

Appendix B3

Construction Flora and Fauna Management Sub-plan

M12 Motorway – Central





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Seymour Whyte Environmental Site Representative	Seymour Whyte Project Manager
18/01/2025	18/01/2025
	

Revision history

Revision	Date	Description
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F	20/09/2023	Updated with revised biodiversity offset figures
G	18/01/2025	Updated in response to OCEMP update

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Glossary/Abbreviations

Abbreviations	Expanded text
AFC	Approved For Construction
APVMA	Australian Pesticides and Veterinary Medicines Authority
AR	Amendment Report
Areas of vegetation to be retained	These areas present potential opportunities for the Construction Contractor to avoid and minimise potential vegetation impacts if possible. As vegetation impacts may occur during construction, these impacts have been considered in biodiversity off-set calculations.
ARSR	Amendment Report Submissions Report
BAR	Biodiversity Assessment Report
BC Act	<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
CA	Consistency Assessment
CCS	Community Communication Strategy
CEMP	Construction Environmental Management Plan
CFFMP	Construction Flora and Fauna Management Sub-plan
CFMP	Construction Flood 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 OCEMP, works approved under a Site Establishment Management Plan, demolition of acquired residential houses, structures and sheds, and works specified in Appendix B of the Infrastructure Approval 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
CWRMP	Construction Waste and Resource Management Plan

Abbreviations	Expanded text
DAWE	Former Commonwealth Department of Agriculture, Water and the Environment (now Commonwealth Department of Climate Change, Energy, Environment and Water)
DCCEEW	Commonwealth Department of Climate Change, Energy, Environment and Water
DEC	Former NSW Department of Environment and Conservation
DECC	Former NSW Department of Environment and Climate Change
DECCW	Former NSW Department of Environment, Climate Change and Water
DITRDC	Commonwealth Department of Infrastructure, Transport, Regional Development and Communications
Division 5.2 Approval	Approval issued by the NSW Minister for Planning and Public Spaces for the M12 Motorway
DPHI	NSW Department of Planning, Housing and Infrastructure (formerly DPE which has now been split into NSW DCCEEW and NSW DPHI)
DPI	Former NSW Department of Primary Industries
DPE	NSW Department of Planning and Environment (former Department of Planning, Industry and Environment (DPIE))
EAD	Environmental Assessment Documentation
EEC	Endangered Ecological Community
EES	Former Environment, Energy and Science group. (now EHG).
EHG	Environment and Heritage Group (part of DPE).
EIS	Environmental Impact Statement
EMS	Environmental Management Systems

<p>Environmental Assessment Documentation</p>	<p>The set of documents that comprise the Division 5.2 Approval:</p> <ul style="list-style-type: none"> • Roads and Maritime Services (October, 2019) M12 Motorway, Environmental Impact Statement (EIS) • Transport for NSW (October, 2020) M12 Motorway, Submissions Report (the Submissions Report) • Transport for NSW (October, 2020) M12 Motorway, Amendment Report (AR) • Transport for NSW (December, 2020) M12 Motorway, Amendment Report submissions report (ARSR) • Transport for NSW (March, 2021) The M12 Motorway Amendment Report Submissions Report – Amendment (ARSR amendment) • WSP (October, 2021) M12 Motorway – West Package Detailed Design Consistency Assessment • GHD (October, 2021) M12 Motorway – Central Package Detailed Design Consistency Assessment • Arcadis (June, 2022) M12 Motorway – Sydney Water Crossings Consistency Assessment • Arcadis (July, 2022) M12 Motorway – Design Boundary Changes Consistency Assessment • Arcadis (August, 2022) M12 Motorway – Minor Consistency Assessment for Proposed Change to the M12 Motorway Project (M12 Central) • Arcadis (September, 2023) M12 Motorway – Devonshire Road Temporary Roundabout Consistency Assessment • WSP (September, 2023) M12 Motorway – Elizabeth Drive Connections Consistency Assessment • TfNSW (September, 2023) M12 Motorway – Minor Consistency Assessment M12 West demolition of structures at 752 Luddenham Road • TfNSW (October, 2023) M12 Motorway – Minor Consistency Assessment M12 East AF9 Power Supply • TfNSW (October, 2023) M12 Motorway – Minor Consistency Assessment M12 East Cecil Road Laydown Area • TfNSW (October, 2023) M12 Motorway – Minor Consistency Assessment M12 East Temporary Construction Signage • Arcadis (December, 2023) M12 Motorway – East Site 48, 50 and 51 Boundary Changes Minor Consistency Assessment • Arcadis (January, 2024) M12 Motorway – Minor Consistency Assessment M12 Central Water Tower Access Road <p>The documents that comprise the EPBC referral:</p>
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Abbreviations	Expanded text
	<ul style="list-style-type: none"> Submission #3486 – The M12 Motorway Project between the M7 Motorway, Cecil Hills and The Northern Road, Luddenham, NSW <p>Notification of referral decision and designated proponent - controlled action; date of decision 19 October 2018; ID: 2018-8286.</p>
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>
EPBC referral	A Proponent must refer a proposed action to the Australian Government Minister for the Environment (the Minister) for assessment, if it has, will have, or is likely to have a significant impact on the world heritage values of a declared World Heritage property, or is likely to have a significant impact on the National Heritage values of a National Heritage place.
EPL	Environment Protection Licence
ER	Environmental Representative
ESM	TfNSW Environment and Sustainability Manager
ESR	Environmental Site Representative (Seymour Whyte)
EWMS	Environmental Work Method Statements
Exclusion Zones	Exclusion zones are areas of environmental importance (e.g. threatened vegetation or heritage items) that need to be protected. These exclusion zones are defined as no-go areas and are to be protected for the duration of construction in that particular footprint area.
FBA	<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

Abbreviations	Expanded text
NASF	National Airports Safeguarding Framework
NPW Act	<i>NSW National Parks and Wildlife Act 1974</i>
NSW CoA	NSW Conditions of Approval
NSW DCCEEW	NSW Department of Climate Change, Energy, the Environment and Water (formerly NSW DPE which has now been split into NSW DCCEEW and NSW DPHI)
NTU	nephelometric turbidity units
OCEMP	Overarching Construction Environmental Management Plan
OEH	NSW Office of Environment and Heritage, now Environment Energy and Science
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	The CSSI as approved by the Minister for Planning and Public Spaces on the 23 April 2021 (SSI 9364)
Project, the	M12 Motorway Project
REMM	Revised Environmental Management Measures
RIAR Group	NSW Regions, Industry, Agriculture and Resources Group (a part of DPE)
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> (repealed) but relevant for this assessment due to being assessed under the Biodiversity Conservation Transitional arrangements.
WSIA	Western Sydney International Airport



Abbreviations	Expanded text
WSP	Western Sydney Parklands
WSA Co	Western Sydney Airport Corporation
WSPT	Western Sydney Parklands Trust

1 Introduction

1.1 Context

This Construction Flora and Fauna Management Sub-plan (CFFMP or Plan) forms part of the Construction Environmental Management Plan (CEMP) for the M12 Motorway – Central package.

This CFFMP has been prepared under the Overarching Construction Environmental Management Plan (OCEMP) and relevant sub-plans developed for M12 Motorway (the Project), to address the requirements of the Minister's Conditions of Approval (CoA), Revised Environmental Management Measures (REMMs) listed in the Environmental Impact Statement (EIS), Submissions Report, Amendment Report, and Amendment Report Submissions Report (ARSR), ARSR Amendment Report, all subsequent Consistency Assessments (CA) and all applicable legislation, and Transport for New South Wales (TfNSW) specifications.

1.2 Background and project description

1.2.1 M12 Motorway (the Project)

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 will run between the M7 Motorway at Cecil Hills and The Northern Road at Luddenham for about 16 kilometres (km) and is expected to be opened to traffic prior to opening of the WSIA.

Key features of the Project include:

- An east-west 16 km motorway between the M7 Motorway, Cecil Hills and The Northern Road, Luddenham
- A motorway built for four lanes (with provision for up to six lanes) with a median to separate opposing traffic flows
- A direct connection to Western Sydney International Airport
- A new connection to The Northern Road with traffic lights
- A motorway-to-motorway interchange at the M7 Motorway
- Provision for a future interchange connecting Mamre Road and Devonshire Road at the M12 Motorway.

A detailed Project description is provided in Section 2.1 of the CEMP.

1.2.2 Statutory Context

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.

The Project was assessed as part of an EIS, Submission Report, Amendment Report, ARSR and ARSR Amendment Report which are herein referred to as the Environmental Assessment Documentation. REMMs are nominated in these assessments to manage the identified impacts.

Approval for the Project under the EP&A Act was granted by the Minister for Planning on 23 April 2021 (CSSI 9364). Approval for the Project under the EPBC Act was granted by the Australian Minister for the Environment on 3 June 2021 (EPBC 2018/8286).

The following additional assessments have since been undertaken:

- Two Consistency Assessments (CA) for M12 West and Central addressing detailed design changes for the Project construction boundary approved in October 2021
- Sydney Water Consistency Assessment related to construction boundary extensions associated with Sydney Water utility crossings; approved in June 2022
- Design Boundary Change Consistency Assessment related to design boundary changes within the M12 alignment. This required an extension of the construction footprint and operational footprint, property adjustments and the demolition of Building No.1 at McMasters Field Station; approved in July 2022. Threatened Species Surveys were also undertaken along the M12 alignment between September and December 2021 to satisfy the NSW Conditions of Approval (CoA) E4, E5 and E6; the outcomes of which captured within the Design CA.
- Minor Consistency Assessment (M12 Central) required amendments to the construction footprint as a result of utility adjustments and tie in works, property adjustments for flood alleviation and improvements to ancillary facility access due to safety concerns, temporary widening of Elizabeth Drive and signage installation; approved in August 2022.
- Devonshire Road Temporary Roundabout Consistency Assessment required to address the requirements of REMM TT10. This has resulted in an increase to the construction footprint at the Elizabeth Drive and Devonshire Road intersection to allow for the construction of a temporary roundabout; approved in September 2023.
- Elizabeth Drive Connections Consistency Assessment addressed detailed design changes for the Elizabeth Drive Connections. This involved minor construction and operation boundary adjustments, design changes, new sediment basin locations, utility works, property access changes and property adjustments; approved in September 2023.
- M12 West Minor Consistency Assessment for the demolition of structures as 752 Luddenham Road required to address the need for the demolition of structures within Ancillary Facility 11. Whilst this ancillary facility is already located within the construction footprint and was previously assessed in the M12 Motorway Amendment Report, the demolition and disposal of structures in this location required assessment; approved in September 2023.
- M12 East AF9 Power Supply Minor Consistency Assessment required to address a minor temporary amendment to the construction footprint in order to provide permanent site power to the construction ancillary facility 9 (AF9); approved in October 2023.
- M12 East Cecil Road Laydown Area Minor Consistency Assessment required to address temporary amendment to the construction boundary to facilitate the installation of a DN150 Steel Secondary Gas main within Cecil Road; approved in October 2023.

- M12 East Temporary Construction Signage Minor Consistency Assessment required to address temporary traffic signage installed prior to the start of temporary barriers on the M7 Motorway; approved in October 2023.
- M12 East Sitesd 48, 50 and 51 Boundary Changes Minor Consistency Assessment addressed the required amendments to the construction footprint in three locations as a result of temporary traffic control measures, pavement build up and resurfacing; approved in December 2023.
- M12 Central Water Tower Access Road Minor Consistency Assessment addressed changes to the construction boundary to facilitate the construction of concrete slabs over the Sydney Water main, the construction of a temporary access road to the existing water town and radar tower, and the subsequent reinstatement of this temporary access road to pre-construction conditions; approved in January 2024.

1.2.3 M12 Motorway Delivery Strategy

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

- **M12 West**– between The Northern Road, Luddenham and about 250 metres east of Badgerys Creek
- **M12 Central** (the subject of this Plan) – between about 500 metres west of South Creek and the Western Sydney Parklands at Duff Road, Cecil Park
- M12 Central (Temporary Roundabout) - temporary roundabout installation at Elizabeth Drive and Devonshire Road, Kemps Creek
- M12 East – (as part of the M7/M12 Integration Project)
 - Elizabeth Drive Connections (EDC) - a two- kilometre section from Duff Road to about 300 metres east of the M7 Motorway
 - M7/M12 Interchange – –An interchange between the M12 Motorway and M7 Motorway and tie-in works for approximately four kilometres on the M7 Motorway.

Each package of work is to be delivered under separate contracts on behalf of the proponent TfNSW. While the packages will commence at different times there will be periods during which the packages works will overlap. Co-ordination between the contractors will be required to manage cumulative impacts, particularly for noise and vibration.

1.3 M12 Central

Seymour Whyte has been engaged to deliver the M12 Central package. Construction of the M12 Central package involves building 7.5 km of motorway from west of Badgerys Creek to the Water Tower Access Road within Western Sydney Parklands.

The M12 Central package will provide a dual carriageway with a wide median to allow for future widening to six lanes. Safety barriers will be provided along the length of the package. Emergency stopping bays and emergency crossovers will also be provided at regular intervals. A shared user path with lighting will provide an active transport link along the motorway and eastward to the M7.

The M12 Central package includes the following bridges:

- Twin bridges over South Creek
- A bridge for Clifton Avenue over the M12 Motorway

- Twin bridges over Kemps Creek
- Twin bridges over Elizabeth Drive near Mamre Road
- Twin Bridges over Range Road
- A bridge for the Water Tower Access Road over the M12 Motorway
- A private property access bridge in University of Sydney land.

Retaining walls will be provided around Range Road to help limit Project impacts on Range Road. Adjustments will be made to local roads including Clifton Avenue and Salisbury Road.

The M12 Central package also requires relocation of utility services including electricity, water and telecommunications. Urban design features of this package include Aboriginal artwork on bridges, rest areas on shared user paths, interpretive signage and landscape planting.

A detailed description of the M12 Central package is provided in Section 2.3 of the CEMP.

1.4 Scope of the plan

The scope of this CFFMP is to describe how the potential flora and fauna impacts will be managed during construction of the M12 Central package. This Plan has been prepared under and consistent with the OCEMP, and in particular the Overarching Construction Flora and Fauna Management Sub-Plan (OCFFMP) considering the existing ecological attributes of the site and construction activities. In the preparation and ongoing implementation of this Plan, SMART (Specific, Measurable, Achievable, Realistic and Timely) principles are to be considered and applied.

This Plan is applicable to all activities during construction of the M12 Central package, including all areas where physical works will occur or areas that may be otherwise impacted by the construction works, and under the control of Seymour Whyte. All Seymour Whyte staff and sub-contractors are required to operate fully under the requirements of this Plan and related environmental management plans, over the full duration of the construction program.

A copy of this CFFMP will be kept on the premises for the duration of construction.

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.

1.5 Environmental Management Systems overview

The Environmental Management System (EMS) for the M12 Central package is described in Section 3 of the CEMP. The EMS is consistent with the overarching EMS described in Section 3 of the OCEMP.

To achieve the intended environmental performance outcomes, Seymour Whyte have established, implemented, maintained and continually improved an EMS in accordance with the requirements of ISO14001:2015. The Seymour Whyte EMS will be adopted as the guiding environmental management framework for the M12 Central package.

The EMS consists of governance documentation, incorporating environmental management plans, policies, procedures and tools including:

- **M12 Central Environment and Sustainability Policy.** Outlines the commitments and intentions established by Seymour Whyte to ensure environmental performance and sustainability objectives and targets are achieved (Appendix A3 of the CEMP)
- **CEMP.** Details the processes and procedures to be implemented during the M12 Central package to comply with applicable CoA, REMMs, Environment Protection Licence (EPL), legislative obligations and contractual requirements. The relevant compliance obligations are detailed in Appendix A1, with a cross reference to where they are met in this Plan
- **Environmental Management Sub-plans.** These documents describe procedures and controls for specific environmental aspects requiring more rigorous management strategies
- **Monitoring Programs.** Details the monitoring regime to be implemented during construction to compare the actual performance of construction against the objectives outlined in the relevant Plan, including setting specific triggers and associated responses
- **Environmental Work Method Statements (EWMS).** Management measures identified in this Plan 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 EWMS. Construction personnel undertaking a task governed by an EWMS must undertake the activity in accordance with the mitigation and management measures identified in the EWMS. See Section 3.3.3 of the CEMP for details of the EWMS preparation and approval requirements
- **Sensitive Area Plans (SAPs).** A series of maps providing key features of the alignment and relevant environmental constraints. Features include waterways, heritage, biodiversity contamination and sensitive receivers amongst other site relevant features
- **Vegetation Clearing Procedure.** Details control measures to minimise the clearing of vegetation and impacts on biodiversity and the surrounding environment during construction
- **Fauna Rescue and Release Procedure.** Details measures to minimise impacts to fauna as a result of being handled by humans and prevent injury to people handling fauna
- **Unexpected Threatened Species and Threatened Ecological Communities (TECs) Finds Procedure.** Identifies actions to be taken when a threatened flora or fauna species or TEC is unexpectedly encountered during construction of the M12 Central package.
- **Weed, Pest and Pathogen Management Plan.** Identifies the key pathogens and weed species, establishes an approach for their management and an inspection and reporting framework.
- **Habitat Compensation Management Plan.** Describes how habitat loss will be compensated for, particularly with regard to the loss of hollow-bearing trees and coarse woody debris.
- **Snag Management Plan.** Outlines environmental control measures for the relocation of snags from Kemps Creek and South Creek and identifies suitable locations for reuse of snags to be removed.
- **Farm Dam Dewatering Procedure.** Provide guidance to ensure that site dewatering activities are completed in a manner that does not cause harm to any aquatic fauna.
- **Native Fauna Mortality Video Surveys Methodology.**
- **Tree Management Strategy.**
- Procedures, strategies and protocols. Detailed procedures for inclusion in work packs.

Management measures identified in this Plan may also be incorporated into site or activity specific Environmental Work Method Statements (EWMS). EWMS incorporate appropriate mitigation measures and controls and identify key procedures to be used concurrently with the CFFMP.

EWMS will be prepared for works in Environmental Sensitive Areas including:

- 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 South Creek, Kemps Creek, Hinchinbrook Creek.
- 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.

A register of EWMS will be maintained in Appendix A5 of the CEMP. A template EWMS is provided in Appendix A8 of the CEMP.

1.5.1 CFFMP preparation, endorsement and approval

The OCFMP has been prepared to satisfy the NSW and Commonwealth CoA's in relation to flora and fauna management during construction of the Project, particularly NSW CoA C8. The OCFMP has been endorsed by a suitably qualified and experienced ecologist and subsequently approved by the Planning Secretary. This stage-specific CFFMP for the M12 Central package has been developed under and consistent with the approved OCFMP.

This CFFMP was reviewed by the TfNSW Environment and Sustainability Manager (ESM) (or delegate) and the independent Environmental Representative (ER) to confirm they are consistent with, and incorporate, all relevant elements of the approved OCFMP, prior to submission to the Planning Secretary for information. Construction of the M12 Central package will not commence until the CFFMP has been reviewed to the satisfaction of the TfNSW ESM and ER and provided to the Planning Secretary for information.

1.5.2 Interactions with other management plans

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

- Site Establishment Management Plan (SEMP), which incorporates appropriate management measures during establishment of the ancillary facilities
- M12 Central Community and Stakeholder Engagement Strategy which has been developed under the Overarching Communication Strategy (OCS), which details procedures and processes for community notification, consultation and complaints management
- Construction Soil and Water Management Plan (CSWMP), which 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
- Construction Waste and Resources Management Plan (CWRMP), which provides a framework for waste management including reuse and disposal of cleared vegetation
- M12 Central Sustainability Management Plan which has been developed under the overarching Project Sustainability Strategy which addresses the requirement to enhance biodiversity conservation where reasonable and feasible
- Safety Management Plan, which provides the framework for managing safety including 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.
- Quality Plan describes the process for managing non-conforming work practices and initiating corrective / preventative actions or system improvements in accordance with the process outlined in Section 7.3 of the CEMP.

1.6 Consultation

The OCFFMP was prepared in consultation with 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) and Fairfield City Council (FCC). Key matters raised by stakeholders and how they have been addressed are outlined in the OCFFMP including consultation evidence in accordance with NSW CoA C4 and A5. This stage-specific CFFMP has been prepared under and consistent with the OCFFMP and therefore no further consultation is required as part of the preparation of this Plan.

During construction changes may occur that potentially change the compliance status of the OCEMP, or as a result of the Review and improvement process in Section 8 of this Plan, which require this Plan to be updated. Where these changes are not considered 'minor' by the ER, further consultation with the relevant stakeholders will occur. TfNSW would undertake this additional consultation and Seymour Whyte would support where required.

Ongoing consultation between TfNSW, Seymour Whyte, neighbouring Project packages, other construction projects, stakeholders, the community and relevant agencies regarding the management of impacts on flora and fauna will be undertaken during the construction of the M12 Central package as required. The process for the consultation will be consistent with the OCS and as described in the M12 Central Community and Stakeholder Engagement Strategy.

Further consultation required for the implementation of this Plan as part of the M12 Central package includes consultees identified in Table 1-1.

Table 1-1: Consultation requirements

Reference	Description	Consultee	Responsibility
G36	Consultation with the appropriate specialists to assess the significance of the unexpected flora/fauna find and development of management options	Technical specialists/Project Ecologist	Environmental Site Representative (ESR)
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 Seymour Whyte will identify and manage construction impacts on flora and fauna during construction for the M12 Central package.

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
- Infrastructure Approval CoA (SSI 9364)
- Commonwealth CoA granted to the Project on 3 June 2021
- TfNSW QA Specifications
- Environment Protection Licence
- All relevant legislation and other requirements described in Section 3.1 of this Plan.

2.3 Targets

The following targets have been established for the management of flora and fauna impacts during construction of the M12 Central package:

- 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 M12 Central package
- No increase in distribution of weeds currently existing within the construction footprint
- No new weeds introduced to the construction footprint
- No transfer of plant diseases or pathogens to or from the construction footprint
- 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

In accordance with NSW CoA A7, references in the terms of this Plan to any guideline, protocol, Australian Standard or policy are to such guidelines, protocols, Standards or policies in the form they are in at the date of the Infrastructure Approval (CSSI 9364).

3.1 Relevant legislation and guidelines

3.1.1 Legislation

Legislation and regulations relevant to flora and fauna management includes:

- *Environmental Planning and Assessment Act 1979 (EP&A Act)*
- *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)*
- *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 (POEO Act)*

Relevant provisions of the above legislation are identified in the register of legal requirements included Appendix A1 of the CEMP.

3.1.2 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).
- 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 – Approved For Construction (AFC) Vegetation Clearing Report (GHD, 2021)
 - Biodiversity Consistency Assessment Memo for M12 Motorway – Central Package Detailed Design (GHD, 2021)
- Consistency Assessments:
 - Biodiversity Consistency Assessment Memo for M12 Motorway – Sydney Water Crossings (Arcadis, 2022a)
 - Biodiversity Consistency Assessment Memo for M12 Motorway – Design boundary changes (Arcadis, 2022b)
 - Minor Biodiversity Consistency Assessment Memo for M12 Motorway – Design boundary changes and temporary signage areas (Arcadis, 2022c).
 - Biodiversity Consistency Assessment Memo M12 Motorway – M12 Central Water Tower Access Road (Arcadis, 2024)



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	Document Reference
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>	OCFFMP Section 1.6
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>	<p>Section 2.2 Section 2.3 Section 3.2 Section 3.3 Section 6</p>
	<p>(b) the mitigation measures identified in the documents listed in Condition A1 will be implemented;</p>	<p>Section 3.2 Section 3.3 Section 3.4 Section 6 Table 6-2</p>
	<p>(c) the relevant terms of this approval will be complied with; and</p>	<p>Section 3.2 Section 3.3 Section 6</p>

CoA No.	Condition Requirements	Document Reference
		Table 6-2
	(d) issues requiring management during construction (including cumulative impacts), as identified through ongoing environmental risk analysis, will be managed through SMART (Specific, Measurable, Achievable, Realistic and Timely) principles.	Section 1.4
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:	OCCFMP This Plan Section 1.5.1
	(a) details of the measures to avoid and minimise disturbance to native vegetation, and other habitat of native flora and fauna species;	Section 6 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;	Section 6.1 Appendix B (Section 2.1.2)
	(c) pre-clearing measures for Cumberland Plain Land Snail known and potential habitat and measures to protect the White-bellied Sea Eagle nest;	Appendix B (Section 2.1.3; Section 2.1.5) Sea Eagle not relevant to M12 Central package
	(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 4.1.2 Section 6.3 Section 6.7
	(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

CoA No.	Condition Requirements	Document Reference
	(h) protocols for incidental finds of threatened species and ecological communities within the construction boundary.	Appendix D
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.	OCCFFMP (TfNSW requirement)
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 1.5.1

3.3 EPBC Conditions of Approval

Table 3-2: Commonwealth CoA

CoA No.	Condition Requirements	Document Reference
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.	Not applicable to M12 Central Package
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

CoA No.	Condition Requirements	Document Reference
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;	Condition E8 is not applicable to M12 Central Package
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. 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 3-3-3: Primary REMMs

ID	Measure/requirement	Timing	CFFMP Reference
B01	A CFFMP will be prepared. The measures in the CFFMP will include:	Prior to construction	OCFFMP This Plan
	<ul style="list-style-type: none"> A site-specific induction 		Section 7.2

ID	Measure/requirement	Timing	CFFMP Reference
	<ul style="list-style-type: none"> • Identification of clearing limits and exclusion fencing 		Section 6.3
	<ul style="list-style-type: none"> • Pre-clearance surveys 		Section 6.1
	<ul style="list-style-type: none"> • Vegetation clearing procedures 		Appendix B
	<ul style="list-style-type: none"> • An unexpected finds procedure 		Appendix D
	<ul style="list-style-type: none"> • Procedures for weed management and monitoring 		Section 6.6 Appendix E
	<ul style="list-style-type: none"> • A process for de-watering farm dams and the relocation of aquatic fauna 		Section 6.5 Appendix H
	<ul style="list-style-type: none"> • Provision of supplementary fauna habitat (e.g. nest boxes). 		Section 6.2 Appendix F

3.5 Environment Protection Licence

The M12 Central package is subject to an EPL as a Scheduled Activity for 'road construction'. Management and protection of flora and fauna is not typically addresses in Environment Protection Licence however compliance with the obligations of the EPL assist in avoiding indirect impacts through pollution or other disturbances. The M12 Central package will be constructed so as to meet requirements identified in the EPL.

3.6 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.

This CFFMP incorporates the relevant requirements for protecting and managing flora and fauna from the TfNSW QA Specifications prepared for the *M12 Motorway (Central), Construction between Badgerys Creek and the Water Tower Access Road, Cecil Hills* including:

- G36 – Environmental Protection (Management System)
- G38 – Environmental Protection (Management System)
- G40 – Clearing and Grubbing
- R178 – Vegetation
- R179 – Landscape Planting.

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 and Witness Points that must be complied with during construction of the M12 Central package. A Hold Point is a point beyond which a work process must not proceed without express written authorisation from TfNSW. Witness Points are an identified point in the process where TfNSW request to, review, witness, inspect method and/or process of work. The activities, however, may proceed. For processes under the CEMP, the request for release of Hold Points and Witness Points is to be made through the TfNSW ESM (or delegate).

Details of the Hold Points and Witness Points relevant to this Plan are outlined in Section 7.4.

Cross references are included in Appendix A, to indicate where the relevant TfNSW QA specifications have been addressed in this Plan or other Project documents.

3.7 Western Sydney Parklands Trust (WSPT) Lease Agreement

Land within M12 Central package that is owned or adjacent to land owned by the Western Sydney Parklands Trust (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 (refer to Appendix A, Table A4). These include:

- Identification of areas where tree protection for mature or hollow bearing native species - standard TPZ regarding compression, drip lines and structural root zones - where possible
- Replacement planting of tree, shrubs and groundcovers for any disturbed lands

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 WSPT Lease Agreement and how they are addresses is outlined in Appendix A, Table A4.

3.8 Infrastructure Sustainability Council

The M12 Central package will employ an integrated approach to sustainability to ensure effective implementation and tracking of initiatives. This approach includes the identification of requirements in Plans for clarity of objectives and transparency in implementation. While the M12 Central Sustainability Management Plan details the overall requirements and targets for the M12 Central package, Table 3-4 summarises the sustainability requirements for ecology to demonstrate compliance with Infrastructure Sustainability Council (ISC) Infrastructure Sustainability (IS) Version 1.2 Rating Tool credit benchmarks.

Table 3-4: Ecology specific sustainability targets

ISC Reference	Commitment	Document reference
Eco-1	The ecological value of the infrastructure site is maintained.	This plan and procedures
Eco-1	The ecological value of infrastructure site is enhanced by 0 to 20%. Fractions of Levels may be achieved on a sliding scale up to 20% for Level 3.	Appendix F Appendix G Appendix J
Eco-2	There is a low or moderate degree of existing habitat connectivity identified.	Section 4.1.7
Eco-2	The existing degree of habitat connectivity is maintained (offsetting allowed).	Section 6.12 Section 6.14

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 and the Biodiversity technical Memorandum (GHD 2021) that was prepared to for the M12 Motorway - Central Section Detailed Design Division 5.2 and EPBC Act Approval Consistency assessment report for design and boundary changes between Cecil Park and east of Badgerys Creek.

Additional field survey was carried out in June 2021 for the Biodiversity Technical Memorandum which comprised:

- Vegetation mapping
- Searches for threatened flora
- Terrestrial fauna habitat assessment
- Searches for the Cumberland Plain Land Snail (*Meridolum corneovirens*) in areas of suitable habitat.
- Additional field surveys were undertaken following Project approval, including:
 - Targeted *Pimelea spicata* surveys over three days between 2 February and 7 May 2021
 - Threatened species spring surveys for 12 threatened species over 11 days between 28 September and 16 December 2021 as required by NSW CoA E4, E5, and E6. Of the 12 species, *Dilwynia tenuifolia* and *Pultenaea parviflora* were identified
 - Several biodiversity surveys for consistency assessments were undertaken to address detailed design boundary changes, including:
 - Targeted flora and fauna surveys carried out in June 2021 for M12 Central Detailed Design Biodiversity Assessment (GHD, 2021)
 - Targeted flora and fauna surveys carried out on 3 February and 14 February 2022 for M12 Sydney Water Crossings Biodiversity Assessment (Arcadis, 2022a)
 - Targeted flora and fauna surveys carried out on 12 April 2022 for M12 Design Boundary Changes Biodiversity Assessment (Arcadis, 2022b)
 - Targeted flora and fauna surveys carried out in August 2022 for M12 Minor Boundary Changes and Temporary Signage Areas Consistency Assessment (Arcadis, 2022c).
 - Targeted flora and fauna surveys carried out in December 2023 for M12 Central Water Tower Access Road (Arcadis, 2024)

The Project boundary and relevant ecological data is shown on the Sensitive Area Plans included in Appendix A6.of the M12 Central CEMP

4.1 Environmental aspects

4.1.1 Threatened ecological communities

Threatened Ecological Communities (TECs) listed under the BC Act have been identified in the construction footprint of the M12 Central package, including:

- Shale Gravel Transition Forest 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).

The corresponding Plant Community Type (PCT) and estimated area of impact for the M12 Central package is provided for these TECs within Section 5.2.1 (in Table 5-1).

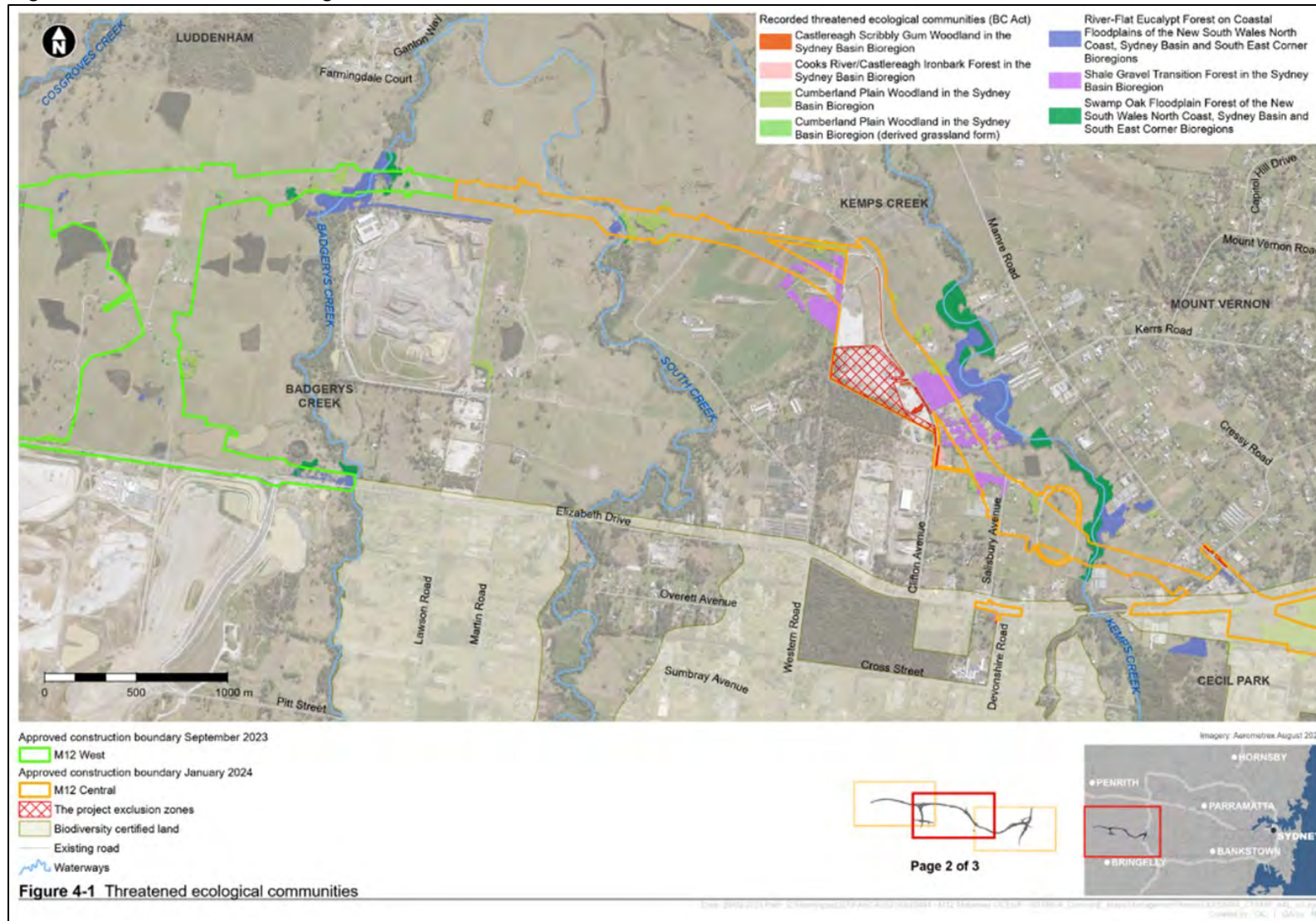
Commonwealth listed EPBC Act listed TECs have also been identified within the construction footprint of the M12 Central package, including:

- Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest (critically endangered).

The corresponding PCT and estimated area of impact for the M12 Central package is provided for these TECs within Section 5.2.1 (in Table 5-2).

The location of State and Commonwealth listed TEC's in relation to the M12 Central package is shown in Figure 4-1. TECs are also identified within the Sensitive Aerial Vegetation Maps provided in Appendix K.

Figure 4-1: Threatened ecological communities



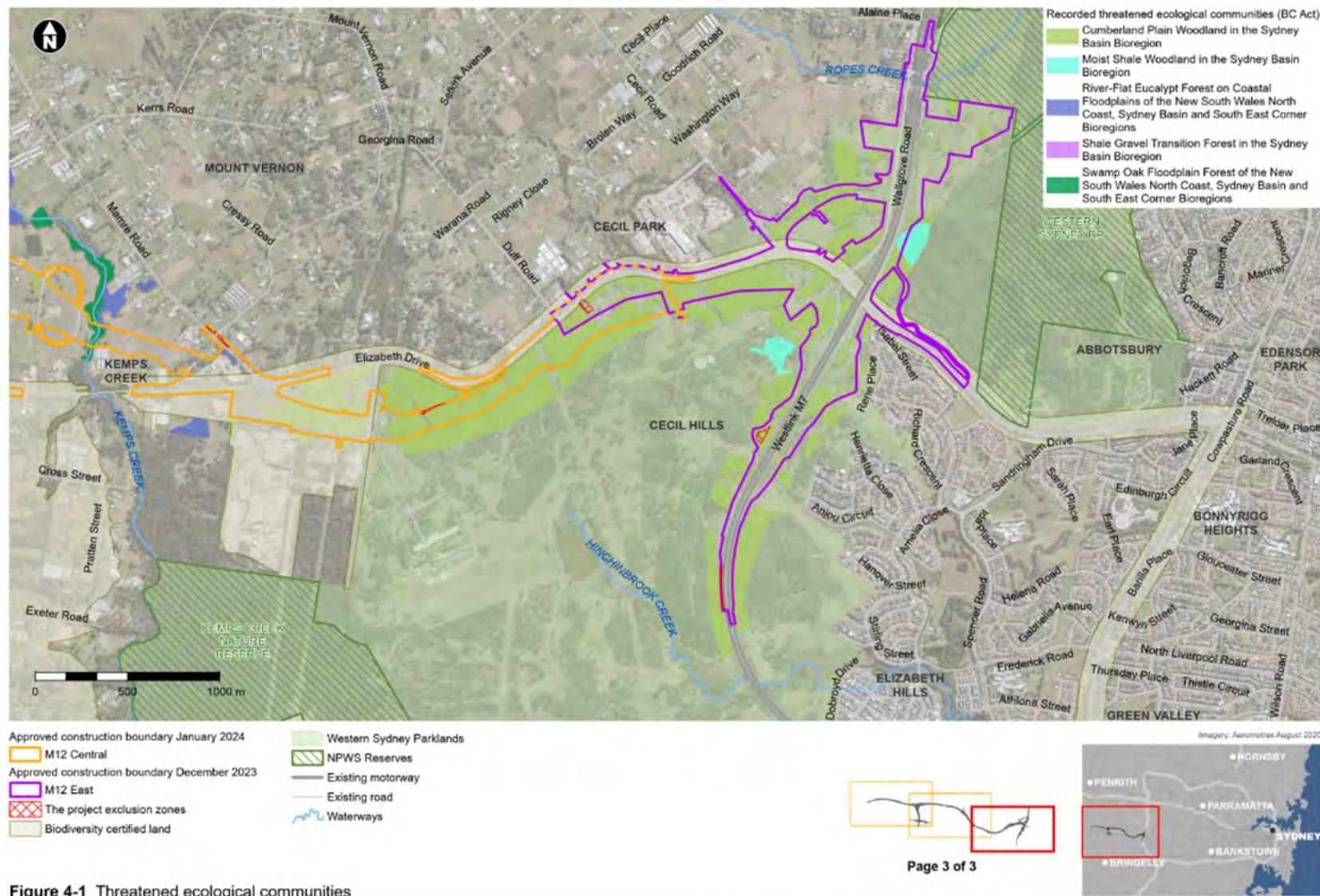


Figure 4-1 Threatened ecological communities

4.1.2 Threatened or otherwise significant flora species

Threatened flora species identified, or with the potential to occur within the M12 Central package, 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	Potential
Native Pear	<i>Marsdenia viridiflora</i> subsp. <i>viridiflora</i>	-	Endangered population	Potential
Spiked Rice-flower	<i>Pimelea spicata</i>	Endangered	Endangered	Potential
Sydney Bush Pea	<i>Pultenaea parviflora</i>	Vulnerable	Endangered	Recorded

The location of the recorded threatened flora species in relation to the M12 Central package are shown in Figure 4-2 and the Sensitive Aerial Vegetation Maps provided in Appendix K..

4.1.3 Fauna habitat

Four fauna habitat types were identified within the area of the M12 Central package. These are listed in Table 4-2 and shown in Figure 4-2 and on the Sensitive Area Plans included at Appendix A6 of the CEMP.

Table 4-2: Fauna habitat types

Name	Habitat description
Woodland	Dense understorey grasses, coarse woody debris and leaf litter provide shelter habitat for small terrestrial amphibians and reptiles. Large living or dead hollow-bearing trees are relatively scarce. Canopy trees in woodland habitat provide blossom resources for common nectivorous birds, small gliders and flying-foxes.
Riparian forest	This habitat typically occurs as linear strips of native vegetation surrounded by largely cleared grazing land. Wider patches of riparian forest (e.g. along some sections of 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.
Grassland	This habitat is comprised almost entirely of land cleared of native forest or woodland for grazing, cropping and more recently for residential and industrial development. Large, scattered paddock trees and stags occur within grassland habitat in some sections of the study area, some supporting small, medium and large hollows. 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.

