the logistical and financial benefits of moving and installing shorter logs. Logs greater than 2m may still be used where appropriate, especially where felled trees can be reused on the same site.	A footnote has been included for both Table 6-1 and Appendix F (Table 7-1) stating: <i><u>"It should be noted that logs greater than 2000 mm in length are preferred for habitat enhancement based on the logistical and financial benefits of moving and installing shorter logs. However, logs greater than 2000 mm may still be used where appropriate, especially where felled trees can be reused on the same site."</u></i>	Table 6-1 Appendix F (Table 7-1)
Table 6-2	Management Measure FF25 '(iii) avoiding excavation or the placing of fill near any tree without advice from an ecologist' should be amended to require advice from an arborist (diploma qualified) in place of an ecologist.	Management Measure FF25 has been updated to state: <i><u>"(iii) avoiding excavation or the placing of fill near any tree without advice from a suitably qualified arborist"</u></i> .	Table 6-2
Table 6-2	Management Measure FF26 states that trees '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' should be amended to include Principal and arborist (diploma qualified). The project ecologist should also be consulted if any of these trees contain habitat features.	Management Measure FF26 has been updated to state: <i><u>"Trees remaining within the road reserve, but outside the limits of clearing, which the Principal, advised by a suitably qualified arborist, 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."</u></i>	Table 6-2

Section of comment	Comments	TfNSW Response	Section Amended
Table 6-2	Evidence of implementation for FF30 and 32 should be documented in an Ecologist report.	<p>FF30 states:</p> <p><i>“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.”</i></p> <p>As outlined in Section 3.2 of Appendix C. The Construction Contractor is required to submit a post-clearing report that details:</p> <ul style="list-style-type: none"> • <i>Live fauna sightings, captures, any releases or injured/shocked wildlife</i> • <i>Injury or mortality of fauna</i> • <i>Photographs of rescued fauna</i> • <i>Records of all fauna rescue events, including locations to where fauna has been relocated and license details of those carrying out the relocation.</i> <p>FF32 states:</p> <p><i>“Fencing will be located to reduce roadkill of fauna species and funnel animals to creek crossings where safe passage will be available <u>subject to construction activities and staging.</u>”</i></p> <p>Section 2.2.1 of Appendix C has been updated to require the Project Ecologist to <i>“<u>identify appropriate locations for fencing to be installed to reduce roadkill of fauna species and funnel animals to creek crossings where safe passage will be available subject to construction activities and staging</u>”</i> during pre-clearing surveys.</p> <p>Section 3.1 of Appendix C has also been updated to require the <i>“<u>identification of appropriate location(s) for fencing to be installed to reduce roadkill of fauna species and funnel animals to creek crossings where safe passage will be available subject to construction activities and staging</u>”</i> within the Pre-Clearing Survey Report.</p> <p>Therefore, these details will be included in the Pre-Clearing and Post-Clearing report to be prepared by the Project Ecologist outlined in Table 7-1 of the CFFMP. ‘Ecologist Report’ has been included in the evidence of implementation column for FF30 and FF32.</p>	Appendix C (Section 2.2.1, Section 3.1) Table 6-2

Section of comment	Comments	TfNSW Response	Section Amended
Appendix C (Section 2.3)	<p>The proposed clearing methods including ‘<i>Separate woody vegetation into millable timber, secondary re-use or exotic vegetation</i>’.</p> <p>Prior to this occurring, hollows, tree trunks, mulch, bush rock, root balls and collected plant material must be considered for reuse on site in habitat enhancement and rehabilitation. Where onsite reuse is not possible or necessary, consultation with relevant local councils, Western Sydney Parklands Trust, Landcare groups and relevant Government agencies (including NSW National Parks and Wildlife Service (Scheyville Office), Greater Sydney Local Land Services and DPI Fisheries) should occur to determine if they can utilise any of these resources.</p>	<p>The Habitat Compensation Plan (HCP)(Appendix F) states that:</p> <p><i>“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.”</i></p> <p>Rather than restate what has already been written within the HCP, an additional requirement has been included within Section 2.3 of Appendix C stating:</p> <p><u><i>“Cleared native trees and vegetation will be reused where possible in accordance with the Habitat Compensation Plan (Appendix F of the CFFMP) before pursuing other disposal options.”</i></u></p>	Appendix C (Section 2.3)
Appendix C (Section 3.1)	<p>Section 3.1 of Appendix C states that a Pre-clearing Survey Report will be provided including the Identification of targeted species ‘<i>including, as a minimum, the Cumberland Plain Land Snail and the White-bellied Sea-Eagle.</i>’</p> <p>This should also include Southern Myotis. Section 2.2.5 states pre-clearing surveys will not be undertaken for the White-bellied Sea-Eagle.</p>	<p>Requirements for the Pre-clearing Survey Report have been updated to require the “<i>Identification of targeted species including, as a minimum, the Cumberland Plain Land Snail and the Southern Myotis</i>”.</p> <p>Identification of White-bellied Sea-eagle will likely not be required in the Pre-clearing Survey Report as the nest identified within the Environmental Assessment Documentation is located about 20 metres from the construction boundary and no clearing is permitted beyond the boundary.</p>	Appendix C (Section 3.1)

Section of comment	Comments	TfNSW Response	Section Amended
Appendix E (Section 4.1)	<p><i>'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.'</i></p> <p>It should be further noted that 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.</p>	<p>Text within Appendix E has been updated to read as follows:</p> <p><i>"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 <u>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.</u>"</i></p>	Appendix E (Section 4.1)
Appendix F (Section 6)	<p>Options identified include the reuse of salvaged hollows, trunk hollows and nest boxes. The reuse of salvaged hollows and trunk hollows is to be prioritized over the use of nest boxes.</p>	<p>Section 5.1 of Appendix F has been updated to state the following:</p> <p><i>"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 Construction Contractor will prioritise the relocation of suitable <u>salvaged hollows</u>. If this approach is deemed unsuitable by the Project Ecologist, the installation of hollow replacements is to be implemented; <u>trunk/bored hollows are to be prioritised over nest boxes.</u>"</i></p>	Appendix F (Section 5.1)

2.4 Penrith City Council

This section details the engagement and response from PCC regarding the CFFMP prior to submission for approval and a summary of how the issues have been addressed.

2.4.1 Evidence of correspondence

Evidence of correspondence between PCC and TfNSW is provided below. It should be noted that no response was received from PCC.

From: [Suzette Graham](#)
To: [Ari Fernando](#)
Cc: [M12 Detailed Design](#)
Subject: M12 Motorway Overarching Construction Management Plans

Hi Ari,

Just getting in touch again regarding the following plans that have been sent to Penrith City Council for review and comment in August and September 2021:

- Construction Flora and Fauna Management Plan
- Construction Cultural Heritage Management Plan
- Construction Noise and Vibration Management Plan
- Construction Contaminated Land Management Plan
- M12 Non-Aboriginal heritage interpretation plan

To date TfNSW hasn't received feedback from PCC on these plans.

I wanted to let you know that TfNSW will now be moving onto finalising the plans to address comments received from other stakeholders and they will then be sent to DPIE for approval.

Please feel free to get in touch with me if you wish to discuss.

Thanks,

Kind regards,
Suzette Graham
Environment and Sustainability Manager
Sydney Infrastructure Development | Safety, Environment and Regulation

Transport for NSW
27 Argyle Street, Parramatta NSW 2150

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1	M12PPW-TFNSW-ALL-EN-PLN-000014	F.01	S3	M12 Motorway Construction Flora and Fauna Management Plan (Rev F) - draft for consultation	M12PPW	
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Transmitted by: Suzette Graham, Transport for NSW

Attachments:

M12 - Feedback on Document Comments or Responses.xlsx(41KB), M12 - Feedback on Document Comments or Responses.xlsx(41KB)

2.5 Liverpool City Council

This section details the engagement and response from LCC regarding the CFFMP prior to submission for approval and a summary of how the issues have been addressed.

2.5.1 Evidence of correspondence

Evidence of correspondence between LCC and TfNSW is provided below. It should be noted that no response was received from LCC.

From: [Suzette Graham](#)
To: [REDACTED]
Cc: [REDACTED]
Subject: M12 Motorway Interpretation Plan and Construction Environmental Management Plans
Date: Wednesday, 29 September 2021 11:13:00 AM

Hi Charles,

Following our phone call this morning, just confirming that I have re-sent the following M12 Motorway documents to you via Teambinder:

- Non-Aboriginal heritage Management Plan – comments were due 3 September 2021
- Construction Cultural Heritage Management Plan – comments were due 27 September 2021
- Noise and Vibration Management Plan – comments were due 23 September 2021
- Contaminated Land Management Plan- Comments were due 22 September 2021
- Flora and Fauna Management Plan – Comments were due 22 September 2021

Can you please advise if Council wish to make comments on these documents, and if so when comments can be expected?

Thomas – I have copied you in as an FYI as I know we sent the Interpretation plan to you as well.

Thanks,

Kind regards,
Suzette Graham
Environment and Sustainability Manager
Sydney Infrastructure Development | Safety, Environment and Regulation
[REDACTED]

Transport for NSW
27 Argyle Street, Parramatta NSW 2150

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From: [Suzette Graham via InEight Document](#)
To: [Suzette Graham](#)
Subject: Resending - M12 Motorway - Overarching Construction Flora and Fauna Management Plan (Rev F) - for review
Date: Wednesday, 29 September 2021 10:46:58 AM
Attachments: [ATT00001.jpg](#)
[M12 - Feedback on Document Comments or Responses.xlsx](#)
[M12 - Feedback on Document Comments or Responses.xlsx](#)

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Document Transmittal



Transmittal No: M12PPW-TFNSW-TX-000424

Date: 07 September 2021 02:57 PM
Reason for Issue: Issued For Review
Subject: M12 Motorway - Overarching Construction Flora and Fauna Management Plan (Rev F) - for review
Contract No: M12PPW - M12 - Project Wide
Message:

Dear Charles,

As you are aware, Transport for NSW (TfNSW) is delivering the M12 Motorway Project between the M7 Motorway and The Northern Road.

The M12 Motorway is to be open by 2026 prior to the opening of the Western Sydney International Airport.

An overarching Construction Environmental Management Plan has been drafted and is ready for stakeholder feedback.

As required by Condition of Approval (CoA) C4(c) in the M12 Motorway Infrastructure Approval (23 April 2021), TfNSW is required to consult with Liverpool City Council in relation to the following construction environmental management sub-plans:

- Construction Flora and Fauna Management Sub-Plan

Please provide your comments using the attached MS Excel spreadsheet by **22/09/2021**.

If you have any questions in relation to this email, please contact me on the details below.

Kind regards,

Suzette Graham

Environment and Sustainability Manager

Sydney Infrastructure Development | Safety, Environment and Regulation

Transport for NSW

27 Argyle Street, Parramatta NSW 2150

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Please submit your comments by 22 September 2021

Transmitted to:

Company	Name
Liverpool City Council	Charles Wiafe

Transmitted cc:

Company	Name
Transport for NSW	Suzette Graham

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Click on Document Nos to download them individually.

Item	Document No	Rev	Sts	Title	Contract No	Design Package No
1	M12PPW-TFNSW-ALL-EN-PLN-000014	F.01	S3	M12 Motorway Construction Flora and Fauna Management Plan (Rev F) - draft for consultation	M12PPW	

Transmitted by: Suzette Graham, Transport for NSW

TeamBinder Transmittal Reference: {E2C4E66D-618D-4E81-BCE3-3BDDD7BD11A6}

1	M12PPW-TFNSW-ALL-EN-PLN-000014	F.01	S3	M12 Motorway Construction Flora and Fauna Management Plan (Rev F) - draft for consultation	M12PPW	
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Transmitted by: Suzette Graham, Transport for NSW

Attachments:

M12 - Feedback on Document Comments or Responses.xlsx(41KB), M12 - Feedback on Document Comments or Responses.xlsx(41KB)

2.6 Fairfield City Council

This section details the engagement and response from FCC regarding the CFFMP prior to submission for approval and a summary of how the issues have been addressed.

2.6.1 Evidence of correspondence

Evidence of correspondence between FCC and TfNSW is provided below.

From: [Kerren Ven](#)
To: [Suzette Graham](#)
Subject: RE: M12 Motorway - Overarching Construction Flora and Fauna Management Plan (Rev F) - for review
Date: Wednesday, 22 September 2021 8:44:09 AM
Attachments: [image007.png](#)
[image015.jpg](#)
[image002.png](#)
[image004.png](#)
[image006.png](#)
[image008.png](#)
[image010.jpg](#)
[image012.jpg](#)
[image014.jpg](#)
[FCC Feedback on Document Comments or Responses - Flora and Fauna Management Plan.xlsx](#)

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Hi Suzette,

Please find attached Council's comments in relation to the Construction Flora and Fauna Management Sub Plan.

If you have any questions, please let me know. Thank you.

Kind regards,

Kerren Ven

Strategic Planner | Strategic Land Use Planning
City Strategic Planning
PO Box 21, Fairfield NSW 1860

[Redacted]

www.fairfieldcity.nsw.gov.au
mail@fairfieldcity.nsw.gov.au



We acknowledge the Cabrogal of the Darug nation who are the Traditional Custodians of this Land. We also pay our respect to the Elders both past, present and emerging of the Darug Nation.



From: Suzette Graham via InEight Document [Redacted]
Sent: Tuesday, 7 September 2021 2:56 PM
To: Kerren Ven [Redacted]
Subject: M12 Motorway - Overarching Construction Flora and Fauna Management Plan (Rev F) - for review

Document Transmittal



Transmittal No: M12PPW-TFNSW-TX-000423

Date: 07 September 2021 02:55 PM

Reason for Issue: Issued For Review

Subject: M12 Motorway - Overarching Construction Flora and Fauna Management Plan (Rev F) - for review

Contract No: M12PPW - M12 - Project Wide

Message:

Dear Kerren,

As you are aware, Transport for NSW (TfNSW) is delivering the M12 Motorway Project between the M7 Motorway and The Northern Road.

The M12 Motorway is to be open by 2026 prior to the opening of the Western Sydney International Airport.

An overarching Construction Environmental Management Plan has been drafted and is ready for stakeholder feedback.

As required by Condition of Approval (CoA) C4(c) in the M12 Motorway Infrastructure Approval (23 April 2021), TfNSW is required to consult with Fairfield City Council in relation to the following construction environmental management sub-plans:

- Construction Flora and Fauna Management Sub-Plan

Please provide your comments using the attached MS Excel spreadsheet by **22/09/2021**.

If you have any questions in relation to this email, please contact me on the details below.

Kind regards,

Suzette Graham
Environment and Sustainability Manager

Sydney Infrastructure Development | Safety, Environment and Regulation


Transport for NSW
27 Argyle Street, Parramatta NSW 2150

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Please submit your comments by 22 September 2021

Transmitted to:

Company	Name
Fairfield City Council	Kerren Ven

Transmitted cc:

Company	Name
Transport for NSW	Suzette Graham

[Click here to download all Transmittal files.](#)

Click on Document Nos to download them individually.

Item	Document No	Rev	Sts	Title	Contract No	Design Package No
1	M12PPW-TFNSW-ALL-EN-PLN-000014	F.01	S3	M12 Motorway Construction Flora and Fauna Management Plan (Rev F) - draft for consultation	M12PPW	

Transmitted by: Suzette Graham, Transport for NSW

TeamBinder Transmittal Reference: {0BE96870-6184-4CBD-82D5-BE8CD423EBBA}

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2.6.3 How issues raised have been addressed

The table below provides a summary of the issues raised by FCC during consultation and how they were addressed.

Table 2-4: FCC comments and TfNSW response

Section of comment	Comments	TfNSW Response	Section Amended
CFFMP	The management plan is very comprehensive. No further comments are added.	No action required	N/A



Appendix B

Construction Flora and Fauna Management Sub-plan

Secondary CoA and REMMs

M12 Motorway

November 2021

Transport for New South Wales

NSW CoA

CoA No.	Condition Requirements	Applicability			Document Reference
		M12 West	M12 Central	M12 East	
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
E3	The Proponent must meet the biodiversity offset obligations for ecosystem and species credits as set out in Table 1 , Table 2 and Table 3 in accordance with the <i>M12 Motorway Amendment Report - Submissions Report</i> (December 2020) and <i>M12 Motorway Amendment Report - Submissions Report - Amendment</i> (dated 8 March 2021) within 12 months of the commencement of construction. The offset obligations must be carried out in accordance with the <i>NSW Biodiversity Offsets Policy for Major Projects</i> and can be achieved by:	✓	✓	✓	Section 6.12 Biodiversity Offset Strategy
	(a) acquiring and retiring "biodiversity credits" within the meaning of the <i>Biodiversity Conservation Act 2016</i> ; and/or	✓	✓	✓	
	(b) properties secured with the NPWS, on the basis of a draft credit report to show what the property would provide and written confirmation from NPWS that the financial contributions for acquisition and management have been received; and/or	✓	✓	✓	
	(c) making a payment into the Biodiversity Conservation Fund; or	✓	✓	✓	
	(d) a Biodiversity Offset Strategy prepared in consultation with EES and DAWE that provides supplementary measures or where the Proponent intends to utilise the biodiversity credit variation rules.	✓	✓	✓	

CoA No.	Condition Requirements	Applicability			Document Reference
		M12 West	M12 Central	M12 East	
E4	The Proponent may review and update the ecosystem and species credit requirements in Table 1, Table 2 and Table 3 to reflect the final construction footprint and resulting extent and type of plant community types to be cleared and the extent of threatened species habitat impacted by the construction of the CSSI (excluding certified areas). Where the construction of the CSSI is staged, the Proponent may review and update the ecosystem and species credit requirements in Table 1, Table 2 and Table 3 for each stage of the CSSI. Amendments to the ecosystem and species credit requirements must be undertaken in consultation with EES and DAWE and submitted to the Planning Secretary for approval within six (6) months of determining the final construction footprint and, where the CSSI is staged, within six (6) months of determining the final construction footprint for each stage.	✓	✓	✓	Section 6.12
E5	The review and update of credit requirements must be undertaken by: (a) using the vegetation mapping in the EIS, <i>M12 Motorway Amendment Report - Appendix A Biodiversity supplementary technical report (October 2020)</i> , and <i>M12 Motorway Amendment Report – Submissions Report (December 2020)</i> ; and/or	✓	✓	✓	Section 6.12
	(b) completing verification surveys to confirm the extent, type and condition of threatened species and ecological communities to be impacted.	✓	✓	✓	
E6	Where verification surveys are required, they must be undertaken in consultation with EES. Any additional surveys must be undertaken at the time of year when groundcover is most likely to be predominantly native. If verification surveys are not possible at a time when groundcover is most likely to be native, the assumed presence of any relevant species and ecosystems may be applied to conservatively evaluate impacts and associated credit requirements.	✓	✓	✓	Section 6.12
E7	The Proponent must submit to the Planning Secretary and DAWE for information: (a) a copy of the Credit Retirement Report; and/or	✓	✓	✓	Section 6.12

CoA No.	Condition Requirements	Applicability			Document Reference
		M12 West	M12 Central	M12 East	
	(b) a receipt confirming payment to the Biodiversity Conservation Fund; and/or	✓	✓	✓	
	(c) correspondence from NPWS,	✓	✓	✓	
	for the retirement of the ecosystem and species credits required by Condition E3 within one (1) month of receiving the report and/or making the payments and/or receiving correspondence from NPWS.	✓	✓	✓	
E8	The Proponent must undertake additional surveys of <i>Pimelea spicata</i> (Spiked Rice-flower) in potential habitat for this species within the refined construction footprint to the north of Elizabeth Drive and west of the existing Wallgrove Road as identified in Figure 6-5 of the M12 Motorway Amendment Report – Submissions Report (December, 2020). The surveys must be undertaken during optimal conditions as defined by the NSW Bionet Threatened Biodiversity Profile Data Collection (DPIE) or as agreed by the Planning Secretary. The surveys must be undertaken in consultation with EES and DAWE and the results of the surveys provided to the Planning Secretary, EES and DAWE for information within one (1) month of completion of the surveys.		✓	✓	Section 4.1.2
E9	If <i>Pimelea spicata</i> is recorded in the surveys carried out under Condition E8, any impacts to the species must be offset in accordance with the options available under Condition E3 and in consultation with EES. The Proponent must provide details of the required biodiversity credits to the Planning Secretary, EES and DAWE for information prior to works that impact the threatened species.		✓	✓	Section 4.1.2 No plants of <i>Pimelea Spicata</i> were recorded during surveys
E11	The Proponent must minimise impacts to Key Fish Habitat (KFH) as defined in Policy and Guidelines for Fish Habitat Conservation and Management (DPI, 2013 update). Residual impacts to KFH must 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.	✓	✓	✓	Section 6.5

CoA No.	Condition Requirements	Applicability			Document Reference
		M12 West	M12 Central	M12 East	
E12	Payment of the habitat offset requirement must be made to the DPI Fish Conservation Trust Fund prior to the commencement of Work that impacts KFH in Badgerys Creek, Cosgroves Creek, Kemps Creek and South Creek.	✓	✓	✓	Section 6.5
E13	The Proponent must submit to the Planning Secretary a receipt confirming payment to the DPI Fish Conservation Trust Fund within one (1) month of making the payment.	✓	✓	✓	Section 6.5
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 6.3
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:	✓	✓	✓	Section 6.4 Section 6.13 Appendix F
	(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.	✓	✓	✓	

CoA No.	Condition Requirements	Applicability			Document Reference
		M12 West	M12 Central	M12 East	
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 6.10
E71	<p>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.</p> <p>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).</p> <p><i>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.</i></p>	✓	✓	✓	Section 6.10
E105	<p>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.</p> <p><i>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</i></p>	✓	✓	✓	Section 6.5

CoA No.	Condition Requirements	Applicability			Document Reference
		M12 West	M12 Central	M12 East	
	<i>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.</i>				
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 6.5.1
E107	Work on waterfront land must have regard to the <i>Guidelines for controlled activities on waterfront land – Riparian Corridors</i> (NRAR, 2018), <i>Controlled activities on waterfront land – Guidelines for watercourse crossings on waterfront land</i> (NSW Office of Water, 2012) and <i>Policy and Guidelines for Fish Habitat Conservation and Management</i> (DPI Fisheries, 2013).	✓	✓	✓	Section 6.5 Section 6.5.1
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 6.5
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 6.10

