

Flora and Fauna Management Sub-plan

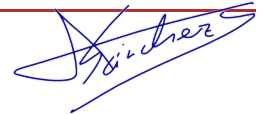
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Parklife Metro D&C

Revision Record

Revision	Author	Date	Comments	Reviewed by	Approved by
A	C. Macpherson	20/02/2023	First Issue	Mark Chilton Environment Manager	Richard Graham Project Manager
B	C. Macpherson	14/04/2023	Second Issue	Mark Chilton Environment Manager	Richard Graham Project Manager
C	C. Kennedy Environmental Manager	25/05/2023	Third Issue	Mark Chilton Environment Manager	Richard Graham Project Manager
00	J. Bradford Senior Environmental Consultant	15/06/2023	Final Issue / IFI	Mark Chilton Environment Manager	Richard Graham Project Manager
01	C. Kennedy Environmental Manager	19/07/2023	First Revision	Mark Chilton Environment Manager	Richard Graham Project Manager
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Signature

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Amendment Record

Date	Revision	Version	Amendment Description
20/02/2023	A	A	Initial Draft
14/04/2023	B	B	Revised following Sydney Metro comment and external review. Issued for review
25/05/2023	C	C	Revised following external consultation and Sydney Metro and ER review
15/06/2023	00	00	Final for ER endorsement and DPE review and approval
19/07/2023	01	01	Revised in response to DPE Comments
13/03/2024	02	02	Minor revision to include Nest Box Strategy for ER endorsement

Details of Revision Amendments

Document Control

The Management Plan's owner Director or his/her delegate is responsible for updating this plan to reflect changes to the project, construction, legal and other requirements, as required.

Plan Authorisation

The implementation and distribution of this Management Plan is under the authority of the Project Director. All personnel employed on the Project will perform their duties in accordance with the requirements of this Management Plan, supporting management plans and related procedures.

Amendments

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

Glossary/Abbreviations

Abbreviation	Expanded Text
AS	Australian Standard
BAM	NSW Biodiversity Assessment Method
BC Act	Biodiversity Conservation Act 2016 (NSW)
BDAR	Biodiversity Development Assessment Report
CEMF	Construction Environmental Management Framework
CEMP	Construction Environmental Management Plan
CSSI	Critical State Significant Infrastructure
DECC	Department of Environment and Climate Change
DEOH	Defence Establishment Orchard Hills
DP	Deposited Plan
DPE	Department of Planning and Environment
DPI	Department of Primary Industries
ECM	Environmental Control Maps
EEC	Endangered ecological community
EES	NSW Environment, Energy and Science (now known as Environment and Heritage Group (EHG))
EHG	NSW Environment and Heritage Group
EIS	Environmental Impact Statement
EM	Environmental Manager
EP&A Act	Environmental Planning and Assessment Act 1979 (NSW)
EPA	Environmental Protection Authority
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Cth)
ER	Independent Environmental Representative
ESCP	Erosion and Sediment Control Plan
EWMS	Environmental Work Method Statement
FFMP	Flora & Fauna Management Sub-plan
FM Act	Fisheries Management Act 1994 (NSW)
GDE	Groundwater Dependent Ecosystems
IBRA	Interim Biogeographic Regionalisation for Australia
ISC	Infrastructure Sustainability Council
ISO	International Organisation for Standardisation
KFH	Key Fish Habitat
Microbat	Microchiropteran bat
Minister, the	Minister of the NSW Department of Planning and Environment (or delegate)
MNES	Matters of National Environmental Significance
NZS	New Zealand Standard
OEH	Office of Environment and Heritage (NSW)
PCT	Plant Community Type

PUDCLP	Place Urban Design and Landscape Corridor Plan
REMMs	Revised Environmental Mitigations Measures
SBT	Station Boxes and Tunnelling
SMART	Smart, Measurable, Achievable, Realistic, Timely
SMWSA	Sydney Metro Western Sydney Airport
SSTOM	Stations, Systems, Trains, Operations and Maintenance
TEC	Threatened ecological communities
WIRES	Wildlife Information Rescue Service (NSW)
WoNS	Weeds of National Significance
WSA	Western Sydney Airport

1 Introduction

This NSW (off-airport) Flora and Fauna Management Sub-plan (FFMP, this Sub-plan) is applicable to the SSTOM Construction Works of the Sydney Metro Western Sydney Airport (the Project). This Plan describes how Parklife Metro D&C will minimise and manage flora and fauna impacts of the SSTOM Project.

This Sub-plan has been prepared to address the requirements of the:

- Critical State Significant Infrastructure (CSSI) 10051 Planning Approval (dated 23 July 2021)
- Modification 1 Sydney Metro Western Sydney Airport Modification 1 - Biodiversity Credits (dated 14 April 2022)
- Sydney Metro Western Sydney Airport – CSSI Staging Report (Staging Report)
- AS/NZS ISO 14001:2016 Environmental Management Systems – Requirements with guidance for use
- Sydney Metro Construction Environmental Management Framework (CEMF)
- Environmental Impact Statement (EIS) and the Submissions Report, including the Revised Environmental Mitigation Measures (REMMs)
- Contractual requirements
- Applicable legislation (NSW and Commonwealth).

1.1 Background

Sydney Metro is Australia's biggest public transport program comprising four main packages of work including Metro North West Line, Sydney Metro City and Southwest, Sydney Metro West and Sydney Metro Western Sydney Airport. The Sydney Metro Western Sydney Airport Project (the Project) will become the transport spine for Greater Western Sydney, connecting communities and travellers with the new Western Sydney International (Nancy-Bird Walton) Airport (referred to as Western Sydney International) and the growing region.

The Sydney Metro Western Sydney Airport Environmental Impact Statement (EIS) was prepared in October 2020, which assessed the impacts of the construction and operation of the Project. The Project EIS was placed on public exhibition for a period of six weeks from 21 October to 2 December 2020. The Project was declared a Critical State Significant Infrastructure (CSSI) Project and is listed in Schedule 5 of *State Environmental Planning Policy (State and Regional Development)*.

The Sydney Metro Western Sydney Airport Project was approved by the Minister for Planning and Public Spaces on 23 July 2021 (CSSI 10051) under section 5.19 of the *Environmental Planning and Assessment Act 1997* (EP&A Act). Modification 1 of the Project Approval, to reduce the biodiversity offsets credit requirements, was approved on the 14 April 2022.

The Project involves the construction and operation of a new metro railway line around 23km in length that extends from the existing Sydney Trains suburban T1 Western Line at St Marys in the north and the Aerotropolis in the south at Bringelly. The alignment includes a combination of tunnel, surface, bridges and viaduct sections, and comprises of six new metro stations between St Marys and the Aerotropolis Core precinct, as well as a stabling and maintenance facility and operational control centre to support the operation of the new metro railway line (see Figure 1).

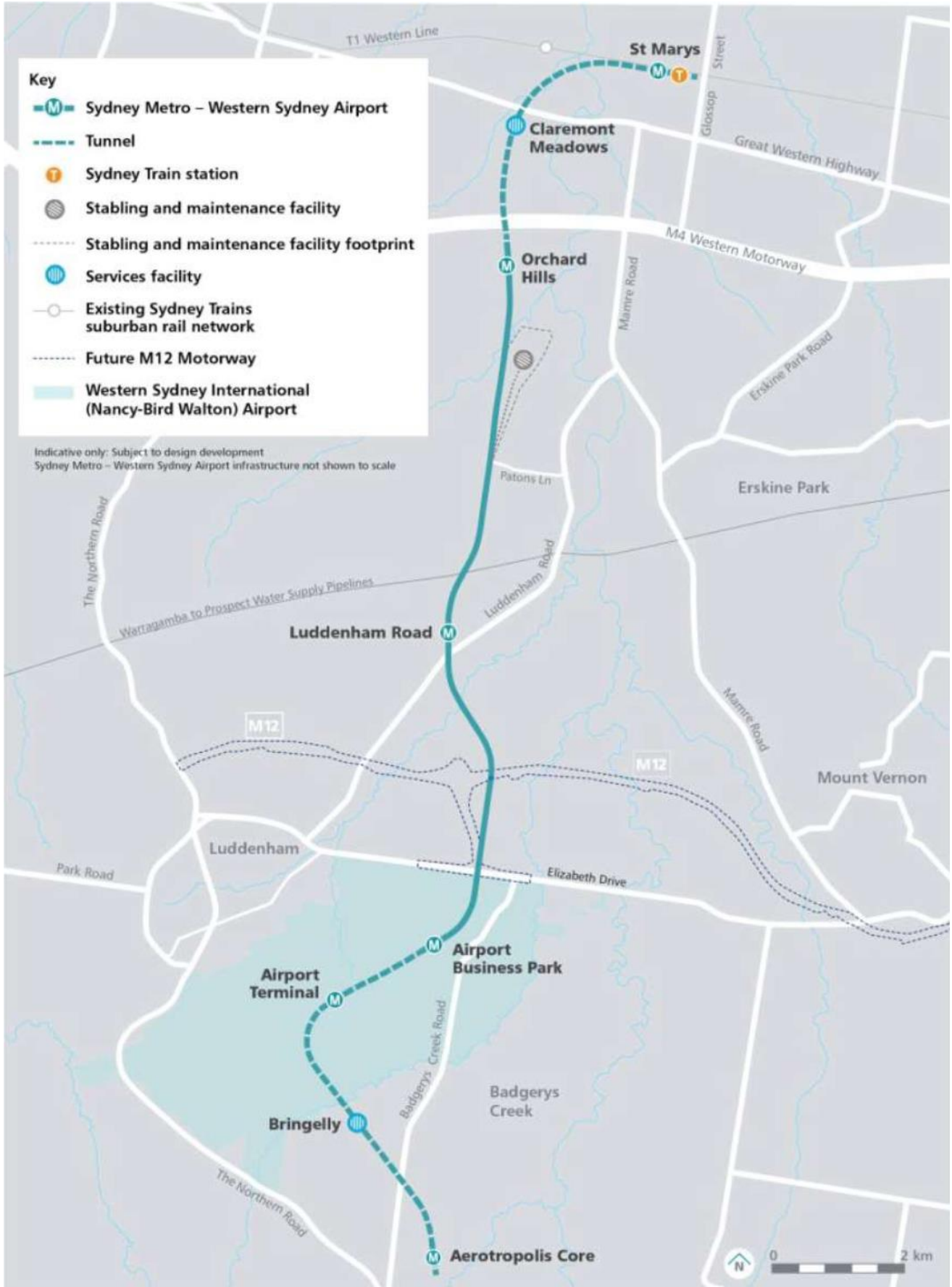


FIGURE 1 OVERVIEW OF SMWSA PROJECT

1.2 Scope

The scope of this FFMP is to describe how Parklife Metro D&C will minimise and manage flora and fauna impacts of the SSTOM Construction Works and discuss how compliance and implementation of the applicable sections from the following documents are addressed, collectively referred to herein as the 'Project requirements':

- NSW Minister for Planning and Public Spaces Conditions of Approval (Conditions) and Modification 1 - Biodiversity Credits
- Revised Environmental Mitigation Measures (REMMs)
- Sydney Metro Construction Environmental Management Framework (CEMF).

The SSTOM Construction Works scope as part of the Sydney Metro Western Sydney Airport Project includes:

- Installation of tracks, signalling, mechanical and electrical systems
- Construction of a stabling and maintenance facility at Orchard Hills
- Construction of the lower chamber of Bringelly shaft, along with capping and backfill
- Construction of the lower chamber of Claremont Meadows shaft, along with capping and backfill
- Construction of six stations, including:
 - A new metro station connecting to, and providing an interchange with, the T1 Western Line (part of the existing Sydney Trains suburban rail network) at St Marys
 - Two new metro stations between the T1 Western Line and Western Sydney International; one at Orchard Hills and one at Luddenham within the Northern Gateway Precinct
 - Two new metro stations within the Western Sydney International site; one at the Airport Terminal and one at the Airport Business Park, both of which are located on Airport land and are managed under a separate CEMP
 - A new metro station within the Aerotropolis Core precinct, south of Western Sydney International.

The SSTOM Package also includes the supply of new driverless trains, and the operation and maintenance of the new metro railway line and its assets, which will be managed separately to this FFMP.

It is noted that the existing environment will have been significantly altered during construction of earlier stages of the Project. Parklife Metro D&C anticipate that construction sites will be handed over from the prior contractors generally cleared and stabilised with all major earthworks completed. The processes, mitigation measures and procedures in this Sub-plan are provided to describe how Parklife Metro D&C would manage impacts to flora and fauna if clearing is required to undertake the works.

2 Objectives and Targets

In order to assess the environmental performance relating to flora and fauna management during construction, environmental objectives and targets have been established. These objectives and targets have been developed to align with those established through the EIS and set out in the Construction Environmental Management Framework (CEMF).

The environmental performance outcomes for flora, fauna and biodiversity as specified in the revised Biodiversity Development Assessment Report (BDAR) and the Staging Report are:

- Minimise or, where possible, avoid impacts on threatened flora and fauna species, and ecological communities listed under the *Biodiversity Conservation Act 2016* (NSW) and *Environment Protection and Biodiversity Conservation Act 1999* (Cth)
- Maintain integrity and functionality of rail corridor fencing to minimise wildlife-train collision while providing opportunities for cross-corridor wildlife movement
- Re-establish native vegetation in accordance with the National Airports Safeguarding Framework principles and guidelines including Guideline C: Managing the Risk of Wildlife Strikes in the Vicinity of Airports (Australian Government, 2014).

Section 10.1 of the CEMF and Section 7.2 of the Submissions Report provides performance objectives for the management of flora, fauna and biodiversity during construction. Table 1 lists those management objectives applicable to Parklife Metro D&C and identifies the targets and tools to be used by Parklife Metro D&C to meet those objectives.

TABLE 1 OBJECTIVES AND TARGETS

Objective	Target	Measurement Tool
Minimise impacts on flora and fauna	Controls are implemented to protect biodiversity and minimise clearing of native vegetation. 100% of weekly environmental inspections are undertaken to review the controls No incidents relating to impacts on biodiversity	Inspection records Pre-clearing permits Audit reports
Design waterway crossings to incorporate best practice principles	100% of waterway modifications and crossings incorporate best practice principles and significant impacts to flow regimes in receiving waterways are avoided	Design Reports
Retain and enhance existing flora and fauna habitat wherever possible	Controls are implemented to protect biodiversity and minimise clearing of native vegetation. 100% of weekly environmental inspections are undertaken to review the controls.	Inspection records Pre-clearing permits Audit reports
Appropriately manage the spread of weeds and plant pathogens.	Controls are implemented to prevent spread of weeds and pathogens and 100% of weekly inspections are undertaken to review the controls	Inspection records Audit reports

Parklife Metro D&C will monitor performance against the objectives and targets and performance monitoring will be documented in the compliance reporting at least on an annual basis as part of auditing requirements (refer to Section 3.9 of the CEMP).

3 Legal and Other Requirements

3.1 Relevant Legislation and Guidelines

Legislation and guidelines relevant to this Flora and Fauna Management Plan includes:

- *Environmental Planning and Assessment Act 1979* (EP&A Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)
- *Biodiversity Conservation Act 2016* (NSW) (BC Act)
- *Fisheries Management Act 1994* (NSW) (FM Act)
- *Biosecurity Act 2015*
- *Liverpool Environment Plan 2008* (*Liverpool LEP*)
- *Penrith Environment Plan 2010* (*Penrith LEP*).

Refer to Section 3.4 the CEMP for further details of the relevant legislation.

Additional guidelines and standards relating to the management of flora, fauna and biodiversity include:

- Australian Standard AS 4373 Pruning of amenity trees
- Australian Standard 4970–2009 Protection of trees on development sites
- Commonwealth Policy Statements on survey guidelines for Australia’s threatened fauna including bats birds, frogs, fish, mammals and reptiles (Department of the Environment, Water, Heritage and the Arts, 2010, 2011)
- Framework for Biodiversity Assessment (OEH, 2014)
- Guidelines for vegetation management plans on waterfront land (NSW Office of Water, 2012)
- Hygiene Protocol for the Control of Disease in Frogs (DECC, 2008)
- NSW Biodiversity Offsets Policy for Major Projects (OEH, 2014)
- Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings, Fairfull and Witheridge (NSW Department of Primary Industries 2003)
- Guidelines for controlled activities on waterfront land riparian corridors (Department of Industry 2018)
- NSW Guide to Surveying Threatened Plants (OEH, 2016)
- Policy and Guidelines for Fish Friendly Waterway Crossings (DPI, 2004)
- Policy and Guidelines for Fish Habitat Conservation and Management (DPI, 2013)
- Recovering Bushland on the Cumberland Plain. Best practice guidelines for the management and restoration of bushland (DECC 2005)
- Significant Impact Guidelines 1.1 - Matters of National Environmental Significance (Department of Sustainability, Environment, Population and Communities, 2013)
- Significant Impact Guidelines 1.2 - Actions on, or impacting upon, Commonwealth land and Actions by Commonwealth agencies (Department of Sustainability, Environment, Population and Communities, 2013)
- Survey Guidelines for Australia’s Threatened Orchids; Guidelines for detecting orchids listed as threatened under the EPBC Act 1999 (Department of Environment, 2013)
- 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 2009).

3.2 Project Requirements

The Conditions and CEMF requirements relevant to the development of this FFMP are listed in Table 2. Other requirements relevant to the management of flora and fauna impacts, including revised environmental mitigation measures (REMMS), are listed in Appendix A.

TABLE 2 COMPLIANCE TABLE

No.	Condition	Where addressed
CSSI 10051 Infrastructure Approval (dated 23 July 2021)		
C1	Construction Environmental Management Plans (CEMPs) and CEMP Sub-plans must be prepared in accordance with the Construction Environmental Management Framework (CEMF) included in the documents listed in Condition A1 of this schedule to detail how the performance outcomes, commitments and mitigation measures specified in the documents listed in Condition A1 of this schedule will be implemented and achieved during construction.	Section 3.2 Appendix A
C5	Of the CEMP Sub-plans required under Condition C1, the following CEMP Sub-plans must be prepared in consultation with the relevant government agencies identified for each CEMP Sub-plan. Details of issues raised by a government agency during consultation (as required by Condition A6) must be provided as part of the relevant CEMP Sub-Plan when submitted to the Planning Secretary / ER (whichever is applicable). Where a government agency(ies) request(s) is not included, the Proponent must provide the Planning Secretary / ER (whichever is applicable) justification as to why. b) Flora and fauna – DPE EHG, DPI Fisheries, and Relevant Councils	Section 3.6 Appendix B
C6	The CEMP Sub-plans must state how:	
	(a) the environmental performance outcomes identified in the documents listed in Condition A1 will be achieved;	Section 2
	(b) the mitigation measures identified in the documents listed in Condition A1 will be implemented;	Table 10
	(c) the relevant terms of this approval will be complied with; and	Section 3.7
	(d) issues requiring management during construction (including cumulative impacts), as identified through ongoing environmental risk analysis, will be managed through SMART principles.	Section 2 Section 5.1
C7	With the exception of any CEMP Sub-plans expressly nominated by the Planning Secretary to be endorsed by the ER, all CEMP Sub-plans must be submitted to the Planning Secretary for approval.	Section 3.7
C8	The CEMP Sub-plans not requiring the Planning Secretary’s approval must obtain the endorsement of the ER as being in accordance with the conditions of approval and all relevant undertakings made in the documents listed in Condition A1. Any of these CEMP Sub-plans must be submitted to the ER with, or subsequent to, the submission of the CEMP but in any event, no later than one (1) month before construction or where construction is staged no later than one (1) month before the commencement of that stage.	Section 3.7

No.	Condition	Where addressed
C9	Any of the CEMP Sub-plans to be approved by the Planning Secretary must be submitted to the Planning Secretary with, or subsequent to, the submission of the CEMP but in any event, no later than one (1) month before construction or where construction is staged no later than one (1) month before the commencement of that stage.	Section 3.7
C10	Construction must not commence until the CEMP and all CEMP Sub-plans have been approved by the Planning Secretary or endorsed by the ER (whichever is applicable), unless otherwise agreed by the Planning Secretary. The CEMP and CEMP Sub-plans, as approved by the Planning Secretary or endorsed by the ER (whichever is applicable), including any minor amendments approved by the ER, must be implemented for the duration of construction.	Section 3.7
C11	In addition to the relevant requirements of the CEMF, the Flora and Fauna CEMP Sub-plan must include but not be limited to: (a) details of how the requirements of Conditions E11 are met;	This Table Appendix A
	(b) details of a dewatering plan of farm dams including: (i) supervision of dewatering by a suitably qualified ecologist; (ii) a methodology for the transfer of native fauna species known to inhabit and/or use the dam; (iii) the location and suitability of the proposed relocation sites; and (iv) any potential impacts of relocating the fauna to the relocation sites;	Not applicable to SSTOM Works – Dewatering of Farm Dams will be completed by previous Project contractors
	(c) protocols for incidental finds of threatened species and ecological communities within the construction boundary.	Section 6.6

Construction Environmental Management Framework

3.5a	Subject to Section 3.4 (b) the Principal Contractors will prepare issue-specific environmental sub plans to the CEMP which address each of the relevant environmental impacts at a particular site or stage of the project. Issue specific sub plans will include: vi. Flora and fauna management	Section 1.2
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3.3 ISC and Green Star Rating Requirements

The Infrastructure Sustainability Council (ISC) and Green Star Rating requirements relevant to this FFMP are outlined in Table 3.

TABLE 3 IS RATING CREDIT REQUIREMENTS RELEVANT TO THIS FFMP

ID	ISC & Green Star Rating Tool Requirement	Where addressed
Eco-1 L1	The ecological value of the infrastructure site is maintained.	Section 4 Section 6
Eco-1 L2	The ecological value of infrastructure site is enhanced by 0 to 20%	Section 6.2 Section 6.3 Revised BDAR
Eco-2 L1	There is a low or moderate degree of existing habitat connectivity identified. AND The existing degree of habitat connectivity is maintained (offsetting allowed).	Section 4.1
Eco-2 L2	There is a low or moderate degree of existing habitat connectivity identified. AND The existing degree of habitat connectivity is enhanced (offsetting allowed).	Section 4.1 Section 5 Section 6.11

ID	ISC & Green Star Rating Tool Requirement	Where addressed
	OR There is a high degree of existing habitat connectivity identified. AND The existing degree of habitat connectivity is maintained (offsetting allowed).	Revised BDAR
GS Credit 35	<ul style="list-style-type: none"> The building was not built on, or significantly impacted, a site with a high ecological value. The building's light pollution has been minimised. There is ongoing monitoring, reporting, and management of the site's wetland ecosystem. AND <ul style="list-style-type: none"> The building's design and construction conserves existing natural soil, hydrological flows, and vegetation elements. If deemed necessary by an Ecologist, at least 50% of existing site with high biodiversity value is retained. 	Note: Parklife Metro D&C will be handed pre-cleared areas by other contractors. Additional clearing will be minimised or avoided where possible. Refer to the VAMP No wetland ecosystems were identified during the EIS surveys. Section 6.11
GS Credit 36	<ul style="list-style-type: none"> The building's site includes an appropriate landscape area. The landscaping includes a diversity of species and prioritises the use of climate-resilient and indigenous plants. The project team develops a site-specific Biodiversity Management Plan and provides it to the building owner or building owner representative. AND <ul style="list-style-type: none"> A greater area of landscaping is provided. The landscaping includes critically endangered and/or endangered plant species native to the bioregion. 	Section 6.11 PUDCLP
GS Credit 37	<ul style="list-style-type: none"> The site must be built to encourage species connectivity through the site, and to adjacent sites. If the project sits within a blue or green grid strategy it must contribute to the goals of the strategy. 	Section 6.11

3.4 EPBC Act 1999

SSTOM Works have been assessed and approved as a controlled action by the Department of Agriculture, Water and the Environment (now Department of Climate Change, Energy, the Environment and Water) under Part 9 of the EPBC Act. The approval was obtained by Sydney Metro on 3 June 2021 (EPBC2020/8687) for the impacts on threatened species and communities and Commonwealth Land (off-airport). A separate approval for on-airport works has also been obtained however is not relevant to this FFMP which applies to off-airport work only.

SSTOM Works located south of the Western Sydney International have undergone a strategic assessment in accordance with Part 10 of the EPBC Act. The *Sydney Growth Centres Strategic Assessment: Program Report* applies to the land within the proposed corridor south of Western Sydney International, and therefore impacts on Matters of National Environmental Significance (MNES) and Commonwealth land protected by the EPBC Act have already been assessed and approved on 28 February 2012 under that strategic assessment. No further approval under the EPBC Act would be required for the SSTOM Works south of Western Sydney International, including no further approval under s146B of the EPBC Act.

3.5 Licences and Permits

A Section 37 permit under the Fisheries Management Act may be triggered if works in a waterway require the relocation of fish, however the likelihood of this occurring is considered low. No additional licences or permits are required for the SSTOM Works applicable to the management of flora and fauna. Note, Sydney Metro are responsible for the management and submission of biodiversity credits.

3.6 Document Consultation

In accordance with REMM FF1, this FFMP has been prepared by personnel within the Parklife Metro D&C and in consultation with the BAM accredited Project Ecologist who satisfies reasonable qualifications and experience necessary to ensure this Sub-plan best minimises and manages impacts to flora and fauna during construction of the SSTOM Works.

Reflecting the requirements of Conditions A6, C5(b) and C6, this Sub-plan will be prepared in consultation with DPE Environment and Heritage Group (EHG) (formerly DPIE EES), DPI Fisheries, Penrith City Council and City of Liverpool Council, as shown in Table 4.

TABLE 4 SUB-PLAN AND MONITORING PROGRAM AGENCY CONSULTATION REQUIREMENTS

Plan	Consultation requirement
Flora and Fauna Management Sub-plan (Condition C5)	DPE EHG, DPI Fisheries and Relevant Councils (Penrith City Council and Liverpool City Council)

Details of issues raised by stakeholders during consultation are provided in Appendix B, in accordance with Condition A6 and summarised below in Table 5.

TABLE 5 CONSULTATION LOG

Agency	Date consulted	Comments received	Discussion
DPE EHG	15 March 2023	17 April 2023	Detailed comments were provided by DPE EHG. Additional information has been included in this FFMP to describe work around waterways as requested by DPE EHG. Further detail was also sought on the location of any native vegetation clearing. Clarification has been made through the document that the need for clearing works will not be known until prior contractors have completed their works, and that this FFMP describes the management process in the event clearing is required. See Appendix B for further detail
DPI Fisheries	15 March 2023	22 March 2023	Fish relocation requirements were highlighted and are addressed in Section 6.10. If required Parklife Metro D&C would seek a s37 permit for fish relocations and DPI Fisheries will be notified 7 days prior to any activities where fish relocation is required. See Appendix B for further detail
Penrith City Council	15 March 2023	29 March 2023	Council finds the plan satisfactory and has no objection, comment or recommendation
Liverpool City Council	5 April 2023	None received	

3.7 Document Approval

In accordance with the Staging Report this Sub-plan will be reviewed and endorsed by the ER for approval no later than one month prior to the commencement of construction.

Construction is not to commence until the CEMP and all required Sub-plans and Monitoring Programs have been endorsed by the ER and approved by the Department of Planning and Environment (DPE). This Sub-plan will be implemented for the duration of construction.

4 Existing Environment

A Biodiversity Development Assessment Report (BDAR) was prepared for the SMWSA Project EIS, and amended in the Submissions Report, to assess the potential biodiversity impacts of the project in relation to State and Commonwealth legislative requirements for both off-airport and on-airport components. The information provided below relates to off-airport land only, which is comprised of two sections:

- South of Western Sydney International (Nancy-Bird Walton) Airport
- North of Western Sydney International (Nancy-Bird Walton) Airport.

The BDAR was updated to incorporate results of targeted field surveys conducted in Spring 2020 and design changes proposed for the project to inform revised credit calculations and offset obligations. The study area of the BDAR is depicted in Figure 2.

Additional figures, in the form of scaled plans illustrating the existing and surrounding environment and identifying PCTs, TECs, threatened flora, fauna habitat and aquatic habitat, as provided in the Submissions Report BDAR, is included in Appendix F.