Name	Habitat description
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>

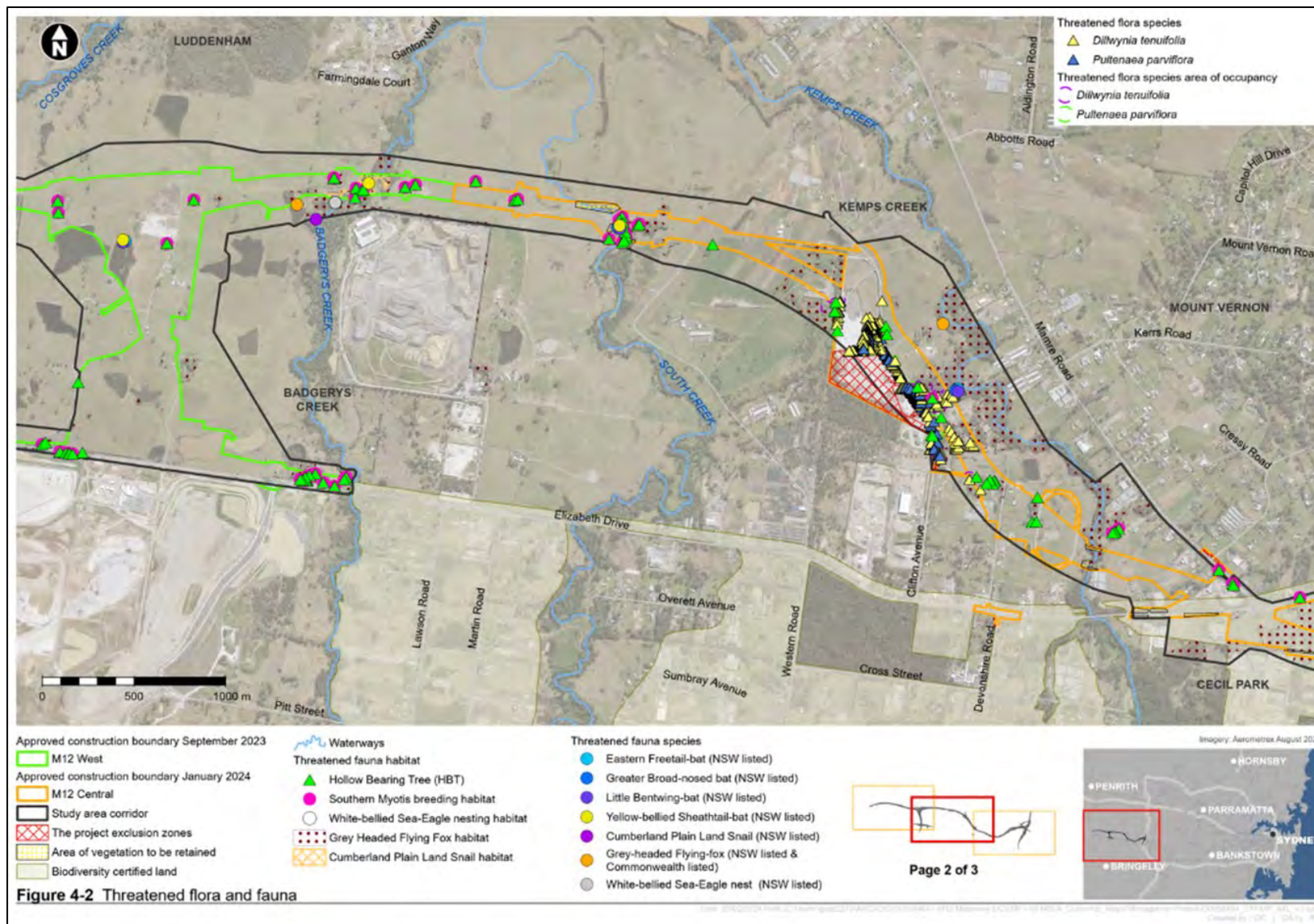


Figure 4-2: Threatened habitat features

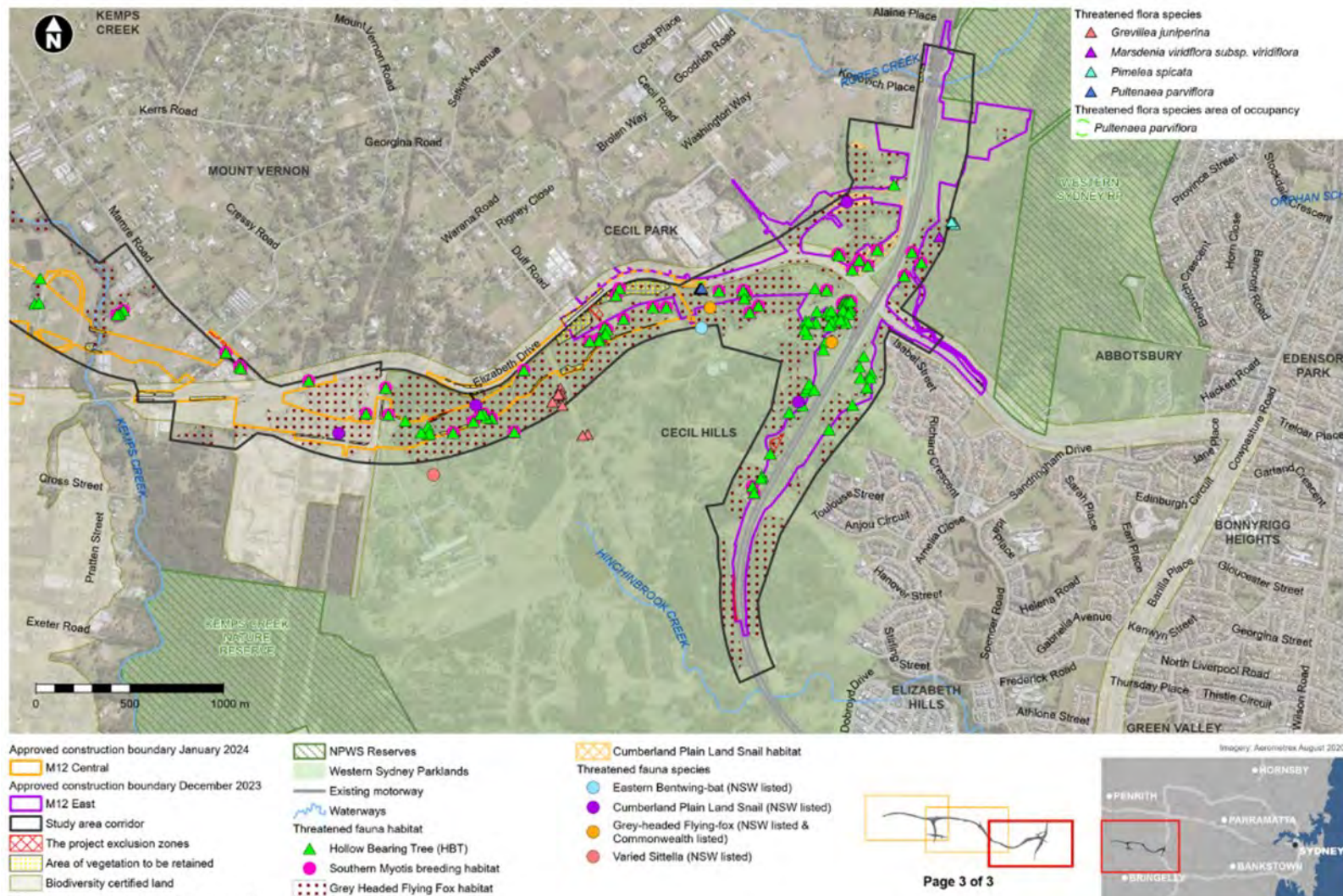


Figure 4-2 Threatened flora and fauna

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	Potential Recorded in M12 Project area outside of Central package
Greater Broad-nosed Bat	<i>Scoteanax rueppellii</i>	-	Vulnerable	Potential Recorded in M12 Project area outside of Central package
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	Potential Recorded in M12 Project area outside of Central package
Little Bent-winged Bat (formerly Little Bentwing-bat)	<i>Miniopterus australis</i>	-	Vulnerable	Potential Recorded in M12 Project area outside of Central package
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	-	Vulnerable	Recorded Note: Nest located outside of M12 Central construction footprint
Yellow-bellied Sheathtail-bat	<i>Saccolaimus flaviventris</i>	-	Vulnerable	Potential Recorded in M12 Project area outside of Central package
Cumberland Plain Land Snail	<i>Meridolum corneovirens</i>	-	Endangered	Potential Recorded adjacent to M12 West package at Badgerys Creek.
Eastern False Pipistrelle	<i>Falsistrellus tasmaniensis</i>	-	Vulnerable	Moderate

Common name	Scientific name	EPBC Act	BC Act	Occurrence likelihood
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 M12 Central package are shown in

Table 4-4. No potential habitat for threatened fish listed under the FM Act or EPBC Act occurs within these stretches of waterways and therefore, no threatened fish species are anticipated to be present.

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 M12 Central package

Waterway	Stream order	Riparian corridor	Waterway class (Fairfull and Witheridge)	Key fish habitat (DPI Fisheries)	Sensitive receiving environment
South Creek	4th	40m on each side of the watercourse	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	40m on each side of the watercourse	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	30m on each side of the watercourse	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

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

- South Creek
- Kemps Creek.

4.1.6 Listed migratory species

The Protected Matters Search Tool (PMST) report identified 16 listed migratory species with the potential to occur within 10 kilometres of the Project study area. Preliminary desktop assessments identified eight of the 16 species to have a moderate likelihood of occurrence and eight to have a low likelihood of occurrence. Subsequent habitat assessments and field surveys assessed that all 16 species have a low likelihood of occurrence in the construction footprint for the M12 Central package.

4.1.7 Habitat connectivity

The M12 Motorway Biodiversity Assessment Report assessed the habitat connectivity values of the site. No State significant biodiversity links were identified, however Kemps Creek and South Creek meet the criteria for regionally significant biodiversity links as defined under the NSW Framework for Biodiversity Assessment 2014 (FBA). A regionally significant biodiversity link is defined as:

- An area identified by the assessor as being part of a regionally significant biodiversity link and in a plan approved by the Chief Executive, EESG; or
- A riparian buffer 20 metres either side of a 4th or 5th order stream; or
- A riparian buffer 30 metres around a regionally significant wetland.

With reference to the ISCA Technical Manual, the regionally significant biodiversity links classify as low degree of connectivity:

- Low condition native vegetation >100m wide or native vegetation in good condition >50m wide that is part of one of several links to other native vegetation in good condition.

4.2 Matters of National Environmental Significance

4.2.1 Threatened species and ecological communities

One TECs listed under the EPBC Act would be removed for the M12 Central package, Cumberland Plain Woodland.

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*, recorded) and Spiked Rice flower (*Pimelea spicata*, potential habitat).

One EPBC listed fauna species, the Grey-headed Flying-fox (*Pteropus poliocephalus*), listed as Vulnerable, was recorded foraging within the vicinity of the M12 Central package.

4.2.2 Migratory species

There are no areas of important habitat for any of the listed migratory species within the construction footprint of the M12 Central package.

4.2.3 Wetlands of international importance

There are no wetlands of international importance within 10 kilometres of the M12 Central package.

4.2.4 World and natural heritage

There are no world heritage locations within 10 kilometres of the M12 Central package. However the Greater Blue Mountains Area is located around seven kilometres from the western most point of the Project. It is highly unlikely that this area will be impacted by the M12 Central package.

4.2.5 National heritage

There are no national heritage locations within 10 kilometres of the M12 Central package. However the Greater Blue Mountains Area is located around seven kilometres from the western most point of the Project. It is highly unlikely that this area will be impacted by the M12 Central package.

5 Environmental aspects and impacts

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

5.1 Construction activities

Key aspects of the M12 Central package 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
- Fencing in accordance with R201
- 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 Initial Impact Register included in Appendix A2 of the CEMP.

5.2 Ecological impacts

Direct / indirect impacts to biodiversity, will occur as a result of the M12 Central package, 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 from the M12 Central package.

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 79.03 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). Whilst design is ongoing for M12 East, these areas are subject to change until the footprint of M12 East is finalised.. TfNSW have assessed the consistency of these changes in the extent of direct and indirect impacts to native vegetation and determined the changes were consistent with the Division 5.2 Approval and EPBC Approval.

The potential area of loss of vegetation and habitat due to construction of the M12 Central package is summarised in Table 5-1. Table 5-2 presents the area of EPBC listed TECs impacted by the M12 Central package. 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. In this instance, consistency assessments will be developed to ensure that the 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. Where additional changes to biodiversity are included in consistency assessments, the figures and relevant tables in this plan will be updated accordingly.

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 DCCEEW within six months of the final construction footprint for that stage being determined. Protected matters outside of the final construction footprint will not be cleared in accordance with Commonwealth CoA 3.

Vegetation areas that may be retained have been adopted for the Project as these areas present potential opportunities for the Construction Contractor to avoid and minimise potential vegetation impacts if possible. As vegetation impacts may occur during construction, these impacts have been considered in biodiversity off-set calculations.

Table 5-1: Approved area of impact to native vegetation for M12 Central package

PCT No	Plant community type (PCT)	Veg zone code	Vegetation zone code within construction footprint	BC Act Status	Area (ha) within the M12 Central portion of the 100% design footprint	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	3.54	0.956
		2	724 - Moderate/ Good_Medium	Endangered	2.41	0.135
		3	724 - Moderate/ Good_Poor	Endangered	0.45	0.459
830	Forest Red Gum - Grey Box shrubby woodland on shale of the southern Cumberland Plain, Sydney Basin Bioregion	4	830 - Moderate/ Good_Poor	Endangered	0.0	0
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	0.41	0.166
849	Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion	6	849 - Moderate/ Good_Medium	Critically Endangered	4.31	0.804
		7	849 - Moderate/ Good_Poor	Critically Endangered	1.3	0.301
		8	849 - Moderate/ Good_Other (Derived Shrubland)	Critically Endangered	0.0	0
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	0.0	0
		10	850 - Moderate/ Good_Medium	Critically Endangered	11.26	1.07
		11	850 - Moderate/ Good_Other (Revegetation)	Critically Endangered	13.54	5.412
		12	850 - Moderate/ Good_Poor	Critically Endangered	0.0	0
		13	850 - Low	Critically Endangered	0.0	0

PCT No	Plant community type (PCT)	Veg zone code	Vegetation zone code within construction footprint	BC Act Status	Area (ha) within the M12 Central portion of the 100% design footprint	Indirect impacts (ha)
883	Hard-leaved Scribbly Gum - Parramatta Red Gum heathy woodland of the Cumberland Plain, Sydney Basin Bioregion	14	883 - Poor	-	0.37	0.084
1800	Swamp Oak open forest on riverflats of the Cumberland Plain and Hunter valley	15	1800 - Moderate/ Good_Poor	Endangered	0.52	0.471
				TOTAL	31.949	9.858

Table 5-2 Area EPBC Act listed TECs impacted by the M12 Central package

TEC Name EPBC Act TEC	EPBC Status	Area directly impacted by Project (ha)
Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest	Critically Endangered	25
Total area of TECs listed under the EPBC Act		25

Removal of threatened plants

The M12 Central package will result in impacts to one 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 636

individual plants of *Pultenaea parviflora* and 245 individual plants of *Dillwynia tenuifolia* will be removed for construction of the M12 Central package. MNES assessments determined that the M12 Central package 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 M12 Central package 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 however, not within the M12 Central package. Clearing of native vegetation will remove approximately 0.52 ha of suitable habitat for this species. Clearing of native vegetation would also remove approximately 0.67 ha of breeding habitat and 21 suitable hollow bearing trees for the BC Act listed Southern Myotis.

The removal of about 32.81 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 Sheath-tail-bat.

Table 5-3: Impacts to species credit threatened fauna and fauna

Threatened species	Status		Habitat area impacted by Project (ha)
	BC Act	EPBC Act	
Cumberland Plain Land Snail	Endangered	Not listed	0

Threatened species	Status		Habitat area impacted by Project (ha)
	BC Act	EPBC Act	
Southern Myotis (breeding habitat)	Vulnerable	Not listed	1.095 ha 21 hollow bearing trees
Dillwynia tenuifolia	Vulnerable	Not listed	636
Pultenaea parviflora	Endangered	Not listed	245

The Woodland and Riparian Forest habitats of the M12 Central package 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 M12 Central package area to identify key foraging trees and identify blossoming events. The Swift Parrot was not recorded within the M12 Central package during the surveys.

The foraging habitat available in the M12 Central package is disturbed, fragmented and often immature and is unlikely to provide a valuable resource for the Swift Parrot. Although the M12 Central package 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.	31.949
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.	31.949

Seymour Whyte will not clear more than the specified amount or another specified amount, determined in consultation with EHG (formerly EES) and DCCEEW in accordance with NSW CoA E4, within the final M12 Central package construction footprint.

Note:

- A section of the M12 Central construction footprint coincides with the M12 East footprint, this has been included in the calculations
- Revised calculations includes M12 Central DD CA (GHD October 2021), M12 Sydney Water Crossings CA (Arcadis June, 2022), Design Boundary Change CA (Arcadis July, 2022) and Minor CA (Arcadis August, 2022)
- PCT883 does not meet the criteria for the associated BC Act status and has been excluded from the ecosystem credits (TfNSW BAR, 2019)

5.2.2 Impacts to aquatic biodiversity

Construction of the M12 Central package would involve the following activities relevant to aquatic habitat:

- Construction of bridges: South Creek, Kemps Creek and Ropes Creek which were assessed as moderate fish habitat and key fish habitat
- Installation of pipe culverts at the unnamed tributaries of South Creek which was assessed as unlikely fish habitat
- Potential installation of temporary waterway crossings for some or all waterways traversed by the works
- Temporary working platforms at bridge sites
- Minor redirection of localised drainage lines.
- Impacts on aquatic habitats may occur during construction as a result of the following:
 - Instream works, including bridge and culvert construction
 - Removal of aquatic vegetation and snags during bridge and culvert works
 - Increased flow velocities in the local area and altered timing of water flows reaching creeks due to minor redirection of localised drainage lines
 - Temporary work platforms could disrupt flow, detain water and increase inundation and disturb creek beds resulting in sedimentation downstream
 - Changes in shading regime and temperature
 - Potential for sedimentation and spills to affect water quality in the waterways.

5.2.3 Habitat fragmentation

The M12 Central package 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.

One area mapped as regional corridors will be impacted by the M12 Central package:

Riparian Forest and adjacent Woodland habitat associated with Kemps Creek and South Creek

No threatened fauna species are likely to be affected by further fragmentation of the riparian corridor from the M12 Central package. Other threatened fauna recorded or assumed present within the study area are highly mobile flying species. Therefore, the M12 Central package 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 M12 Central package will 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 M12 Central package 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 area. Other activities, including earthworks and movement of soil, can also result in the dispersal and introduction of weeds throughout the area.

A total of 14 introduced vertebrate fauna species were recorded within the Project 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.

Construction 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 M12 Central package is unlikely to significantly increase the overall impact of pest species in this 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 construction activities would increase fragmentation in the study area, it is likely that the M12 Central package would increase the abundance of Noisy Miner in the area and exacerbate this KTP.

In addition to the above, there is a current NSW DPI Biosecurity Emergency Order in place regarding Red imported fire ants (fire ants) (*Solenopsis invicta*), which are invasive introduced ants that cause serious social, economic and environmental harm. A copy of the TfNSW Red Imported Fire Ant Alert Factsheet has been included in Appendix I, which details the actions required in regard to fire ant awareness training and management.

5.2.6 Invasion and spread of pathogens and disease

Construction has the potential to increase the spread of pathogens that threaten native biodiversity values. Pathogens specific to the M12 Central package include:

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

All four of these pathogens are listed as KTPs under the BC Act. The M12 Central package 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 M12 Central package, and chytrid fungus is therefore considered unlikely to have a significant impact. As there are no threatened parrot species likely to occur within the area, psittacine beak and feather disease is also unlikely to have a major impact.

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 will be an increase in artificial lighting within the area of the M12 Central package and surrounds. As such, construction 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 M12 Central package is unlikely to have a significant effect on fauna in the locality.

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 the landscape of the M12 Central package 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. 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 concurrent construction of various projects within the vicinity of the M12 Central package gives rise to the potential of cumulative ecological impacts included the clearing of large amounts of TECs, native vegetation and fauna habitat.

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

Interagency communication between government departments undertaking work in the area is required to manage the cumulative impacts of the extensive work that will be happening in the area with the aim of combining messages when possible and minimising impacts to the local community. Regular interface meetings will be undertaken with government authorities, neighbouring Project packages, other projects, and stakeholders as detailed in Section 5.5.2 and 5.5.3 of the CEMP and within the Overarching Communication Strategy (OCS).

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 B has been prepared in accordance with the requirements of Guide 1 of the *Biodiversity Guidelines* (RTA, 2011) and TfNSW specifications.

The purpose of the Vegetation Clearing Procedure (Appendix B) 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:

- Cumberland Plain Land Snail
- Southern Myotis
- Grey-headed Flying-fox
- Specific reporting requirements associated with additional survey work and control of clearing activities.

Prior to commencement of clearing a M12 Central Clearing and Grubbing Plan incorporating a Clearing and Grubbing EWMS will be prepared 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 existing trees, plants, and other vegetation marked for preservation within or adjacent to the Site and use every precaution necessary to prevent damage or injury thereto.
- 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

The Clearing and Grubbing EWMS will be prepared in accordance with Specification TfNSW G40/D under the Clearing and Grubbing Plan.

The results of all pre-clearing surveys will be used to update and maintain the Sensitive Area Plans including any unexpected finds and habitat trees within retained areas, and progressively removed cleared vegetation or threatened species and their habitats.

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 (Appendix F). 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 Habitat Compensation Plan.

6.1.1 Post-Clearing Report

At the completion of clearing, the Project Ecologist (see Section 7.1 for details) 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 7.6 and Appendix C, Appendix F and Appendix G of this CFFMP.

6.2 Hollow Replacement

Clearing activities for the M12 Central package will result in the removal of hollow bearing trees that may provide shelter and nesting sites for fauna. To compensate for the loss of habitat trees within the cleared area, hollow replacements will be provided in accordance with the Habitat Compensation Plan (Appendix F) 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 Habitat Compensation Plan will include:

- Target species

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

6.3 Exclusion zones

Exclusion zones have been defined in the TfNSW design drawings and impacts in these areas are not permitted under the Planning Approval. TfNSW have also identified a number of Vegetation Saving Areas which include important ecological values and areas identified in the WSPT lease agreement for tree protection measures (refer to Appendix A, Table A4 and Figure A1-5). Impacts in Vegetation Saving Areas are permitted under the Planning Approval and WSPT lease, however only with prior approval from TfNSW.

Exclusion zones and Vegetation Saving Areas are identified in the Sensitive Area Plans (SAPs) in CEMP Appendix A6 and the Sensitive Aerial Vegetation Maps in Appendix K of this Plan. Exclusion zones and Vegetation Saving Areas however will be demarcated on the ground the same way.

Exclusion zones (including Vegetation Saving Area) fencing or other means to demarcate vegetation to be retained, will be installed 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 B) and Specification TfNSW G40.

Environmental protection area signage on exclusion zone fencing will be installed at regular intervals). The fencing will only be removed following agreement by the TfNSW ESM (or delegate). The exclusion zones are shown on Figure 4-1 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). Where practicable, exclusion zones will be maintained below the 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.

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 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 additional surveys to determine 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 ESR 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.

Consultation will occur with DPI Fisheries prior to vegetation clearing if the trees proposed to be removed could potentially be used for re-snagging of a waterway as confirmed by the Project Ecologist.

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 ² (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 Parklands Trust, Landcare groups and relevant government agencies to determine possible off-site reuse in accordance with NSW CoA E15. Where disposal for reuse off site is proposed a Habitat

² It should be noted that logs greater than 2,000 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.

and Timber Reuse Disposal Plan will be prepared detailing the possible reuse and/or disposal options.

6.5 Aquatic and riparian habitat

Aquatic and riparian habitat will be managed 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 (Appendix H)
- 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 (NRAR 2018) which seek to minimise disturbance and harm to the waterfront land and maintain or rehabilitate the riparian corridor with fully structured native vegetation.

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 C of the CSWMP. The M12 Central package will be subject to EPL (licence number 21596) as a Scheduled Activity for 'road construction. In accordance with the EPL c.L2.4, any water discharged from site must align with the following discharge water quality criteria:

- Oil and grease: Not visible

- pH: 6.5-8.5
- Turbidity: 50 NTU

Bridge designs were altered during detailed design to avoid creek realignment and retain fauna passage at the main creek lines (South Creek and Kemps Creek).

Clearing within riparian corridors impacted by the M12 Central package will be undertaken in accordance with the Vegetation Clearing Procedure (refer to Section 6.1 and Appendix B). Furthermore, revegetation of the riparian corridor and banks of watercourses impacted by the M12 Central package 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.

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. 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 required for the M12 Central package will be designed, constructed and maintained in accordance 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 number and width of temporary creek crossings and work platforms in South Creek, Kemps Creek and the tributary of Kemps Creek will be minimised during construction planning. The potential impact of temporary crossing to existing hydraulic capacity will be modelled prior to the commencement of works (refer to CFMP Section 6.1.2).

To avoid the formation of a perched culverts and damage to the stream's bed and banks, erosion at the outlet should be controlled with the use of rock protection and/or the formation of a stabilised energy dissipation pool. Where multiple pipes are required in temporary crossings, at least one pipe will be installed as a low-flow pipe to carry the normal dry weather flow and maintain fish connectivity.

TfNSW have completed consultation with DPI Fisheries and EHG during the detailed design of the permanent watercourse crossings. Seymour Whyte will consult with TfNSW regarding the need to take additional consultation if changes occur during construction (e.g. changes to scour protection of revegetation within the creeks).

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 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
- Constructing instream crossings during low flows and design so that drainage off crossing doesn't contribute sediment load to the stream.

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. Staging of the waterway crossing is to be detailed in EWMS prepared for these activities.

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 M12 Central package.

The Weed, Pest and Pathogen Management Plan provided in Appendix E has been prepared in accordance with the requirements of Guides 6 and 7 of the *Biodiversity Guidelines* (RTA, 2011), TfNSW specifications, and the Overarching Weed, Pest and Pathogen Management Plan. The purpose of the Plan is to:

- Identify pathogens and key weed species and distribution across the construction footprint
- Prevent the introduction and spread of weeds, pests and pathogens throughout the construction of the M12 Central package 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.
- 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 construction 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.

6.7 Unexpected threatened species finds

The Unexpected Threatened Species or TEC Finds Procedure provided in Appendix D has been prepared in accordance with Guide 1 of the *Biodiversity Guidelines* (RTA, 2011) and the TfNSW

specifications. 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 EHG, DPI, DPHI, NSW DCCEEW and DCCEEW as appropriate
- A procedure to obtain approvals, licences or permits prior to recommencement of works
- Requirement for impact assessment and calculation of additional off-sets will be calculated to account for the impact.

6.8 Fauna rescue and release procedure

Handling of fauna during the M12 Central package 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 Fauna Handling and Rescue Procedure provided in Appendix C has been prepared 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 M12 Central package.

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.

6.9 Fauna mortality monitoring

Vehicle strikes is a major cause of fauna injury and mortality during construction, therefore mortality video surveys on the haulage roads (public and internal) will be undertaken. 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 haulage roads to inform adaptive management strategies where practicable to reduce the incidence of

native fauna mortality in proximity to the M12 Central package. A methodology a methodology for carrying out the native fauna mortality video surveys in accordance with TfNSW specifications is provided in Appendix I.

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 M12 Central package. Habitat trees have been identified in the Tree Survey and are included in the Sensitive Area Plan provided in Appendix A6 of the CEMP. Where practicable, local provenance native species from the relevant native vegetation community (or communities) that occur, or once occurred in these locations will be used. Where trees are to be removed, they will be replaced at a ratio of 2:1, except trees that are offset under NSW CoA E3.

Revegetation for the M12 Central package 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 M12 Central package 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.

A landscape subcontractor will be engaged 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 landscape subcontractor will undertake the revegetation and landscaping for the M12 Central package 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.

Revegetation works will be undertaken to 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.

Revegetation undertaken within land subject to the WSPT lease agreement will be done so in accordance with the lease agreement. Replacement planting of tree, shrubs and groundcovers for any disturbed lands are covered in design plans for the new access road (12CDD-GHDA-UAR-LA-DRG-617602) (refer to Appendix A, Table A4).

Regular inspections, monitoring and maintenance of revegetated areas will be carried out 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, a Tree Management Strategy has been prepared and provided in Appendix J outlining:

- Measures to minimise tree removal to retain and protect as many trees within the construction footprint as reasonable and feasible
- Arboricultural assessment for existing trees within the road reserve that are to be retained to identify techniques which can be applied to maximise the trees health and longevity
- 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.

The tree management strategy has been informed by the by tree survey data provided to Seymour Whyte by TfNSW.

As described in Section 6.10 habitat trees have been identified in the Tree Survey and are included in the Sensitive Aerial Vegetation Maps provided in Appendix K.

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.

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

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

6.13 Seed collection and propagation

Seymour Whyte will manage seed collection and propagation in accordance with TfNSW Seed Collection Program and facilitate access to TfNSW's seed collection contractor. 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 Seymour Whyte set up a site nursery. If this occurs, Seymour Whyte will set up and maintain this site nursery and TfNSW will provide access points for power and water at the site nursery.

During construction TfNSW will direct their seed collection contractor to collect plants, rhizomatous material and seeds 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 M12 Central package or other Project packages.

In consultation seed collection contractor, suitable areas may be utilised as seed production areas to increase efficiency in seed collection. The seed collection contractor will be responsible for storage of seeds and plants until requested by 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(M12 Central)

ID	Management Measure	When to implement	Responsibility for implementation	Reference or source	Evidence of implementation
Pre-Construction Management Actions					
FF1	A Clearing and Grubbing Plan will be prepared in accordance with the requirements of Specification TfNSW G40 and TfNSW publication "Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects". A Clearing and Grubbing EWMS within the Clearing and Grubbing Plan will be prepared if required in accordance with Specification G36.	Prior to clearing	ESR	TfNSW QA G36 TfNSW QA G38 TfNSW QA 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	ESR	TfNSW QA 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	ESR Project Ecologist	NSW CoA C8 REMM B05	Pre-clearing report
FF4	Southern Myotis Southern myotis procedure to be followed prior to clearing of habitat trees. Anabat surveys will be undertaken to determine presence of southern myotis. Should they be present, tree removal will be undertaken at night once bats have left the roost. No clearing of habitat will occur during winter torpor and breeding in October to January.	Prior to Southern Myotis Habitat tree removal	Project Ecologist	REMM B05	Ecologist report

ID	Management Measure	When to implement	Responsibility for implementation	Reference or source	Evidence of implementation
FF5	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
FF6	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
FF7	<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	<p>Consultation records</p> <p>Section 143 Notice</p> <p>Assessment Report</p> <p>Habitat and Timber Reuse Disposal Plan</p>

ID	Management Measure	When to implement	Responsibility for implementation	Reference or source	Evidence of implementation
FF8	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	TfNSW QA G40	Ecologist report
FF9	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	TfNSW QA G40	Arborist report
FF10	Areas of weed infestation identified in the ecologist report will be marked in the Clearing and Grubbing Plan.	Prior to construction	Project Ecologist	TfNSW QA G40	Ecologist report, Clearing and Grubbing Plan
FF11	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	ESR	TfNSW QA G40	Site inspection report (G38 Witness point)

ID	Management Measure	When to implement	Responsibility for implementation	Reference or source	Evidence of implementation
Exclusion Zones					
FF12	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 B).	Prior to clearing	Construction Manager ESR	NSW CoA E2 REMM B24 TfNSW QA G40	Ecologist Report
FF13	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 TfNSW QA G40	Hold Point
FF14	Environmental protection area signage will be placed on exclusion zone fencing at regular intervals	Prior to clearing	Supervisor ESR	Best Practice	Site inspection report
FF15	Clearing limits will be identified on Sensitive Area Plans	Prior to clearing	ESR	Best Practice	Sensitive Area Plans
Vegetation Clearing					
FF16	Clearing will be undertaken in accordance with the Vegetation Clearing Procedure (Appendix B)	During Construction	Construction Manager ESR	REMM B01	Ecologist report

ID	Management Measure	When to implement	Responsibility for implementation	Reference or source	Evidence of implementation
FF17	<p>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.</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>	Prior to and During Construction	ESR	TfNSW QA G40 REMM B10	Ecologist Report
FF18	Removal of riparian vegetation at creek crossings will be minimised and vegetation connectivity across the riparian zone will be maintained where possible.	During construction	ESR	REMM B10 TfNSW QA G40	Clearing Reports
FF19	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	ESR	REMM B07	Ecologist Report
FF20	All construction activities will be planned and carried out within the M12 Central package boundary and approved clearing limits to ensure that there is no damage to any vegetation outside the specified clearing limits.	During construction	Construction Manager ESR	TfNSW QA G40	Site inspection report

ID	Management Measure	When to implement	Responsibility for implementation	Reference or source	Evidence of implementation
FF21	<p>Damage or destruction of threatened flora species and trees which have been identified for preservation will be minimised by:</p> <ul style="list-style-type: none"> (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	ESR	TfNSW QA G40	Site inspection report
FF22	<p>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.</p> <p>The Project Ecologist will be consulted if any of these trees contain habitat features.</p>	During construction	ESR Project Ecologist	TfNSW QA G40	Post clearing report Arboricultural assessment report
FF23	Any branch, which overhangs the road formation, will be cut back flush with the tree trunk in accordance with AS 4373.	During construction	Construction Manager	TfNSW QA G40	Post clearing report
FF24	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 Manager	TfNSW QA G40	Post clearing report

ID	Management Measure	When to implement	Responsibility for implementation	Reference or source	Evidence of implementation
FF25	Holes left following the removal of trees and stumps will be backfilled and vegetated as described in Clause 3 of G40.	During construction	Construction Manager	TfNSW QA G40	Site diary
Fauna Management					
FF26	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	ESR	REMM B25	As built drawings Ecologist Report
FF27	Connectivity measures will be implemented in accordance with Wildlife Connectivity Guidelines for Road Projects (TfNSW, under preparation).	During construction	ESR	REMM B23	Ecologist report
FF28	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 Manager Supervisor ESR	REMM B23 R201 3.7.2	Arborist report Ecologist Report
FF29	Implement the detailed design to retain fauna passage at all main creek lines (South and Kemps Creeks).	During construction	Construction Manager	REMM B23	Ecologist report, Clearing and Grubbing Plan
FF30	Undertake fauna mortality video surveys on haulage roads (public and internal) in accordance with the fauna mortality video survey methodology (Appendix I) regularly during rainfall events and following high risk activities including vegetation clearing and dam dewatering maintain a native fauna mortality register.	During Construction	ESR Project Ecologist	TfNSW QA G36	Fauna mortality register

ID	Management Measure	When to implement	Responsibility for implementation	Reference or source	Evidence of implementation
FF31	The results for the native fauna mortality register must be provided to the Principal with the Monthly 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	ESR	TfNSW QA G36	Fauna mortality register
FF32	Any injury or death of threatened species will be reported to the Principal.	During construction	ESR	TfNSW QA G36	Incident Report
Weeds and Pathogens					
FF33	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 E).	During construction	Construction Manager Supervisor ESR	REMM B26	Ecologist report
FF34	All staff will be made aware of the Priority Weeds present on-site and requirements	During construction	ESR	TfNSW QA G40	Site induction records
FF35	Weeds will be removed and disposed of in accordance with the requirements of the local Council.	During construction	Supervisor ESR	TfNSW QA G40	Waste Management Register
FF36	Pathogens will be managed in accordance with Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA, 2011) (Guide 2: Exclusion zones).	During construction	ESR	REMM B27	Ecologist report

ID	Management Measure	When to implement	Responsibility for implementation	Reference or source	Evidence of implementation
FF37	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 Manager Supervisor ESR	TfNSW QA G40	Site inspection report and daily diary
FF38	Weeds and topsoil will be treated and disposed of in accordance with their category under the Biosecurity Act.	During construction	Construction Manager Supervisor ESR	TfNSW QA G40	Waste Management Register
Lighting					
FF39	Where works are undertaken at night, direction lighting will be used and directed away from vegetated areas where practicable.	During construction	Supervisor	REMM B28	Site inspection report
Aquatic and riparian habitat					
FF40	Works to be undertaken in accordance with the Snag Management Plan (Appendix G) and Habitat Compensation Plan (Appendix F)	During construction	Construction Manager Supervisor ESR	REMM B2 and B12	Ecologist report
FF41	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. Refer to Appendix H.	During construction	ESR	NSW CoA E121	Ecologist report
FF42	Minimum flows will be maintained to assist in maintaining the viability of aquatic communities and preventing barriers to fish passage.	During construction	ESR	REMM SWH12	Permit to pump

ID	Management Measure	When to implement	Responsibility for implementation	Reference or source	Evidence of implementation
FF43	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	ESR	TfNSW QA G38	As built drawings Design Reports
FF44	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 the Project Ecologist and undertaken in accordance with the Snag Management Plan (Appendix G).	During construction	ESR	REMM B16	Ecologist report
FF45	Stumps in riparian zones and aquatic habitats will be retained, where practicable, to reduce the potential for bank erosion.	During construction	Construction Manager ESR	TfNSW QA G38	Ecologist report
FF46	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 Conservation and Management</i> (DPI, 2013 update) and in consultation with DPI Fisheries.	Prior to commencement of work in KFH	Construction Manager ESR	NSW CoA E11 NSW CoA E12	Consultation records
FF47	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	Supervisor	TfNSW QA G38	Site inspection report

ID	Management Measure	When to implement	Responsibility for implementation	Reference or source	Evidence of implementation
FF48	<p>In the event of a spill, refer to the Spill Response Procedure Spill Response and Management Procedure is provided in the CSWMP Appendix G to minimise impacts from spills. This Procedure details the requirements for managing, cleaning up and reporting of spills.</p> <p>If a spill has resulted in, or has potential to result in, material harm, refer to the Project's Pollution Incident Reponse Management Plan prepared under the EPL.</p> <p>In the event of a spill that results in an emergency, refer to the emergency preparedness and response in the CEMP Appendix A7 M12 Environmental Incident Classification and Reporting.</p> <p>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.</p>	During construction	Supervisor ESR	REMM B19	Incident reports
FF49	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 channel bed or wash damage to channel banks.	During construction	Construction Manger Supervisor	TfNSW QA G38	Site inspection report
Pesticide Use					
FF50	<p>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.</p> <p>Herbicides and pesticides must be currently registered for their intended use by the Australian Pesticides and Veterinary Medicines Authority (APVMA).</p>	During construction	Supervisor ESR	TfNSW QA G36 TfNSW QA G179	Records Sheet

ID	Management Measure	When to implement	Responsibility for implementation	Reference or source	Evidence of implementation
FF51	<p>A Records Sheet will be completed within 24 hours of applying a pesticide and a copy will be submitted to TfNSW.</p> <p>A Records Sheet is not required when all of the following are satisfied:</p> <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>	During construction	ESR	TfNSW QA G36	Records Sheet
FF52	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	ESR	TfNSW QA G36	Records Sheet
FF53	<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 • Use of hand-held application of pesticides where mechanical means of pest control are not feasible. 	During construction	ESR	TfNSW QA G36	Records Sheet

ID	Management Measure	When to implement	Responsibility for implementation	Reference or source	Evidence of implementation
FF54	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	Supervisor ESR	TfNSW QA G36	Records Sheet
Stockpile Management					
FF55	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	Supervisor ESR	TfNSW QA G38	Site inspection report
FF56	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	Supervisor ESR	TfNSW QA G38	Site inspection report
FF57	Topsoil that is not contaminated by priority weeds will be kept in stockpiles for later spreading on fill batters and other areas. Other stockpiled material will be kept separate from the topsoil stockpiles.	During construction	Construction Manager Supervisor ESR	TfNSW QA G38	Site inspection report
FF58	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	Supervisor ESR	TfNSW QA R44 TfNSW QA G38	Site inspection report

ID	Management Measure	When to implement	Responsibility for implementation	Reference or source	Evidence of implementation
FF59	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	Supervisor ESR	TfNSW QA R44	Site inspection report
FF60	Following completion of the Works, restoration of the stockpile areas will be carried out in accordance with Specification TfNSW R178.	Post Construction	Supervisor ESR	TfNSW QA R44 TfNSW QA G40	Site inspection report
Mulch					
FF61	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	Supervisor ESR	TfNSW QA G40	Post clearing report
FF62	Mulch stockpile sites will be established with appropriate controls in place before the main site clearing activities commence. Refer to the Tannin Management Procedure in the CSWMP Appendix F.	During construction	Supervisor ESR	G40	PESCP Site inspection report
FF63	Mulch stockpiles will be monitored and turned over as required to avoid spontaneous combustion.	During construction	Supervisor ESR	TfNSW QA G40	Site inspection report
FF64	Mulch in excess of the quantity required for landscape planting will not be stockpiled on site.	During construction	Supervisor	TfNSW QA G40	Site inspection report

ID	Management Measure	When to implement	Responsibility for implementation	Reference or source	Evidence of implementation
FF65	<p>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:</p> <ul style="list-style-type: none"> limiting the application of mulch near waterways where practicable limiting the application of mulch in poorly drained areas where mulch has potential to soak in water and generate tannins. Mixing mulch into topsoil <p>The application of mulch for permanent landscaping will be designed and planned to avoid material and tannin runoff.</p>	<p>Design</p> <p>During construction</p>	<p>Supervisor</p> <p>ESR</p>	REMM B18	Site inspection report
Bushfire					
FF66	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 construction	All staff	Best practice	Induction and Toolbox talks records
FF67	All works involving a fire source will have a hot works permit in place with specific controls to prevent fire risk.	During construction	Construction Manager Supervisor	Best practice	Safe Work Method Statement
FF68	No 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 construction	Supervisor	Best practice	Safe Work Method Statement
FF69	Vehicles will not be driven or idled in areas of long grass on fire ban days or after prolonged periods of dry weather.	During construction	All staff	Best practice	Induction and Toolbox Talks records

ID	Management Measure	When to implement	Responsibility for implementation	Reference or source	Evidence of implementation
FF70	All entry points into the site will be kept shut to prevent unauthorised vehicle access and torching.	During construction	Supervisors	Best practice	Induction and Toolbox Talks records
FF71	A supply of water will be available at all times for firefighting purposes and supply point will be communicated with local firefighting authorities.	During construction	Construction Manager Supervisor	Best practice	Safe Work Method Statement
FF72	Fire extinguishers will be available on all plant and equipment.	During construction	Construction Manager Safety Manager	Best practice	Safe Work Method Statement
Revegetation					
FF73	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	ESR	REMM B08	Site inspection report
FF74	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 (Appendix F).	During construction	ESR	REMM B02 and B09	Post clearing report
FF75	Revegetation and the provision of replacement trees will be informed by the Tree Survey undertaken during detailed design of the Project.	During construction	ESR	NSW CoA E71	Tree survey report

ID	Management Measure	When to implement	Responsibility for implementation	Reference or source	Evidence of implementation
FF76	Rehabilitation and revegetation of the riparian corridor and banks of watercourses impacted by the M12 Central package 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	ESR	NSW CoA E109	Site inspection report
FF77	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	ESR	REMM B14	Site inspection report
FF78	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 by the TfNSW seed collection contractor.	During construction	ESR	TfNSW QA G40	Seed collection records
FF79	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 by the TfNSW seed collection contractor.	During Construction	TfNSW	Seed Collection Program	Seed collection records
FF80	Replacement planting of tree, shrubs and groundcovers for any disturbed lands within the WSP are detailed in design plans for the new access road.	During Construction	TfNSW	WSPT Lease Agreement	Design drawings

ID	Management Measure	When to implement	Responsibility for implementation	Reference or source	Evidence of implementation
FF81	Tree protection for mature native trees and HBT's within the leased areas where possible"	During Construction	TfNSW	WSPT Lease Agreement	Design drawings Pre-clearing surveys

7 Compliance management

7.1 Roles and responsibilities

The organisational structure for the M12 Central package and overall roles and responsibilities are outlined in Section 5.1 of the CEMP. Specific responsibilities for the implementation of environmental controls are detailed in Section 6 of this CFFMP.