REMMs

ID	Measure/Requirement	Timing	Applicability			Document Reference
			M12 West	M12 Central	M12 East	
B02	<p>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.</p> <p>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).</p>	Prior to construction	✓	✓	✓	Appendix F
B04	Biodiversity offsets for the Project will be purchased and managed in accordance with the Biodiversity Offset Strategy prepared for the project.	Prior to operation	✓	✓	✓	Section 6.12
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:	Prior to construction	✓	✓	✓	Section 6.1 Appendix C
	<p>White-bellied Sea-Eagle</p> <p>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).</p>	The White-bellied Sea-eagle nest is located about 20 metres from the construction boundary. No pre-clearing measures are required.	✓			Appendix C (Section 2.2.5) Table 6-2

ID	Measure/Requirement	Timing	Applicability			Document Reference
			M12 West	M12 Central	M12 East	
	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.					
	<p>Cumberland Plain Land Snail</p> <p>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 Section 6.2). 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.</p>	Prior to construction	✓		✓	Appendix C (Section 2.2.3)
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).	During construction	✓	✓	✓	Appendix D
	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.		✓	✓	✓	Appendix D
	<p>In the event that any threatened species are identified during construction, the following steps would be carried out:</p> <ol style="list-style-type: none"> 1. Stop work immediately in the location of the unexpected find to avoid any potential impacts. 2. Notify the Environmental Manager 		✓	✓	✓	Appendix D

ID	Measure/Requirement	Timing	Applicability			Document Reference
			M12 West	M12 Central	M12 East	
	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 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, EES and 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.					
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	✓	✓	✓	Section 6.1 Section 6.4 Section 6.5 Appendix C
B08	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	✓	✓	✓	Section 6.11

ID	Measure/Requirement	Timing	Applicability			Document Reference
			M12 West	M12 Central	M12 East	
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 F
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 6.5 Appendix F
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 6.5
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 (DPIE, 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.	Prior to construction	✓	✓	✓	Section 6.5 Appendix G
	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:		✓	✓	✓	Section 6.5 Appendix G

ID	Measure/Requirement	Timing	Applicability			Document Reference
			M12 West	M12 Central	M12 East	
	<ul style="list-style-type: none"> Clearly outline the objectives to be achieved 		✓	✓	✓	Section 6.5 Appendix G (Section 1.4)
	<ul style="list-style-type: none"> Document the actions to be taken for each individual snag 		✓	✓	✓	Section 6.5 Appendix G (Section 3.1)
	<ul style="list-style-type: none"> Detail the methods and machinery to be use 		✓	✓	✓	Section 6.5 Appendix G (Section 3.2.2)
	<ul style="list-style-type: none"> Specify the season or time period over which the works will be carried out. 		✓	✓	✓	Section 6.5 Appendix G (Section 3.2.5)
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 6.5 Section 6.9
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 6.4

ID	Measure/Requirement	Timing	Applicability			Document Reference
			M12 West	M12 Central	M12 East	
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 6.5.1
B18	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. The application of mulch for permanent landscaping must be designed and planned to avoid material and tannin runoff.	During construction	✓	✓	✓	Section 6.5
B19	Emergency response protocols and procedures will be included in the Project CEMP and implemented in the event of a contaminant spill or leak.	During construction	✓	✓	✓	OCEMP Section 6.1
B20	Spill kits will be located to allow for timely response to uncontained spills. Site inductions will include a briefing on the use of spill kits.	During construction	✓	✓	✓	OCEMP Section 6.1
B23	Connectivity measures will be implemented in accordance with Wildlife Connectivity Guidelines for Road Projects (TfNSW, under preparation). Fencing will be located to reduce roadkill of fauna species and funnel animals to creek crossings where safe passage will be available. Detailed design is to retain fauna passage at all four main creek lines (Cosgroves, South, Kemps and Badgerys Creeks).	Detailed design and during construction	✓	✓	✓	Section 6.3

ID	Measure/Requirement	Timing	Applicability			Document Reference
			M12 West	M12 Central	M12 East	
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 this amendment report (including Figure 1-2 of Appendix A of the amendment report).	During construction	✓	✓	✓	Section 6.3
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	✓	✓	✓	Section 6.8
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	✓	✓	✓	Section 6.6 Appendix E
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	✓	✓	✓	Section 6.6 Appendix E
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	✓	✓	✓	Table 6-2FF44

ID	Measure/Requirement	Timing	Applicability			Document Reference
			M12 West	M12 Central	M12 East	
B29	Additional targeted surveys for <i>Pimelea spicata</i> will be conducted in optimal conditions, as defined by NSW Bionet Threatened Biodiversity Profile Data Collection (DPIE). <i>Pimelea spicata</i> must be surveyed at least three occasions, with each occasion at least a month apart unless the species is found prior. A reference population must also be surveyed on each occasion.	Detailed design, prior to construction		✓	✓	Section 4.1.2
LVIA02	A detailed Landscape Plan will be prepared for the project and implemented throughout construction. The plan will guide the implementation of measures to minimise landscape character and visual impacts, including revegetation requirements.	Detailed design, prior to construction and during construction	✓	✓	✓	Section 6.10
LVIA03	Existing vegetation within the construction footprint will be retained and protected where possible. This includes densely vegetated areas such as remnant riparian forests and Cumberland Woodlands in Western Sydney Parkland.	Detailed design and during construction	✓	✓	✓	Section 6.1 Section 6.3 Appendix C
LVIA15	A tree management strategy will be prepared for the project, outlining:	Detailed design and prior to construction	✓	✓	✓	Section 6.11
	<ul style="list-style-type: none"> Measures to minimise tree removal to retain and protect as many trees within the construction footprint as reasonable and feasible 		✓	✓	✓	Section 6.11
	<ul style="list-style-type: none"> 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 with AS4970-2009 Protection of trees on development sites 		✓	✓	✓	Section 6.11

ID	Measure/Requirement	Timing	Applicability			Document Reference
			M12 West	M12 Central	M12 East	
	<ul style="list-style-type: none"> 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. 		✓	✓	✓	Section 6.11
	<ul style="list-style-type: none"> Consideration of maintenance requirements and safety standards 		✓	✓	✓	Section 6.11
	<ul style="list-style-type: none"> Requirements for the replacement trees where removal cannot be avoided including: <ul style="list-style-type: none"> 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 (2018) subject to long-term viability of the plant. 		✓	✓	✓	Section 6.11
GG03	Vegetation removal will be minimised where practicable.	Detailed design and construction	✓	✓	✓	Section 6.1 Appendix C

ID	Measure/Requirement	Timing	Applicability			Document Reference
			M12 West	M12 Central	M12 East	
SWH12	<p>The following measures will be carried out to manage activities within watercourses or on waterfront land:</p> <ul style="list-style-type: none"> • Implementing practices to minimise disturbance of banks • Undertaking bank stabilisation and installing instream structures • Maintaining minimum flows to assist in maintaining the viability of aquatic communities and preventing barriers to fish passage • Constructing instream crossings during low flows and design so that drainage off crossing doesn't contribute sediment load to the stream • All drainage feature crossings (permanent and temporary watercourse crossings and stream diversions), drainage swales and depressions will be designed by a suitably qualified and experienced professional and will be designed and constructed in accordance with relevant guidelines. 	During construction	✓	✓	✓	Section 6.5



Appendix C

Construction Flora and Fauna Management Sub-plan

Vegetation Clearing Procedure

M12 Motorway

November 2021

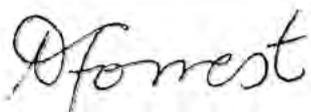


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Document control

File Name	M12PPW-ADAP-ALL-EV-PLN-000001_E-S3_CFFMP_App_C
Title	M12 Motorway OCEMP Construction Flora and Fauna Management Sub-plan Appendix C- Vegetation Clearing Procedure

Approval and authorisation

Plan reviewed by:	Plan reviewed by:
Suzette Graham, TfNSW Environment and Sustainability Manager	Deanne Forrest, TfNSW Project Director – M12
16/11/2021	17/11/2021
	

Revision history

Revision	Date	Description
A	02/09/2020	1 st Draft for TfNSW Review
B	18/09/2020	Response to TfNSW comments
C	21/10/2020	Response to TfNSW comments
D	22/07/2021	Updated with NSW and Federal Approval
E	16/08/2021	Response to TfNSW and ER comments
F	03/09/2021	Response to TfNSW and ER comments
G	12/11/2021	Response to comments received during consultation

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Glossary/ Abbreviations

Abbreviations	Expanded text
AR	Amendment Report
ARSR	Amendment Report Submissions Report
BC Act	<i>Biodiversity Conservation Act 2016</i>
CEEC	Critically Endangered Ecological Community
CFFMP	Construction Flora and Fauna Management Plan
CoA	Conditions of Approval
DAWE	Commonwealth Department of Agriculture, Water and Environment
DBH	Diameter at Breast Height
DPIE	NSW Department of Planning, Industry and Environment
EEC	Endangered Ecological Community
EES	NSW Environment, Energy and Science Group (a part of DPIE)
Environmental Assessment Documentation	Collective reference to the M12 EIS (Oct 2019), Submissions Report (Oct 2020), Amendment Report (Oct 2020), Amendment Report-Submissions Report (Dec 2020) and supplementary reports as detailed in NSW CoA A1
EPBC Act	<i>Environmental Protection and Biodiversity Conservation Act 1999</i>
EWMS	Environmental Work Method Statements
OCEMP	Overarching Construction Environmental Management Plan
Project, the	M12 Motorway Project
PCT	Plant Community Type
RTA	Former Roads & Traffic Authority
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 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 Clearing Procedure has been prepared in accordance with *Guide 1: Pre-clearing process*, *Guide 2: Exclusion zones* and *Guide 4: Clearing of vegetation and removal of bushrock*, *Biodiversity Guidelines* (RTA, 2011) and Transport for NSW (TfNSW) specifications.

The purpose of this Procedure is to outline environmental control measures to minimise the clearing of vegetation associated with the Project and impacts on biodiversity and the surrounding environment. 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.

1.2 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.

1.3 Scope

This Procedure details control measures to minimise impacts of vegetation clearing to be implemented throughout the construction of the Project.

1.4 Roles and Responsibilities

This Procedure will be updated by the Construction Contractor 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 Plain 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

Consultation requirements relevant to this Procedure include:

- Consultation will be undertaken with community groups, Western Sydney Parklands, Penrith City Council, Liverpool City Council, Fairfield City Council and relevant government agencies prior to the commencement of vegetation clearing to investigate the options for re-use of retained timber and root balls. It is noted that TfNSW have commenced discussions as part of TfNSW undertaking a project wide tree survey
- Consultation will be undertaken with the Project Ecologist or, where threatened species are likely to be encountered, NSW Environment, Energy and Science (EES) and the Commonwealth Department of Agriculture, Water and Environment (DAWE) to determine suitable habitat for fauna.

1.6 Review

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

2 Vegetation Clearing Procedure

2.1 Clearing and Grubbing Plan and EWMS

Construction Contractors will prepare a Clearing and Grubbing Plan with an Environmental Work Method Statement (EWMS). This will 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 15 working days prior to starting any clearing. The Clearing and Grubbing Plan and EWMS will include, but not be limited to, the following information:

- Methods used to identify and mark areas of weeds to be removed and 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
- Management measures to be implemented to identify and protect clearing limits, habitat features and exclusion areas.

2.2 Pre-clearing

2.2.1 Pre-clearing process

The pre-clearing process provides a final check for any threatened flora or fauna species that may have moved into the area since previous surveys were undertaken. The Project Ecologist will undertake the pre-clearing survey to identify and mark any habitat features within the area to be cleared and to advise on the presence of any fauna. The pre-clearing process will include the following activities:

- Identify and locate habitat features on site
- Identify exclusion zones, install fencing/flagging/signage
- Install erosion and sedimentation controls
- Identify fauna that have the potential to be disturbed, injured or killed during clearing activities (e.g. nesting birds)
- Survey for the presence of threatened flora and fauna species identified as being confirmed or likely to occur in the Project area
- Survey for the presence of any weed and pest species within the construction site and adjacent areas
- Identify appropriate locations for fencing to be installed to reduce roadkill of fauna species and funnel animals to creek crossings where safe passage will be available subject to construction activities and staging

- Identify the number and species of trees, beyond those identified in the TfNSW tree survey, outside of EECs where a tree is defined as “*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*”
- Mark habitat trees within the clearing footprint
- Identify suitable habitat areas for fauna and fauna habitat (e.g. coarse woody debris and hollows) relocation
- 24 hours prior to clearing, licensed wildlife carers and/or Project Ecologist should capture and/or remove fauna that have the potential to be disturbed as a result of clearing activities and relocate to the pre-determined location (as above).

Note: tree survey information obtained by TfNSW will be provided to the Construction Contractor to help facilitate their pre-clearing surveys.

2.2.2 Targeted pre-clearing survey – Southern Myotis

Targeted pre-clearing surveys will be carried out, where required, for the Southern Myotis in any potential habitat trees, by the Project Ecologist as per Figure 2-1.

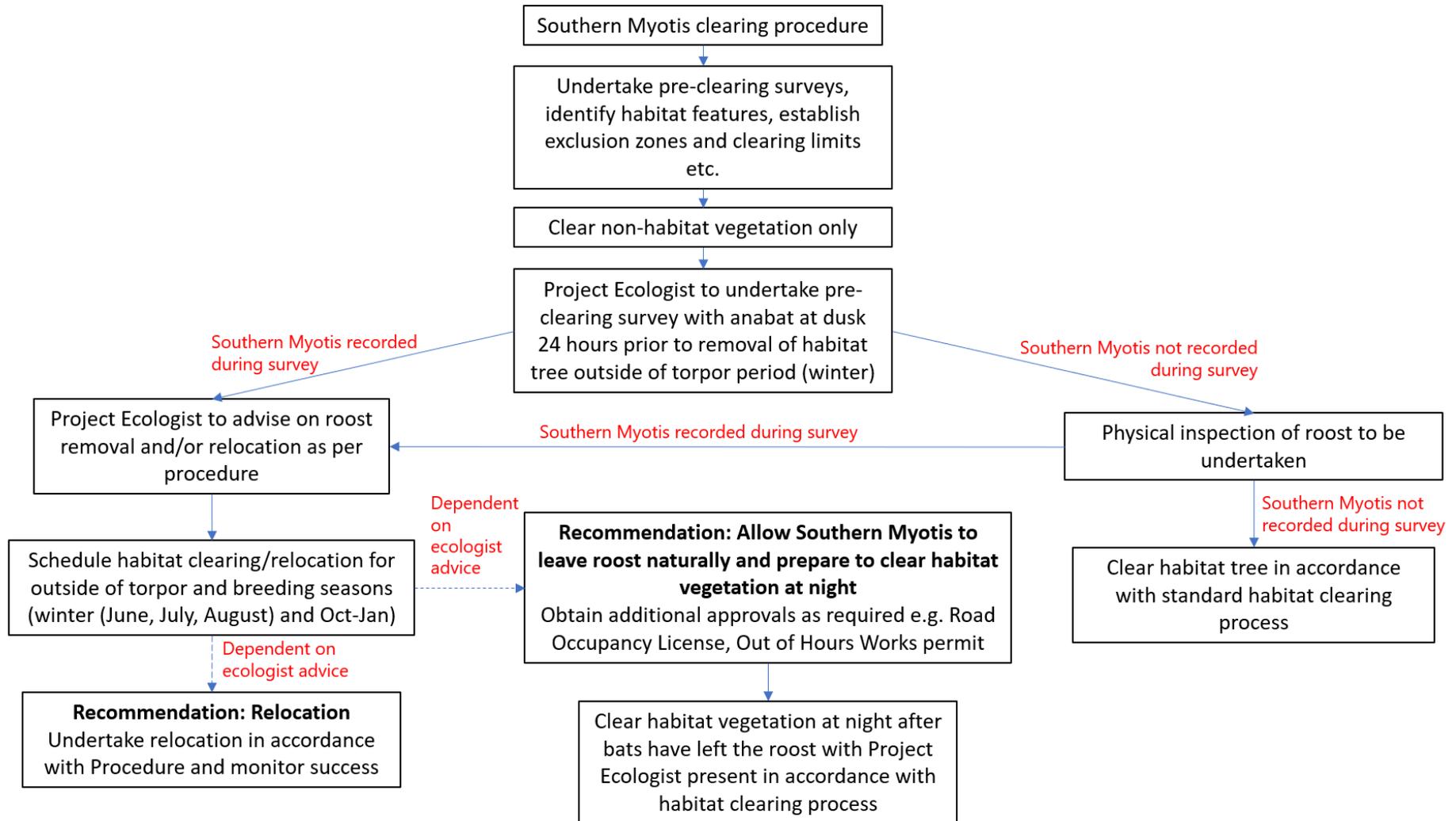


Figure 2-1: Southern Myotis clearing procedure

2.2.3 Targeted pre-clearing survey – Cumberland Plain Land Snail

During pre-clear surveys, in areas identified as potential Cumberland Plain Land Snail (CPLS) habitat (e.g. under leaf and bark litter, leaves and logs, or shelters in loose soil around grass clumps, and it has been found under rubbish), the following procedure will be followed:

1. Within 7 days of clearing, identify the closest safe receiving habitat where snails can be safely transferred to (preferably within 100 metres of habitat to be cleared)
2. Search the habitat to be cleared by hand, to minimise the chance of damaging snail shells.
 - a. Collect all live snails
 - b. Photograph and record the location found, and translocated to, for all potential CPLS.
 - c. If in doubt, assume it is a CPLS but take photos of ventral and dorsal surfaces and get expert verification (for example Michael Shea from the Australian Museum). Garden Snails (*Helix aspersa*) and other *Meridolum* species can be confused with CPLS.
3. Dampen receiving habitat and translocate some soil from the habitat to be cleared (to ensure that the fungus that CPLS feeds on is available within the receiving habitat)
4. Search the habitat at night for signs of active snails, as CPLS is generally active at night
5. Just prior to clearing, scrape habitat away down to at least 10 cm since CPLS can burrow down into the soil, especially during dry periods
6. Translocate any remaining live snails.

2.2.4 Targeted pre-clearing survey – Grey-headed Flying-fox

If nightworks in foraging habitat is required, supervision by the Project Ecologist, as per standard clearing procedures is considered adequate to address any potential risks to foraging flying foxes. No roosts have been identified within or near to the clearing footprint, if they do move into the area the Unexpected Threatened Species and Threatened Ecological Communities (TECs) Finds Procedure (Appendix D of the CFFMP) should be followed and expertise advice sought and followed on how to proceed.

2.2.5 Targeted pre-clearing survey – White-bellied Sea-eagle

Targeted pre-clearing surveys will not be required for the White-bellied Sea-Eagle as the nest identified within the Environmental Assessment Documentation is located about 20 metres from the construction boundary and no clearing is permitted beyond the boundary.

An exclusion zone will be established around the nest and all site personnel will be informed of the location of the nest and exclusion zone during inductions.

2.2.6 Exclusion zones

Exclusion zones will be established to prevent damage to native vegetation and fauna habitats and prevent the distribution of pests, weeds and disease in accordance with the following:

- Identify exclusion zones on a suitable plan to be displayed in prominent places in the Project area. Include in the plan aerial photographs, construction chainages, clear labelling of what is being excluded and access points
- Mark out exclusion zones on site with temporary markings such as pegs or paint and where possible use a qualified surveyor
- Erect signs to inform personnel of the purpose of exclusion zone fencing

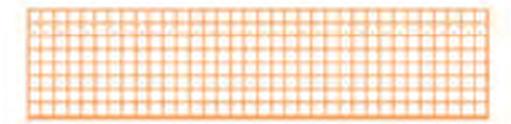
- Ensure all exclusion zones are regularly inspected and repairs to fencing are made where required
- Maintain exclusion fencing until the risk of disturbance within the excluded zone has been eliminated through other means or is no longer relevant
- Update Sensitive Area Plans to ensure exclusion zones are clearly detailed
- Undertake removal of fencing in consultation with the Construction Contractor's Environmental Representative.

2.2.7 Flagging protocol

Site delineation, including environmentally sensitive area protection, habitat tree identification and clearing limits, must be consistent with the TfNSW Flagging Protocol. Clearing boundary survey pegs must be numbered as outlined in the Flagging Protocol.

Clearing limits will be flagged at least seven working days prior to the proposed commencement of clearing. Clearing limits will be identified using signage and highly visible continuous barrier or tape such as bunting, nightline or other similarly robust and durable material. Sensitive areas, Aboriginal heritage areas and non-Aboriginal heritage areas will be identified. No vegetation clearing within the excluded areas will occur.

Table 2-1: Flagging type

Flagging Type	Description
	Red Flagging – Project Boundary
	Orange Flagging – Clearing Limits/Exclusion Fencing. No clearing outside this flagging at any time during the Project
	<u>HABITAT TREE</u> Red and White Tape around habitat tree. Spray circle and write “H” (in white) on habitat tree
	Yellow and Black Tape – 10m exclusion zone from underground services. Trees to only be stump cut within this area
	To be allocated by Construction Contractor
	Orange Parrawebbing with “NO ENTRY – ENVIRONMENTAL PROTECTION AREA” sign – (heritage, threatened flora/fauna). Absolutely no entry without written permit from TfNSW Environment and Sustainability Manager

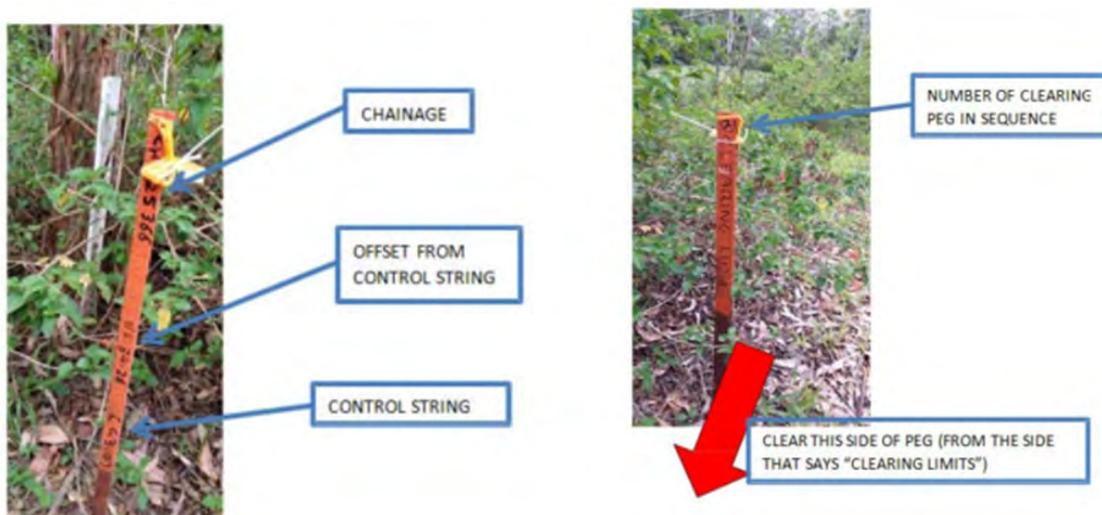


Figure 2-2: Pegging arrangement

2.3 Clearing Process

The area to be cleared will be confirmed following a site inspection with the TfNSW Environment and Sustainability Manager (or delegate). Clearing within identified environmentally sensitive areas will not be undertaken without the approval of the TfNSW Project Manager and Environment and Sustainability Manager (or delegate). Clearing of riparian vegetation or TECs will be in accordance with the areas assessed in the Environmental Assessment Documentation.