The existing environment will have been significantly altered during construction of earlier stages of the Project and Parklife Metro D&C anticipate that construction sites will be handed over from the prior contractors generally cleared and stabilised with all major earthworks completed. The information provided is based on details of the surrounding environment around the work areas.

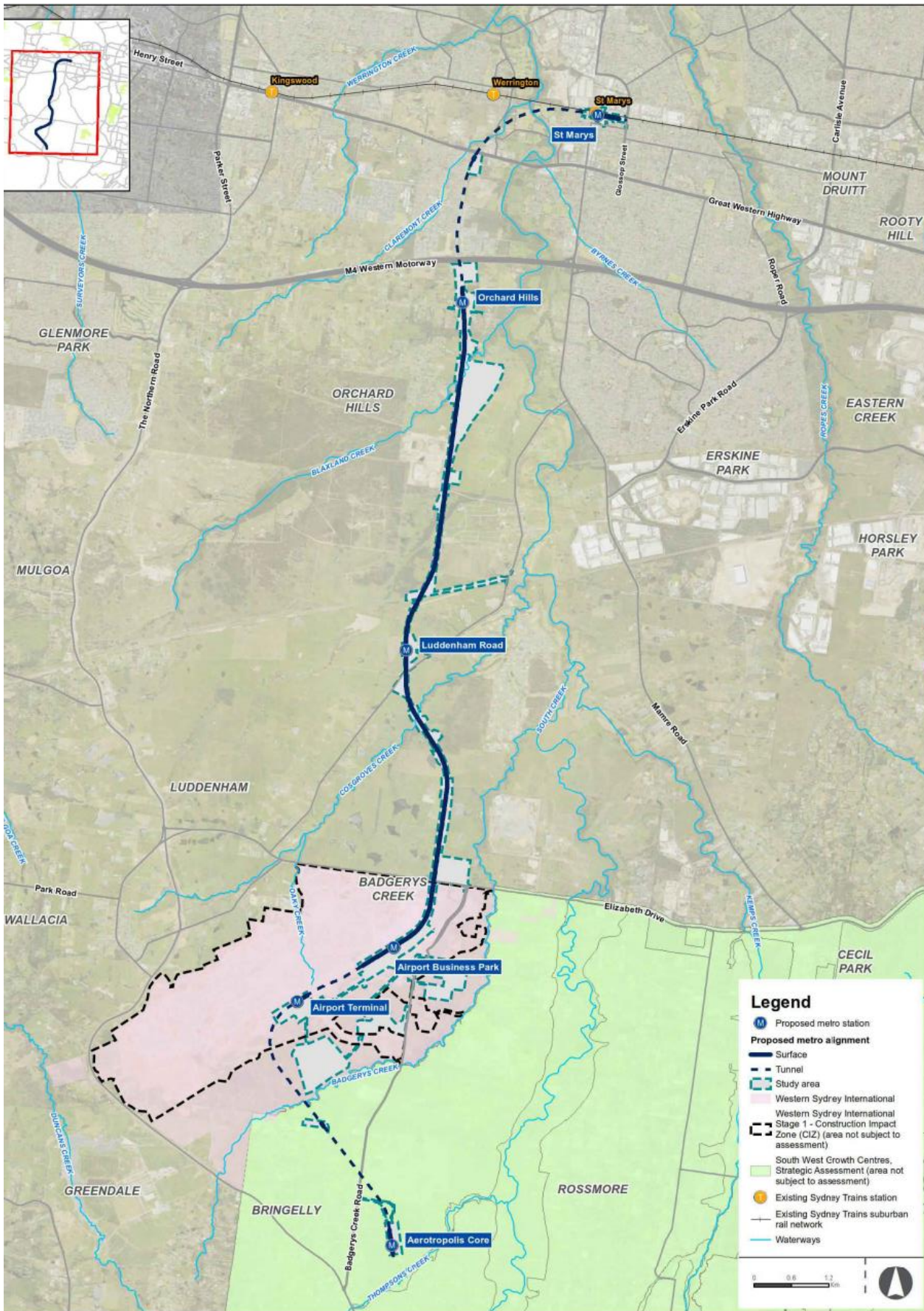


FIGURE 2 BDAR STUDY AREA

4.1 Landscape Features

The landscape north of Western Sydney International is a mix of rural residential development and farmland, as well as undeveloped land in the northern and eastern parts of the Defence Establishment Orchard Hills. Farmland in Orchard Hills and Luddenham comprises mostly rural industries, rural residential properties and agricultural land, with interspersed stands of remnant native vegetation generally remaining only along creek lines, low-lying areas and some roadside patches. South Creek forms a north–south green corridor, particularly through St Marys, where parks and recreational facilities are located next to the creek. The majority of the land to the north of the M4 Motorway is residential with a few industrial complexes and some stands of remnant native vegetation. The study area encompasses a highly fragmented landscape with areas of agricultural, residential and commercial land use.

The SSTOM Works located south of the Western Sydney International at the surface (not including tunnel works) is limited to the Bringelly Service Shaft and the Aerotropolis Station. These areas were assessed in the *South West Growth Centre Strategic Assessment* and were not identified as ‘protected areas’ identified in that report.

Generally, habitat connectivity was limited to riparian corridors (particularly Badgerys Creek, Cosgrove Creek and Blaxland Creek). Defence Establishment Orchard Hills (DEOH) (off-airport) is located between Warragamba to Prospect Water Supply Pipelines and Patons Lane and has connectivity to a large bushland patch to the west. This large patch (about 700 hectares) is isolated in the locality. A summary of the landscape features within the off-airport area are summarised in Table 6.

TABLE 6 SUMMARY OF LANDSCAPE FEATURES IN OFF-AIROPART AREA

Landscape Features	Off-airport
IBRA bioregions and subregions	Sydney Basin Bioregion, Cumberland subregion
NSW landscape regions	Cumberland Plain, Hawkesbury - Nepean Channels and Floodplains
Rivers, streams and estuaries	Blaxland Creek, Cosgroves Creek, South Creek, Kemps Creek
Important and local wetlands	None
Connectivity features	Riparian areas of creek lines; Defence Establishment Orchard Hills (DEOH)
Area of geological significance and soil hazard features	None
Area of outstanding biodiversity value	None

4.2 Threatened Ecological Communities

Vegetation mapping and detailed floristic assessments prepared for the EIS and submissions report identified five plant community types (PCT) within the off-airport project area:

- PCT 724 – Broad-leaved Ironbark – Grey Box – *Melaleuca decora* grassy open forest on clay/gravel soils of the Cumberland Plain, Sydney Basin Bioregion
- PCT 835 – Forest Red Gum – Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion
- PCT 849 – Grey Box – Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion
- PCT 1071 – *Phragmites australis* and *Typha orientalis* coastal freshwater wetlands of the Sydney Basin Bioregion

- PCT 1800 – Swamp Oak open forest on riverflats of the Cumberland Plain and Hunter Valley.

In addition, three non-native vegetation types were assigned to a miscellaneous ecosystem class, being:

- Miscellaneous ecosystem – highly disturbed areas with no or limited native vegetation
- Miscellaneous ecosystem – urban exotic/native landscape plantings
- Miscellaneous ecosystem – water bodies, rivers, lakes, streams (not wetlands).

Four terrestrial threatened ecological communities (TECs) listed under the BC Act were identified within the project area and are shown in Figure 3 and Figure 4.

- Cumberland Plain Woodland listed as Critically Endangered under the BC Act (PCT 849) and Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest listed as Critically Endangered under EPBC Act (PCT 849 and PCT 724)
- River-Flat Eucalypt Forest listed as Endangered under the BC Act (PCT 835)
- Shale Gravel Transition Forest listed as Endangered under the BC Act (PCT 724)
- Swamp Oak listed as Endangered under the BC Act (PCT 1800) and Coastal Swamp Oak listed as Endangered under EPBC Act (PCT 1800).

Areas identified in Figure 3 and Figure 4 as “not yet surveyed” were not accessible during the preparation of the EIS. For consistency the assessment undertaken for the Strategic Assessment (Open Lines and Biosis, 2020) and the Penrith to Eastern Creek Growth Investigation Area (Biosis 2018) and EPBC TEC Mapping (Biosis 2019) were used to provide information for the Revised BDAR, which is used in this FFMP. In the event clearing is required in TEC or areas where threatened species have been identified, the process in Section 6.2 will be employed to ensure actual community types and species are recorded to inform reporting and revegetation efforts.

4.3 Threatened Flora Species

Two threatened flora species, *Grevillea juniperina* subsp. *juniperina* and *Dillwynia tenuifolia*, listed as vulnerable under the BC Act were recorded within the study area during project field surveys. A total of 1,225 individuals of *Grevillea juniperina* subsp. *juniperina* were recorded. The total combined area of habitat for *Grevillea juniperina* subsp. *juniperina* within the study area has been estimated to be about 6.38 hectares. A total of 100 individuals of *Dillwynia tenuifolia* were recorded. The total combined area of habitat for *Dillwynia tenuifolia* within the study area has been estimated to be about 3.05 hectares.

A total of 15 threatened flora species were considered to have a moderate or higher likelihood of occurrence within the off-airport study area. Due to limited access to private residential properties for project field surveys, a conservative assessment has been applied and 12 threatened flora species have been assumed present based on presence of associated habitat.

No commonwealth threatened flora was recorded during field surveys or in previous ecological assessments within the study area.

4.4 Threatened Fauna Species

A total of 47 threatened fauna species were considered to have a moderate or higher likelihood of occurrence within the off-airport study area. Threatened fauna species recorded during field surveys include:

- Cumberland Plain Land Snail
- Southern Myotis
- Eastern False Pipistrelle
- East Coast Freetail Bat.

4.5 Migratory Species

Four migratory species were considered to have suitable foraging habitat within the study area:

- Latham's Snipe
- White-bellied Sea-eagle
- White-throated Needletail
- Satin Fly-catcher.

The White-bellied Sea-eagle was recorded flying over off-airport lands within the study area during the field surveys undertaken for the BDAR.

4.6 Groundwater Dependent Ecosystems

Groundwater dependent ecosystems (GDEs) are defined as ecosystems that require access to groundwater to meet all or some of their water requirements to maintain their communities of plants and animals, ecological processes and ecosystem services. Ecosystems which have their species composition and natural ecological processes wholly or partially determined by groundwater may include native plant communities. GDEs which are surface expressions of groundwater within the locality of the study area (<10 kilometres) include South Creek and associated tributaries. Other GDEs which are reliant on subsurface groundwater in the study area include:

- 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.

Drawdown modelling carried out by the prior Station Boxes and Tunnelling (SBT) contractors identified moderate potential for adverse effects along the project alignment at the Claremont Meadows facility, Orchard Hills station, and Bringelly services facility, where dewatering is likely to cause groundwater levels to be temporarily drawn-down below the root zone of facultative terrestrial GDEs for a period of greater than six months. The native vegetation identified in these potential drawdown zones corresponds to the Cumberland Plain Woodland in the Sydney Basin Bioregion and Shale Gravel Transition Forest in the Sydney Basin Bioregion Areas TEC.

4.7 Aquatic Ecology

Table 7 details the waterways within the off-airport study area and their key fish habitat (KFH) and waterway classification under the FM Act, as provided by the EIS and Submissions Report. No threatened fish species listed under the FM Act or EPBC Act were recorded or considered likely to occur within the study area and as such the project is unlikely to significantly impact any threatened aquatic species or their habitats.

The EIS and Submission Report stated that Badgerys Creek, Cosgroves Creek, Oaky Creek, South Creek, Thompsons Creek and their tributaries were representative of poor water quality with a macroinvertebrate community and fish community dominated by species indicative of disturbed habitats.

The macroinvertebrate community in a portion of Blaxland Creek tributaries upstream from the project was identified to contain a high representation of pollution-sensitive macroinvertebrate taxa. The Blaxland tributaries within or adjacent to the project area were identified to have a macrofaunal assemblage and water quality environment similar to that identified for Badgerys Creek and Cosgroves Creek.

TABLE 7 KEY FISH HABITAT WATERWAY CLASSIFICATION

River/stream	Strahler order	KFH	Habitat sensitivity	Waterway classification
Blaxland Creek	4th	Yes	Type 2 - Moderate	Class 2 - moderate
Unnamed tributary of South Creek (DEOH land, Lot 1 DP242968 south of Patons Lane)	4th	Yes	Type 2 – Moderate	Class 3 - moderate
Claremont Creek	4th	Yes	Type 2 Moderate	Class 2 - moderate
Cosgroves Creek	4th	Yes	Type 2 Moderate	Class 2 - moderate
Unnamed tributary of Badgerys Creek (Lot 26 DP2650)	3rd	Yes	Type 3 – Minimal	Class 4 - unlikely
South Creek	5th	Yes	Type 1 – Highly sensitive	Class 2 – moderate

4.8 Weeds

During field surveys, exotic species listed as High Threat weeds under the Biodiversity Conservation Act 2016, Priority Weeds for the Greater Sydney region under the Biosecurity Act 2015 (Department of Primary Industries, 2019a) and Weeds of National Significance (WoNS) (Australian Weeds Committee, 2020) were noted. Each species is outlined in Table 8.

TABLE 8 PRIORITY WEEDS IDENTIFIED WITHIN THE STUDY AREA

Scientific name	Common name	BAM	Priority weed listing	WONS	Off-Airport
<i>Acetosella vulgaris</i> *	Sheep sorrel	HT	-	No	x
<i>Alternanthera pungens</i> *	Khaki weed	HT	General Biosecurity Duty	No	x
<i>Araujia sericifera</i> *	Moth Vine	HT	General Biosecurity Duty	No	x
<i>Asparagus aethiopicus</i> *	Asparagus Fern	HT	Regional Recommended Measure	Yes	x
<i>Asparagus asparagoides</i> *	Bridal Creeper	HT	General Biosecurity Duty	Yes	x
<i>Axonopus fissifolius</i> *	Narrow- leaved Carpet Grass	HT	-	No	x
<i>Chloris gayana</i> *	Rhodes grass	HT	-	No	x
<i>Cyperus eragrostis</i> *	Tall flatsedge	HT	-	No	x
<i>Eragrostis curvula</i> *	African Love Grass	HT	General Biosecurity Duty	No	x
<i>Cestrum parqui</i> *	Green Cestrum	HT	General Biosecurity Duty Regional Recommended Measure	No	x
<i>Ehrharta erecta</i> *	Panic veldtgrass	HT	-	No	x

Scientific name	Common name	BAM	Priority weed listing	WONS	Off-Airport
<i>Lantana camara</i> *	Lantana	HT	General Biosecurity Duty Prohibition on dealings	Yes	-
<i>Ligustrum sinense</i> *	Small- leaved Privet	HT	General Biosecurity Duty	No	x
<i>Ligustrum lucidum</i> *	Broad- leaved Privet	-	General Biosecurity Duty	No	-
<i>Lycium ferocissimum</i> *	African Box Thorn	HT	General Biosecurity Duty Prohibition on dealings	Yes	x
<i>Olea europaea</i> *	African Olive	HT	General Biosecurity Duty Regional Recommended Measure	No	x
<i>Opunita sp.</i> *	Prickly Pear		General Biosecurity Duty Prohibition on dealings	Yes	-
<i>Paspalum dilatatum</i> *	-	HT	-	No	x

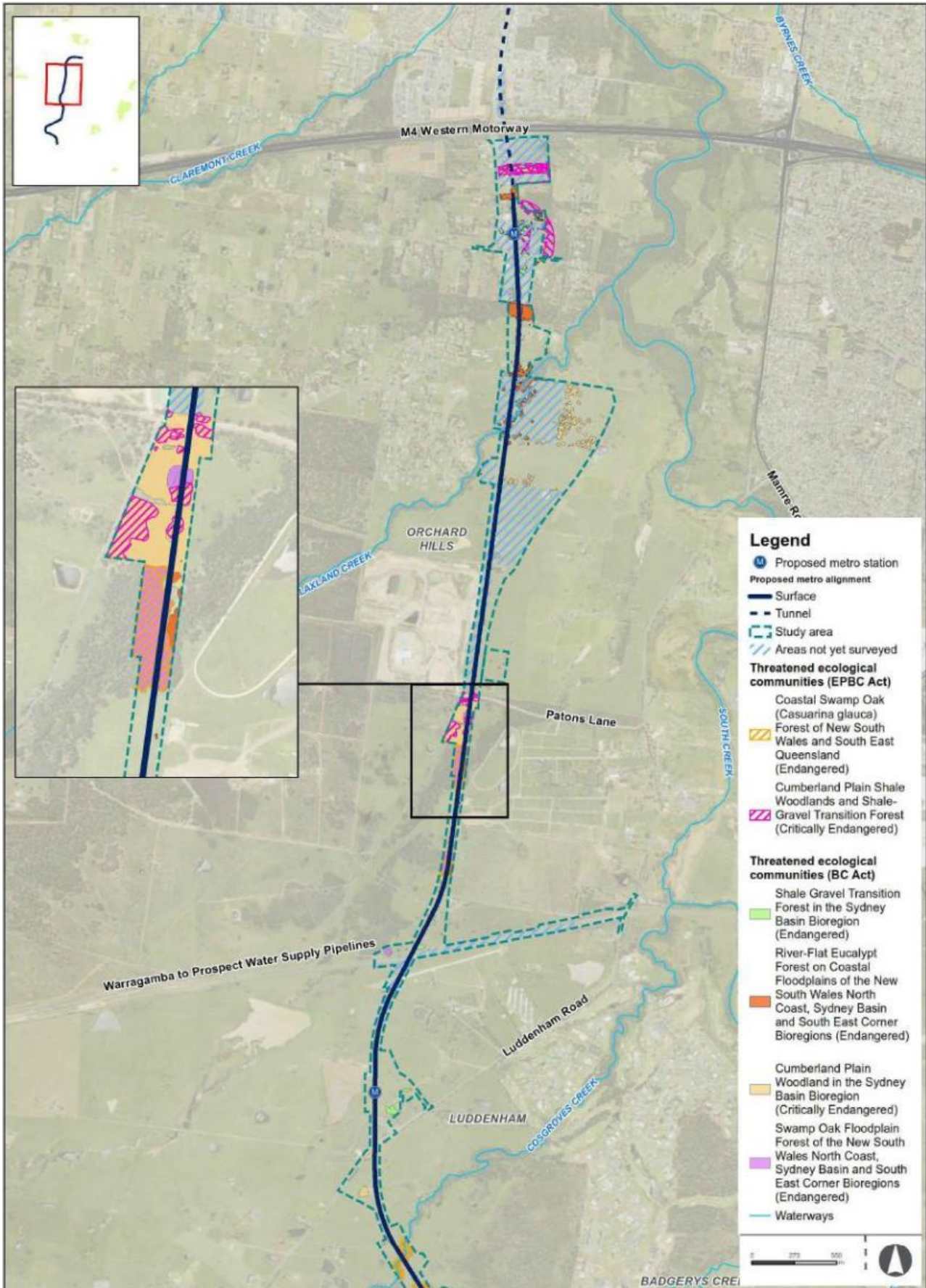


FIGURE 3 TECs ON SSTOM PROJECT - NORTHERN PORTION

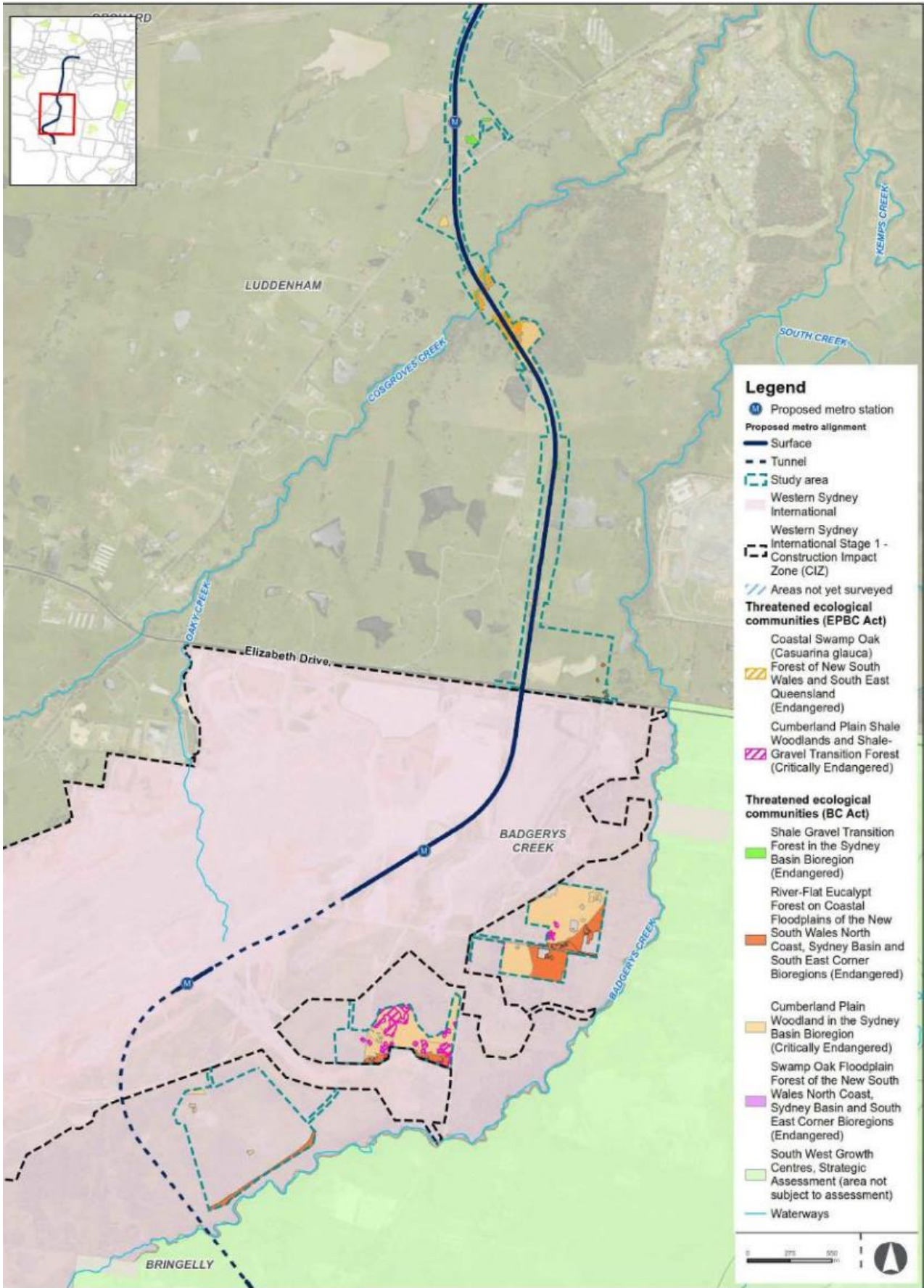


FIGURE 4 TECS ON SSTOM PROJECT - SOUTHERN PORTION

5 Environmental Aspects and Impacts

The SMWSA Project has been refined to avoid and minimise potential impacts on biodiversity including:

- Refining the construction footprint at Orchard Hills Station to minimise impacts on threatened ecological communities and to avoid large areas of intact contiguous vegetation that provides fauna habitat and movement corridors
- The inclusion of structures such as bridges and viaducts over creek lines and Key Fish Habitat at Blaxland Creek, an unnamed tributary of South Creek to the south of Patons Lane and Cosgroves Creek to minimise impacts on sensitive environmental receivers and habitat connectivity
- Straightening the project alignment (for example at Blaxland Creek) to avoid vegetation impacts
- Designing tunnel options to avoid direct impacts on riparian vegetation, Cumberland Plain Woodland and the Badgerys Creek Environment Conservation Zone.

Delivery of the off-airport component of the project (north of Western Sydney International) would have a residual impact on up to 31.67 hectares of native vegetation (29.86 hectares direct impact and 1.81 hectares of indirect impact).

SSTOM Works have limited potential to impact biodiversity as vegetation clearing will have generally been completed in earlier stages of the Project. Should clearing activities be required for SSTOM Works, the extent of clearing will be assessed by the Project Ecologist as part of the pre-clearing inspection process (Appendix C) and the management measures in this FFMP will be applied.

SSTOM Works will include the construction of the permanent maintenance road/active transport corridor which will run generally beside the surface rail alignment between Orchard Hills Station to the Airport Business Park Station. This will include three additional bridges: at the unnamed creek south of Orchard Hills Station, Blaxland Creek and Cosgroves Creek. Works in and around waterways will be designed and constructed in accordance with Condition E14 and will aim to minimise the need for any additional clearing, and maximise the use of areas cleared by prior works contractors for temporary works.

Biodiversity impacts relevant to the SSTOM package are detailed in Table 9, which is provided as a worst-case scenario based on potential vegetation clearing, and/or demolition of built structures not being completed by previous contractors.

TABLE 9 SUMMARY OF ASPECTS AND POTENTIAL IMPACTS

Aspect	Impact
Clearing of native vegetation	<ul style="list-style-type: none"> • Loss of native vegetation, including TECs and threatened plant species • Loss of habitat, including threatened and listed migratory fauna species habitat • Direct and indirect impacts to terrestrial, including threatened species • Direct injury and mortality of fauna (including vehicle strike) • Edge effects on adjacent native vegetation and habitat • Fragmentation of habitats and wildlife corridors • Impact on biological diversity through clearing of native vegetation
Works around and within watercourses	<ul style="list-style-type: none"> • 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 • Changes in hydrology and aquatic environment potentially impacting aquatic macroinvertebrate and fish habitat

Aspect	Impact
Construction noise and vibration, vehicle movements and light	<ul style="list-style-type: none"> • Direct injury and mortality of fauna (including vehicle strike) • Noise, vibration, dust and light disturbance on nocturnal species habitat
Establishment of ancillary sites	<ul style="list-style-type: none"> • Invasion and spread of weeds and pests • Loss of native vegetation, including TECs • Edge effects on adjacent native vegetation and habitat • Fragmentation of habitats and wildlife corridors
Demolition of built structures	<ul style="list-style-type: none"> • Loss of habitat, including threatened and listed migratory fauna species habitat • Direct injury and mortality of fauna including Microchiropteran bat (microbats) species.
Excavation and drainage works	<ul style="list-style-type: none"> • Direct injury and mortality of fauna (including vehicle strike) • Decrease in health of GDE's due to water draw down
General earthworks near vegetation, disturbance of soils, consequential erosion and the mobilisation of sediment	<ul style="list-style-type: none"> • 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

5.1 Environmental Risk Identification and Management

The ongoing identification and management of environmental risks and opportunities is a key consideration during all project risk assessment activities and is fully described in Section 3.4 of the CEMP.

Ongoing environmental risk and opportunity identification will be undertaken via the following risk assessment processes:

- Overarching SSTOM Works risk assessment undertaken and a SSTOM Works Risk Register maintained incorporating high level environmental risks from the Environmental Risk Register
- Monthly review of the Environmental Risk Register to address construction changes or new risks identified – any new high level environmental risks to be included in the SSTOM Works Risk Register
- SSTOM Works Risk Register review process will be undertaken in accordance with the Risk Management Plan,
- Environmental Work Method Statements
- Risk assessment undertaken on site at pre-start meetings.

6 Environmental Controls

6.1 Mitigation and Management Measures

The project has included specific performance outcomes with regards to biodiversity including:

- Minimising or where possible avoiding impacts to threatened flora and fauna species, and ecological communities listed under the BC Act and EPBC Act
- Design waterway crossings to incorporate best practice principles
- Retain and enhance existing flora and fauna habitat and connectivity wherever possible
- Appropriately manage the spread of weeds and plant pathogens.

A full list of the mitigation measures to be implemented for the SSTOM Works are provided in Table 10.

Where mitigation measures or controls are identified in this FFMP or during construction that are not necessarily sourced from industry guidelines and standards but are considered industry best-practice and are the most suitable approach for management of the SSTOM Works, this will be approved by the Parklife Metro D&C Environmental Manager, in consultation with Sydney Metro and the ER, as required.