7.1.1 Project Ecologist

An ecologist will be appointed by Seymour Whyte (Project Ecologist) to provide advice throughout construction and to supervise and lead the implementation of processes and management measures for ecologically sensitive activities for the M12 Central package. 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 appointed by Seymour Whyte is Peter Monsted from Leneco Pty Ltd. Peter is degree qualified in Wildlife Conservation, an Biodiversity Assessment Method Accredited Assessor (BAAS22011) and holds relevant Animal Research Authority and Scientific License (SL102553).

The Project Ecologist will maintain responsibility for tracking the area of native vegetation cleared during construction. This information will be included in the Compliance Report. The responsibilities of the Project Ecologist are detailed in Table 7-1.

Table 7-1: Project Ecologist

Environmental Co-ordinators	
Authority	<ul style="list-style-type: none"> Appointed by the ESR.
Responsibility	<ul style="list-style-type: none"> Provide expert advice on biodiversity related issues Review and provide input to fauna handling procedures and relevant EWMS Conduct pre-clearing survey and provide clearing supervision in accordance with TfNSW G40 Perform fauna handling and relocation where required Conduct flora and fauna surveys, weed surveys, ecological constraints assessments, monitoring and trapping where required Prepare detailed pre-clearing and post-clearing reports Review and advise on the Clearing and Grubbing Plan (CGP) Provide advice on reuse opportunities for hollows, tree trunks, mulch, bushrock and root balls required to be cleared for the project before any clearing activities are undertaken. Opportunities may include habitat enhancement, beneficial re-use and rehabilitation work and are to be informed by the expression of interest process detailed in G36, Clause 4.8(n) Work in partnership with the ESR to build environmental capabilities, drive cultural change, and achieve performance improvements Assist Seymour Whyte staff with environmental inquiries.

Environmental Co-ordinators	
Lines of communication	<ul style="list-style-type: none"> Functional reporting to the ESR Indirect reporting to Area Project Manager(s) Liaise with any ecologist appointed for the Project by TfNSW.
Minimum Skill Levels	<ul style="list-style-type: none"> A suitably qualified, experienced and licenced Ecologist. The Ecologist must have qualifications and experience in fauna identification and handling, botany, environmental science, landscaping or bush regeneration and experience in identifying weeds and other plant species.

7.2 Training

To ensure that this Plan is effectively implemented, all site personnel (including sub-contractors) will undergo site induction training relating to flora and fauna issues before construction commencing. The induction training will address elements related to flora and fauna management, including:

- Existence and requirements of the OCFFMP, this CFFMP and all plans and procedures prepared under the CFFMPs relevant to the M12 Central package
- Relevant legislation and regulations
- Incident response, management and reporting
- Environmentally sensitive locations and exclusion zones
- Species likely to be affected by construction 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 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 Foreman / Site Supervisor (or delegate) 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 CEMP.

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 M12 Central package.

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

7.4 Hold Points and Witness Points

Hold Points and Witness Points relevant to this Plan are outlined in Table 7-2.

Table 7-2: Hold Points and Witness Points applicable to this Plan

TfNSW QA spec	Clause	Type	Description	Plan reference
G36	4.13	Hold	At least 10 working days prior, provide a copy of the EWMS for working in or near the environmentally sensitive areas and written notice that the environmentally sensitive areas are clearly delineated with locations and boundaries signposted.	Section 1.5.2
G40	2.4	Hold	At least 15 days prior to clearing any area, provide Clearing and Grubbing Plan and a Clearing and Grubbing EWMS, report on your Ecologists pre-clearing survey, Toolijooa clearance, all locations of environmentally sensitive areas, measures to reduce clearing in environmentally sensitive	Section 6.1 Appendix B
G40	6.1	Hold	At least 15 working days before starting any clearing, provide Weed, Pest and Pathogen Management Plan together with written notice that areas of weed infestation identified in the Ecologist's report are marked,	Section 6.6 Appendix E

7.5 Auditing

Audits (both internal and external) will be undertaken to assess the effectiveness of environmental controls, compliance with this Plan, CoA and REMMs, and other relevant approvals, licenses, and guidelines. Audit requirements are detailed in Section 7.4 of the CEMP.

7.6 Reporting and identified records

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

Accurate records will be maintained substantiating all construction activities associated with the M12 Central package or relevant to the conditions of approval, including measures taken to implement this CFFMP. Records will be made available to the DPHI, NSW DCCEE and Commonwealth DEECCW 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. Specific reporting requirements associated with additional survey work and control of clearing activities are outlined in Table 7-3.

Table 7-3: Reporting requirements relevant to flora and fauna management

Item	Frequency	Standard	External reporting	Responsibility
Monthly Environmental Report	Monthly	Reporting as required by TfNSW G36 Specification, Section 3.11.1.2, including: <ul style="list-style-type: none"> • Vegetation Clearing quantities, with separate quantities for each type of vegetation • Nest box installations/bored tree hollows planned and completed • Fauna and flora relocations, habitat trees • Actual cleared area • Progress of seed collection by TfNSW seed collection contractor (Toolijooa). 	TfNSW	ESR
Pre-clearing weed and unsound tree report	At least seven working days prior to commencement of clearing	Reporting as required by TfNSW G40 Specification Section 2.4.1 for the G40 2.4 Hold Point submission including 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	TfNSW	ESR Project Ecologist
Pre-clearing Survey Report	Prior to undertaking clearing	Reporting as required by TfNSW G40 Specification Section 2.4.1 for the G40 2.4 Hold Point submission including survey methodology, targeted species, habitat trees to be removed, fauna rescue events and relocations	TfNSW	ESR Project Ecologist

Item	Frequency	Standard	External reporting	Responsibility
Progressive and Post Clearing Report	Weekly, and a final report within 21 days from the completion of substantial clearing Six monthly	Reporting as required by TfNSW G40 Specification Section 2.6 including summary of the results of surveys, vegetation cleared, fauna rescues, fauna injury and mortality during clearing activities. Summary of areas of vegetation cleared and areas approved for clearing for the Project to be included in the Construction Compliance Reports. Summary of the reuse, relocation or disposal of hollows, coarse woody debris and snags. Progressive reporting of fauna mortality monitoring. Refer to Appendix B for further details.	TfNSW	ESR Project Ecologist
Weed inspections	Monthly for six months following weed treatment then quarterly for remainder of contract	Monitoring in accordance with G40 Section 6.2 to monitor the effectiveness of weed treatments. Report to the Principal the results of each monitoring inspection against the weed management objectives in the Weed, Pest and Pathogen Management Plan (Appendix E) and prepare and implement an Action Plan	TfNSW	ESR Project Ecologist
Final fauna mortality monitoring report	At completion of Construction	Reporting on the methodology, results and findings of the video fauna mortality monitoring	TfNSW	ESR Project Ecologist
Compliance Reports	Three monthly	Summary of areas of vegetation cleared and areas approved for clearing for the Project.	TfNSW	ESR Project Ecologist

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 ESR is responsible for ensuring stage-specific environmental risks are identified and included in the M12 Central package risk register and appropriate mitigation measures implemented throughout the construction, as part of the continuous improvement process. The process for ongoing risk identification and management during construction is outlined in Section 4.1.2 of the CEMP.

8.2 CFFMP update and amendment

The processes described in Section 7.7 of the CEMP may result in the need to update or revise this Plan. This will occur as needed. Any revisions to the CFFMP will be in accordance with the process outlined in Section 1.12 of the CEMP.

A copy of the updated Plan and changes will be distributed to all relevant stakeholders in accordance with the approved document control procedure (refer to Section 7.6.2 of the CEMP).

Construction Flora and Fauna Management Sub-plan

Appendix A – Secondary CoA, Secondary REMMs and TfNSW QA specifications

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Appendix A – Secondary CoA, Secondary REMMs and TfNSW QA Specifications

Secondary requirements that are related, but not specific to, the development of this Plan are outlined in this appendix. Cross references are provided to indicate where the requirements are addressed in this Plan or other Project management documents. This includes:

- Secondary NSW Conditions of Approval (CoA) which are listed in Table A1
- Secondary Revised Environmental Management Measures (REMMs) which are listed in Table A2
- Relevant requirements of the TfNSW QA Specifications which are listed in Table A3.

Table A1: Secondary NSW CoA

CoA No.	Condition Requirements	Document Reference
A5	<p>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:</p> <ul style="list-style-type: none"> (a) documentation of the engagement with the party identified in the condition of approval that has occurred before submitting the document for approval; (b) a log of the dates of engagement or attempted engagement with the identified party; (c) documentation of the follow-up with the identified party where engagement has not occurred to confirm that they do not wish to engage or have not attempted to engage after repeated invitations; (d) outline of the issues raised by the identified party and how they have been addressed; and (e) a description of the outstanding issues raised by the identified party and the reasons why they have not been addressed. 	Section 1.6

CoA No.	Condition Requirements	Document Reference
E2	The clearing of native vegetation must be minimised with the objective of reducing impacts to threatened ecological communities and threatened species habitat.	Section 6
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 M12 Motorway Amendment Report - Submissions Report - Amendment (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	Document Reference
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</i> (October 2020), and <i>M12 Motorway Amendment Report – Submissions Report</i> (December 2020); 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
	(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.	

CoA No.	Condition Requirements	Document Reference
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.	No applicable to M12 Central Package
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.	No applicable to M12 Central Package
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
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

CoA No.	Condition Requirements	Document Reference
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
	(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.	
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 Section 6.13
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 6.11

CoA No.	Condition Requirements	Document Reference
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 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></p>	Section 6.5
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	<p>The Proponent must consult DPI Fisheries and EES during the detailed design of the watercourse crossings. The consultation must include:</p> <ul style="list-style-type: none"> (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

Table A2: Secondary REMMs

ID	Measure/Requirement	Timing	Document Reference
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 B
	<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> <p>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>	The White-bellied Sea-eagle nest is located about 20 metres from the construction boundary. No pre-clearing measures are required.	Not applicable to M12 Central package
	<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	Section 6.1 Appendix B

ID	Measure/Requirement	Timing	Document Reference
B06	An unexpected threatened species finds procedure will be developed as part of the CFFMP and based on Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA, 2011) (Guide 1: Pre-clearing process).	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 3. Environmental Manager will arrange for an ecologist to conduct an assessment of significance of the likely impact, develop management options, and notify DPE, EHG, and DEECCW 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: <ol style="list-style-type: none"> a. Consult with DPE, EHG and DEECCW 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. 		Appendix D
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 B

ID	Measure/Requirement	Timing	Document Reference
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
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 G
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
	<ul style="list-style-type: none"> Clearly outline the objectives to be achieved 		Section 6.5 Appendix G (Section 1.4)

ID	Measure/Requirement	Timing	Document Reference
	<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 Section 6.10 Table 6-2, FF77
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 Table 6-2, FF44
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 Table 6-2, FF43

ID	Measure/Requirement	Timing	Document Reference
B18	<p>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.</p> <p>The application of mulch for permanent landscaping must be designed and planned to avoid material and tannin runoff.</p>	During construction	Section 6.5 Table 6-2, FF65
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	CEMP 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	CEMP 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 Table 6-2, FF28
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 Table 6-2, FF12
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 Appendix C
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

ID	Measure/Requirement	Timing	Document Reference
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	Detailed design Table 6-2, FF39
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	No applicable to M12 Central Package. Refer to CoA E8
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 B
LVIA15	A tree management strategy will be prepared for the project, outlining:	Detailed design and prior to construction	Section 6.11 Appendix J
	<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 		Appendix J, Section 2

ID	Measure/Requirement	Timing	Document Reference
	<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 		Appendix J, Section 3
	<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. 		Appendix J, Section 3.2
	<ul style="list-style-type: none"> Consideration of maintenance requirements and safety standards 		Appendix J, Section 2.5
	<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. 		Appendix J, Section 4
GG03	Vegetation removal will be minimised where practicable.	Detailed design and construction	Section 6.1 Appendix B

ID	Measure/Requirement	Timing	Document Reference
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

Table A3: TfNSW QA specifications

Specification	Measure/requirement	CFFMP Reference
G36 4.8	<p>Prepare and implement a Flora and Fauna Management Sub-Plan in consultation with DPIE (Environment, Energy and Science and Fisheries) as part of the CEMP to provide effective environmental controls to protect all native flora, fauna, and fish from the impact of your construction activities.</p> <p>The Flora and Fauna Management Sub-Plan must include, as a minimum, the following:</p>	Section 1.6
G36 4.8 (a)	Provisions for compliance with statutory requirements applicable to flora, fauna and fish management, in <i>National Parks and Wildlife Act 1974</i> (NSW), <i>Biodiversity Conservation Act 2016</i> (NSW), <i>Environmental Planning and Assessment Act 1979</i> (NSW), <i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cth), <i>Fisheries Management Act 1994</i> (NSW) and <i>Biosecurity Act 2015</i> (NSW).	Section 3.1.1 Appendix A1 of the CEMP
G36 4.8 (b)	<p>Fauna and flora management strategies for pre-construction, construction and post-construction activities including:</p> <ul style="list-style-type: none"> (i) environmental control measures for pre-clearing process; (ii) measures to avoid and minimise disturbance to native vegetation and habitat of native flora and fauna including aquatic and riparian habitat; and (iii) details of specific proposed management and mitigation measures for <i>Dilwynia tenuifolia</i>, <i>Pultenaea parviflora</i> (Sydney Bush-pea), Cumberland Plain Land Snail and Southern Myotis. 	Section 6.1 Appendix B
G36 4.8 (c)	<p>Fauna rescue and release procedure.</p> <p>Handling of injured fauna must be carried out by licensed fauna handler such as fauna ecologist, or wildlife carer. Twenty-four hours prior to clearing, licensed fauna handlers must capture and/or remove fauna that have the potential to be disturbed as a result of clearing. If native fauna are captured during vegetation clearing, they must be released into a predetermined suitable nearby location that has been identified as such by an ecologist and at a time of day appropriate for release of the species. Keep records of fauna captured and relocated.</p> <p>Report any injury or death of threatened species to the Principal. The fauna rescue and release procedure must include management measures for aquatic fauna and fish.</p> <p>Additional fauna management measures include:</p>	Section 6.8 Appendix C

Specification	Measure/requirement	CFFMP Reference
	<ul style="list-style-type: none"> (i) locations for fauna release would be in appropriate habitat determined prior to commencement of clearing/ dewatering of farm dams; and (ii) provision for temporary fencing to reduce potential for fauna mortality/injury, as required. 	
G36 4.8 (d)	<p>Procedure for controlling the introduction and spreading of weeds, diseases and pests (termed “biosecurity matter” under the Biosecurity Act 2015 (NSW)) caused by the Work Under the Contract, including hygiene protocols and the arrangements for monitoring including the following management measures:</p> <ul style="list-style-type: none"> (i) preparation of a Weed, Pest and Pathogen Management Sub-Plan including measures to minimise the spread of <i>Phytophthora cinnamomic</i> (refer TfNSW G40); (ii) all vehicles and footwear to be washed down before entering or exiting the Site. 	Section 6.6 Appendix E
G36 4.8 (e)	<p>Proposed strategies for re-use of coarse woody debris, logs, mulch, root balls and bushrock (refer also (n) below) including, but not limited to:</p> <ul style="list-style-type: none"> (i) preparation of a Habitat and Timber Reuse Disposal Plan (refer TfNSW G40) (ii) relocation instream of all large woody debris or snags existing in waterways; (iii) determining position and relocation areas based on advice from your Ecologist; and (iv) undertaking transport of wood debris and/or bushrock in a manner to minimise damage/ disturbance. 	Section 6.4 Appendix H
G36 4.8 (f)	<p>Procedure for dealing with unexpected threatened species finds that may be discovered by you when undertaking Physical Work on Site. The procedure must include, as a minimum, the following:</p> <ul style="list-style-type: none"> (i) stop work arrangements in the immediate area of the threatened species; (ii) notification and communication protocol; (iii) consultation with appropriate specialists to assess the significance of the find and development management options; (iv) a notification process for DPIE and DAWE; and (iv) a list of approvals, licences or permits that may need to be obtained before the works can recommence. 	Section 6.7 Appendix D

Specification	Measure/requirement	CFFMP Reference
G36 4.8 (g)	Updated sensitive aerial vegetation maps based on clearance surveys and previous survey work;	Section 6.1.1
G36 4.8 (h)	<p>Exclusion zones and fencing or other means to demarcate vegetation to be retained (endangered ecological communities) in close proximity to the WUC including:</p> <ul style="list-style-type: none"> (i) identifying exclusion zones on sensitive area mapping, mapped out by a qualified surveyor and flagged in accordance with flagging protocol in TfNSW G40; (ii) installing environmental protection area signage on exclusion zone fencing at regular intervals agreed to by the Principal; and (iii) only removing fencing following agreement by the Principal. 	<p>Section 6.3</p> <p>Table 6-2, FF12, FF13 and FF14</p> <p>Appendix B</p>
G36 4.8 (i)	Mechanism for the monitoring, review and amendment of this Sub-Plan;	Section 8
G36 4.8 (j)	<p>Work in accordance with the Guidelines for Controlled Activities on Waterfront Land – Riparian Corridors (NRAR, 2018), Guidelines for instream works on waterfront land (DPI, 2012), Controlled activities on waterfront land – Guidelines for watercourse crossings on waterfront land (NSW Office of Water, 2012) and Policy and Guidelines for Fish Habitat and Conservation and Management (DPI Fisheries, 2013). The Flora and Fauna Management Plan must include details of:</p> <ul style="list-style-type: none"> (i) riparian corridor widths along the watercourses in proximity to the WUC (so that these areas can be avoided where possible); (ii) riparian areas potentially impacted, either temporarily or permanently, by the WUC; and (iii) rehabilitation and revegetation of riparian areas temporarily impacted within three months of completion of waterway work, bridge work and other construction work required in the riparian corridor. 	Section 6.5
G36 4.8 (k)	<p>Management of aquatic habitat including key fish habitat in accordance with Guide 10 of the Biodiversity Guidelines and Section 3.3.2 of the Policy and Guidelines for Fish Habitat Conservation and Management Update (Department of Primary Industries, 2013) including:</p> <ul style="list-style-type: none"> (i) timing of clearing to avoid flooding risks; (ii) retaining of tree roots or staged removal on the bank of a waterway in order to maintain bank stability; (iii) progressive removal of flow diversion barriers and sediment control; 	Section 6.5.1

Specification	Measure/requirement	CFFMP Reference
	(iv) progressive stabilisation of banks; (v) avoidance of activities in aquatic habitats and riparian zones as much as practicable; (vi) establishment of exclusion zones for vehicles, plant and equipment, and provision of exclusion fencing around sensitive areas; (vii) keeping vehicles and machinery away from the banks of a waterway where possible; (viii) preventing refuelling of vehicles and plant, and chemical storage and decanting within 50 m of aquatic habitats; (ix) 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;	
	(x) procedures for the dewatering of farm dams and relocation of aquatic habitat in accordance with Clause 4.8(c); and	Appendix H
	(xi) Preparation of a Snag Management Plan.	Appendix G
G36 4.8 (l)	Preparation of a Habitat Compensation Plan (for nest box/bored tree hollows) in consultation with the Principal and the relevant stakeholders;	Section 6.2 Appendix F
G36 4.8 (m)	Procedures for undertaking pre-clearing surveys for native fauna, including surveys by suitably qualified and experienced ecologist to determine the presence of native fauna and procedures to manage relocation. Include pre-clearing measures for Cumberland Plain Land Snail and Eastern Long neck turtles in identified habitat areas by an appropriately qualified Ecologist;	Section 6.1 Appendix B
G36 4.8 (n)	Prepare and implement a Reuse Strategy including: (i) consideration of the use of hollows, root balls, bushrock, mulch, firewood, logs for habitat relocation on and off Site; and (ii) an expression of interest process with relevant local councils, Western Sydney Park Lands Trust, landcare groups, Local Government community groups and relevant Government agencies for the supply of root balls, mulch, bushrock, logs prior to clearing commencement;	Section 6.4

Specification	Measure/requirement	CFFMP Reference
G36 4.8 (o)	Process to ensure all requirements of Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (NSW Roads and Traffic Authority, 2011) are met;	This Plan
G36 4.8 (p)	Undertake fauna mortality video surveys on project haulage roads (public and internal) and maintain a native fauna mortality register. Prepare a methodology for carrying out the native fauna mortality video surveys on project haulage roads (public and internal). Prepare the survey methodology in consultation with the Principal and implemented throughout Construction. Carry out surveys regularly including after rainfall events, as well as during and following high risk activities such as vegetation clearing and dam dewatering. Record results of the surveys in a native fauna mortality register and use to inform adaptive management strategies where practicable to reduce the incidence of native fauna mortality in proximity to the Works Under the Contract. Provide the results for the native fauna mortality register to the Principal with the Monthly Reports.	Section 6.9 Appendix I
G36 4.8	<p>Prepare and include an EWMS, for clearing and grubbing that meets the requirements of Specification TfNSW G40 and TfNSW publication “Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects”, in the Flora and Fauna Management Sub-Plan or CEMP.</p> <p>Refer to, and comply with, the TfNSW Biodiversity Guidelines and be consistent with the OCEMP when preparing the Flora and Fauna Management Sub-Plan.</p> <p>Preserve existing trees, plants, and other vegetation that are to remain within or adjacent to the Site and use every precaution necessary to prevent damage or injury thereto. Identify and protect areas of vegetation to be retained showing them as exclusion zones in accordance with the TfNSW Biodiversity Guidelines.</p>	Section 6.1 Appendix B CEMP Section 3.3.3 EWMS
G38 2.1.2 (j)	<p>A stream (where relevant) and farm dam dewatering plan (the plan must be reviewed and endorsed by your experienced and qualified Ecologist) to be prepared include:</p> <ul style="list-style-type: none"> (i) a map showing locations of farm dams to be dewatered; (ii) a Fisheries Permit (where determined by the Ecologist) and animal care and ethics requirements; (iii) methodology for dewatering dams with consideration to aquatic ecology including the capture, storage, relocation, release of fish and other aquatic fauna including turtles; (iv) euthanasiation procedure; (v) location of any offsite discharge points; 	Section 6.5 Appendix H

Specification	Measure/requirement	CFFMP Reference
	<p>(vi) requirements to manage encounters of contaminated water;</p> <p>(vii) contact details of your Ecologist who will oversee the dewatering of farm dams and undertake any required relocation or euthanasia;</p> <p>(viii) details of identified fauna relocation sites, including permission from private landowners if the relocation site is on private land; and</p> <p>(ix) mitigation measure to prevent fauna being hit by vehicles when dewatering dams adjacent to roads.</p>	
G38 3.4.2	<p>Prepare a procedure for all identified dewatering activities as part of the SWMP or ESCP. Further guidance for the preparation of a dewatering procedure is provided in TfNSW Technical Guideline EMS-TG-011: Environmental Management of Construction Site Dewatering.</p> <p>This procedure must be approved by your ESR and include:</p> <p>(ix) Measures to prevent potential release and potential disposal of exotic aquatic fauna/ flora and pathogens during dewatering into waterbodies;</p> <p>(xi) EPA, Fisheries and Water Management Permits (as applicable) and their requirements with respect to site dewatering;</p> <p>(xiii) Animal care and ethics requirements including reference to procedures for fauna (including fish and turtle) capture, storage, relocation, and release (if required) through the use of a suitably qualified Ecologist (See G36 clause 4.8);</p>	Section 6.5 Appendix H
G40 2.1	<p>Unless shown otherwise on the Drawings, the area to be cleared for the formation is that which will be occupied by the completed formation plus a clearance of 4 m beyond tops of cuts and toes of embankments where the natural fall of the ground is towards the roadway and 2 m beyond the tops of cuts and toes of embankments where the natural fall of the ground either slopes away from the roadway or is level.</p> <p>Also clear areas that will be occupied by ancillary earth features shown on the Drawings, including sediment basins and traps, open drains and diversion banks.</p>	Section 6.1 Appendix B
G40 2.2	<p>Any area outside the area to be cleared for the formation as defined in Clause 2.1 and which the Principal has approved as a site for the Contractor's facilities, the Principal's accommodation, stockpiles, borrow pits, areas for landscape planting where required outside the formation and up to the construction boundary or any other purpose connected with</p>	Section 6.1 Appendix B

Specification	Measure/requirement	CFFMP Reference
	<p>the contract must be cleared to the extent required for the approved purpose. The area cleared must be the minimum consistent with the intended use.</p> <p>Clear also for utilities adjustment or construction where not already cleared for other reasons, outside of the formation (including for areas required for construction of the access tracks). Confirm the extents of these areas to be cleared after a walk-through of the Site with the Principal.</p> <p>Do not undertake clearing in identified exclusion zones.</p> <p>Do not undertake clearing in identified environmentally sensitive areas or identified areas of retained vegetation without the approval of the Principal.</p> <p>Do not undertake clearing in aquatic habitat, riparian vegetation or Endangered Ecological Communities (as defined by TfNSW G36) beyond the area as defined in Clause 2.1. No other construction activity, including parking of machinery during periods of inactivity, is permitted beyond the area as defined in Clause 2.1. Aquatic habitat must be protected in accordance with Guide 10: Aquatic habitats and riparian zones of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (NSW Roads and Traffic Authority 2011) and Section 3.3.2 Standard precautions and mitigation measures of the Policy and guidelines for fish habitat conservation and management Update 2013 (Department of Primary Industries 2013).</p> <p>All trees, stumps and logs of the sizes listed below which are outside the area to be cleared for the formation as defined in Clause 2.1 but which are considered by the Principal to be a potential traffic within the hazard line shown on the Drawings must be pruned or removed with a minimum of disturbance to adjacent trees and other vegetation. The sizes of the trees, stumps and logs that must be removed are shown in Table G40.1.</p>	

Specification	Measure/requirement	CFFMP Reference
G40 2.3	<p>At bridges, all trees and stumps and all built structures must be removed within the area specified in Annexure G40/A except:</p> <ul style="list-style-type: none"> (a) where shown otherwise on the Drawings; or (b) marked to be preserved; or (c) within 5 m of the bank of any stream or other waterway. <p>Trees outside this area but having branches overhanging the bridge must have their branches lopped to be 3 metres clear of the bridge.</p> <p>Trees within 10 m of the centreline of the bridge and within 5 metres of the bank of any stream or other waterway must be cleanly cut off between 300 mm and 600 mm above the adjacent ground level so that stable vegetation is retained on the banks. This work must be undertaken in consultation with the Principal.</p>	Section 6.1 Appendix B
G40 2.4.1	<p>Prior to undertaking any clearing, prepare a Site specific Clearing and Grubbing Plan incorporating a Clearing and Grubbing Environmental Work Method Statement (EWMS) to cover the environmental management of works under this Specification (see Annexure G40/D and TfNSW G36 Clause 3.2.4). Include in your Clearing and Grubbing EWMS all the controls required by the Flora and Fauna Management Sub-Plan, Cultural Heritage Management Sub-Plan, Construction Noise Management Sub-Plan, Construction Vibration Management Sub-Plan and the Soil and Water Management Sub-Plan for the WUC. Outline in the EWMS how you will progressively maintain the clearing limits and ensure that no person, plant, equipment or material goes beyond these limits.</p>	CEMP Section 3.3.3 EWMS Section 7.4
	<p>Also provide a report prepared in consultation with your Ecologist (to be incorporated into the CEMP) which:</p> <ul style="list-style-type: none"> (a) includes a statement from an your Ecologist that identifies the species and location of any weeds growing anywhere in the road reserve project (construction and operational) boundary over the length to be cleared and grubbed and acceptable weed control treatments at this Site. Refer to Clause 6 for further Weed Management requirements; (b) includes a detailed sensitive area map (not just extracted from details included in the Environmental Assessment Documentation – refer to TfNSW G36) clearly showing vegetation boundaries, and exclusion/vno-go zones/ identified areas of retained vegetation, identifies all locations of threatened flora species, Aboriginal heritage areas, non-Aboriginal heritage areas and trees which have been marked or otherwise identified through your own site investigations as well as extracted from details included in the Environmental Assessment Documentation for preservation; and 	

Specification	Measure/requirement	CFFMP Reference
	<p>(c) lists any trees identified by your suitably qualified arborist outside the limits of clearing which are unsound and likely to fall upon the roadway or onto private property.; and</p> <p>(d) incorporates the planning measures identified in Annexure G40/D.</p>	
G40 2.4.1 continued	Plan and carry out all operations to ensure that there is no damage to any trees outside the limits of clearing specified.	Section 6.3 Appendix B
	Trees nominated in (c) above must be marked and identified in the clearing and grubbing plan in a manner which allows them to be identified as one of the listed trees and whether pruning or removal is recommended. Areas of weed infestation identified in the ecologist report (Clause 2.4 (a) must be marked).	Appendix B
	<p>Plan the clearing of habitat trees in accordance with RMS Biodiversity Guidelines: Guide 4 Clearing of vegetation and removal of bush rock to allow for a two-stage clearing process. You are also required to plan for clearing of Myotis Macropus (Southern Myotis) habitat (as identified in the Environmental Assessment Documents) in accordance with the overarching Flora and Fauna Management Sub-Plan. Requirements may include but not be limited to:</p> <p>(a) Undertaking an Anabat survey at dusk 24 hours prior to removal;</p> <p>(b) Physical inspection of roosts by your ecologist;</p> <p>(c) Scheduling of habitat clearing or relocation outside of Winter months (torpor) and breeding season (Oct-Jan); and</p> <p>(d) Clearing of habitat trees at night after Myotis Macropus have left identified roosts.</p>	Appendix B
G40 2.4.2	Before commencing clearing and grubbing all soil erosion and sedimentation controls required for this phase of construction must be installed in accordance with TfNSW G38.	CSWMP
	All staff must be made aware of the Noxious Weeds present on-site and requirements related to the listing under the Noxious Weeds Act 1993, Biosecurity Act 2015.	Section 7.2

Specification	Measure/requirement	CFFMP Reference
	At least five working days prior to the proposed commencement of clearing, clearly delineate limits on Site. Delineate clearing limits, environmentally sensitive areas, habitat trees and other no-go zones using signage and highly visible continuous barrier or tape consistent with the flagging guide in Annexure G40/E. Clearing boundary survey pegs must be numbered as outlined in Annexure G40/E. Ensure there is no direct disturbance occurring in these areas, including vehicle access, stockpiling or vegetation clearing. Inform all personnel working in the project area what exclusion zones are and where they occur at Site inductions and toolbox talks.	Appendix B
	Weeds must be removed and disposed of in accordance with the requirements of Clause 6.	Table 6-2, FF35
G40 2.4.2 continued	Your Ecologist must undertake a pre-clearing survey (among other requirements throughout the Contract) to identify and mark any habitat trees (i.e. hollow bearing trees and other trees occupied by fauna), that have not already been tagged, within the clearing footprint and advise on the presence of any fauna. Refer to TfNSW G36 Clause 4.8.	Appendix B
	Facilitate access for the Principal's seed collection contractor, Toolijooa, to enable them to undertake a final seed/ plant material collection during your pre-clearing surveys.	Section 6.13 Table 6-2, FF78
	Prior to undertaking your pre-clearing survey, prepare a pre-clearing survey procedure. The pre-clearing survey procedure must describe the survey methodology and targeted species. Target species must include as a minimum target species identified in the Principal's own biodiversity assessments (known and potential) as included in the following Table G40.2:	Appendix B
	Mark, and remove habitat trees within areas to be cleared in accordance with the RMS Biodiversity Guidelines: Guide 4 Clearing of vegetation and removal of bush rock.	Appendix B
	Keep records of all fauna rescue events, including locations to where fauna have been relocated.	Section 6.8 Appendix C
	Keep records of the number of trees cleared in a register and provide your records to the Principal with the project Monthly Report. For the purposes of this requirement, a tree has a trunk diameter 300 mm or more at a point 1.5 m above the adjacent ground level and/ or a height of 3 metres or more.	Section 6.11 Section 7.6

Specification	Measure/requirement	CFFMP Reference
	<p>Take protective measures during the operations of clearing and road construction to avoid damaging or destroying threatened flora species and trees which have been marked or otherwise identified for preservation. These measures must include but not be limited to:</p> <ul style="list-style-type: none"> (i) fencing around trees clear of the canopy line and adjacent environmentally sensitive and heritage areas; (ii) ensuring no materials are stockpiled and no vehicles are parked or operated under the canopy; (iii) avoiding excavation or the placing of fill near any tree without advice from an ecologist; and (iv) routing haul roads and access tracks clear of the canopy; and (v) marking of trees for directional felling to avoid damage to environmentally protected areas and exclusion zones. 	Section 6.3
G40 2.4.2 continued	If any tree, which must be preserved, is found to be within the area to be covered by embankment, protective measures for the tree and safety barriers of a type not specifically shown on the Drawings will be directed as a Variation to the Contract.	Section 6.11 Appendix J
	Undertake an arboricultural assessment for existing trees within the road reserve that are to be retained to identify techniques which can be applied to maximise the trees health and longevity.	Section 6.11 Table 6-2, FF22
	<p>Those trees remaining within the road reserve, but outside the limits of clearing, which the Principal has agreed to be unsound and are likely to fall upon the roadway or onto private property, must be cleared or pruned in accordance with AS 4373.</p> <p>Any branch, which overhangs the road formation, must be cut back flush with the tree trunk in accordance with AS 4373.</p> <p>Every precaution must be taken to prevent timber from falling on private property and dispose of any timber so fallen or produce written consent of the owner to its remaining there.</p> <p>Existing trees, grasses and other ground cover must be retained within 15 m of rivers, creeks and watercourses and in all drainage lines until immediately before construction commences in the area. An access track may be constructed across these areas on an alignment that will minimise erosion. Notwithstanding the retention of the ground cover, soil erosion and sedimentation controls for the area must be installed in accordance with TfNSW G38. All trees in these areas must be felled manually, leaving grasses and small understorey species wherever possible.</p>	Section 6.11 Appendix J

Specification	Measure/requirement	CFFMP Reference
G40 2.4.2 continued	<p>Protect the WUC during clearing operations and select your plant / equipment to ensure that constant tracking of the underlying ground does not turn the existing ground into unsuitable material.</p> <p>Damage of any kind, including destruction of the existing ground or other asset, such as utilities, damage to fencing or trees or other vegetation outside the limits of clearing, which occurs during clearing operations, must be made good by you at your expense.</p> <p>Raise a non-conformance and an environmental incident report (refer to TfNSW G36) if the exclusion fencing fails to prevent access or damage to protected areas. Immediately notify the Principal and Environmental Representative of such non-conformance.</p> <p>Holes left following the removal of trees and stumps must be backfilled and vegetated as described in Clause 3.</p>	Section 6.11 Appendix J
G40 2.6	<p>Provide the Principal progressive Clearing Reports providing a summary of the results of surveys, fauna rescues, fauna injury and mortality, at weekly intervals during clearing activities.</p> <p>Update and provide this report to the Principal progressively, by close of business Thursday each week and include:</p> <ul style="list-style-type: none"> (a) the name and qualifications of the Ecologist or wildlife carer present during clearing; (b) an assessment of the habitat and handling of fauna; (c) information on clearing operations, dates, procedures, areas; (d) live animal sightings, captures, any releases (including details on where the fauna was released) or injured/shocked wildlife; (e) any dead animals located; and, (f) photographs of rescued fauna. <p>Provide to the Principal a Post-Completion Clearing Report within 20 working days from the completion of substantial clearing (as determined by the Principal) providing a final summary of the progressive Clearing Reports. Include survey and mapping (including GIS files) of the actual cleared area compared to the final construction footprint and a calculation of any retained vegetation in the final Post-Completion Clearing Report.</p>	Section 7.6
G40 3.1	Remove any rubbish on the Site at the start of Work Under the Contract. The cost of initial waste removal is included in TfNSW G40P1.	Appendix B

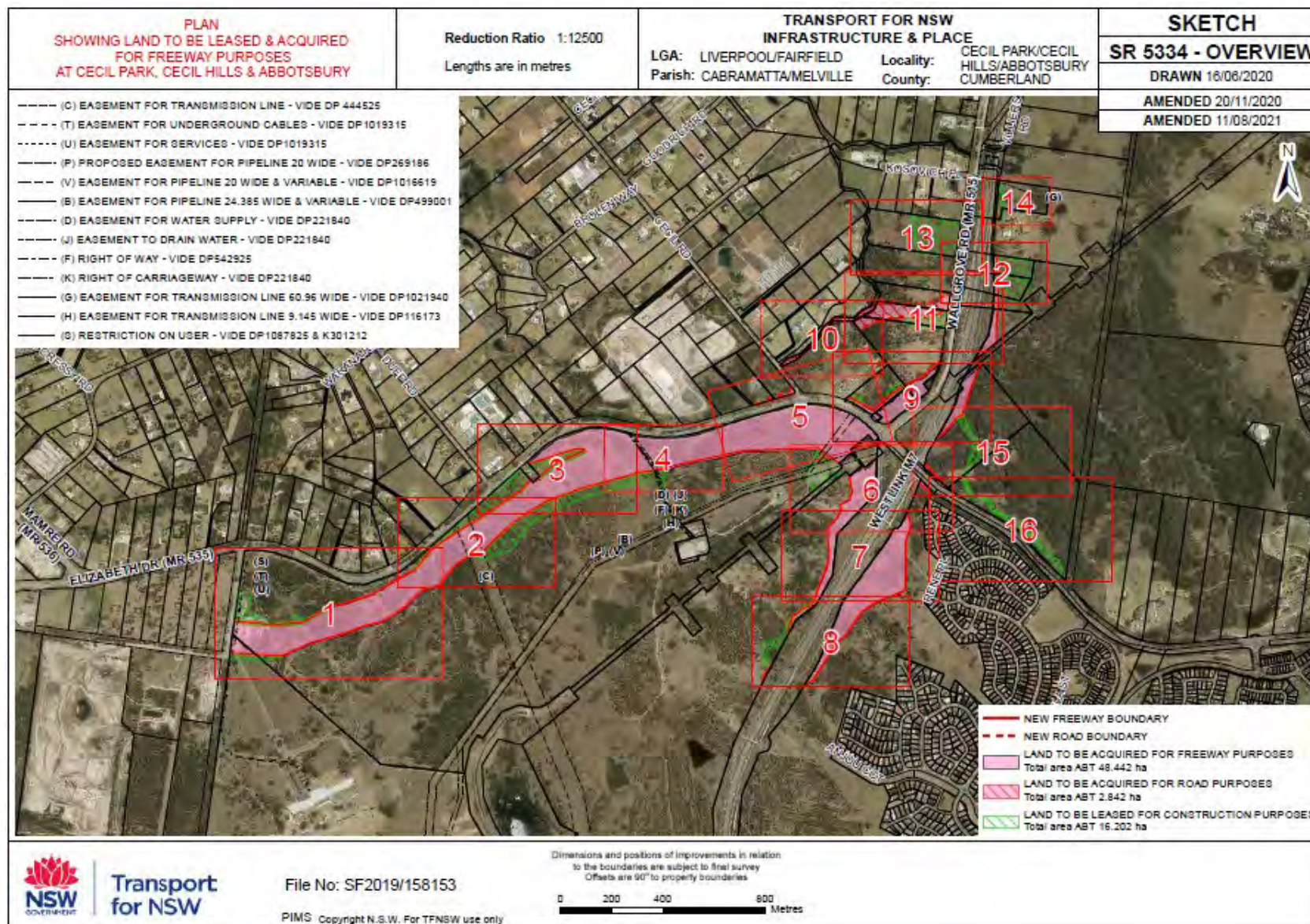
Specification	Measure/requirement	CFFMP Reference
	<p>Additionally, as part of this initial rubbish removal, remove any rubbish within 500mm of existing surface levels on, or within, the limits of clearing defined in Clauses 2.1, 2.2 and 2.3 whenever you undertake topsoil stripping.</p> <p>The cost of this further rubbish removal is also included in TfNSW G40P1.</p> <p>The extra over cost for initial removal/ treatment of asbestos materials will be paid under Pay Item R44P9.</p> <p>Refer to TfNSW G2-C2 Clause 18 for removal of subsequent material dumped on the Site.</p>	
G40 3.2	<p>All trees and stumps, on or within the limits of clearing defined in Clauses 2.1, 2.2 and 2.3, and which are unable to be felled and removed by the clearing methods used by you, must be removed by grubbing.</p> <p>Grubbing operations must be carried out both to a depth of 0.5 m below the natural surface and 1.5 m below the top of the Selected Material Zone.</p> <p>Holes remaining after trees and stumps have been grubbed or rubbish removed must be backfilled promptly with sound material to prevent the infiltration and ponding of water. The backfilling material must be compacted to at least the relative compaction of the material existing in the adjacent ground. Ensure backfill material and compaction complies with the requirements of TfNSW R44 when it forms part of an engineered embankment or foundation. In the area defined in Clause 2.2, the final 50 mm of backfilling must be topsoil and the area must be vegetated within 7 days of removal of stump. Topsoil and vegetation must comply with Specification TfNSW R178.</p>	Appendix B
G40 5	<p>Unless otherwise specified, all materials cleared, pruned, demolished, cleaned, removed and grubbed in accordance with this Specification shall become your property and must be removed from the site for recycling or disposal at suitable lawful locations. Disposal must be in accordance with your Waste and Resources Management Sub-Plan (see TfNSW G36) and recorded on the waste register.</p> <p>Disposal of timber and other combustible materials by burning is not permitted.</p>	CWRMP
	<p>Unless otherwise agreed with the Principal, relocate fauna microhabitat such as hollows, dead wood, dead trees, fallen logs and cleared tree trunks greater than 200mm diameter in adjacent vegetated areas outside roadway clear zones within the operational footprint (as agreed with the Principal), for use in conjunction with soil erosion and sediment control measures within the vegetation community of origin and in a manner sympathetic to the requirements of native fauna.</p>	Appendix F