Exclusion zone fencing will be installed to delineate the areas to be cleared.

Prior to commencement of clearing, the Construction Contractor will prepare a Clearing and Grubbing Plan for review by the TfNSW Project Manager and TfNSW Environment and Sustainability Manager (or delegate).

The Construction Contractor will also prepare a pre-clearing survey report that includes:

- The identity of species and location of any weeds growing in the area to be cleared and grubbed
- Detailed Sensitive Area Plans
- Identification of any unsound trees outside the limits of clearing
- Management measures to be implemented to identify and protect clearing limits, habitat features and exclusion areas
- Measures to prevent clearing beyond the vegetation clearing limit
- Measures to educate site personnel on clearing procedures
- Measures to clearly mark the clearing boundary, in line with the Flagging Protocol
- Procedure for clearing of vegetation including potential habitat, hollow-bearing trees and culverts
- Procedure for vegetation removal/disposal

Clearing will be undertaken in accordance with the following methods:

- Carefully clear vegetation so as not to mix topsoil with debris and to avoid impacts to surrounding native vegetation
- Cleared native trees and vegetation will be reused where possible in accordance with the Habitat Compensation Plan (Appendix F of the CFFMP) before pursuing other disposal options
- Separate woody vegetation into millable timber, secondary re-use or exotic vegetation
- Temporary stockpiles of vegetation and timber will be less than 2 metres in height, and mulched as soon as practical and managed in accordance with the Management of Tannins from Vegetation Mulch Procedure (refer to the Construction Soil and Water Management Plan (CSWMP))
- Non-woody vegetation should be incorporated into the stripping of topsoil to retain any organic materials and nutrients
- Topsoil is not to be mixed with subsoil and will be stockpiled separately for re-use on site
- Topsoil stockpiles are not to be compacted, as this can damage the soil structure
- Topsoil stockpiles are to be managed in accordance with Section 6.4 of the Construction Soil and Water Management Plan
- The staged habitat removal process is to be used when identified habitat is to be removed, with the Project Ecologist on site
- Undertake bush rock removal in a way that minimises damage to the bush rock, avoids excessive soil disturbance
- Pruning will be supervised by a Level 3 or above qualified arborist.

2.3.1 Staged habitat removal

The staged habitat removal process will be used when identified habitat (e.g. hollow-bearing trees, habitat trees or bushrock) is required to be removed.

Staged habitat removal is conducted in at least two stages. After pre-clearing surveys are completed, non-habitat trees and surrounding understorey vegetation will be felled or cleared first in order to give any fauna an opportunity to relocate. Habitat trees will be felled or cleared under the supervision of the Project Ecologist a minimum of 24 hours after clearing of non-habitat vegetation.

The following actions will be undertaken for staged habitat removal:

- Removal works will be timed to minimise impacts on fauna (e.g. avoid known breeding/nesting seasons, where possible)
- Contact vets and wildlife carers prior to commencing works to ensure willingness to assist if required
- The Project Ecologist and/or a licensed wildlife carer will be present on site during habitat removal
- Habitat trees will be felled using the "slow drop" technique and relocated for re-use, where possible, will be used as coarse woody debris, if damage occurs

- Accurate records will be maintained.

2.4 Controls for protection of fauna

The Project Ecologist or suitably qualified delegate will be present during clearing and will direct clearing in a manner that encourages and allows fauna to safely flee the clearing area.

If fauna is encountered during clearing activities, a stop work procedure will be implemented in accordance with the Unexpected Threatened Species or TEC Finds Procedure (refer Appendix D of this CFFMP). The following steps will be taken:

- Cease work in the vicinity of the fauna and immediately notify the Construction Contractor Environmental Site Representative
- 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 captured and relocated to appropriate pre-determined nearby habitat.

In the event that fauna handling is required, the Fauna Handling and Rescue Procedure will be implemented (refer Appendix G of this CFFMP).

2.5 Controls for protection of vegetation

2.5.1 General controls

The Construction Contractor will implement protective measures during clearing to avoid damaging or destroying vegetation and habitat which have been marked or otherwise identified for preservation. Measures will include:

- Installation of suitable fencing to prevent plant, personnel and equipment entering the exclusion zones
- Avoid stockpiling of materials and vehicle parking under the tree canopy
- Avoid excavation or the placing of fill near any tree without advice from an arborist
- Haul roads and access tracks will be located away from the tree drip zone
- Trees will be marked for directional felling to avoid damage to environmentally protected areas
- Assess existing trees within the road reserve that are to be retained to identify techniques to maximise their health and longevity
- Existing trees, grasses and other ground cover within 15 metres of watercourses and in all drainage lines will be retained until immediately before construction commences in the area
- Access tracks will be constructed and aligned to minimise erosion as per the Blue Book (Landcom, 2004)
- Plant and equipment will be selected to minimise tracking and disturbance of existing ground.

2.5.2 Threatened flora

The Project will result in impacts to two threatened plant species:

- *Pultenaea parviflora* (listed as Endangered under the NSW *Biodiversity Conservation Act 2016* (BC Act) and Vulnerable under the *Commonwealth Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act))
- *Dillwynia tenuifolia* (listed as Vulnerable under the BC Act).

The location of these species is identified in Figure 4-1 of the CFFMP.

Management measures to minimise impacts to threatened flora, in addition to the general control measures listed above, include:

- Exclusion zones will be established around 139 *Pultenaea parviflora* plants in the road reserve on the western side of Clifton Avenue
- Exclusion zones will be established around 44 *Dillwynia tenuifolia* plants in the road reserve on the western side of Clifton Avenue
- Exclusion zones will be established around any additional plants identified during the pre-clearing surveys
- Measures will be taken to avoid publication of these locations, to minimise the risk of tampering by members of the public (e.g. ensure this document and others showing locations are kept confidential among team members and the risks of publication explained).

2.5.3 Root ball management

During vegetation clearing, timber and root balls will be retained where practicable for reuse in habitat enhancement and rehabilitation work. The retained timber and root balls may be used on or offsite. Prior to the commencement of vegetation clearing, the Construction Contractor will consult with community groups, Western Sydney Parklands, Penrith City Council, Liverpool City Council, Fairfield City Council and relevant government agencies to determine if retained timber and root balls could be used for environmental rehabilitation projects, before pursuing other disposal options.

2.6 Post-clearing

The post-clearing process includes:

- Completion of a post-clearance checklist
- Stabilisation of disturbed areas with revegetation or other material to be carried out where earthworks are not planned to commence within four weeks of clearing, to prevent erosion
- Any damage to vegetation to be retained will be immediately reported to the Construction Contractor Environmental Site Representative and TfNSW Environment and Sustainability Manager (or delegate) and rectified with the advice of the Project Ecologist
- Where holes remaining after tree removal are located in areas where pedestrian or foot traffic is likely to occur, the holes will be backfilled and vegetated. Backfill material will prevent the infiltration and ponding of water and be compacted to at least the relative compaction of adjacent ground.

3 Reporting

3.1 Pre-clearing Survey Report

The Construction Contractors will prepare a Pre-Clearing Survey Report after undertaking the pre-clearing survey for review by the TfNSW Environment and Sustainability Manager (or delegate). The report will include:

- Description of the pre-clearing survey methodology
- Identification of targeted species including, as a minimum, the Cumberland Plain Land Snail and the Southern Myotis
- Identification of number and species of trees to be removed
- Identification of habitat trees to be removed within areas to be cleared
- Identification of areas of high weed infestation and measures to be employed to manage
- Identification of any pest animal species and measures to be employed to manage
- Identification of active nests present (if any)
- Identification of appropriate location(s) for fencing to be installed to reduce roadkill of fauna species and funnel animals to creek crossings where safe passage will be available subject to construction activities and staging.

3.2 Post-clearing Report

The Construction Contractors will prepare Post-Clearing Reports containing a summary of the results of post-clearing surveys, and any fauna rescues, injuries or mortalities during clearing activities. The Post-Clearing Reports will be reviewed by the TfNSW Environment and Sustainability Manager (or delegate). The reports will be provided progressively (weekly) and a final report within 21 days from the completion of substantial clearing. The reports will include:

- 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
- Areas of Plant Community Type (PCTs), TECs, Critically Endangered Ecological Communities (CEECs) and all other vegetation removed and areas approved for removal in the EIS and Amendment Report
- Number and species of trees and other vegetation removed
- Number and size of hollows contained in trees removed
- 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 and license details of those carrying out the relocation.

The Construction Contractors will provide details of the vegetation cleared against the areas assessed and approved in the Environmental Assessment Documentation and Infrastructure Approval.



Appendix D

Construction Flora and Fauna Management Sub-plan

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

M12 Motorway

November 2021



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Plan reviewed by:	Plan reviewed by:
Suzette Graham TfNSW Environment and Sustainability Manager	Deanne Forrest TfNSW Project Director – M12
16/11/2021	17/11/2021
	

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A	02/09/2020	1 st Draft for TfNSW Review
B	18/09/2020	Response to TfNSW comments
C	21/10/2020	Response to TfNSW comments
D	22/07/2021	Updated with NSW and Federal Approval
E	13/08/2021	Response to ER and TfNSW comments
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Glossary/ Abbreviations

Abbreviations	Expanded text
CFFMP	Construction Flora and Fauna Management Plan
CoA	Conditions of Approval
DAWE	Commonwealth Department of Agriculture, Water and Environment
DPI Fisheries	NSW Department of Primary Industries - Fisheries
DPIE	NSW Department of Planning, Industry and Environment
EEC	Endangered Ecological Community
EES	NSW Environment, Energy and Science group (a part of DPIE)
Environmental Assessment Documentation	Collective reference to the M12 EIS (Oct 2019), Submissions Report (Oct 2020), Amendment Report (Oct 2020), Amendment Report-Submissions Report (Dec 2020) and supplementary reports as detailed in NSW CoA A1
EPBC Act	<i>Environmental Protection and Biodiversity Conservation Act 1999</i>
ER	Environmental Representative
ESM	Environment and Sustainability Manager
ESR	Construction Contractor - Environmental Site Representative
OCEMP	Overarching Construction Environmental Management Plan
RTA	Former Roads & Traffic Authority, now Transport for New South Wales
Project, the	M12 Motorway 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 for the Project. Contractors 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

The Contractor Environmental Site Representative will be notified in the event of an unexpected threatened species or TEC find on site during construction of the Project. The Contractor Environmental Site Representative is the key contact point for the Transport for NSW (TfNSW) Environment and Sustainability Manager (or delegate) in regard to this Procedure. A Project Ecologist will be engaged by the Construction Contractor if required for the implementation of this Procedure.

The TfNSW Environment and Sustainability Manager (or delegate) will act as the liaison between the Construction Contractor 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 Contractor Environmental Site Representative (ESR) in consultation with the Project Ecologist and reviewed by the TfNSW Environment and Sustainability Manager (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
<p>Cumberland Plain Land Snail</p> <p>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.</p> <p>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</p>	
<p>Southern Myotis</p> <p>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.</p> <p>It has disproportionately large feet; more than 8 mm long, with widely-spaced toes which are distinctly hairy and with long, curved claws.</p>	
<p>Grey-headed Flying-fox</p> <p>In times of natural resource shortages, the species can occur in unusual locations including urban gardens and cultivated fruit crops.</p> <p>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.</p> <p>This species is a nocturnal species.</p>	

Species	Photo
<p>Eastern Coastal Free-tailed Bat (formerly Eastern Freetail-bat)</p> <p>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.</p> <p>This species is a nocturnal species.</p>	
<p>Greater Broad-nosed Bat</p> <p>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.</p> <p>This species is a nocturnal species.</p>	
<p>Large Bent-winged Bat (formerly Eastern Bentwing-bat)</p> <p>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.</p> <p>Their primary roosting habitat are caves, but the species is also known to use derelict mines, stormwater tunnels, buildings and other manmade structures.</p> <p>This species is a nocturnal species.</p>	
<p>Little Bent-winged Bat (formerly Little Bentwing-bat)</p> <p>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.</p> <p>This species is a nocturnal species.</p>	

Species	Photo
<p>White-bellied Sea-Eagle</p> <p>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).</p> <p>Nest trees are typically large emergent eucalypts and often have dead emergent branches or large dead trees nearby which are used as guard roosts.</p>	
<p>Yellow-bellied Sheath-tail-bat</p> <p>The species roosts in tree hollows and buildings. In treeless areas, they are known to utilise mammal burrows.</p> <p>This species is a nocturnal species.</p>	
<p>Eastern False Pipistrelle</p> <p>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.</p> <p>This species is a nocturnal species</p>	
<p><i>Dillwynia tenuifolia</i></p> <p>In western Sydney, may be locally abundant particularly within scrubby/dry heath areas within Castlereagh Ironbark Forest and Shale Gravel Transition Forest.</p>	

Species	Photo
<p><i>Grevillea juniperina subsp. Juniperina</i></p> <p>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.</p> <p>Recorded from Cumberland Plain Woodland, Castlereagh Ironbark Woodland, Castlereagh Scribbly Gum Woodland and Shale/Gravel Transition Forest.</p>	
<p><i>Marsdenia viridiflora subsp. Viridiflora</i></p> <p>Grows in vine thickets and open shale woodland.</p>	
<p><i>Pimelea spicata</i></p> <p>Found on the Cumberland Plain sites, it is associated with Grey Box communities (particularly Cumberland Plain Woodland variants and Moist Shale Woodland) and in areas of ironbark.</p>	
<p><i>Pultenaea parviflora</i></p> <p>May be locally abundant, particularly within scrubby/dry heath areas within Castlereagh Ironbark Forest and Shale Gravel Transition Forest</p>	

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.

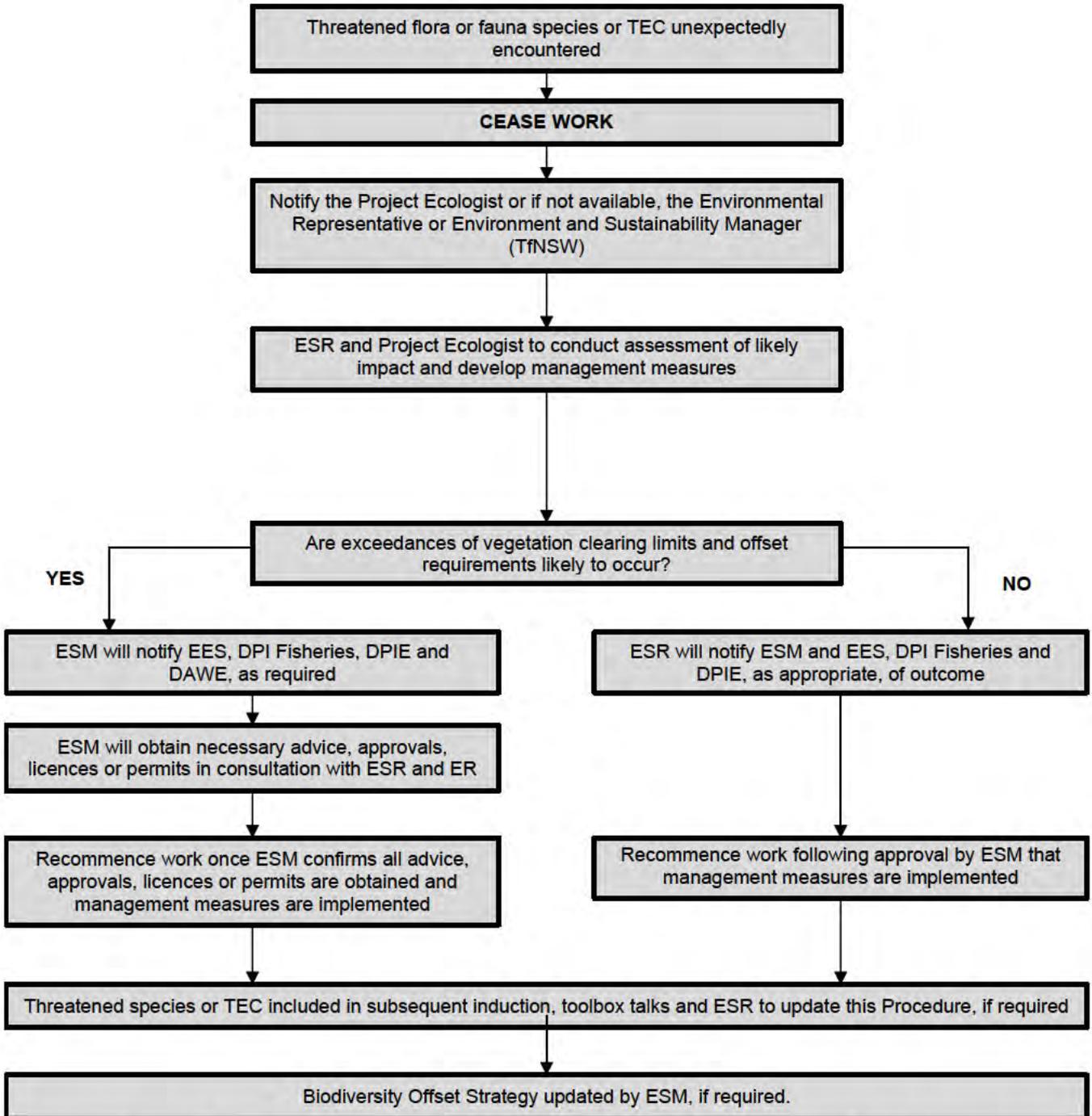


Figure 3-1: Unexpected threatened species or TECs finds procedure flow chart

3.2 Detailed procedure

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

If a new threatened flora or fauna species or TEC is unexpectedly encountered:

Cease work in the vicinity of the unexpected find.

Immediately notify the Project Ecologist who will notify Construction Contractor Environmental Site Representative and the TfNSW Environment and Sustainability Manager (or delegate) and the ER. On instruction from the Project Ecologist, The Contractor Environmental Site Representative will notify NSW Department of Planning, Industry and Environment (DPIE), Commonwealth Department of Agriculture, Water and Environment (DAWE), NSW Environment, Energy and Science (EES) and NSW Department of Primary Industries (DPI) Fisheries, if required.

Step 2. **Assessment of impact**

The Construction Contractor Environmental Site Representative 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.

The Construction Contractor Environmental Site Representative will notify the TfNSW Environment and Sustainability Manager (or delegate) and the ER, EES, DPI Fisheries and DPIE, as appropriate, of the outcome of the assessment, including any management measures to be implemented.

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 Environment and Sustainability Manager (or delegate) will notify EES, DPI, DPIE and DAWE 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, the Construction Contractor may reduce vegetation clearing in another area to compensate.

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**

Any approvals, licences or permits required will be obtained by the TfNSW Environment and Sustainability Manager (or delegate) in consultation with the Contractor Environmental Site Representative and the Environment Representative (ER).

Step 4. Recommencement of works

Where impact is likely to occur, work will not recommence prior to confirmation by the TfNSW Environment and Sustainability Manager (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.

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

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



4 Records

The Construction Contractors will maintain accurate records of all unexpected threatened species or EEC finds for the duration of the Project.



Appendix E

Construction Flora and Fauna Management Sub-plan

Weed, Pest and Pathogen Plan

M12 Motorway

November 2021



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Glossary/ Abbreviations

Abbreviations	Expanded text
BC Act	<i>Biosecurity Act 2015</i>
CFFMP	Construction Flora and Fauna Management Plan
DAWE	Commonwealth Department of Agriculture, Water and Environment
DPI Fisheries	NSW Department of Primary Industries - Fisheries
DPIE	NSW Department of Planning, Industry and Environment
EEC	Endangered Ecological Community
EES	NSW Environment, Energy and Science Group (a part of DPIE)
Environmental Assessment Documentation	Collective reference to the M12 EIS (Oct 2019), Submissions Report (Oct 2020), Amendment Report (Oct 2020), Amendment Report-Submissions Report (Dec 2020) and supplementary reports as detailed in NSW CoA A1
ER	Environmental Representative
LGA	Local Government Area
NATA	National Association of Testing Authorities
PBFD	Psittacine beak and feather disease
Pesticide Act	<i>Pesticides Act 1999</i>
Project, the	M12 Motorway 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, Pest 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), the *Greater Sydney Regional Strategic Pest Animal Plan 2018-2023* 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, Pest 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, pests and pathogens throughout the construction of the Project
- Establish an inspection and reporting framework for weeds, pests 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 and pest management during clearing, and progressive weed and pest 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 Construction Contractor Environmental Site Representative 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

This Plan will be updated by the Construction Contractor's and reviewed by the Transport for NSW (TfNSW) Environment and Sustainability Manager (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 7 of the OCEMP.