TABLE 10 FLORA AND FAUNA MITIGATION MEASURES

ID	Control	Source or req.	Responsibility
Management			
FF_M1	<p>Prior to any disturbance, clearing or grubbing activities, the following will be in place:</p> <ul style="list-style-type: none"> • A Pre-Clearing and Grubbing Permit • No-go Zones established for native or significant flora and fauna, which will be fenced/flagged and sign posted prior to commencement of clearing. • Clear identification, and fencing/flagging of clearing boundaries. • The Project Ecologist will conduct a search for any wildlife that may need to be removed and relocated • Release of the Hold Point. 	CEMF 10.2(b)	<p>Construction Manager</p> <p>Environmental Manager</p> <p>Environmental Coordinator</p>
FF_M2	Vegetation clearing, particularly native vegetation, will be minimised as much as practicable.	Condition E2	<p>Construction Manager</p> <p>Environmental Manager</p> <p>Environmental Coordinator</p>
FF_M3	<p>A Pre-clearing inspection will be undertaken prior to vegetation clearing and will include:</p> <ul style="list-style-type: none"> • Identification of hollow bearing trees and other habitat features • Identification of threatened flora and fauna • A check on the physical demarcation of the limit of clearing • An approved erosion and sediment control plan for the worksite. 	CEMF 10.2(b)	<p>Site Supervisor</p> <p>Environmental Coordinator</p> <p>Project Ecologist</p>
FF_M4	A pre-demolition inspection will be undertaken prior to removal of any built structure, including drainage culverts, for the presence of micro-bats.		<p>Site Supervisor</p> <p>Environmental Coordinator</p> <p>Project Ecologist</p>
FF_M5	If a threat to an animal is evident onsite you must contact your supervisor and/or Environmental Coordinator immediately. Works may need to cease if the animal is in danger or harmed, until it has been relocated.	CEMF 10.1(a)	Site Supervisor
FF_M6	The local WIRES group and/or veterinarian will be contacted if any fauna is injured on site or requires capture and/or relocation, where it cannot be relocated by the Project Ecologist or professional fauna handler (ie. Snake catcher)	CEMF 10.1(a)	Environmental Coordinator

ID	Control	Source or req.	Responsibility
FF_M7	No-go zones will be established around retained native vegetation or environmentally sensitive areas. No-go zones must be obeyed at all times, unless a Permit to Enter No-go Zone has been approved by the Environmental Manager, or delegate. Any damage to no-go zone fencing or signage must be reported to your supervisor or Environmental Coordinator immediately.	CEMF 10.3 EPBC Ref 1, 2	Site Supervisor
FF_M8	Project boundaries and areas of allowable disturbance areas are clearly marked and delineated.	CEMF 10.3 Condition E3	Site Supervisor
FF_M9	The use of artificial lighting and shading would be minimised where practicable in locations adjacent to remnant bushland that is in intact condition.	REMM FF6	Construction Manager Environmental Manager
FF_M10	Site offices, compounds and ancillary facilities will be located in areas where there is limited biodiversity values (e.g. cleared land), where practicable.	REMM FF1	Construction Manager Environmental Manager
FF_M11	To prevent establishment or spread of weeds: Machinery will be cleaned before entering work sites Cleared weed material will be disposed of at a site licensed to receive green waste.	CEMF 10.3	Site Supervisor
FF_M12	Weed management is to be undertaken in areas affected by construction prior to any clearing works.	CEMF 10.3	Construction Manager
FF_M13	Biodiversity offset credits will be retired prior to impacts occurring.	Condition E4, E8 EPBC Ref 1	Sydney Metro
FF_M14	Works around and within watercourses will be designed to incorporate best practice principles and constructed to minimise impacts to aquatic flora and fauna and the riparian corridor as far as practicable and in accordance with an erosion and sediment control plan (ESCP), as per the Blue Book. Where clearing is required within the riparian buffer zones, the Project Ecologist will provide advice and supervision, as required.	Condition E14	Environmental Manager Design Manager Construction Manager
FF_M15	Tree health will be monitored for GDEs which may be impacted by groundwater draw down	Condition C16(i) REMM GW6	Environmental Manager Project Ecologist
Training			

ID	Control	Source or req.	Responsibility
FF_M15	Induction will include information about: <ul style="list-style-type: none"> • Flora and fauna on site • Requirements for management of unexpected finds. • Sensitivity of threatened fauna species • Emergency and incident response (chemical spills, fire, injured fauna). 	CEMF 3.11	Environmental Manager
FF_M16	Toolbox training will be rolled out on management of flora and fauna that will reinforce and reiterate information from inductions.	CEMF 3.11	Environmental Coordinator
FF_M17	Training will be rolled out to relevant staff in the environmental procedures developed for the management of flora and fauna, including Hold Points.	CEMF 3.11	Environmental Manager

6.2 Pre-Clearing Inspection

Sites will be handed over to Parklife Metro D&C generally cleared and stabilised with all major earthworks completed and for this reason SSTOM Works have limited potential to impact biodiversity. However until detailed design is further progressed, and the full extent of clearing is completed by prior Works contractors, Parklife Metro D&C is unable to confirm if any areas will require clearing as part of SSTOM Works.

If vegetation clearing cannot be avoided, the Clearing and Grubbing Procedure (Appendix C) must be followed. The clearing and grubbing procedure will be implemented, requiring completion of a Pre-Clearing Inspection. The Pre-Clearing Inspection will be undertaken by the Project Ecologist and the Environmental Manager (or delegate) prior to any clearing of native vegetation and/or habitat features.

Prior to any disturbance of vegetation, a Pre-Clearing and Grubbing Permit must be obtained. The Pre-Clearing Inspection and Pre-Clearing and Grubbing Permit will be implemented as a Hold Point prior to any vegetation clearing. The Pre-Clearing and Grubbing Permit may be signed off by the Environmental Manager (or delegate) or the Project Director to authorise removal of vegetation. Operators involved in clearing activities must be advised of permit conditions and understand all applicable clearing requirements and boundaries. This will be documented by signing on to the permit.

In accordance with REMM LV1, during early construction planning Parklife Metro D&C will assess opportunities for the retention and protection of existing street trees and trees within the construction sites. Construction and ancillary facility footprints will be refined to conserve vegetation where practicable. Vegetation adjacent to or within construction sites that is to be retained and protected will be appropriately demarcated (e.g., fenced, flagged, etc.), and signage will be erected identifying these areas as 'Tree Protection Zone – No Access', in accordance with AS 4970–2009. These areas will also be clearly marked on Environmental Control Maps (ECMs) as 'Tree Protection Zone – No Access'.

Disturbance area and clearing limits will be clearly delineated with flagging. Areas to be retained and adjacent habitat areas will be fenced off prior to works to prevent damage or accidental over clearing. No-go zones will be clearly identified with signage. Areas to be cleared/retained as per design will be confirmed by survey and documented in the Pre-Clearing Inspection.

In addition to the controls listed in the Clearing and Grubbing Procedure, if clearing is required, a Tree Survey will be completed to identify the number, type and location of any trees to be removed. This information will be used during revegetation in accordance with Condition E13.

6.3 Biodiversity Offsets

Ecosystem and species credit offset obligations for the overarching SMWSA Project are provided in Table 11 and Table 12, as required under CSSI-10051-Mod-1 (14 April 2022) .

The SSTOM Works have limited potential to impact biodiversity as vegetation clearing will have generally been completed in earlier work stages. However, should impacts to threatened ecological communities or endangered species be unavoidable, Parklife Metro D&C will quantify the impacts and communicate these to Sydney Metro to inform offset requirements. Offsets will be managed by Sydney Metro in accordance with the requirements of the EPBC Act approval and NSW Biodiversity Offsets Policy for Major Projects (OEH, 2014) in agreement with DPE EHG. Biodiversity offset credits will be retired prior to impacts to vegetation occurring.

Any approved biodiversity offsets allowed for in the SSTOM Works footprint and contained in Condition E4 will be monitored and tracked by the Parklife Metro D&C Environment Manager during construction. Sydney Metro is responsible for the requirements of Condition E4, E5, E6 and E7.

TABLE 11 ECOSYSTEM CREDITS REQUIRED

Plant Community Type (PCT) ID and name	Number of Credits
724: Broad-leaved Ironbark – Grey Box – <i>Melaleuca decora</i> grassy open forest on clay/gravel soils of the Cumberland Plain, Sydney Basin Bioregion	246
835: Forest Red Gum – Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion	217
849: Grey Box – Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion	202
1800: Swamp Oak open forest on riverflats of Cumberland Plain and Hunter Valley	181
TOTAL	846

TABLE 12 SPECIES CREDITS REQUIRED

Species	Number of Credits
<i>Dillwynia tenuifolia</i>	21
<i>Grevillea juniperina</i> subsp. <i>juniperina</i> (Juniper-leaved Grevillea)	57
<i>Pultenaea parviflora</i>	10
<i>Meridolum corneovirens</i> Cumberland Plain Land Snail	159
<i>Myotis Macropus</i> (Southern Myotis)	292
TOTAL	539

6.4 Erosion and Sediment Control Plan

Erosion and Sediment Control Plans (ESCPs) are planning documents that identify the site layout, general locations of construction works and the approximate location of erosion and sediment control features onsite. ESCPs cover all construction stages from initial vegetation clearing through to rehabilitation when erosion and sediment control are no longer required and are removed.

ESCPs will be regularly updated following changes in the site layout or phase of works. Parklife Metro D&C will conduct ongoing consultation with the Project Soil Conservationist, which will include reviews of ESCPs, as well as site inspections, to ensure they meet best practice and Blue Book requirements.

ESCPs will be prepared and updated progressively, endorsed by the Environment Manager or delegate, and communicated to relevant workers throughout construction. The implementation of erosion and sediment controls prior to grubbing is a key step outlined in the Clearing and Grubbing Procedure (Appendix C).

6.5 Habitat Feature Identification and Clearing Procedure

6.5.1 Waterways and Riparian Zone

As described in Section 5, SSTOM Works will include the construction of three additional bridges at the following locations:

- Unnamed creek south of Orchard Hills Station
- Blaxland Creek and

- Cosgroves Creek.

Works in and around all waterways will be designed and constructed in accordance with Condition E14 and will aim to minimise, or avoid where possible, the need for any additional clearing, in will be undertaken in accordance with an erosion and sediment control plan (ESCP), as per the Blue Book. Where clearing is required within the riparian buffer zones, the Project Ecologist will provide advice and supervision, as required. The design of crossings will maximise the use of existing disturbed areas including the footprint of temporary works by prior works contractors.

The design of these structures and any temporary works will consider fauna sensitive design and maintain habitat connectivity across the riparian corridors. The dedicated fauna crossing culvert, constructed by prior work contractors, will be maintained at the Unnamed watercourse (tributary of Blaxland Creek) between Lansdowne Road and Blaxland Creek. This will include maintenance of fauna furniture for fauna shelter at the culvert entrances (e.g. vegetation, logs, rocks, leaf-litter, refuge pipes, escape poles, roofing tiles, and roofing iron). Design of the watercourse crossings will be undertaken in consultation with DPE EHG, DPI Fisheries and the Project Ecologist.

Aquatic ecology and macroinvertebrate environments will be protected during work through the implementation of the ESCPs including implementing the Guidelines for controlled activities on waterfront land riparian corridors (Department of Industry 2018) for any work in and around waterways.

6.5.2 Habitat Trees

The Nest Box Strategy (Appendix H) has been developed to mitigate disturbance to native fauna prior to the removal of hollow-bearing trees or habitat trees. In accordance with Condition E11, nest boxes would be installed one month prior to removal of existing tree hollows and/or the release of any captured hollow dependent fauna.

For any clearing of PCTs, or removal of potential fauna habitat (e.g. hollow bearing trees), the Project Ecologist will be present during clearing to assist with management of potential impacts to resident fauna and provide advice on opportunities to salvage habitat where feasible. If habitat trees are identified during the pre-clearing inspection, clearing will follow a two-stage process as follows:

- Non-habitat trees and other vegetation will be cleared first after sign-off of the pre-clearing inspection and pre-clearing and grubbing permit.
- Habitat trees will be cleared no sooner than 48 hours after non-habitat trees have been cleared, where feasible. The project Ecologist will be present on site during the clearing of habitat trees. Felled habitat trees will be left on the ground for 24 hours, with hollow entrances exposed (to allow fauna escape) or inspected by the ecologist prior to further processing.

A record of inspection of any identified habitat trees will be undertaken during the Pre-Clearing Inspection by the Project Ecologist or environmental coordinator and documented in the Pre-clearing and Grubbing Permit prior to the clearing of any habitat trees.

6.5.3 Nest Box Strategy

The SSTOM Works have limited potential to impact any existing hollow bearing trees as vegetation clearing will have generally been completed in earlier work stages. However, in the event any hollow bearing tree clearing occurs during SSTOM Works, the Nest box Strategy (Appendix H) will be implemented to minimise habitat loss to hollow-dependent fauna by replacing the previously existing hollow with an appropriate replacement. The Nest Box Strategy will act as a general guide on the installation of nest boxes and the appropriate design specifications but can be modified to better suit the inhabitant(s) at the Project Ecologist's discretion. The nest boxes will be installed one month prior to any removal of existing tree hollows and/or the release of any captured hollow dependent fauna in accordance with Condition E11. They will be monitored on an annual basis and replaced where fallen, damaged, degraded, or otherwise unsuitable for the inhabitants.

6.5.4 Microbat Management

SSTOM Works are not anticipated to require demolition of dwellings and other existing structures, as these works should be fully completed in earlier stages of the Project. If demolition, removal or modification of dwellings and structures is unavoidable as part of the SSTOM works, including the removal of any culverts constructed for temporary access requirements, a targeted microbat survey (including Eastern Coastal Free-tailed Bat, Large Bent-winged Bat and Eastern False Pipistrelle) would be undertaken in accordance with 'Species credit' threatened bats and their habitats NSW survey guide for the Biodiversity Assessment Method (OEH, 2018), as required by REMM FF4.

The survey objective is to collect data to determine the area of suitable habitat on the subject land which is used to calculate species credits. Other human-made structures such as culverts and other under-road structures within the construction footprint will be surveyed for threatened microbats (e.g., particularly the Southern Myotis) in accordance with the relevant guidelines. If threatened microbats are detected, a Microbat Management Plan (MMP) will be developed and implemented by a suitably qualified bat specialist. The MMP would be included in an updated version of this FFMP for consultation with EHG and other agencies as required. The requirement for a microbat survey will be implemented as a Hold Point prior to any demolition activities.

6.6 Unexpected Flora and Fauna Finds

A comprehensive survey of all vegetation was conducted during the EIS which identified threatened flora and fauna species and EECs pursuant to the *Biodiversity Conservation Act 2016*. An unexpected threatened species find would be either:

- Threatened flora individual(s) (including EEC) that were not known of at the time of the EIS, or
- Occurrence of a threatened species not assessed in the EIS.

All unexpected flora and fauna finds will be recorded by the Project Ecologist and be reported to Sydney Metro and the ER. If a new threatened species or ecological community is identified that was not assessed in the EIS, consultation with DPE and DPE EHG will be undertaken to confirm the appropriate level of assessment and applicable approval pathway. If required, a Consistency Assessment will be prepared to assess the significance of the impacts to the species.

For unexpected threatened flora individual(s) that will be directly or indirectly impacted by the SSTOM Works, the area will be protected and the potential for translocation as individuals or part of a soil translocation will be assessed by the Project Ecologist and documented in a translocation feasibility assessment. If translocation is determined to be feasible (likely to result in survival of the individuals or part of a soil translocation), a Threatened Flora Translocation Plan will be prepared, which will be prepared in consultation with DPE EHG.

The Clearing and Grubbing Procedure (Appendix C) and the Fauna Handling Procedure (Appendix D) outline the process to follow in the event of an unexpected species or EEC find during construction. In addition, details of any threatened flora and fauna finds will be entered into BioNet by the Project Ecologist.

6.7 Environmental Controls Maps

In accordance with CEMF 3.6(c), environmental control maps (ECMs) depicting vegetation clearing boundaries and exclusion/no-go zones will be prepared and provided to the construction team through a toolbox talk or pre-start meeting. The pre-start meeting will also include discussion of clearing procedures, erosion and sediment controls, fauna handling and any weed identification and control measures, as appropriate (Appendix C). The ECMs will identify haul roads and access points to be used by LV and HVs, and will differentiate between existing haul roads and any new waterway crossings to be installed.

Information obtained from the Pre-clearing Inspections, such as the identification of unexpected flora, fauna species or weeds, areas of retained vegetation and no-go zones will be included in the ECMS, where required. The ECM will act as a Vegetation Management Plan as required under the CEMF, Section 10.2a(vii). The ECMS will identify locations of PCTs, TECs, threatened flora, fauna habitat and aquatic habitat, as well as watercourses and riparian zones. While

initial ECMs are provided in Appendix D of the CEMP, existing flora and fauna constraints, as identified in the EIS and Submissions Report, is illustrated in the mapping provided in Appendix F of this FFMP.

6.8 Weed and Pathogen Management

The EIS identified that construction activities, in general, have the potential to introduce or spread pathogens such as Phytophthora (*Phytophthora cinnamomi*), Myrtle Rust (*Uredo rangelii*) and Chytrid fungus (*Batrachochytrium dendrobatidis*) into native vegetation and habitats. A list of weeds identified during fields surveys undertaken for the EIS is included in Section 4.8.

Parklife Metro D&C will implement measures to prevent the spread and introduction of the following weeds and pathogens, in particular:

- Exotic vines and scramblers, *Olea europaea* (African Olive)
- *Chrysanthemoides monilifera*
- *Lantana camara*
- Exotic perennial grasses
- Amphibian chytrid,
- *Phytophthora implementa*; and
- Exotic Rust Fungi of the order *Pucciniales*

In order to avoid the introduction and spread of weeds and pathogens, the following controls will be implemented during the SSTOM Works, where required:

- Inspect plant and equipment prior to site entry to ensure they are free from soil
- Identify and demarcate areas or individual weeds that are considered high threat or Weeds of National Significance
- Map and mark areas that are infested with pathogens as an exclusion zone with fencing and signage to limit access by personnel and vehicles
- Separate weed contaminated material during clearing works (if clearing is required) and disposal through on site encapsulation or at a licensed green waste facility
- Install wheel wash and rumble grids at construction sites
- Provide boot wash down facilities at construction sites
- Program works from uninfected areas to infected areas, where possible.

Priority weeds will be managed in accordance with the *Biosecurity Act (2015)* and Weeds of National significance will be managed in accordance with the applicable NSW WeedWise guide should they be encountered during SSTOM Works. Parklife Metro D&C will endeavour to appropriately manage the spread of weeds and plant pathogens by implementing all applicable mitigation measures. Weed identification will be undertaken in accordance with the Clearing and Grubbing Procedure (Appendix C). Weed management will be completed prior to vegetation removal in accordance with the process outlined in the Weed Management Procedure (Appendix E). Ongoing weed management will occur throughout the construction phase, where required. In the event that weed management is identified as an ongoing risk to be managed during the operation or maintenance stage, this will be detailed in the Operational Environmental Management Plan, under Condition D1, where required.

SSTOM Works may increase the risk of dispersal of Phytophthora and Myrtle rust, from soil disturbance, clearing activities and plant movement during construction.

During pre-clearing inspections (Appendix C) an assessment of the condition/health of vegetation to be removed will be undertaken to identify the likelihood of the presence of these pathogens. In the event the Project Ecologist

identifies potential pathogen impacts specific mitigation measures will be included in the pre-clearing inspection documentation for implementation during clearing and grubbing activities. Specific mitigation measures will be communicated to site staff involved in clearing and grubbing activities through toolbox talks or pre-start meetings prior to the commencement of any clearing activities.

Refer to the Soil and Water Management Sub-plan for additional mitigation measures such as management of contaminated material, stockpile management, plant and equipment inspections and stable site access.

6.9 Groundwater Dependant Ecosystem Management and Monitoring

Groundwater level, Groundwater Dependant Ecosystem (GDE) monitoring performance criteria, and the groundwater network is detailed in the Groundwater Monitoring Program, which is included as an Appendix to the Soil and Water Management Sub-plan. GDEs will be monitored using control and impact sites to monitor for any changes to tree health as a result of groundwater drawdown. The objectives of the monitoring will be to:

- Monitor for potential effects the GDE vegetation resulting from water draw down and
- Determine the extent to which reduced groundwater availability to GDE vegetation impacts on the ecological condition of individual trees and the vegetation communities within which they occur

Prior to site handover, Parklife Metro D&C will review the tree health monitoring locations established by the SBT works contractor (it is noted details on these locations are yet to be finalised). It is expected that for each GDE, three monitoring sites will be located within the GDE area and up to three control monitoring sites will be established outside the drawdown zone. Continued monitoring of these sites will be undertaken by Parklife Metro D&C dependant on ongoing negotiated site access with private landholders. Where access is not available monitoring will be undertaken based on available data (refer to the Groundwater Monitoring Program).

Ecological monitoring variables will include:

- Foliage cover measurements using digital cameras and specialised software for analysis
- Assessments of vegetation community condition and health and
- Plant species diversity and community composition

Data from each variable will be collected from each monitoring plot at the time of Parklife Metro D&C acceptance of the station/service facility. After this, data collection will continue twice a year during construction. The control sites will be monitored concurrently to the impact sites so that any changes in vegetation observed at control sites can be compared to changes at impact sites. If similar changes are observed at both site types, it is more likely to be a result of climatic conditions rather than groundwater drawdown.

Where declining tree health is identified and groundwater level monitoring confirms a lowered water table, manual tree watering would be initiated. The Project Ecologist would provide detail on the frequency of watering events and advise on implementation of other mitigation measures.

6.10 Fauna Rescue and Relocation

Any fauna that is encountered during construction will be managed in accordance with the fauna handling process, within the Fauna Handling Procedure (Appendix D). This is applicable to any fauna; however, it contains specific requirements for management of bats and snakes.

Any fauna relocations involving fish are to be carried out by an experienced ecologist and may require a s37 permit to be obtained prior to relocation. Furthermore, notification to NSW DPI Fisheries will be undertaken seven days prior to dewatering of temporary in-stream structures in order to organise any fish rescue activities.

All fauna relocations will be documented by the Project Ecologist or environmental coordinator using the Fauna Relocation Record (Appendix G).

6.11 Rehabilitation of Disturbed Areas

Parklife Metro D&C will undertake landscaping and revegetation works of disturbed areas as soon as practicable, in accordance with the Place, Urban Design and Corridor Landscape Plan (PUDCLP). During development of the PUDCLP, Parklife Metro D&C will identify and implement initiatives, in consultation with Sydney Metro, to:

- Enhance biodiversity and habitat connectivity
- Prioritise the reuse of native vegetation and timber as required by Condition E12, if clearing is required and where practical
- Collaborate with Sydney Metro and other SMWSA Contractors to ensure plantings used in rehabilitation incorporate native species and propagations of plants collected during salvage programs, where practical.
- Incorporate pre-construction plans developed by the FIW Contractors that show impacted and adjoining areas showing vegetation communities, important flora and fauna habitat areas, and locations where threatened species, populations or ecological communities exist, where practical.

Disturbed areas that require rehabilitation will be rehabilitated by cultivating subsoil to a minimum 150mm depth and the placement of 200mm of weed-free topsoil. The use of suitable site won material in landscaping and revegetation works will be prioritised. Where practicable, landscaping treatments within the Corridor will:

- Maximise the retention of existing established trees that provide value to the landscape character or ecology
- Be suitable for the existing soil, drainage, microclimate and development environment of the area
- Comprise of suitable plant species that require minimal water, are low maintenance and drought tolerant
- Ensure diversity through the planting of different species
- Only use species that are 100% endemic to the area

Rehabilitation sites will be regularly inspected to monitor the health of plantings and a safety risk assessment will be carried out to identify future hazards for plantings

7 Compliance Management

7.1 People, Responsibilities and Communication

Parklife Metro D&C will ensure effective and open communication and engagement with external and internal stakeholders is established and maintained to create an environment of trust, openness and involvement. Through the central communication point of the Environmental Manager, Parklife Metro D&C will ensure opportunities to minimise impacts are explored and implemented where reasonable and feasible.

A description of environmental responsibilities and positions relevant to this Sub-plan is provided in Table 13.

TABLE 13 ROLES AND RESPONSIBILITIES

Position	Key Responsibilities
Project Director	The Project Director and Construction Managers are responsible for facilitating and enforcing compliance with the environmental requirements of the Contract and this Sub-plan and providing sufficient resources to ensure that Parklife Metro D&C meets the environmental responsibilities for the Project. The Project Director and Construction Managers also have responsibilities with regards to environmental Objectives and Targets.
Environment Manager	The EM is responsible for overall management and implementation of this Sub-plan, statutory requirements and the CEMP. Key duties include, but are not limited to: <ul style="list-style-type: none"> • Overseeing the implementation of all flora and fauna management initiatives • Preparing and implementing this Sub-plan • Overseeing monitoring, inspections and auditing • Having the ability to stop works on environmental grounds • Reporting any incidents or non-compliances to Sydney Metro and the ER
Qualified Ecologist	A Project Ecologist(s) will be engaged for the duration of SSTOM Works to provide advice and to supervise and lead the implementation of processes and management measures for ecologically sensitive activities, including: <ul style="list-style-type: none"> • Pre-clearing processes, pre-demolition surveys, weed and pathogen management • Fauna relocation and handling • Supervising work in riparian zones • GDE tree health monitoring • Preparing post clearing survey reports.
Environmental Advisor / Coordinator	<ul style="list-style-type: none"> • Assist the Environmental Manager in the day-to-day environmental management of SSTOM Works • Manage the on-ground application of flora and fauna management measures during construction (e.g. clearing limit delineation, coordinating pre-clearing surveys) • Monitor and report on flora and fauna management during construction • Have the ability to stop works on environmental grounds • Deliver training to site staff on flora and fauna management processes and procedures
Site Supervisors	<ul style="list-style-type: none"> • Construction delivery in relation to environmental management and compliance in conjunction with the Environmental Manager • Authority to direct personnel and/or subcontractors to carry out actions to avoid or minimise unintended environmental impacts

7.2 Training

Parklife Metro D&C will deliver environmental training specific to flora and fauna management through:

- The site induction where the requirements of this Sub-plan will be communicated
- Toolbox talks for site specific flora and fauna management actions and tasks, including training in the environmental procedures developed for the management of flora and fauna and relevant Hold Points

- Site pre-starts or work crew specific pre-starts may include information related to flora and fauna management actions on an as needs basis.

7.3 Monitoring and Inspections

Inspection of sensitive areas and observation of activities with the potential to impact flora and fauna will occur for the duration of construction. The project requirements for monitoring are detailed in Table 14.

TABLE 14 FLORA AND FAUNA MONITORING AND INSPECTION REQUIREMENTS

Monitoring/inspection	Frequency	Responsibility
Rehabilitation of site including retained vegetation	Quarterly	Environmental Manager (or delegate) under direction of Project Ecologist if required by the EPBC Biodiversity Management Plan
Pre-clearing inspection	Prior to vegetation clearance	Project ecologist
Inspection of environmental management controls	Fortnightly	Environmental Manager (or delegate)
Site inspections (including check of ecological mitigation measures and project boundary fencing)	At least weekly	Environmental Manager (or delegate)
Tree health monitoring	At site handover then 6 monthly	Project ecologist Environmental Manager (or delegate)

7.3.1 Pre-Clearing Inspection

A pre-clearing inspection will be undertaken by the Project Ecologist and the Environmental Manager (or delegate) prior to any clearing of PCTs and/or habitat features. The pre-clearing inspection will include, as a minimum:

- Identification, numbering and flagging of hollow bearing trees or other habitat features such as nests, dreys and hollow logs
- Identification of any threatened flora and fauna
- A check on the physical demarcation of the clearing limit or boundary
- An approved erosion and sediment control plan for the worksite
- The completion of any other pre-clearing requirements required by any project approvals, permits or licences.

7.4 Complaints

Complaints related to flora and fauna will be handled in accordance with the Construction Complaints Management System and the Parklife Metro D&C’s Community Communication Strategy. Complaints will be dealt with in a responsive manner, with a verbal response provided to the complainant as soon as possible and within a maximum of two hours from the time of the complaint (unless the complainant requests otherwise). A detailed written response will then be provided, if required, to the complainant within one week. For further details on complaints management refer to Section 3.7 of the CEMP.