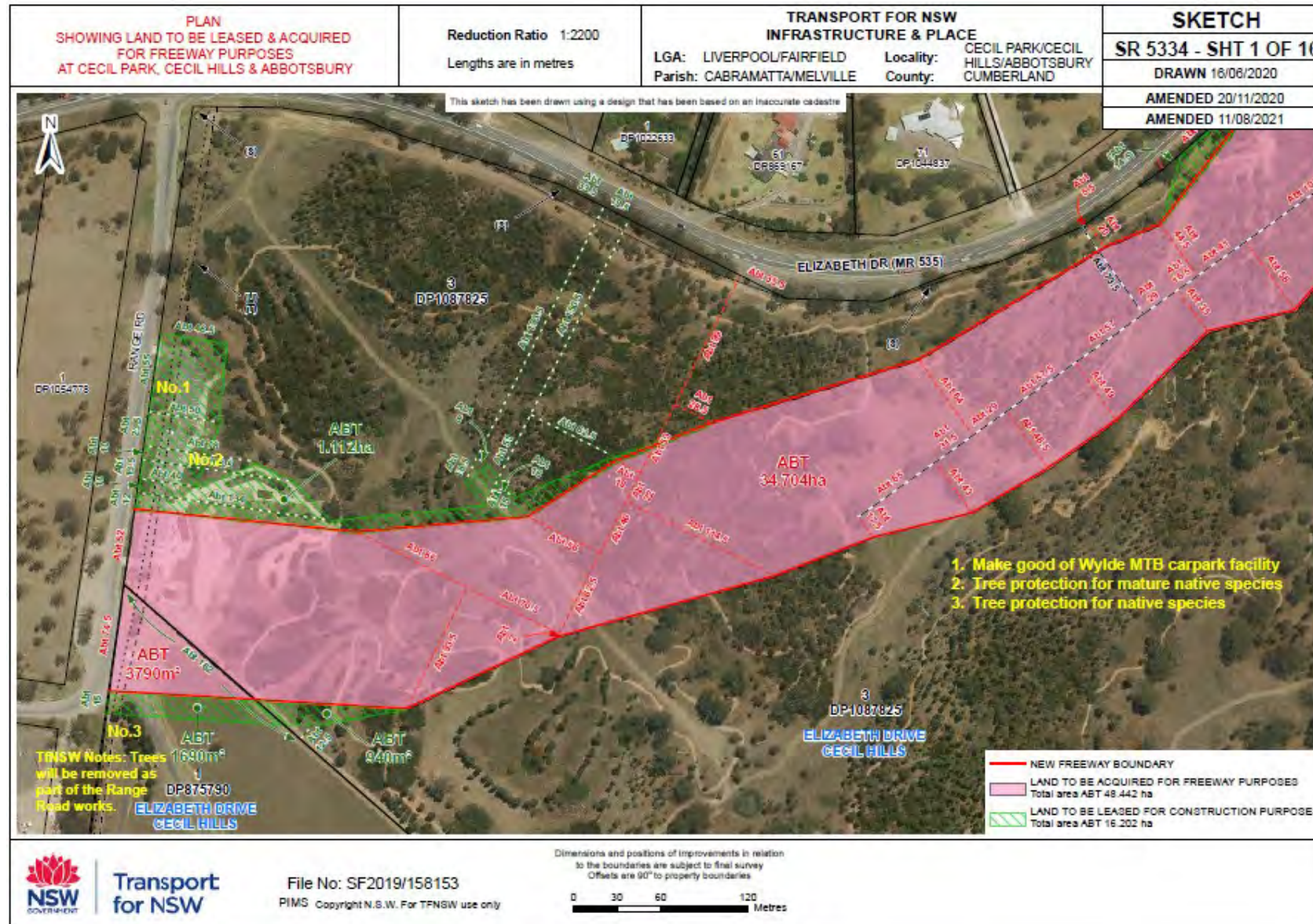
Specification	Measure/requirement	CFFMP Reference
G40 5	<p>Liaise with relevant local councils, landcare groups, relevant Government Agencies and Western Sydney Parklands Trust to maximise the reuse of remaining logs, habitat features, mulch, root balls and bush rock off the Site. Prepare a Habitat and Timber Reuse Disposal Plan detailing the possible reuse and/or disposal options and the benefits of these options to the Principal. Include the Habitat and Timber Reuse Disposal Plan in the CEMP.</p> <p>The Principal will consider your Habitat and Timber Reuse Disposal Plan, and may direct you to undertake this work, or to direct you to reuse remaining logs, habitat features, mulch, root balls and bush rock on-Site. Where the Principal directs you to reuse remaining logs, habitat features, mulch, root balls and bush rock on-Site the costs are included in Pay Item G40P1. Where the Principal directs you to reuse remaining logs, habitat features, mulch, root balls and bush rock off-Site the Principal will pay you for the extra over cost for the transport and offloading only under Pay Item G40P4.</p> <p>Convert any remaining native vegetation into mulch and stockpile and reuse on Site, in accordance with Clause 4.</p>	Appendix F
G40 6.1	<p>Prepare a Weed, Pest and Pathogen Management Plan in accordance with TfNSW Biodiversity Guidelines: Guide 6 (to be incorporated into the CEMP). The Weed, Pest and Pathogen Management Plan must include, but not be limited to, the following information:</p> <ul style="list-style-type: none"> (a) Identification of the weeds on Site (confirm during Ecologist pre-clearing inspection); (b) Identification of relevant pathogens that may be harmful to native biota; (c) Weed management priorities and objectives; (d) Sensitive environmental areas within or adjacent to the site; (e) Location of weed infested areas; (f) Weed and pathogen control methods; (g) Measures to prevent the spread of weeds and pathogens, including machinery hygiene procedures and disposal requirements, in accordance with the relevant weed's Acts, National Trust Weed Management Manual, the Introductory Weed Management Manual published by CRC Australian Weed Management 2004 and TfNSW Biodiversity Guidelines; and, (h) A monitoring program to measure the success of weed management. 	Appendix E
	<p>Include in the Weed, Pest and Pathogen Management Plan pre-clearing, during construction and post construction (to Contract Completion) weed control activities to control the spread of weeds and to reduce the levels of weed infestation</p>	Appendix E

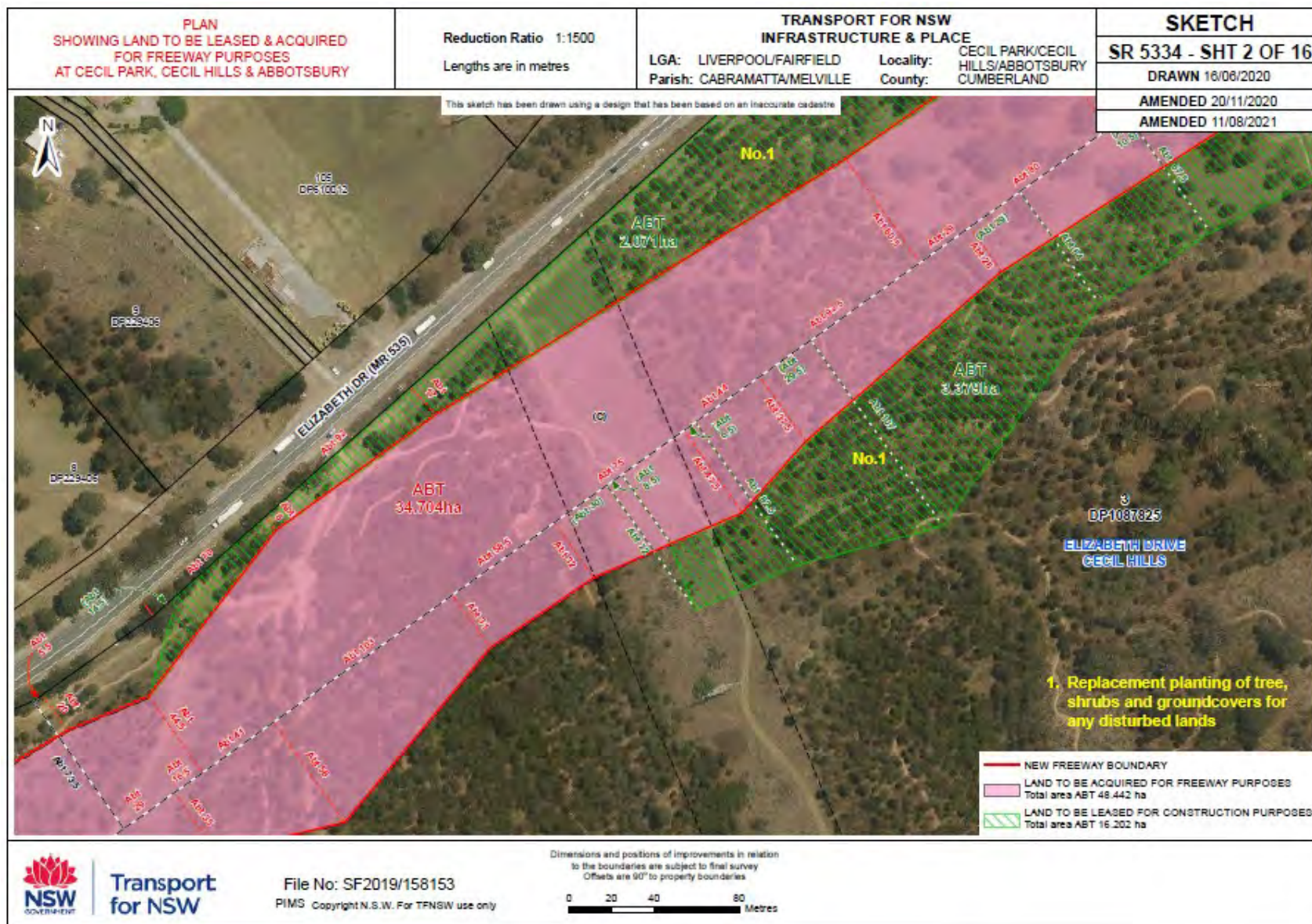
Specification	Measure/requirement	CFFMP Reference
G40 6.1 continued	within the construction corridor and adjoining areas. Also include measures to improve the quality of habitat in retained vegetation.	
	Also include in the Weed, Pest and Pathogen Management Plan a weed monitoring program through which the success of weed control is assessed and techniques modified where necessary, and measures to improve the quality of habitat in retained vegetation. The monitoring program must include Site visits, mapping and fixed point photographs of the construction corridor and adjoining impacted areas.	
G40/D	Provide a Clearing and Grubbing Plan including the EWMS which must include, but not be limited to, the following information:...{truncated}	Appendix B, Section 2.1.1

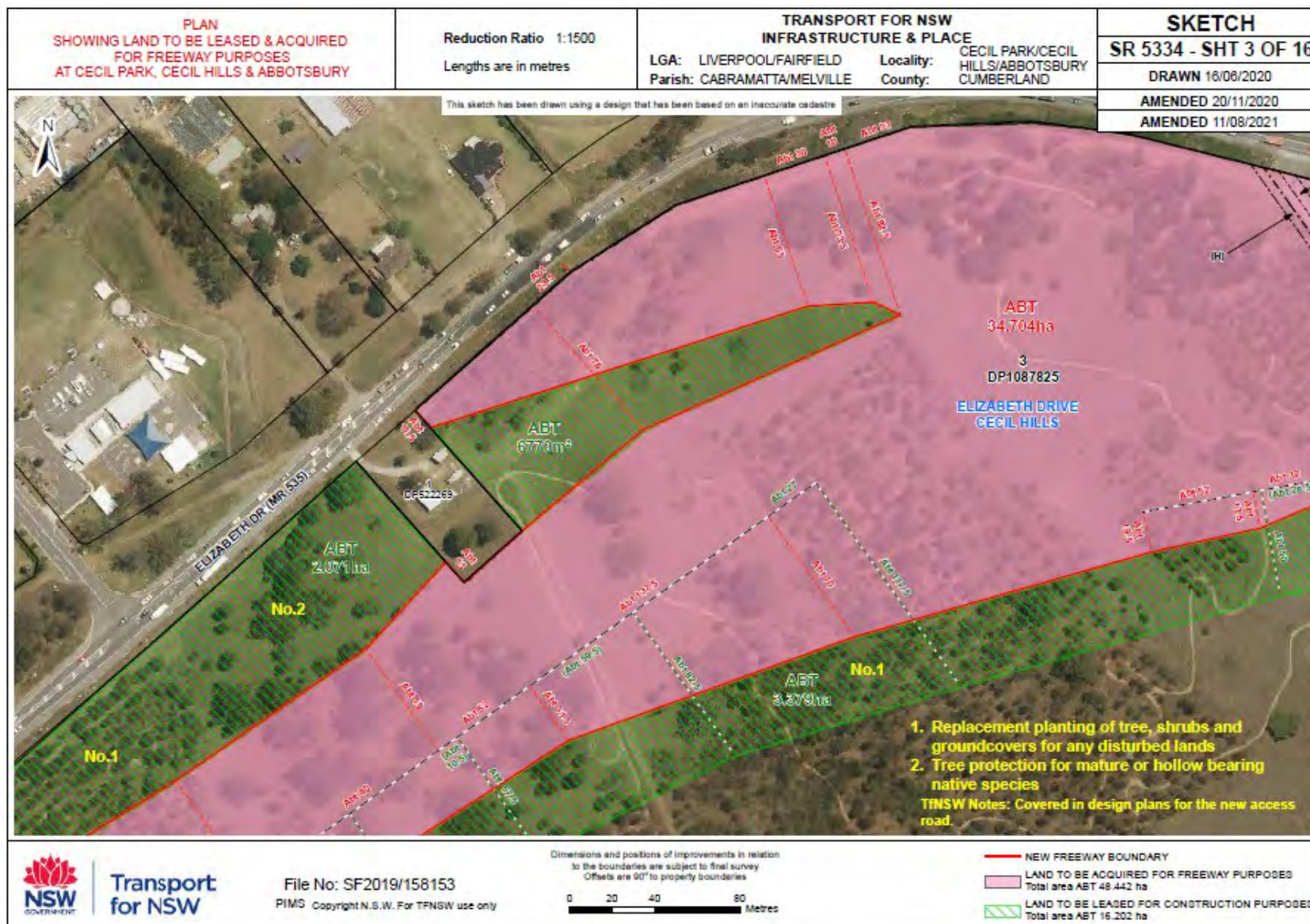
Table A4: Western Sydney Parkland Trust Usage Restrictions and Make Good Schedule relevant to this Plan

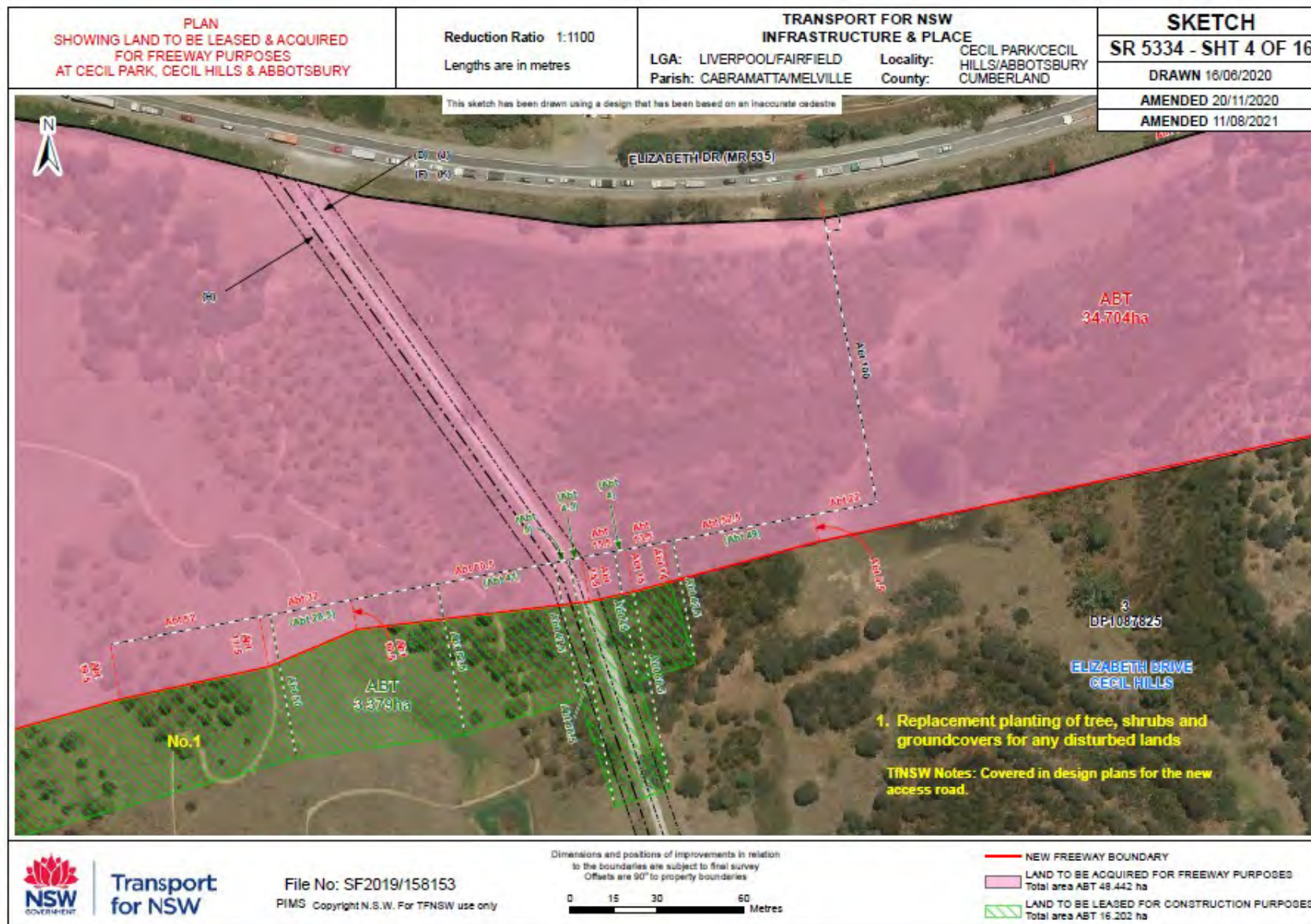
Sketch / Sheet	Lot / DP	Item#	Agreed Work Requirement	CFFMP Reference
5334 - 1 of 16	Lot 3 DP1272682 (3/1087825)	2	Tree protection for mature native species - standard TPZ regarding compression, drip lines and structural root zones	Section 3.7 Table 6-2, FF81 Appendix K Nominated area is included in Vegetation Saving Area
5334 - 2 of 16	Lot 3 DP1272682 (3/1087825)	1	Replacement planting of tree, shrubs and groundcovers for any disturbed lands are covered in design plans for the new access road. 12CDD-GHDA-UAR-LA-DRG-617602	Table 6-2, FF80
5334 - 3 of 16	Lot 3 DP1272682 (3/1087825)	1	Replacement planting of tree, shrubs and groundcovers for any disturbed lands are covered in design plans for the new access road. 12CDD-GHDA-UAR-LA-DRG-617602	Table 6-2, FF80
5334 - 3 of 16	Lot 3 DP1272682 (3/1087825)	2	Tree protection for mature or hollow bearing native species - standard TPZ regarding compression, drip lines and structural root zones - where possible	Section 3.7 Table 6-2, FF81 Appendix K Nominated area is included in Vegetation Saving Area
5334 - 4 of 16	Lot 3 DP1272682 (3/1087825)	1	Replacement planting of tree, shrubs and groundcovers for any disturbed lands are covered in design plans for the new access road. 12CDD-GHDA-UAR-LA-DRG-617602	Table 6-2, FF80













Appendix B – Vegetation Clearing Procedure

Appendix B

Construction Flora and Fauna Management Sub-plan

Vegetation Clearing Procedure

M12 Motorway – Central





January 2025

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Document control

File Name	
Title	M12 Central CEMP: Appendix B3 Construction Flora and Fauna Management Sub-plan Appendix B - Vegetation Clearing Procedure

Approval and authorisation

Plan reviewed by:	Plan endorsed by:
	
Seymour Whyte Environmental Site Representative	Seymour Whyte Project Manager
18/01/2025	18/01/2025
	

Revision history

Revision	Date	Description
A	18/02/2022	First draft for TfNSW review
B	29/04/2022	Internal review
C	29/06/2022	Updated in response to TfNSW review
D	27/07/2022	Updated in response to TfNSW and ER review
E	18/07/2023	Updated in response to OCEMP review
F	18/01/2025	Updated in response to OCEMP review

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Glossary/ Abbreviations

Abbreviations	Expanded text
AR	Amendment Report
Areas of vegetation to be retained	These areas present potential opportunities for the Construction Contractor to avoid and minimise potential vegetation impacts if possible. As vegetation impacts may occur during construction, these impacts have been considered in biodiversity off-set calculations.
ARSR	Amendment Report Submissions Report
BC Act	<i>Biodiversity Conservation Act 2016</i>
CA	Consistency Assessment
CEEC	Critically Endangered Ecological Community
CFFMP	Construction Flora and Fauna Management Plan
CoA	Conditions of Approval
DAWE	Former Commonwealth Department of Agriculture, Water and the Environment (now Commonwealth Department of Climate Change, Energy, Environment and Water (DCCEEW))
DBH	Diameter at Breast Height
DPE	Former Department of Planning and Environment
DPE	Former NSW Department of Planning and Environment (former Department of Planning, Industry and Environment (DPIE))
DPHI	NSW Department of Planning, Housing and Infrastructure (formerly NSW DPE which has now been split into NSW DCCEEW and NSW DPHI)
EAD	Environmental Assessment Documentation
EEC	Endangered Ecological Community
EES	Former Environment, Energy and Science group. (now EHG).
EHG	Environment and Heritage Group (part of DPE). Formerly EES.
Environmental Assessment Documentation	<p>The set of documents that comprise the Division 5.2 Approval:</p> <ul style="list-style-type: none"> Roads and Maritime Services (October, 2019) M12 Motorway, Environmental Impact Statement (EIS) Transport for NSW (October, 2020) M12 Motorway, Submissions Report (the Submissions Report) Transport for NSW (October, 2020) M12 Motorway, Amendment Report (AR) Transport for NSW (December, 2020) M12 Motorway, Amendment Report submissions report (ARSR)

Abbreviations	Expanded text
	<ul style="list-style-type: none"> • Transport for NSW (March, 2021) The M12 Motorway Amendment Report Submissions Report – Amendment (ARSR amendment) • WSP (October, 2021) M12 Motorway – West Package Detailed Design Consistency Assessment • GHD (October, 2021) M12 Motorway – Central Package Detailed Design Consistency Assessment • Arcadis (June, 2022) M12 Motorway – Sydney Water Crossings Consistency Assessment • Arcadis (July, 2022) M12 Motorway – Design Boundary Changes Consistency Assessment • Arcadis (August, 2022) M12 Motorway – Minor Change Consistency Assessment. • Arcadis (January, 2024) M12 Motorway – Minor Consistency Assessment M12 Central Water Tower Access Road <p>The documents that comprise the EPBC referral:</p> <ul style="list-style-type: none"> • Submission #3486 – The M12 Motorway Project between the M7 Motorway, Cecil Hills and The Northern Road, Luddenham, NSW • Notification of referral decision and designated proponent - controlled action; date of decision 19 October 2018; ID: 2018-8286.
EPBC Act	<i>Environmental Protection and Biodiversity Conservation Act 1999</i>
EPBC referral	A Proponent must refer a proposed action to the Australian Government Minister for the Environment (the Minister) for assessment, if it has, will have, or is likely to have a significant impact on the world heritage values of a declared World Heritage property, or is likely to have a significant impact on the National Heritage values of a National Heritage place.
ESM	TfNSW Environment and Sustainability Manager
ESR	Environmental Site Representative (Seymour Whyte)
EWMS	Environmental Work Method Statements
Exclusion zones	Exclusion zones are areas of environmental importance (e.g., threatened vegetation or heritage items) that need to be protected. These exclusion zones are defined as no-go areas and are to be protected for the duration of construction in that particular footprint area.
FM Act	<i>Fisheries Management Act 1994</i>
NSW DCCEEW	NSW Department of Climate Change, Energy, the Environment and Water (formerly NSW DPE which has now been split into NSW DCCEEW and NSW DPHI)
OCEMP	Overarching Construction Environmental Management Plan
Project, the	M12 Motorway Project
PCT	Plant Community Type

Abbreviations	Expanded text
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 Central package 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 M12 Central package 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 M12 Central package, and this Procedure. Training will include inductions, toolbox talks, pre-starts and targeted training as required.

All site personnel working in the M12 Central package 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 M12 Central package.

This Procedure forms part of the M12 Central package CEMP and has been prepared in accordance with the overarching Vegetation Clearing Procedure presented in the M12 Motorway Overarching Construction Flora and Fauna Management Plan.

1.4 Roles and Responsibilities

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

The following specialised roles are required for M12 Central package 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 also supervise vegetation clearing and capture and relocate fauna, as required in accordance with the Fauna rescue and release procedure (Appendix C to the CFFMP).

- 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 the Project Ecologist or, where threatened species are likely to be encountered, NSW Environment, Energy and Science (EES) and the Commonwealth Department of Climate Change, Energy, Environment and Water (DCCEEW) 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.

Updates of the procedure will be reviewed by the Project Ecologist and Transport for NSW (TfNSW) Environment and Sustainability Manager (ESM) (or delegate).

2 Pre-clearing survey methodology and targeted species

2.1.1 Habitat trees

The Project Ecologist will undertake a pre-clearing survey to identify and mark any habitat trees (i.e. hollow bearing trees and other trees occupied by fauna), that have not already been tagged, within the clearing footprint and advise on the presence of any fauna.

A ground-based observation hollow-bearing tree survey will be completed in accordance with the methods described in the Operation Manual for BioMetric 3.1 (DECCW, 2011) in that tree hollows will only recorded if the:

- Entrance can be seen from the ground
- Hollow appears to have depth
- Hollow is at least 1m above the ground (basal hollows were only recorded if they continued up into the tree above 1m).

For each hollow-bearing tree, the following data will be collected.

- Whether the tree is dead or alive
- The species of tree (if alive)
- Height and diameter at breast height (DBH)
- Approximate number of hollows and position in the tree (e.g. trunk, limb, basal or fissure, termitaria)
- Estimated size classes of hollows
 - Small <50 mm
 - Medium 50-150 mm
 - Large > 150 mm
- Evidence of occupancy including
 - animals utilising hollow (and if so what species)
 - evidence of scratching / chews around entrance
 - occupancy unconfirmed.

Trees with visible bird nests will also be recorded during the hollow-bearing tree survey particularly targeting White-bellied Sea-Eagle and Little Eagle. Other Threatened fauna species (refer to Section 2.1.6) will also be recorded during these surveys if observed.

The location of each hollow-bearing tree will be recorded with a hand-held GPS unit and assigned a unique identification number that indicates that the tree has been identified as part of M12 Central tree survey. A tag with the tree's identification number will also attached to each tree, if the tree does not already have one from the previous M12 Motorway tree surveys.

2.1.2 Threatened flora surveys

Table 2-1 provides a summary of the target Threatened flora species for the M12 Central package based on the species previously recorded within the M12 Central package, species previously recorded within the other M12 Motorway package areas and other target species potentially present based literature review for the EIS and subsequent targeted surveys completed during detailed design.

Table 2-1: Target flora species

Target species	Known presence within M12 Central	Known presence within M12 Motorway study area (outside construction footprint)	Potentially Present (based literature review for the EIS)
<i>Dillwynia tenuifolia</i>	X		
<i>Pultenaea parviflora</i>	X		
<i>Grevillea juniperina</i> subsp. <i>juniperina</i>		X	
<i>Marsdenia viridiflora</i> subsp. <i>viridiflora</i>		X	
<i>Pimelea spicata</i>		X	
<i>Acacia bynoeana</i>			X
<i>Acacia pubescens</i>			X
<i>Cynanchum elegans</i>			X
<i>Grevillea parviflora</i> subsp. <i>parviflora</i>			X
<i>Micromyrtus minutiflora</i>			X
<i>Persoonia nutans</i>			X
<i>Pultenaea pedunculata</i>			X

Targeted surveys for the target flora species will be completed in areas of suitable habitat using a random meander survey technique. As the name suggests, the random meander technique involves traversing areas of suitable habitat in no set pattern, but roughly back and forth, whilst searching for the target plant species.

Where target species have been previously recorded (*Dillwynia tenuifolia* and *Pultenaea parviflora*), general observations of presence absence will be made within during the pre-clearing survey, however detailed counts will not be completed.

In the event of an unexpected find of a threatened species, including *Dillwynia tenuifolia* or *Pultenaea parviflora* at a location not previously recorded for the project, a 10m spaced parallel transects will be searched around the location to confirm the extend. A detailed count of the number of individuals will also be completed. The parallel field traverse survey technique involves searching along a grid of parallel traverses a set distance apart, across areas of suitable habitat for each target threatened plant species. Traverses will be recorded on a global positioning system (GPS) and plotted on the Site Map in the Pre-clearing report. The Unexpected Threatened Species or EEC Finds Procedure will also be followed (Appendix D of the CFFMP).

If there is any uncertainty regarding identification of a threatened species, a voucher specimen should be collected and sent to the NSW Herbarium for confirmation.

2.1.3 Cumberland Plain Land Snail

Cumberland Plain Land Snail searches will be completed in areas of potential habitat (within all suitable Woodland and Riparian Forest fauna habitats) in accordance with the Cumberland Plain Land Snail (*Meridolum corneovirens* Pfeiffer, 1851) Environmental Impact Assessment Guidelines (NPWS, 2000).

The methodology involves active searches under logs and debris (including rubbish), amongst leaf and bark accumulations around the base of trees and within grass clumps. This may be completed in conjunction with targeted flora surveys outlined in Section 2.1.2). If Cumberland Plain Land Snail are detected, photographs of snails identified will be taken and representative empty shells of snails collected to allow for confirmation of identification if required.

2.1.4 Threatened microbats

Seven species of microbat were known to occur within the M12 Motorway study area including Southern Myotis. A further three species were considered potentially present based literature review for the EIS.

The targeted surveys for threatened bats will comprise roost searches and echolocation call recording. Roost searches involve looking for bats or signs of bats (urine stains, droppings, remains) in suitable habitat. Depending on the species this may be trees, caves or overhangs, old buildings and sheds or bridges and culverts. Roost searches should use a torch to shine in holes, cracks and crevices, and the surveyor will carry a handheld bat detector to locate (and identify) bats. Audible calls from microbats may also be heard when approaching. Small video cameras may also be used to investigate crevasses for roosting bats.

If threatened microbats are confirmed within hollow bearing trees, the clearing should be programmed for night when the individual(s) are not within the tree. If threatened microbats are confirmed to be roosting within structures, a bat exclusion procedure is to be developed in consultation with EHG prior to demolition.

If Southern Myotis is detected, refer to Section 4.2.2 for additional mitigation measures prior to clearing.

2.1.5 Green and Golden Bell Frog

Green and Golden Bell Frog was not detected on the M12 Motorway site during the EIS surveys, however was listed as potential to occur based on suitable habitat. Based on review of previous records of the species from the BioNet Atlas, and results of surveys from nearby infrastructure projects (Northern Road Upgrade, Western Sydney Airport and Sydney Metro Western Sydney Airport), the Green and Golden Bell Frog is likely to be locally extinct. As such, targeted searches for Green and Golden Bell Frog will be limited to diurnal searches for the species, along with other frogs, during pre-clearing surveys in areas of suitable habitat.

2.1.6 Other Threatened fauna

Koala, Grey-headed Flying-fox and a number of threatened species of bird were also considered potentially present based on the literature review for the EIS. Pre-clearing surveys for these species will involve diurnal searches of trees in the woodland and riparian habitat forest fauna habitats in conjunction with the habitat tree surveys.

2.1.7 Weeds and pathogens

Surveys for weeds and pathogens will be completed across the entire site using a random meander survey technique (described in Section 2.1.2). The meander will be recorded on a global positioning system (GPS) and plotted on the Site Map in the Pre-clearing report.

High threat weeds will be marked in the field with high visibility tape and plotted in the GIS and on the Site Map in the Pre-clearing report.

Signs of pathogens will also be recorded during these searches. This will include observations of dieback in Phytophthora indicator species such as Eucalypts, banksia, Grass trees (*Xanthorrhoea* spp.) and native peas. If dieback is observed, soil samples will be collected for laboratory sampling to confirm if Phytophthora is the cause.

Myrtle rust can be easily seen on affected plants. Generally myrtle rust starts as small purple spots on leaves. Bright yellow spores form in pustules within these purple spots. Pustules fade to dull yellow and then grey as the infection ages. In severe infections, spots enlarge and merge, often causing leaf distortion.

Any frogs that are captured for relocation will be assessed for Amphibian chytrid fungus disease. All species of frogs will be handled with washed single-use vinyl gloves. If gloves are not readily available, a single-use, lightweight plastic bag will suffice. Cleaning of hands and handling equipment should be carried out with a disinfectant.

Weeds and pathogens will be managed in accordance with the Weed, Pest and Pathogen Management Plan, CFFMP Appendix E.

2.1.8 Snags

In accordance with REMM B12 and the Snag Management Plan (CFFMP Appendix G), the Project Ecologist will provide details of the snags to be relocated (such as numbers and locations) and relocation methods. Upon the completion of additional field work, the Project Ecologist will prepare a Snag Report for South Creek and Kemps Creek, including the following information:

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

Where removal of the snag(s) 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.

2.1.9 Timber reuse

A site-specific Habitat and Timber Reuse Disposal plan(s) will be prepared as part of agreements to document each Timber Reuse opportunity including the number of logs, transportation timing and logistics and stockpiling arrangements and the recipient site (refer to Section 4.4 of the Habitat Compensation Plan in Appendix F of the CFFMP).

During pre-clearing surveys, trees that are suitable for re-use in accordance with the Timber Reuse Disposal Plan(s) will be located, identified and marked. This will include marking what the intended reuse will be so that the clearing sub-contractor can prepare and stockpile the timber in accordance with Timber Reuse Disposal Plan.

2.1.10 Unsound trees on the limit of clearing

During the pre-clearing surveys, trees that are outside the limits of clearing however are likely to fall upon the roadway or onto private property will be located, identified and marked. These trees will be assessed by a suitably qualified arborist.

Those trees remaining within the road reserve, but outside the limits of clearing, which the Principal has agreed to be unsound and are likely to fall upon the roadway or onto private property, must be cleared or pruned in accordance with AS 4373. Any branch, which overhangs the road formation, must be cut back flush with the tree trunk in accordance with AS 4373.

3 Clearing

3.1.1 Limit of clearing

Clearing must only occur within the limits of clearing shown on the Design Drawings provided by TfNSW. This is provided that the cleared area does not extend beyond the road reserve or the approved project construction boundary (“construction boundary”), as outlined in the EIS as amended by the Amendment Report, or any consistency assessment approved by TfNSW.

The limits of clearing shown on the Design Drawings include the area required for the formation, plus identified areas outside the area to be cleared for the formation which TfNSW has approved for the Seymour Whyte’s facilities, the TfNSW’s accommodation, stockpiles, borrow pits, areas for landscape planting where required outside the formation and up to the construction boundary and any other purpose connected with the construction of the M12 Central package.

Nonetheless, clearing outside the formation must be avoided as far as reasonably practicable. The area cleared must be the minimum consistent with the intended use. Clearing in identified exclusion zones is not permitted (refer to Section 3.1.4).

All trees and stumps, on or within the limits of clearing defined, and which are unable to be felled and removed by the clearing methods used by you, must be removed by grubbing.

3.1.2 Clearing required outside the limits of clearing

Clearing may also be required outside the limits of clearing shown on the Design Drawings, such as for utilities adjustment or construction where not already cleared for other reasons (including areas required for construction of the access tracks). This may include clearing within the vegetation saving areas (refer to Section 3.1.4) subject to TfNSW approval. The extents of these areas to be cleared will be confirmed after a walk-through of the Site with TfNSW.

Clearing will not be permitted in identified exclusion zones.

3.1.3 Area to be cleared for bridges

At bridges, all trees and stumps and all built structures must be removed within the area specified in design drawings except:

- where shown otherwise on the Drawings; or
- marked to be preserved; or
- within 5 m of the bank of any stream or other waterway.

Trees outside this area but having branches overhanging the bridge must have their branches lopped to be 3 metres clear of the bridge.

Trees within 10 m of the centreline of the bridge and within 5 metres of the bank of any stream or other waterway must be cleanly cut off between 300 mm and 600 mm above the adjacent ground level so that stable vegetation is retained on the banks. This work must be undertaken in consultation with the TfNSW.

3.1.4 Exclusion zones and Vegetation Saving Areas

Exclusion zones have been defined in the TfNSW design drawings and impacts in these areas are not permitted under the Planning Approval.

Vegetation Saving Areas have been identified within the approved project boundary as areas which include important ecological values, and areas identified in the WSPT lease agreement for tree

protection measures. Impacts in Vegetation Saving Areas should be avoided where possible, however are permitted under the Planning Approval and WSPT lease. Do not undertake clearing in identified environmentally sensitive areas or identified areas of retained vegetation without the approval of the TfNSW.

Exclusion zones and Vegetation Saving Areas are identified in the Sensitive Area Plans (SAPs) in CEMP Appendix A6 and the Sensitive Aerial Vegetation Maps in Appendix K of the CFFMP. Exclusion zones and Vegetation Saving Areas however will be demarcated on the ground the same way.

Do not undertake clearing in aquatic habitat, riparian vegetation or Endangered Ecological Communities beyond the area as defined in limits of clearing. No other construction activity, including parking of machinery during periods of inactivity, is permitted beyond the area as defined in design documentation.

3.1.5 Aquatic habitats

Aquatic habitat must be protected in accordance with Guide 10: Aquatic habitats and riparian zones of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (NSW Roads and Traffic Authority 2011) and Section 3.3.2 Standard precautions and mitigation measures of the Policy and guidelines for fish habitat conservation and management Update 2013 (Department of Primary Industries 2013).

4 Vegetation Clearing Procedure

The method of clearing and the general extent and sequencing of clearing must be in accordance with Guide 4: Clearing Vegetation and Bush Rock of the Biodiversity Guidelines: Protecting and managing biodiversity on TfNSW projects.

4.1 Clearing and Grubbing Plan and EWMS

A Clearing and Grubbing Plan with an Environmental Work Method Statement (EWMS) will be prepared in accordance with TfNSW QA Specification G40, Section 2.4 Hold Point. The Clearing and Grubbing Plan and EWMS will include the site-specific details from the pre-clearing surveys for the nominated areas of clearing.

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 Habitat trees to be removed (or retained) and the procedures for their removal to minimise impacts to fauna
- Trees identified for timber reuse in accordance with the Timber Reuse Disposal Plan (refer to Appendix F of the CFFMP)
- Methods used to identify and mark snags for salvage and relocation and details for reintroduction of new snags (refer to Appendix G of the CFFMP)
- Methods used to identify and mark areas of weeds to be removed and any specific weed treatment prior to removal
- Procedure for the disposal of weeds and exotics (refer to Appendix E of the CFFMP)
- Methods used to identify and mark areas of potential pathogens and specific procedures to manage the spread of those pathogens (refer to Appendix E of the CFFMP)
- Procedure for protecting threatened flora species and trees marked for preservation, including any unexpected finds of threatened species or ecological communities
- Identification of potential *Myotis Macropus* (Southern Myotis) habitat and procedures for clearing of habitat trees or structures to minimise impacts to the species
- Methods used for identifying, marking and removing or pruning unsound trees likely to fall upon the roadway or onto private property (refer to Appendix J of the CFFMP)
- 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.