2 Weeds, pests and pathogens in the Project area

2.1 Weeds and pest species

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
<i>Alternanthera philoxeroides</i>	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
<i>Anredera cordifolia</i>	Madeira vine	Yes	Prohibition on dealings	Must not be imported into the State or sold
<i>Acetosa sagittata</i>	Turkey rhubarb	No	N/A	N/A
<i>Acetosella vulgaris</i>	Sheep sorrel	No	N/A	N/A
<i>Ageratina adenophora</i>	Crofton weed	No	N/A	N/A
<i>Araujia sericifera</i>	Moth vine, Moth plant	No	N/A	N/A
<i>Asparagus asparagoides</i>	Bridal keeper	Yes	Prohibition on dealings	Must not be imported into the State or sold

Species	Common name	WoNS?	Biosecurity Act 2015	Legal Requirement
<i>Axonopus fissifolius</i>	Common carpetgrass	No	N/A	N/A
<i>Bidens Pilosa</i>	Black-jack	No	N/A	N/A
<i>Briza subaristata</i>	Fairy bells	No	N/A	N/A
<i>Cardiospermum grandiflorum</i>	Balloon vine	No	N/A	N/A
<i>Cestrum parqui</i>	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
<i>Chloris gayana</i>	Rhodes grass	No	N/A	N/A
<i>Cyperus eragrostis</i>	Tall flatsedge	No	N/A	N/A
<i>Ehrharta erecta</i>	Panic veldtgrass	No	N/A	N/A
<i>Eragrostis curvula</i>	African lovegrass	No	N/A	N/A
<i>Hypericum perforatum</i>	St John's wort	No	N/A	N/A
<i>Juncus acutus</i>	Spiny rush, Spike rush, Sharp rush	No	N/A	N/A
<i>Lantana camara</i>	Lantana	Yes	Prohibition on dealings	Must not be imported into the State or sold
<i>Ligustrum lucidum</i>	Privet spp.	No	N/A	N/A
<i>Ligustrum sinense</i>	Privet spp.	No	N/A	N/A
<i>Lycium ferocissimum</i>	African boxthorn	Yes	Prohibition on dealings	Must not be imported into the State or sold
<i>Nassella neesiana</i>	Chilean needle grass	Yes	Prohibition on dealings	Must not be imported into the State or sold

Species	Common name	WoNS?	Biosecurity Act 2015	Legal Requirement
<i>Olea europaea subsp. cuspidata</i>	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
<i>Opuntia stricta</i>	Common prickly pear	Yes	Prohibition on dealings	Must not be imported into the State or sold
<i>Paspalum dilatatum</i>	Dallas grass	No	N/A	N/A
<i>Romulea rosea</i>	Onion grass	No	N/A	N/A
<i>Rubus fruticosus (sp. agg)</i>	Blackberry	Yes	Prohibition on dealings	Must not be imported into the State or sold
<i>Senecio madagascariensis</i>	Fireweed	Yes	Prohibition on dealings	Must not be imported into the State or sold
<i>Tradescantia fluminensis</i>	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 vertebrate 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 2-3.

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 and biodiversity. Eradicate/contain new or localised populations. Maintain absence in pig free areas.

Pest Animal	Management Category	Objective
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
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 and pest species 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 and pest 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 Construction Contractor will update this Weed, Pest and Pathogen Management Plan with a detailed list of all weed and pest species identified during the pre-clearing surveys as part of the Construction Contractor's CFFMP. The Construction Contractor will include details of the weed and pest species including photographs, detailed descriptions and known locations. The detail to be provided will also include the weed and pest species status in accordance with Attachments 1 and 2 of the *Greater Sydney Regional Strategic Weed Management Plan 2017 – 2022* and Table 2-3.

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

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).

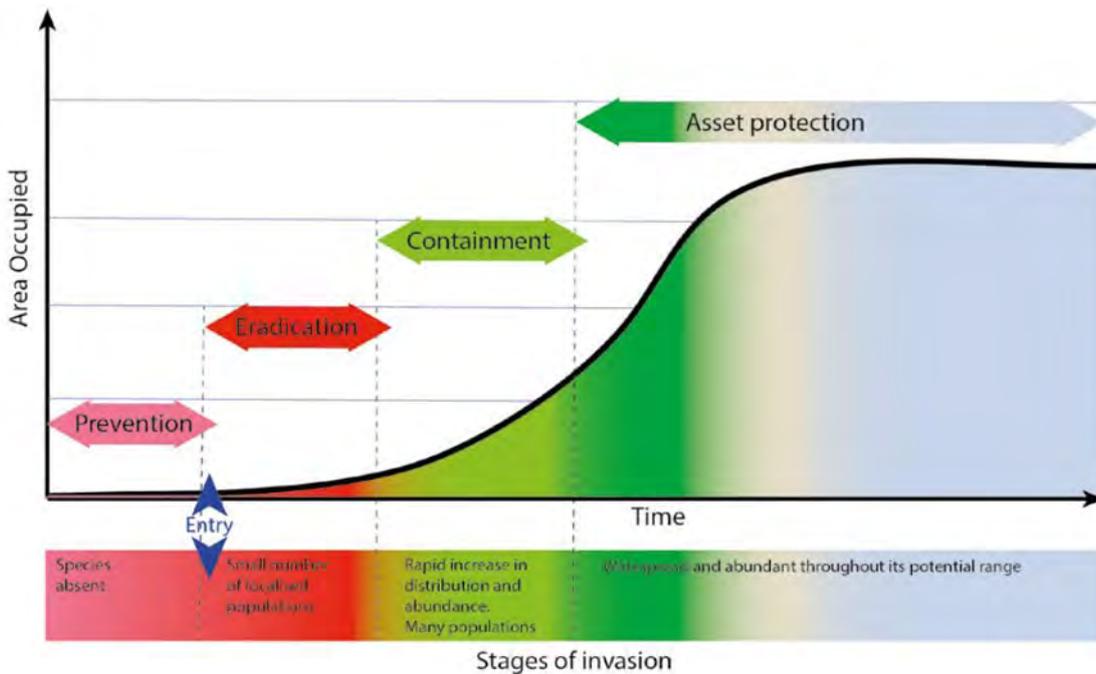
The Construction Contractor's will prepare identification and/or fact sheets on each pathogen identified as having the potential to occur within the Project area or with the potential to be introduced to the area.

3 Weed and pest management procedure

3.1 Approach to weed and pest management

In NSW, all plants and animals 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 and pest animals 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 and pest species earlier rather than later is more effective. The asset protection phase shown in Figure 3-1 illustrates the shift in the focus from controlling weed and pest species to limiting the impact it may have on important assets.



Source: Greater Sydney Regional Strategic Weed Management Plan 2017 – 2022¹

Figure 3-1: Invasion curve

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

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

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.
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 and pest 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* and Table 2-3.
- Describe the weed disposal procedure.

3.3 Establish weed and pest control measures

3.3.1 Prevention of weed and pest spread / importation

Environmental controls will be implemented by the Construction Contractor's 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 and pest 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 and pest treatment/removal 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 QA Specification G36.

The Construction Contractor 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 Construction Contractor Environmental Site Representatives will complete a Pesticides Application Record Sheet (provided in TfNSW QA

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 and pests.

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 Construction Contractor's 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 the Construction Contractor's 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 Construction Contractor from NSW Environment, Energy and Science (EES).

To avoid cross contamination of frogs with *Chytrid*, the Contractors 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.

Also, the Construction Contractor's will prepare a weed, pest and pathogen monitoring program that includes:

- Inspection of the general condition of the Project area including identification of additional weeds, pests and pathogens or reduction in the occurrence of weeds and pathogens
- Measures to assess the effectiveness of weed, pest and pathogen treatments
- Modifications to weed, pest 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 Construction Contractor Environmental Site Representative will report the results of each monitoring inspection against the weed, pest and pathogen management objectives to the TfNSW Project Manager and the TfNSW Environment and Sustainability Manager (or delegate).

The Construction Contractor's will prepare and implement an action plan to manage any ongoing weed and pathogen problems.

Attachment 1

Biodiversity Guide 6: Overview

Guide 6: Weed management

Background

A 'weed' is a plant growing in a terrestrial or aquatic area where it is not wanted. This can include seeds, flower heads or woody material. A plant that is considered a weed may not always be classed as a weed by everyone in all regions. Weeds are plants that may threaten agricultural productivity, have detrimental effects on the natural environment or impact on human health. Weeds may be native or introduced plant species.

The construction of road projects and maintenance works has the potential to introduce and promote the spread of weed species. The *Noxious Weeds Act 1993* (NSW) has provisions for the control of certain weeds and the RTA is required to control noxious weeds under this Act.

There are currently six Key Threatening Processes listed under the *NSW Threatened Species Conservation Act 1995* (NSW) (TSC Act) that relate to the invasion and establishment of weeds:

- Invasion and establishment of exotic vines and scramblers.
- Invasion and establishment of Scotch Broom (*Cytisus scoparius*).
- Invasion of native plant communities by Bitou Bush & Boneseed.
- Invasion of native plant communities by exotic perennial grasses.
- Invasion of native plant communities by African Olive (*Olea europaea L. subsp. cuspidata*).
- Invasion, establishment and spread of Lantana (*Lantana camara*).

Weeds are often classed into broad groups depending on their characteristics and impacts. The main groups of weeds are provided in Table 6.1.

TABLE 6.1: CLASSIFICATION OF WEEDS IN NSW.

Classification	Description
Weeds of National Significance (WONS)	Listed under the National Weeds Strategy (see www.weeds.gov.au/weeds/lists/wons.html).
National Environmental Alert List Weeds	Identified under the National Weeds Strategy (see www.weeds.gov.au/weeds/lists/alert.html).
Noxious	Require control under the <i>Noxious Weeds Act 1993</i> (NSW). Noxious weed declarations, their control class and control requirements are different for each Local Government Area (see www.dpi.nsw.gov.au/agriculture/pests-weeds/weeds/noxweed).
Environmental	Represent a threat to the conservation values of natural ecosystems.
Agricultural	Represent a threat to agricultural production.

Objective

The objective of this guide is to prevent or minimise the spread of noxious and environmental weed species on all RTA project sites and during maintenance works.

Application of this guide

This guide is applicable where RTA activities disturb vegetation, soil or aquatic environments.

This guide outlines weed management requirements for environmental and noxious weeds during construction but also provides best practice methods for weed management during maintenance works.

Specialist input requirements

Use an ecologist or person trained in weed management and identification to conduct the site weed assessment before works begin and assist in developing the weed management plan.

Management requirements

General requirements for weed management for projects and maintenance works

The project manager and/or environment manager should ensure the following best practice methods for weed management are undertaken:

- Mow/slash areas infested with weeds before they seed. This may reduce the propagation of new plants.
- Program works from least to most weed infested areas.
- Clean machinery, vehicles and footwear before moving to a new location.
- Securely cover loads of weed-contaminated material to prevent weed plant material falling or blowing off vehicles.
- Dispose of weed-contaminated soil at an appropriate waste management facility.
- Remove weeds immediately onto suitable trucks and dispose of without stockpiling.

- Separate weeds from native vegetation where native vegetation is to be used for mulch. Dispose of weeds to an appropriate waste management facility. Do not use weeds for mulch.
- Send samples of topsoil being imported onto site to a **National Association of Testing Authorities (NATA)** approved soil laboratory to ensure it contains no weed seeds or propagules (vegetative parts of plants such as buds or offshoots that can grow into new individuals)(see *Guide 3: Re-establishment of native vegetation*).



FIGURE 6.1: The weed Singapore Daisy (*Sphagneticola trilobata*) on the Pacific Highway – Banora Point Upgrade project. Once confined to Queensland, this weed has spread down the NSW coast and invaded rainforest edges and disturbed areas such as roadsides of the Northern Region (Photo: Tammie Tribe).



Site weed assessment

The project manager and/or environment manager should engage an **ecologist or person trained in weed identification and management** to undertake a site weed assessment including:

1. Identifying and describing or mapping weed infested areas within the site and adjacent areas. A weed assessment may have been done as part of the environmental assessment. Other useful resources for the identification of weeds can be found in the *Supporting Documents* section of this guide. Weed identification and description/mapping will provide an understanding of the scale of weed occurrences and any associated management issues.
2. Identifying and recommendations for managing any Weeds of National Significance (WONS), National Environmental Alert Weeds and/or noxious weeds located within the site or adjacent areas in consultation with the **weeds officer** at the relevant local council. Many of these weeds have legislative control requirements and most have separate weed management guides (see www.weeds.gov.au/publications/guidelines/index.html).
3. Identifying surrounding land uses and consultation with surrounding landholders where required.

Weed management plan

The project manager and/or environment manager should ensure a weed management plan is developed for the site with consideration of the resources available to implement the plan. The *Introductory Weed Management Manual* (Natural Heritage Trust 2004) provides guidance for developing weed management plans.

The requirements of the weed management plan would be incorporated into relevant plans for the project (eg landscape management plan, Construction Environmental Management Plan (CEMP) or work method statements).

The detail of the weed management plan would vary for each site but should include:

- Type and source of the weed/s.
- Weed management priorities and objectives.
- Sensitive environmental areas within or adjacent to the site.
- Location of weed infested areas.
- Mechanical weed control methods such as slashing or mowing, as well as a range of herbicides to avoid the development of herbicide resistance.
- Measures to prevent the spread of weeds.
- A monitoring program to measure the success of weed management.
- Communication strategies to improve contractor awareness of weeds and weed management.



Weed control methods

Weed control methods include mechanical, physical and chemical techniques. The *Introductory Weed Management Manual* (Module 2) (Natural Heritage Trust 2004) and *Noxious and Environmental Weed Control Handbook* (DPI 2007) provide examples of weed control methods.

In order to effectively control weeds it is important to have an understanding of the types of weeds present and their growth cycles and flowering times. Reference should be made to the Department of Primary Industries (DPI) Calendar of Growth Cycle and Control Times for different regions across NSW (see www.dpi.nsw.gov.au/agriculture/pests-weeds/weeds/publications/management/calendar).

Herbicide use

The use of herbicides is controlled in NSW by the *Pesticides Act 1999*. The project manager and/or environment manager should ensure that pesticides (including herbicides) are only be applied by **personnel trained and competent in chemical use**.

The application of herbicide should ensure the safety of users and other people, and minimise risks to the broader environment. The National Heritage Trust (2004) *Introductory Weed Management Manual* and the 'Pesticides and Chemicals' section of the Office of Environment and Heritage (OEH) website (www.environment.nsw.gov.au/pesticides/index.htm) provides further information on using herbicides appropriately.

CropLife Australia (the main industry body for Australian plant science) has grouped herbicides according to the way they work on plants ('mode of action') and the potential for resistance to them.

Each herbicide has a mode of action letter printed on the product label and herbicides with similar modes of action are put into the same group. CropLife Australia regularly revises the modes of action and resistance management strategies. These are available at www.croplifeaustralia.org.au

The RTA has obligations to notify the community of proposed pesticide use (including herbicides) in accordance with the NSW Pesticides Regulation 2009 (see the *RTA's Pesticide Use Notification Plan*).

The following should be considered when using herbicides:

- **The type and dose of herbicide** – choose the right herbicide for the weed species. Refer to manufacturer's label for target weeds, application rates and 'mode of action' groups.
- **Application method** – consider the type of weed to be treated, label instructions, resources available and weed management objectives.
- **Risks** – consider associated risks with each type of application method (eg spray drift), surrounding land uses (eg schools), suitable Personal Protective Equipment (PPE), weather and proximity to areas of environmental sensitivity.
- **Timing** – some control methods may not be effective at certain times of the year and weeds should be targeted when their growth cycle stage provides the best opportunity for control.
- **Herbicide resistance** – at sites where the same herbicide (eg glyphosate) has been sprayed on weeds repeatedly, the weeds may develop resistance to that particular chemical. These weeds may no longer be controlled by that herbicide. Some examples of glyphosate resistant weeds include Annual Rye Grass (*Lolium rigidum*) and Feathertop Rhodes Grass (*Chloris virgata*). Further information on the management of glyphosate resistant weeds is available at www.glyphosateresistance.org.au

Exclusion zones

Areas that are infested with weeds should be identified, mapped and marked as an exclusion zone with fencing and signage to limit access by personnel and vehicles (see *Guide 2: Exclusion zones*). This will minimise the spread of weeds. Maps of infested areas should be provided to contractors and highlighted during inductions.

Topsoil management

Topsoil management needs to be planned so as to minimise the spread of weeds originating from the topsoil, while making best use of the native seed bank. Topsoil recovered from areas of low weed infestation can be re-used onsite with treatment but should be stockpiled separately. Soil disturbance within weed infested areas should be minimised. Refer to RTA's Stockpile Site Management Guideline, the Blue Book, *RTA Environmental Protection (Management System) QA Specification G36* and *RTA Vegetation QA Specification RI 78* for further guidance on stockpile management.

Integrated weed management

Weed management is most effective through an integrated approach that utilises a variety of control techniques (eg mechanical and chemical). The suitability of certain control techniques for a site will vary depending upon the target weed species and the desired outcomes for the site. An integrated and strategic approach may sometimes require cooperation with adjacent landholders in order to provide adequate long-term control.

Weed disposal

All weed plant material and topsoil containing weed plant material should be disposed of to an appropriate waste management facility. Contact the local council for a list of disposal facilities within the local area. Topsoil from areas of high weed infestation may be disposed of on site by burial. The depth of burial will depend on the weed species and conditions at the site. Specific information on the disposal of weeds according to species can be found on the DPI website (www.dpi.nsw.gov.au/agriculture/pests-weeds/weeds).

Control of aquatic weeds

Aquatic weeds may need to be controlled when they interfere with the use of a particular aquatic environment or when there is a statutory obligation.

The best option for controlling aquatic weeds in a body of water is through integrated management which combines a number of techniques such as physical removal, chemical control, biological control or booms and barriers.

For more information on aquatic weed control techniques, refer to *NSW DPI Primefact 30: Aquatic weed management in waterways and dams*.



FIGURE 6.2: *Salvinia* (*Salvinia molesta*) treatment within Pola Creek on the Kempsey Bypass Project. *Salvinia* weevils were also introduced to the waterway to manage *Salvinia* (Photo: Sarah Wain).

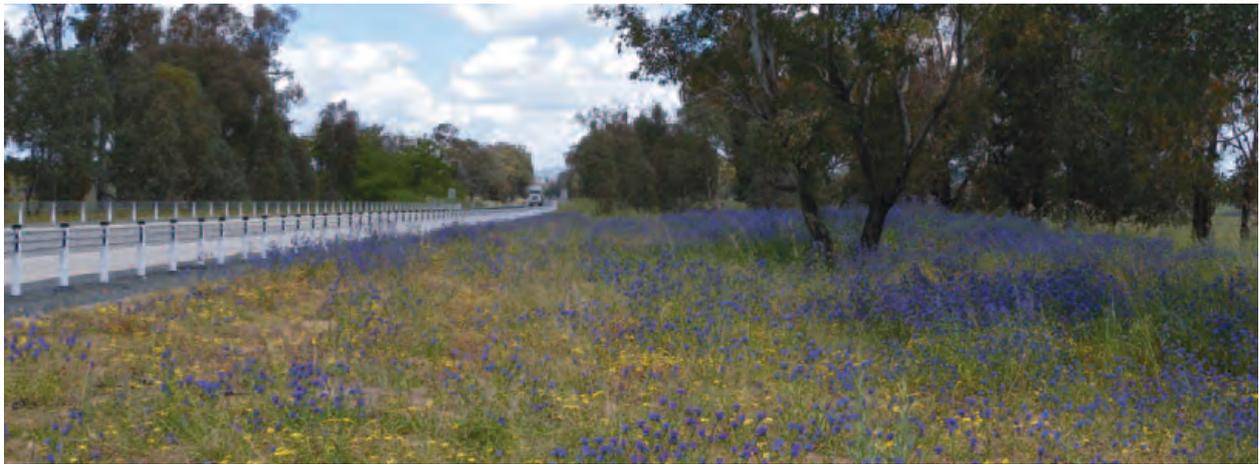


FIGURE 6.3: Paterson's Curse (*Echium plantagineum*) in the road reserve along Hume Highway, South Western region (Photo: Leigh Trevitt).

Supporting documents

1. Environmental assessment and associated supporting documents (eg ecological report, conditions of approval).
2. Environmental management plans and associated sub-plans and procedures for the works
3. Ainsworth, N and Bowcher, A (2005) *Guidelines for Herbicide Use near Water*, Cooperative Research Centres (CRC) for Australian Weed Management, South Australia.
4. Department of Primary Industries (DPI) Calendar of Growth Cycle and Control Times for different regions across NSW (www.dpi.nsw.gov.au/agriculture/pests-weeds/weeds/publications/management/calendar).
5. Department of Primary Industries (DPI) Weeds Training Program (www.dpi.nsw.gov.au/agriculture/pests-weeds/weeds/training#clm).
6. Department of Primary Industries (DPI) Weeds website (www.dpi.nsw.gov.au/agriculture/pests-weeds/weeds).
7. Department of Sustainability, Environment, Water, Population and Communities (DSEWPC) Weed Identification Tool (www.weeds.gov.au/cgi-bin/weedidtool.pl).
8. Ensbey, R (2009, accessed 7 April 2011) *Noxious and Environmental Weed Control Handbook: A guide to weed control in non-crop, aquatic and bushland situations*, 4th ed, Industry and Investment NSW, Orange, NSW (www.dpi.nsw.gov.au/agriculture/pests-weeds/weeds/publications/noxious-enviro-weed-control).
9. Gorham, P (2008, accessed 7 April 2011) *Primefact 30: Aquatic weed management in waterways and dams*, Industry and Investment NSW (www.dpi.nsw.gov.au/primefacts).
10. Natural Heritage Trust (2004, accessed 7 April 2011) *Introductory Weed Management Manual*, Natural Heritage Trust (with the CRC for Australian Weed Management and the Commonwealth Department of Environment and Heritage), ACT (www.weedscrc.org.au/documents/manual.pdf).
11. Office of Environment and Heritage (updated 14 April 2011) 'Pesticides and Chemicals' NSW Government Office of Environment and Heritage (www.environment.nsw.gov.au/pesticides/index.htm).
12. RTA (2007) Pesticide Use Notification Plan (www.rta.nsw.gov.au/environment/biodiversity/pesticideplan.html).
13. RTA *Environmental Protection (Management Plan) QA Specification G35* (Accessed via the RTA intranet TechInfo page, Techdocs).
14. RTA *Environmental Protection (Management System) QA Specification G36* (Accessed via the RTA intranet TechInfo page, Techdocs).
15. RTA *Vegetation QA Specification R1 78* (Accessed via the RTA intranet TechInfo page, Techdocs).