7.5 Audits

The implementation of this Sub-plan will be the subject of both internal and external audits in order to confirm compliance against relevant approvals, monitor performance and identify opportunities for improvement. Refer to Section 3.9 CEMP for an indicative audit schedule for the SSTOM Works.

7.6 Hold Points

Hold points relevant to the management of impacts to flora and fauna from SSTOM Works are listed in Table 15.

TABLE 15 FLORA AND FAUNA HOLD POINTS

Hold Point	Release of Hold Point	By Who
Prior to native vegetation clearing	Pre-clearing inspection Erosion and sediment control plan Pre-clearing Permit	Qualified Ecologist Parklife Metro D&C Environmental Manager, or delegate
Prior to demolition / structure removal	Microbat Survey	Qualified Ecologist Parklife Metro D&C Environmental Manager, or delegate
Prior to entry to No-go zones	Permit to Enter No-go Zone	Parklife Metro D&C Environmental Manager, or delegate

7.7 Reporting and Records

The following compliance records will be kept during construction:

- Records of pre-clearing inspections
- Records of release of the pre-clearing hold point
- Records of environmental and ecological inspections undertaken, including areas undergoing rehabilitation
- Records of Pre-clearing and Grubbing permits / approvals
- Unexpected threatened flora and fauna finds
- All revisions of this Sub-plan.

Records will be retained for a period of no less than seven years. Other reporting requirements relevant to this Sub-plan are detailed in Table 15.

TABLE 16 FFMP REPORTING REQUIREMENTS

Action	Scope	Timing/ Frequency	Responsibility
Post-clearance report	In accordance with CEMF 10.2(b)(iii), after clearing of native vegetation, a post clearance report, including any relevant Geographical Information System files, will be produced that validates the type and area of vegetation cleared including confirmation of the number of hollows impacted and the corresponding nest box requirements to offset these impacts.	As required post clearing	Qualified Ecologist

8 Compliance Management and Review

8.1 Non-Compliances and Incidents

A non-compliance is a breach of the Parklife Metro D&C EMS, which requires a system improvement action. The Parklife Metro D&C Environment Manager will record any non-compliances that are identified during observations, inspection or audits or as a result of a complaint or environmental incident in an Environmental Non-Compliance Register. Where rectification works are required, an appropriate person will be identified by the Environment Manager who will be issued a corrective or preventative action to implement, and a timeframe by when this should be completed. The action will remain open until the Environment Manager has reviewed the supplied evidence and confirmed the non-compliance has been adequately addressed. Environmental non-compliances will form part of the ongoing EMS continual review and improvement process.

In the event that a non-compliance is identified, Sydney Metro, the ER, and the appropriate regulatory agency will be notified immediately. Refer to Section 3.9 of the CEMP for further details on the management and types of non-compliances.

Reporting requirements are outlined in Section 3.9 of the CEMP. In addition to this, Incidents will be classified and reported in accordance with the Sydney Metro Environmental Incident and Non-compliance Reporting Procedure, which describes specific requirements based on the incident classification. Internally, within Parklife Metro D&C, incidents will be reported, managed and tracked through the use of Glaass Pro, which is a software platform used to manage project management systems. Refer to Section 3.8 of the CEMP for further details on incident reporting.

8.2 Continuous Improvement

Parklife Metro D&C will continually improve environmental systems and performance through the implementation of an audit and review program. Refer to Section 3.9 of the CEMP.

8.3 Sub-plan Update and Amendment

A formal review of the management systems by the Parklife Metro D&C Senior Management Team will occur on an annual basis, as a minimum. This review shall generate actions for the continual improvement of the systems and supporting management plans. Refer to Section 3.11 of the CEMP. In addition to this, should Sydney Metro submit a revised action management plan (RAMP), this FFMP will be updated to maintain consistency once the RAMP is approved for implementation.

If changes to this FFMP are identified as required as a result of an annual performance review, or as a result of project changes, construction updates, risk reviews, or general observations throughout construction, they may be approved by the ER in accordance with Condition A32(j) or by the Planning Secretary. Minor changes to this FFMP that may be approved by the ER would generally comprise changes that are of an administrative or minor nature, which do not increase impacts to nearby sensitive land use(s), and are consistent with the terms of the Infrastructure Approval and with the document as approved by the Planning Secretary. Where the ER deems it necessary (ie. where the change is not considered to be minor), the amended FFMP will be provided to the Planning Secretary for approval.

Appendices

Appendix A Other Conditions of Approval, REMMS, CEMF Requirements and EPBC Conditions Relevant to this Sub-plan

Note: additional Conditions relevant to the preparation and approval of this Plan are included in Table 2.

Minister's Conditions of Approval (23 July 2021) CSSI 10051 includes MOD 1 determined 14 April 2022

Reference	Requirement	Where addressed
E2	The clearing of native vegetation must be minimised to the greatest extent practicable with the objective of reducing impacts to threatened ecological communities and threatened species habitat.	Section 6.1
E3	Impacts to plant community types must not exceed those identified in the documents listed in Condition A1, unless otherwise approved by the Planning Secretary. In requesting the Planning Secretary's approval, an assessment of the additional impact(s) to plant community types and an updated ecosystem and / or species credit requirement under Condition E4 below, if required, must be provided.	Section 6.3
E4	Prior to impacts on the biodiversity values set out in Table 3 and Table 4, the number and classes of ecosystem credits and species credits (like-for-like) must be retired.	Section 6.3

Table 3: Ecosystem credits

Plant Community Type (PCT) ID and name	Number of Credits
724: Broad-leaved Ironbark – Grey Box – Melaleuca decora grassy open forest on clay/gravel soils of the Cumberland Plain, Sydney Basin Bioregion	246
835: Forest Red Gum – Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion	217
849: Grey Box – Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion	202 204
1800: Swamp Oak open forest on riverflats of Cumberland Plain and Hunter Valley	181
TOTAL	846 848

Table 4: Species credits required

Species	Number of Credits
<i>Acacia bynoeana</i> (Bynoe's Wattle)	31
<i>Acacia pubescens</i> (Downy Wattle)	54
<i>Allocasuarina glauca</i>	47
<i>Cynanchum elegans</i> (White-flowered Wax Plant)	18
<i>Dillwynia tenuifolia</i>	21 72
<i>Grevillea juniperina subsp. juniperina</i> (Juniper-leaved Grevillea)	57 153
<i>Grevillea parviflora subsp. parviflora</i> (Small-flower Grevillea)	32
<i>Marsdenia viridiflora subsp. viridiflora</i> (Endangered population <i>Marsdenia viridiflora</i> R. Br. subsp. <i>viridiflora</i>)	137
<i>Micromyrtus minutiflora</i>	47
<i>Pimlea curvilora var. curvilora</i>	18
<i>Pimlea spicata</i> (Spiked Rice-flower)	22
<i>Pultenaea parviflora</i>	10 34
<i>Meridolum corneovirens</i>	159
Cumberland Plain Land Snail	
<i>Myotis Macropus</i> (Southern Myotis)	292
TOTAL SPECIES CREDITS	539 1,113

- | | | |
|-----------|---|-------------|
| E5 | The requirement to retire like-for-like ecosystem credits and species credits in Condition E4 may be satisfied by payment to the Biodiversity Conservation Fund of an amount equivalent to the number and classes of ecosystem credits and species credits. | Section 6.3 |
| E6 | Where evidence of compliance with the Ancillary rules: Reasonable steps to seek like-for-like biodiversity credits for the purpose of applying the variation rules has been provided to the Planning Secretary, variation rules may be applied to retire the relevant ecosystem credits and species credits as set out in the BAM Biodiversity Credit Report (Variation). | Section 6.3 |

E7	Evidence of the retirement of credits in satisfaction of Condition E4 or payment to the Biodiversity Conservation Fund in satisfaction of Condition E5 must be provided to the Planning Secretary prior to impacts on the biodiversity values.	Section 6.3
E8	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, following the implementation of habitat rehabilitation or other environmental compensation measures, 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 5 In accordance with the SMWSA Staging Report – Condition E8 is not applicable to the SSTOM Works. Sydney Metro is responsible for the requirements to offset any residual impacts to Key Fish Habitat in accordance with the Policy and Guidelines for Fish Habitat Conservation and Management (DPI, 2013 update).
E9	Where offsets are required in accordance with Condition E8, 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 accordance with the SMWSA Staging Report – Condition E9 is not applicable to the SSTOM Works.
E10	Where offsets are required in accordance with Condition E8, 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.	In accordance with the SMWSA Staging Report – Condition E10 is not applicable to the SSTOM Works. Sydney Metro is responsible for submitting evidence of payment to the Planning Secretary.
E11	Nest Boxes must be installed one (1) month prior to any removal of existing tree hollows and/or the release of any captured hollow dependent fauna.	Appendix H
E12	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 removed native trees and vegetation, the Proponent must consult with the relevant council(s), NSW National Parks & Wildlife Service, Western Sydney Parklands Trust, Greater Sydney Local Land Services, Landcare groups, DPI Fisheries and any additional relevant government agencies to determine if: (a) hollows, tree trunks (greater than 25-30 centimetres in diameter and 2-3 metres in length), mulch, bush rock and root balls salvaged from native vegetation impacted by the CSSI; and	Section 6.11 and Appendix C

(b) collected plant material, seeds and/or propagated plants from native vegetation impacted by the CSSI, could be used by others in habitat enhancement and rehabilitation work, before pursuing other disposal options

E13	<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, Urban Design and Corridor Landscape Plan required under Condition E79.</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 E4. 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>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.</p>	Section 6.2
C16(i)	management and mitigation measures and criteria including measures to address impacts on groundwater dependent ecosystems	Section 6.9

EPBC Commonwealth Approval (EPBC 2020/8687)

Reference	Requirement	Where addressed
1	The approval holder must not clear protected matters outside the study area.	Section 6.2 Appendix C
2	<p>To minimise the impacts of the action on protected matters, the approval holder must not clear more than the following specified amounts within the study area:</p> <p>5.87 ha of Cumberland Plain Woodlands and Shale-Gravel Transition Forest threatened ecological community (TEC).</p> <p>4.94 ha of Coastal Swamp oak (<i>Casuarina glauca</i>) Forest of New South Wales and South East Queensland TEC.</p> <p>24.79 ha of Grey-headed Flying-fox foraging habitat.</p> <p>7.3 ha of native vegetation on the Defence Establishment Orchard Hills site (which may include threatened ecological communities in conditions 2a and 2b).</p> <p>335 identified individuals of <i>Grevillea juniperina</i> subsp. <i>Juniperina</i> on the Defence Establishment Orchard Hills site (Lot 1 DP 629326 and Lot 2 DP 242968).</p> <p>The number of individuals identified by pre-clearance surveys, undertaken in accordance with conditions 3-5.</p>	Section 6.3 Appendix C
11	If the Minister approves the Biodiversity Management Plan then the Biodiversity Management Plan must be implemented.	Section 6.3
13	The approval holder must implement the Staging Plan approved by the Minister.	Section 6.3
21	If the Minister approves the Biodiversity Offset Strategy then the Biodiversity Offset Strategy must be implemented.	Section 6.3
24	The approval holder must maintain accurate and complete compliance records.	Section 7.7
25	If the Department makes a request in writing, the approval holder must provide electronic copies of compliance records to the Department within the timeframe specified in the request.	Section 7.7

27	The approval holder must ensure that any monitoring data (including sensitive ecological data), surveys, maps, and other spatial and metadata required under the Biodiversity Management Plan, is prepared in accordance with the Department's Guidelines for biological survey and mapped data (2018) and submitted electronically to the Department in accordance with the requirements of the plan.	Section 6.7 Section 7.7
28	<p>The approval holder must prepare a compliance report addressing each condition of this approval for each 12-month period following the date of commencement of the action, or otherwise in accordance with an annual date that has been agreed to in writing by the Minister. The approval holder must:</p> <ol style="list-style-type: none"> publish each compliance report on the website within 3 months following the relevant 12-month period; notify the Department by email that a compliance report has been published on the website and provide the weblink for the compliance report within 5 business days of the date of publication; keep all compliance reports publicly available on the website until 24 months after the completion of the action, or as otherwise agreed by the department in writing; exclude or redact sensitive ecological data from compliance reports published on the website; and where any sensitive ecological data has been excluded from the version published, submit the full compliance report to the Department within 5 business days of publication. <p>Note: Compliance reports may be published on the Department's website.</p>	Section 7.7 Note: Sydney Metro is responsible for the preparation, submission and publishing of the compliance report. Parklife Metro D&C will provide relevant compliance records.
29	<p>The approval holder must notify the Department in writing of any: incident; non-compliance with the conditions; or non-compliance with the commitments made in plans. The notification must be given as soon as practicable, and no later than 2 business days after becoming aware of the incident or non-compliance. The notification must specify:</p> <ol style="list-style-type: none"> any condition which is or may be in breach a short description of the incident and/or non-compliance the location (including co-ordinates), date, and time of the incident and/or non-compliance. In the event the exact information cannot be provided, provide the best information available. 	Section 8.1 Note: Sydney Metro is responsible for providing incident notification to the Department. Parklife Metro D&C is responsible for notifying Sydney Metro immediately on becoming aware of an incident.
30	<p>The approval holder must provide to the Department the details of any incident or non-compliance with the conditions or commitments made in plans as soon as practicable and no later than 10 business days after becoming aware of the incident or non-compliance, specifying:</p> <ol style="list-style-type: none"> any corrective action or investigation which the approval holder has already taken or intends to take in the immediate future the potential impacts of the incident or non-compliance the method and timing of any remedial action that will be undertaken by the approval holder. 	Section 8.1 Note: Sydney Metro is responsible for providing incident details to the Department. Parklife Metro D&C is responsible for notifying Sydney Metro immediately on becoming aware of an incident.

31	The approval holder must ensure that independent audits of compliance with the conditions are conducted as requested in writing by the Minister.	Section 7.5 Note: Sydney Metro is responsible for arranging independent audits. Parklife Metro D&C will participate, where required.
38	If the Minister gives a notice to the approval holder that the Minister is satisfied that the taking of the action in accordance with the RAMP would be likely to have a new or increased impact, then: a. condition 35 does not apply, or ceases to apply, in relation to the RAMP b. the approval holder must implement the action management plan specified by the Minister in the notice.	Section 8.3 Note: Sydney Metro is responsible for revising action management plans.
40	Within 20 business days after the completion of the action, the approval holder must notify the Department in writing and provide completion data.	Section 7.7 Note: Sydney Metro is responsible for providing completion of action notification to the Department. Parklife Metro D&C will provide relevant compliance records.

Revised Environmental Management Measures (Submissions Report (April 2021))

Reference	Requirement	Where addressed
FF1	<p>The Biodiversity Construction Environmental Management Plan (on airport)/ and Flora and Fauna Management Plan (off-airport) would be prepared by a suitably qualified and experienced person to minimise and manage the clearing of native vegetation and habitat by:</p> <ul style="list-style-type: none"> seeking to locate site offices, site compounds and ancillary facilities in areas where there are limited biodiversity values (e.g. cleared land) delaying the removal of vegetation until absolutely necessary avoiding the removal of hollow-bearing trees, where possible using a qualified surveyor and suitably qualified ecologist to mark out exclusion zones and clearing/project boundaries prior to construction providing contractors with regularly updated sensitive area maps (showing clearing boundaries and exclusion zones) investigating opportunities for salvage and storage of felled native trees for potential use in landscape design <p>The Biodiversity Construction Environmental Management Plan (on airport) and Flora and Fauna Management Plan (off-airport) would be implemented throughout construction.</p>	Section 3.6 Table 9

FF2	<p>A Nest Box Strategy would be prepared to minimise habitat loss to hollow-dependent fauna in accordance with the Flora and Fauna Management Plan and would include the following requirements:</p> <p>Hollow-bearing trees would be marked/tagged and mapped prior to their removal. The size, type, number and location of nest boxes required would be based on the results of the pre-clearing survey</p> <p>about 70 per cent of nest boxes would be installed about one month prior to any vegetation removal to provide alternate habitat for hollow-dependent fauna displaced during clearing</p>	Appendix H
FF3	<p>Works on-airport would be undertaken in consultation with Western Sydney Airport subject to the wildlife hazard management requirements</p>	Not applicable to SSTOM Works. This FFMP applies to off-airport work only.
FF4	<p>A targeted microbat survey (including Eastern Coastal Free-tailed Bat, Large Bent-winged bat and or Eastern False Pipistrelle) of dwellings and structures proposed for demolition, removal or modification would be undertaken in accordance with 'Species credit' threatened bats and their habitats NSW survey guide for the Biodiversity Assessment Method (OEH, 2018) prior to disturbance.</p> <p>Other human-made structures such as culverts and other under-road structures within the construction footprint would be surveyed for threatened microbats (e.g. particularly the Southern Myotis) in accordance with the Biodiversity Assessment Method (OEH, 2018). If threatened microbats are detected, a Microbat Management Plan would be developed as part of the Flora and Fauna Management Plan and implemented by a suitably qualified bat specialist.</p>	Section 6.5.4
FF5	<p>Works on-airport would be managed in accordance with the Western Sydney Airport Microbat Management Plan and in consultation with Western Sydney Airport</p>	Not applicable to SSTOM Works. This FFMP applies to off-airport work only.
FF6	<p>During construction, shading and artificial light impacts would be minimised in areas adjoining remnant bushland that is in intact condition</p>	Table 10
FF10	<p>The impact of Key Threatening Processes as a result of the project would be managed and minimised where possible through:</p> <ul style="list-style-type: none"> • implementation of weed management measures to prevent the introduction and spread of weeds including exotic vines and scramblers, <i>Olea europaea</i> (African Olive), <i>Chrysanthemoides monilifera</i>, <i>Lantana camara</i>, and exotic perennial grasses • implementation of pathogen management measures to prevent the introduction and spread of pathogens including amphibian chytrid, <i>Phytophthora implementa</i>, and Exotic Rust Fungi of the order Pucciniales • implementation of management measures to protect the riparian zone to ensure fish passage and protect fish habitat in accordance with the Policy and Guidelines for Fish Habitat Conservation and Management (DPI (Fisheries NSW), 2013), and minimisation of vegetation removal within the riparian zone where possible 	Section 6.8
FF11	<p>A native vegetation seed collection and salvage program would be developed prior to the commencement of construction and implemented during construction. The seed collection and salvage program would target native species prioritising the Cumberland Plain Woodland species to be utilised in landscaping for the project where possible. Opportunities for use of collected and salvaged seed outside of the project would also be investigated.</p>	Section 6.2 and Appendix C Note: SSTOM Works only include propagation of collected material.

GW6	<p>A Groundwater Management Plan would be prepared and implemented. The plan must include the following trigger-action response measures in relation to groundwater levels in areas identified as subject to potential drawdown (at groundwater dependent ecosystems or other sensitive receivers) but outside the construction footprint and Western Sydney International Stage 1 Construction Impact Zone:</p> <ul style="list-style-type: none"> a. target criteria, set with reference to relevant standards and site specific parameters; b. trigger values and corresponding corrective actions to prevent recurring or long-term exceedance of the target criteria described in (a); c. corrective actions to compensate for any recurring or long-term exceedance of the target criteria described in (a) <p>Response measures may include:</p> <ul style="list-style-type: none"> targeted ground improvement and grouting to limit groundwater inflows into station excavations, tunnels and cross-passage to reduce groundwater drawdown design of undrained temporary retention systems to minimise groundwater inflow into station excavations and reduce groundwater drawdown supplementing groundwater supply at affected groundwater dependent ecosystems or watercourses make good provisions for groundwater supply wells impacted by changes in groundwater level or quality 	Section 6.9 and Soil and Water Management Plan
LV1	Opportunities for the retention and protection of existing street trees and trees within the construction sites would be identified during detailed construction planning.	Section 6.2
LV2	Existing trees to be retained would be protected prior to the commencement of construction in the vicinity of these trees in accordance with AS4970-2009 Protection of Trees on Development Sites.	Section 6.2

Construction Environmental Management Framework

Reference	Requirement	Where addressed
7.1a	The following groundwater management objectives will apply to construction:.. iii. Reduce the potential impacts of groundwater dependent ecosystems.	Section 6.9
10.2a	On-airport management of flora and fauna will be achieved through the implementation of the SMWSA Biodiversity CEMP and Principal Contractors will develop and implement a Flora and Fauna Management Plan for all off-airport works. Both plans will include as a minimum:	
i.	The biodiversity mitigation measures as detailed in the planning approval documentation;	Table 10
ii.	The responsibilities of key project personnel with respect to the implementation of the plan	Section 7.1
iii.	Procedures for the clearing of vegetation and the relocation of flora and fauna;	Appendix C Appendix D

iv.	Details on the locations, monitoring program and use of nest boxes by fauna	Appendix H
v.	Procedures for the demarcation and protection of retained vegetation, including all vegetation outside and adjacent to the construction footprint, and the protection of retained vegetation within the environmental conservation zone on the airport site;	Appendix C On-Airport Biodiversity CEMP
vi.	Plans for impacted and adjoining areas showing vegetation communities; important flora and fauna habitat areas; locations where threatened species, populations or ecological communities have been recorded;	Section 6.2 Section 6.5 Section 6.7
vii.	Vegetation management plan(s) for sites where native vegetation is proposed to be retained;	Section 6.7
viii.	Identification of measures to reduce disturbance to sensitive fauna;	Appendix C Appendix D
ix.	Rehabilitation details, including identification of flora species and sources, and measures for the management and maintenance of rehabilitated areas (including duration of the implementation of such measures);	Section 6.11
x.	Weed and disease management measures focusing on early identification of invasive weeds and diseases. Protocols to address the effective management of these risks;	Section 6.8
xi.	A procedure for dealing with unexpected threatened species identified during construction, including cessation of work and notification to the relevant government department for both on- and off-airport works. The procedure shall define how appropriate mitigation measures (including relevant relocation measures) and updating of ecological monitoring or off-set requirements;	Section 6.3 Section 6.5.4 Section 6.6 Appendix C
xii.	Details on the methodology for vegetation mapping and survey;	Section 6.2 Section 6.7 Appendix C
xiii.	Ecological monitoring requirements; and	Section 7.3
xiv.	Compliance record generation and management.	Section 7.7 Section 8
10.2b	Principal Contractors would undertake the following ecological monitoring as a minimum:	
i.	A pre-clearing inspection is undertaken prior to any native vegetation clearing by a suitable qualified ecologist and the Contractor's Environment Manager (or delegate). The pre-clearing inspection will include, as a minimum: <ul style="list-style-type: none"> • Identification of hollow bearing trees or other habitat features 	Section 6.2

	<ul style="list-style-type: none"> • A check on the physical demarcation of the limit of clearing • An erosion and sediment control plan for the worksite • The completion of any other pre-clearing requirements required by any project approvals, permits or licences. 	
ii.	The completion of pre-clearing inspection will form a HOLD POINT requiring sign-off from the Contractor's Environmental Manage (or delegate) and a qualified ecologist.	Section 7.6
iii.	A post clearance report, including any relevant Geographical Information System Files, will be produced that validates the type and area of vegetation cleared including confirmation of the number of hollows impacted and the corresponding nest box requirements to offset these impacts.	Section 7.7
10.2c	The Principal Contractor's regular inspections will include a check on the ecological mitigation measures and project boundary fencing.	Section 7.3.1
10.2d	The following compliance records would be kept by the Principal Contractor: <ul style="list-style-type: none"> • Records of pre-clearing inspections undertaken • Records of release of the pre-clearing hold point • Records of ecological inspections undertaken. 	Section 7.7
10.3a	The on-airport Biodiversity CEMP and the off-airport Flora and Fauna Management Plan will include the following flora and fauna mitigation measures as well as any relevant Conditions:	
i.	Areas to be retained and adjacent habitat areas will be fenced off prior to works to prevent damage or accidental over clearing;	Section 6.2
ii.	Clearing will follow a two-stage process as follows: <ul style="list-style-type: none"> • Non-habitat trees will be cleared first after sign-off of the pre-clearing inspection • Habitat trees will be cleared no sooner than 48 hours after non-habitat trees have been cleared. A suitably qualified ecologist will be present on site during the clearing of habitat trees. Felled habitat trees will be left on the ground for 24 hours or inspected by the ecologist prior to further processing. 	Appendix C
iii.	Weed management is to be undertaken in areas affected by construction prior to any clearing works. Off-airport weed management will be undertaken in accordance with the NSW Noxious Weeds Act 1993. On-airport weed management will also be undertaken in accordance with the NSW Noxious Weeds Act 1993 and the NSW Biosecurity Act 2015, which is consistent with the approach adopted in the Western Sydney Airport Weed and Disease Management Plan (Appendix C of the Western Sydney Airport Biodiversity CEMP).	Section 6.8 Appendix E

Appendix B Records of Consultation

Consultation Summary

Document Reference	Stakeholder	Comment	Parklife Metro D&C Response
N/A	Penrith City Council	It is understood that majority of clearing has been undertaken during earlier stages of the project. The submitted report is satisfactory. Council has no objection, comment or recommendation.	Noted.
N/A	DPI Fisheries	It should be noted that any fauna relocation activities involving fish must be carried out by an experienced ecologist and may require a s37 permit to relocate fish.	This requirement is included in Section 6.9 of the FFMP.
Section 3.4	DPE EHG (Formerly DPIE EES)	<p>Section 3.4 of the draft FFMP states “this FFMP applies to off-airport work only” and Section 1.2 notes the SSTOM Works scope include:</p> <ul style="list-style-type: none"> • Installation of tracks, signalling, mechanical and electrical systems • Construction of a stabling and maintenance facility at Orchard Hills • Construction of the lower chamber of Bringelly shaft, along with capping and backfill • Construction of the lower chamber of Claremont Meadows shaft, along with capping and backfill • Construction of six stations, including: <ul style="list-style-type: none"> o A new metro station connecting to, and providing an interchange with, the T1 Western Line (part of the existing Sydney Trains suburban rail network) at St Marys o Two new metro stations between the T1 Western Line and Western Sydney International; one at Orchard Hills and one at Luddenham within the Northern Gateway Precinct o Two new metro stations within the Western Sydney International site; one at the Airport Terminal and one at the Airport Business Park, both of which are located on Airport land and are managed under a separate CEMP o A new metro station within the Aerotropolis Core precinct, south of Western Sydney International. 	Section 1.2 clarifies that the two metro stations on the airport site would be, “managed under a separate CEMP”.
Impacts on Biodiversity	DPE EHG	<p>The draft FFMP is not clear whether the SSTOM works will impact/disturb biodiversity, for example it is unclear if the STOM works will impact:</p> <ul style="list-style-type: none"> • native vegetation and if clearing is required, and if so where the vegetation is located, and the PCT area to be impacted • threatened ecological communities (TEC’s) and threatened flora species 	SSTOM works are anticipated to have minimal clearing activities. Parklife Metro D&C has been progressively reviewing FIW contractors plans, as they are made available, including temporary access and haul road designs. As work sites are handed over to Parklife Metro D&C from

Document Reference	Stakeholder	Comment	Parklife Metro D&C Response
		<ul style="list-style-type: none"> • threatened fauna and/or their habitat • buildings and structures and if demolition is required where the structures are located and the number of structures to be demolished • waterways and riparian corridors. <p>The FFMP needs to provide greater clarity on potential impacts.</p>	<p>prior work contractors the final handover state of the site will be confirmed. In general sites are expected to be cleared and stabilised with major earthworks completed.</p> <p>It is also noted that the SCAW Works package has not commenced in a number of locations at this time and this FFMP can only be prepared based on best available information. For this reason clearing locations have not been identified. This FFMP is considered to adequately describe the process that will be implemented to manage flora and fauna impacts.</p> <p>Minor updates have been made through the document on the scope of works.</p>
<p>Vegetation Clearing</p>	<p>DPE EHG</p>	<p>The FFMP indicates clearing has already occurred during earlier stages of the project, but it is unclear if the STTOM works require any clearing /disturbance of vegetation. The FFMP needs to provide greater clarity on this, for example:</p> <ul style="list-style-type: none"> • Section 1.2 of the FFMP states “it is likely that vegetation clearing and disturbance within the Project footprint would have already occurred” • Section 4 states “the majority of vegetation clearing and disturbance within the Project footprint would have already occurred prior to the SSTOM works.” • Section 5 states “SSTOM Works have limited potential to impact biodiversity as most vegetation clearing will have occurred in earlier stages of the Project” but it also states, “should clearing activities be required for SSTOM, the extent of clearing will be assessed by the Project Ecologist as part of the pre-clearing inspection process (Appendix C)”. It also refers to biodiversity impacts relevant to the SSTOM package which is provided as a worst-case scenario based on potential vegetation clearing of previous contractors not being completed. 	<p>The descriptions provided in the FFMP are considered to accurately describe the current known state of works. All works will be designed to avoid the need for any additional clearing as far as practicable. The final footprint of SSTOM works will be included on the detailed ECMs. Should an area require clearing by Parklife D&C this will be captured within the ECM and the process outlined in FFMP will be followed.</p>