4.2 Pre-clearing

4.2.1 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 pre-clearing process also provides for the identification of habitat trees, timber that may be reused, snags in creeks and weeds, pests and pathogens, and their management.

The Project Ecologist will undertake the pre-clearing survey which will include the following activities:

- Identify, locate and mark habitat features on site
- Identify, locate and mark trees proposed for reuse on site
- Identify and locate trees on the boundary requiring assessment by an arborist
- Confirming exclusion zones and limits of clearing area clearly demarcated with fencing/flagging/signage
- Identify fauna that have the potential to be disturbed, injured or killed during clearing activities (e.g. nesting birds)
- Complete anabat survey at dusk 24 hours prior to removal of habitat trees or structures identified as potential *Myotis Macropus* (Southern Myotis) habitat
- Survey for the presence of any weed, pest or pathogen 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”*
- 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).

4.2.2 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 4-1

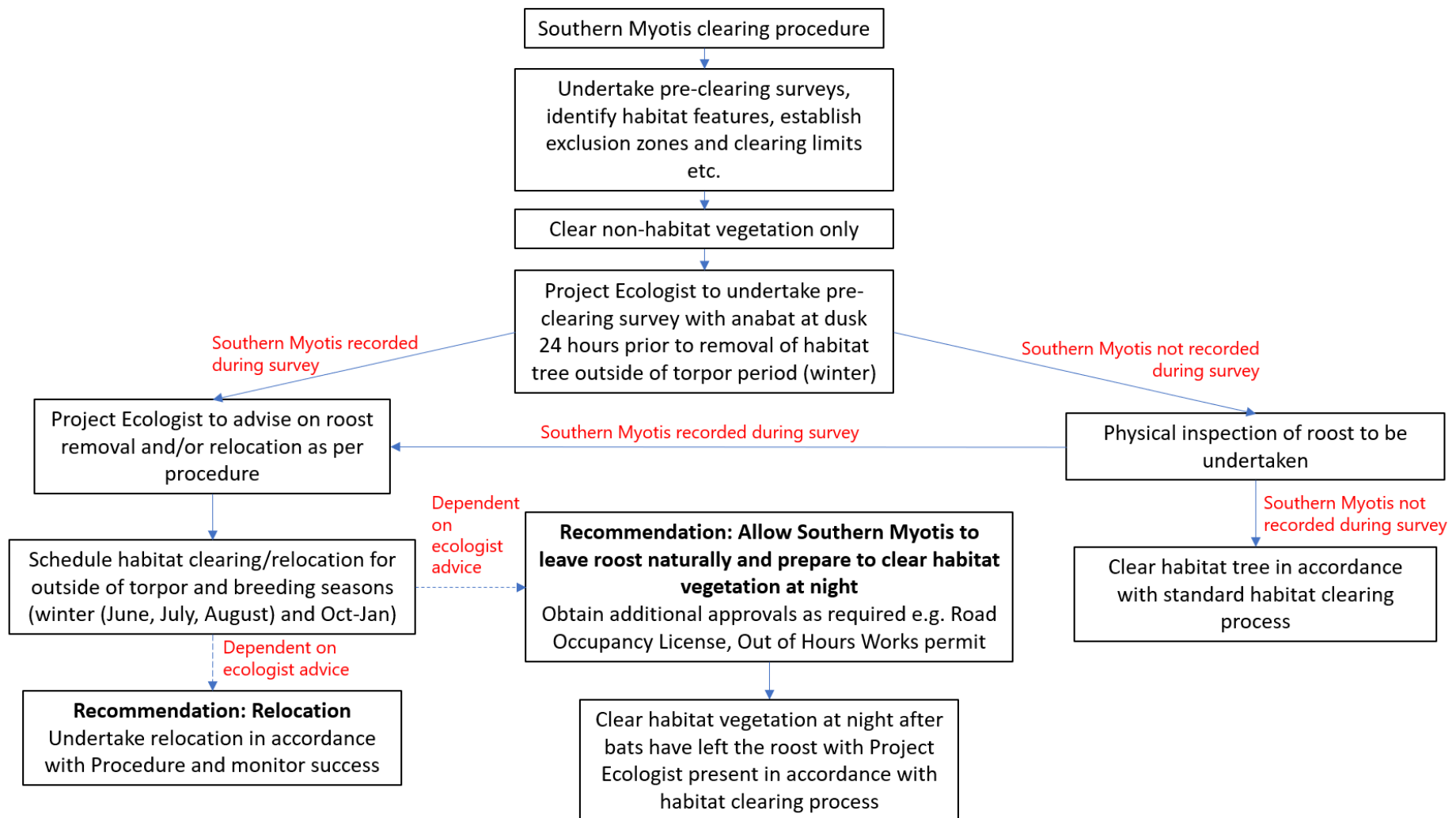


Figure 4-1: Southern Myotis clearing procedure

4.2.3 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.

4.2.4 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.

4.2.5 Seed collection

Seymour Whyte will manage seed collection and propagation in accordance with TfNSW Seed Collection Program and facilitate access to TfNSW's seed collection contractor. The program prioritises the use of Cumberland Plain Woodlands and local native species sourced from locally sourced seed.

During construction TfNSW will direct their seed collection contractor to collect plants, rhizomatous material and seeds 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 M12 Central package or other Project packages.

4.2.6 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 M12 Central package 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
- Exclusion zones may only be entered in agreement with TfNSW to enhance biodiversity values only i.e. landscaping or weed management
- 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.

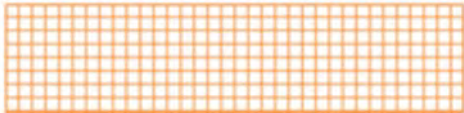
4.2.7 Flagging protocol

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 4-1: 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

Flagging Type	Description
	<p>Orange Parrawebbing with “NO ENTRY – ENVIRONMENTAL PROTECTION AREA” sign – (heritage, threatened flora/fauna).</p> <p>Absolutely no entry without written permit from TfNSW Environment and Sustainability Manager</p>

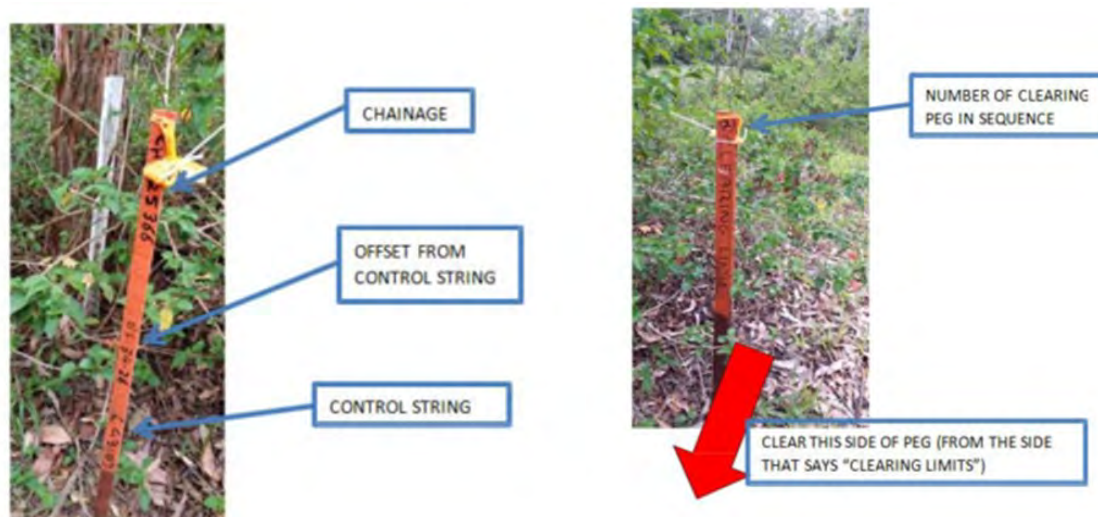


Figure 4-2: Pegging arrangement

4.3 Clearing Process

The area to be cleared will be confirmed following a site inspection with the TfNSW ESM (or delegate). Clearing within identified environmentally sensitive areas will not be undertaken without the approval of the TfNSW Project Manager and ESM (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 Clearing and Grubbing Plan will be prepared for review by the TfNSW Project Manager and TfNSW ESM (or delegate).

The Ecologist's pre-clearing survey report will be submitted to TfNSW with the Clearing and Grubbing Plan 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) and the Habitat and Timber Reuse Disposal Plan prepared in accordance with the CFFMP Section 6.4 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) Appendix E)
- 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 6.5 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.

4.3.1 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.

4.4 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 C of this CFFMP).

4.5 Controls for protection of vegetation

4.5.1 General controls

Protective measures will be implemented 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.

4.5.2 Threatened flora

The M12 Central package 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 174 *Pultenaea parviflora* plants in the road reserve on the western side of Clifton Avenue
- Exclusion zones will be established around 93 *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).

4.5.3 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. Where disposal for reuse off site is proposed a Habitat and Timber Reuse Disposal Plan will be prepared detailing the possible reuse and/or disposal options.

4.6 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.

5 Reporting

5.1 Pre-clearing Survey Report

The Project Ecologist will prepare a Pre-Clearing Survey Report after undertaking the pre-clearing survey for review by the TfNSW ESM (or delegate). The report will include:

- Description of the pre-clearing survey methodology
- Identification of targeted species including, as a minimum, 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 trees identified for the Timber Reuse Disposal Plan to be removed within areas to be cleared
- Identification of areas of high weed and pathogens 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.

5.2 Post-clearing Report

The Project Ecologist 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 ESM (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 ESR will provide details of the vegetation cleared against the areas assessed and approved in the Environmental Assessment Documentation and Infrastructure Approval.



Appendix C – Fauna rescue and release procedure

Appendix C

Construction Flora and Fauna Management Sub-plan

Fauna rescue and release procedure

M12 Motorway – Central



January 2025

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Document control

File Name	
Title	M12 Central CEMP: Appendix B3 Construction Flora and Fauna Management Sub-plan Appendix C – Fauna rescue and release procedure

Approval and authorisation

Plan reviewed by:	Plan endorsed by:
Tom Bath Seymour Whyte Environmental Site Representative	Peter Toma Seymour Whyte Project Manager
18/01/2025	18/01/2025
	

Revision history

Revision	Date	Description
A	18/02/2022	First draft for TfNSW review
B	29/04/2022	Updated in response to TfNSW review
C	29/06/2022	Updated in response to TfNSW review
D	27/07/2022	Updated in response to TfNSW and ER review
E	18/07/2023	Updated in response to OCEMP review
F	18/01/2025	Updated in response to OCEMP review

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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	Former NSW Department of Planning, Industry and Environment
DPHI	NSW Department of Planning, Housing and Infrastructure (formerly NSW DPE which has now been split into NSW DCCEE and NSW DPHI)
EES	NSW Environment, Energy and Science Group (a part of DPIE)

<p>Environmental Assessment Documentation</p>	<p>The set of documents that comprise the Division 5.2 Approval:</p> <ul style="list-style-type: none"> • Roads and Maritime Services (October, 2019) M12 Motorway, Environmental Impact Statement (EIS) • Transport for NSW (October, 2020) M12 Motorway, Submissions Report (the Submissions Report) • Transport for NSW (October, 2020) M12 Motorway, Amendment Report (AR) • Transport for NSW (December, 2020) M12 Motorway, Amendment Report submissions report (ARSR) • Transport for NSW (March, 2021) The M12 Motorway Amendment Report Submissions Report – Amendment (ARSR amendment) • WSP (October, 2021) M12 Motorway – West Package Detailed Design Consistency Assessment • GHD (October, 2021) M12 Motorway – Central Package Detailed Design Consistency Assessment • Arcadis (June, 2022) M12 Motorway – Sydney Water Crossings Consistency Assessment • Arcadis (July, 2022) M12 Motorway – Design Boundary Changes Consistency Assessment • Arcadis (August, 2022) M12 Motorway Minor Consistency Assessment for Proposed Change to the M12 Motorway Project (M12 Central) • Arcadis (September, 2023) M12 Motorway – Devonshire Road Temporary Roundabout Consistency Assessment • WSP (September, 2023) M12 Motorway – Elizabeth Drive Connections Consistency Assessment • TfNSW (September, 2023) M12 Motorway – Minor Consistency Assessment M12 West demolition of structures as 752 Luddenham Road • TfNSW (October, 2023) M12 Motorway – Minor Consistency Assessment M12 East AF9 Power Supply • TfNSW (October, 2023) M12 Motorway – Minor Consistency Assessment M12 East Cecil Road Laydown Area • TfNSW (October, 2023) M12 Motorway – Minor Consistency Assessment M12 East Temporary Construction Signage • Arcadis (December, 2023) M12 Motorway – East Site 48, 50 and 51 Boundary Changes Minor Consistency Assessment • Arcadis (January, 2024) M12 Motorway – Minor Consistency Assessment M12 Central Water Tower Access Road <p>The documents that comprise the EPBC referral:</p> <ul style="list-style-type: none"> • Submission #3486 – The M12 Motorway Project between the M7 Motorway, Cecil Hills and The Northern Road, Luddenham, NSW
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Abbreviations	Expanded text
	Notification of referral decision and designated proponent - controlled action; date of decision 19 October 2018; ID: 2018-8286.
EPBC Act	<i>Environmental Protection and Biodiversity Conservation Act 1999</i>
ER	Environmental Representative
ESM	TfNSW Environment and Sustainability Manager
ESR	Environmental Site Representative (Seymour Whyte)
EWMS	Environmental Work Method Statements
FM Act	<i>Fisheries Management Act 1994</i>
NSW DCCEEW	NSW Department of Climate Change, Energy, the Environment and Water (formerly NSW DPE which has now been split into NSW DCCEEW and NSW DPHI)
OCEMP	Overarching Construction Environmental Management Plan
Project, the	M12 Motorway Project
Snag(s)	A snag is considered to be any piece of woody debris that is both greater than 3 metres in length and 300 mm in diameter, or any rock larger than 500 mm in two dimensions, that is located within a waterway (either fresh, estuarine or marine) and is, or would be, wholly or partly submerged at a 'bank-full' flow level or highest astronomical tide level.
TfNSW	Transport for New South Wales
WIRES	NSW Wildlife Information Rescue and Education Service

1 Introduction

1.1 Purpose

Handling of fauna may be necessary when they are encountered during construction of the M12 Central package and need to be relocated or, if injured, taken to a vet or wildlife carer. The careful handling of fauna is essential to minimise stress or further injury on the animal, to prevent the spread of diseases and to avoid injury to fauna handlers.

The purpose of this Fauna Rescue and Release Procedure (the Procedure) is to outline how fauna will be safely rescued, handled and released during construction of the M12 Central package.

1.2 Scope

This Plan details control measures to minimise impacts on fauna during the construction of the Project and applies to native and introduced species (domestic or pest) that are found on the site including injured, shocked, juvenile and other animals.

This Procedure forms part of the M12 Central package CEMP.

1.3 Objectives

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

To minimise the requirements to handle fauna, it is assumed that Vegetation Clearing Procedure outlined Appendix A of the Construction Flora and Fauna Management Plan (CFFMP), has been completed prior to clearing.

1.4 Roles and Responsibilities

The ESR is responsible for ensuring this M12 Central package Fauna Rescue and Release Procedure is implemented. This Procedure will be reviewed by the ESM (or delegate) prior to commencement of any clearing activities.

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

- The Project Ecologist(s) will undertake the pre-clearing surveys, supervision of clearing activities and be responsible for capture or rescue and release of fauna that have the potential to be disturbed, injured or killed as a result of clearing and construction activities.
- Handling of fauna must only be carried out by licensed fauna handler such as fauna ecologist. Untrained and unlicensed personnel are not permitted to handle fauna on the site.
- The ESR, advised by the Project Ecologist, will be responsible for updating this M12 Central package Fauna Rescue and Release Procedure 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.

Contact details for the implementation of this procedure are provided in Table C-1.

Table 1-1 Emergency Contacts

Contact	Contact Number
Environment and Sustainability Manager, Tom Bath	0447 491 159
Project Ecologist, Peter Monsted	0437 685 224
General Superintendent, Frank Callanan	0448 968 722
WIRES	1300 094 737
Local Veterinary Hospital	
Mulgoa Vet Clinic 1284 Mulgoa Road, Mulgoa. M-F 8am-5:30pm, Sat 8:30am-12pm, Sun - Closed	4773 9091
Nepean Animal Hospital 48-50 Mulgoa Road, Regentville. Hours- 24/7	47333456

1.5 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)
- *National Parks and Wildlife Act 1974* (NPWS Act)
- *Fisheries Management Act 1994* (FM Act)
- *Biodiversity Conservation Act 2016* (BC Act)
- *Environmental Planning and Assessment Act 1979* (EP&A Act)
- *Biosecurity Act 2015* (NSW)
- TfNSW Biodiversity Guidelines Guide 9: Fauna Handling (September 2011)
- TfNSW QA Specification G36, specifically Section 4.8 (c).

2.2 Fauna disturbance

Fauna are expected to be encountered during the following stages of the M12 Central package:

- Pre-clearing surveys, vegetation Clearing and demolition of structures
- Dewatering of farm dams
- Vagrant animals that traverse site during construction.

Handling of fauna should be avoided where ever possible to reduce:

- Stress on animals
- Spreading of disease (e.g. Chytrid amphibian fungus)
- Risk to health or safety (e.g. venomous snakes, raptors, bats with potential to carry Australian bat lyssavirus).

Where handling of animals cannot be avoided, it should only be performed by a licensed fauna ecologist or wildlife carer with specific animal handling experience.

2.3 Fauna Likely to be Directly Affected

While some mobile species, such as birds, may be able to move away from the clearing and construction activities, other species likely to be directly affected by the works include:

- Less mobile species unable to move rapidly over relatively large distances (e.g. frogs and reptiles, nesting birds and juvenile fauna)
- Species using tree hollows (e.g. possums, gliders, microbats and birds)
- Microbats residing in structures (bridges and culverts)
- Fish and aquatic fauna (e.g. fish or eels) in waterways.

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

3 Procedure

3.1 Fauna capture and rescue

If fauna is discovered on site during activities that may harm the animal when the Project Ecologist is not on site, or if the animal poses a risk to site personnel, the following procedure will be followed:

1. Stop all works near the animal and notify Supervisor or Superintendent, who is to notify the ESR. The ESR (or delegate) will notify the Project Ecologist of the fauna.
2. Provide location of the animal, clear directions to access the area and contact details for Supervisor or ERS to meet the Ecologist and direct them to the animal(s).
3. Establish a safe exclusion area around the animal. Control vehicle, plant and personnel movements around exclusion area.
4. Allow animal to leave the area without handling if the animal is mobile. Make sure the animal has a clear safe path to leave the construction area.
5. If the animal is unable to leave the area of its own accord, only the Project Ecologist with specific animal handling experience should attempt to handle and relocate the animal.

3.2 Animal Handling Consideration

Table 3-1 provides specific consideration for the handling of the fauna likely to require handling during the M12 Central package works. These considerations are for the safety of personnel, to minimise stress on animals and to prevent the spread of pest and disease. Refer to the TfNSW Biodiversity Guidelines Guide 9: Fauna Handling (September 2011) for further animal handling considerations (.

Table 3-1 Animal handling considerations

Fauna group	Handling considerations
Snakes	Handling of snakes can poses a safety risk from bites. Handling of snake should be done by appropriately qualified personnel, and where possible, use of no-direct contact handling techniques (i.e. snake hook and bag, opposed to handling the animal).
Bats	Some species of bats carry the Australian Bat Lyssavirus (ABL): a form of rabies. Project Ecologists handling bats must have a current rabies vaccination. Bats that are held should be stored in a calico bag or sealed bat nest box for release after dusk.
Frogs	Frogs and tadpoles are to be placed into plastic bag (ziplock) or other plastic containers with a small amount of water and vegetation. Handling of frogs can result in the spread of the Amphibian Chytrid Fungus and must be undertaken in accordance with the DECC Hygiene Protocol for Control of Disease in Frogs (DECC 2008).
Mammals and birds	Small mammals and birds can cause injury to handlers including bites and scratches if handled incorrectly.

Fauna group	Handling considerations
	Mammals and birds should be placed into a calico/hessian bag or a cardboard box. Possums can easily rip through calico bags and should be placed within double lined canvas bags or a nest box.
Nestlings or juveniles	Where possible, the trees with nestlings or juveniles birds should be left intact until juveniles have vacated the nest or den. If construction timing does not permit this, attempts will be made to rescue juveniles for captive-rearing by a responsible wildlife group (such as Wires) and subsequent release into translocation sites. The success of this will depend upon the species, their stage of development and likely chances of survival. Alternatively, and only as a last resort, juveniles may be euthanized on-site.
Arboreal animals (animals in tree hollows)	If arboreal animals do not move or they cannot be captured because the tree hollow is too large, high, then the tree will be felled and animals recovered post-felling.
Fish and aquatic species	Refer to the Farm Dewatering Management Plan in Appendix H of the CFFMP. Ensure that containers for holding aquatic species provide enough water and adequate aeration.
Domestic animals (pets)	Check is a collar and tag has contact details for the owner. Alternatively take the animal to the nearest vet to scan the pet for a microchip to try and reunite the pet with its owner.
Pest species	Pest animals are not to be released and should be euthanized (see below).

3.3 Injured Animals

Injured animals will be cared for according to specific animal care and ethics guidelines, and be given appropriate veterinary care, and if available, the services of one of the local animal welfare groups.

3.3.1 Euthanasia

In some instances, severely injured and pest animals may need to be euthanized. Euthanasia is only permitted by a Project Ecologist(s) or a veterinarian that is trained and competent in methods of euthanasia. The Project Ecologist will consider methods that are humane, painless and rapid such as those in accordance with Methods of Euthanasia (Sharp and Saunders 2004, prepared for NSW Department of Primary Industries).

For animals up to 150g, cervical dislocation followed by pithing as secondary technique.

Animals over 150g should be taken to veterinarian, or veterinarian brought to it, for lethal injection. Lethal injection will be completed only by a veterinarian or other suitable trained professional.

The use of firearms is not permitted by any personnel on site.

4 Reporting and performance monitoring

4.1 Pre-clearing survey report

The details of the additional field surveys for snags in South Creek and Kemps Creek will be reported in the Ecologist's pre-clearing survey report outlined in Section 3.1 of the Vegetation Clearing Procedure (Appendix B of the CFFMP). Additional fauna management measures include:

- locations for fauna release would be in appropriate habitat determined prior to commencement of clearing/ dewatering of farm dams; and
- provision for temporary fencing to reduce potential for fauna mortality/injury, as required.

4.2 Post-clearing report

The findings of the post-relocation surveys will be included within the post-clearing report outlined in Section 3.2 of the Vegetation Clearing Procedure (refer Appendix B 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
- Live fauna sightings, captures, any releases or injured/shocked wildlife
- Injury or mortality of fauna
- Photographs of rescued fauna
- Records of all fauna rescue events, including locations to where fauna has been relocated.

Guide 9: Fauna handling

Background

Handling of fauna may be necessary when they are encountered on a project and need to be relocated or, if injured, taken to a **vet or wildlife carer**. The careful handling of fauna is essential to minimise stress or further injury on the animal, to prevent the spread of diseases and to avoid injury to fauna handlers.

Fauna should only be handled when absolutely necessary. It is preferable to avoid fauna handling unless the life of the animal is at risk. Fauna handling should be undertaken either by a **licensed fauna ecologist or wildlife carer** skilled in handling the type of fauna encountered.



FIGURE 9.1: A tree skink (*Egernia striolata*) being handled by a licensed ecologist with gloves (Photo: Lukas Clews).

Objective

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

Application of this guide

This guide is applicable whenever it is necessary to handle fauna.

Specialist input requirements

Use a **licensed fauna ecologist or wildlife carer** with specific animal handling experience to carry out any animal handling.

Management requirements

Allow fauna to leave an area without intervention as much as possible. The project manager and/or environment manager should ensure that fauna handling is only carried out by people who are appropriately licensed (eg a **fauna ecologist or wildlife carer**).

The project manager and/or environment manager should ensure that an **animal rescue agency/wildlife care group or vet** has been contacted before works start to check they are willing and available to be involved in fauna rescue and assist with injured animals. The project manager and/or environment manager should ensure the contact details of the **animal rescue agency/wildlife care group or vet** are provided to the site manager, displayed in the site office and included in the Construction Environmental Management Plan (CEMP) or other relevant management plans for the project.

The project manager and/or environment manager should ensure that project inductions include the procedure to be followed if fauna are found or injured on site. The procedure should include that fauna handling is to be avoided. However, the project manager and/or environment manager should ensure the best practice methods outlined below are communicated to the contractor in circumstances where the handling of fauna is completely unavoidable.

The project manager or site manager should ensure that personnel do not feed any wildlife that may be encountered on construction sites (especially birds and lizards). The project manager should include this in project inductions and erect relevant signs informing personnel not to feed the wildlife around the work site.

Injured fauna

Contact the nominated **animal rescue agency/wildlife care group or vet** if an animal is injured. Keep the injured animal in a box in a quiet, warm, dark place until transferred. If the animal is dangerous, carefully place a box over the top of it if possible, or section off the area and wait for an experienced and **licensed fauna ecologist or wildlife carer** to arrive.

Snakes

- Avoid handling snakes. Snakes should be left alone and allowed to vacate the area of their own accord.
- If a snake must be handled to remove the risk of harm to the snake or people then handling should only be done by a **licensed fauna ecologist or wildlife carer** with skills and experience in snake handling.
- Never deliberately kill a snake as all snakes are protected under the *National Parks and Wildlife ACT 1974 (NSW)*.



FIGURE 9.2: Snakes, like this non-venomous Green Tree Snake (*Dendrelaphis punctulata*) on the Sapphire to Woolgoolga project, should be left alone and allowed to vacate the area (Photo: Laurenne O'Brien).



FIGURE 9.3: A non-venomous Carpet Python (*Morelia spilota*) being removed by a licensed ecologist with skills and experience in snake handling. This was during staged habitat removal at the Sapphire to Woolgoolga project in Northern Region (Photo: Laurenne O'Brien).

Amphibians

Follow the *Hygiene Protocol for the control of disease in frogs* (Wellington and Haering 2008) for all frog handling. Key points include:

- Wear disposable gloves when handling frogs.
- Place only one frog in each plastic bag.
- Do not re-use plastic bags.
- Disinfect any handling equipment and boots when moving between waterbodies.
- Wash hands thoroughly with disinfectant after handling frogs from one waterbody.
- Frogs or tadpoles/spawn should not be moved between catchments.

Guide 7: Pathogen management provides further information on managing diseases in frogs.



FIGURE 9.4: A threatened Green-thighed Frog (*Litoria brevipalmata*) being handled using disposable gloves on the Herons Creek to Stills Road project in Northern Region NSW (Photo: Josie Stokes).



FIGURE 9.5: An endangered Giant Barred Frog (*Mixophyes iteratus*) being relocated from the Sapphire to Woolgoolga project corridor in a plastic bag (Photo: Laureenne O'Brien).

Fish

- Fish should only be handled by experienced **aquatic ecologists**.
- Handle fish with dip nets with knotless or rubber netting and/or with wet hands or wet gloves.
- Avoid contact with gills and eyes.
- Keep fish in water whenever possible. If fish need to be transferred between water bodies they should not be left out of the water for more than a few seconds.
- Fill containers used for transferring fish between sites with water from the source. Keep water oxygenated and at the same temperature as the source.
- Fish should not be moved between catchments.

Mammals

- Wear gloves when handling mammals (including bats) to protect against bites and scratches.
- Transfer small mammals to a small cloth bag after capture and before release. Larger mammals may require a large pillow case or hessian bag.
- If handling bats, the **licensed fauna ecologist or wildlife carer** must be vaccinated against the Australian Bat *Lyssavirus* (ABL) which is a form of rabies.



FIGURE 9.6: Microbats such as the Lesser Long-Eared Bat (*Nyctophilus geoffroyi*) should only be handled by licensed and experienced wildlife carers and/or ecologists who have been vaccinated against the Australian Bat *Lyssavirus* (ABL) (Photo: Nathan Cooper).

Fauna release

- Release fauna into pre-determined habitat identified for fauna release. This habitat would have been identified by an **ecologist** and marked on maps for the project during the pre-clearing process (see *Guide I: Pre-clearing process*).
- Release fauna into similar habitats, as near as possible to their capture location.
- Release nocturnal fauna at or after dusk.
- Arboreal fauna should be slowly released from their bag onto the trunk of a tree.
- Select trees with rough or peeling bark and hollows for bats and gliders.



FIGURE 9.7: A Squirrel Glider (*Petaurus norfolcensis*) on a tree with rough bark. Trees with rough or peeling barks should be selected for the release of bats and gliders (Photo: David Nelson).

Temporary fauna fencing

Temporary fauna fencing may be required on projects to reduce the chances of road kill/injury from public traffic or construction machinery especially where:

- There is a high risk of mobile threatened fauna species entering the works area.
- There is a known history of threatened species roadkill.



FIGURE 9.8: Temporary frog fencing installed for the Sapphire to Woolgoolga project to prevent the endangered Giant Barred Frog (*Mixophyes iteratus*) from entering construction areas (Photo: Josie Stokes).

Monitoring

The project manager and/or environment manager should ensure that details of fauna captured and relocated are recorded. Include the following information:

- Species.
- Location and time captured.
- Location and time released.
- Behaviour and condition upon release.
- Details of any injury or deaths that occurred.
- Contact details and location of **licensed wildlife carer or vet** if the animal was transferred into their care.

The project manager and/or environment manager should ensure that any injury to or death of a threatened species is reported to the **RTA's environmental staff**.

Supporting documents

1. Department of Environment, Climate Change and Water (September 2009) Statement of Intent 2: Infection of frogs by amphibian chytrid causing the disease chytridiomycosis, NSW Department of Environment, Climate Change and Water, Sydney.
2. NSW Health (Updated 15 January 2008, accessed 7 April 2011) 'Rabies and bat lyssavirus infection: Infectious disease fact sheet' NSW Health, (www.health.nsw.gov.au/factsheets/infectious/rabiesbatinfection.html).
3. NSW Health (Updated 19 December 2007, accessed 7 April 2011) 'Leptospirosis: Infectious disease fact sheet' NSW Health, (www.fwahs.health.nsw.gov.au/factsheets/infectious/leptospirosis.htm).
4. 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.



Biodiversity Guide 9 – Fauna handling

Objective

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

Application of this guide

This guide is applicable whenever it is necessary to handle fauna.

Management Requirements:

- Allow fauna to leave an area without intervention as much as possible.
- Use a licensed fauna ecologist or wildlife carer with specific animal handling experience to carry out any fauna handling.
- Contact an **animal rescue agency/wildlife care group or vet** before works start to ensure they are willing and available to be involved in fauna rescue and assist with injured animals.
- The contact details of the **animal rescue agency/wildlife care group or vet** should be provided to the site manager, displayed in the site office and included in the Construction Environmental Management Plan (CEMP) or other relevant management plans for the project.
- Include the procedures to follow if fauna is found or injured on site in project inductions.
- Follow the best practice methods outlined below in circumstances where the handling of fauna is completely unavoidable:
 - Contact the nominated **animal rescue agency/wildlife care group or vet** if an animal is injured. Keep the injured animal in a box in a quiet, warm, dark place until transferred. If an injured animal is dangerous, carefully place a box over the top of it if possible, or section off the area and wait for an **experienced and licensed fauna ecologist or wildlife carer** to arrive.
 - Never deliberately kill a snake as all snakes are protected under the *National Parks and Wildlife Act 1974* (NSW).
 - If a snake must be handled to remove the risk of harm to the snake or people then handling should only be done by a **licensed fauna ecologist or wildlife carer** with skills and experience in snake handling.
 - Follow the *Hygiene Protocol for the control of disease in frogs* (Wellington and Haering 2008) for all frog handling.
 - Fish should only be handled by experienced **aquatic ecologists**.
 - Wear gloves when handling mammals (including bats) to protect against bites and scratches.
 - If handling bats, the handler must be vaccinated against the Australian Bat *Lyssavirus* (ABL) which is a form of rabies.
 - Release fauna into pre-determined habitat identified for fauna release.
 - Release fauna into similar habitats, as near as possible to their capture location. Release nocturnal fauna at dusk.
- Temporary fauna fencing may be required on projects to reduce the chances of road kill/injury from public traffic or construction machinery.
- Keep records of fauna captured and relocated.
- Report any injury to or death of a threatened species to the RTA's environmental staff.
- The project manager or site manager should ensure that personnel do not feed any wildlife that may be encountered on construction sites (especially birds and lizards). The project manager should include this in project inductions and erect relevant signs informing personnel not to feed the wildlife around the work site.



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

Appendix D

Construction Flora and Fauna Management Sub-plan

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

M12 Motorway – Central

January 2025






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Document control

File Name	Appendix B03 Flora and Fauna MP
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Approval and authorisation

Plan reviewed by:	Plan endorsed by:
	
Seymour Whyte Environmental Site Representative	Seymour Whyte Project Manager
18/01/2025	18/01/2025
	

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A	18/02/2022	First draft for TfNSW review
B	29/04/2022	Updated document control page for CFFMP Rev B
C	29/06/2022	Updated document control page for CFFMP Rev C
D	27/07/2022	Updated document control page for CFFMP Rev D
E	18/07/2023	Updated in response to OCEMP update
F	18/01/2025	Updated in response to OCEMP update

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Glossary/ Abbreviations

Abbreviations	Expanded text
CFFMP	Construction Flora and Fauna Management Plan
CoA	Conditions of Approval
DAWE	Former Commonwealth Department of Agriculture, Water and Environment (now Commonwealth Department of Climate Change, Energy, Environment and Water)
DCCEEW	Commonwealth Department of Climate Change, Energy, Environment and Water
DPE	Former Department of Planning and Environment
DPHI	NSW Department of Planning, Housing and Infrastructure (formerly NSW DPE which has now been split into NSW DCCEEW and NSW DPHI)
DPI Fisheries	NSW Department of Primary Industries - Fisheries
DPiE	Former NSW Department of Planning, Industry and Environment (now NSW Department of Planning and Environment)
EAD	Environmental Assessment Documentation
EEC	Endangered Ecological Community
EES	Former NSW Environment, Energy and Science group (now EHG)
EHG	Environment and Heritage Group (a part of NSW DPE)

<p>Environmental Assessment Documentation</p>	<p>The set of documents that comprise the Division 5.2 Approval:</p> <ul style="list-style-type: none"> • Roads and Maritime Services (October, 2019) M12 Motorway, Environmental Impact Statement (EIS) • Transport for NSW (October, 2020) M12 Motorway, Submissions Report (the Submissions Report) • Transport for NSW (October, 2020) M12 Motorway, Amendment Report (AR) • Transport for NSW (December, 2020) M12 Motorway, Amendment Report submissions report (ARSR) • Transport for NSW (March, 2021) The M12 Motorway Amendment Report Submissions Report – Amendment (ARSR amendment) • WSP (October, 2021) M12 Motorway – West Package Detailed Design Consistency Assessment • GHD (October, 2021) M12 Motorway – Central Package Detailed Design Consistency Assessment • Arcadis (June, 2022) M12 Motorway – Sydney Water Crossings Consistency Assessment • Arcadis (July, 2022) M12 Motorway – Design Boundary Changes Consistency Assessment • Arcadis (August, 2022) M12 Motorway – Minor Consistency Assessment for Proposed Change to the M12 Motorway Project (M12 Central) • Arcadis (September, 2023) M12 Motorway – Devonshire Road Temporary Roundabout Consistency Assessment • WSP (September, 2023) M12 Motorway – Elizabeth Drive Connections Consistency Assessment • TfNSW (September, 2023) M12 Motorway – Minor Consistency Assessment M12 West demolition of structures as 752 Luddenham Road • TfNSW (October, 2023) M12 Motorway – Minor Consistency Assessment M12 East AF9 Power Supply • TfNSW (October, 2023) M12 Motorway – Minor Consistency Assessment M12 East Cecil Road Laydown Area • TfNSW (October, 2023) M12 Motorway – Minor Consistency Assessment M12 East Temporary Construction Signage • Arcadis (December, 2023) M12 Motorway – East Site 48, 50 and 51 Boundary Changes Minor Consistency Assessment • Arcadis (January, 2024) M12 Motorway – Minor Consistency Assessment M12 Central Water Tower Access Road <p>The documents that comprise the EPBC referral:</p>
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Abbreviations	Expanded text
	<ul style="list-style-type: none"> Submission #3486 – The M12 Motorway Project between the M7 Motorway, Cecil Hills and The Northern Road, Luddenham, NSW Notification of referral decision and designated proponent - controlled action; date of decision 19 October 2018; ID: 2018-8286.
EPBC Act	<i>Environmental Protection and Biodiversity Conservation Act 1999</i>
ER	Environmental Representative
EPBC referral	A Proponent must refer a proposed action to the Australian Government Minister for the Environment (the Minister) for assessment, if it has, will have, or is likely to have a significant impact on the world heritage values of a declared World Heritage property, or is likely to have a significant impact on the National Heritage values of a National Heritage place.
ESM	TfNSW Environment and Sustainability Manager
ESR	Environmental Site Representative (Seymour Whyte)
Exclusion zones	Exclusion zones are areas of environmental importance (e.g. threatened vegetation or heritage items) that need to be protected. These exclusion zones are defined as no-go areas and are to be protected for the duration of construction in that particular footprint area.
Federal Approval	Approval (EPBC 2018/8286) for carrying out the M12 Project under Part 8 of the <i>Environmental Protection and Biodiversity Conservation Act 1999</i> subject to specific CoA as detailed in Annexure A of the approval.
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 Central package. 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 M12 Central package.

This Procedure forms part of the M12 Central package CEMP and has been prepared in accordance with the overarching Unexpected Threatened Species and Threatened Ecological Community (TEC) Finds Procedure presented in the M12 Motorway Overarching Construction Flora and Fauna Management Plan.

Where threatened fauna is unexpectedly encountered, the Fauna Handling and Rescue Procedure (Appendix C 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 M12 Central package area and the requirements of this Procedure.

Training will include inductions, toolbox talks, pre-starts and targeted training as required, to be approved by TfNSW Environment and Sustainability Manager (ESM) for the Project. Training material will include photos and descriptions of threatened species and TECs occurring or likely to occur within the M12 Central package area as described in this Procedure and communicate the information to all site personnel.

1.4 Roles and responsibilities

The Environmental Site Representative (ESR) will be notified in the event of an unexpected threatened species or TEC find on site during construction of the M12 Central package. The ESR is the key contact point for the Transport for NSW (TfNSW) Environment and Sustainability Manager (ESM) (or delegate) in regard to this Procedure. A Project Ecologist will be engaged by the Seymour Whyte if required for the implementation of this Procedure.

The ESM (or delegate) will act as the liaison between the ESR 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 M12 Central Package.

1.5 Review



This Procedure will be updated by the ESR in consultation with the Project Ecologist and reviewed by the TfNSW ESM (or delegate) prior to commencement of construction of the M12 Central package.




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 M12 Central package area





The threatened flora and fauna species and TECs which may be impacted by the M12 Central package 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>No Cumberland Plain Land Snail or their habitat were recorded within the M12 Central Package area.</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>Potential breeding habitat for this species has been mapped within the M12 Central package area associated with a number of hollow bearing trees.</p>	

Species	Photo
<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> <p>No camps are known to occur within the M12 Central package area however the species is may forage with the area.</p>	
<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>	

Species	Photo
<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>	
<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>No nesting sites are known with the M12 Central package area.</p>	

Species	Photo
<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>	
<p><i>Grevillea juniperina</i> subsp. <i>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>	

Species	Photo
<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.