Attachment 2

Biodiversity Guide 7: Overview

Guide 7: Pathogen management

Background

Pathogens are agents that cause disease in flora and fauna and are usually living microorganisms such as a bacterium, virus, or fungus. Some pathogens are restricted to certain areas, and others are widespread across Australia. The severity of infection can also differ between areas.

Pathogens can be spread on footwear, vehicles and machinery, particularly during wet weather or in wet conditions. Strict precautions are necessary to prevent the spread of some pathogens. Some pathogens cannot be eradicated from infected sites so controlling their introduction and spread is a high priority.

Several pathogens in NSW have the potential to impact on the environment and biodiversity. These may be introduced and spread during the construction of road projects and roadside maintenance works. They include:

- Phytophthora (*Phytophthora cinnamomi*).
- Chytrid fungus (*Batrachochytrium dendrobatidis*).
- Myrtle rust (*Uredo rangelli*).
- Fusarium wilt/Panama disease (*Fusarium oxysporum*).

Phytophthora is a soil-borne fungus that causes tree death (dieback) where infestation occurs. Phytophthora attacks the roots of a wide range of native plant species causing them to rot. 'Dieback caused by Phytophthora' is listed as a Key Threatening Process under the *Environmental Protection and Biodiversity Conservation Act 1999* (Cwlth)(EPBC Act) and the *Threatened Species Conservation Act 1995* (NSW)(TSC Act). Spores can be dispersed over relatively large distances by surface and sub-surface water flows. Infected soil/root material may be dispersed by vehicles (eg earth moving equipment) animals and bushwalkers.



FIGURE 7.1: Dieback in Grass-tree (*Xanthorrhoea australis*) (Photo: K McDougall, OEH).

Chytridiomycosis (Chytrid) is an infectious disease that affects amphibians worldwide. The disease is caused by the fungus *Batrachochytrium dendrobatidis*. In Australia, chytrid has impacted on native frog species, causing the extinction of one species of frog and suspected to have caused the extinction of three others. 'Infection of frogs by amphibian chytrid fungus causing the disease chytridiomycosis' is listed as a Key Threatening Process under the EPBC and TSC Acts. Chytrid is a water-borne fungus that may be spread as a result of handling frogs or through cross contamination of water bodies.



FIGURE 7.2: A Great Barred Frog (*Mixophyes fasciolatus*) displaying symptoms of chytrid such as lethargy, emaciation, half closed eyes and accumulation of sloughed skin over the body (Photo: Lee Berger, CSIRO).



FIGURE 7.3: A Common Green Tree Frog (*Litoria caerulea*) with chytrid symptoms, including redness on the underside of the body and legs (Photo: K Gillet, OEH).

Myrtle rust is a plant disease caused by the introduced fungus *Uredo rangelli*. It was first detected on the Central Coast (NSW) in April 2010 and has since spread along the east coast from Wollongong to Tweed Heads. Myrtle rust attacks the young leaves, shoot tips and stems of Myrtaceous plants (eg Bottle Brush, Tea Tree, Lilly Pilly and Turpentine) eventually killing the plant. Myrtle rust is an air-borne fungus that may be spread by moving infected plant material, contaminated clothing (especially hats), equipment and vehicles.

The 'Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae' is listed as a Key Threatening Process under the TSC Act. Myrtle rust is included in this Key Threatening Process.



FIGURE 7.4: Leaves infected with Myrtle rust (Photos: courtesy of Department of Primary Industries).

Fusarium wilt (or Panama disease) is an introduced plant disease caused by the fungus *Fusarium oxysporum*. It is widespread in banana plantations in the Northern Rivers region of NSW, but is also known from a few plantations in Coffs Harbour and Woolgoolga. Fusarium wilt is spread when spores are moved in soil by water, workers, vehicles, animals or movement of infected plant material. Plants affected by Fusarium wilt show unusual patterns of frond (leaves) death and will eventually die. There is no cure or control mechanism but it can be kept out of a plantation through best practice hygiene protocols.

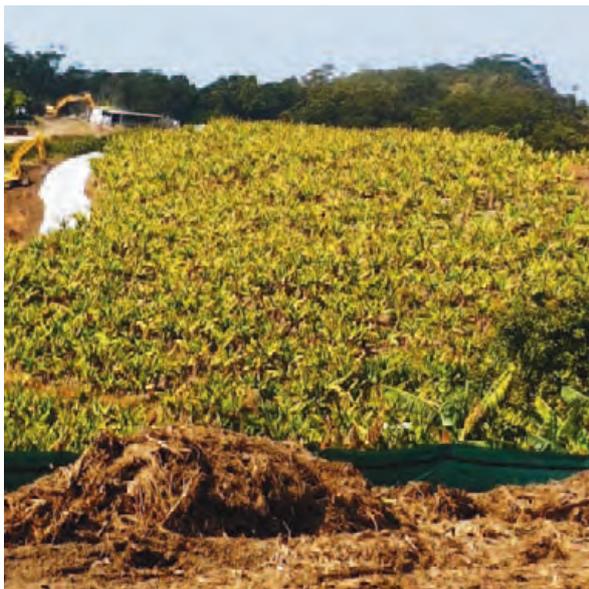


FIGURE 7.5: Banana plantations near Coffs Harbour showing yellow leaves, a symptom of Panama Disease (Photos: Josie Stokes).

Objective

The objective of this guide is to provide guidance for preventing the introduction and/or spread of disease causing agents such as bacteria and fungi.

Application of this guide

This guide is applicable wherever pathogens are known or suspected to occur on or adjacent to RTA projects and during maintenance works.

Specialist input requirements

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.

Advice from **Department of Primary Industries (DPI)** or the **Office of Environment and Heritage (OEH)** regarding the most practical hygiene management measures may be required if pathogens are present.

Management requirements

The project manager and/or environment manager should consider the potential for pathogens to occur on site or in the area at an early stage (eg in the environmental assessment). This includes considering the potential risk for the project to contribute to the spread of pathogens. Pathogen management is ongoing throughout the period in which works are being carried out.

Industry response to pathogens and quarantine areas is dynamic. The project manager and/or environment manager should check the DPI website (www.industry.nsw.gov.au) for the most up-to-date hygiene protocols for each pathogen and for the most recent locations of contamination. Table 7.1 provides best practice hygiene protocols to help prevent the introduction or spread of pathogens.

The project manager and/or environment manager should ensure the risk of spreading pathogens and the mitigation measures required on site are regularly communicated to staff and contractors eg during inductions and toolbox talks.

TABLE 7.1: BEST PRACTICE HYGIENE PROTOCOLS TO PREVENT THE INTRODUCTION OR SPREAD OF PATHOGENS ON RTA PROJECT SITES AND DURING MAINTENANCE WORKS.

Best Practice Hygiene Protocols	Phytophthora (<i>Phytophthora cinnamomi</i>)	Chytrid (<i>Batrachochytrium dendrobatidis</i>)
Test for presence if determined in REF or environmental assessment	<ul style="list-style-type: none"> • Soil test by a NATA approved laboratory. 	<ul style="list-style-type: none"> • Water test by a NATA approved laboratory.
Work programs	<ul style="list-style-type: none"> • Minimise work during excessively wet or muddy conditions. • Programming of works should always move from uninfected areas to infected areas. 	<ul style="list-style-type: none"> • Minimise work during excessively wet or muddy conditions. • Programming of works should always move from uninfected areas to infected areas.
Restrict access	<ul style="list-style-type: none"> • Set up exclusion zones with fencing and signage to restrict access into contaminated areas. 	<ul style="list-style-type: none"> • Set up exclusion zones with fencing and signage to restrict access into contaminated areas.
Inductions	<ul style="list-style-type: none"> • All personnel (including visitors) to be inducted on Phytophthora management measures for the site. 	<ul style="list-style-type: none"> • All personnel (including visitors) to be inducted on chytrid management measures for the site.
Vehicles and machinery	<ul style="list-style-type: none"> • Provide vehicle wash down facility. • Restrict vehicles to designated tracks, trails and parking areas. • Provide parking and turn-around points on hard, well-drained surfaces. 	<ul style="list-style-type: none"> • Provide vehicle wash down facility. • Restrict vehicles to designated tracks, trails and parking areas. • Provide parking and turn-around points on hard, well-drained surfaces.
Personnel and equipment	<ul style="list-style-type: none"> • Provide boot wash down facility. • Restrict personnel to designated tracks and trails. 	<ul style="list-style-type: none"> • Provide boot wash down facility. • Disinfect with cleaning products containing benzalkonium chloride or 70 per cent methylated spirits in 30 per cent water. • Disinfect hands or change gloves between the handling of individual frogs and between each site. • Only handle frogs when necessary. Use the 'one bag-one frog' approach.
New material	<ul style="list-style-type: none"> • Use a certified supply of plants and soil that is disease-free. 	<ul style="list-style-type: none"> • n/a
Disposing of material	<ul style="list-style-type: none"> • Retain all potentially affected materials within the contaminated area. • Ensure stockpiles of mulch, topsoil and fill material are separated to avoid potential contamination and spread. 	<ul style="list-style-type: none"> • To avoid cross contamination, generally avoid transferring water between two or more separate waterbodies.
Further information	<ul style="list-style-type: none"> • National best practice guidelines for management of Phytophthora for biodiversity conservation in Australia (O'Gara et al. 2005). 	<ul style="list-style-type: none"> • Hygiene protocol for the control of disease in frogs, Information Circular Number 6 (Wellington and Haering 2008).

Best Practice Hygiene Protocols	Fusarium wilt (eg Panama disease)	Myrtle rust (<i>Uredo rangelli</i>)
Test for presence if determined in REF or environmental assessment	<ul style="list-style-type: none"> Contact DPI before carrying out the works in former banana sites to see if and where Fusarium wilt is present. 	<ul style="list-style-type: none"> Before carrying out works in bushland, consult: <ol style="list-style-type: none"> The DPI Myrtle Rust Management Zone map (www.dpi.nsw.gov.au/biosecurity/plant/myrtle-rust/zones) to determine reporting required and whether you are working in a high risk area, and Local offices of OEH/NPWS for additional rust records and risk assessments. Photograph potentially infected plants and send to: biosecurity@industry.nsw.gov.au for confirmation.
Work programs	<ul style="list-style-type: none"> No earth work should occur during heavy rainfall or after extended rainfall. Programming of works should always move from uninfected areas to infected areas. 	<ul style="list-style-type: none"> Programming of works should always move from uninfected areas to infected areas.
Restrict access	<ul style="list-style-type: none"> Set up exclusion zones with fencing and signage to restrict access into contaminated areas. 	<ul style="list-style-type: none"> Set up exclusion zones with fencing and signage to restrict access into contaminated areas.
Inductions	<ul style="list-style-type: none"> All personnel (including visitors) to be inducted on Fusarium wilt management measures for the site. 	<ul style="list-style-type: none"> All personnel (including visitors) to be inducted on Myrtle rust management measures for the site.
Vehicles and machinery	<ul style="list-style-type: none"> Provide vehicle wash down facility. All vehicles to be washed with Truckwash[®] and then disinfected with Castrol Farmcleanse[®] (or equivalent). For medium-long term projects, install a concrete wash down bay which will capture the water in a trench or bunded area. Water used for wash downs must not be used for dust control. 	<ul style="list-style-type: none"> Provide vehicle wash down facility. All vehicles and machinery to be washed with Truckwash[®] (or equivalent). Restrict vehicles to designated tracks, trails and parking areas. For medium-long term projects, install a concrete wash down bay which will capture the water in a trench or bunded area. Water used for wash downs must not be used for dust control.
Personnel and equipment	<ul style="list-style-type: none"> Provide boot wash down facility. Remove mud/dirt from footwear and equipment and disinfect with Castrol Farmcleanse[®] (or equivalent). 	<ul style="list-style-type: none"> Personnel working in an infected site should shower and launder clothes (especially hats) before moving to another bushland site. Provide boot wash down facility. Footwear and equipment to be cleaned of soil/mud then sprayed with 70 per cent methylated spirits in 30 per cent water.
New material	<ul style="list-style-type: none"> Ensure that new soil being brought onto the site is disease-free. 	<ul style="list-style-type: none"> Use a certified supply of plants and soil that is disease-free (the Australian Nursery Industry <i>Myrtle Rust Management Plan</i> (McDonald 2011) provides best practice Myrtle rust management that is to be expected from suppliers).
Disposing of material	<ul style="list-style-type: none"> Run-off water must not be used for dust control or irrigation and it is not to be released. Topsoil from potentially infected plantations must only be stockpiled and used within contaminated areas of the plantation. 	<ul style="list-style-type: none"> Plant material should be buried on site if possible. Do not dispose of waste at another bushland site. Buried material sites must be mapped to prevent re-exposure, especially if located near utility easements. If material cannot be buried advice should be sought from DPI.
Further information	<ul style="list-style-type: none"> Fusarium wilt management procedures should be included in the Construction Environmental Management Plan (CEMP) or associated plans. 	<ul style="list-style-type: none"> DPI handout prepared for Myrtle rust response 2010–11: <i>Preventing spread of Myrtle Rust in bushland</i>. Information on managing Myrtle rust can be obtained from: www.dpi.nsw.gov.au/biosecurity/plant/myrtle-rust The OEI Interim management plan for Myrtle rust in bushland (2011).

Examples of pathogen management on RTA projects

The following photos provide best practice examples of hygiene protocols applied to RTA projects across NSW. This includes handheld boot and vehicle wash down, truck wash down bays, secure disposal of cleared vegetation and disposable suits for personnel on high risk sites.



FIGURE 7.6: Vehicle wash down to prevent the spread of pathogens at Bulahdelah, Hunter Region (Photo: Angie Radford).



FIGURE 7.7: Wheel wash bay used at Tempe Reserve during construction of the Airport Link, Sydney Region. Most trucks drove through the wheel wash, but some vehicles needed to be scrubbed to ensure materials were not transported from site. The water depth was approximately 400mm, with a cattle grate underwater for solids to settle under (Photo: Leigh Trevitt).



FIGURE 7.8: Wheel wash bay used at Sassafras during upgrades on Main Road 92 (Nowra to Nerriga) Southern Region. Vehicles drive onto the grid and are washed down. Water is contained under the grid (Photo: Julian Watson).



FIGURE 7.9: Boot wash down to prevent the spread of the Pathogen chytrid on shoes on the Sapphire to Woolgoolga project, Northern Region (Photo: Josie Stokes).



FIGURE 7.10: Pythophthora management measures on the Main Road 92 near Nowra, Southern Region (Photo: Scott Fayers).



FIGURE 7.11: Removed vegetation was securely wrapped in black plastic bags before disposal to prevent the spread of the pathogen Myrtle rust on the M2 Upgrade, Sydney region (Photo: Nicholas Francesconi).



FIGURE 7.12: Disposable suits were worn on the M2 Upgrade Sydney Region when contractors were working in a positively identified Myrtle rust site adjacent to a critically endangered ecological community of Blue Gum High Forest. This level of hygiene is recommended when working in Myrtle rust sites that are adjacent to highly sensitive ecological areas (eg endangered populations and endangered ecological communities) (Photo: Donald Cheong).

Supporting documents

1. Environmental assessment and associated supporting documents (eg ecological report, conditions of approval).
2. Environmental management plans and associated sub-plans and procedures for the works.
3. Department of Environment and Climate Change (April 2008), Statement of Intent 1. Infection of native plants by *Phytophthora cinnamomi*, New South Wales Department of Environment and Climate Change, Sydney.
4. Gollnow, B, Carnegie, A, Horwood, M and Driessen, S (2010, accessed 7 April 2011) PrimeFacts 1017 (2nd Edition) Myrtle Rust – *Uredo rangelli*, Industry and Investment NSW (www.dpi.nsw.gov.au/primefacts).
5. Industry and Investment NSW (November 2010, accessed 7 April 2011) *Preventing spread of Myrtle Rust in bushland: Handout prepared for Myrtle Rust response 2010–11*, Industry and Investment NSW, Gosford (www.dpi.nsw.gov.au/primefacts).
6. McDonald, J (2011) *Australian Nursery Industry Myrtle Rust (Uredo rangelli) Management Plan*, Nursery and Garden Industry Australia, Sydney (www.ngia.com.au).
7. Newley, P (August 2010, accessed 7 April 2011) PrimeFacts 1029 Panama Disease in Bananas, Industry and Investment NSW (www.dpi.nsw.gov.au/primefacts).
8. O’Gara, E, Howard, K, Wilson, B and Hardy, J (2005) *Management of Phytophthora cinnamomi for Biodiversity Conservation in Australia: Part 2 National Best Practice Guidelines*, A report funded by the Commonwealth Government Department of the Environment and Heritage by the Centre for Phytophthora Science and Management, Murdoch University, Western Australia.
9. Suddaby, T and Liew, E (2008) *Best Practice Management Guidelines for Phytophthora cinnamomi within the Sydney Metropolitan Catchment Management Authority Area*, Royal Botanic Gardens Trust, Sydney.
10. Threat Abatement Plans or Strategies and Priority Actions as issued and updated from time to time by
11. Threat Abatement Plans or Strategies and Priority Actions as issued and updated from time to time by OEH online (www.environment.nsw.gov.au).
12. Wellington, R and Haering, R (2008) *Hygiene Protocol for the control of disease in frogs: Threatened Species Management Information Circular No. 6*, Department of Environment and Climate Change, Sydney South.

Attachment 3

Priority Weeds

A1.1 State level determined priority weeds

State Priority Weed Objective – PREVENTION:

The following weeds are currently not found in the state, pose significant biosecurity risk and prevention of the biosecurity risk is a reasonably practical objective.

Species	Biosecurity Act requirements & Strategic Response in the region
All species of vascular plant (Tracheophyta)	<p>Mandatory Measure (Division 8, Clause 34) Duty to notify on importation of plants into the State:</p> <p>(1) A person must not import a species of vascular plant (Tracheophyta) into the State if the species is not currently present in the State unless the person has, at least 20 working days before the plant is imported into the State, notified the species of plant and its proposed location within the State.</p> <p>(2) The notification is to be given to the Secretary and is to be given in accordance with Part 6.</p> <p>(3) A species of plant is taken not to be present in the State if the National Herbarium of New South Wales does not show it as being present in the State.</p> <p>Note. See http://plantnet.rbg Syd.nsw.gov.au/.</p> <p>Regional Strategic Response: Manage in accordance with the New Weed Incursion Plan.</p>
Gamba grass - <i>Andropogon gayanus</i>	<p>Prohibited Matter (Part 4, Biosecurity Act, 2015): A person who deals with any biosecurity matter that is Prohibited Matter throughout the State is guilty of an offence.</p> <p>Regional Strategic Response: Manage in accordance with the New Weed Incursion Plan.</p>
Pond apple - <i>Annona glabra</i>	
Bridal veil creeper - <i>Asparagus declinatus</i>	
Kochia - <i>Bassia scoparia</i> (excluding subsp. <i>trichophylla</i>)	
Spotted knapweed - <i>Centaurea stoebe</i> subsp. <i>australis</i>	
Black knapweed - <i>Centaurea x moncktonii</i>	
Siam weed - <i>Chromolaena odorata</i>	
Koster's curse - <i>Clidemia hirta</i>	
Rubber vine - <i>Cryptostegia grandiflora</i>	
Anchored water hyacinth - <i>Eichhornia azurea</i>	
Hawkweed - <i>Hieracium</i> spp (all species)	
Hydrocotyl/Water pennywort - <i>Hydrocotyle ranunculoides</i>	
Lagarosiphon - <i>Lagarosiphon major</i>	
Frogbit / Spongeplant - <i>Limnobium</i> spp. (all species)	
Yellow burrhead - <i>Limnocharis flava</i>	
Miconia - <i>Miconia</i> spp. (all species)	
Mikania vine - <i>Mikania micrantha</i>	

State Priority Weed Objective – PREVENTION:

The following weeds are currently not found in the state, pose significant biosecurity risk and prevention of the biosecurity risk is a reasonably practical objective.

Species	Biosecurity Act 2015 requirements & Strategic Response in the region
Mimosa - <i>Mimosa pigra</i>	<p>Prohibited Matter (Part 4, Biosecurity Act, 2015): A person who deals with any biosecurity matter that is Prohibited Matter throughout the State is guilty of an offence.</p> <p>Regional Strategic Response: Manage in accordance with New Weed Incursion Plan.</p>
Eurasian water milfoil - <i>Myriophyllum spicatum</i>	
Mexican feather grass - <i>Nassella tenuissima</i> (syn. <i>Stipa tenuissima</i>)	
Broomrape - <i>Orobancha</i> spp. (all species except the native <i>O. cernua</i> var. <i>australiana</i> and <i>O. minor</i>)	
Water soldier - <i>Stratiotes aloides</i>	
Witchweed - <i>Striga</i> spp. (except the native <i>S. parviflora</i>)	
Water caltrop - <i>Trapa</i> spp. (all species)	
Karoo acacia - <i>Vachellia karroo</i> (syn. <i>Acacia karroo</i>)	
Prickly acacia - <i>Vachellia nilotica</i> (syn. <i>Acacia nilotica</i>)	
Parthenium Weed - <i>Parthenium hysterophorus</i>	<p>Prohibited Matter (Part 4, Biosecurity Act, 2015): A person who deals with any biosecurity matter that is Prohibited Matter throughout the State is guilty of an offence.</p> <p>Mandatory Measure (Division 8, Clause 35, Biosecurity Regulation, 2017) - Parthenium weed carriers – machinery and equipment</p> <p>(1) This clause applies to the following equipment:</p> <ul style="list-style-type: none"> (a) grain harvesters (including the comb or front), (b) comb trailers (including the comb or front), (c) bins used for holding grain during harvest operations (d) augers or similar equipment used for moving grain (e) vehicles used for transporting grain harvesters (f) vehicles used as support vehicles with grain harvesters and that have been driven in paddocks during harvest operations, and (g) mineral exploration drilling rigs and vehicles used for transporting those rigs. <p>(2) A person must not import into the State from Queensland any equipment to which this clause applies</p> <p>Regional Strategic Response: Manage in accordance with the New Weed Incursion Plan.</p>

State Priority Weed Objective – ERADICATION:

The following weeds are present in limited distribution and abundance in some parts of the state. Elimination of the biosecurity risk posed by these weeds is a reasonably practical objective.