Document Reference	Stakeholder	Comment	Parklife Metro D&C Response
		<ul style="list-style-type: none"> Section 6.2 states “Areas requiring clearing by Parklife Metro D&C will not be fully understood until detailed design is progressed, and condition of the site at handover from previous Project stages is known”. 	
Vegetation Clearing	DPE EHG	<p>Section 1.2 notes the processes, mitigation measures and procedures described in the FFMP are provided to describe how Parklife Metro D&C will manage impacts to flora and fauna during construction, in the situation that additional clearing is identified during construction. If most of the native vegetation clearing has already occurred in early stages, the FFMP needs to clarify what additional clearing may be required and whereas it is unclear if the SSTOM works will need to clear vegetation that previous contractors have not yet completed and what areas may need to be cleared. Also, it is unclear why the previous contractors have not completed the clearing.</p>	As noted above works by FIW contractors is ongoing. This FFMP is considered to adequately describe the process that will be implemented to manage flora and fauna impacts.
Vegetation Clearing	DPE EHG	<p>Scaled plans need to be provided which show the location of:</p> <ul style="list-style-type: none"> plant community types (PCTs), threatened ecological communities (TEC’s), threatened flora threatened fauna habitat features <p>in relation to the footprint of the SSTOM works footprint and areas potentially impacted by the works.</p>	Appendix F includes the existing flora and fauna areas of sensitivity. These will be considered and included as necessary in the preparation of the ECMs. No additional mapping has been provided in the FFMP.
Vegetation Clearing	DPE EHG	<p>EHG notes Figure 3 shows ‘areas not yet surveyed’ within the study area. It is unclear if these surveys need to be undertaken in relation to the proposed SSTOM works and if so when and whether any clearing is proposed within the areas not yet surveyed. The FFMP should address this.</p>	Additional information provided in Section 4.2 to clarify the ‘areas not yet surveyed’. These areas were previously assessed but were not surveyed as part of the assessment of this Project. The revised BDAR in the Submissions Report assumes areas meet relevant TEC listing criteria and have mapped in Figure 3 and 4 of the FFMP to that effect.
Table 2 – Compliance Table	DPE EHG	<p>In relation to the FFMP including a dewatering plan for farm dams, Table 2 indicates for Condition of Approval C11(b) that this is ‘not applicable to SSTOM works’. This appears to imply that there are no</p>	Dewatering of farm dams will be undertaken by previous Project contractors and will therefore not be applicable to SSTOM Works. Additional

Document Reference	Stakeholder	Comment	Parklife Metro D&C Response
		farm dams which require dewatering in the STTOM footprint. The FFMP should clarify/explain why this is not applicable.	clarification of why dewatering of farm dams is not applicable to SSTOM scope added to Table 2 of the FFMP.
3.3 ISC Rating Requirements	DPE EHG	Section 3.3 refers to the 'ISC rating requirements', the Glossary/Abbreviations section should be amended to include what 'ISC' means.	Glossary/Abbreviations section revised to include 'ISC'. Written in full in first use of the acronym.
3.6 Document Consultation	DPE EHG	Section 3.6 states "In accordance with REMM FF1, this FFMP has been prepared in consultation with the Project Ecologist (WolfPeak Pty Ltd), who satisfies reasonable qualifications and experience necessary to ensure this Sub-plan best minimises and manages impacts to flora and fauna during construction of the SSTOM Work". REMM FF1 in Table 7.2 of the Submissions Report however states the FFMP (off airport) "would be prepared by a suitably qualified and experienced person" and not "prepared in consultation with the Project Ecologist". The FFMP needs to clarify if it has been prepared in consultation with the Project Ecologist, or if it has been prepared by the Project Ecologist.	Section 3.6 has been updated to clarify the compliance with REMM FF1.
3.7 Document Approval	DPE EHG	Section 3.7 states "this Sub-plan is to be endorsed by the project Environmental Representative (ER) no later than one month before the commencement of construction. Construction is not to commence until the CEMP, and all required Sub-plans and Monitoring Programs have been endorsed by the ER and/or approved by DPE". According to Table 9 in the Staging Report for this SSI the FFMP for the SSTOM is meant to have ER review and endorsement prior to submission to the Planning Secretary for review and approval (page 34 of 133 of Staging Report). Therefore Section 3.7 needs to be amended and it should not include the 'or' in the "and/or approved by DPE" it should only include the 'and'.	Section 3.7 has been updated to reflect the requirement for Planning Secretary review and approval of the FFMP.
4.7 Aquatic Ecology	DPE EHG	Section 4.7 lists the waterways within the off-airport study area and notes the "project is unlikely to significantly impact any threatened aquatic species or their habitats". The FFMP needs to clarify if any creeks/riparian corridors will be impacted by the SSTOM works, particularly Table 8 list works around and within watercourses as potential impacts relevant to the SSTOM package.	Additional detail has been provided in Section 5 and a new section included (section 6.5.1) to address mitigation measures for Waterways and Riparian Zones in Section 6.5.1.
4.7 Aquatic Ecology	DPE EHG	EES in its submissions on the EIS (dated 18 Nov 2020), draft Submissions Report (dated 31 March 2021) and Submissions Report (dated 5 May 2021) requested scaled plans are provided which show: <ul style="list-style-type: none"> the location of watercourses 	Detail of works in and around waterways will be captured in the preparation of the ECMs and ESCPs.

Document Reference	Stakeholder	Comment	Parklife Metro D&C Response
		<ul style="list-style-type: none"> • top of bank • width of proposed riparian corridors • existing remnant vegetation / EEC • associated works including the footprint of the project, length and location of temporary and permanent crossings. <p>EHG recommends these scaled plans for works around/within watercourses are included in the FFMP.</p>	
<p>4.7 Aquatic Ecology</p>	<p>DPE EHG</p>	<p>Section 1.2 indicates the SSTOM works scope includes the installation of tracks and the construction of a stabling and maintenance facility at Orchard Hills. EHG considers further details are required as to whether the works could potentially impact the tributaries of Blaxland Creek at Orchard Hills, particularly as the EIS for SSI-7127 for the Northern Road Upgrade – Mersey Road- Bringelly to Glenmore Parkway, Glenmore Park noted that the tributaries of Blaxland Creek at Orchard Hills are among the least disturbed catchments remaining in the Cumberland Plain and are regarded as possibly the most pristine creek system on Wianamatta Shale left in Western Sydney (page 316). The EIS for the Northern Road Upgrade also outlined these tributaries are richer in aquatic macroinvertebrate genera than most other creeks of western Sydney and that the macroinvertebrate community of this catchment has a high representation of disturbance-sensitive species (Table 6.28, page 537). The FFMP provides no details on the macroinvertebrate communities in these waterways or if the works could potentially impact / disturb this pristine creek system and aquatic macroinvertebrate species. The FFMP should address where the proposed SSTOM works are in relation to the tributaries of Blaxland Creek.</p>	<p>Section 6.3.4 of the Revised BDAR states, <i>“A study by Chessman and Williams (1999) showed that a tributary of Blaxland Creek within the heavily vegetated area of DEOH upstream to the west of the study area contained a high representation of pollution-sensitive macroinvertebrate taxa. This tributary of Blaxland Creek is upstream from the study area and retains remnant vegetation in the catchment, so these data are not directly relevant to the portion of Blaxland Creek within the study area. The section of Blaxland Creek within the study area contains a thin strip of riparian vegetation with cleared agricultural land either side and urban development nearby (to the west) and is more comparable to Cosgroves Creek or Badgerys Creek in that regard and is likely to contain similar macrofaunal assemblages and water quality in this area.”</i></p> <p>No additional detail has been provided in the FFMP in relation to macroinvertebrates or the upstream</p>

Document Reference	Stakeholder	Comment	Parklife Metro D&C Response
			<p>tributaries of Blaxland Creek. Reference has been made in Section 4.7 to the application of the Guidelines for controlled activities on waterfront land riparian corridors (Department of Industry 2018) for any work in and around waterways (within 40m)</p>
<p>Figures 3 and 4</p>	<p>DPE EHG</p>	<p>Figure 3 is titled 'TECs on SSTOM Project – northern portion' – but it is unclear if the SSTOM project area only applies to the area near Patons Lane which has been enlarged in the rectangle. Figure 3 shows 'areas not yet surveyed' within the 'study area'. It is unclear if these surveys have now been undertaken and if not when the surveys are to be undertaken. The FFMP should address this.</p>	<p>As above, additional information provided in Section 4.2 to clarify the 'areas not yet surveyed'. The call out within Figure 3 is to show the TEC detail, no changes to the Figure have been made.</p>
	<p>DPE EHG</p>	<p>EHG recommends scaled figures are included in the FFMP which clearly show:</p> <ul style="list-style-type: none"> • the proposed SSTOM works footprint • the boundary of SSI-10051 • remnant native vegetation/EEC • watercourses and top of bank • riparian corridor widths • the proposed clearing boundary • native vegetation to be retained • threatened flora and fauna species locations • buildings and structures to be demolished and potential microbat roosting structures • areas to be covered by the pre-clearing surveys etc. 	<p>As above detail will be included on ECMS as appropriate for SSTOM work areas.</p>
<p>5 Environmental Aspects and Impacts</p>	<p>DPE EHG</p>	<p>Section 5 states “Biodiversity impacts relevant to the SSTOM package are detailed in Table 8, which is provided as a worst-case scenario based on potential vegetation clearing of previous contractors not being completed”. This sentence needs to be amended to also include reference to the demolition of buildings and structures as Table 8 includes ‘demolition of built structures’ as an aspect. While</p>	<p><i>‘.and/or demolition of built structures..’</i> has been included in Section 5 for completeness.</p>

Document Reference	Stakeholder	Comment	Parklife Metro D&C Response
		<p>Section 6.5.2 notes the “SSTOM Works have limited potential to require demolition of dwellings and structures, as demolition works will have occurred in earlier stages of the Project. It also states if demolition, removal or modification of dwellings and structures is unavoidable as part of the SSTOM works...” so Section 5 should be amended.</p>	
<p>Table 8 – Summary of Aspects and Potential Impacts</p>	<p>DPE EHG</p>	<p>As noted above, Table 8 lists ‘works around and within watercourses’ as potential impacts relevant to the SSTOM package. It is unclear what these works entail. Section 6.1 implies that waterway crossings are proposed, and they are to be designed to incorporate best practice. The FFMP needs to provide details on this and explain why works are required within the watercourses and where the waterway crossings are proposed and the type of crossings such as temporary or permanent / bridge or culvert etc.</p>	<p>Additional detail has been provided in Section 5 and Section 6.5.1</p>
<p>Table 8 – Summary of Aspects and Potential Impacts</p>	<p>DPE EHG</p>	<p>EHG understood the watercourse crossings (permanent and temporary crossings) formed part of the Surface and Civil Alignment Works (SCAW) scope of works. The FFMP should clarify if watercourse crossings are required to be constructed as part of the SSTOM works.</p>	<p>The Active Transport Corridor (ATC) / maintenance road will require construction of three (3) bridges by Parklife Metro D&C in the Project corridor adjacent to the main formation.</p> <ul style="list-style-type: none"> -1. Unnamed Creek south of Orchard Hills Station -2. Blaxland Creek -3. Cosgroves Creek <p>All work for the construction of the new bridge structures maximise the use of the SCAW temporary access and haul roads. Works in and around waterways will be in accordance with the appropriate guidelines including Guidelines for controlled activities on waterfront land riparian corridors (Department of Industry 2018) for any work in and around waterways (within 40m).</p>

Document Reference	Stakeholder	Comment	Parklife Metro D&C Response
Table 8 – Summary of Aspects and Potential Impacts	DPE EHG	If the crossings have already been constructed as part of previous works, the FFMP should clarify if the temporary crossings have been removed or if they are to be removed as part of the SSTOM works. Once the temporary crossings are no longer required for construction purposes they should be removed and the area that has been impacted by the crossing stabilised, rehabilitated and revegetated. The FFMP should clarify if any temporary crossings are to be removed as part of the SSTOM works.	An additional description has been provided in Section 5 to clarify the extent of this work. Design of the permanent works is currently in progress. As discussed above all work for the construction of the new bridge structures will be kept within the footprint of existing clearing as far as practicable, maximising use of the SCAW temporary access and haul roads. Any temporary crossing not used within the final permanent works will be removed and rehabilitated. Rehabilitation work will be carried out by SCAW contractors in any area not required by Parklife Metro D&C for the permanent works, or by Parklife D&C where SCAW temporary works areas are handed over. No additional details have been included within the FFMP.
Table 8 – Summary of Aspects and Potential Impacts	DPE EHG	Table 8 also lists the demolition of built structures. Details need to be provided on the number and location of built structures and when surveys are to be undertaken for the presence of microbats.	The FFMP (Section 6.5.3) is considered to adequately describe the process that will be implemented if demolition work is required to be carried out by Parklife Metro D&C. An additional mitigation measure has been included in Table 10 for pre-demolition inspection of built structures.
6.1 Mitigation and Management Measures	DPE EHG	Section 6.1 implies that waterway crossings are proposed, and they are to be designed to incorporate best practice. The FFMP needs to provide details on where the waterway crossings are proposed and the type of crossing.	Bridge construction locations have been listed in Section 5. Section 3 and a mew Section 6.5.1 outlines the relevant

Document Reference	Stakeholder	Comment	Parklife Metro D&C Response
			guidelines to be implemented during design and construction.
Table 9 – Flora and Fauna Mitigation Measures	DPE EHG	As demolition of human structures could potentially be undertaken as part of the SSTOM works it is recommended Table 9 is amended to include that a survey for the presence of native fauna including threatened microbats is undertaken prior to the demolition of buildings and structures.	An additional mitigation measure has been included in Table 10 for pre-demolition inspection of built structures for micro-bats. Additional details are already provided in Section 6.5.3 on micro-bat management and pre-demolition survey work
Table 9 – Flora and Fauna Mitigation Measures	DPE EHG	FF-M13 works around and within watercourses should be designed and constructed to avoid and minimise impacts to the waterway and the riparian corridor. The riparian corridor should be marked and identified on the ground and if it is disturbed by SSTOM works the corridor should be revegetated with local native provenance plant species at the completion of works.	Reference to the ‘riparian corridor’ has been included in this mitigation measure. Clearing and disturbance limits are described in Section 6.2 ‘Pre-clearing Inspection, which is also applicable to the riparian zone. Revegetation work is described in Section 6.11
Table 9 – Flora and Fauna Mitigation Measures	DPE EHG	EHG recommends an additional mitigation measure includes: <ul style="list-style-type: none"> • topsoil from areas of native vegetation that are approved to be cleared for the works should be collected and used in the revegetation areas. 	Appendix C (Clearing and Grubbing Procedure) includes separation of topsoil for reuse.
6.2 Pre-Clearing inspection	DPE EHG	Section 6.2 states “areas requiring clearing by Parklife Metro D&C will not be fully understood until detailed design is progressed, and condition of the site at handover from previous Project stages is known. The areas proposed to be cleared and retained need to be clearly identified and marked on the ground and shown on maps prior to any clearing of vegetation and the pre-clearing surveys. It is noted Section 6.7 indicates environmental control maps depicting vegetation clearing boundaries and exclusion/no-go zones will be prepared and provided to the construction team. It is suggested these maps are included in the FFMP as an appendix for ease of reference.	As described above this FFMP includes the processes and procedures to be implemented to manage potential flora and fauna impacts. The detail requested by EHG will be included in ECMs. These plans will be developed prior to construction but will not be included in the FFMP.
6.2 Pre-Clearing inspection	DPE EHG	Section 6.2 states “The Pre-Clearing Inspection will be undertaken by the Project Ecologist and the Environmental Manager (or delegate) prior to any clearing of native vegetation and/or habitat features”	The second sentence has been deleted to ensure the FFMP reflects the CEMF.

Document Reference	Stakeholder	Comment	Parklife Metro D&C Response
		but it also states, “All other pre-clearing inspections will be undertaken by the Parklife Metro D&C Environment Team, in consultation with the Project Ecologist, as required.” Section 10.2(b)(i) of the CEMF for this CSSI states, “A pre-clearing inspection will be undertaken prior to any native vegetation clearing by a suitable qualified ecologist and the Contractor’s Environmental Manager (or delegate)”.	
6.2 Pre-Clearing inspection	DPE EHG	<p>Section 6.2 should identify what pre-clearing inspections are required, when and where these surveys are to be undertaken. It is recommended Section 6.2 is crosslinked to FF-M3 in Table 9 which indicates the pre-clearing surveys will include:</p> <ul style="list-style-type: none"> • Identification of hollow bearing trees and other habitat features • Identification of threatened flora and fauna • A check on the physical demarcation of the limit of clearing • An approved erosion and sediment control plan for the worksite. 	Pre-clearing inspections will be required in areas where vegetation removal can not be avoided. Section 6.2 and Appendix C are considered to adequately address the process.
6.2 Pre-Clearing inspection	DPE EHG	<p>EHG recommends the FFMP includes specific sections which deal with:</p> <ul style="list-style-type: none"> • tree hollow surveys (these surveys should be undertaken prior to the pre-clearing surveys) to identify and count the number of tree hollows and the required number of replacement nest boxes • pre-clearing surveys • pre-demolition surveys of buildings and structures. 	Appendix C provides further detail on the survey scope including fauna habitat and tree hollows. As noted above an additional mitigation measure has been included to note the requirement for pre-demolition fauna survey in the unlikely even this is required.
6.2 Pre-Clearing inspection	DPE EHG	<p>The FFMP should:</p> <ul style="list-style-type: none"> • provide details on what these surveys/ inspections entail and when and where these surveys will be undertaken • include scaled plans which locate the areas to be covered by the tree hollow surveys and pre-clearing surveys. 	Appendix C provides further detail on the pre-clearing survey process. No further plans have been provided.
6.2 Pre-Clearing inspection	DPE EHG	<p>The purpose of these surveys is to identify and mark hollow bearing trees and any other habitat features (stags, hollow logs, birds’ nests or possum dreys). This should occur at least one week before the removal of vegetation. Hollow bearing trees should be flagged and counted to indicate the number and type of replacement nest boxes to be identified, obtained, and installed. To meet</p>	Appendix C – Clearing and Grubbing Procedure provides further detail on the pre-clearing inspection

Document Reference	Stakeholder	Comment	Parklife Metro D&C Response
		Condition E11 the nest boxes must be installed one (1) month prior to any removal of existing tree hollows and/or the release of any captured hollow dependent fauna.	<p>Appendix D - Fauna Handling Procedure includes further detail on fauna management and relocation.</p> <p>In the event a hollow-bearing or habitat tree is identified for removal the a Nest Box Strategy would be prepared and the FFMP updated to include the Strategy. Nest boxes would be installed in accordance with Condition E11 as required.</p>
6.2 Pre-Clearing inspection	DPE EHG	The pre-clearing surveys and/or pre-demolition surveys should identify potential release sites if fauna require capture and relocation during clearing.	Noted. Appendix D - Fauna Handling Procedure includes further detail on fauna management and relocation
6.2 Pre-Clearing inspection	DPE EHG	<p>EHG recommends the pre-clearing survey includes:</p> <ul style="list-style-type: none"> • the ecologist checking the tree hollows for the presence of native fauna • covering the tree hollows once the hollows have been checked and it is verified that fauna are not present to ensure the hollows are not reoccupied prior to removal of the trees and/or the project ecologist endeavours to individually remove sections of a tree containing a hollow or other habitat features for relocation and reuse by the project • where hollow dependent native fauna are found using tree hollows that are to be removed <p>- the fauna should be captured and relocated prior to felling the tree</p> <p>- compensatory tree hollows are provided prior to removing the tree hollows and prior to the release of the hollow dependent fauna.</p>	<p>Appendix C – Clearing and Grubbing Procedure provides further detail on the pre-clearing inspection</p> <p>Appendix D - Fauna Handling Procedure includes further detail on fauna management and relocation</p> <p>No further changes have been to the FFMP</p>
6.5 Habitat feature and Clearing Procedure	DPE EHG	<p>Depending on when the pre-clearing surveys are undertaken it is recommended that prior to the commencement of clearing, the Project Ecologist completes a survey to ensure no fauna have moved into the area since the initial pre-clearing inspection and the FFMP includes the following.</p> <p>Tree Removal</p>	As above Appendix C and D are considered to contain an appropriate description tree removal and fauna handling. No additional information has been included.

Document Reference	Stakeholder	Comment	Parklife Metro D&C Response
		<ul style="list-style-type: none"> • During any tree removal, an experienced and qualified ecologist is to be present to re-locate any displaced fauna that may be disturbed during this activity. • Native trees that are approved for removal (including tree trunks greater than approximately 25-30cm in diameter and 2-3m in length, tree hollows and rootballs) and other habitat features (such as logs and bush rock) should be marked and stored on site for reuse as habitat by the project. • Where hollow dependent native fauna are found using tree hollows that are to be removed <ul style="list-style-type: none"> - the fauna should be captured and relocated prior to felling the tree - compensatory tree hollows should be provided prior to removing the tree hollows and prior to the release of the hollow dependent fauna. • Any nocturnal fauna found must be captured and re-released to nearby suitable habitat, at a time suitable for the subject species they should not be released during daylight hours. • The clearing of trees and shrubs should be avoided where possible in late winter/spring during breeding/nesting period for birds. • Trees with hollows shall be lopped in such a way that the risk of injury or mortality to fauna is minimised, such as top-down lopping, with lopped sections gently lowered to the ground, or by lowering whole trees to the ground with the “grab” attachment of a machine. • Any injured fauna is to be placed into the hands of a wildlife carer (please note only appropriately vaccinated personnel are to handle bats) and released on site when re-habilitated. 	
6.5.2 Microbat Management	DPE EHG	<p>Section 6.5.2 indicates if threatened microbats are detected, a Microbat Management Plan (MMP) will be developed and implemented by a suitably qualified bat specialist. The former EES (now EHG) in its submission on the draft conditions for this SSI advised there is a need to allow enough time to consult with EES on the MMP. The preparation of the FFMP / MMP should be completed to the satisfaction of EES before it is submitted to the Planning Secretary. The FFMP needs to address the time frame that is proposed for the microbat surveys to be undertaken of the abandoned dwellings, structures, culverts and other under road structures. If microbats are found, enough time needs to be allowed to prepare the MMP and consult with EHG.</p>	<p>Noted. Section 6.5.3 has been updated to clarify the preparation of an MMP requires an update to the FFMP with corresponding agency consultation.</p>
6.5.2 Microbat Management	DPE EHG	<p>The MMP, if required, should include details on:</p> <p>(i) measures to avoid and minimise impacts</p>	<p>Noted. No further detail has been included at this point. Reference to the ‘Species credit’ threatened bats and their habitats NSW survey guide for the Biodiversity</p>

Document Reference	Stakeholder	Comment	Parklife Metro D&C Response
		<p>(ii) details of potential impacts from construction</p> <p>(iii) an adaptive management plan, which includes a decision-making framework that:</p> <p>(a) defines performance criteria and thresholds, including ‘impact trigger’ and ‘unacceptable impact’ thresholds to be used as triggers for intervention, that are ecologically based and adhere to SMART principles</p> <p>(b) details monitoring techniques, timing, duration and frequency/intensity and equipment to be used</p> <p>(c) in the event that an impact trigger, unacceptable impact or other threshold is detected, the actions and mitigation measures to be implemented</p> <p>(iv) ongoing monitoring and reporting requirements during construction and operation; and</p> <p>(v) contingency measures to address impacts attributable to the construction of the CSSI</p> <p>The plan must be developed in consultation with an appropriately qualified expert in microbat biology and behaviour, EHG, relevant council(s). The plan must be implemented during construction and operation of the CSSI</p>	<p>Assessment Method (OEH, 2018) is considered to be appropriate.</p>
6.5.2 Microbat Management	DPE EHG	<p>It is unclear what is proposed for microbats potentially using the abandoned buildings and structures as habitat if they do not use nest boxes. The MMP will need to address how abandoned buildings and structures will be demolished if microbats are using them as habitat and what actions are required to ensure minimal impacts to these microbats. The MMP should have options for the relocation of any individuals found in preclearance /pre-demolition surveys.</p>	<p>Noted. To be addressed within a MMP if required for the SSTOM works.</p>
6.6 Unexpected Flora and Fauna Finds	DPE EHG	<p>Section 6.6 of the FFMP states “If a new threatened species or ecological community is identified that was not assessed in the EIS, a Consistency Assessment will be prepared to assess the significance of the impacts to the species”. If a new threatened species or ecological community is identified, DPE as the consent authority should be contacted and EHG consulted. It is recommended Section 6.6 is amended to include this and that a record of the unexpected threatened flora and fauna finds will be maintained by the Project Ecologist and this record will include the following details:</p> <ul style="list-style-type: none"> • the flora and fauna species • the date, time, number of species and location of the unexpected find • details regarding assessment by the Environmental Manager (and advice from suitably qualified ecologist or specialist), and 	<p>Notification to Sydney Metro and the ER (as the DPE representative) is included in Section 6.6. An additional description has been included in Section 6.6 that all unexpected finds will be recorded by the Project Ecologist.</p>

Document Reference	Stakeholder	Comment	Parklife Metro D&C Response
		<ul style="list-style-type: none"> actions undertaken before work recommenced. <p>The record of unexpected finds should be provided to DPE as the consent authority.</p>	
6.6 Unexpected Flora and Fauna Finds	DPE EHG	In relation to the potential for translocation of unexpected threatened flora individual(s), or part of a soil translocation and the preparation of a Threatened Flora Translocation Plan, EHG requests it is consulted on this plan prior to any translocation of threatened plant species.	Noted
6.6 Unexpected Flora and Fauna Finds	DPE EHG	For any unexpected threatened flora and fauna finds the Project Ecologist must ensure the details on the threatened flora and fauna species found are entered into BioNet https://www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity/nsw-bionet/about-bionet-atlas/contribute-data-to-bionet-atlas . Section 6.6 should be amended to include this.	Noted
6.8 Weed and Pathogen Management	DPE EHG	Section 6.8 states “ongoing weeding will occur throughout the construction phase, where required”. The Weed Management Procedure in Appendix E implies ongoing weed management is to occur (periodic inspections to assess weed regrowth), but it does not specify the time frame that ongoing weeding is to be undertaken and when it is proposed to cease.	Weed management under this FFMP will continue until the construction completion scheduled for end 2026. Weed management will then become the responsibility of the Parklife Metro Operations and Maintenance and Sydney Metro.
6.8 Weed and Pathogen Management	DPE EHG	As advised in the EES submission of 31 March 2021 on the draft Submissions Report and revised BDAR EES recommended a mitigation measure is included to address ongoing weed management and maintenance in areas disturbed by the project (including areas downslope of, and/or adjoining the disturbed areas) both during and following construction until the disturbed areas are stabilised and/or rehabilitated.	Parklife Metro D&C will be responsible for weed management within and Project Site and Temporary Areas during the construction period. Ongoing weed management will be the responsibility of Parklife Metro O&M for the Licenced Maintenance Areas (LMA) and Sydney Metro for the wider project corridor.
6.8 Weed and Pathogen Management	DPE EHG	EHG recommends ongoing weeding / weed management continues after the completion of construction especially in areas that have been disturbed by construction works and/or adjoining the disturbed areas including in the vicinity of watercourses /riparian corridors/ corridor connections and areas adjoining remnant native vegetation. Section 6.8 and the Weed Management Procedure should	Ongoing, operational phase weed management will be as per Project Deed requirements and/or as addressed in the Place, Urban Design and Corridor Landscape Plan (PUDCLP).