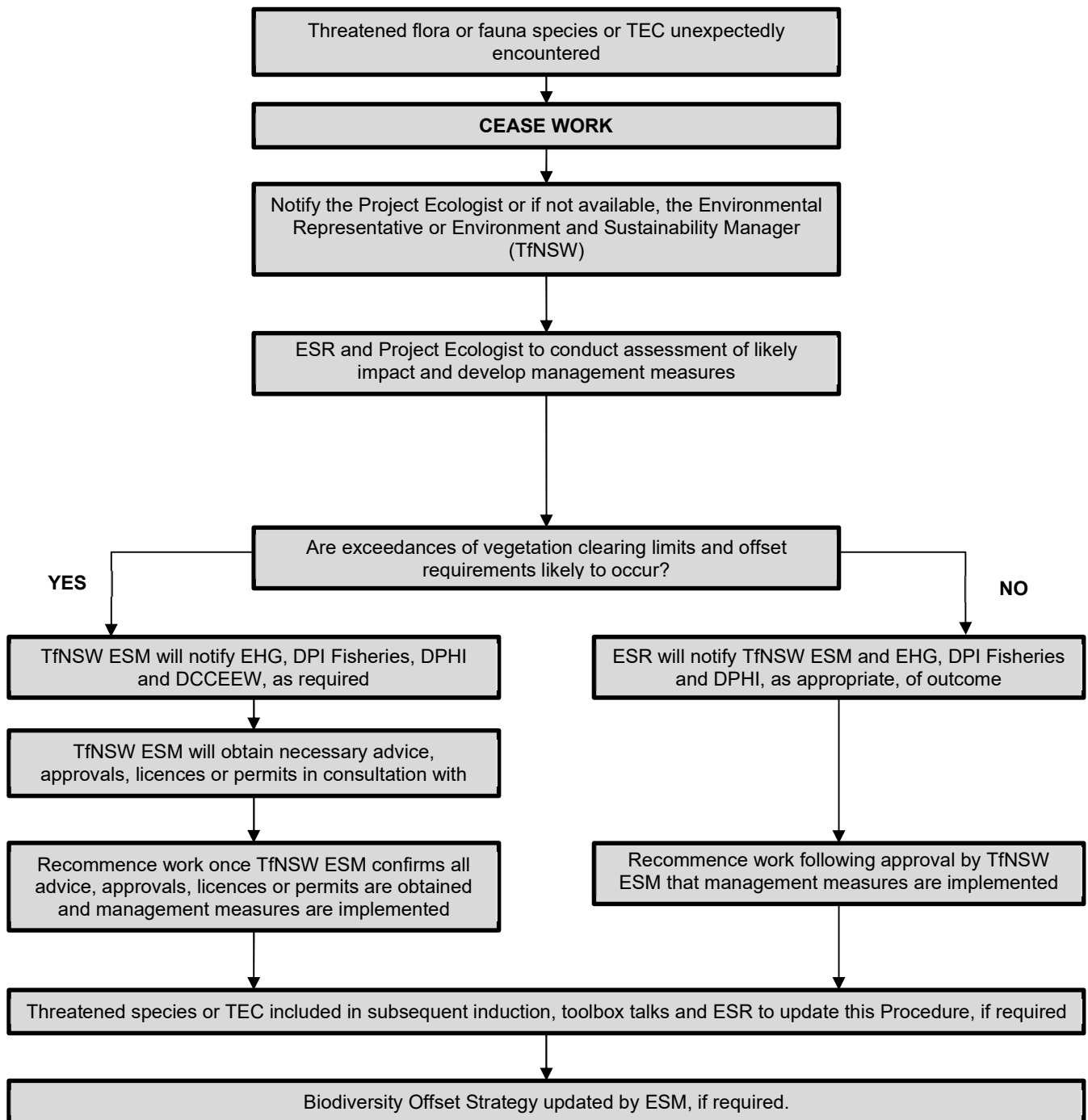


Figure 3-1: Unexpected threatened species or TECs finds procedure flow chart

3.2 Detailed procedure

Step 1	Threatened flora or fauna species or TEC unexpectedly encountered during construction activities
	<p>If a new threatened flora or fauna species or TEC is unexpectedly encountered:</p>
	<p><u>Cease work in the vicinity of the unexpected find.</u></p>
	<p>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 DPHI, DEECCW, NSW Environment and Heritage Group (EHG) and NSW Department of Primary Industries (DPI) Fisheries, if required.</p>
Step 2.	Assessment of impact
	<p>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.</p>
	<p>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.</p>
	<p>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 EHG, DPI, DPHI and DEECCW 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.</p>
	<p>DEECCW will be notified and consulted if the threatened species or TEC encountered is listed under the <i>Commonwealth Environmental Protection and Biodiversity Conservation Act 1999</i> (EPBC Act).</p>
Step 3	Approvals
	<p>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).</p>

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

Accurate records will be maintained substantiating all construction activities associated with the M12 Central package or relevant to the conditions of approval, including measures taken to implement this Procedure.



Appendix E – Weed, Pest and Pathogen Management Plan

Appendix E

Construction Flora and Fauna Management Sub-plan

Weed, Pest and Pathogen Plan

M12 Motorway – Central





January 2025

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Document control

File Name	Appendix B03 Flora and Fauna MP
Title	M12 Central CEMP: Appendix B3 Construction Flora and Fauna Management Sub-plan Appendix E – Weed and Pathogen Plan
Document Number (Teambinder)	M12CCO-SYW-ALL-EN-PLN-000006

Approval and authorisation

Plan reviewed by:	Plan endorsed by:
	
Seymour Whyte Environmental Site Representative	Seymour Whyte Project Manager
18/01/2025	18/01/2025
	

Revision history

Revision	Date	Description
A	18/02/2022	First draft for TfNSW review
B	29/04/2022	Updated in response to TfNSW review
C	29/06/2022	Updated in response to TfNSW review
D	27/07/2022	Updated in response to TfNSW and ER review
E	18/07/2023	Updated in response to OCEMP review
F	18/01/2025	Updated in response to OCEMP review

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Glossary/ Abbreviations

Abbreviations	Expanded text
BC Act	<i>Biosecurity Act 2015</i>
CFFMP	Construction Flora and Fauna Management Plan
DAWE	Former Commonwealth Department of Agriculture, Water and the Environment (now Commonwealth Department of Climate Change, Energy, Environment and Water)
DCCEEW	Commonwealth Department of Climate Change, Energy, Environment and Water
DPHI	NSW Department of Planning, Housing and Infrastructure (formerly NSW DPE which has now been split into NSW DCCEEW and NSW DPHI)
DPIE	Former NSW Department of Planning, Industry and Environment (now NSW Department of Planning and Environment)
DPI Fisheries	NSW Department of Primary Industries - Fisheries
DPE	Former NSW Department of Planning and Environment
EAD	Environmental Assessment Documentation
EEC	Endangered Ecological Community
EHG	Environment and Heritage Group (part of DPE). Formerly EES.
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ER	Environmental Representative
Exclusion zones	Exclusion zones are areas of environmental importance (e.g. threatened vegetation or heritage items) that need to be protected. These exclusion zones are defined as no-go areas and are to be protected for the duration of construction in that particular footprint area.
Federal Approval	Approval (EPBC 2018/8286) for carrying out the M12 Project under Part 8 of the <i>Environmental Protection and Biodiversity Conservation Act 1999</i> subject to specific CoA as detailed in Annexure A of the approval.
ESM	TfNSW Environment and Sustainability Manager
ESR	Environmental Site Representative (Seymour Whyte)
LGA	Local Government Area
NATA	National Association of Testing Authorities
NSW DCCEEW	NSW Department of Climate Change, Energy, the Environment and Water (formerly NSW DPE which has now been split into NSW DCCEEW and NSW DPHI)
PBFD	Psittacine beak and feather disease
Pesticide Act	<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 Central package 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 M12 Central package 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 M12 Central package sites
- Prevent the introduction and spread of weeds, pests and pathogens throughout the construction of the M12 Central package
- Establish an inspection and reporting framework for weeds, pests and pathogens
- Set out performance criteria for the management of weeds and pathogens for the M12 Central package.

1.2 Scope

This Plan details control measures to be implemented throughout the construction of the M12 Central package. 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 M12 Central package.

This Procedure forms part of the M12 Central package CEMP and has been prepared in accordance with the overarching Weed, Pest and Pathogen Management Plan presented in the M12 Motorway Overarching Construction Flora and Fauna Management Plan.

1.3 Induction / training

All site personnel involved in the weed, pest and pathogen control activities will be trained and inducted in this Procedure.

The induction will include descriptions of the priority and other weeds in the M12 Central package area.

Inductions 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 Environmental Site Representative (ESR) is responsible for ensuring this M12 Central package specific Weed, Pest and Pathogen Management Plan is implemented. This Plan will be reviewed by the ESM (or delegate) prior to commencement clearing works.

The following specialised roles are required for the management of snags during construction of the M12 Central package:

- The ESR will be responsible for 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 M12 Central package construction sites are responsible for preventing the spread of weeds and pathogens within the M12 Central package area and offsite.

1.5 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 Weeds, pests and pathogens in the M12 Central package area

2.1 Weeds and pest species

2.1.1 Weeds within the M12 Central package 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 M12 Motorway 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

Species	Common name	WoNS	Biosecurity Act 2015	Legal Requirement
<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
<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

Species	Common name	WoNS	Biosecurity Act 2015	Legal Requirement
<i>Nassella neesiana</i>	Chilean needle grass	Yes	Prohibition on dealings	Must not be imported into the State or sold
<i>Olea europaea</i> subsp. <i>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</i> (sp. agg)	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 2-2.

Table 2-2: Priority pests

Pest Animal	Management Category	Objective
Wild Dog	Asset protection	Reduce impacts on agricultural production, domestic pets, public safety and biodiversity
Feral Pig	Eradicate/Contain/Asset based protection	Reduce impacts on agricultural production 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.

This Weed, Pest and Pathogen Management Plan will be updated with a detailed list of all weed and pest species identified during the pre-clearing surveys as part of the M12 Central package CFFMP. The update 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 2-2.

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

2.1.7 Red imported fire ants

Red imported fire ants (*Solenopsis invicta*) are regulated as prohibited matter under the *Biosecurity Act 2015*. The potential spread of fire ants in fire ant carrier material is regulated under the *NSW Biosecurity (Fire Ant) Emergency Order (No 1) 2024* and the *Biosecurity (Fire Ant) Emergency Amendment Order 2024*. Carrier material includes soil, sand, quarry material, organic waste, potted plants, mulch, manure, earth moving equipment, hay, turf. The movement of carrier materials from Queensland and Fire Ant Movement Control Areas is subject to requirements as per the Order. For further information, refer to Appendix L of the CFFMP.

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

2.2 Pathogens

As part of ecological surveys for the approval of the M12 Central package, the following four pathogens have the potential to occur within the M12 Central package 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).

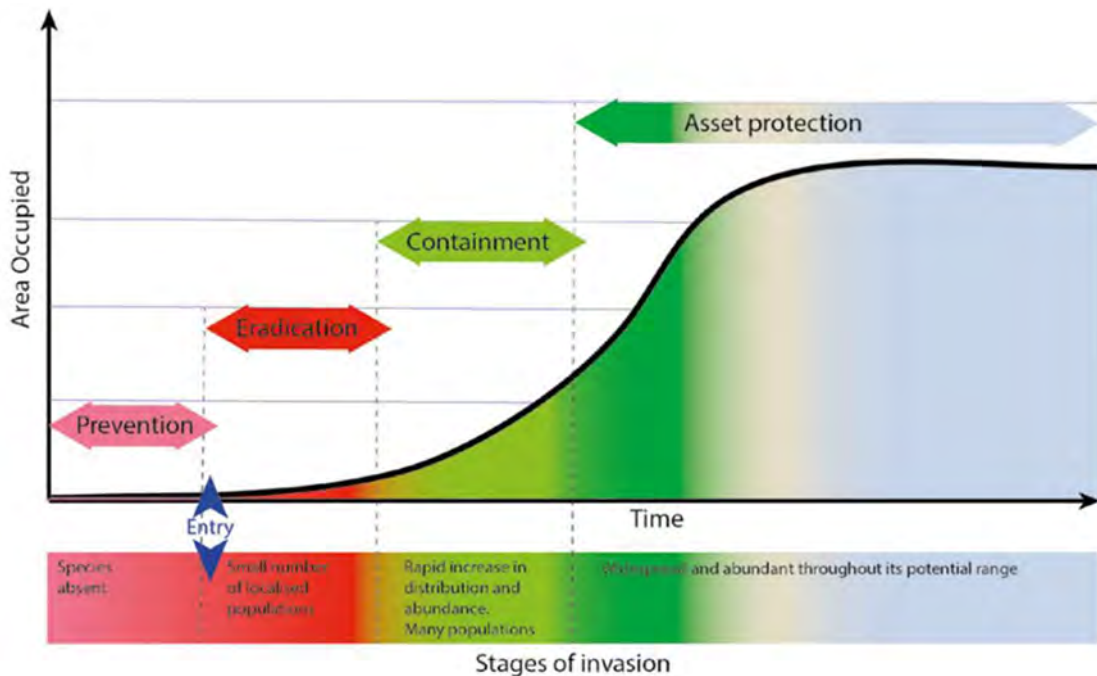
Identification and/or fact sheets on each pathogen identified as having the potential to occur within the M12 Central package area or with the potential to be introduced to the area will be prepared and include in the induction and training materials.

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 M12 Central package. 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 M12 Central package 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 2-2.
- 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 in consultation with the Project Ecologist to prevent the spread or introduction of weeds and pests to the M12 Central package 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 vehicle and boot wash down facilities at construction sites and educate personnel on when and how to use both vehicle and boot wash down facilities when moving from areas with infestations of priority weeds that are in seed or could be transported in soil into area that are free of weeds (particularly Chilean Needle Grass)
- 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 Environmental Site Representatives (ESR) 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 ESR 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 (ESM) (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 hold an appropriate licence (AQF3 Chemical Accreditation) prior to commencing work. Appropriate PPE must be worn as prescribed on the label or in the MSDS including, however not limited to:

- Eye protection
- Gloves
- Respiratory protection
- Suitable chemical resistant footwear.

PPE should be used:

- in an open field situation where engineering controls are not available
- when mixing, decanting or spraying
- in some circumstances as a back-up for other control measures.

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 M12 Central package 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 ESR 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 (hygiene protocol)

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 M12 Central package area is a high priority. Environmental controls will be implemented in consultation with the Project Ecologist to prevent the spread or introduction of pathogens to the M12 Central package 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
- Ensuring vehicles, material and footwear are clean upon entry into, and exit from, infested areas. Vehicles and plant arriving at site with visible mud will be denied access and required to complete a wash down prior to entry.
- Install wheel wash and rumble grids at construction sites where vehicles are moving between infected areas and uninfected areas to
- Provide boot wash down facilities at construction sites where pathogens are detected
- 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 Project Ecologist or ESR 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.

A weed, pest and pathogen monitoring program will be developed and implemented that includes:

- Inspection of the general condition of the M12 Central package 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 M12 Central package. The Project Ecologist will undertake all monitoring and inspections. The ESR 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 ESR 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*).

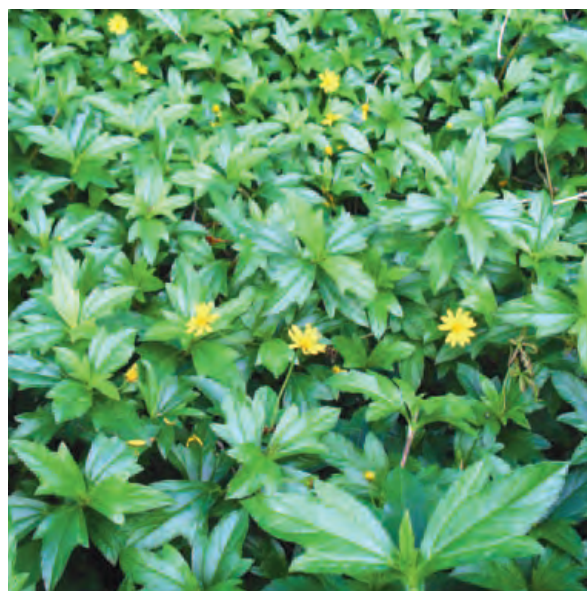


FIGURE 6.1: The weed Singapore Daisy (*Sphagneticola trilobata*) on the Pacific Highway – Banora Point Upgrade project. Once confined to Queensland, this weed has spread down the NSW coast and invaded rainforest edges and disturbed areas such as roadsides of the Northern Region (Photo: Tammie Tribe).



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 R178* 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) Calender 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 (OEI)** 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 1 Biodiversity Guide 9 - Fauna handling

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.rbgsyd.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>Orobanch</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
Boneseed - <i>Chrysanthemoides monilifera</i> subspecies <i>monilifera</i>	<p>Biosecurity (Boneseed) Control Order 2017</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 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> <ol style="list-style-type: none"> as soon as practicable after becoming aware of the new infestation; verbally or in writing; giving the following: <ol style="list-style-type: none"> the person's full name and contact number; the location of the Boneseed, including the property identification code for the land (if this is known); and 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</p> <p>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> <ol style="list-style-type: none"> as soon as practicable after becoming aware of the presence of Boneseed; verbally or in writing; giving the following: <ol style="list-style-type: none"> the person's full name and contact number; the location of the Boneseed, including the property identification code for the land (if this is known); and 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> <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 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> <ul 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: <ul 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); and iv) 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 <i>Eichhornia crassipes</i>	
<p>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:</p> <p>(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).</p>	<p>Biosecurity Regulation 2017 - Part 5, Division 4 (Biosecurity Zone)</p> <p>An owner or occupier of land in the water hyacinth biosecurity zone on which there is the weed <i>Eichhornia crassipes</i> (Water hyacinth) 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: See Appendix 1.2 Containment.</p>

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 hygrophylla - *Hygrophylla 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):</i> A person must not move, import into the State or sell. 	<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):</i> A person must not move, import into the State or sell. 	<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):</i> A person must not move, import into the State or sell. 	<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
Ming fern - <i>Asparagus macowanii</i> var. <i>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.
Mysore thorn - <i>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.
Sicilian sea lavender - <i>Limonium hyblaum</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.
Sicklethorn - <i>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.
Skunk vine - <i>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
African olive - <i>Olea europaea</i> subsp. <i>cuspidata</i>		
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>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.
Alligator weed - <i>Alternanthera philoxeroides</i>		
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>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>		
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>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, Clause 33, 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>		
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>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.		
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>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
<i>Salvinia - 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.
<i>Sea spurge - 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>		
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>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>		
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>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
<i>Cat's claw creeper - Dolichandra unguis-cati</i>	
<ul style="list-style-type: none"> 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. <p><i>The following legislative requirement also applies: Mandatory Measure (Division 8, Clause 33): A person must not move, import into the State or sell.</i></p>	<ul style="list-style-type: none"> 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.
<i>Cabomba - Cabomba caroliniana</i>	
<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><i>The following legislative requirement also applies: Mandatory Measure (Division 8, Clause 33): A person must not move, import into the State or sell.</i></p>	<ul style="list-style-type: none"> The plant should be fully and continuously suppressed and destroyed Implement quarantine and/or hygiene protocols.
<i>Giant reed – Arundo donax</i>	
<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. 	<ul style="list-style-type: none"> The plant should be fully and continuously suppressed and destroyed Implement quarantine and/or hygiene protocols.
<i>Green cestrum - Cestrum parqui</i>	
<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> The plant should be fully and continuously suppressed and destroyed on grazing land Implement quarantine and/or hygiene protocols.
<i>Ludwigia - Ludwigia peruviana</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. Local Control Authority is notified if the plant is found on the land. 	<ul style="list-style-type: none"> 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, Brazilian 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>Heimerocallis 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>Raphiolepis indica</i>	Environment
Japanese climbing Fern	<i>Lygodium japonicum</i>	Environment
Japanese hawthorn, Yeddo hawthorn	<i>Raphiolepis 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>Crocsmia 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</i> and <i>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 – Habitat Compensation Plan

Appendix F

Construction Flora and Fauna Management Sub-plan

Habitat Compensation Plan

M12 Motorway – Central





January 2025

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Document control

File Name	Appendix B03 Flora and Fauna MP
Title	M12 Central CEMP: Appendix B3 Construction Flora and Fauna Management Sub-plan Appendix F - Habitat Compensation Plan
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Approval and authorisation

Plan reviewed by:	Plan endorsed by:
	
Seymour Whyte Environmental Site Representative	Seymour Whyte Project Manager
18/01/2025	18/01/2025
	

Revision history

Revision	Date	Description
A	18/02/2022	First draft for TfNSW review
B	29/04/2022	Updated in response to TfNSW review
C	29/06/2022	Updated in response to TfNSW review
D	27/07/2022	Updated in response to TfNSW and ER review
E	18/07/2023	Updated in response to OCEMP review
F	18/01/2025	Updated in response to OCEMP review

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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	Former Commonwealth Department of Agriculture, Water and the Environment (now Commonwealth Department of Climate Change, Energy, Environment and Water)
dbh	diameter breast height
DCCEEW	Commonwealth Department of Climate Change, Energy, Environment and Water
DECCW	Former NSW Department of Environment, Climate Change and Water
Division 5.2 Approval	Approval issued by the NSW Minister for Planning and Public Spaces for the M12 Motorway
DPE	Former NSW Department of Planning and Environment
DPHI	NSW Department of Planning, Housing and Infrastructure (formerly NSW DPE which has now been split into NSW DCCEEW and NSW DPHI)
DPI	NSW Department of Primary Industry
DPIE	Former NSW Department of Planning, Industry and Environment (now NSW Department of Planning and Environment)
EAD	Environmental Assessment Documentation
EEC	Endangered Ecological Community
EES	Former NSW Environment, Energy and Science group
EIS	Environmental Impact Statement

<p>Environmental Assessment Documentation</p>	<p>The set of documents that comprise the Division 5.2 Approval:</p> <ul style="list-style-type: none"> • Roads and Maritime Services (October, 2019) M12 Motorway, Environmental Impact Statement (EIS) • Transport for NSW (October, 2020) M12 Motorway, Submissions Report (the Submissions Report) • Transport for NSW (October, 2020) M12 Motorway, Amendment Report (AR) • Transport for NSW (December, 2020) M12 Motorway, Amendment Report submissions report (ARSR) • Transport for NSW (March, 2021) The M12 Motorway Amendment Report Submissions Report – Amendment (ARSR amendment) • WSP (October, 2021) M12 Motorway – West Package Detailed Design Consistency Assessment • GHD (October, 2021) M12 Motorway – Central Package Detailed Design Consistency Assessment • Arcadis (June, 2022) M12 Motorway – Sydney Water Crossings Consistency Assessment • Arcadis (July, 2022) M12 Motorway – Design Boundary Changes Consistency Assessment • Arcadis (August, 2022) M12 Motorway – Minor Consistency Assessment for Proposed Change to the M12 Motorway Project (M12 Central) • Arcadis (rSeptember, 2023) M12 Motorway – Devonshire Road Temporary Roundabout Consistency Assessment • WSP (September, 2023) M12 Motorway – Elizabeth Drive Connections Consistency Assessment • TfNSW (September, 2023) M12 Motorway – Minor Consistency Assessment M12 West demolition of structures at 752 Luddenham Road • TfNSW (October, 2023) M12 Motorway – Minor Consistency Assessment M12 East AF9 Power Supply • TfNSW (October, 2023) M12 Motorway – Minor Consistency Assessment M12 East Cecil Road Laydown Area • TfNSW (October, 2023) M12 Motorway – Minor Consistency Assessment M12 East Temporary Construction Signage • Arcadis (December, 2023) M12 Motorway – East Site 48, 50 and 51 Boundary Changes Minor Consistency Assessment • Arcadis (January, 2024) M12 Motorway – Minor Consistency Assessment M12 Central Water Tower Access Road <p>The documents that comprise the EPBC referral:</p>
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Abbreviations	Expanded text
	<ul style="list-style-type: none"> Submission #3486 – The M12 Motorway Project between the M7 Motorway, Cecil Hills and The Northern Road, Luddenham, NSW Notification of referral decision and designated proponent - controlled action; date of decision 19 October 2018; ID: 2018-8286.
EPBC Act	<i>Environmental Protection and Biodiversity Conservation Act 1999</i>
EPBC referral	A Proponent must refer a proposed action to the Australian Government Minister for the Environment (the Minister) for assessment, if it has, will have, or is likely to have a significant impact on the world heritage values of a declared World Heritage property, or is likely to have a significant impact on the National Heritage values of a National Heritage place.
Exclusion zones	Exclusion zones are areas of environmental importance (e.g. threatened vegetation or heritage items) that need to be protected. These exclusion zones are defined as no-go areas and are to be protected for the duration of construction in that particular footprint area.
ER	Environmental Representative
ESM	TfNSW Environment and Sustainability Manager
ESR	Environmental Site Representative (Seymour Whyte)
EWMS	Environmental Work Method Statements
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.
HCP	Habitat Compensation Plan
OCEMP	Overarching Construction Environmental Management Plan
NSW DCCEEW	NSW Department of Climate Change, Energy, the Environment and Water (formerly NSW DPE)
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 Plan (CFFMP) which forms part of the Construction Environmental Management Plan (CEMP) for the M12 Central package.

This HCP has been prepared to detail the requirements for replacement and compensation for habitat loss on the M12 Central package and incorporates both a Hollow Replacement Strategy and a Habitat and Timber Reuse Disposal plan.

1.2 Background and M12 Central package description

Refer to Section 1.2 of the CFFMP for M12 Central package background and description.

1.3 Importance of hollows to fauna

The Project Environmental Assessment Documentation identified that 38 hollow bearing trees would be removed during the construction of the M12 Central package. Hollow bearing trees in Woodland and Riparian Forest provide important habitat for fauna. Four threatened hollow-dependent microbat species were detected during surveys for approval of the Project. They were:

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

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

Threatened owls that rely on hollows for breeding have been detected within 10 kilometres of the M12 Central package and common mammals and birds would also depend on these hollows within the M12 Central package 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

This Procedure applies to the construction of the M12 Central package.

This Procedure forms part of the M12 Central package CEMP and has been prepared in accordance with the overarching Habitat Compensation Plan Framework presented in the M12 Motorway Overarching Construction Flora and Fauna Management Plan (OCFFMP).

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 M12 Central package.

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 M12 Central package 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 M12 Central package.

3 Environmental requirements

3.1 Relevant legislation and guidelines

3.1.1 Legislation

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

3.1.2 Additional approvals, licences, permits and requirements

Refer to Appendix A1 of the CEMP.

3.1.3 Guidelines

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

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

3.2 Revised Environmental Management Measures

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

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

REMM No.	Requirement	Reference
B2	A Habitat Compensation Plan (HCP) will be prepared and implemented as part of the CFFMP for the project.	This HCP
	The HCP will target those species that will be impacted by the loss of hollows.	Section 4.2
	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 8

4 Existing Environment

4.1 Threatened Fauna

Threatened fauna identified within and in proximity to the M12 Central package construction boundary are outlined in Section 4.1.4 of the CFFMP.

4.2 Hollow-dependent fauna

The EIS BDAR identified a range of hollow dependant species that will be impacted by the vegetation clearing on the M12 Central package including:

- Large parrots - Sulphur-crested Cockatoo, Little Corella and Southern Boobook
- Small / Medium parrots – Red-rumped Parrot, Eastern Rosella, Rainbow Lorikeet
- Brush tailed possum
- Sugar glider
- Microbats.

Hollow-bearing trees in Woodland and Riparian Forest habitats are assumed to provide roosting habitat for the 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.

4.3 Inventory of hollows within the M12 Central package boundary

TfNSW have completed a Tree Surveys during the EIS, for the Amendment Report and in 2021-22 of the Project area including a ground based visual tree hollow inventory by a suitably qualified ecologist. The 2021-22 data set was reviewed by an ecologist for Seymour Whyte to provide an indication on the number of hollow resources within the requiring replacement for the M12 Central Package. The 2021-22 tree survey was used due to it being more detailed and more recent.

This data set will be reviewed during clearing in accordance with Section 5.1.

4.4 Habitat and timber reuse plan

The clearing of vegetation for the M12 Central package provides an opportunity to salvage scarce natural resources in the form of coarse woody debris that can be used in habitat reinstatement or restoration projects within the project corridor, or by natural resource management agencies off site.

TfNSW have completed a Tree Survey of the Project area. This data set was reviewed to provide an estimate of the available coarse woody debris that is likely to be generated by the M12 Central clearing activities.

TfNSW completed preliminary consultation prior to the award of the M12 Central Package with a range of stakeholders including:

- National Parks and Wildlife Service
- Western Sydney Parklands
- Penrith City Council
- Fairfield City Council
- Liverpool Council
- Soil Conservation Service
- DPI Fisheries
- OzFish Unlimited
- Taronga Zoo.

In May 2022, Seymour Whyte contacted Soil Conservation Service, Western Sydney Parklands, DPI Fisheries, OzFish and Taronga Zoo to review opportunities for timber reuse from the M12 Central project.

The Soil Conservation Service have identified at least one riverbank stabilisation project at Camden that could receive approximately 250 logs and 300 pins (200-300mm diameter x 4-6m length). Based on an initial review of the timber resources on the M12 Central Project, this project could exceed the timber resources available from the M12 Central project.

Western Sydney Parklands area also interested in logs for habitat features and possibly mulch, however will be subject to availability of suitable stockpile areas.

The final details of the timber reuse will be subject agreement from the Stakeholder and TfNSW prior to commencement of transport. A site-specific Habitat and Timber Reuse Disposal plan will be prepared as part of the agreement to document agreed number of logs, transportation timing and logistics and stockpiling arrangements and the recipient site.

Taronga Zoo are interested in collection of leaf material for koala feed and Seymour Whyte will facilitate this collection prior to the felling of the trees.

5 Pre-clearing surveys

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

5.1 Surveys of hollow-bearing trees within the M12 Central package boundary

During the pre-clearing surveys, the following information will be collected on hollow-bearing trees within the M12 Central package 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).

5.2 Inventory of hollows within the M12 Central package boundary

The Project Ecologist will develop an inventory of hollows within the M12 Central package 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 M12 Central package. 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 M12 Central package boundary
- Number of hollows within the Project boundary
- Hollow-bearing tree density/hectare
- Hollow density/hectare.

5.3 Suitability of tree hollows

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

5.4 Surveys of coarse woody debris within the M12 Central package boundary

The Project Ecologist will confirm the presence, suitability and location of coarse woody debris within the M12 Central package 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 M12 Central package boundary.

5.5 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.

5.6 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 M12 Central package 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.

6 Compensatory Requirements

6.1 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 and TfNSW Environment Staff 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 salvage and relocation of suitable salvaged hollows will be prioritised as the preferred source of hollow replacements. 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.

6.2 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.

7 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 M12 Central package.

In order of preference, Seymour Whyte will use a combination of salvaged hollows, trunk hollows and nest boxes on the M12 Central project as described below. Based on the initial review of the hollow bearing trees data provided in the TfNSW Survey, Seymour Whyte will install 50 nest boxes (combination of salvaged hollows and net boxes) and 25 bored hollows. Hollows will be provided in a range of sized and with suitable entrances for the target species (refer to Section 4.2) and approximately 15% of boxes will be designed specifically for micro bats species. Bored Hollows will be provided for replacement of small and medium hollows only.

A detailed plan for the number and type of hollows (salvaged hollow, nest box or bored hollow) to be installed at nominated recipient sites will be provided to TfNSW following completion of the pre-clearance surveys, including the method outlined in Section 5.6, and prior to installation of hollows.

7.1 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 areas for hollow replacements to be located in.

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 and TfNSW Environment Staff to meet the specific objectives and needs for the target species and location.

7.2 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).

Seymour Whyte have procured approximately 20 salvaged hollows for the M12 Central project that have been prepared for installation as replacement hollows.

7.2.1 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).

7.2.2 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.

7.3 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.

An alternate to 'chainsaw hollows' is the technique of boring holes into the tree creating a cavity.

7.3.1 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. Seymour Whyte have engaged a sub-contractor that will provide 25 bored hollows prior to clearing.

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.

7.3.2 Installation

To prevent tree failures and for safety considerations, trunk hollows will only be created in mature trees >40cm trunk diameter. An initial tree health assessment will be conducted by an adequately qualified arborists (Australian Qualifications Framework (AQF) Level 5 or equivalent).

Figure 7-1 provides a visual representation of the procedure for making trunk hollows using the chain saw method. Figure 7-2 illustrates hollows created using the bored method.

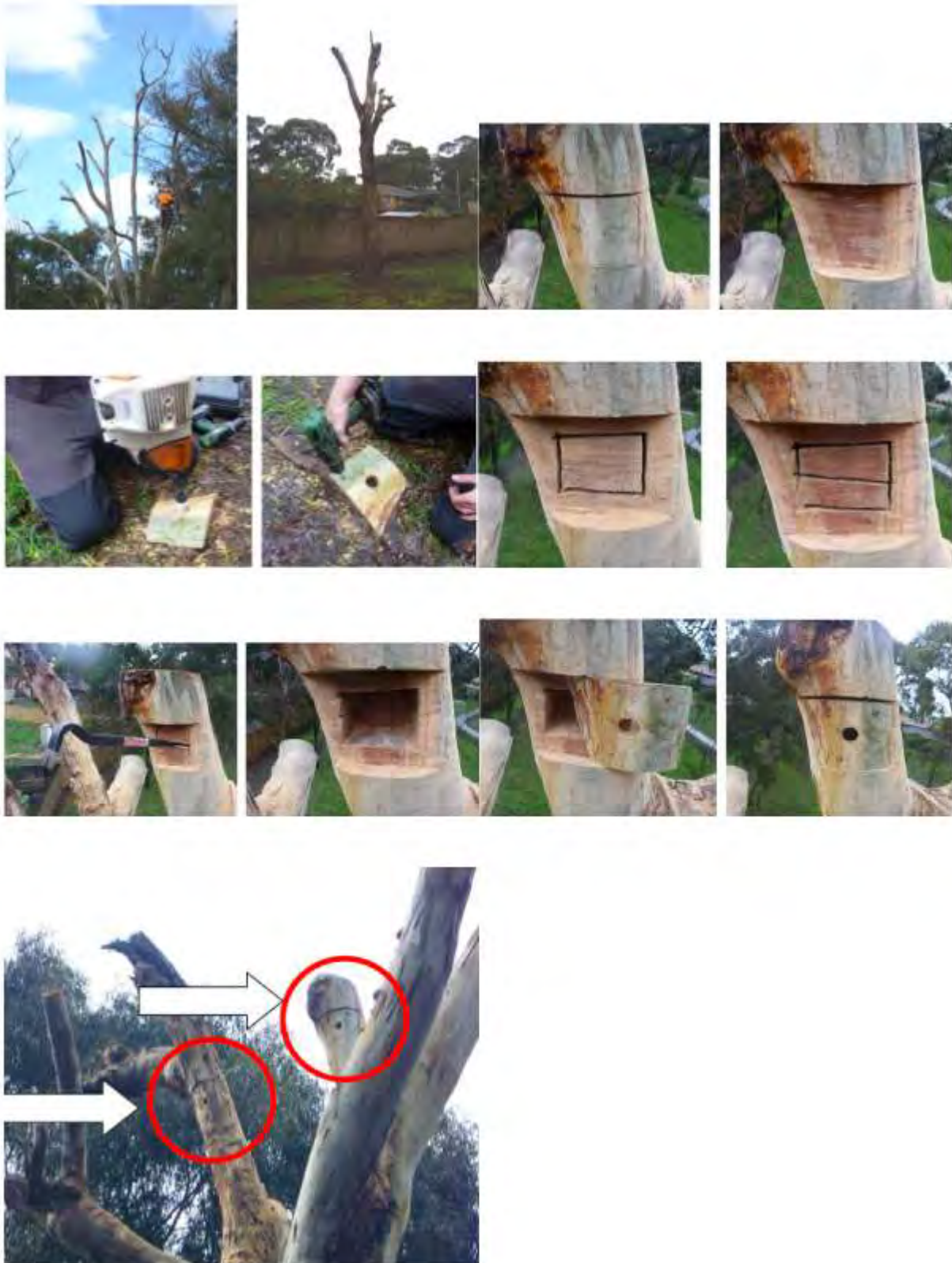


Figure 7-1: Procedure for the installation of trunk hollows (The University of Melbourne, 2013).



Figure 7-2: Hollow replacement using the bored method.

7.4 Nest boxes

Nest boxes can be used to augment hollow replacement, after the above strategies (salvaged and trunk hollows) have been investigated. Seymour Whyte have procured approximately 30 nest boxes for the M12 Central project in a range of sizes for the target species.

7.4.1 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.

7.4.2 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.

7.5 Distribution and position of hollow replacements

7.5.1 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.

7.5.2 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 M12 Central package 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 M12 Central package with consideration to available habitat within the area.

7.5.3 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.

7.5.4 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.

7.6 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.

8 Coarse woody debris requirements

8.1 Re-use of coarse woody debris and bushrock

Coarse woody debris and bushrock will be reused on site where possible. Table 8-1 shows how woody debris is classified and suggests possible uses.

Table 8-1: 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, suitability of the trees identified from the Tree Survey would be reviewed during pre-clearing surveys by the Project Ecologist. Seymour Whyte will consult with the stakeholders, which TfNSW have already consulted with, to determine whether this material can be used by others in habitat enhancement, beneficial re-use and rehabilitation work before pursuing other disposal options. This will include, however not be limited to, 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).

Based on the consultation there is keen interest in receiving the coarse woody debris from Soil Conservation Service and Western Sydney Parklands. Seymour Whyte will prepare the logs and root balls based on specifications of receiving stakeholder and stockpile the materials within the project alignment or at the ancillary facilities until it is ready for delivery to the stakeholders nominated site.

The tree crowns (smaller branches and leaves) of native species will be made available for seed collection (refer to Section 6.13 of the CFFMP) and then mulched and stockpiled on site for use in landscape planting. Mulch in excess of the quantity required for landscape planting will not be stockpiled on site and Seymour Whyte will offer to stakeholders or the community. Prior to removal off site, the Project Ecologist will examine the material prior to clearing, as per the EPA Mulch Order

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.

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.

Bush rock with a b-max >1m will be marked during pre-clearing surveys. If rock of this size is identified that can be salvaged, Seymour Whyte will consultation with TfNSW regarding opportunities for habitat replacement with the project corridor. Consultation will be completed with external stakeholders if the quantity of bush rock exceeds what can be placed within the project corridor.

8.2 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 M12 Central package area, therefore, providing habitat for similar fauna species
- Avoid creating conditions where the distribution, total volume, age, species or size class, exceeds the benchmark values for that PCT
- Avoid the spread of any weeds or pathogens that may be in the soil 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.).

9 Compliance management

9.1 Roles and responsibilities

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

9.2 Training

All site personnel (including sub-Construction Contractor) will undergo M12 Central package specific induction training relating to flora and fauna management issues prior to the commencement of work on site. The induction training will address relevant elements related to the implementation of this HCP.

Further details regarding staff induction and training are provided in Section 7.4 of the CFFMP.

9.3 Monitoring and inspections

9.3.1 Overview

The ESR will be responsible for ensuring that monitoring of all compensatory habitat (hollows and coarse woody debris locations) is undertaken by the Project Ecologist.

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.

9.3.2 Hollows

Each hollow replacement will be monitored for a period of time that reflects the overall objective of the artificial hollow placement as determined by the Project Ecologist upon the completion of pre-clearing surveys. The monitoring program will coincide with nesting seasons for target species and occur at least annually

The ESR will ensure that hollow replacements are checked by the Project Ecologist every six months during the construction phase of the M12 Central package. However, the timeframe shall be updated and informed by Ecologist advice following pre-clearing surveys and an understanding of the target species nesting seasons.

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

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

9.4 Maintenance

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

- Repairing hollow replacements
- Re-attaching 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.

9.5 Reporting

9.5.1 Pre-clearing survey report

The ESR 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 B of the CFFMP). The pre-clearing survey report will also include the following details in relation to habitat compensation:

- Attributes of the sites to be cleared (as outlined in Section 4 and 6.2)
- Attributes of the receiving sites (as outlined in Section 4 and 6.2)
- Species identified during pre-clearing surveys.

The pre-clearing survey report will inform the Construction Contractor stage specific HCP.

9.5.2 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.

10 Review and improvement

10.1 Performance Measures

10.1.1 Hollow replacement

The effectiveness of the hollow replacement program should be assessed against the performance criteria listed in Table 10-1.

Table 10-1: 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.

10.1.2 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.

10.2 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 8.1 of the CFFMP.

References

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

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

The University of Melbourne. (2013), *A practical solution for habitat creation*.