Species	Biosecurity Act 2015 requirements & Strategic Response in the region
<p>Boneseed -<i>Chrysanthemoides monilifera</i> subspecies <i>monilifera</i></p>	<p>Biosecurity (Boneseed) Control Order 2017 6. Control measures for owners and occupiers of land Pursuant to section 62(1)(b) of the Act, an owner or occupier of land in the Boneseed Control Zone on which there is Boneseed must:</p> <p>(a) notify the local control authority for the area if the Boneseed is part of a new infestation on the land:</p> <ul style="list-style-type: none"> i) as soon as practicable after becoming aware of the new infestation; ii) verbally or in writing; iii) giving the following: <ul style="list-style-type: none"> (1) the person’s full name and contact number; (2) the location of the Boneseed, including the property identification code for the land (if this is known); and (3) any other information reasonably requested by the local control authority; and <p>(b) immediately destroy all Boneseed on the land;</p> <p>(c) ensure that subsequent generations of Boneseed are destroyed; and</p> <p>(d) the land is kept free of Boneseed.</p> <p>(e) The owner or occupier does not need to comply with (a) above if they know that notification of the infestation on the land has already been given to the local control authority for the area.</p> <p>7. Control measures for persons dealing with carriers Pursuant to section 62(1)(b) of the Act, a person who deals with a carrier of Boneseed in the Boneseed Control Zone, in circumstances where the person knows or ought reasonably to know of the presence of Boneseed on the land or in or on the carrier, must:</p> <p>(a) ensure that Boneseed (including any seed and propagules) is not moved from the land; and</p> <p>(b) immediately notify the local control authority for the area:</p> <ul style="list-style-type: none"> i) as soon as practicable after becoming aware of the presence of Boneseed; ii) verbally or in writing; iii) giving the following: <ul style="list-style-type: none"> (1) the person’s full name and contact number; (2) the location of the Boneseed, including the property identification code for the land (if this is known); and iv) any other information reasonably requested by the local control authority. <p>(c) The person who deals with a carrier of Boneseed does not need to comply with (b) above if they know that notification of the infestation on the land has already been given to the local control authority for the area.</p> <p>Mandatory Measure (Division 8, Clause 33, Biosecurity Regulation 2017): A person must not move, import into the State or sell.</p> <p>Regional Strategic Response:</p> <ul style="list-style-type: none"> • manage in accordance with New Weed Incursion Plan • detailed surveillance and mapping to locate infestations • high level analysis of pathways to identify potential introduction areas and prevention options • implement quarantine and/or hygiene protocols, and • monitor progress towards eradication

State Priority Weed Objective – ERADICATION:

The following weeds are present in limited distribution and abundance in some parts of the state. Elimination of the biosecurity risk posed by these weeds is a reasonably practical objective.

Species	Biosecurity Act 2015 requirements & Strategic Response in the region
Chinese violet - Asystasia gangetica	<p>Biosecurity (Chinese violet) Control Order 2019</p> <p>6. Control measures for owners and occupiers of land</p> <p>Pursuant to section 62(1)(b) of the Act, an owner or occupier of land in the Chinese violet Control Zone on which there is Chinese violet must:</p> <p>(a) notify the local control authority for the area if the Chinese violet is part of a new infestation on the land:</p> <ol style="list-style-type: none"> i) as soon as practicable after becoming aware of the new infestation; ii) verbally or in writing; iii) giving the following: <ol style="list-style-type: none"> (1) the person's full name and contact number; (2) the location of the Chinese violet, including the property identification code for the land (if this is known); and (3) any other information reasonably requested by the local control authority; and <p>(b) immediately destroy all Chinese violet on the land;</p> <p>(c) ensure that subsequent generations of Chinese violet are destroyed; and</p> <p>(d) the land is kept free of Chinese violet.</p> <p>(e) The owner or occupier does not need to comply with (a) above if they know that notification of the infestation on the land has already been given to the local control authority for the area.</p> <p>7. Control measures for persons dealing with carriers</p> <p>Pursuant to section 62(1)(b) of the Act, a person who deals with a carrier of Chinese violet in the Chinese violet Control Zone, in circumstances where the person knows or ought reasonably to know of the presence of Chinese violet on the land or in or on the carrier, must:</p> <p>(a) ensure that Chinese violet (including any seed and propagules) or matter suspected to be or contain Chinese Violet (including any suspected seeds and propagules) is not moved from the land; and</p> <p>(b) immediately notify the local control authority for the area:</p> <ol style="list-style-type: none"> i) as soon as practicable after becoming aware of the presence of Chinese violet; ii) verbally or in writing; iii) giving the following: <ol style="list-style-type: none"> (1) the person's full name and contact number; (2) the location of the Chinese violet, including the property identification code for the land (if this is known); and iv) any other information reasonably requested by the local control authority. <p>(c) The person who deals with a carrier of Chinese violet does not need to comply with (b) above if they know that notification of the infestation on the land has already been given to the local control authority for the area.</p> <p>Regional Strategic Response:</p> <ul style="list-style-type: none"> • manage in accordance with New Weed Incursion Plan

State Priority Weed Objective – ERADICATION:

The following weeds are present in limited distribution and abundance in some parts of the state. Elimination of the biosecurity risk posed by these weeds is a reasonably practical objective.

Species	Biosecurity Act 2015 requirements & Strategic Response in the region
Parkinsonia - <i>Parkinsonia aculeata</i>	<p>Biosecurity (Parkinsonia) Control Order 2017</p> <p><u>6. Control measures for owners and occupiers of land</u></p> <p>Pursuant to section 62(1)(b) of the Act, an owner or occupier of land in the Parkinsonia Control Zone on which there is Parkinsonia must:</p> <ul style="list-style-type: none">(a) notify the local control authority for the area if the Parkinsonia is part of a new infestation of Parkinsonia on the land:<ul style="list-style-type: none">i) as soon as practicable after becoming aware of the new infestation;ii) verbally or in writing;iii) giving the following:<ul style="list-style-type: none">(1) the person's full name and contact number;(2) the location of the Parkinsonia, including the property identification code for the land (if this is known); and(3) any other information reasonably requested by the local control authority; and(b) immediately destroy all Parkinsonia on the land; and(c) ensure that subsequent generations of Parkinsonia are destroyed; and(d) the land is kept free of Parkinsonia.(e) The owner or occupier does not need to comply with (a) above if they know that notification of the infestation on the land has already been given to the local control authority for the area. <p><u>7. Control measures for persons dealing with carriers</u></p> <p>Pursuant to section 62(1)(b) of the Act, a person who deals with a carrier of Parkinsonia in the Parkinsonia Control Zone, in circumstances where the person knows or ought reasonably to know of the presence of Parkinsonia on the land or in or on the carrier, must:</p> <ul style="list-style-type: none">(a) ensure that Parkinsonia (including any seed and propagules) is not moved from the land; and(b) immediately notify the local control authority:<ul style="list-style-type: none">i) as soon as practicable after becoming aware of the presence of Parkinsonia;ii) verbally or in writing;iii) giving the following:<ul style="list-style-type: none">(1) the person's full name and contact number;(2) the location of the Parkinsonia, including the property identification code for the land (if this is known); andiv) any other information reasonably requested by the local control authority.(c) The person who deals with a carrier of Parkinsonia does not need to comply with (b) above if they know that notification of the infestation on the land has already been given to the local control authority for the area. <p>Mandatory Measure (Division 8, Clause 33, Biosecurity Regulation 2017): A person must not move, import into the State or sell.</p> <p>Regional Strategic Response: Manage in accordance with the New Weed Incursion Plan.</p>

State Priority Weed Objective – ERADICATION:

The following weeds are present in limited distribution and abundance in some parts of the state. Elimination of the biosecurity risk posed by these weeds is a reasonably practical objective.

Species	Biosecurity Act 2015 requirements & Strategic Response in the region
Tropical soda apple - <i>Solanum viarum</i>	<p>Biosecurity (Tropical Soda Apple) Control Order 2017</p> <p><u>6. Control measures for owners and occupiers of land</u></p> <p>Pursuant to section 62(1)(b) of the Act, an owner or occupier of land in the Tropical Soda Apple Control Zone on which there is Tropical Soda Apple must:</p> <p>(a) notify the local control authority for the area if the Tropical Soda Apple is part of a new infestation of Tropical Soda Apple on the land:</p> <ul style="list-style-type: none"> i) as soon as practicable after becoming aware of the new infestation; ii) verbally or in writing; iii) giving the following: <ul style="list-style-type: none"> (1) the person's full name and contact number; (2) the location of the Tropical Soda Apple, including the property identification code for the land (if this is known); and (3) any other information reasonably requested by the local control authority; and <p>(b) destroy all Tropical Soda Apple on the land, including fruit; and</p> <p>(c) ensure that subsequent generations of Tropical Soda Apple are destroyed; and</p> <p>(d) that the land is kept free of Tropical Soda Apple.</p> <p>(e) The owner or occupier does not need to comply with (a) above if they know that notification of the infestation on the land has already been given to the local control authority for the area.</p> <p><u>7. Control measures for persons dealing with carriers</u></p> <p>Pursuant to section 62(1)(b) of the Act, a person who deals with a carrier of Tropical Soda Apple in the Tropical Soda Apple Control Zone, in circumstances where the person knows or ought reasonably to know of the presence of Tropical Soda Apple on the land or in or on the carrier, must:</p> <p>(a) ensure that Tropical Soda Apple (including any seed and propagules) is not moved from the land; and</p> <p>(b) immediately notify the local control authority for the area:</p> <ul style="list-style-type: none"> i) as soon as practicable after becoming aware of the presence of Tropical Soda Apple; ii) verbally or in writing; iii) giving the following: <ul style="list-style-type: none"> (1) the person's full name and contact number; (2) the location of the Tropical Soda Apple, including the property identification code for the land (if this is known); and iv) any other information reasonably requested by the local control authority. <p>(c) The person who deals with a carrier of Tropical Soda Apple does not need to comply with (b) above if they know that notification of the infestation on the land has already been given to the local control authority for the area.</p> <p>Regional Strategic Response: Manage in accordance with the New Weed Incursion Plan</p>

State Priority Weed Objective – CONTAINMENT:

These weeds are widely distributed in some parts of the state. While broad scale elimination is not practicable, minimisation of the biosecurity risk posed these weeds is reasonably practicable.

Land area where requirements apply	Biosecurity Act 2015 requirements & Strategic Response in the region
Alligator Weed - <i>Alternanthera philoxeroides</i>	
<p>A biosecurity zone, to be known as the alligator weed biosecurity zone, is established for all land within the State except land in the following regions:</p> <p>(a) Greater Sydney,</p> <p>(b) Hunter (but only in respect of land in the local government area of City of Lake Macquarie, City of Maitland, City of Newcastle or Port Stephens).</p>	<p>Biosecurity Regulation 2017 - Part 5, Division 2 (Biosecurity Zone) An owner or occupier of land in the alligator weed biosecurity zone on which there is the weed <i>Alternanthera philoxeroides</i> (Alligator weed) must:</p> <p>(a) if the weed is part of a new infestation of the weed on the land, notify the local control authority for the land as soon as practicable in accordance with Part 6, and</p> <p>(b) eradicate the weed or, if that is not practicable, destroy as much of the weed as is practicable and suppress the spread of any remaining weed.</p> <p>Mandatory Measure (Division 8, Clause 33, Biosecurity Regulation 2017): A person must not move, import into the State or sell.</p> <p>Regional Strategic Response: Refer Appendix 1.2 Containment.</p>
Bitou Bush - <i>Chrysanthemoides monilifera</i> subsp. <i>rotundata</i>	
<p>A biosecurity zone, to be known as the bitou bush biosecurity zone, is established for all land within the State except land within 10 kilometres of the mean high water mark of the Pacific Ocean between Cape Byron in the north and Point Perpendicular in the South.</p>	<p>Biosecurity Regulation 2017 - Part 5, Division 3 (Biosecurity Zone) An owner or occupier of land in the bitou bush biosecurity zone on which there is the weed <i>Chrysanthemoides monilifera</i> subsp. <i>rotundata</i> (Bitou bush) must:</p> <p>(a) if the weed is part of a new infestation of the weed on the land, notify the local control authority for the land as soon as practicable in accordance with Part 6, and</p> <p>(b) eradicate the weed or, if that is not practicable, destroy as much of the weed as is practicable and suppress the spread of any remaining weed.</p> <p>Mandatory Measure (Division 8, Clause 33, Biosecurity Regulation 2017): A person must not move, import into the State or sell.</p> <p>Regional Strategic Response: Manage in accordance with NSW Threat Abatement Plan and Saving Our Species.</p>

State Priority Weed Objective – CONTAINMENT:

These weeds are widely distributed in some parts of the state. While broad scale elimination is not practicable, minimisation of the biosecurity risk posed these weeds is reasonably practicable.

Land area where requirements apply

Biosecurity Act 2015 requirements & Strategic Response in the region

Water Hyacinth *Eichhornia crassipes*

A biosecurity zone, to be known as the water hyacinth biosecurity zone, is established for all land within the State except land in the following regions:

(a) Greater Sydney or North Coast, (b) North West (but only land in that region that is in the local government area of Moree Plains), (c) Hunter (but only land in that region that is in the local government area of City of Cessnock, City of Lake Macquarie, Mid-Coast, City of Maitland, City of Newcastle or Port Stephens), (d) South East (but only land in that region that is in the local government area of Eurobodalla, Kiama, City of Shellharbour, City of Shoalhaven or City of Wollongong).

Biosecurity Regulation 2017 - Part 5, Division 4 (Biosecurity Zone)

An owner or occupier of land in the water hyacinth biosecurity zone on which there is the weed *Eichhornia crassipes* (Water hyacinth) must:

- (a) if the weed is part of a new infestation of the weed on the land, notify the local control authority for the land as soon as practicable in accordance with Part 6, and
- (b) eradicate the weed, or if that is not practicable, destroy as much of the weed as is practicable and suppress the spread of any remaining weed.

Mandatory Measure (Division 8, Clause 33, Biosecurity Regulation 2017): A person must not move, import into the State or sell.

Regional Strategic Response: See Appendix 1.2 Containment.

State Priority Weed Objective – ASSET PROTECTION (Whole of State):

These weeds are widely distributed in some areas of the State. As Weeds of National Significance, their spread must be minimised to protect priority assets.

Species	Biosecurity Act 2015 requirements & Strategic Response in the region
Madeira vine - <i>Anredera cordifolia</i>	<p>Mandatory Measure (Division 8, Clause 33, Biosecurity Regulation 2017): A person must not import into the State or sell.</p> <p>Regional Strategic Response: Identify priority assets for targeted management.</p> <p># Refer Appendix 1.2 Prevention. † Refer Appendix 1.2 Eradication. †† Refer Appendix 1.2 Containment. ‡ Refer Appendix 1.2 Asset Protection.</p>
Asparagus weeds - <i>Asparagus aethiopicus</i> , † <i>A. africanus</i> , <i>A. asparagoides</i> including the Western Cape form*, <i>A. plumosus</i> , and <i>A. scandens</i>	
‡Cabomba - <i>Cabomba caroliniana</i>	
‡Scotch/English broom - <i>Cytisus scoparius</i> subsp. <i>scoparius</i>	
‡Cat's Claw Creeper - <i>Dolichandra unguis-cati</i>	
Cape/Montpellier broom - <i>Genista monspessulana</i>	
Flax-leaf broom - <i>Genista linifolia</i>	
#Hymenachne - <i>Hymenachne amplexicaulis</i>	
Bellyache bush - <i>Jatropha gossypifolia</i>	
Lantana - <i>Lantana camara</i>	
African boxthorn - <i>Lycium ferocissimum</i>	
Chilean needle grass - <i>Nassella neesiana</i>	
††Serrated tussock - <i>Nassella trichotoma</i>	
Opuntia- <i>Opuntia</i> spp., <i>Cylindropuntia</i> spp., <i>Austrocylindropuntia</i> spp. (Excludes <i>O. ficus-indica</i>)	
Mesquite - <i>Prosopis</i> spp.	
Blackberry - <i>Rubus fruticosus</i> agg. (Blackberry except the varieties <i>Chester Thornless</i> , <i>Dirksen Thornless</i> , <i>Loch Ness</i> , <i>Silvan</i> , <i>Black Satin</i> , <i>Murrindindi</i> , <i>Smooth Stem</i> , <i>Thornfree</i> and <i>Chehalem</i>)	
Sagittaria - <i>Sagittaria platyphylla</i>	
†Willows - <i>Salix</i> spp.(excludes <i>S.babylonica</i> , <i>S.X calodendron</i> & <i>S. x reichardtiji</i>)	
††Salvinia - <i>Salvinia molesta</i>	
Fireweed - <i>Senecio madagascariensis</i>	
Silver-leaf nightshade - <i>Solanum elaeagnifolium</i>	
Athel pine - <i>Tamarix aphylla</i>	
††Gorse - <i>Ulex europaeus</i>	

A1.2 Regional priority weeds

Regional Priority Weed Objective – PREVENTION:

The following weeds are currently not found in the Greater Sydney region, pose significant biosecurity risk and prevention of the biosecurity risk posed by these weeds is a reasonably practical objective.

Coral creeper - *Barleria repens*

East Indian hygrophila - *Hygrophila polysperma*

Giant devil's fig - *Solanum chrysotrichum*

Giant rats tail grass - *Sporobolus pyramidalis*

Hymenachne - *Hymenachne amplexicaulis*

Nodding thistle - *Carduus nutans*

Spanish broom - *Spartium junceum*

Water lettuce - *Pistia stratiotes*

Water star grass - *Heteranthera zosterifolia*

White blackberry / Mysore raspberry - *Rubus niveus*

Outcomes to demonstrate compliance with the GBD

- The plant is eradicated from the land and the land is kept free of the plant.
- Land managers mitigate the risk of the plant being introduced to their land.
- The plant or parts of the plant are not traded, carried, grown or released into the environment.
- Local Control Authority is notified if the plant is found on the land

Strategic response in the region

- Implement quarantine and/or hygiene protocols
- Undertake high risk sites & pathways analysis to identify potential introduction areas and preventative options
- Have a collaborative rapid response protocol in place

Supporting documents:

New Weed Incursion Plan (includes rapid response protocol)
Look, Learn, Act Community awareness program

Regional Priority Weed Objective – ERADICATION:

The following weeds are present in limited distribution and abundance. Elimination of the biosecurity risk posed by these weeds is a reasonably practical objective.

Outcomes to demonstrate compliance with the GBD	Strategic response in the region
Black willow - <i>Salix nigra</i>	
<ul style="list-style-type: none"> • The plant is eradicated from the land and the land is kept free of the plant. • Local Control Authority is notified if the plant is found on the land. • <i>The following legislative requirement also applies: Mandatory Measure (Division 8, Clause 33, Biosecurity Regulation, 2017): A person must not move, import into the State or sell.</i> 	<ul style="list-style-type: none"> • Destruction of all infestations where feasible. • Manage in accordance with New Weed Incursion Plan. • Detailed surveillance and mapping to locate all infestations.
Chinese knotweed - <i>Persicaria chinensis</i>	
<ul style="list-style-type: none"> • The plant is eradicated from the land and the land is kept free of the plant. • Local Control Authority is notified if the plant is found on the land. • The plant or parts of the plant are not traded, carried, grown or released into the environment. 	<ul style="list-style-type: none"> • Destruction of all infestations where feasible. • Manage in accordance with New Weed Incursion Plan. • Detailed surveillance and mapping to locate all infestations.
Climbing asparagus - <i>Asparagus africanus</i>	
<ul style="list-style-type: none"> • The plant is eradicated from the land and the land is kept free of the plant. • Local Control Authority is notified if the plant is found on the land. • <i>The following legislative requirement also applies: Mandatory Measure (Division 8, Clause 33, Biosecurity Regulation, 2017): A person must not move, import into the State or sell.</i> 	<ul style="list-style-type: none"> • Destruction of all infestations where feasible. • Manage in accordance with New Weed Incursion Plan. • Detailed surveillance and mapping to locate all infestations.
Glory lily – <i>Gloriosa superba</i>	
<ul style="list-style-type: none"> • The plant is eradicated from the land and the land is kept free of the plant. • Local Control Authority is notified if the plant is found on the land. • The plant or parts of the plant are not traded, carried, grown or released into the environment. 	<ul style="list-style-type: none"> • Destruction of all infestations where feasible. • Manage in accordance with New Weed Incursion Plan. • Detailed surveillance and mapping to locate all infestations.
Grey sallow – <i>Salix cinerea</i>	
<ul style="list-style-type: none"> • The plant is eradicated from the land and the land is kept free of the plant. • Local Control Authority is notified if the plant is found on the land. • <i>The following legislative requirement also applies: Mandatory Measure (Division 8, Clause 33, Biosecurity Regulation, 2017): A person must not move, import into the State or sell.</i> 	<ul style="list-style-type: none"> • Destruction of all infestations where feasible. • Manage in accordance with New Weed Incursion Plan. • Detailed surveillance and mapping to locate all infestations.

Regional Priority Weed Objective – ERADICATION:

The following weeds are present in limited distribution and abundance. Elimination of the biosecurity risk posed by these weeds is a reasonably practical objective.