Document Reference	Stakeholder	Comment	Parklife Metro D&C Response
		outline the duration that ongoing weed management is proposed to be undertaken from the completion of construction works.	
6.8 Weed and Pathogen Management	DPE EHG	It is noted Condition E80 requires ongoing operational maintenance of open space and landscaping which implies that this would need to incorporate ongoing operational weed management.	Condition E80 relates to the operational stage of the operational stage of the Project. This FFMP is a construction stage plan only so does not specifically address these ongoing requirements. See above.
6.10 Rehabilitation of Disturbed Areas	DPE EHG	The rehabilitation of disturbed areas should use a diversity of local provenance native species from the relevant native vegetation community (or communities) that once occurred in the area of the proposed works rather than use exotic species or non-local native species. It is recommended the FFMP states that local provenance plant species are to be used.	Section 6.11 notes that rehabilitation will include diversity through planting of different species and use of species that are 100% endemic to the area.
6.10 Rehabilitation of Disturbed Areas	DPE EHG	Section 6.10 notes the rehabilitation sites will be regularly inspected to monitor the health of plantings. According to Table 13 in the FFMP monitoring/inspection of the rehabilitation of site is to occur quarterly. Inspections to monitor the health of the plantings and/or undertake weed maintenance may need to be undertaken more frequently than quarterly (particularly during summer/ warmer weather after rainfall when weed growth is more prolific) to control weed growth and remove weeds while they are still young to prevent weed infestation and larger weeds taking water and nutrients from the soil and choking out the natives. Efforts need to be focussed on reducing the weed seed bank and eradicating weeds from the site.	Noted however ongoing inspections following the construction period will be detailed in the Landscape Master Plan and PUDCLP which is outside the scope of this FFMP.
6.10 Rehabilitation of Disturbed Areas	DPE EHG	The FFMP needs to include details on the frequency of maintenance inspections and duration of the maintenance period and what the maintenance entails.	As above.
6.10 Rehabilitation of Disturbed Areas	DPE EHG	As noted above for Section 6.8, EHG recommends ongoing weeding / weed management continues after the completion of construction especially in areas that have been disturbed by construction works.	As above
6.10 Rehabilitation of Disturbed Areas	DPE EHG	As local native plant species are to be used it is recommended the maintenance is undertaken by a qualified bush regenerator to ensure only weed species are removed and not native plant species.	As above.

Document Reference	Stakeholder	Comment	Parklife Metro D&C Response
6.10 Rehabilitation of Disturbed Areas	DPE EHG	<p>Any plant losses and maintenance replanting should replace plants by the same species. Where that species is not available, the FFMP should specify:</p> <ul style="list-style-type: none"> • the replacement plantings should be with the same growth form (i.e., a tree with a tree, a shrub with a shrub etc) • the replacement planting must not decrease species diversity • any new species must still be from the local native vegetation community being emulated and local provenance. 	As above
Table 13 - Flora and Fauna Monitoring and Inspection Requirements	DPE EHG	Table 13 needs to be amended to also include an inspection of existing buildings /structures for microbats by the Project ecologist prior to the demolition of buildings/structures	Pre-demolition survey has been added to the responsibility of the qualified ecologist
7.3.1 Pre-clearing Inspection	DPE EHG	Similar to Section 6.2, Section 7.3.1 states “a pre-clearing inspection will be undertaken by the Project Ecologist and the Environmental Manager (or delegate) prior to any clearing of PCTs and/or habitat features” but it also states, “All other pre-clearing inspections will be undertaken by the Parklife Metro D&C Environment Team, in consultation with the Project Ecologist, as required”. It is unclear why this second sentence states “All other pre-clearing inspections will be undertaken by the Parklife Metro D&C Environment Team, in consultation with the Project Ecologist.”	The second sentence has been removed.
7.3.1 Pre-clearing Inspection	DPE EHG	Section 10.2(b) (i) of the CEMF for this CSSI states, “A pre-clearing inspection will be undertaken prior to any native vegetation clearing by a suitable qualified ecologist and the Contractor’s Environmental Manager (or delegate)”.	Noted
7.6 Hold Points	DPE EHG	If an unexpected new threatened species or ecological community is identified that was not assessed in the EIS, this should be another hold point until a Consistency Assessment has been undertaken.	Finding of a threatened species or EEC triggers stop work. A hold point is already in place for the pre-clearing inspection.
7.7 Reporting and Records	DPE EHG	As noted for Section 6.6, EHG recommends records are kept by the Project Ecologist of any unexpected threatened flora and fauna finds and this is listed in section 7.7 as a compliance record to be kept during construction.	Unexpected flora and fauna finds have been included as a required compliance record in Section 7.7

Document Reference	Stakeholder	Comment	Parklife Metro D&C Response
Appendix A REMM FF2 - Nest box strategy	DPE EHG	<p>The Revised Environmental Management Measures (REMM) in Appendix A includes REMM FF2 which requires a Nest Box Strategy to be prepared (see page 41 of FFMP). Appendix A indicates this is addressed in Table 9 of the FFMP. REMM FF2 in Appendix A includes a note which states that this is 'Not applicable to SSTOM works. If it is determined that removal of hollow-bearing or habitat trees is required, a Nest Box Strategy would be developed prior to that disturbance'.</p> <p>As the FFMP indicates the SSTOM works could include the clearing of native vegetation it is unclear why a specific section is not included which relates to the Nest Box Strategy in accordance with REMM FF2.</p>	A Nest Box Strategy has not been prepared. However it is noted that a Nest Box Strategy would be prepared in the event habitat or hollow bearing trees are required to be removed. The FFMP would be updated accordingly.
Appendix A REMM FF2 - Nest box strategy	DPE EHG	EHG recommends the FFMP includes a specific section which deals with tree hollow surveys and that these surveys are undertaken prior to the pre-clearing surveys to identify and count the number of tree hollows to be removed and the required number and type of replacement nest boxes. If tree hollows are found during the pre-clearing inspection and are to be removed, to meet Condition E11 replacement nest boxes must be installed one (1) month prior to any removal of existing tree hollows and/or the release of any captured hollow dependent fauna.	Appendix C provides a process for inspection of habitat and hollow bearing trees. As noted above a Nest Box Strategy would only be prepared in the event it is required.
Appendix A REMM FF2 - Nest box strategy	DPE EHG	The provision of nest boxes and their installation should be undertaken in consultation with appropriately qualified and experienced experts on the fauna species that use or potentially use the tree hollows and the replacement nest boxes, including experts in microbat biology and behaviour.	Noted
Appendix A REMM FF2 - Nest box strategy	DPE EHG	It is important that adequate preconstruction, construction and post construction monitoring is undertaken to confirm the species that will potentially use the nest boxes are using them. Contingency measures/corrective actions should also be put in place in case monitoring indicates the nest boxes are not effective. EHG recommends a long-term monitoring program is undertaken to evaluate the effectiveness of the nest boxes and that the monitoring covers all seasons (spring, summer, winter and autumn) and it is not just undertaken annually.	Noted.
Appendix A REMM FF2 - Nest box strategy	DPE EHG	Nest boxes should preferably be monitored for any repair /maintenance /replacement requirements for a minimum of 5 years. At the end of the 5 years the proponent needs to provide the results of the nest box monitoring and their use or lack thereof to DPE and provide recommendations as to the ongoing use of the nest boxes and any future maintenance requirements.	Noted

Document Reference	Stakeholder	Comment	Parklife Metro D&C Response
Appendix A REMM FF2 - Nest box strategy	DPE EHG	If the land the subject of the FFMP remains in Sydney Metro ownership then EHG recommends the FFMP should take an adaptive management approach which responds to the results of the monitoring program, including the monitoring of nest boxes. Once the construction period is complete, the monitoring program can inform ongoing management actions required during the operation of the Sydney Metro. If the land the subject of the FFMP does not remain in Sydney Metro ownership at the completion of construction, the monitoring program can end at the completion of construction.	Noted
Appendix A REMM FF2 - Nest box strategy	DPE EHG	EHG recommends the nest box monitoring includes details on: <ul style="list-style-type: none"> • the number of nest boxes to be monitored • the GPS locations of the nest boxes • the characteristics of all nest boxes to be monitored / the native fauna species that the boxes are designed for • the duration and frequency of monitoring • how the nest boxes are to be monitored (e.g., visual checks, installation of wildlife cameras which are motion activated) • the reporting of monitoring results - nest box installation details (date installed, direction the box entrance faces, height above ground) - the time of year, date and time that boxes are checked - what was found in the nest box – the species and the number of individuals - occupancy rates - frequency of use - pattern and timing of use - maintenance needs. 	Noted
Appendix A REMM FF2 - Nest box strategy	DPE EHG	The full monitoring data should be made publicly available in annual reports and made available online and published in scientific literature. It is important that TfNSW makes its monitoring data available for other projects to benefit. If the data is collected under licence, then this should be imported into BioNet which can then be used in the future.	Noted

Document Reference	Stakeholder	Comment	Parklife Metro D&C Response
Appendix A - REMM FF11 - Native seed collection and salvage program	DPE EHG	REMM FF11 in Appendix A requires a native vegetation seed collection and salvage program to be developed prior to the commencement of construction and implemented during construction (see page 41 of FFMP). Appendix A indicates this is addressed in Section 6.2 of the FFMP and it includes a note that 'SSTOM works only include propagation of collected material'. If the SSTOM works also include the clearing of native vegetation it is unclear why a native vegetation seed collection program is also not proposed to be undertaken in accordance with REMM FF11.	Sydney Metro are responsible for collection of seed on the Project. If clearing of native vegetation is required, Parklife Metro D&C will facilitate access for collection as detailed in Appendix C.
Appendix A - REMM FF11 - Native seed collection and salvage program	DPE EHG	As previously advised by EES in its submission (dated 18 November 2020) on the EIS, seed collection should commence as soon as possible so that local native provenance plant species are available to be planted, and the trees are advanced and established in size to improve the urban tree canopy and local biodiversity.	Seed collection has been carried out as part of prior works contracts and remains the responsibility of Sydney Metro. Parklife Metro D&C will be responsible for the propagation of any seed as directed by Sydney Metro.
Appendix A - REMM FF11 - Native seed collection and salvage program	DPE EHG	EES also previously recommended a suitably qualified bush regenerator is engaged to provide advice on the collection of local native seed, the use of local native provenance species and to prepare a landscape plan for the project.	As above seed collection has been carried out as part of prior works contracts and remains the responsibility of Sydney Metro. Detail on landscaping will be provided in the PUDCLP.
Appendix A - REMM FF11 - Native seed collection and salvage program	DPE EHG	The earlier the seed is collected and propagated the more established the plants will be for use by the project in landscaping/revegetation.	Noted

1 Penrith City Council



Our reference: InfoStore
Contact: Lauren Vallejo
Telephone: 0439 608 010

29 March 2023

Mr Mark Chilton
Environment Manager
Parklife Metro Joint Venture

Sent by email: mark.chilton@parklifejv.au

Dear Mr Chilton

Sydney Metro – WSA: SSTOM Non-Aboriginal Heritage and Environmental Management and Monitoring

Thank you for providing Council with the opportunity to review and provide comment on the Non-Aboriginal Heritage Management Sub-Plan (Revision B), Flora and Fauna Management Sub-Plan (Revision B), and Air Quality Monitoring Program (Revision B), for works related to Stations, Systems, Trains, Operations and Maintenance.

After review of the abovementioned documentation, the following is provided.

Non-Aboriginal Heritage Management Sub-Plan (Revision B)

1. Council requests a copy of the archival recordings stated to have been undertaken.
2. It is noted that works are occurring in proximity to listed heritage items that are unlikely to be impacted, but there is still a potential for these items to be adversely impacted. It is therefore requested that an archival recording is undertaken for any listed heritage items within proximity to the works.
3. It is noted that an appropriately qualified heritage specialist is to be engaged for the project. It is requested that Council be furnished with details, including CV's of the shortlist of candidates for review and comment prior to engagement.
4. It is recommended that the appointed qualified heritage specialist is to be employed throughout the construction phase

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to attend regular site inspections, issue instructions, take photographs and record meeting notes especially relating to latent conditions and to ensure the approved plans and documents have been followed. Site visits are recommended to occur weekly as a minimum, particularly for works associated with St Marys Station. Prior to the issue of an Occupation Certificate, the consultant heritage architect is to submit a report detailing site inspections, issued instructions, photographs, meeting notes and confirmation that the works have adhered to approved plans and approval conditions. It is requested that Council be furnished with the final report.

5. A detailed archival recording should be undertaken for the jib crane at St Marys Station that is proposed to be dismantled and reassembled. Additionally, an archival recording of the jib crane is to be completed whilst it is being dismantled.

Flora and Fauna Management Sub-Plan (Revision B)

6. It is understood that majority of clearing has been undertaken during earlier stages of the project. The submitted report is satisfactory. Council has no objection, comment or recommendation.

Air Quality Monitoring Program (Revision B)

7. The proposed monitoring program is generally satisfactory.
8. The Air Quality Monitoring Program document details the baseline data available for reference during baseline modelling, as well as the parameters of the project to be monitored and frequency of monitoring to be undertaken. It is also noted the procedures to implement for additional mitigation measures should monitoring reveal unacceptable air quality impacts recorded.
9. It is noted in Section 6.1 that it is proposed to have wind conditions monitored and reviewed daily either via the project automatic weather station or via daily data available online. There is also mention of a daily review of the wind forecast in Table 7. It is recommended that wind direction and wind speed be monitored in real time, or on an hourly basis to ensure that appropriate mitigation measures can be implemented, or activities can cease within suitable timeframes to avoid any

potential impacts on surrounding sensitive receivers in terms of air quality.

10. Whilst details have been provided in relation to the methods for selection of locations for which monitoring is to be undertaken, the specific locations have not been disclosed in Section 6.3.2. It is stated within the monitoring program document that the specific sampling locations will be determined in consultation with Sydney Metro and the Environmental Representative and will consider previous monitoring locations on the Sydney Metro – WSA project. It is recommended that the Air Quality Monitoring Program document include detailed locations for which the monitoring is to be undertaken, as well as identifying such locations on a diagrammatic figure to obtain perspective in relation to the subject property and surrounding sensitive receivers.

If you have any questions about this matter, please contact myself via email to lauren.vallejo@penrith.city or on 0439 608 010.

Yours sincerely



Lauren Vallejo
Project Interface – Sydney Metro

2 Liverpool City Council

Agency	Date consulted	Details
Liverpool City Council	5 April 2023	Initial consultation – via email
	10 May 2023	Follow-up email sent
	1 June 2023	Follow up phone call
	2 June 2023	Phone call and follow-up email

Note: no response currently received

General Correspondence

Reference No: SMWSASSM-PLD-GEN000141
Project Title: Sydney Metro Western Sydney Airport Project Delivery
Contract No: SSM - Stations, Systems, Trains, Operations and Maintenance (SSTOM)
Sub Contract: -
Orig Ref No:
DLM:

Date: 05 April 2023, 04:13 PM
From: Keirron Anderson (Parklife Metro D&C)
To: Stella Qu (Liverpool City Council)
Cc: Mark Chilton (Parklife Metro D&C) ; Foster Walker (Sydney Metro) ; Rebecca Pearson (Sydney Metro) ; Jeremy Parkin
Subject: **SMWSA Project - SSTOM Works - Non-Aboriginal Heritage, Fauna and Flora Management Sub-plan and Air Quality**

Hi All,

As part of the Sydney Metro Western Sydney Airport (SMWSA) Project, Parklife Metro will be constructing the Stations, Systems, Trains, Operations and Maintenance (SSTOM) package. Aerotropolis Station at Bringelly in the south, but by way of providing background to the SSTOM Project, it includes the construction of the six new metro stations, installation of tracks, sign

In accordance with the SMWSA Project's infrastructure approval (SSI-10051), we have prepared a Non- Aboriginal Heritage, Flora and Fauna Management Sub-plan and Air Quality M Council review these documents and if required, provide comment. Any review comments or issues raised will be duly considered by Parklife Metro in the name of open and honest c

Further to previous correspondence, we appreciate that you may have been contracted by other parties regarding earlier stages of the SMWSA Project, and therefore, Parklife Metro : have any questions or would like to set up a time to meet, please contact me via reply email or on 0488 477 686.

Regards,

Mark Chilton

Sent by Keirron Anderson

Discipline:
Sub Discipline: -

Design Series:
Design Lots:

Attachments

Sydney Metro - WSA - SSTOM - Non-Aboriginal Heritage, Fauna and Flora Management Sub-plan and Air Quality Monitoring Program Consultation.htm (10 KB), Sydney Metro - WSA - SSTOM - Non-Aboriginal Heritage, Fauna and Flora Management Sub-plan and Air Quality Monitoring Program Consultation.zip (15 MB)

From: [Mark Chilton](#)
To: nelsonp@liverpool.nsw.gov.au
Cc: gus@liverpool.nsw.gov.au
Subject: Documents for review RE: SSTOM Project
Date: Friday, 2 June 2023 2:50:00 PM
Attachments: [image001.png](#)
[image002.png](#)

Hi Peter

It is required under our planning approval for the SSTOM Project (Metro from St Marys to Aerotropolis) to consult with you on the development of certain documents which are detailed in the next paragraph. Could you please confirm by return email if you have any comment on the documents provided. If you have no comment it would be greatly appreciated if you could respond accordingly as it would allow us to close out this condition.

In relation to the emails/transmittals sent to you on the 13th March, 29th March, 5th April regarding the review of the Non-Aboriginal Heritage Management Sub-plan, Flora and Fauna Management Sub-plan, Soil and Water Management Sub-plan, Noise and Vibration Management Sub-plan and Air Quality Monitoring Program.

Thank You

Mark Chilton
Environment Manager
Mob. +61-0488 477 686
email: mark.chilton@parklifejv.au
Parklife Metro JV
680 George Street, Sydney NSW 2000



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3 **DPI Fisheries**

Our Ref: C23/142

22 March 2023

Mark Chilton
Parklife Metro JV
c/o: mark.chilton@parklifejv.au

Dear Mark,

Consultation for the Sydney Metro Western Sydney Airport Project (CSSI-10051) – Condition C5 – Flora and Fauna Management Sub-plan for the construction of the Stations, Systems, Trains, Operations and Maintenance (SSTOM) package

Thank you for your referral of 15/03/2023 seeking comment on the proposal from DPI Fisheries, a division of NSW Department of Primary Industries on the proposed works stated above. This notification complies with s.199(1)(a) of the *Fisheries Management Act 1994* (FM Act) concerning the proposed dredging and reclamation activities.

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

DPI Fisheries has reviewed the *Flora and Fauna Management Sub-plan* in light of those provisions and has the following comments:

1. It should be noted that any fauna relocation activities involving fish must be carried out by an experienced ecologist and may require a s37 permit to relocate fish.

If you require any further information, please contact me on jess.hyland@dpi.nsw.gov.au.

Yours sincerely,



Jessica Hyland
Fisheries Manager, Coastal Systems

4 DPE EHG (Formerly DPIE EES)

Department of Planning and Environment

Our ref: DOC23/223791

Your ref: SSI-10051

Mr Mark Chilton
Environment Manager
Parklife Metro
680 George Street
SYDNEY NSW 2000

17 April 2023

Subject: Environment and Heritage Group comments on the post approval draft Flora and Fauna Management Plan (Rev B) – Stations, Systems, Trains, Operations and Maintenance (SSTOM) works for the Sydney Metro – Western Sydney Airport – SSI-10051

Dear Mr Chilton

I refer to your email of 15 March 2023 requesting advice on the draft Fauna and Flora Management Plan (FFMP) – Stations, Systems, Trains, Operations and Maintenance (SSTOM) works for this critical State significant infrastructure proposal (SSI-10051).

The Environment and Heritage Group (EHG) has reviewed the draft FFMP and EHG's comments and recommendations are provided at Attachment A.

Please note, as advised in EHG's email of 4 April 2023, EHG does not consider the request for EHG to review and provide comments on the draft FFMP within 9 working days is a sufficient period of time to enable EHG to undertake its review.

If you have any queries regarding this matter, please contact Janne Grose, Senior Conservation Planning Officer on 02 8837 6017 or at janne.grose@environment.nsw.gov.au.

Yours sincerely,



Susan Harrison
Senior Team Leader Planning
Greater Sydney Branch
Biodiversity and Conservation

CC: Grant Rokoabuer, DPE

Attachment A

Subject: Environment and Heritage Group comments on the post approval draft Flora and Fauna Management Plan (Rev B) – Stations, Systems, Trains, Operations and Maintenance (SSTOM) works for the Sydney Metro – Western Sydney Airport – SSI-10051

The Environment and Heritage Group (EHG) has reviewed the draft Flora and Fauna Management Plan (FFMP) – Rev B (dated 8 March 2023) for this State Significant Infrastructure proposal (SSI) and provides the following comments.

Section 3.4 of the draft FFMP states “this FFMP applies to off-airport work only” and Section 1.2 notes the SSTOM Works scope include:

- Installation of tracks, signalling, mechanical and electrical systems
- Construction of a stabling and maintenance facility at Orchard Hills
- Construction of the lower chamber of Bringelly shaft, along with capping and backfill
- Construction of the lower chamber of Claremont Meadows shaft, along with capping and backfill
- Construction of six stations, including:
 - A new metro station connecting to, and providing an interchange with, the T1 Western Line (part of the existing Sydney Trains suburban rail network) at St Marys
 - Two new metro stations between the T1 Western Line and Western Sydney International; one at Orchard Hills and one at Luddenham within the Northern Gateway Precinct
 - Two new metro stations within the Western Sydney International site; one at the Airport Terminal and one at the Airport Business Park, both of which are located on Airport land and are managed under a separate CEMP
 - A new metro station within the Aerotropolis Core precinct, south of Western Sydney International.

Impacts on Biodiversity

The draft FFMP is not clear whether the SSTOM works will impact/disturb biodiversity, for example it is unclear if the STOM works will impact:

- native vegetation and if clearing is required, and if so where the vegetation is located, and the PCT area to be impacted
- threatened ecological communities (TEC’s) and threatened flora species
- threatened fauna and/or their habitat
- buildings and structures and if demolition is required where the structures are located and the number of structures to be demolished
- waterways and riparian corridors.

The FFMP needs to provide greater clarity on potential impacts.

Vegetation Clearing

The FFMP indicates clearing has already occurred during earlier stages of the project, but it is unclear if the STTOM works require any clearing /disturbance of vegetation. The FFMP needs to provide greater clarity on this, for example:

- Section 1.2 of the FFMP states “it is likely that vegetation clearing and disturbance within the Project footprint would have already occurred”
- Section 4 states “the majority of vegetation clearing and disturbance within the Project footprint would have already occurred prior to the SSTOM works.”

Department of Planning and Environment

- Section 5 states “SSTOM Works have limited potential to impact biodiversity as most vegetation clearing will have occurred in earlier stages of the Project” but it also states, “should clearing activities be required for SSTOM, the extent of clearing will be assessed by the Project Ecologist as part of the pre-clearing inspection process (Appendix C)”. It also refers to biodiversity impacts relevant to the SSTOM package which is provided as a worst-case scenario based on potential vegetation clearing of previous contractors not being completed.
- Section 6.2 states “Areas requiring clearing by Parklife Metro D&C will not be fully understood until detailed design is progressed, and condition of the site at handover from previous Project stages is known”.

Section 1.2 notes the processes, mitigation measures and procedures described in the FFMP are provided to describe how Parklife Metro D&C will manage impacts to flora and fauna during construction, in the situation that additional clearing is identified during construction. If most of the native vegetation clearing has already occurred in early stages, the FFMP needs to clarify what additional clearing may be required and whereas it is unclear if the SSTOM works will need to clear vegetation that previous contractors have not yet completed and what areas may need to be cleared. Also, it is unclear why the previous contractors have not completed the clearing.

Scaled plans need to be provided which show the location of:

- plant community types (PCTs),
- threatened ecological communities (TEC's),
- threatened flora
- threatened fauna habitat features

in relation to the footprint of the SSTOM works footprint and areas potentially impacted by the works.

EHG notes Figure 3 shows ‘areas not yet surveyed’ within the study area. It is unclear if these surveys need to be undertaken in relation to the proposed SSTOM works and if so when and whether any clearing is proposed within the areas not yet surveyed. The FFMP should address this.

Table 2 – Compliance Table

In relation to the FFMP including a dewatering plan for farm dams, Table 2 indicates for Condition of Approval C11(b) that this is ‘not applicable to SSTOM works’. This appears to imply that there are no farm dams which require dewatering in the SSTOM footprint. The FFMP should clarify/explain why this is not applicable.

3.3 ISC Rating Requirements

Section 3.3 refers to the ‘ISC rating requirements’, the Glossary/Abbreviations section should be amended to include what ‘ISC’ means.

3.6 Document Consultation

Section 3.6 states “In accordance with REMM FF1, this FFMP has been prepared in consultation with the Project Ecologist (WolfPeak Pty Ltd), who satisfies reasonable qualifications and experience necessary to ensure this Sub-plan best minimises and manages impacts to flora and fauna during construction of the SSTOM Work”. REMM FF1 in Table 7.2 of the Submissions Report however states the FFMP (off airport) “would be prepared by a suitably qualified and experienced person” and not “prepared in consultation with the Project Ecologist”. The FFMP needs to clarify if it has been prepared in consultation with the Project Ecologist, or if it has been prepared by the Project Ecologist.

3.7 Document Approval

Section 3.7 states “this Sub-plan is to be endorsed by the project Environmental Representative (ER) no later than one month before the commencement of construction. Construction is not to commence until the CEMP, and all required Sub-plans and Monitoring Programs have been endorsed by the ER and/or approved by DPE”. According to Table 9 in the Staging Report for this SSI the FFMP for the SSTOM is meant to have ER review and endorsement prior to submission to the Planning Secretary for review and approval (page 34 of 133 of Staging Report). Therefore Section 3.7 needs to be amended and it should not include the ‘or’ in the “and/or approved by DPE” it should only include the ‘and’.

4.7 Aquatic Ecology

Section 4.7 lists the waterways within the off-airport study area and notes the “project is unlikely to significantly impact any threatened aquatic species or their habitats”. The FFMP needs to clarify if any creeks/riparian corridors will be impacted by the SSTOM works, particularly Table 8 list works around and within watercourses as potential impacts relevant to the SSTOM package.

EES in its submissions on the EIS (dated 18 Nov 2020), draft Submissions Report (dated 31 March 2021) and Submissions Report (dated 5 May 2021) requested scaled plans are provided which show:

- the location of watercourses
- top of bank
- width of proposed riparian corridors
- existing remnant vegetation / EEC
- associated works including the footprint of the project, length and location of temporary and permanent crossings.

EHG recommends these scaled plans for works around/within watercourses are included in the FFMP.

Section 1.2 indicates the SSTOM works scope includes the installation of tracks and the construction of a stabling and maintenance facility at Orchard Hills. EHG considers further details are required as to whether the works could potentially impact the tributaries of Blaxland Creek at Orchard Hills, particularly as the EIS for SSI-7127 for the Northern Road Upgrade – Mersey Road-Bringelly to Glenmore Parkway, Glenmore Park noted that the tributaries of Blaxland Creek at Orchard Hills are among the least disturbed catchments remaining in the Cumberland Plain and are regarded as possibly the most pristine creek system on Wianamatta Shale left in Western Sydney (page 316). The EIS for the Northern Road Upgrade also outlined these tributaries are richer in aquatic macroinvertebrate genera than most other creeks of western Sydney and that the macroinvertebrate community of this catchment has a high representation of disturbance-sensitive species (Table 6.28, page 537). The FFMP provides no details on the macroinvertebrate communities in these waterways or if the works could potentially impact / disturb this pristine creek system and aquatic macroinvertebrate species. The FFMP should address where the proposed SSTOM works are in relation to the tributaries of Blaxland Creek.

Figures 3 and 4 - TECS on SSTOM Project – Northern Portion and Southern Portion

Figure 3 is titled ‘TECs on SSTOM Project – northern portion’ – but it is unclear if the SSTOM project area only applies to the area near Patons Lane which has been enlarged in the rectangle. Figure 3 shows ‘areas not yet surveyed’ within the ‘study area’. It is unclear if these surveys have now been undertaken and if not when the surveys are to be undertaken. The FFMP should address this.