<https://blogs.unimelb.edu.au/sciencecommunication/2013/10/27/a-practical-solution-for-habitat-creation/>. Accessed 21 July 2021

Appendix A – Fauna Group Nest Box Requirements

The nest box requirements for each fauna group are provided below. Table 10-2 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 10-2: 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 – Snag Management Plan

Appendix G

Construction Flora and Fauna Management Sub-plan

Snag Management Plan

M12 Motorway – Central





January 2025

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Document control

File Name	Appendix B03 Flora and Fauna MP
Title	M12 Central CEMP: Appendix B3 Construction Flora and Fauna Management Sub-plan Appendix G – Snag Management Plan
Document Number (Teambinder)	M12CCO-SYW-ALL-EN-PLN-000006

Approval and authorisation

<i>Plan reviewed by:</i>	<i>Plan endorsed by:</i>
	
<i>Seymour Whyte Environmental Site Representative</i>	<i>Seymour Whyte Project Manager</i>
<i>18/01/2025</i>	<i>18/01/2025</i>
	

Revision history

Revision	Date	Description
A	18/02/2022	First draft for TfNSW review
B	29/04/2022	Updated in response to TfNSW review
C	29/06/2022	Updated in response to TfNSW review
D	27/07/2022	Updated in response to TfNSW and ER review
E	19/07/2023	Updated in response to OCEMP update.
F	18/01/2025	Updated in response to OCEMP update

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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	Former Commonwealth Department of Agriculture, Water and the Environment (now Commonwealth Department of Climate Change, Energy, Environment and Water)
DCCEEW	Commonwealth Department of Climate Change, Energy, Environment and Water
DPHI	NSW Department of Planning, Housing and Infrastructure (formerly NSW DPE which has now been split into NSW DCCEEW and NSW DPHI)
DPIE	Former NSW Department of Planning, Industry and Environment
EES	Former NSW Environment, Energy and Science Group (now EHG)
EHG	Environment and Heritage Group

<p>Environmental Assessment Documentation</p>	<p>The set of documents that comprise the Division 5.2 Approval:</p> <ul style="list-style-type: none"> • Roads and Maritime Services (October, 2019) M12 Motorway, Environmental Impact Statement (EIS) • Transport for NSW (October, 2020) M12 Motorway, Submissions Report (the Submissions Report) • Transport for NSW (October, 2020) M12 Motorway, Amendment Report (AR) • Transport for NSW (December, 2020) M12 Motorway, Amendment Report submissions report (ARSR) • Transport for NSW (March, 2021) The M12 Motorway Amendment Report Submissions Report – Amendment (ARSR amendment) • WSP (October, 2021) M12 Motorway – West Package Detailed Design Consistency Assessment • GHD (October, 2021) M12 Motorway – Central Package Detailed Design Consistency Assessment • Arcadis (June, 2022) M12 Motorway – Sydney Water Crossings Consistency Assessment • Arcadis (July, 2022) M12 Motorway – Design Boundary Changes Consistency Assessment • Arcadis (August, 2022) M12 Motorway – Minor Consistency Assessment for Proposed Change to the M12 Motorway Project (M12 Central) • Arcadis (September, 2023) M12 Motorway – Devonshire Road Temporary Roundabout Consistency Assessment • WSP (September, 2023) M12 Motorway – Elizabeth Drive Connections Consistency Assessment • TfNSW (September, 2023) M12 Motorway – Minor Consistency Assessment M12 West demolition of structures at 752 Luddenham Road • TfNSW (October, 2023) M12 Motorway – Minor Consistency Assessment M12 East AF9 Power Supply • TfNSW (October, 2023) M12 Motorway – Minor Consistency Assessment M12 East Cecil Road Laydown Area • TfNSW (October, 2023) M12 Motorway – Minor Consistency Assessment M12 East Temporary Construction Signage • Arcadis (December, 2023) M12 Motorway – East Site 48, 50 and 51 Boundary Changes Minor Consistency Assessment • Arcadis (January, 2024) M12 Motorway – Minor Consistency Assessment M12 Central Water Tower Access Road <p>The documents that comprise the EPBC referral:</p>
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Abbreviations	Expanded text
	<ul style="list-style-type: none"> Submission #3486 – The M12 Motorway Project between the M7 Motorway, Cecil Hills and The Northern Road, Luddenham, NSW Notification of referral decision and designated proponent - controlled action; date of decision 19 October 2018; ID: 2018-8286.
EPBC Act	<i>Environmental Protection and Biodiversity Conservation Act 1999</i>
EPBC referral	A Proponent must refer a proposed action to the Australian Government Minister for the Environment (the Minister) for assessment, if it has, will have, or is likely to have a significant impact on the world heritage values of a declared World Heritage property, or is likely to have a significant impact on the National Heritage values of a National Heritage place.
ER	Environmental Representative
ESM	TfNSW Environment and Sustainability Manager
ESR	Environmental Site Representative (Seymour Whyte)
EWMS	Environmental Work Method Statements
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.
FM Act	<i>Fisheries Management Act 1994</i>
NSW DCCEEW	NSW Department of Climate Change, Energy, the Environment and Water (formerly NSW DPE which has now been split into NSW DCCEEW and NSW DPHI)
OCEMP	Overarching Construction Environmental Management Plan
Project, the	M12 Motorway Project
Snag(s)	A snag is considered to be any piece of woody debris that is both greater than 3 metres in length and 300 mm in diameter, or any rock larger than 500 mm in two dimensions, that is located within a waterway (either fresh, estuarine or marine) and is, or would be, wholly or partly submerged at a 'bank-full' flow level or highest astronomical tide level.
TfNSW	Transport for New South Wales
WIRES	NSW Wildlife Information Rescue and Education Service

1 Introduction

1.1 Purpose

Snag removal associated with construction of the M12 Central package will result in impacts to aquatic and terrestrial fauna. This Snag Management Plan has been prepared for snag removal and relocation at Kemps Creek and South Creek in accordance the *Policy and guidelines for fish habitat conservation and management* (DPI Fisheries, 2013) and the overarching Snag Management Plan presented in the M12 Motorway Overarching Construction Flora and Fauna Management Plan.

The purpose of this Plan is to outline how environmental control measures for the relocation of snags, and identification of suitable locations for reuse of snags to be removed, will be determined prior to construction following additional field work undertaken by the Project Ecologist.

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 South Creek and Kemps Creek, to be implemented throughout the construction of the M12 Central package.

This Snag Management Plan forms part of the M12 Central package CEMP. It is related to the coarse woody debris guidelines within the Habitat Compensation Plan (HCP) (refer Appendix F of the CFFMP) for the M12 Central package, but relates to coarse woody debris in the aquatic environment.

Implementation of this plan will be informed by additional field work undertaken by the Project Ecologist and preparation of additional documentation as outlined in this Plan.

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 M12 Central package has the potential to require

the removal of snags and therefore has the potential to impact habitat for aquatic and semi-aquatic organisms. The objective of this Snag Management Plan is to ensure that the M12 Central package does not result in an overall loss of habitat features within South Creek and Kemps Creek.

1.5 Roles and Responsibilities

The ESR is responsible for ensuring this M12 Central package specific Snag Management Plan is implemented. This Plan will be reviewed by the ESM (or delegate) prior to commencement of any de-snagging or re-snagging activities.

The following specialised roles are required for the management of snags during construction of the M12 Central package:

- The Project Ecologist will undertake additional field work in conjunction with pre-clearing surveys to ascertain snags to be removed and relocated
- The ESR, advised by the Project Ecologist, will be responsible for updating this M12 Central package 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 M12 Central package.

1.6 Consultation

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

Seymour Whyte 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 legislations and guidelines:

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

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

2.2 Snag management

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

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

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

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

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

3 Methodology

3.1 Additional field work

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

Upon the completion of additional field work, the Project Ecologist will prepare a Snag Report including 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.

3.1.1 Re-snagging

In the event that re-snagging needs to occur, the Project Ecologist is to advise on the appropriate sourcing of snags. The Project 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 Ecologist's Snag Report will include the following information regarding the introduction of new snag following additional field work:

- Source – site won timber. This may be from existing snags or from felled timber.
- Wood type - large hardwood native trees (i.e. *Eucalyptus* spp.). This will generally be *Eucalyptus teriticornis* and *E. amplifolia*.
- Size classes – >300 diameter, >3m in length
- Location of placement – within the construction project boundary as determined on site by the Project Ecologist.
- Orientation – logs will be orientated to direct water downstream back towards the centre of the channel to minimise bank scour erosion.
- Method of installation – installation will be with an excavator and possibly assistance from a crane depending on the size of the snag.

The site selection process for re-snagging will take into account the existing woody habitat amount, complexity and location within the channel, identification of 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 project's 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 prioritised to avoid additional clearing of native vegetation.

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

3.1.3 Preparation of a stage specific Snag Management Plan

Upon the completion of additional field work by the Project Ecologist, this M12 Central package Snag Management Plan will be updated to identify and document the proposed actions for each individual snag identified.

The 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 revised M12 Central Snag Management Plan has been approved by TfNSW.

3.2 Commencement of de-snagging or re-snagging activities

3.2.1 Clearing and grubbing plan

Prior to the commencement of clearing activities, Seymour Whyte will prepare and submit a Site Specific Clearing and Grubbing Plan, Environmental Work Method Statement (Annexure G40/D) and the Project Ecologist's report of the pre-clearing survey under the TfNSW QA Specification G40 Clause 2.4. The Site-Specific Clearing and Grubbing Plans may for works around Kemps and South Creek will include details for the additional field works under this Plan (Section 3.1) and the proposed measures for avoiding or collection of snags and where relevant, re-snagging.

3.2.2 Environmental Works Method Statement

Seymour Whyte 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 for de-snagging and/or re-snagging activities will include details on snag relocation, including individual snag, methods and machinery to be used and the season or time period for this to be carried out.

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

EWMS incorporate appropriate mitigation measures and controls, including those identified in the relevant Sub-plans. They also identify key activity specific 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 simple written instructions. A template EWMS is provided in Appendix A8 of the CEMP.

3.2.3 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 M12 Central package are discussed below. The appropriate method for installation will be determined based on the findings from 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 prevent 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.

3.2.4 Protection of riparian vegetation

Protective measures will be implemented during the removal and installation of snags to avoid damaging or destroying vegetation and habitat which have been marked or otherwise identified for preservation. These measures will be detailed in the EWMS following the additional field surveys and site-specific considerations. General measures for the protection of vegetation are outlined in Section 2.5 of the Vegetation Clearing Procedure (refer Appendix C of the CFFMP).

3.2.5 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, the Fauna Handling and Rescue Procedure in Appendix C of the CFFMP 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.

3.2.6 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 beds are exposed and to provide for better access to sites. Water-based re-snagging is possible during most flow scenarios.

In addition, re-snagging is most likely to occur during any channel reinstatement works, such as in conjunction with the removal of in-stream working platforms. Where this is the case, suitable logs for re-snagging will be set aside and stored during the clearing operation for later re-snagging.

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 Project Ecologist.

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 M12 Central package 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 details of the additional field surveys for snags in South Creek and Kemps Creek will be reported in the Ecologist's pre-clearing survey report outlined in Section 3.1 of the Vegetation Clearing Procedure (Appendix B of the CFFMP). The pre-clearing survey will report on 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 findings of the post-relocation surveys will be included within the Post-clearing Report outlined in Section 3.2 of the Vegetation Clearing Procedure (refer Appendix B 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 M12 Central package. 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 – Farm Dewatering Management Plan

Appendix H

Construction Flora and Fauna Management Sub-plan

Farm Dam Dewatering Procedure

M12 Motorway – Central





January 2025

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Document control

File Name	Appendix B03 Flora and Fauna MP
Title	M12 Central CEMP: Appendix B3 Construction Flora and Fauna Management Sub-plan Appendix H – Farm Dam Dewatering Procedure
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08/01/2025	18/01/2025
	

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A	18/02/2022	First draft for TfNSW review
D	29/06/2022	Updated document control page for CSWMP Rev D
E	19/07/2023	Updated in response to OCEMP review
F	18/01/2025	Updated in response to OCEMP 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>
ESM	TfNSW Environment and Sustainability Manager
ESR	Environmental Site Representative (Seymour Whyte)
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 Central package 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 M12 Central package .

This Procedure forms part of the M12 Central package CEMP and has been prepared in accordance with the overarching Farm Dam Dewatering Procedure presented in the M12 Motorway Overarching Construction Flora and Fauna Management Plan.

Water quality and potential reuse of discharged water will be managed in accordance with the M12 Central package Dewatering Management Plan and Water Reuse Strategy presented in Appendix C and Appendix F of the Construction Soil and Water Management Plan (CSWMP).

1.4 Induction / training

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

An Environmental Work Method Statement (EWMS) will be prepared in accordance with this Procedure to manage and control dewatering activities in a manner that does not cause harm to the environment (refer to Section 3.1).

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

1.5 Roles and responsibilities

The Environmental Site Representative (ESR) 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 reviewed annually or as required in accordance with the continuous improvement process described in Section 8 of the CFFMP.



Updates of the procedure will be reviewed by the Project Ecologist and Transport for NSW (TfNSW) Environment and Sustainability Manager (ESM) (or delegate) prior to commencement of construction.

2 Environmental Requirements

2.1 Legislation and guidelines

This Procedure 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

Seymour Whyte 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 ESR and reviewed by the TfNSW Project Manager, TfNSW ESM (or delegate) and Environmental Representative (ER) before commencement of the dewatering activity.

EWMS incorporate appropriate mitigation measures and controls, including those identified in the relevant Sub-plans. They also identify key activity specific 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 simple written instructions. A template EWMS is provided in Appendix A8 of the CEMP.

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 M12 Central package 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 Appendix C 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 ESR who will confirm that the water quality criteria outlined in the Appendix C of the CSWMP are met prior to reusing or discharging.

4 Records

Accurate records will be maintained substantiating all construction activities associated with the M12 Central package or relevant to the conditions of approval, including measures taken to implement this Procedure.

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 report 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.

Appendix I – Native Fauna Mortality Video Surveys Methodology

Appendix I

Construction Flora and Fauna Management Sub-plan

Native Fauna Mortality Video Surveys Procedure

M12 Motorway – Central





January 2025

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File Name	
Title	M12 Central CEMP: Appendix B3 Construction Flora and Fauna Management Sub-plan Appendix I – Native Fauna Mortality Video Surveys Methodology

Approval and authorisation

Plan reviewed by:	Plan endorsed by:
	
Seymour Whyte Environmental Site Representative	Seymour Whyte Project Manager
18/01/2025	18/01/2025
	

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A	29/04/2022	First draft for TfNSW review
D	27/07/2022	Updated document control page for CFFMP Rev D
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Glossary/Abbreviations

Abbreviations	Expanded Text
CEMP	M12 Central Construction Environment Management Plan
CFFMP	Construction Flora and Fauna Management Plan
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
ESM	TfNSW Environment and Sustainability Manager
ESR	Environmental Site Representative (Seymour Whyte)
Project, the	M12 Motorway Project
TfNSW	Transport for New South Wales

1 Introduction

1.1 Purpose

Vehicle strikes are a major cause of fauna injury and mortality during construction, therefore, mortality video surveys on the haulage roads (public and internal) will be undertaken. Data captured from the surveys will be maintained in a Native Fauna Mortality Register and provided to TfNSW.

The purpose of the native fauna mortality video surveys is to undertake rapid assessment of fauna mortality on the haulage roads to inform adaptive management strategies where practicable to reduce the incidence of native fauna mortality in proximity to the M12 Central package.

1.2 Scope

This Native Fauna Mortality Video Surveys Procedure (the Procedure) describes the methods Seymour Whyte will use to complete fauna mortality video surveys on the haulage roads (public and internal) for the M12 Central package prior to and during construction, including:

- Monitoring procedure
- Locations where surveys will be completed
- Monitoring schedule
- Reporting framework.

This Procedure forms part of the M12 Central package CEMP.

1.3 Induction / training

All site personnel involved in the fauna mortality video surveys will be trained and inducted in this Methodology. The induction will include descriptions of the monitoring procedures and safety considerations.

1.4 Roles and responsibilities

The Environmental Site Representative (ESR) is responsible for ensuring this M12 Central package specific Native Fauna Mortality Video Surveys Procedure is implemented.

A Project Ecologist experienced in the identification of fauna will be required to undertake the surveys, analyse the data and report the findings of the surveys.

1.5 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 Monitoring Procedure

A vehicle mounted with video cameras and a GPS tracking device will drive along the entire length of the haulage roads (public and internal) to record dead wildlife (road kill). The vehicle will be driven by the Project Ecologist with experience in the identification of fauna.

2.1 Vehicle hardware

The monitoring vehicle will be equipped with the following cameras and GPS:

- A dashcam will be mounted on the windscreen within the vehicle that will record audio signals and GPS position on the video stream. The purpose of the dashcam is to:
 - Allow the spotter to record an audio cue when a roadkill is spotted on the audit transcript
 - Provide an overview of the road to assist in identifying where the roadkill was observed
 - Provide a GPS stamp when the location is identified that can be used to record the location in a GIS file.
- A 4K (or better) action camera will be mounted on the exterior of the car to provide high quality footage of the road and assist in identifying species from the video footage. The purpose of the action camera is to provide a high-quality video stream that is not possible with a dashcam.
- A GPS streaming device to record the circuit of each monitoring event for verification purposes.

2.2 Monitoring locations

The fauna mortality video surveys will be completed on all approved haulage roads surrounding the M12 Central package, including:

- Elizabeth Drive from Badgerys Creek and the Water Tower Access Road, Cecil Hills
- Clifton Ave from Elizabeth Drive to the Project Corridor
- Salisbury Ave to the Project Corridor
- Mamre Road from Elizabeth Drive to the Project Corridor
- Range Road from Elizabeth Drive to the Project Corridor.

Any changes to the approved haulage roads via an update of the Construction Transport and Traffic Management Sub-plan, will be added to the public road monitoring locations.

As internal access roads are developed, these will be incorporated into the fauna mortality video surveys locations.

2.3 Monitoring methodology

The vehicle mounted with the monitoring cameras and GPS will drive along the Project haulage roads and internal haulage roads as they are developed for use by general vehicles.

Where possible, each survey will start within two hours of sunrise in order to maximise the potential to record road kills before either carrion eating animals or traffic render any road kill unidentifiable.

When a road kill is observed from the vehicle, an audio cue will be given to mark the location on the dashcam camera video. This may include an initial identification or any other comments relevant to the observation.

Where safe to do so (e.g., internal haulage roads), the vehicle may be stopped and a closer visual inspection of the carcass undertaken. This may include taking additional photos or collection of the carcass. If safe access is not possible due to local traffic conditions, the video footage will be reviewed to provide as detailed information as is possible on the carcass.

The timing of fauna mortality video surveys is summarised in Table 2-1.

Table 2-1. Timing of Fauna Mortality Monitoring

Project Phase	Timing of Survey	Location
During clearing operations or dam dewatering	Daily	Haulage roads (public and internal) within 500m of the clearing operations or dam dewatering.
One month following clearing operations	Twice weekly	Haulage roads (public and internal) within 500m of the clearing operations or dam dewatering.
During construction	Monthly	All haulage roads (public and internal).

2.3.1 Animal welfare

Any animals that are found to be injured and not dead will be collected and taken to a licenced Wildlife Carer for rehabilitation (i.e., a WIRES or Sydney Metropolitan Wildlife Service carer), or to a vet to be assessed or humanly euthanised. Where safe to do so, pouches of all injured or deceased marsupials will also be checked for young.

2.4 Data review

The dashcam and action camera video will be reviewed in parallel and x1.5 to x2 speed. The audio cues on the dashcam will assist in identifying road kill recorded during the monitoring.

Where an animal is identified in the video footage, the videos will be passed and a screen grab of the dashcam will be captured with the GPS location of the vehicle at the location of the road kill. A screen grab of the action camera will then be collected to provide a higher quality image of the animal which will allow for the most accurate identification possible. The screen grabs will be saved in a pro forma for each monitoring event.

Road kill fauna will be identified to species level where possible, with reference to field guides. Where there is any doubt to the identification of the carcass, the genus or taxa will be recorded. Where safe to do so, additional photographs of the carcass may be taken to assist in identification/confirmation of the species. Those too seriously damaged to be accurately identified will be recorded as “unknown”.

2.5 Records and Reporting

The results of the video fauna monitoring will be recorded in a 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.

The Native Fauna Mortality Register will be maintained in a GIS format that will allow rapid access to visualise the date, location and species (or highest level of identification) of each fauna mortality. Photographs/screen grabs of each fauna mortality will be compiled to support the GIS register. The GIS will allow trends in fauna mortality to be identified rapidly and mitigation measures to developed or adapted, as required, in consultation with TfNSW.

The GIS streaming files of the haulage routes will be archived with the video footage. They will also be compiled based on date and made available to TfNSW upon request.

The results for the Native Fauna Mortality Register will be provided to TfNSW in the Monthly Progress Report. The results of the fauna video monitoring will be analysed in the Progressive and Post Clearing Reports and a final Mortality Monitoring Report will be prepared upon completion of the construction for the M12 Central package.

Any injury or death of threatened species will be reported to the TfNSW as soon as reasonably possible.



Appendix J – Tree Management Strategy



Appendix J

Tree Management Strategy

M12 Motorway – Central

January 2025







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File Name	Appendix B03 Flora and Fauna MP
Title	M12 Central CEMP: Appendix B3 Construction Flora and Fauna Management Sub-plan Appendix J Tree Management Strategy
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Glossary/ Abbreviations

Abbreviations	Expanded text
ARSR	Amendment Report Submissions Report
CoA	Conditions of Approval
CEMP	Construction Environmental Management Plan
CFFMP	Construction Flora and Fauna Management Sub-plan
EIS	Environmental Impact Statement
ER	Environmental Representative
ESM	TfNSW Environment and Sustainability Manager
ESR	Environment Site Representative (Seymour Whyte)
EWMS	Environmental Work Method Statement
OCEMP	Overarching Construction Environmental Management Plan
QA	Quality Assurance
REMM	Revised Environmental Management Measures
TfNSW	Transport for NSW

1 Introduction

1.1 Purpose

The purpose of this Tree Management Strategy (the Strategy) is to describe measures to minimise tree removal, avoid damage to trees and replace trees where removal cannot be avoided, by Seymour Whyte employees and its subcontractors during construction of the M12 Central package.

1.2 Objective

The objectives of this Plan include:

- minimise tree removal to retain and protect as many trees within the construction footprint as reasonable and feasible
- avoid damage to trees that are to be retained within the construction footprint to ensure the maintenance of health and stability of the trees
- ensure pruning of trees to be carried out by a suitably qualified person
- consider the maintenance requirements and safety standards for retained trees
- Replace trees where removal cannot be avoided.

1.3 Scope

This Tree Management Strategy is an appendix of the Construction Flora and Fauna Management Sub-plan (CFFMP) which forms part of the Construction Environmental Management Plan (CEMP) for the M12 Motorway – Central package.

This Plan has been prepared to address the requirements of the Minister's Conditions of Approval (CoA), Revised Environmental Management Measures (REMMs) listed in the M12 Motorway Environmental Impact Statement (EIS), Amendment Report, and Amendment Report Submissions Report (ARSR), all applicable legislation, Transport for New South Wales (TfNSW) Quality Assurance (QA) Specifications.

1.4 Guidelines and standards

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

- TfNSW QA Specification G40 – Clearing and Grubbing
- TfNSW QA Specification R178 – Vegetation
- Australian Standard AS 4373 Pruning of Amenity Trees
- Australian Standard 4970 – 2009 Protection of Trees.
- WSPT lease agreement (AQ120616).

1.5 Induction / training

All site personnel involved in construction of the M12 Central package will be trained and inducted in this Plan.

Additional training will be provided personnel involved in clearing works. This will include:

- Existence and requirements of this Plan
- Roles and responsibilities under this Plan

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

1.6 Roles and responsibilities

The Environmental Site Representative (ESR) is responsible for ensuring this Plan is effectively implemented, and all site personnel are aware of the requirements of this Plan.

All personnel involved site stabilisation works are responsible for undertaking works in accordance with this Plan.

Assessments of the safety of retained trees must be completed by an adequately qualified arborist (Australian Qualifications Framework (AQF) Level 5 or equivalent).

Pruning will be supervised by a Level 3 AFQ or above qualified arborist.

1.7 Review

This Plan will be reviewed by TfNSW Environment and Sustainability Manager (ESM) (or delegate) prior to commencement of construction.

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

2 Tree protection measures

2.1 Limits of clearing

Clearing will only occur within the limits of clearing shown on the Design Drawings provided by TfNSW. This is provided that the cleared area does not extend beyond the road reserve or the approved project construction boundary (“construction boundary”), as outlined in the EIS as amended by the Amendment Report, or any consistency assessment approved by TfNSW.

The limits of clearing shown on the Design Drawings include the area required for the formation, plus identified areas outside the area to be cleared for the formation which TfNSW has approved for Seymour Whyte’s facilities, the TfNSW’s accommodation, stockpiles, borrow pits, areas for landscape planting where required outside the formation and up to the construction boundary and any other purpose connected with the construction of the M12 Central package.

Nonetheless, clearing outside the formation must be avoided as far as reasonably practicable. The area cleared must be the minimum consistent with the intended use. Clearing in identified exclusion zones is not permitted (refer to Section 2.2).

The limits of clearing 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 B to the CFFMP) and Specification TfNSW G40.

A non-conformance and an environmental incident report (refer to TfNSW G36) will be raised if the exclusion fencing fails to prevent access or damage to protected areas. Immediately notify the Principal and Environmental Representative of such non-conformances.

2.2 Exclusion Zones

Exclusion zones have been defined in the TfNSW design drawings and impacts in these areas are not permitted under the Planning Approval.

Environmental protection area signage on exclusion zone fencing will be installed at regular intervals agreed to by the TfNSW ESM (or delegate). The fencing will only be removed following agreement by the TfNSW ESM (or delegate).

2.3 Vegetation saving areas

TfNSW have identified a number of Vegetation Saving Areas which include important ecological values, and areas identified in the WSPT lease agreement, for tree protection. Impacts in Vegetation Saving Areas are permitted under the Planning Approval and WSPT lease, however only with prior approval from TfNSW.

2.4 Western Sydney Parklands

The Western Sydney Parklands lease agreement (AQ120616) has identified a number of areas for tree protection for mature or hollow bearing native species (standard TPZ regarding compression, drip lines and structural root zones) where possible.

2.5 Assessment of trees to be retained

Hazardous trees (likely to fall onto a road or adjoining property and cause damage) outside the clearing limits should be marked and reported to the ESR. The Project Arborist will assess these trees and inspect with TfNSW. Those trees remaining within the road reserve, but outside the limits of clearing, which the Principal has agreed to be unsound and are likely to fall upon the roadway or onto private property, must be cleared or pruned in accordance with AS 4373.

Any branch, which overhangs the road formation, must be cut back flush with the tree trunk in accordance with AS 4373.

An arboricultural assessment will be prepared for existing trees within the road reserve that are to be retained to identify techniques which can be applied to maximise the trees health and longevity.

3 Construction near trees

3.1 General

Protective measures will be taken during the operations of clearing and road construction to avoid damaging or destroying threatened flora species and trees which have been marked or otherwise identified for preservation. These measures must include but not be limited to:

- fencing around trees clear of the canopy line and adjacent environmentally sensitive and heritage areas in accordance with the flagging protocol in Section 4.2.7 of Vegetation Clearing Procedure (Appendix B of the CFFMP)
- ensuring no materials are stockpiled and no vehicles are parked or operated under the canopy (refer to Figure 3-1).
- avoiding excavation or the placing of fill near any tree without advice from an ecologist
- routing haul roads and access tracks clear of the canopy
- marking of trees for directional felling to avoid damage to environmentally protected areas and exclusion zones.
- Report any tree damage to the Supervisor or ESR as soon as possible. Quick remedial action can prevent long-term damage to the tree.

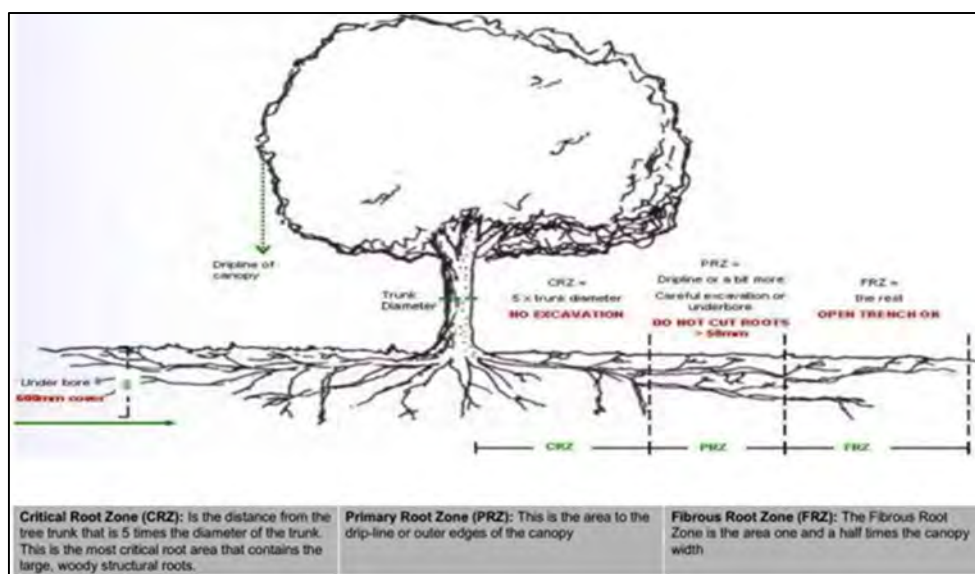


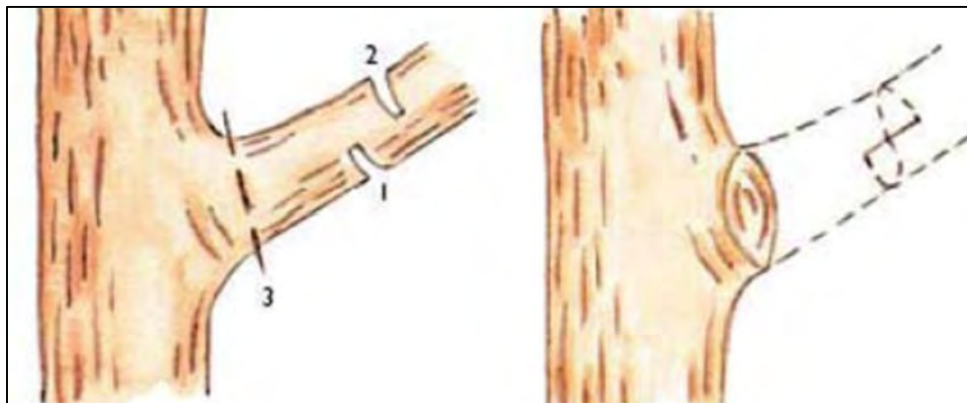
Figure 3-1: Tree root protection zone

3.2 Lopping, pruning or trimming trees

The following instructions are to be followed when lopping, pruning or trimming vegetation to be retained:

- If branch trimming is required for any vegetation to be retained, report to the Foreman or ESR. Figure 2 overleaf indicates the most appropriate method of branch trimming.
- Pruning of limbs must be complete by or supervised by a Level 3 AFQ (or above) qualified arborist.

- Heavy machinery should not be used for pruning or trimming. Appropriate tools to use are loppers, chain saws and vehicle mounted saws.
- Hollow bearing limbs should be retained. Where this is not possible, the limb must be inspected by the Project Ecologist.



- 1 – The undercut
2 – The uppercut to remove the branch
3 – The final trim.

Figure 3-2: Trimming tree branch

3.3 Excavation near trees

Some construction works may be designed within close-proximity to retained trees and vegetation. When conducting excavation work near trees, ensure roots are not damaged in a way that could impact on tree health.

Where excavation cannot be avoided within the critical root zone, the impacts to the tree must be assessed by a suitably qualified arborist (Level 5) to assess the risk of retaining the tree.

4 Replacement trees

Revegetation and the provision of replacement trees must be informed by a Tree Survey undertaken during detailed design. TfNSW are responsible for the Tree Survey to identify the number, type and location of any trees to be removed and will provide a copy of the Tree Survey to Seymour Whyte. The Tree Survey must be submitted to the Planning Secretary for information with the Place, Design and Landscape Plan.

Where trees are to be removed, TfNSW 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).

Seymour Whyte must keep records of the number of trees cleared in a register and the records to TfNSW with the project Monthly Report. For the purposes of this requirement, a tree has a trunk diameter 300 mm or more at a point 1.5 m above the adjacent ground level and/ or a height of 3 metres or more.



Appendix K – Sensitive Aerial Vegetation Maps

Appendix K

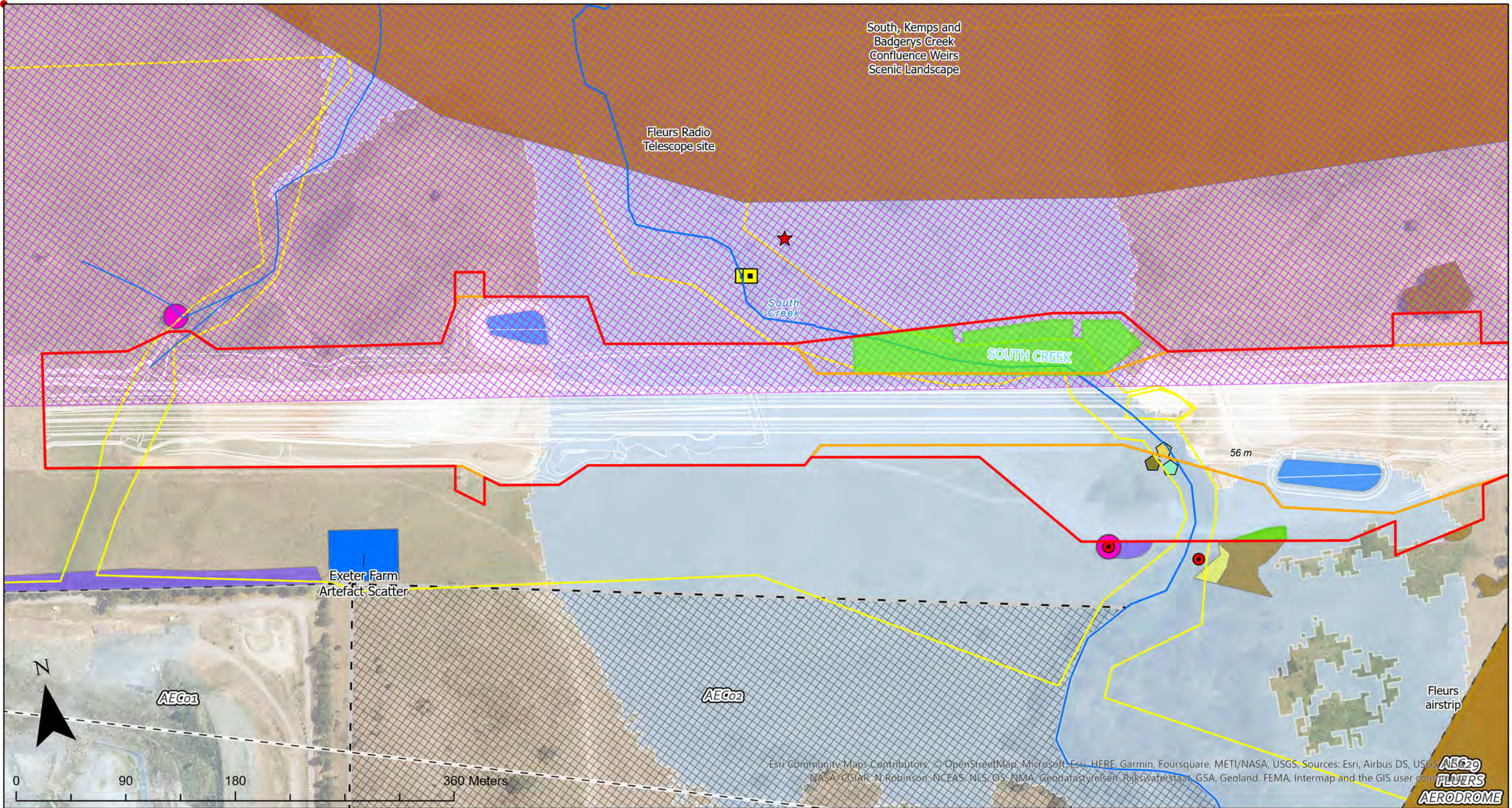
Construction Flora and Fauna Management Sub-plan

Sensitive Aerial Vegetation Maps

M12 Motorway – Central

January 2025

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- M12 Central Construction Footprint

M12 Central Operational Footprint

M12C Construction Ancillary Facilities

Exclusion Zones

Vegetation Saving Area

Watercourses

Greater Broad-nosed Bat

Little Bentwing-bat

Yellow-bellied Sheath-tail-bat

Habitat Trees

Southern Myotis Habitat

Aboriginal heritage sites complex (potential area of sensitivity)

Aboriginal Heritage sensitive area

Non-Aboriginal Heritage sensitive area

State and potentially national

State

Local

Exeter Farm Artefact Scatter

Fleurs Radiotelescope Dishes

Fleurs Radiotelescope Cables

Area of Environment Concern

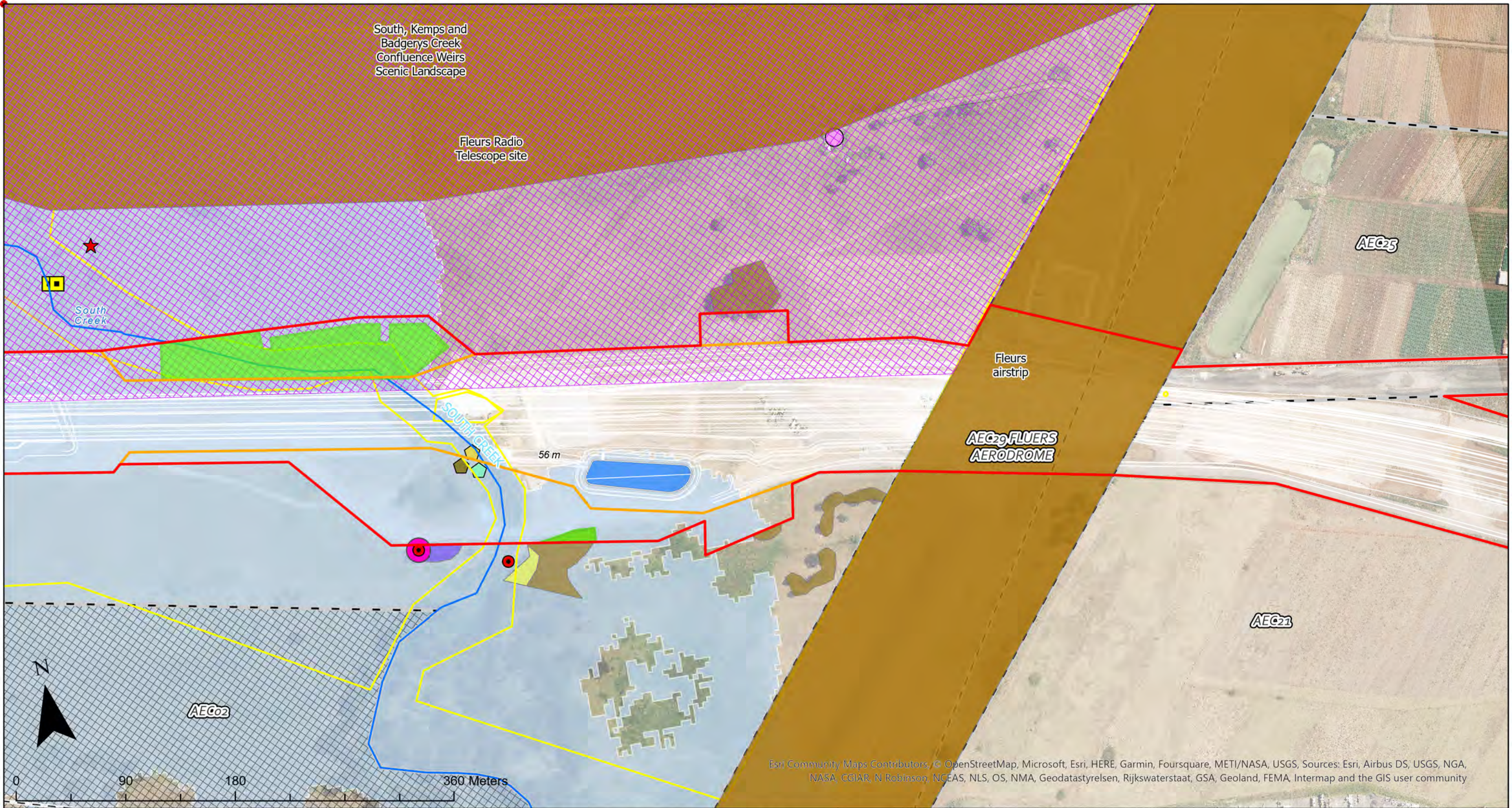
Potential Areas Of Fill

Flood Prone Lane (100yr ARI)

Cumberland Plain 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

Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions
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M12 Central Construction Footprint

M12 Central Operational Footprint

M12C Construction Ancillary Facilities

Exclusion Zones

Vegetation Saving Area

Watercourses

Greater Broad-nosed Bat

Little Bentwing-bat

Yellow-bellied Sheath-tail-bat

Habitat Trees

Southern Myotis Habitat

Aboriginal heritages sites complex (potential area of sensitivity)

Aboriginal Heritage sensitive area

Non-Aboriginal Heritage sensitive area

State and potentially national

State

Local

Fleurs Radiotelescope Dishes

Fleurs Radiotelescope Cables

Area of Environment Concern

Potential Areas Of Fill

Flood Prone Lane (100yr ARI)

Residential

Cumberland Plain 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

Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions

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South, Kemps and
Badgerys Creek
Confluence Weirs
Scenic Landscape

Fleurs Radio
Telescope site

Fleurs
airstrip

AEC29 FLUERS
AERODROME

AEC25

AEC26

AEC03

AF4

AEC20

AEC21

AF12a

AEC05

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M12 Central Construction Footprint

M12 Central Operational Footprint

M12C Construction Ancillary Facilities

Exclusion Zones

Vegetation Saving Area

Watercourses

Dillwynia tenuifolia

Habitat Trees

Aboriginal heritagesites
complex (potential area of
sensitivity)