Outcomes to demonstrate compliance with the GBD	Strategic response in the region
<i>Groundsel bush - Baccharis halimifolia</i>	
<ul style="list-style-type: none"> • The plant is eradicated from the land and the land is kept free of the plant. • Local Control Authority is notified if the plant is found on the land. • The plant or parts of the plant are not traded, carried, grown or released into the environment. 	<ul style="list-style-type: none"> • Destruction of all infestations where feasible. • Manage in accordance with New Weed Incursion Plan. • Detailed surveillance and mapping to locate all infestations. • Implement quarantine and/or hygiene controls
<i>Hygrophila - Hygrophila costata</i>	
<ul style="list-style-type: none"> • The plant is eradicated from the land and the land is kept free of the plant. • Local Control Authority is notified if the plant is found on the land. • The plant or parts of the plant are not traded, carried, grown or released into the environment. 	<ul style="list-style-type: none"> • Destruction of all infestations where feasible. • Manage in accordance with New Weed Incursion Plan. • Detailed surveillance and mapping to locate all infestations.
<i>Kei apple - Dovyalis caffra</i>	
<ul style="list-style-type: none"> • The plant is eradicated from the land and the land is kept free of the plant. • Local Control Authority is notified if the plant is found on the land. • The plant or parts of the plant are not traded, carried, grown or released into the environment. 	<ul style="list-style-type: none"> • Destruction of all infestations where feasible. • Manage in accordance with New Weed Incursion Plan. • Detailed surveillance and mapping to locate all infestations.
<i>Kidney leaf mud plantain - Heteranthera reniformis</i>	
<ul style="list-style-type: none"> • The plant is eradicated from the land and the land is kept free of the plant. • Local Control Authority is notified if the plant is found on the land. • The plant or parts of the plant are not traded, carried, grown or released into the environment. 	<ul style="list-style-type: none"> • Destruction of all infestations where feasible. • Manage in accordance with New Weed Incursion Plan. • Detailed surveillance and mapping to locate all infestations. • Implement quarantine and/or hygiene protocols.
<i>Kudzu - Pueraria lobata</i>	
<ul style="list-style-type: none"> • The plant is eradicated from the land and the land is kept free of the plant. • Local Control Authority is notified if the plant is found on the land. • The plant or parts of the plant are not traded, carried, grown or released into the environment. 	<ul style="list-style-type: none"> • Destruction of all infestations where feasible. • Manage in accordance with New Weed Incursion Plan. • Detailed surveillance and mapping to locate all infestations. • Implement quarantine and/or hygiene protocols.
<i>Leaf cactus - Pereskia aculeata</i>	
<ul style="list-style-type: none"> • The plant is eradicated from the land and the land is kept free of the plant. • Local Control Authority is notified if the plant is found on the land. • The plant or parts of the plant are not traded, carried, grown or released into the environment. 	<ul style="list-style-type: none"> • Destruction of all infestations where feasible. • Manage in accordance with New Weed Incursion Plan. • Detailed surveillance and mapping to locate all infestations. • Implement quarantine and/or hygiene protocols.

Regional Priority Weed Objective – ERADICATION:

The following weeds are present in limited distribution and abundance. Elimination of the biosecurity risk posed by these weeds is a reasonably practical objective.

Outcomes to demonstrate compliance with the GBD	Strategic response in the region
<i>Ming fern - Asparagus macowanii var. zuluensis</i>	
<ul style="list-style-type: none"> • The plant is eradicated from the land and the land is kept free of the plant. • Land managers mitigate the risk of the plant being introduced to their land. • Local Control Authority is notified if the plant is found on the land. • The plant or parts of the plant are not traded, carried, grown or released into the environment. 	<ul style="list-style-type: none"> • Destruction of all infestations where feasible. • Detailed surveillance and mapping to locate all infestations. • High level pathways analysis to identify potential introduction areas and preventative options. • Implement quarantine and/or hygiene protocols. • Monitor progress towards eradication.
<i>Mysore thorn - Caesalpinia decapetala</i>	
<ul style="list-style-type: none"> • The plant is eradicated from the land and the land is kept free of the plant. • The plant or parts of the plant are not traded, carried, grown or released into the environment. 	<ul style="list-style-type: none"> • Destruction of all infestations where feasible. • Manage in accordance with New Weed Incursion Plan. • Detailed surveillance and mapping to locate all infestations. • Implement quarantine and/or hygiene protocols.
<i>Sicilian sea lavender - Limonium hyblaenum</i>	
<ul style="list-style-type: none"> • The plant is eradicated from the land and the land is kept free of the plant. • Local Control Authority is notified if the plant is found on the land. • The plant or parts of the plant are not traded, carried, grown or released into the environment. 	<ul style="list-style-type: none"> • Destruction of all infestations where feasible. • Manage in accordance with New Weed Incursion Plan. • Detailed surveillance and mapping to locate all infestations. • Implement quarantine and/or hygiene protocols.
<i>Sicklethorn - Asparagus falcatus</i>	
<ul style="list-style-type: none"> • The plant is eradicated from the land and the land is kept free of the plant. • Local Control Authority is notified if the plant is found on the land. • The plant or parts of the plant are not traded, carried, grown or released into the environment. 	<ul style="list-style-type: none"> • Destruction of all infestations where feasible. • Manage in accordance with New Weed Incursion Plan. • Detailed surveillance and mapping to locate all infestations. • Implement quarantine and/or hygiene protocols.
<i>Skunk vine - Paederia foetida</i>	
<ul style="list-style-type: none"> • The plant is eradicated from the land and the land is kept free of the plant. • Local Control Authority is notified if the plant is found on the land. • The plant or parts of the plant are not traded, carried, grown or released into the environment. 	<ul style="list-style-type: none"> • Destruction of all infestations where feasible. • Manage in accordance with New Weed Incursion Plan. • Detailed surveillance and mapping to locate all infestations. • Implement quarantine and/or hygiene protocols.

Regional Priority Weeds objective – CONTAINMENT: *These weeds are widely distributed in the region. While broad scale elimination is not practicable, minimisation of the biosecurity risk posed by these weeds is reasonably practicable.*

Land area where requirements apply	Outcomes to demonstrate compliance with the GBD	Strategic response in the region
<i>African olive - Olea europaea subsp. cuspidata</i>		
<p>An exclusion zone is established for all lands in the Blue Mountains local government area and lands to the west of the Nepean River in the Penrith local government area. The remainder of the region is classified as the core infestation area.</p>	<p>Whole region:</p> <ul style="list-style-type: none"> The plant or parts of the plant are not traded, carried, grown or released into the environment. <p>Within Exclusion zone:</p> <ul style="list-style-type: none"> The plant is eradicated from the land and the land is kept free of the plant. <p>Within Core infestation:</p> <ul style="list-style-type: none"> Land managers prevent spread from their land where feasible. Land managers reduce the impact on priority assets. 	<p>Whole region:</p> <ul style="list-style-type: none"> Implement quarantine and/or hygiene protocols. Surveillance and mapping to locate all infested properties and maintain currency of exclusion zone and objectives. Monitor change in current distribution to ensure containment of spread. <p>Within Exclusion zone:</p> <ul style="list-style-type: none"> Destruction of all infestations, aiming at local eradication where feasible <p>Within Core infestation:</p> <ul style="list-style-type: none"> Identify priority assets for targeted management.
<i>Alligator weed - Alternanthera philoxeroides</i>		
<p>An exclusion zone is established for all lands in the Blue Mountains local government areas. The remainder of the region is classified as the core infestation area.</p>	<p>Whole region:</p> <ul style="list-style-type: none"> Land managers prevent spread from their land where feasible. <p>Within Exclusion zone:</p> <ul style="list-style-type: none"> The plant is eradicated from the land and the land is kept free of the plant. <p>Within Core infestation:</p> <ul style="list-style-type: none"> Land managers mitigate the risk of the plant being introduced to their land. Land managers reduce the impact on priority assets. <p>The following legislative requirement also applies: Mandatory Measure (Division 8, Clause 33): A person must not move, import into the State or sell.</p> <p>Note a Biosecurity Zone applies to this species under Part 5 of Division 2 of the <i>Biosecurity Regulation 2017</i>. However this does not apply to the Greater Sydney region.</p>	<p>Blue Mountains LGA:</p> <ul style="list-style-type: none"> Destruction of all infestations, where feasible. Implement quarantine and/or hygiene protocols. <p>Remainder of region:</p> <ul style="list-style-type: none"> Implement quarantine and/or hygiene protocols. Manage in accordance with the Priorities for the control of Alligator Weed in the Sydney Region.

Regional Priority Weeds objective – CONTAINMENT:		
Land area where requirements apply	Outcomes to demonstrate compliance with the GBD	Strategic response in the region
Asparagus fern - <i>Asparagus virgatus</i>		
<p>An <i>exclusion zone</i> is established for the whole of the region except Central Coast local government area. Central Coast local government area is classified as the <i>core infestation area</i>.</p>	<p>Whole region:</p> <ul style="list-style-type: none"> Land managers mitigate the risk of the plant being introduced to their land. The plant or parts of the plant are not traded, carried, grown or released into the environment. Local Control Authority is notified if the plant is found on the land. <p>Within Exclusion zone:</p> <ul style="list-style-type: none"> The plant is eradicated from the land and the land is kept free of the plant. <p>Within Core infestation:</p> <ul style="list-style-type: none"> Land managers prevent spread from their land where feasible. Land managers reduce the impact on priority assets. 	<ul style="list-style-type: none"> Destruction of all infestations where feasible. Monitor change in current distribution to ensure containment of spread.
Gorse - <i>Ulex - europaeus</i>		
<p>An <i>exclusion zone</i> is established for the Blue Mountains local government area.</p> <p>The remainder of the region is classified as the <i>core infestation area</i>.</p>	<p>Whole region:</p> <ul style="list-style-type: none"> Land managers mitigate the risk of the plant being introduced to their land. The plant or parts of the plant are not traded, carried, grown or released into the environment. <p>Within Exclusion zone:</p> <ul style="list-style-type: none"> The plant is eradicated from the land and the land is kept free of the plant. <p>Within Core infestation:</p> <ul style="list-style-type: none"> Land managers prevent spread from their land where feasible. <p><i>The following legislative requirement also applies: Mandatory Measure (Division 8, Clause33, Biosecurity Regulation, 2017): A person must not move, import into the State or sell.</i></p>	<ul style="list-style-type: none"> Destruction of all infestations, aiming at local eradication where feasible. Detailed surveillance and mapping to locate all infestations. Implement quarantine and/or hygiene protocols. Monitor progress towards eradication.

Regional Priority Weeds objective – CONTAINMENT:

Land area where requirements apply	Outcomes to demonstrate compliance with the GBD	Strategic response in the region
Holly-leaved senecio - <i>Senecio glastifolius</i>		
<p>An exclusion zone is established for the whole of the region except the Royal National Park. The Royal National Park is classified as the core infestation area.</p>	<p>Whole region:</p> <ul style="list-style-type: none"> • Land managers mitigate the risk of the plant being introduced to their land. • The plant or parts of the plant are not traded, carried, grown or released into the environment. • Local Control Authority is notified if the plant is found on the land. <p>Within Exclusion zone:</p> <ul style="list-style-type: none"> • The plant is eradicated from the land and the land is kept free of the plant. <p>Within Core infestation:</p> <ul style="list-style-type: none"> • Land managers prevent spread from their land where feasible. • Land managers reduce the impact on priority assets. 	<ul style="list-style-type: none"> • The plant should be fully and continuously suppressed and destroyed • Monitor change in current distribution to ensure containment of spread.
Horsetails - <i>Equisetum</i> spp.		
<p>An exclusion zone is established for whole of region except Northern Beaches local government area. The Northern Beaches local government area is classified as the core infestation area.</p>	<p>Whole region:</p> <ul style="list-style-type: none"> • Land managers mitigate the risk of the plant being introduced to their land. • Local Control Authority is notified if the plant is found on the land. • The plant or parts of the plant are not traded, carried, grown or released into the environment. <p>Within Exclusion zone:</p> <ul style="list-style-type: none"> • The plant is eradicated from the land and the land is kept free of the plant. <p>Within Core infestation:</p> <ul style="list-style-type: none"> • Land managers prevent spread from their land where feasible. 	<ul style="list-style-type: none"> • Destruction of all infestations, where feasible. • Monitor change in current distribution to ensure containment of spread.

Regional Priority Weeds objective – CONTAINMENT:		
Land area where requirements apply	Outcomes to demonstrate compliance with the GBD	Strategic response in the region
Salvinia - <i>Salvinia molesta</i>		
<p>An exclusion zone is established for the whole of the region except the Georges and Hawkesbury-Nepean Rivers and their tributaries. The Georges and Hawkesbury-Nepean Rivers and tributaries are classified as the core infestation area.</p>	<p>Whole region:</p> <ul style="list-style-type: none"> Land managers mitigate the risk of the plant being introduced to their land. <p>Within Exclusion zone:</p> <ul style="list-style-type: none"> The plant is eradicated from the land and the land is kept free of the plant. Local Control Authority is notified if the plant is found on the land. <p>Within Core infestation:</p> <ul style="list-style-type: none"> Land managers prevent spread from their land where feasible. <p>The following legislative requirement also applies: Mandatory Measure (Division 8, Clause 33, Biosecurity Regulation, 2017): A person must not move, import into the State or sell.</p>	<ul style="list-style-type: none"> The plant should be fully and continuously suppressed and destroyed Monitor change in current distribution to ensure containment of spread.
Sea spurge - <i>Euphorbia paralias</i>		
<p>An exclusion zone is established for whole of region except Sutherland local government area. Sutherland local government areas is classified as the core infestation area.</p>	<p>Whole region:</p> <ul style="list-style-type: none"> Land managers mitigate the risk of the plant being introduced to their land. The plant or parts of the plant are not traded, carried, grown or released into the environment. <p>Within Exclusion zone:</p> <ul style="list-style-type: none"> The plant is eradicated from the land and the land is kept free of the plant. Local Control Authority is notified if the plant is found on the land. <p>Within Core infestation:</p> <ul style="list-style-type: none"> Land managers prevent spread from their land where feasible. 	<ul style="list-style-type: none"> Destruction of all infestations, where feasible. Detailed surveillance and mapping to locate all infestations. High level pathways analysis to identify potential introduction areas and preventative options. Implement quarantine and/or hygiene protocols. Monitor progress towards eradication.

Regional Priority Weeds objective – CONTAINMENT:

Land area where requirements apply	Outcomes to demonstrate compliance with the GBD	Strategic response in the region
Senegal tea - <i>Gymnocoronis spilanthoides</i>		
<p>An exclusion zone is established for the whole of the region except Central Coast LGA, Royal National Park and the Hawkesbury-Nepean River and its tributaries. Central Coast LGA, Royal National Park and the Hawkesbury-Nepean River and its tributaries are classified as the core infestation area.</p>	<p>Whole region:</p> <ul style="list-style-type: none"> Land managers mitigate the risk of the plant being introduced to their land. The plant or parts of the plant are not traded, carried, grown or released into the environment. Local Control Authority is notified if the plant is found on the land. <p>Within Exclusion zone:</p> <ul style="list-style-type: none"> The plant is eradicated from the land and the land is kept free of the plant. <p>Within Core infestation:</p> <ul style="list-style-type: none"> Land managers prevent spread from their land where feasible. 	<ul style="list-style-type: none"> The plant should be fully and continuously suppressed and destroyed Monitor change in current distribution to ensure containment of spread.
Serrated tussock - <i>Nassella trichotoma</i>		
<p>An exclusion zone is established for all lands in the region, excluding areas comprising Wollondilly and Camden local government areas, which will be known as the core infestation area.</p>	<p>Whole region:</p> <ul style="list-style-type: none"> Land managers mitigate the risk of the plant being introduced to their land. The plant or parts of the plant are not traded, carried, grown or released into the environment. Local Control Authority is notified if the plant is found on the land. <p>Within Exclusion zone:</p> <ul style="list-style-type: none"> The plant is eradicated from the land and the land is kept free of the plant. <p>Within Core infestation:</p> <ul style="list-style-type: none"> Land managers prevent spread from their land where feasible. <p>The following legislative requirement also applies: Mandatory Measure (Division 8, Clause 33, Biosecurity Regulation, 2017): A person must not move, import into the State or sell.</p>	<ul style="list-style-type: none"> Monitor change in current distribution to ensure containment of spread. Promote best practice principles to landholders, including a range of control techniques for integrated weed management; maintaining competitive vegetation/crops/pastures, hygiene and property management plans. <p>Within Exclusion zone:</p> <ul style="list-style-type: none"> The plant should be fully and continuously suppressed and destroyed.

Regional Priority Weed Objective – CONTAINMENT:		
Land area where requirements apply	Outcomes to demonstrate compliance with the GBD	Strategic response in the region
Tiger pear - <i>Opuntia aurantiaca</i>		
An exclusion zone is established for the whole of the region except Blacktown and Wollondilly local government areas. Blacktown and Wollondilly local government areas are classified as the core infestation area.	<p>Whole region:</p> <ul style="list-style-type: none"> Land managers prevent spread from their land where feasible. Local Control Authority is notified if the plant is found on the land. <p>Within Exclusion zone:</p> <ul style="list-style-type: none"> The plant is eradicated from the land and the land is kept free of the plant. <p>Within Core infestation:</p> <ul style="list-style-type: none"> Land managers mitigate the risk of the plant being introduced to their land Land managers reduce the impact on priority assets. <p>The following legislative requirement also applies: Mandatory Measure (Division 8, Clause 33): A person must not move, import into the State or sell.</p>	<ul style="list-style-type: none"> Destruction of all infestations, where feasible. Monitor change in current distribution to ensure containment of spread.
Water poppy - <i>Hydrocleys nymphoides</i>		
An exclusion zone is established for all lands (and waters) in the region, excluding areas comprising the Hacking River Catchment, which will be known as the core infestation area .	<p>Whole region:</p> <ul style="list-style-type: none"> The plant or parts of the plant are not traded, carried, grown or released into the environment. <p>Within Exclusion zone:</p> <ul style="list-style-type: none"> The plant is eradicated from the land and the land is kept free of the plant. Local Control Authority is notified if the plant is found on the land. <p>Within Core infestation:</p> <ul style="list-style-type: none"> Land managers mitigate the risk of the plant being introduced to their land. Land managers prevent spread from their land where feasible. 	<ul style="list-style-type: none"> Monitor change in current distribution to ensure containment of spread. Promote best practice principles to landholders, including a range of control techniques for integrated weed management; maintaining competitive vegetation/crops/pastures, hygiene and property management plans. <p>Within Exclusion zone:</p> <ul style="list-style-type: none"> The plant should be fully and continuously suppressed and destroyed.

Regional Priority Weed Objective – ASSET PROTECTION:

Outcomes to demonstrate compliance with the GBD

Strategic response in the region

Cat's claw creeper - *Dolichandra unguis-cati*

- Land managers prevent spread from their land where feasible.
- Land managers mitigate the risk of the plant being introduced to their land.
- Land managers reduce the impact on priority assets.
- The plant or parts of the plant are not traded, carried, grown or released into the environment.

- The plant should be fully and continuously suppressed and destroyed
- Identify priority assets for targeted management
- Promote best practice principles to landholders, including a range of control techniques for integrated weed management; maintaining competitive vegetation/crops/pastures, hygiene and property management plans.

The following legislative requirement also applies: Mandatory Measure (Division 8, Clause 33): A person must not move, import into the State or sell.

Cabomba - *Cabomba caroliniana*

- Land managers mitigate the risk of the plant being introduced to their land.
- The plant or parts of the plant are not traded, carried, grown or released into the environment.

- The plant should be fully and continuously suppressed and destroyed
- Implement quarantine and/or hygiene protocols.

The following legislative requirement also applies: Mandatory Measure (Division 8, Clause 33): A person must not move, import into the State or sell.

Giant reed – *Arundo donax*

- Land managers mitigate the risk of the plant being introduced to their land.
- The plant or parts of the plant are not traded, carried, grown or released into the environment.

- The plant should be fully and continuously suppressed and destroyed
- Implement quarantine and/or hygiene protocols.

Green cestrum - *Cestrum parqui*

- Land managers mitigate the risk of the plant being introduced to land used for grazing of livestock.
- Land managers prevent spread from their land where feasible.
- The plant or parts of the plant are not traded, carried, grown or released into the environment.

- The plant should be fully and continuously suppressed and destroyed on grazing land
- Implement quarantine and/or hygiene protocols.

Ludwigia - *Ludwigia peruviana*

- Land managers mitigate the risk of the plant being introduced to their land.
- Land managers prevent spread from their land where feasible.
- Land managers reduce the impact on priority assets.
- The plant or parts of the plant are not traded, carried, grown or released into the environment.
- Local Control Authority is notified if the plant is found on the land.

- The plant should be fully and continuously suppressed and destroyed.
- Identify priority assets for targeted management.

Regional Priority Weed Objective – ASSET PROTECTION:	
Outcomes to demonstrate compliance with the GBD	Strategic response in the region
Pampas grass - <i>Cortaderia species</i>	
<ul style="list-style-type: none"> Land managers mitigate the risk of the plant being introduced to their land. Land managers prevent spread from their land where feasible. Land managers reduce the impact on priority assets. The plant or parts of the plant are not traded, carried, grown or released into the environment. 	<ul style="list-style-type: none"> The plant should be fully and continuously suppressed and destroyed. Identify priority assets for targeted management
Scotch/English Broom - <i>Cytisus scoparius</i>	
<ul style="list-style-type: none"> Land managers mitigate the risk of the plant being introduced to their land. Land managers reduce the impact on priority assets. <p>The following legislative requirement also applies: Mandatory Measure (Division 8, Clause 33): A person must not move, import into the State or sell.</p>	<ul style="list-style-type: none"> The plant should be managed in accordance with a regional best practice guide identifying assets to be protected, including the Greater Blue Mountains World Heritage Area and Sydney water supply catchment lands.
Singapore daisy - <i>Sphagneticola trilobata</i>	
<ul style="list-style-type: none"> Land managers mitigate the risk of the plant being introduced to their land. Land managers reduce the impact on priority assets. The plant or parts of the plant are not traded, carried, grown or released into the environment. 	<ul style="list-style-type: none"> Manage in accordance with New Weed Incursion Plan Implement quarantine and/or hygiene protocols. Identify priority assets Promote best practice principles to landholders, including a range of control techniques for integrated weed management; maintaining competitive vegetation/crops/pastures, hygiene and property management plans.
Water hyacinth - <i>Eichhornia crassipes</i>	
<ul style="list-style-type: none"> Land managers prevent spread from their land where feasible. The plant or parts of the plant are not traded, carried, grown or released into the environment. <p>The following legislative requirement also applies: Mandatory Measure (Division 8, Clause 33): A person must not move, import into the State or sell.</p> <p>Note a Biosecurity Zone applies to this species under Part 5 of Division 2 of the <i>Biosecurity Regulation 2017</i>. However this does not apply to the Greater Sydney region.</p>	<ul style="list-style-type: none"> Develop and implement Community Campaign Promote best practice principles to landholders, including a range of control techniques for integrated weed management; maintaining competitive vegetation/crops/pastures, hygiene and property management plans.

Attachment 4

Other Weeds of Regional Concern

Appendix 2: Other weeds of regional concern

The following table recognises that whether a plant is a weed depends on the location, and that some plants grown as crops may function as weeds in other land uses. For example, kikuyu is a valuable pasture grass in grazing paddocks but is an invasive weed in the natural environment ie. bushland and National parks. Agapanthus are very popular garden plants, often used as border plants or to hold low banks. However, agapanthus are also known to invade roadsides, bushland and waterways.