EHG recommends scaled figures are included in the FFMP which clearly show:

- the proposed SSTOM works footprint
- the boundary of SSI-10051
- remnant native vegetation/EEC
- watercourses and top of bank
- riparian corridor widths
- the proposed clearing boundary
- native vegetation to be retained
- threatened flora and fauna species locations
- buildings and structures to be demolished and potential microbat roosting structures
- areas to be covered by the pre-clearing surveys etc.

5 Environmental Aspects and Impacts

Section 5 states “Biodiversity impacts relevant to the SSTOM package are detailed in Table 8, which is provided as a worst-case scenario based on potential vegetation clearing of previous contractors not being completed”. This sentence needs to be amended to also include reference to the demolition of buildings and structures as Table 8 includes ‘demolition of built structures’ as an aspect. While Section 6.5.2 notes the “SSTOM Works have limited potential to require demolition of dwellings and structures, as demolition works will have occurred in earlier stages of the Project. It also states if demolition, removal or modification of dwellings and structures is unavoidable as part of the SSTOM works...” so Section 5 should be amended.

Table 8 – Summary of Aspects and Potential Impacts

As noted above, Table 8 lists ‘works around and within watercourses’ as potential impacts relevant to the SSTOM package. It is unclear what these works entail. Section 6.1 implies that waterway crossings are proposed, and they are to be designed to incorporate best practice. The FFMP needs to provide details on this and explain why works are required within the watercourses and where the waterway crossings are proposed and the type of crossings such as temporary or permanent / bridge or culvert etc.

EHG understood the watercourse crossings (permanent and temporary crossings) formed part of the Surface and Civil Alignment Works (SCAW) scope of works. The FFMP should clarify if watercourse crossings are required to be constructed as part of the SSTOM works.

If the crossings have already been constructed as part of previous works, the FFMP should clarify if the temporary crossings have been removed or if they are to be removed as part of the SSTOM works. Once the temporary crossings are no longer required for construction purposes they should be removed and the area that has been impacted by the crossing stabilised, rehabilitated and revegetated. The FFMP should clarify if any temporary crossings are to be removed as part of the SSTOM works.

Table 8 also lists the demolition of built structures. Details need to be provided on the number and location of built structures and when surveys are to be undertaken for the presence of microbats.

6.1 Mitigation and Management Measures

Section 6.1 implies that waterway crossings are proposed, and they are to be designed to incorporate best practice. The FFMP needs to provide details on where the waterway crossings are proposed and the type of crossing.

Table 9 – Flora and Fauna Mitigation Measures

As demolition of human structures could potentially be undertaken as part of the SSTOM works it is recommended Table 9 is amended to include that a survey for the presence of native fauna including threatened microbats is undertaken prior to the demolition of buildings and structures.

FF-M13 works around and within watercourses should be designed and constructed to avoid and minimise impacts to the waterway and the riparian corridor. The riparian corridor should be marked and identified on the ground and if it is disturbed by SSTOM works the corridor should be revegetated with local native provenance plant species at the completion of works.

EHG recommends an additional mitigation measure includes:

- topsoil from areas of native vegetation that are approved to be cleared for the works should be collected and used in the revegetation areas.

6.2 Pre-Clearing inspection

Section 6.2 states “areas requiring clearing by Parklife Metro D&C will not be fully understood until detailed design is progressed, and condition of the site at handover from previous Project stages is known. The areas proposed to be cleared and retained need to be clearly identified and marked on the ground and shown on maps prior to any clearing of vegetation and the pre-clearing surveys. It is noted Section 6.7 indicates environmental control maps depicting vegetation clearing boundaries and exclusion/no-go zones will be prepared and provided to the construction team. It is suggested these maps are included in the FFMP as an appendix for ease of reference.

Section 6.2 states “The Pre-Clearing Inspection will be undertaken by the Project Ecologist and the Environmental Manager (or delegate) prior to any clearing of native vegetation and/or habitat features” but it also states, “All other pre-clearing inspections will be undertaken by the Parklife Metro D&C Environment Team, in consultation with the Project Ecologist, as required.” Section 10.2(b)(i) of the CEMF for this CSSI states, “A pre-clearing inspection will be undertaken prior to any native vegetation clearing by a suitable qualified ecologist and the Contractor’s Environmental Manager (or delegate)”.

Section 6.2 should identify what pre-clearing inspections are required, when and where these surveys are to be undertaken. It is recommended Section 6.2 is crosslinked to FF-M3 in Table 9 which indicates the pre-clearing surveys will include:

- Identification of hollow bearing trees and other habitat features
- Identification of threatened flora and fauna
- A check on the physical demarcation of the limit of clearing
- An approved erosion and sediment control plan for the worksite.

EHG recommends the FFMP includes specific sections which deal with:

- tree hollow surveys (these surveys should be undertaken prior to the pre-clearing surveys) to identify and count the number of tree hollows and the required number of replacement nest boxes
- pre-clearing surveys
- pre-demolition surveys of buildings and structures.

The FFMP should:

- provide details on what these surveys/ inspections entail and when and where these surveys will be undertaken

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- include scaled plans which locate the areas to be covered by the tree hollow surveys and pre-clearing surveys.

The purpose of these surveys is to identify and mark hollow bearing trees and any other habitat features (stags, hollow logs, birds' nests or possum dreys). This should occur at least one week before the removal of vegetation. Hollow bearing trees should be flagged and counted to indicate the number and type of replacement nest boxes to be identified, obtained, and installed. To meet Condition E11 the nest boxes must be installed one (1) month prior to any removal of existing tree hollows and/or the release of any captured hollow dependent fauna.

The pre-clearing surveys and/or pre-demolition surveys should identify potential release sites if fauna require capture and relocation during clearing.

EHG recommends the pre-clearing survey includes:

- the ecologist checking the tree hollows for the presence of native fauna
- covering the tree hollows once the hollows have been checked and it is verified that fauna are not present to ensure the hollows are not reoccupied prior to removal of the trees and/or the project ecologist endeavours to individually remove sections of a tree containing a hollow or other habitat features for relocation and reuse by the project
- where hollow dependent native fauna are found using tree hollows that are to be removed
 - the fauna should be captured and relocated prior to felling the tree
 - compensatory tree hollows are provided prior to removing the tree hollows and prior to the release of the hollow dependent fauna.

6.5 Habitat feature and Clearing Procedure

Depending on when the pre-clearing surveys are undertaken it is recommended that prior to the commencement of clearing, the Project Ecologist completes a survey to ensure no fauna have moved into the area since the initial pre-clearing inspection and the FFMP includes the following.

Tree Removal

- During any tree removal, an experienced and qualified ecologist is to be present to re-locate any displaced fauna that may be disturbed during this activity.
- Native trees that are approved for removal (including tree trunks greater than approximately 25-30cm in diameter and 2-3m in length, tree hollows and rootballs) and other habitat features (such as logs and bush rock) should be marked and stored on site for reuse as habitat by the project.
- Where hollow dependent native fauna are found using tree hollows that are to be removed
 - the fauna should be captured and relocated prior to felling the tree
 - compensatory tree hollows should be provided prior to removing the tree hollows and prior to the release of the hollow dependent fauna.
- Any nocturnal fauna found must be captured and re-released to nearby suitable habitat, at a time suitable for the subject species they should not be released during daylight hours.
- The clearing of trees and shrubs should be avoided where possible in late winter/spring during breeding/nesting period for birds.
- Trees with hollows shall be lopped in such a way that the risk of injury or mortality to fauna is minimised, such as top-down lopping, with lopped sections gently lowered to the ground, or by lowering whole trees to the ground with the "grab" attachment of a machine.
- Any injured fauna is to be placed into the hands of a wildlife carer (please note only appropriately vaccinated personnel are to handle bats) and released on site when re-habilitated.

6.5.2 Microbat Management

Section 6.5.2 indicates if threatened microbats are detected, a Microbat Management Plan (MMP) will be developed and implemented by a suitably qualified bat specialist. The former EES (now EHG) in its submission on the draft conditions for this SSI advised there is a need to allow enough time to consult with EES on the MMP. The preparation of the FFMP / MMP should be completed to the satisfaction of EES before it is submitted to the Planning Secretary. The FFMP needs to address the time frame that is proposed for the microbat surveys to be undertaken of the abandoned dwellings, structures, culverts and other under road structures. If microbats are found, enough time needs to be allowed to prepare the MMP and consult with EHG.

The MMP, if required, should include details on:

- (i) measures to avoid and minimise impacts*
- (ii) details of potential impacts from construction*
- (iii) an adaptive management plan, which includes a decision-making framework that:
 - (a) defines performance criteria and thresholds, including ‘impact trigger’ and ‘unacceptable impact’ thresholds to be used as triggers for intervention, that are ecologically based and adhere to SMART principles*
 - (b) details monitoring techniques, timing, duration and frequency/intensity and equipment to be used*
 - (c) in the event that an impact trigger, unacceptable impact or other threshold is detected, the actions and mitigation measures to be implemented**
- (iv) ongoing monitoring and reporting requirements during construction and operation; and*
- (v) contingency measures to address impacts attributable to the construction of the CSSI*

The plan must be developed in consultation with an appropriately qualified expert in microbat biology and behaviour, EHG, relevant council(s). The plan must be implemented during construction and operation of the CSSI

It is unclear what is proposed for microbats potentially using the abandoned buildings and structures as habitat if they do not use nest boxes. The MMP will need to address how abandoned buildings and structures will be demolished if microbats are using them as habitat and what actions are required to ensure minimal impacts to these microbats. The MMP should have options for the relocation of any individuals found in preclearance /pre-demolition surveys.

6.6 Unexpected Flora and Fauna Finds

Section 6.6 of the FFMP states “If a new threatened species or ecological community is identified that was not assessed in the EIS, a Consistency Assessment will be prepared to assess the significance of the impacts to the species”. If a new threatened species or ecological community is identified, DPE as the consent authority should be contacted and EHG consulted. It is recommended Section 6.6 is amended to include this and that a record of the unexpected threatened flora and fauna finds will be maintained by the Project Ecologist and this record will include the following details:

- the flora and fauna species
- the date, time, number of species and location of the unexpected find
- details regarding assessment by the Environmental Manager (and advice from suitably qualified ecologist or specialist), and
- actions undertaken before work recommenced.

The record of unexpected finds should be provided to DPE as the consent authority.

In relation to the potential for translocation of unexpected threatened flora individual(s), or part of a soil translocation and the preparation of a Threatened Flora Translocation Plan, EHG requests it is consulted on this plan prior to any translocation of threatened plant species.

For any unexpected threatened flora and fauna finds the Project Ecologist must ensure the details on the threatened flora and fauna species found are entered into BioNet <https://www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity/nsw-bionet/about-bionet-atlas/contribute-data-to-bionet-atlas>. Section 6.6 should be amended to include this.

6.8 Weed and Pathogen Management

Section 6.8 states “ongoing weeding will occur throughout the construction phase, where required”. The Weed Management Procedure in Appendix E implies ongoing weed management is to occur (periodic inspections to assess weed regrowth), but it does not specify the time frame that ongoing weeding is to be undertaken and when it is proposed to cease.

As advised in the EES submission of 31 March 2021 on the draft Submissions Report and revised BDAR EES recommended a mitigation measure is included to address ongoing weed management and maintenance in areas disturbed by the project (including areas downslope of, and/or adjoining the disturbed areas) both during and following construction until the disturbed areas are stabilised and/or rehabilitated.

EHG recommends ongoing weeding / weed management continues after the completion of construction especially in areas that have been disturbed by construction works and/or adjoining the disturbed areas including in the vicinity of watercourses /riparian corridors/ corridor connections and areas adjoining remnant native vegetation. Section 6.8 and the Weed Management Procedure should outline the duration that ongoing weed management is proposed to be undertaken from the completion of construction works.

It is noted Condition E80 requires ongoing operational maintenance of open space and landscaping which implies that this would need to incorporate ongoing operational weed management.

6.10 Rehabilitation of Disturbed Areas

The rehabilitation of disturbed areas should use a diversity of local provenance native species from the relevant native vegetation community (or communities) that once occurred in the area of the proposed works rather than use exotic species or non-local native species. It is recommended the FFMP states that local provenance plant species are to be used.

Section 6.10 notes the rehabilitation sites will be regularly inspected to monitor the health of plantings. According to Table 13 in the FFMP monitoring/inspection of the rehabilitation of site is to occur quarterly. Inspections to monitor the health of the plantings and/or undertake weed maintenance may need to be undertaken more frequently than quarterly (particularly during summer/ warmer weather after rainfall when weed growth is more prolific) to control weed growth and remove weeds while they are still young to prevent weed infestation and larger weeds taking water and nutrients from the soil and choking out the natives. Efforts need to be focussed on reducing the weed seed bank and eradicating weeds from the site.

The FFMP needs to include details on the frequency of maintenance inspections and duration of the maintenance period and what the maintenance entails.

As noted above for Section 6.8, EHG recommends ongoing weeding / weed management continues after the completion of construction especially in areas that have been disturbed by construction works.

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As local native plant species are to be used it is recommended the maintenance is undertaken by a qualified bush regenerator to ensure only weed species are removed and not native plant species.

Any plant losses and maintenance replanting should replace plants by the same species. Where that species is not available, the FFMP should specify:

- the replacement plantings should be with the same growth form (i.e., a tree with a tree, a shrub with a shrub etc)
- the replacement planting must not decrease species diversity
- any new species must still be from the local native vegetation community being emulated and local provenance.

Table 13 - Flora and Fauna Monitoring and Inspection Requirements

Table 13 needs to be amended to also include an inspection of existing buildings /structures for microbats by the Project ecologist prior to the demolition of buildings/structures

7.3.1 Pre-clearing Inspection

Similar to Section 6.2, Section 7.3.1 states “a pre-clearing inspection will be undertaken by the Project Ecologist and the Environmental Manager (or delegate) prior to any clearing of PCTs and/or habitat features” but it also states, “All other pre-clearing inspections will be undertaken by the Parklife Metro D&C Environment Team, in consultation with the Project Ecologist, as required”. It is unclear why this second sentence states “All other pre-clearing inspections will be undertaken by the Parklife Metro D&C Environment Team, in consultation with the Project Ecologist.”

Section 10.2(b) (i) of the CEMF for this CSSI states, “A pre-clearing inspection will be undertaken prior to any native vegetation clearing by a suitable qualified ecologist and the Contractor’s Environmental Manager (or delegate)”.

7.6 Hold Points

If an unexpected new threatened species or ecological community is identified that was not assessed in the EIS, this should be another hold point until a Consistency Assessment has been undertaken.

7.7 Reporting and Records

As noted for Section 6.6, EHG recommends records are kept by the Project Ecologist of any unexpected threatened flora and fauna finds and this is listed in section 7.7 as a compliance record to be kept during construction.

Appendix A - Other Conditions of Approval, REMMS, CEMF Requirements and EPBC conditions Relevant to this Sub-plan

REMM FF2 - Nest box strategy

The Revised Environmental Management Measures (REMM) in Appendix A includes REMM FF2 which requires a Nest Box Strategy to be prepared (see page 41 of FFMP). Appendix A indicates this is addressed in Table 9 of the FFMP. REMM FF2 in Appendix A includes a note which states that this is ‘Not applicable to SSTOM works. If it is determined that removal of hollow-bearing or habitat trees is required, a Nest Box Strategy would be developed prior to that disturbance’.

As the FFMP indicates the SSTOM works could include the clearing of native vegetation it is unclear why a specific section is not included which relates to the Nest Box Strategy in accordance with REMM FF2.

Department of Planning and Environment

EHG recommends the FFMP includes a specific section which deals with tree hollow surveys and that these surveys are undertaken prior to the pre-clearing surveys to identify and count the number of tree hollows to be removed and the required number and type of replacement nest boxes. If tree hollows are found during the pre-clearing inspection and are to be removed, to meet Condition E11 replacement nest boxes must be installed one (1) month prior to any removal of existing tree hollows and/or the release of any captured hollow dependent fauna.

The provision of nest boxes and their installation should be undertaken in consultation with appropriately qualified and experienced experts on the fauna species that use or potentially use the tree hollows and the replacement nest boxes, including experts in microbat biology and behaviour.

It is important that adequate preconstruction, construction and post construction monitoring is undertaken to confirm the species that will potentially use the nest boxes are using them. Contingency measures/corrective actions should also be put in place in case monitoring indicates the nest boxes are not effective. EHG recommends a long-term monitoring program is undertaken to evaluate the effectiveness of the nest boxes and that the monitoring covers all seasons (spring, summer, winter and autumn) and it is not just undertaken annually.

Nest boxes should preferably be monitored for any repair /maintenance /replacement requirements for a minimum of 5 years. At the end of the 5 years the proponent needs to provide the results of the nest box monitoring and their use or lack thereof to DPE and provide recommendations as to the ongoing use of the nest boxes and any future maintenance requirements.

If the land the subject of the FFMP remains in Sydney Metro ownership then EHG recommends the FFMP should take an adaptive management approach which responds to the results of the monitoring program, including the monitoring of nest boxes. Once the construction period is complete, the monitoring program can inform ongoing management actions required during the operation of the Sydney Metro. If the land the subject of the FFMP does not remain in Sydney Metro ownership at the completion of construction, the monitoring program can end at the completion of construction.

EHG recommends the nest box monitoring includes details on:

- the number of nest boxes to be monitored
- the GPS locations of the nest boxes
- the characteristics of all nest boxes to be monitored / the native fauna species that the boxes are designed for
- the duration and frequency of monitoring
- how the nest boxes are to be monitored (e.g., visual checks, installation of wildlife cameras which are motion activated)
- the reporting of monitoring results
 - nest box installation details (date installed, direction the box entrance faces, height above ground)
 - the time of year, date and time that boxes are checked
 - what was found in the nest box – the species and the number of individuals
 - occupancy rates
 - frequency of use
 - pattern and timing of use
 - maintenance needs.

The full monitoring data should be made publicly available in annual reports and made available online and published in scientific literature. It is important that TfNSW makes its monitoring data available for other projects to benefit. If the data is collected under licence, then this should be imported into BioNet which can then be used in the future.

REMM FF11 - Native seed collection and salvage program

REMM FF11 in Appendix A requires a native vegetation seed collection and salvage program to be developed prior to the commencement of construction and implemented during construction (see page 41 of FFMP). Appendix A indicates this is addressed in Section 6.2 of the FFMP and it includes a note that 'SSTOM works only include propagation of collected material'. If the SSTOM works also include the clearing of native vegetation it is unclear why a native vegetation seed collection program is also not proposed to be undertaken in accordance with REMM FF11.

As previously advised by EES in its submission (dated 18 November 2020) on the EIS, seed collection should commence as soon as possible so that local native provenance plant species are available to be planted, and the trees are advanced and established in size to improve the urban tree canopy and local biodiversity.

EES also previously recommended a suitably qualified bush regenerator is engaged to provide advice on the collection of local native seed, the use of local native provenance species and to prepare a landscape plan for the project.

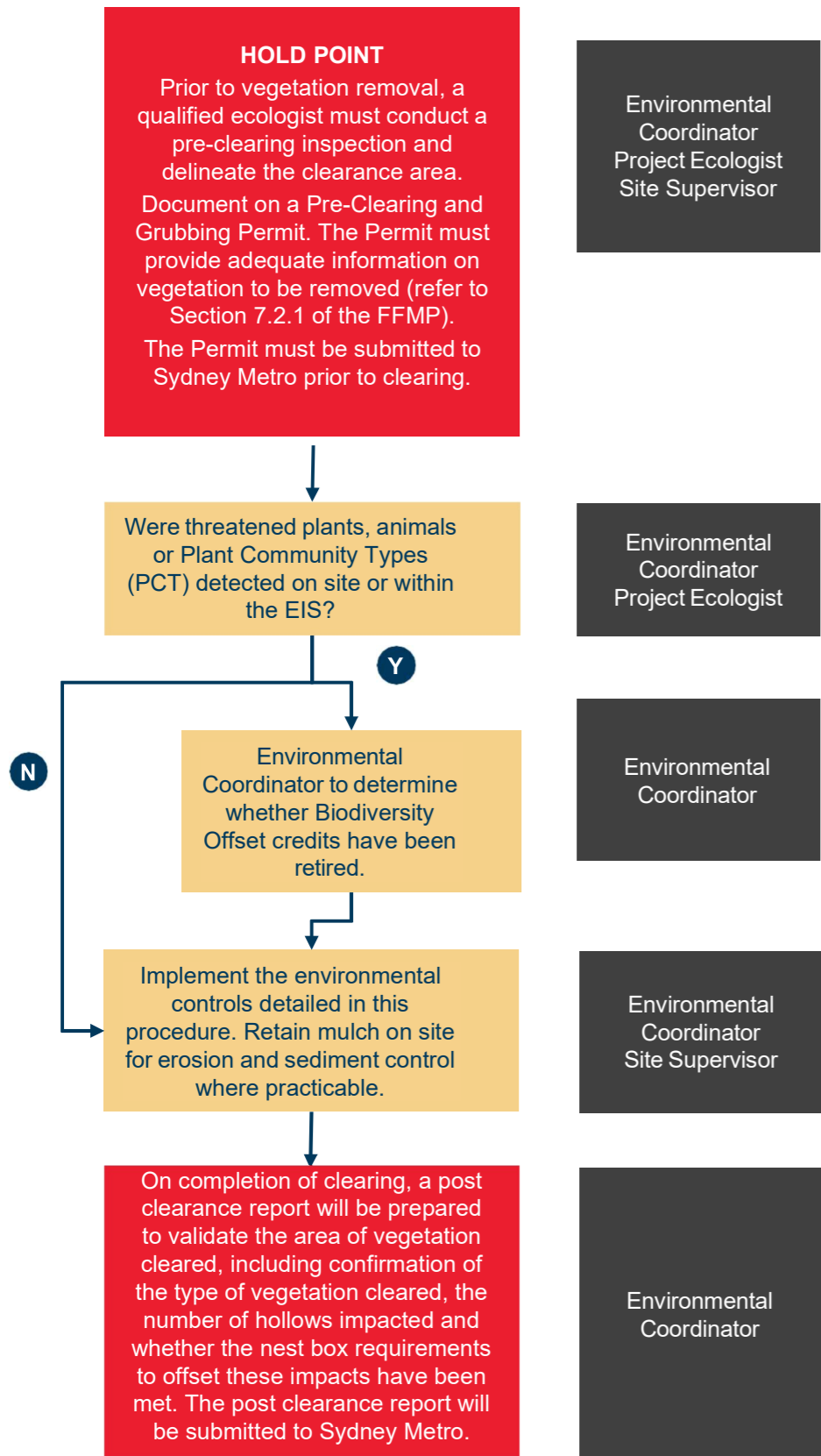
The earlier the seed is collected and propagated the more established the plants will be for use by the project in landscaping/revegetation.

End of Submission

Appendix C Clearing and Grubbing Procedure

Clearing and Grubbing Procedure

MANAGEMENT & RESPONSIBILITIES



PROTOCOL

Delineate Vegetation to be Cleared or Trimmed

Environment Coordinator, Project Ecologist and Site Supervisor to delineate the area of vegetation to be cleared or trimmed based on the EIS and confirmed through survey. Install perimeter flagging/fencing to signify “No Access” and ensure this is communicated via project induction and Toolbox.

Identify the potential for reuse of native vegetation and timber as required by Condition E12

Pre-clearing inspection & Seed Collection

Prior to vegetation removal, a suitable qualified ecologist must conduct a pre-clearing inspection to:

- Mark habitat features, including trees containing hollows or nests
- Conduct searches for threatened Cumberland Plain Land Snails (if the species is predicted to occur) and unexpected threatened species.
- Survey clearing area for any PCT’s or threatened species. If PCT’s or threatened species are present within the clearing footprint, works must stop until the Environmental Coordinator has confirmed whether the overall impact and whether updates to the ecosystem or species credits are required.
- Inspect for presence of fauna; capture and relocate in accordance with the Fauna Handling Procedure.
- Identify features that could provide roosts for microbats and survey as required. Should microbats be detected, a Microbat Management Plan is to be developed.
- Identify and mark Weeds of National Significance and Priority Weeds.
- **Provide a risk assessment and mitigation measures (if any) to prevent the spread of pathogens such as amphibian chytrid *Phytophthora implemanta*, and Exotic Rust Fungi**
- Submit the Pre-Clearing and Grubbing Permit to the Environment Manager for approval and submission to Sydney Metro.

On completion of the pre-clearing inspection, maps depicting vegetation clearing boundaries and exclusion/no-go zones will be provided to the construction team through a toolbox talk or pre-start meeting. The meeting will also include discussion of clearing procedures, fauna handling and any weed identification and control measures.

Parklife Metro D&C will coordinate with Sydney Metro to facilitate seed collection prior to, during and immediately after vegetation clearing, to maximise seed collection prior to mulching.

Implement Environmental Controls

- Install erosion and sediment controls prior to grubbing works
- Separate topsoil from sub soil and green waste and stockpile for reuse onsite or offsite. Stockpiles are to be on hardstand or appropriately delineated and must not be compacted.

Remove Vegetation

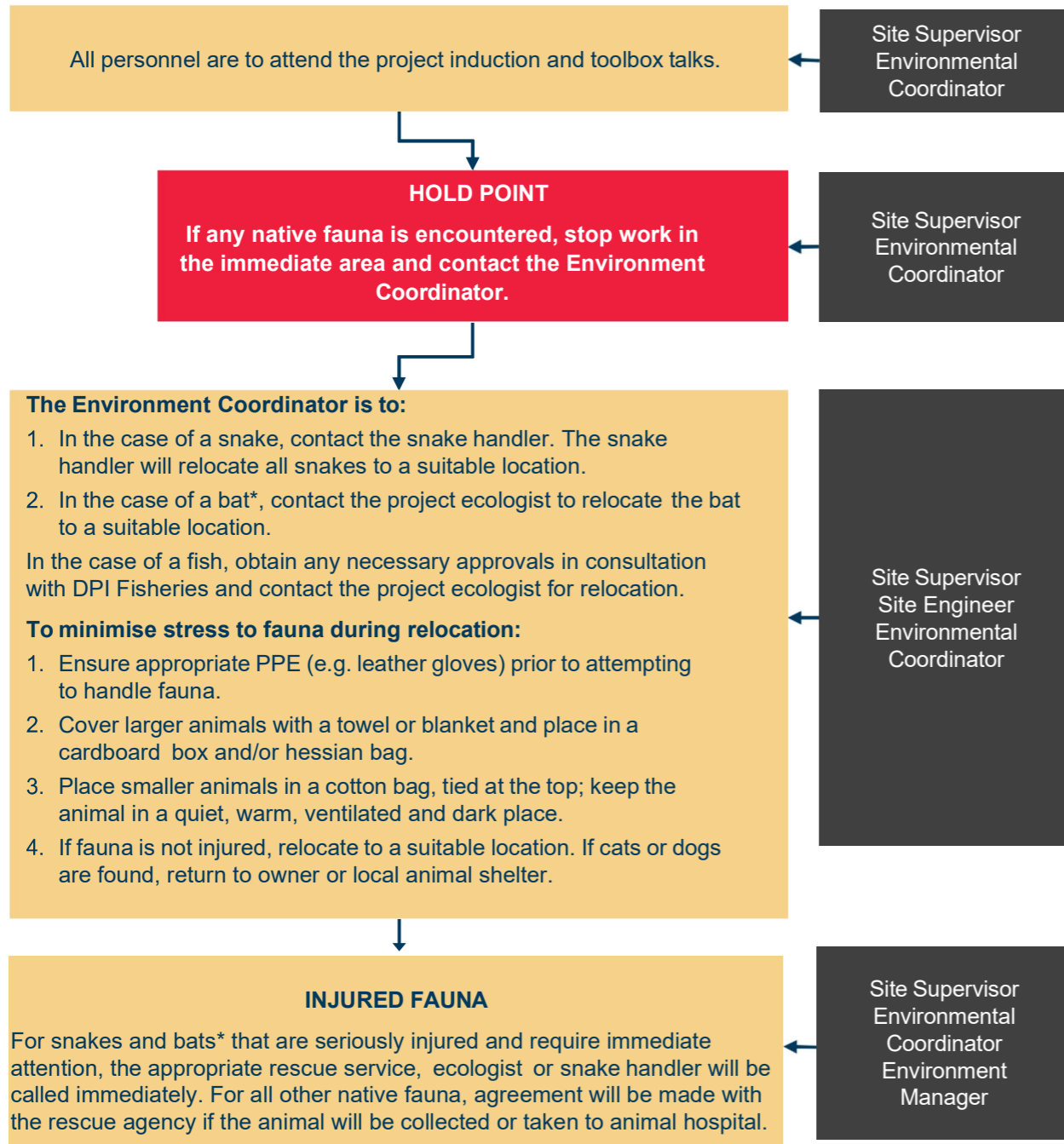
STAGE CLEARING TO AVOID DISTURBANCE UNTIL NECESSARY AND ONLY CLEAR VEGETATION WITHIN THE APPROVED PRE-CLEARING AND GRUBBING PERMIT.