Aboriginal Heritage sensitive
area

Non-Aboriginal Heritage sensitive area

State and potentially national

State

Local

Area of Environment
Concern

Potential Areas Of Fill

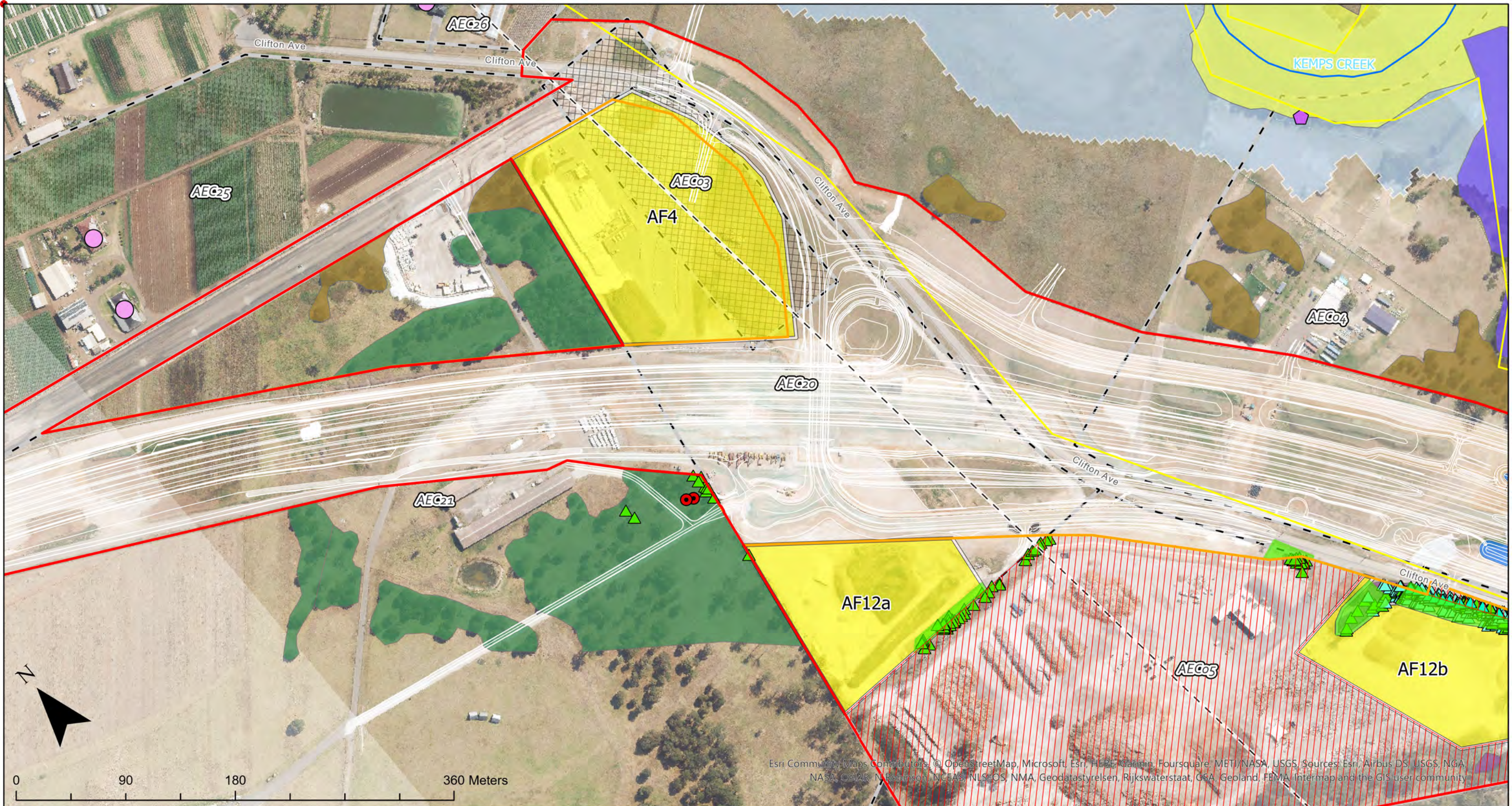
Flood Prone Lane (100yr ARI)

Residential

Cumberland Plain Woodland in the Sydney
Basin Bioregion

Shale Gravel Transition Forest in the
Sydney Basin Bioregion

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- M12 Central Construction Footprint

M12 Central Operational Footprint

M12C Construction Ancillary Facilities

Exclusion Zones

Vegetation Saving Area

Watercourses

Dillwynia tenuifolia

Pultenaea parviflora

GHFF

Habitat Trees

Aboriginal heritages sites complex (potential area of sensitivity)

Aboriginal Heritage sensitive area

Non-Aboriginal Heritage sensitive area

State and potentially national

State

Local

Area of Environment Concern

Potential Areas Of Fill

Flood Prone Lane (100yr ARI)

Residential

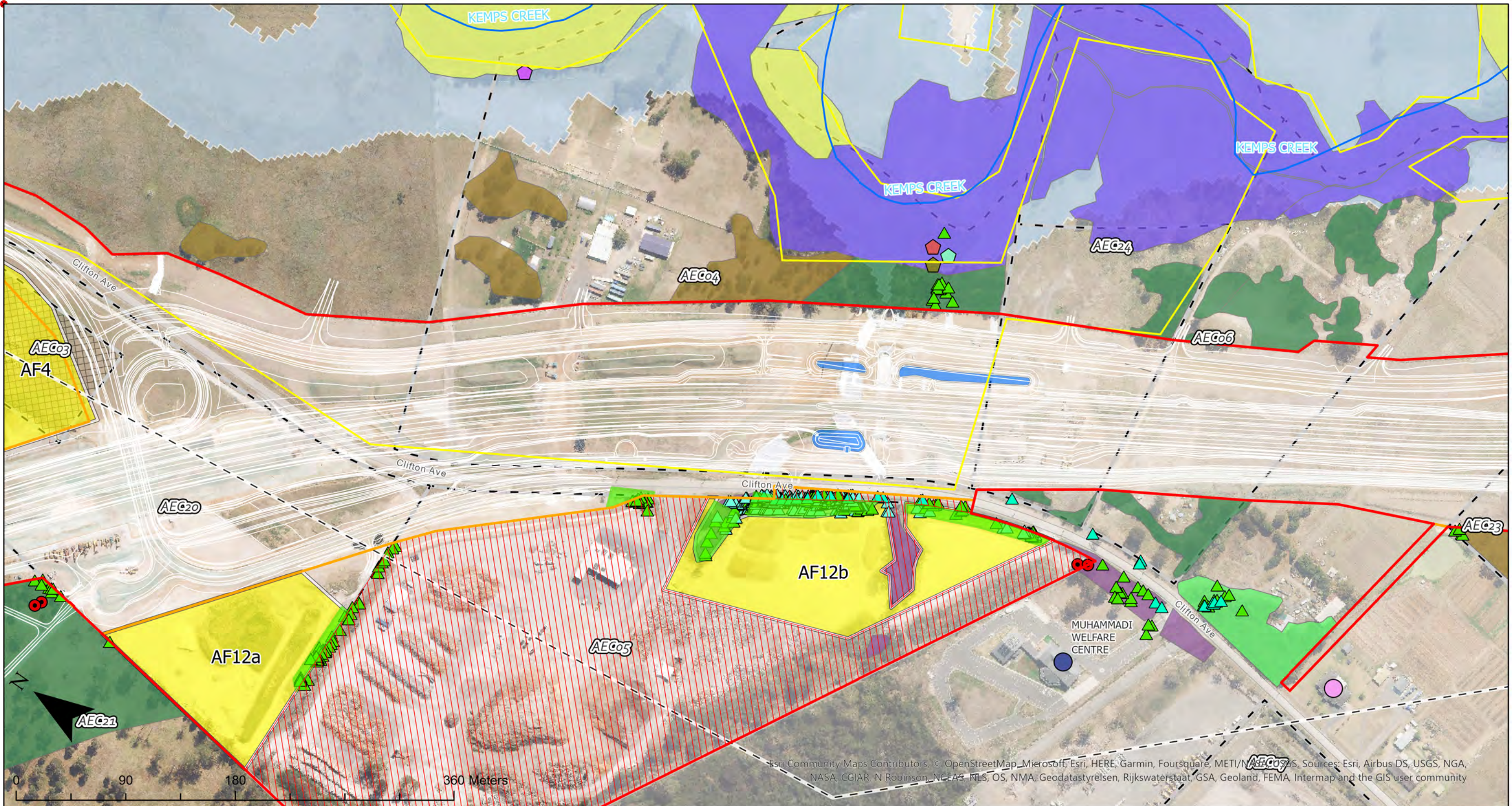
Castlereagh Scribbly Gum Woodland in the Sydney Basin Bioregion

Cumberland Plain 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
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- M12 Central Construction Footprint

M12 Central Operational Footprint

M12C Construction Ancillary Facilities

Exclusion Zones

Vegetation Saving Area

Watercourses

Dillwynia tenuifolia

Pultenaea parviflora

Eastern Freetail-bat

GHFF

Greater Broad-nosed Bat

Little Bentwing-bat

Habitat Trees

Aboriginal heritages sites complex (potential area of sensitivity)

Aboriginal Heritage sensitive area

Non-Aboriginal Heritage sensitive area

State and potentially national

State

Local

Area of Environment Concern

Potential Areas Of Fill

Flood Prone Lane (100yr ARI)

Place of Worship

Residential

Castlereagh Scribbly Gum Woodland in the Sydney Basin Bioregion

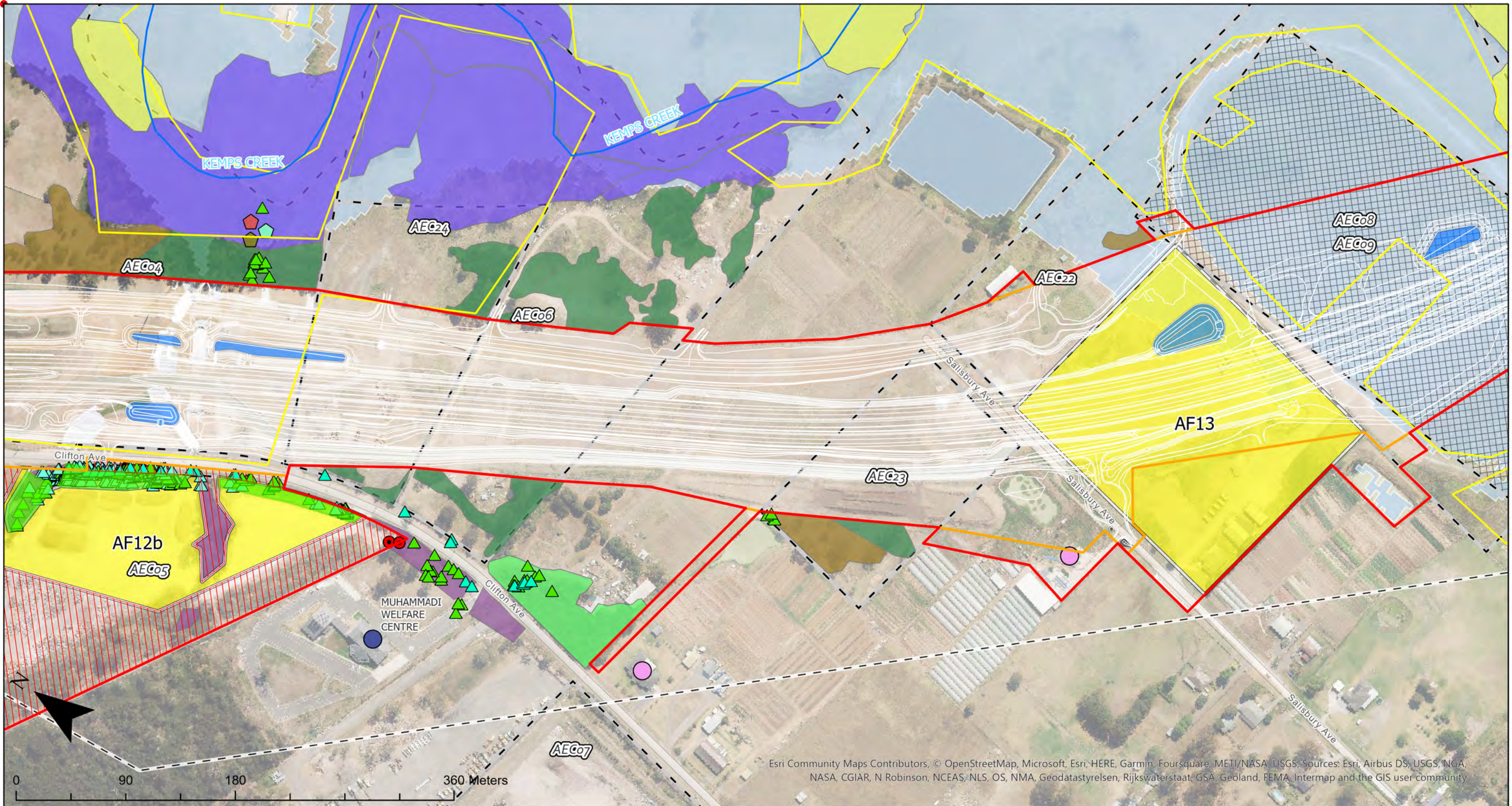
Cooks River/Castlereagh Ironbark Forest in the Sydney Basin Bioregion

Cumberland Plain 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

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M12 Central Construction Footprint	Dillwynia tenuifolia	Aboriginal heritages sites complex (potential area of sensitivity)	Non-Aboriginal Heritage sensitive area	Area of Environment Concern	Castlereagh Scribbly Gum 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
M12 Central Operational Footprint	Pultenaea parviflora	Aboriginal Heritage sensitive area	State and potentially national	Potential Areas Of Fill	Cooks River/Castlereagh Ironbark Forest in the Sydney Basin Bioregion	Shale Gravel Transition Forest in the Sydney Basin Bioregion
M12C Construction Ancillary Facilities	Eastern Freetail-bat		State	Flood Prone Lane (100yr ARI)	Cumberland Plain Woodland in the Sydney Basin Bioregion	Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions
Exclusion Zones	Greater Broad-nosed Bat		Local	Place of Worship		
Vegetation Saving Area	Little Bentwing-bat			Residential		
Watercourses	Habitat Trees					

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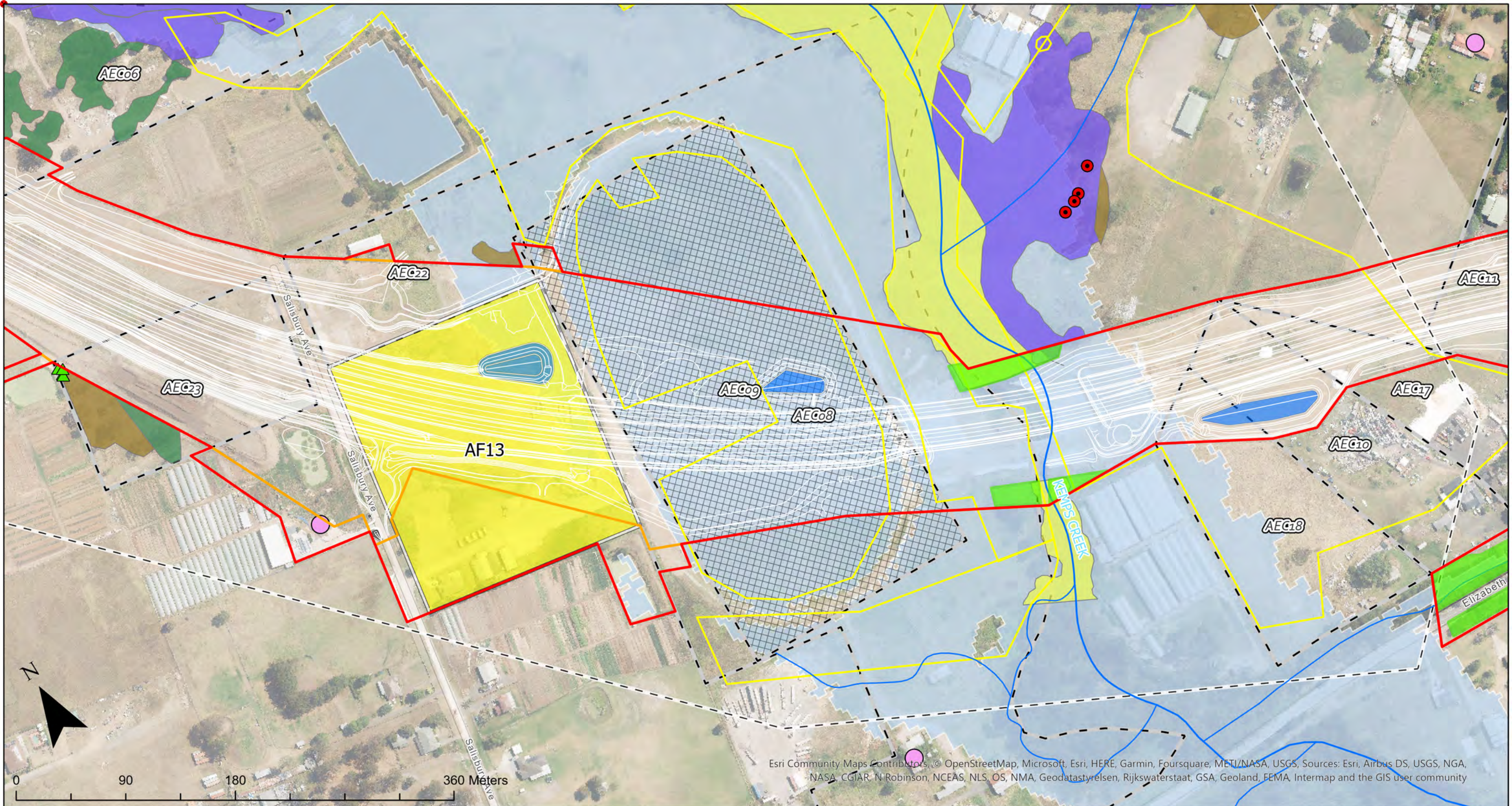
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SENSITIVE AREA PLANS	Page 7 of 15



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M12 Central Construction Footprint

M12 Central Operational Footprint

M12C Construction Ancillary Facilities

Exclusion Zones

Vegetation Saving Area

Watercourses

Dillwynia tenuifolia

Habitat Trees

Aboriginal heritages sites complex (potential area of sensitivity)

Aboriginal Heritage sensitive area

Non-Aboriginal Heritage sensitive area

State and potentially national

State

Local

Area of Environment Concern

Potential Areas Of Fill

Flood Prone Lane (100yr ARI)

Residential

Cumberland Plain 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

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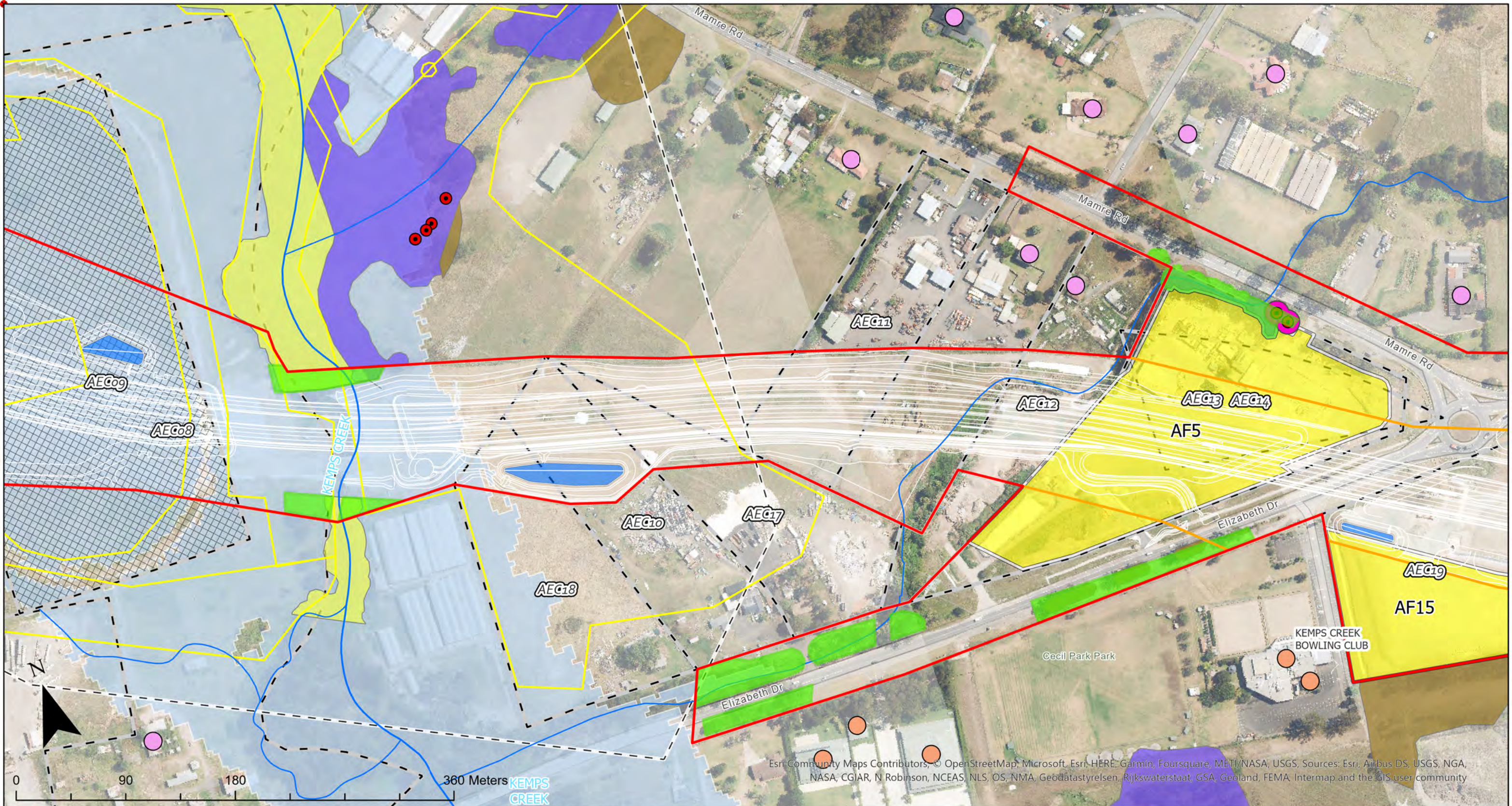
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PROJECT NAME: M12 CENTRAL

SENSITIVE AREA PLANS

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M12 Central Construction Footprint

M12 Central Operational Footprint

M12C Construction Ancillary Facilities

Exclusion Zones

Vegetation Saving Area

Watercourses

Habitat Trees

Southern Myotis Habitat

Aboriginal heritages sites complex (potential area of sensitivity)

Aboriginal Heritage sensitive area

Non-Aboriginal Heritage sensitive area

State and potentially national

State

Local

Area of Environment Concern

Potential Areas Of Fill

Flood Prone Lane (100yr ARI)

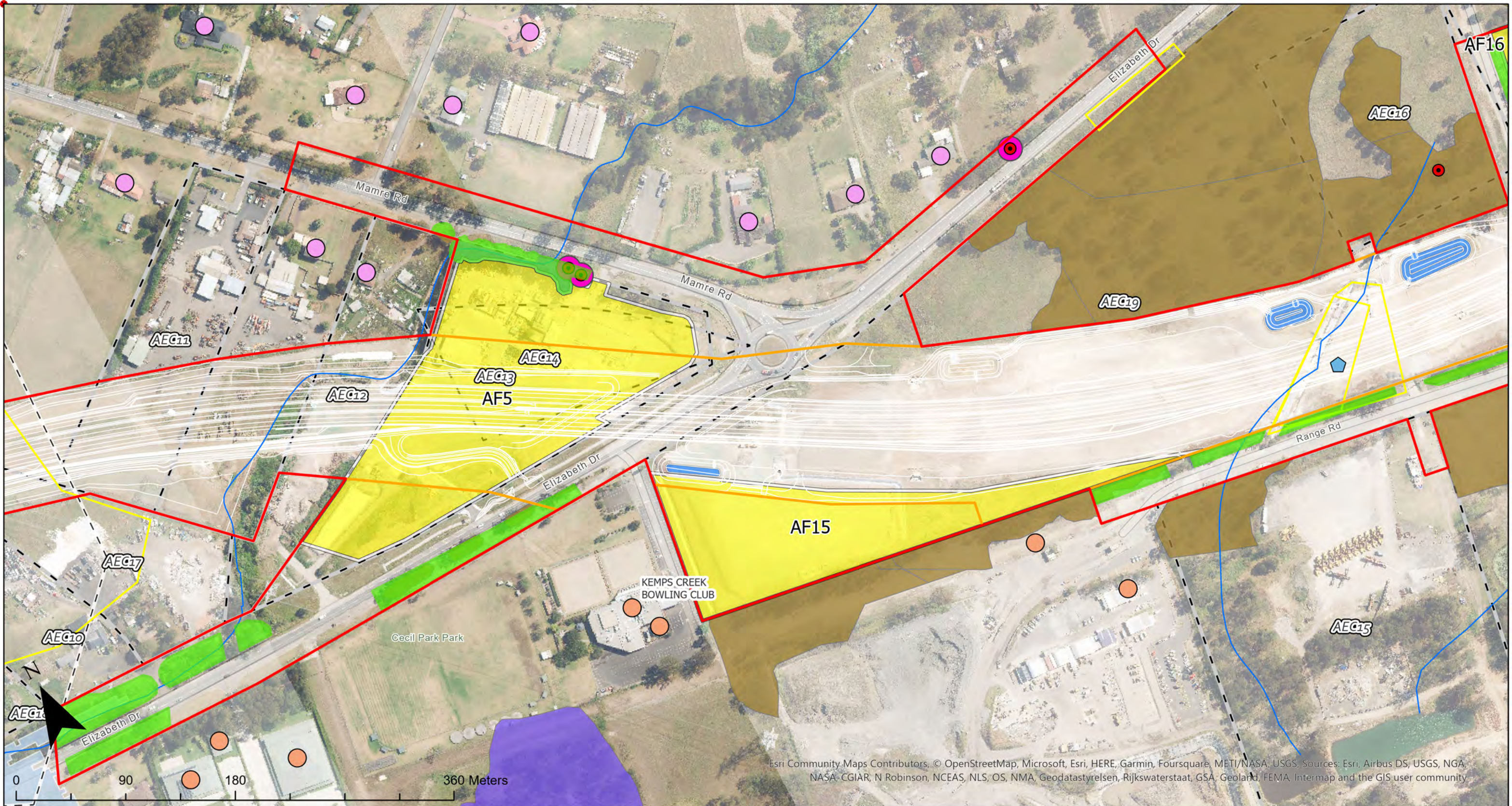
Residential

Cumberland Plain 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

Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions

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M12 Central Construction Footprint

M12 Central Operational Footprint

M12C Construction Ancillary Facilities

Exclusion Zones

Vegetation Saving Area

Watercourses

CPLS

Habitat Trees

Southern Myotis Habitat

Aboriginal heritages sites complex (potential area of sensitivity)

Aboriginal Heritage sensitive area

Non-Aboriginal Heritage sensitive area

State and potentially national

State

Local

Area of Environment Concern

Potential Areas Of Fill

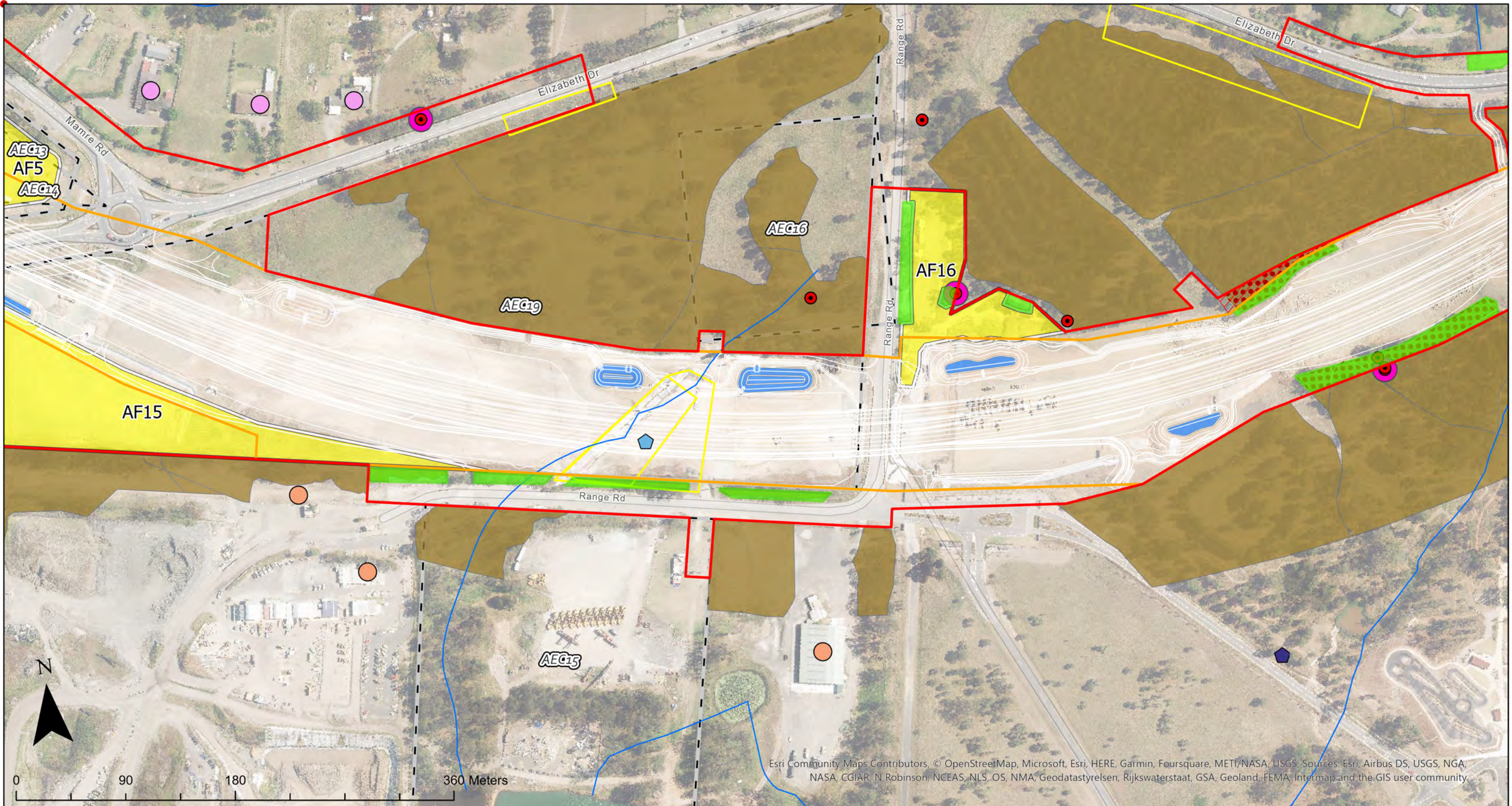
Flood Prone Lane (100yr ARI)

Residential

Cumberland Plain 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

DWG.No.	REFERENCE DRAWINGS TITLE	REV.N	REVISIONS	DATE	DRAWN	CHECK	CONSULTANT APPROVED	REVIEW	COPYRIGHT				QUALITY RECORD				PROJECT NAME: M12 CENTRAL		SENSITIVE AREA PLANS	Page 10 of 15
	CEMP SAP	D		20/06/22					THIS DOCUMENT IS CONFIDENTIAL AND REMAINS THE PROPERTY OF SWC. IT MUST NOT BE COPIED BY ANY MEMBER OR USED FOR ANY OTHER PROJECT WITHOUT THE WRITTEN APPROVAL OF SWC CONSTRUCTIONS				REVIEW							
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M12 Central Construction Footprint

M12 Central Operational Footprint

M12C Construction Ancillary Facilities

Exclusion Zones

Vegetation Saving Area

Watercourses

CPLS

Varied Sittella

Habitat Trees

Southern Myotis Habitat

status

Grey Headed Flying Fox Habitat

Aboriginal Heritage sensitive area

Non-Aboriginal Heritage sensitive area

State and potentially national

State

Local

Area of Environment Concern

Potential Areas Of Fill

Flood Prone Lane (100yr ARI)

Residential

Cumberland Plain Woodland in the Sydney Basin Bioregion

DWG.No.	REFERENCE DRAWINGS TITLE	REV#	REVISIONS	DATE	DRAWN	CHECK	CONSULTANT APPROVED	REVIEW
	CEMP SAP	D		20/06/22				
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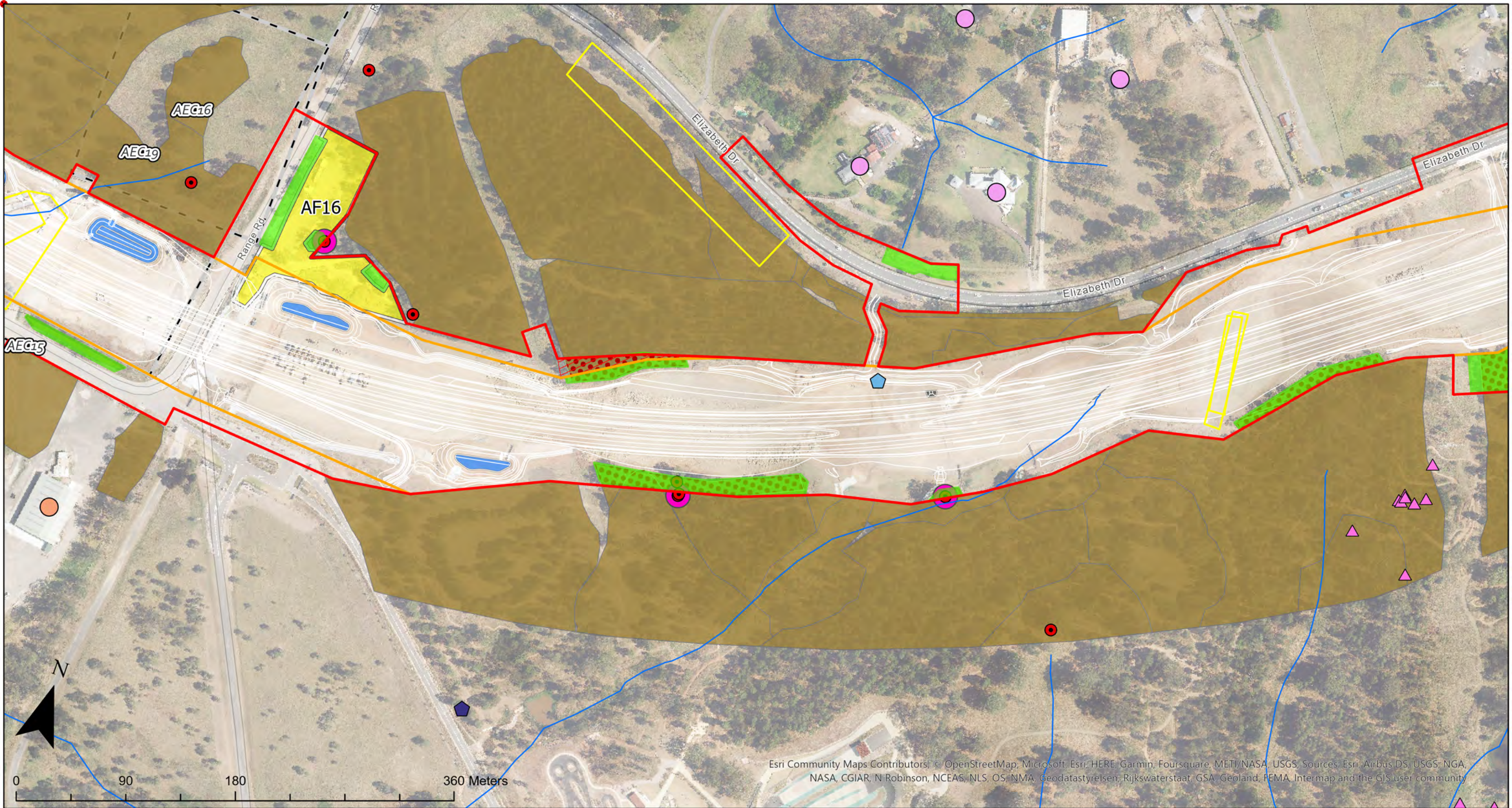
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REVIEW			
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PROJECT NAME: M12 CENTRAL	
SENSITIVE AREA PLANS	

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M12 Central Construction Footprint

M12 Central Operational Footprint

M12C Construction Ancillary Facilities

Exclusion Zones

Vegetation Saving Area

Watercourses

Grevillea juniperina

CPLS

Varied Sittella

Habitat Trees

Southern Myotis Habitat

status

Grey Headed Flying Fox Habitat

Aboriginal Heritage sensitive area

Non-Aboriginal Heritage sensitive area

State and potentially national

State

Local

Area of Environment Concern

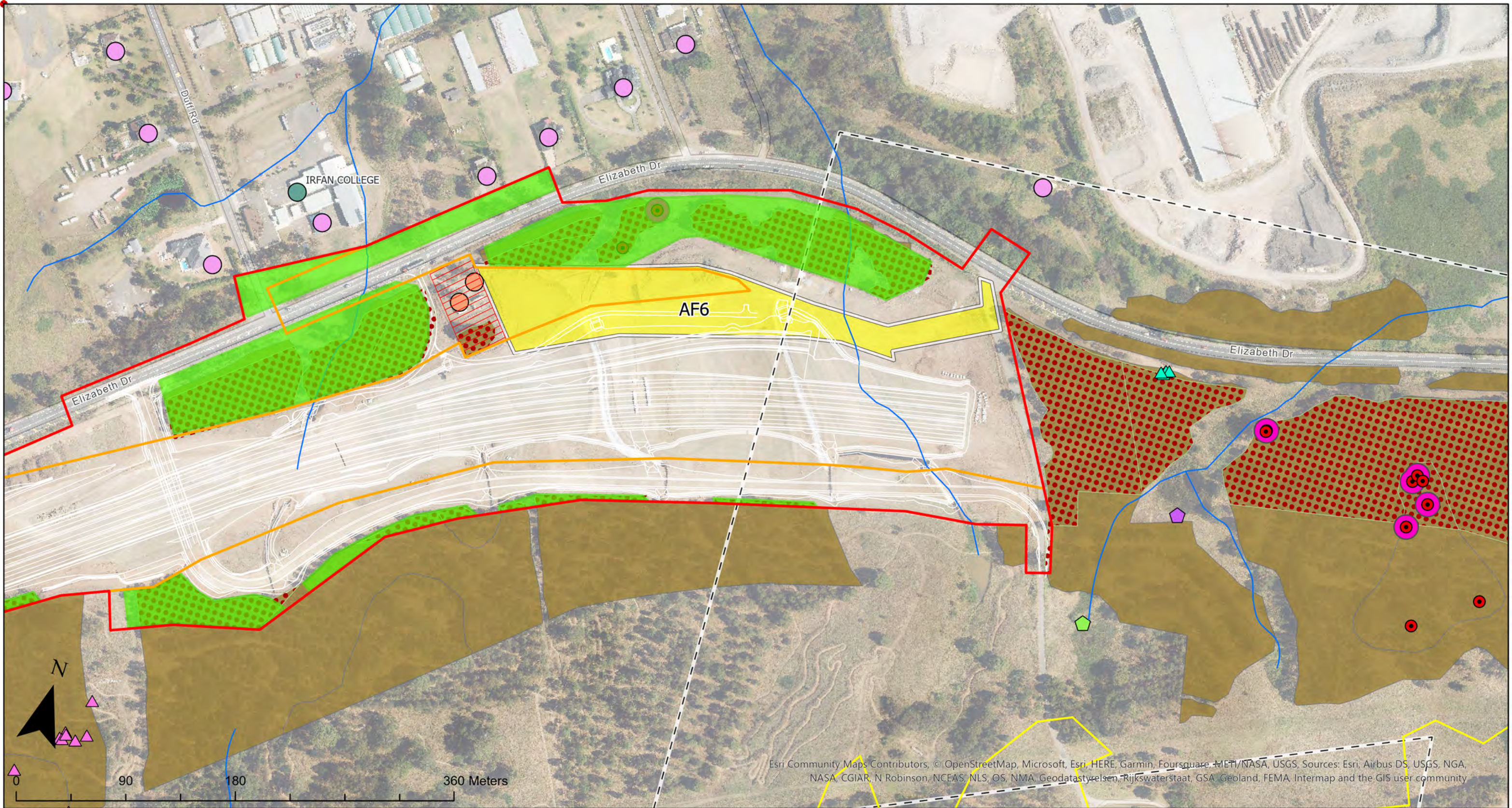
Potential Areas Of Fill

Flood Prone Lane (100yr ARI)

Residential

Cumberland Plain Woodland in the Sydney Basin Bioregion

DWG.No.	REFERENCE DRAWINGS TITLE	REV#	REVISIONS	DATE	DRAWN	CHECK	CONSULTANT APPROVED	REVIEW	QUALITY RECORD				PROJECT NAME: M12 CENTRAL	
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M12 Central Construction Footprint

M12 Central Operational Footprint

M12C Construction Ancillary Facilities

Exclusion Zones

Vegetation Saving Area

Watercourses

Grevillea juniperina

Pultenaea parviflora

Eastern Bentwing-bat

GHFF

Habitat Trees

Southern Myotis Habitat

status

Grey Headed Flying Fox Habitat

Aboriginal heritages sites complex (potential area of sensitivity)

Aboriginal Heritage sensitive area

Non-Aboriginal Heritage sensitive area

State and potentially national

State

Local

Area of Environment Concern

Potential Areas Of Fill

Flood Prone Lane (100yr ARI)

Combined Primary-Secondary School

Residential

Cumberland Plain Woodland in the Sydney Basin Bioregion

DWG.No.	REFERENCE DRAWINGS TITLE	REV	REVISIONS	DATE	DRAWN	CHECK	CONSULTANT APPROVED	REVIEW	COPYRIGHT			QUALITY RECORD			PROJECT NAME: M12 CENTRAL	
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Appendix L – Red Imported Fire Ants (*Solenopsis Invicta*) NSW Biosecurity (Fire Ant) Emergency Order (No1) 2024

Appendix L

Construction Flora and Fauna Management Sub-plan

Red Imported Fire Ant Alert

M12 Motorway – Central

January 2025

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Alert

January 2024



Audience

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

Background

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

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

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

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

This Alert:

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

Restrictions apply on the movement of [fire ant carriers](#):

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

A [fire ant carrier](#) means any of the following potential carriers of fire ants:

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

* No restrictions apply to the movement of a [fire ant carrier](#) into and within the [fire ant movement control area](#).

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

Actions required – North Coast Region NSW

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

Actions required – Materials from Queensland

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

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

A person who receives a fire ant carrier that was moved into the Emergency Zone **must** (Cl13):

- a) produce the approved biosecurity certificate that accompanied the fire ant carrier for inspection when requested by an authorised officer, and
- b) retain the approved biosecurity certificate for 4 years.

Penalties apply for failure to follow the Order

Ongoing management actions

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

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

Training

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

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

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

Fire ant nests

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



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

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

Fire ant identification

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



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

First aid

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

When to report fire ant sightings

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

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

Contact and information



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

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

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

E: environmentandsustainability@transport.nsw.gov.au
[Environment & Sustainability Management Framework](#)