Weeds listed in Appendix 2 include species known to occur in the Greater Sydney region as well as species not currently known to occur but at risk of moving into the region in the future. They have been identified as a potential risk in some (not all) situations. Many of the species pose potential risks to biodiversity (i.e. the environment), for example if they were to spread to or be found in a National Park. Some of the species pose potential risks to agriculture and some of the weeds pose potential risks to human health. In most situations this is when ingested but can also include risks associated with asthma and other allergic reactions.

This plan recognises that many weeds are already so well established that they can only be managed and will never be eradicated from the region. The species included in Appendix 2 may warrant resources for control or management programs, or occur in neighbouring regions and are a priority to keep out of the region. Inclusion on the list may assist Local Control Authorities and/or land managers prioritise action in certain circumstances where it can be demonstrated the weed poses a threat to the environment, agriculture and/or the community/human health.

The *Biosecurity Act 2015* provides powers to Local Control Authorities to take action in relation to these weeds in particular circumstances, for example where a weed threatens a high value asset and prevention, elimination or reduction of the risk is feasible and reasonable.

Common name	Scientific name	Asset/value at risk
Aaron's Beard, Rose-of-Sharon	<i>Hypericum calycinum</i>	Environment
African lovegrass	<i>Eragrostis curvula</i>	Environment
African marigold	<i>Cineraria lyratiformis</i>	Environment
Agapanthus	<i>Agapanthus praecox subsp. orientalis</i>	Environment
American Cotton Palm, Cotton Palm, California fan palm.	<i>Washingtonia filifera</i>	Environment
Apple of Sodom	<i>Solanum linnaeanum</i>	Environment, Agriculture, Community amenity
Arrowhead	<i>Sagittaria calycina</i> var. <i>calycina</i>	Environment, Agriculture, Community amenity
Arum lily	<i>Zantedeschia aethiopica</i>	Human health, Environment
Awabuki sweet viburnum	<i>Viburnum odoratissimum</i> var <i>awabuki</i>	Environment
Balloon vine	<i>Cardiospermum grandiflorum</i>	Environment
Banana passionfruit	<i>Passiflora tarminiana</i>	Environment
Beach daisy	<i>Arctotheca populifolia</i>	Environment, Community amenity

Common name	Scientific name	Asset/value at risk
Berberis, Barberry	<i>Berberis aristata</i> , <i>B. darwini</i> and <i>B. thunbergii</i>	Environment
Billardiera, Bluebell creeper	<i>Billardiera heterophylla</i>	Environment
Black cherry, Wild black cherry	<i>Prunus serotina</i>	Environment
Black locust	<i>Robinia pseudoacacia</i>	Environment, Human health
Blue heliotrope	<i>Heliotropium amplexicaule</i>	Agriculture
Blue hound's tongue	<i>Cynoglossum creticum</i>	Agriculture
Blue morning glory	<i>Ipomoea indica</i>	Environment, Human health
Blue stars	<i>Aristea ecklonii</i>	Environment
Bokhara	<i>Melilotus albus</i>	Environment
Box elder	<i>Acer negundo</i>	Environment
Brazilian button flower	<i>Centratherum punctatum</i>	Environment
Brazilian cherry	<i>Eugenia uniflora</i>	Environment
Broad leaf pepper	<i>Schinus terebinthifolius</i>	Environment
Buckthorn	<i>Rhamnus alaternus</i>	Environment
Buffel grass	<i>Cenchrus ciliaris</i>	Environment
Burr ragweed	<i>Ambrosia confertiflora</i>	Agriculture, human health
Bushman's Poison, Hottentot's-poison, Poison arrow plant, Wintersweet	<i>Acokanthera oblongifolia</i>	Agriculture
Camphor laurel	<i>Cinnamomum camphora</i>	Environment, Agriculture, Human health
Cane needle grass	<i>Nassella hyalina</i>	Agriculture
Cape honeysuckle	<i>Tecoma capensis</i>	Environment
Cape ivy	<i>Delairea odorata</i>	Environment
Cape tulip	<i>Moraea flaccida</i>	Environment, Agriculture
Cassia, Senna	<i>Senna pendula</i>	Environment
Cherry guava	<i>Psidium cattleianum</i>	Environment, Agriculture
Chinese celtis/ Chinese hackberry	<i>Celtis sinensis</i>	Environment, Agriculture
Chinese elm	<i>Ulmus parvifolia</i>	Environment
Chinese tallow	<i>Triadica sebifera</i>	Environment
Climbing nightshade, Brazillian nightshade	<i>Solanum seaforthianum</i>	Environment, Human health
Coastal morning glory	<i>Ipomoea cairica</i>	Environment
Cockspur coral tree	<i>Erthrina crista-galli</i>	Environment
Cocos palm	<i>Syagrus romanzoffiana</i>	Environment
Coffee bush, Leucaena	<i>Leucaena leucocephala</i>	Environment, Community amenity
Common morning glory	<i>Ipomoea purpurea</i>	Environment, Agriculture
Coolatai grass	<i>Hyparrhenia hirta</i>	Environment, Agriculture
Coral Berry	<i>Ardisia crenata</i>	Environment
Coral tree, Common coral tree	<i>Erythrina x sykesii</i>	Environment
Corky passionflower	<i>Passiflora suberosa</i>	Environment
Cotoneaster	<i>Cotoneaster</i> spp	Environment

Common name	Scientific name	Asset/value at risk
Creeping lantana, trailing lantana	<i>Lantana montevidensis</i>	Environment, Agriculture
Crofton weed	<i>Ageratina adenophora</i>	Environment, Agriculture
Cumbungi	<i>Typha latifolia</i>	Environment
Day-lily, Kwanso	<i>Hemerocallis fulva</i>	Environment
Dense waterweed, Leafy elodea, Egeria, Anacharis, Brazilian elodea	<i>Egeria densa</i>	Environment, Community amenity
Dipogon, Dolichos pea,	<i>Dipogon lignosus</i>	Environment
Dutchmans pipe	<i>Aristolochia elegans</i>	Environment
Espartillo, Broad-kernel espartillo	<i>Amelichloa caudata</i> (syn. <i>Achnatherum caudatum</i>)	Environment, Agriculture
Espartillo – narrow kernel	<i>Amelichloa brachychaeta</i>	Environment, Agriculture
European olive	<i>Olea europaea subsp. europaea</i>	Environment
Firethorn	<i>Pyracantha</i> spp.	Environment
Fishbone fern	<i>Nephrolepis cordifolia</i>	Environment
Formosa lily, Taiwan lily	<i>Lilium formosanum</i>	Environment
Fountain grass	<i>Pennisetum setaceum</i>	Environment
Foxglove tree, Empress tree	<i>Paulownia tomentosa</i>	Environment
Galenia	<i>Galenia pubescens</i>	Environment, Agriculture
Giant Parramatta grass (GPG)	<i>Sporobolus fertilis</i>	Environment, Agriculture
Ginger lily	<i>Hedychium gardnerianum</i>	Environment
Golden rain tree	<i>Koelreuteria elegans</i>	Environment
Golden wreath wattle	<i>Acacia saligna</i>	Environment
Harrisia cactus	<i>Harrisia</i> spp.	Environment
Himalayan honeysuckle	<i>Leycesteria formosa</i>	Environment
Holly, English holly	<i>Ilex aquifolium</i>	Environment
Honey locust	<i>Gleditsia triacanthos</i>	Environment, Agriculture
Indian hawthorn	<i>Rhaphiolepis indica</i>	Environment
Japanese climbing Fern	<i>Lygodium japonicum</i>	Environment
Japanese hawthorn, Yeddo hawthorn	<i>Rhaphiolepis umbellata</i>	Environment
Japanese honeysuckle	<i>Lonicera japonica</i>	Environment
Keriberry	<i>Rubus rugosus</i>	Environment
Kikuyu	<i>Pennisetum clandestinum</i>	Environment
Long leaf water primrose	<i>Ludwigia longifolia</i>	Environment, Agriculture, Community amenity
Lote tree, Nettle tree, Mediterranean hackberry	<i>Celtis australis</i>	Environment
Mahonia, Chinese Holly	<i>Berberis lomariifolia</i>	Environment
Mexican water lily, Yellow water lily	<i>Nymphaea mexicana</i>	Environment
Mimosa bush, Briar bush, Yellow mimosa	<i>Vachellia farnesiana</i>	Environment, Agriculture
Mirror bush, Mirror plant	<i>Coprosma repens</i>	Environment

Common name	Scientific name	Asset/value at risk
Mistflower	<i>Ageratina riparia</i>	Environment, Agriculture
Monkey's comb	<i>Pithecoctenium crucigerum</i>	Environment
Montbretia	<i>Crocasmia x crocosmiiflora</i>	Environment
Mossman river grass	<i>Cenchrus echinatus</i>	Environment
Moth vine, Moth plant	<i>Araujia sericifera</i>	Environment
Mother of millions	<i>Bryophyllum</i> spp.	Environment, Agriculture, Human health
New Zealand flax	<i>Phormium tenax</i>	Environment
Ochna	<i>Ochna serrulata</i>	Environment
Onion Grass	<i>Romulea rosea</i>	Environment, Agriculture
Orange jessamine, Murraya	<i>Murraya paniculata</i>	Environment
Osage orange	<i>Maclura pomifera</i>	Environment
Ox-eye daisy	<i>Leucanthemum vulgare</i>	Environment
Pampas lily of the valley	<i>Salpichroa organifolia</i>	Environment
Paper mulberry	<i>Broussonetia papyrifera</i>	Environment
Paterson's curse	<i>Echium plantagineum</i>	Environment, Agriculture, Human health
Patula pine, Mexican weeping pine	<i>Pinus patula</i>	Environment
Pellitory, Asthma weed	<i>Parietaria judaica</i>	Environment, Human health
Periwinkle, Blue periwinkle	<i>Vinca major</i>	Environment
Phoenix palm, Canary Island date palm	<i>Phoenix canariensis</i>	Environment
Pink trumpet vine	<i>Podranea ricasoliana</i>	Environment
Privet spp.	<i>Ligustrum sinense, Ligustrum lucidum, Ligustrum vulgare</i>	Environment, Human health
Radiata pine, Pine wildings	<i>Pinus radiata</i>	Environment
Rattleseed pod, Rattlepod	<i>Crotalaria lunata</i>	Environment
Red ludwigia	<i>Ludwigia repens</i>	Environment, Agriculture, Community amenity
Reed canary grass	<i>Phalaris arundinacea</i>	Environment
Reed sweet grass	<i>Glyceria maxima</i>	Environment
Rhizomatous bamboo, Black bamboo	<i>Phyllostachys nigra</i>	Environment
Rhizomatous bamboo, Fishpole bamboo, Yellow bamboo	<i>Phyllostachys aurea</i>	Environment
Rhodes grass	<i>Chloris gayana</i>	Environment
Rhus tree	<i>Toxicodendron succedaneum</i>	Human health
Rush	<i>Juncus articulatus</i>	Environment
Rush	<i>Juncus effusus</i>	Environment
Scotch, Illyrian thistles	<i>Onopordum acanthium, O. Illyricum and O. acaulon</i>	Agriculture
Sedge, Cyperus	<i>Cyperus teneristolon</i>	Environment, Agriculture
Spanish heath	<i>Erica lusitanica</i>	Environment
Spiderwort, Moss inch plant	<i>Tradescantia cerinthoides</i>	Environment

Common name	Scientific name	Asset/value at risk
Spiny burrgrass - longispinus	<i>Cenchrus longispinus</i>	Environment, Agriculture, Human health
Spiny rush, Spike rush, Sharp rush	<i>Juncus acutus</i>	Environment
St John's wort	<i>Hypericum perforatum</i>	Environment, Agriculture
Sweet briar	<i>Rosa rubiginosa</i>	Agriculture
Sweet vernal-grass	<i>Anthoxanthum odoratum</i>	Environment, Agriculture
Tall wheat grass	<i>Thinopyrum ponticum</i>	Environment
Tangier Pea	<i>Lathyrus tingitanus</i>	Environment
Telegraph Weed	<i>Heterotheca grandiflora</i>	Environment
Trad	<i>Tradescantia fluminensis</i>	Environment
Tree of heaven	<i>Ailanthus altissima</i>	Environment, Human health
Turkey rhubarb	<i>Acetosa sagittata</i>	Environment
Tussock paspalum, Blue grass	<i>Paspalum quadrifarium</i>	Environment
Tutsan	<i>Hypericum androsaemum</i>	Environment
Umbrella tree	<i>Schefflera actinophylla</i>	Environment
Viper's bugloss	<i>Echium vulgare</i>	Agriculture
Watsonia	<i>Watsonia meriana</i>	Environment
Whisky grass	<i>Andropogon virginicus</i>	Environment
White jasmine, Chinese jasmine	<i>Jasminum polyanthum</i>	Environment
Wild poinsettia	<i>Euphorbia cyathophora</i>	Environment
Wild tobacco bush	<i>Solanum mauritianum</i>	Environment, Agriculture
Yellow bells, Golden bells	<i>Tecoma stans</i>	Environment, Agriculture
Yorkshire fog	<i>Holcus lanatus</i>	Environment



Appendix F

Construction Flora and Fauna Management Sub-plan

Habitat Compensation Plan - Framework

M12 Motorway

November 2021



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Approval and authorisation

Plan reviewed by:	Plan reviewed by:
Suzette Graham TfNSW Environment and Sustainability Manager	Deanne Forrest TfNSW Project Director – M12
16/11/2021	17/11/2021
	

Revision history

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B	18/09/2020	Response to TfNSW comments
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D	22/07/2021	Updated with NSW and Federal Approval
E	16/08/2021	Response to TfNSW and ER comments
F	03/09/2021	Response to TfNSW and ER comments
G	12/11/2021	Response to comments received during consultation

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Glossary/ Abbreviations

Abbreviations	Expanded text
BC Act	<i>Biodiversity Conservation Act 2016</i>
CFFMP	Flora and Fauna Management Sub-plan
CoA	Conditions of Approval
DAWE	Commonwealth Department of Agriculture, Water and Environment
DECCW	Former NSW Department of Environment, Climate Change and Water
DPI	NSW Department of Primary Industries
DPIE	NSW Department of Planning, Industry and Environment
EEC	Endangered Ecological Community
EES	NSW Environment, Energy and Science group (a part of DPIE)
EIS	Environmental Impact Statement
Environmental Assessment Documentation	Collective reference to the M12 EIS, Submissions Report and Amendment Report and supplementary reports as detailed in NSW CoA A1
EPBC Act	<i>Environmental Protection and Biodiversity Conservation Act 1999</i>
EWMS	Environmental Work Method Statements
HCP	Habitat Compensation Plan
OCEMP	Overarching Construction Environmental Management Plan
Project, the	M12 Motorway Project
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 Overarching Construction Environmental Management Plan (OCEMP) for the M12 Motorway 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 OCEMP for Project background and description.

1.3 Importance of hollows to fauna

The Project Environmental Assessment Documentation identified that 54 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.

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

Coarse 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 F of the CFFMP for the Project.

This HCP forms part of the OCEMP and is to be used as a guideline for Construction Contractor when developing their stage specific HCP that 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 OCEMP.

3.1.2 Additional approvals, licences, permits and requirements

Refer to Appendix A1 of the OCEMP.

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 4.1.4
	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 C. 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 Sheath-tail-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 Construction Contractor will prioritise the relocation of suitable salvaged 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.

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. It is noted that the use of trunk/bored hollows are to be prioritised over nest boxes.

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 Construction Contractor:

- 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

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

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

- 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 Construction Contractor's Project Team's organisational structure and overall roles and responsibilities are outlined in Section 5.3 of the OCEMP. 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 5.3.1 of the OCEMP and Section 7.2 of the CFFMP.

8.3 Monitoring and inspections

8.3.1 Overview

The Construction Contractor 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.

The Construction Contractor will ensure that hollow replacements are checked by the Project Ecologist every six months during the construction phase of the Project.

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 (eg 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 Construction Contractor 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 C). 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 Construction Contractor stage specific HCP.

8.5.2 Post-clearing report

The Construction Contractors 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 C 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.

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, the Construction Contractor 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 7 of the OCEMP and Section 8.1 of the CFFMP.

References

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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 Construction Contractor 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 G

Construction Flora and Fauna Management Sub-plan Snag Management Plan

M12 Motorway

November 2021

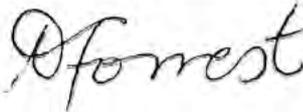


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Title	M12 Motorway OCEMP Construction Flora and Fauna Management Sub-plan Appendix G – Snag Management Plan

Approval and authorisation

Plan reviewed by:	Plan reviewed by:
Suzette Graham TfNSW Environment and Sustainability Manager	Deanne Forrest TfNSW Project Director, M12
16/11/2021	17/11/2021
	

Revision history

Revision	Date	Description
A	12/07/2021	First draft for TfNSW Review
B	13/08/2021	Response to TfNSW and ER comments
C	03/09/2021	Response to TfNSW and ER comments
D	12/11/2021	Response to comments received during consultation

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Glossary/ Abbreviations

Abbreviations	Expanded text
BC Act	<i>Biodiversity Conservation Act 2016</i>
CFFMP	Construction Flora and Fauna Management Plan
CoA	Conditions of Approval
DAWE	Commonwealth Department of Agriculture, Water and Environment
DPIE	NSW Department of Planning, Industry and Environment
EES	NSW Environment, Energy and Science Group (a part of DPIE)
Environmental Assessment Documentation	Collective reference to the M12 EIS (Oct 2019), Submissions Report (Oct 2020), Amendment Report Oct 2020), Amendment Report-Submissions Report (Dec 2020) and supplementary reports as detailed in NSW CoA A1
EPBC Act	<i>Environmental Protection and Biodiversity Conservation Act 1999</i>
EWMS	Environmental Work Method Statements
FM Act	<i>Fisheries Management Act 1994</i>
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, Kemps Creek and South 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, South Creek, and Kemps Creek to be implemented throughout the construction of the Project.

This Snag Management Plan forms part of the OCEMP and is to be used as a guideline for Construction Contractor when developing their stage specific Snag Management Plan that will be informed by additional field work undertaken by the Project Ecologist. It is related to the coarse woody debris guidelines within the Habitat Compensation Plan (HCP) (refer Appendix F 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 Badgerys Creek, South Creek and Kemps Creek.

1.5 Roles and Responsibilities

This Plan will be updated by the Construction Contractor and reviewed by the TfNSW Environment and Sustainability Manager (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
- The Construction Contractor, advised by the Project Ecologist, will be responsible for developing a stage specific Snag Management Plan 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 Construction Contractor will consult with DPI Fisheries when developing their stage specific Snag Management Plan where the removal or relocation of a snag has been identified as the appropriate method of management by the Project Ecologist.

The Construction Contractor 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 required to develop the Construction Contractor's stage specific Snag Management Plan 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 the Construction Contractor's stage specific 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.

The Construction Contractor is to provide the following information regarding the introduction of new snag in their stage specific 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, the Construction Contractor will prepare a stage specific Snag Management Plan that identifies and documents actions to be taken for each individual snag.

The site-specific 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 stage specific Snag 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 Construction Contractor 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 Construction Contractor 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 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. A template EWMS for use by the Construction Contractors is provided in Appendix A8 of the OCEMP. Appendix A8 also contains a template EWMS register and template EWMS training register

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 Construction Contractor 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 Construction Contractor (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 re-snagging 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 Construction Contractor 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

Construction Contractors 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 C 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 D of the CFFMP).

The following steps will be taken:

- Cease work in the vicinity of the fauna and immediately notify the Construction Contractor Environmental Site Representative
- 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 the Construction Contractor.

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 Construction Contractor 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 C of the CFFMP). The pre-clearing survey report will the following details in relation to snag management:

- Details of snags to be removed/relocated
- Details on receiving sites identified for snag relocation.

4.2 Post-clearing report

The Construction Contractors 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 C 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
- 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 H

Construction Flora and Fauna Management Sub-plan

Farm Dam Dewatering Procedure

M12 Motorway

November 2021

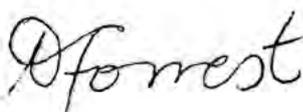


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File Name	M12PPW-ADAP-ALL-EV-PLN-000001_B_S3_CFFMP_App_H
Title	M12 Motorway OCEMP Construction Flora and Fauna Management Sub-plan Appendix H – Farm Dam Dewatering Procedure

Approval and authorisation

Plan reviewed by:	Plan reviewed by:
Suzette Graham TfNSW Environment and Sustainability Manager	Deanne Forrest TfNSW Project Manager – M12
16/11/2021	17/11/2021
	

Revision history

Revision	Date	Description
A	12/07/2021	First draft for TfNSW review
B	16/08/2021	Response to TfNSW and ER review
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Glossary/ Abbreviations

Abbreviations	Expanded text
BC Act	<i>Biodiversity Conservation Act 2016</i>
CoA	Conditions of Approval
CSWMP	Construction Soil and Water Management Plan
EPBC Act	<i>Environmental Protection and Biodiversity Act 1999</i>
ER	Environmental Representative
EWMS	Environmental Work Method Statement
FM Act	<i>Fisheries Management Act 1994</i>
OCEMP	Overarching Construction Environmental Management Plan
POEO Act	<i>Protection of the Environment Operations Act 1997</i>
Project, the	M12 Motorway Project
QA	Quality Assurance
REMM	Revised Environmental Management Measures
TfNSW	Transport for NSW

1 Introduction

1.1 Purpose

Construction of the M12 Motorway 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 Construction Contractors Water Reuse Strategy.

1.4 Induction / training

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

The Construction Contractors 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 Construction Contractor 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 Construction Contractor 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 quality assurance (QA) clauses specific to dewatering are identified in the CSWMP.

3 Procedure

3.1 Environmental Work Method Statement

The Construction Contractors 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 Construction Contractor 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. A template EWMS for use by the Construction Contractors is provided in Appendix A8 of the OCEMP. Appendix A8 also contains a template EWMS register and template EWMS training register.

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 Construction Contractors 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 Construction Contractor 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 Construction Contractor 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 Construction Contractors will include this information within a post-dewatering report.