1. Trimming of threatened or endangered ecological communities will be conducted by an arborist.
2. All non-marked trees and features will be removed first. Groundcover habitat features that are not too large to be moved will be removed and searched. All remaining marked habitat trees will be knocked (gently tapped with construction equipment) at the end of each day of clearing and groundcover features such as logs will be gently rolled and searched for the presence of animals.
3. At least 48 hours after the clearance of non-marked vegetation, each habitat tree will be carefully removed in the presence of the project ecologist, and thoroughly searched for the presence of animals:
 - Marked trees will be shaken prior to felling using an excavator or similar equipment and then left for a specific period (determined by the project ecologist) to allow any fauna using the hollows to be observed.
 - Hollow-bearing trees will be slowly pushed over to avoid damage to hollows.
 - Fauna rescue personnel will instruct the equipment operators regarding how and which side to fell the trees so that hollows can be quickly checked. In some circumstances, sections of a tree containing a hollow or habitat may be individually removed prior to felling.
 - Felled habitat trees will be left on the ground for 24 hours or inspected by the project ecologist prior to further processing.
3. Habitat features to be used for habitat enhancement or in rehabilitation works will be relocated to adjacent habitat (subject to landowner consent).
4. Report any injured native fauna to the Environment Coordinator immediately. The Environment Coordinator will provide direction on relocation of the native fauna.
5. Mulch is to be reused on-site for erosion and sediment control, if practicable. Residual mulch is to be taken to a recycling facility. Mulch/ green waste containing herbaceous noxious weeds will be managed in accordance with the Weed Management Procedure. Disposal records will be retained.

Appendix D Fauna Handling Procedure

Fauna Handling Procedure

MANAGEMENT AND RESPONSIBILITY



Rescue Service Contact

WIRES	1300 094 737
RSPCA (Emergency Line)	02 9770 7556
Sydney Snake Catchers	1300 599 938
Small Animal Hospital - Ryde	02 9889 0289
Vet Hospital – St Marys	02 98339321
Vet Hospital – Orchard Hills	02 47362027
Vet Hospital – Rossmore	02 96066984

*Australian Bat Lyssavirus (ABL) Warning

Australian Bat Lyssavirus is a rabies like virus that can infect humans if they are bitten or scratched by an infected bat. Bats that are symptomatic with the virus often behave as if injured, disorientated or unwell.

Under no circumstances should unvaccinated and untrained personnel approach, capture or handle Grey-Headed Flying Foxes or microbat species.

PROTOCOL

HANDLING PROCEDURE

- If the animal cannot be handled (i.e. venomous snake or bats), the exact location of the animal is to be recorded and provided to the snake handler or project ecologist. All personnel and/or subcontractors are to be excluded from the vicinity.
- If the animal requires immediate attention, as determined by the Environmental Coordinator in consultation with the project ecologist or fauna specialist (where required), a rescue service will be contacted.
- In the event the rescue service cannot attend the site, the Environmental Coordinator will deliver the injured/captured animal (other than snakes or bats) to the animal service/shelter as soon as practical.
- If the animal is a threatened species that was not previously identified, the Environment Manager is to notify the Principal and the ER. In consultation with relevant stakeholders, the Environment Manager and project ecologist will implement any corrective action and additional safeguards required. Refer to Section 6.8.4 of the Preparatory CEMP for additional details.

RELEASE PROCEDURE

(Native fauna other than snakes or bats)

If the animal is not injured, the Environment Coordinator, in consultation with the project ecologist (where required), may release the fauna into a suitable area in accordance with the following procedures:

- The Environment Coordinator in consultation with the project ecologist is responsible for undertaking the release. Release sites should be identified during pre-clearing inspections.
- Animals must be released in suitable habitat as close as possible to the original capture location where possible. Cumberland Plain Land Snails should be released in areas with thick leaf/ bark cover or areas with numerous fallen logs.
- If the species is nocturnal, release should be carried out at dusk if practicable. Animals can be left in nest boxes at dusk and allowed to vacate them passively. The nest box can then be inspected in the morning.

DOMESTIC ANIMALS

If the animal is not aggressive the Environmental Coordinator, in consultation with the Community and Stakeholder Team, is to organize for the animal to be returned to its owner or the local council animal shelter. If the animal is aggressive, the Environment Coordinator is to arrange for the local council animal control officer to collect the animal.

If the animal is injured and not aggressive, the Environment Coordinator will take the animal to the nearest vet.

REPORTING

Records of any fauna handling and release locations will be retained using the Fauna Relocation Record - Appendix 1G.

Threatened and Common Fauna that could be Encountered

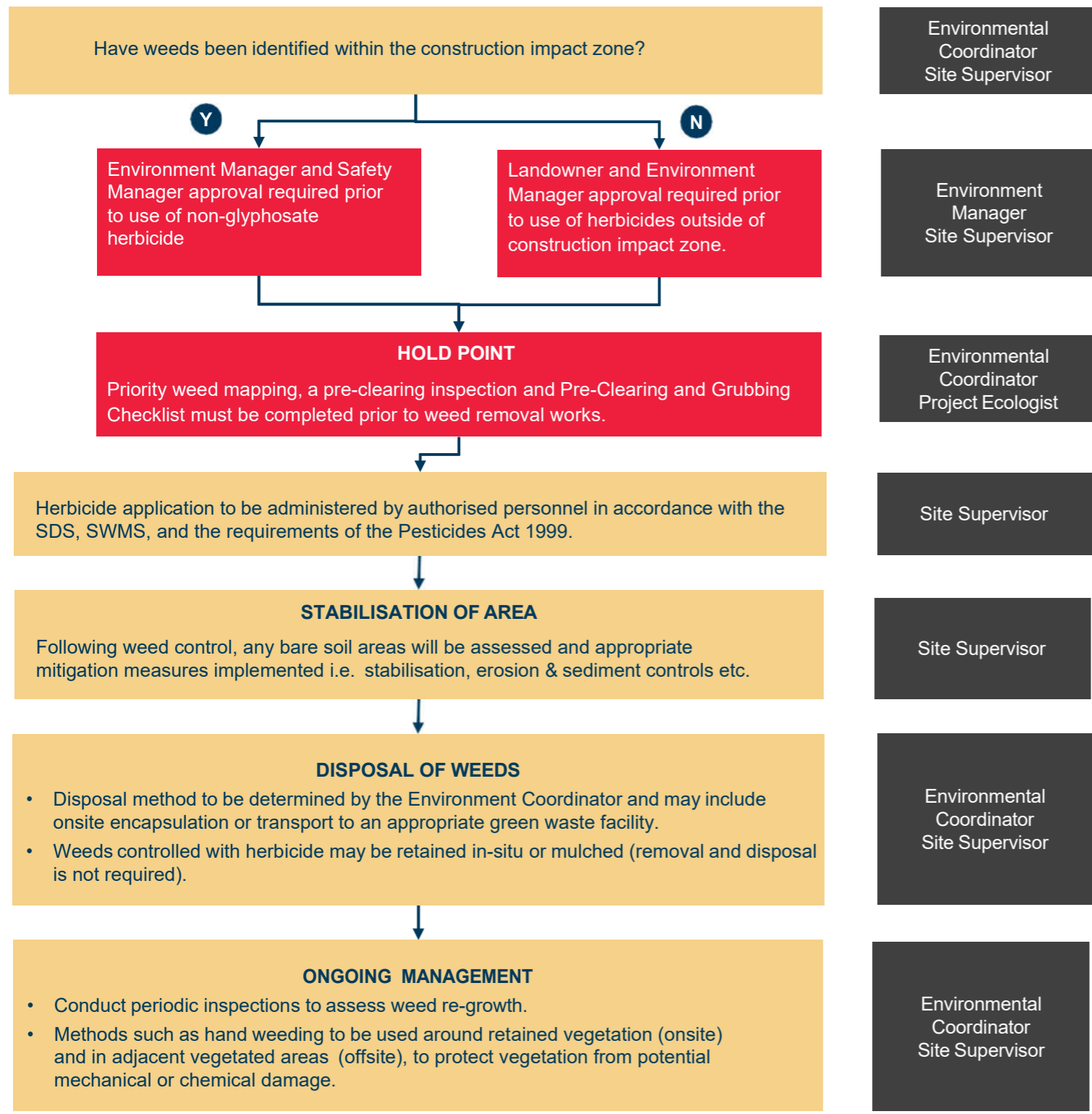
Image	Name	EPBC Act Listing	BC Act Listing
	Southern Myotis <i>Myotis marcopus</i> *	Not Listed	Vulnerable
	Grey-headed Flying Fox <i>Pteropus poliocephalus</i> *	Vulnerable	Vulnerable
	Cumberland Plain Land Snail <i>Meridolum corneovirens</i> *	Not Listed	Endangered
	Green and Golden Bell Frog <i>Litoria aurea</i> *	Vulnerable	Endangered
	Brush-tailed Possum <i>Trichosurus vulpecula</i> *	Not Listed	Not Listed
	Ring-tailed Possum <i>Pseudocheirus peregrinus</i> *	Not Listed	Not Listed
	Blue Tongue Lizard <i>Tiliqua scincoides</i> *	Not Listed	Not Listed
	Red-bellied Black Snake <i>Pseudechis porphyriacus</i> *	Not Listed	Not Listed
	Eastern Brown Snake* <i>Pseudonaja textilis</i>	Not Listed	Not Listed

* Images © Henry Cook AMBS Ecology and Heritage

Appendix E Weed Management Procedure

Weed Management Procedure

MANAGEMENT AND RESPONSIBILITY



WEEDS of NATIONAL SIGNIFICANCE AND PRIORITY WEEDS TO BE CONTROLLED

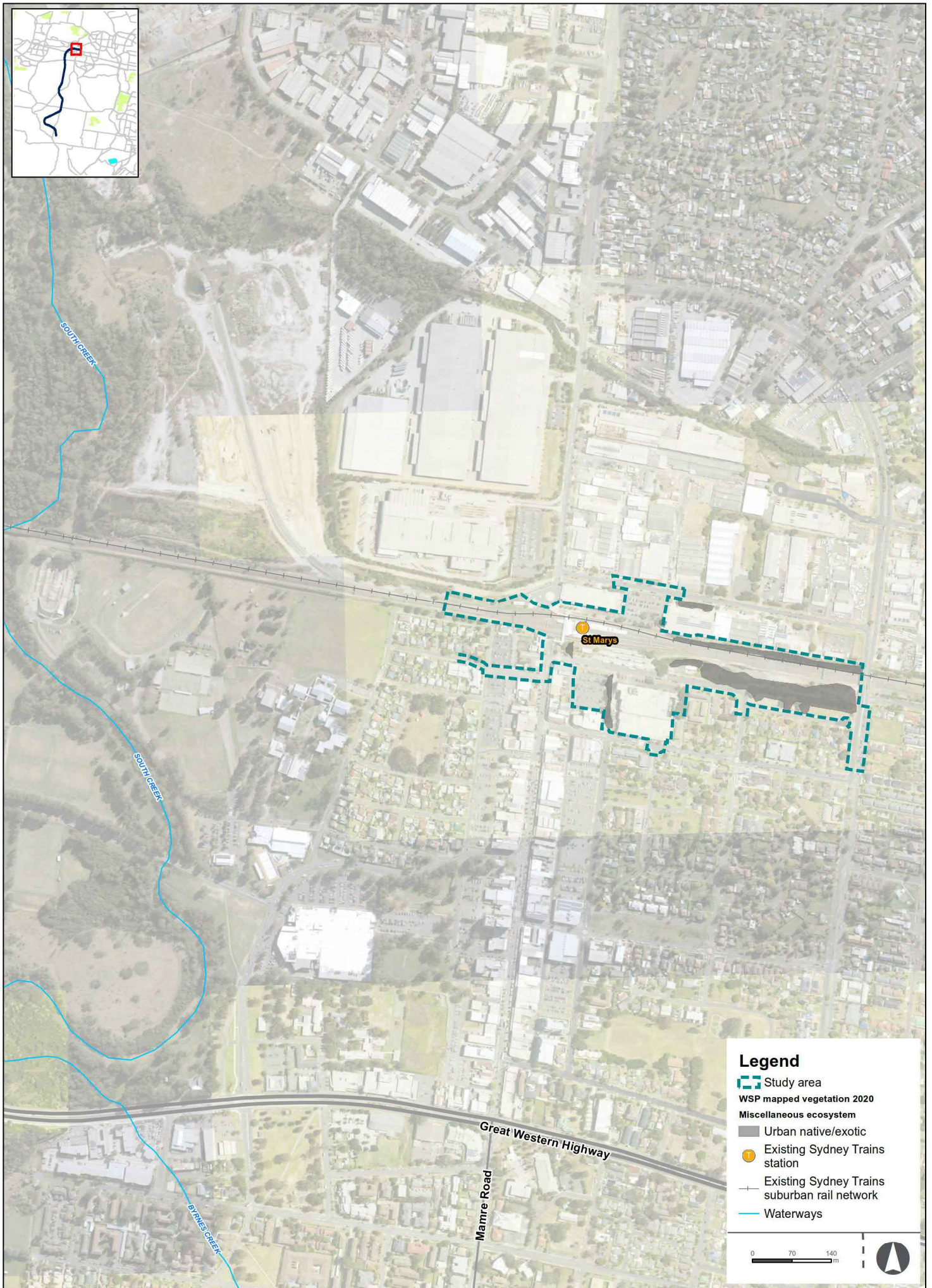
IMAGE*	WEED	SOLUTION	IMAGE*	WEED	SOLUTION
	Name: Sheep Sorrel <i>Acetosella vulgaris</i> WoNS: No HT Weed: Yes			Name: Khaki Weed (<i>Alternanthera pungens</i>) WoNS: No HT Weed: Yes	
	Name: Moth Vine <i>Araujia sericifera</i> WoNS: No HT Weed: Yes			Name: Asparagus Fern <i>Asparagus aethiopicus</i> WoNS: Yes HT Weed: Yes	
	Name: Bridal Creeper <i>Asparagus asparagoides</i> WoNS: Yes HT Weed: Yes			Name: Green Cestrum <i>Cestrum parqui</i> WoNS: No HT Weed: Yes	
	Name: African Love Grass <i>Eragrostis curvula</i> WoNS: No HT Weed: Yes			Name: Small-leafed Privet <i>Ligustrum sinense</i> WoNS: No HT Weed: Yes	
	Name: African Box Thorn <i>Lycium ferocissimum</i> WoNS: Yes HT Weed: Yes			Name: African Olive <i>Olea europaea</i> WoNS: No HT Weed: Yes	
	Name: Castor Oil Plant <i>Ricinus communis</i> WoNS: No HT Weed: Yes			Name: Blackberry <i>Rubus fruticosus</i> complex WoNS: Yes HT Weed: Yes	
	Name: Fireweed <i>Senecio madagascariensis</i> WoNS: Yes HT Weed: Yes			Name: Bathurst Burr <i>Xanthium spinosum</i> WoNS: No HT Weed: Yes	
	Name: <i>Lantana camara</i> WoNS: Yes HT Weed: Yes			Name: Boneseed <i>Chrysanthemum oides monilifera</i> WoNS: Yes HT Weed: No	

KEY

	Hand weeding
	Spray with herbicide treatment
	Cut and paint herbicide treatment
	Scrape and paint herbicide treatment

* Images sourced from NSW WeedWise (<https://weeds.dpi.nsw.gov.au/>)

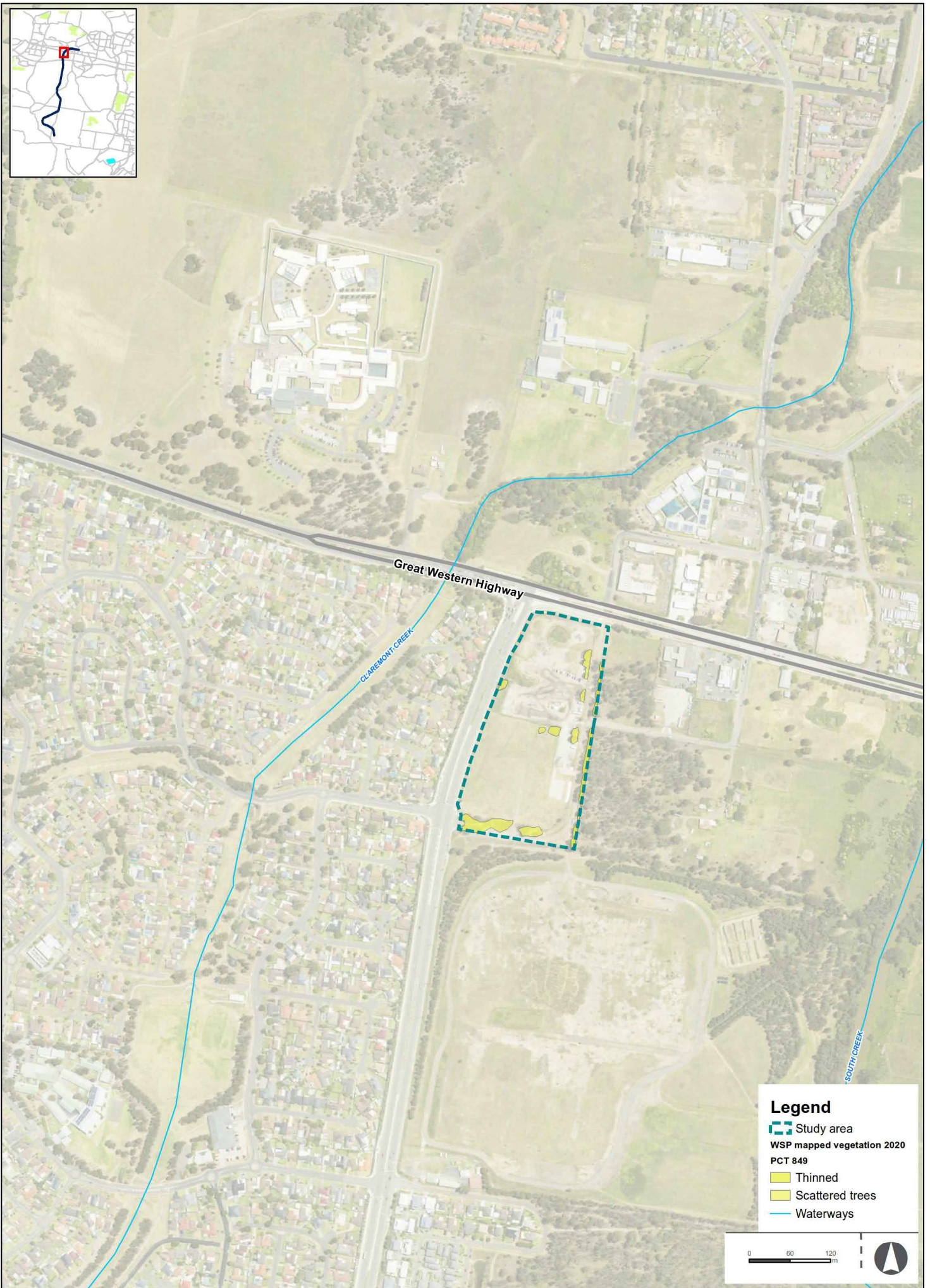
Appendix F Existing Environment Figures



Legend

- Study area
- WSP mapped vegetation 2020**
- Miscellaneous ecosystem**
- Urban native/exotic
- Existing Sydney Trains station
- Existing Sydney Trains suburban rail network
- Waterways

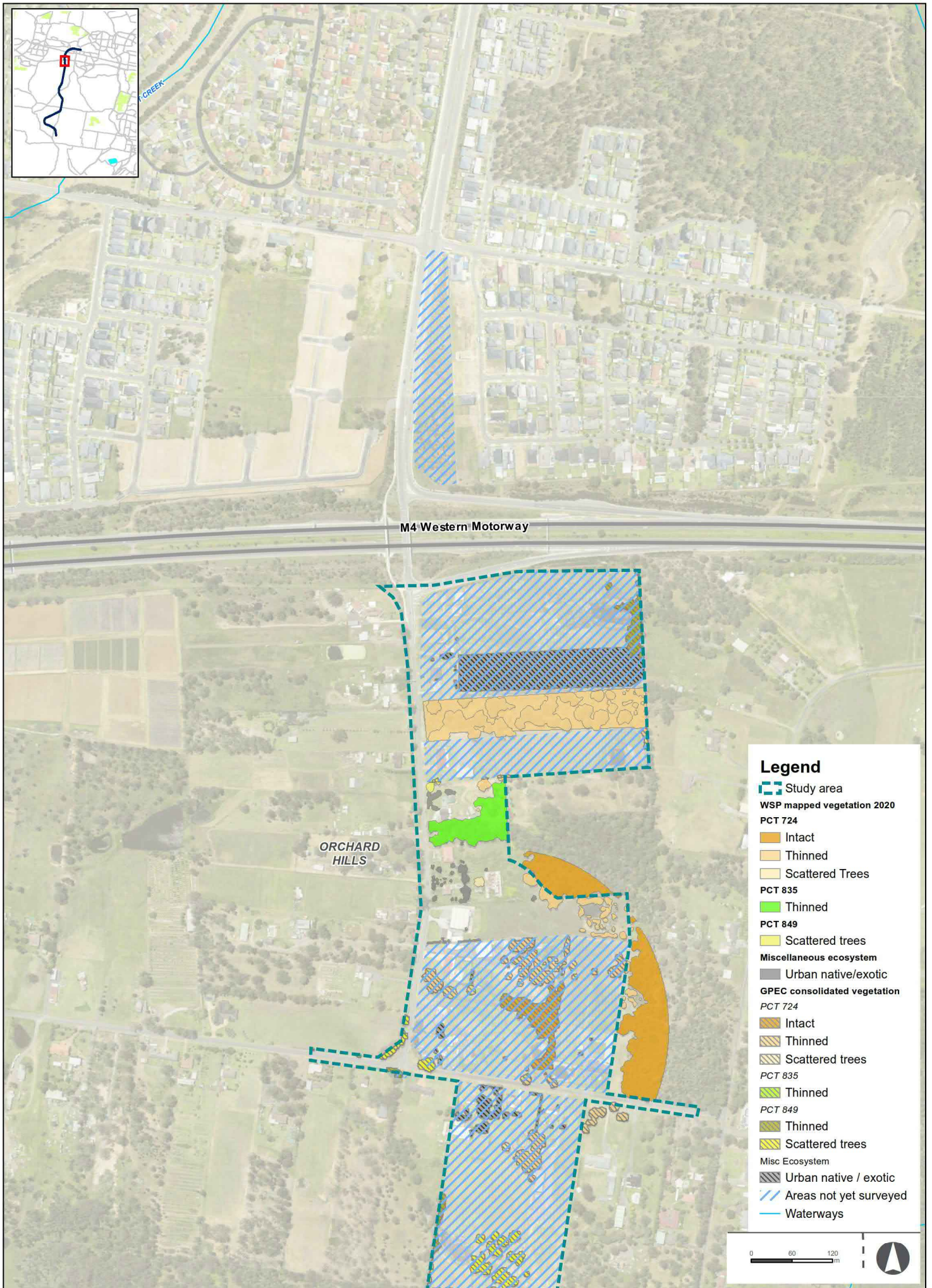
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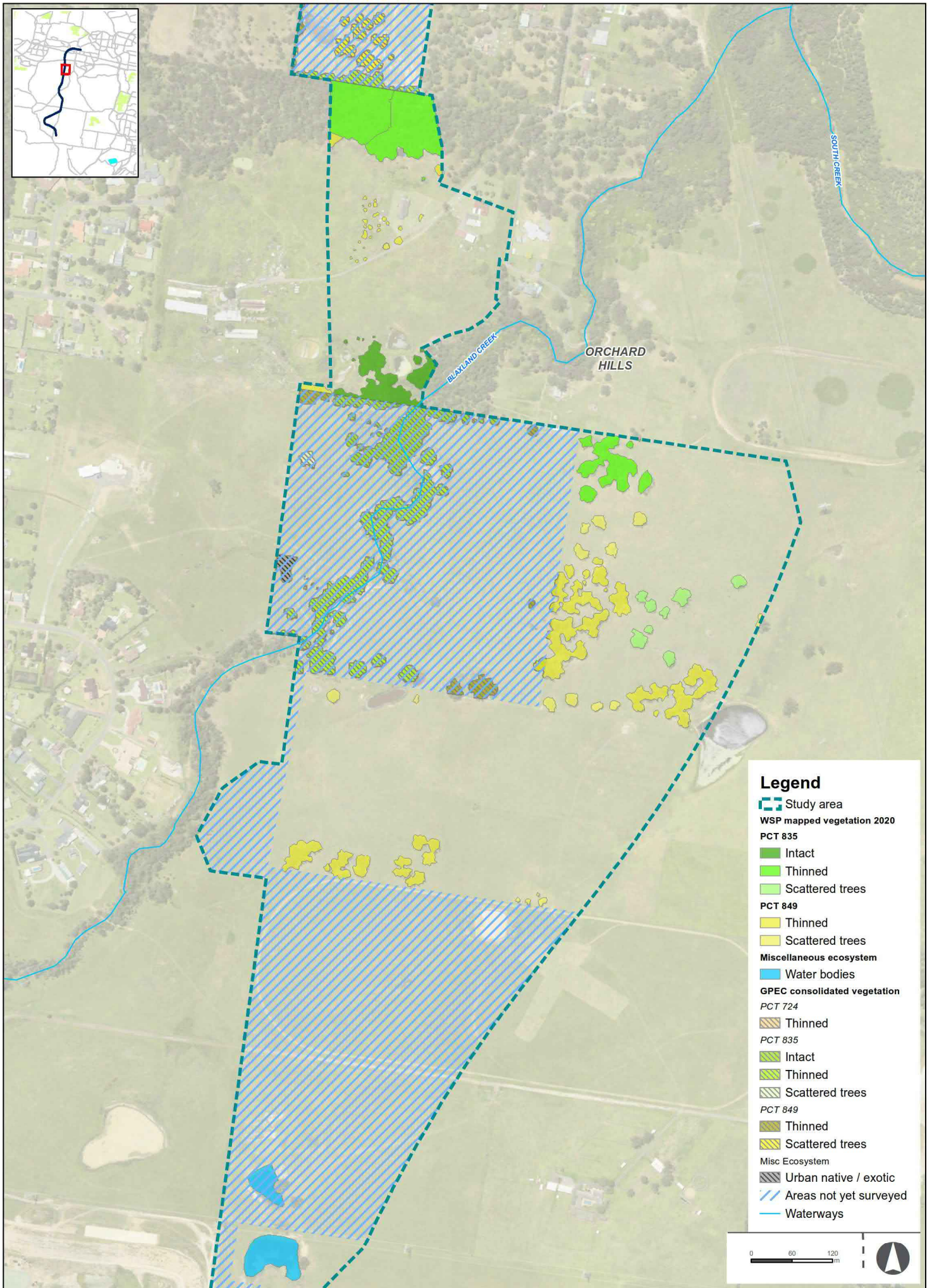


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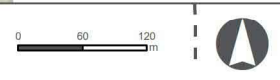
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- WSP mapped vegetation 2020 PCT 849
- Thinned
- Scattered trees
- Waterways

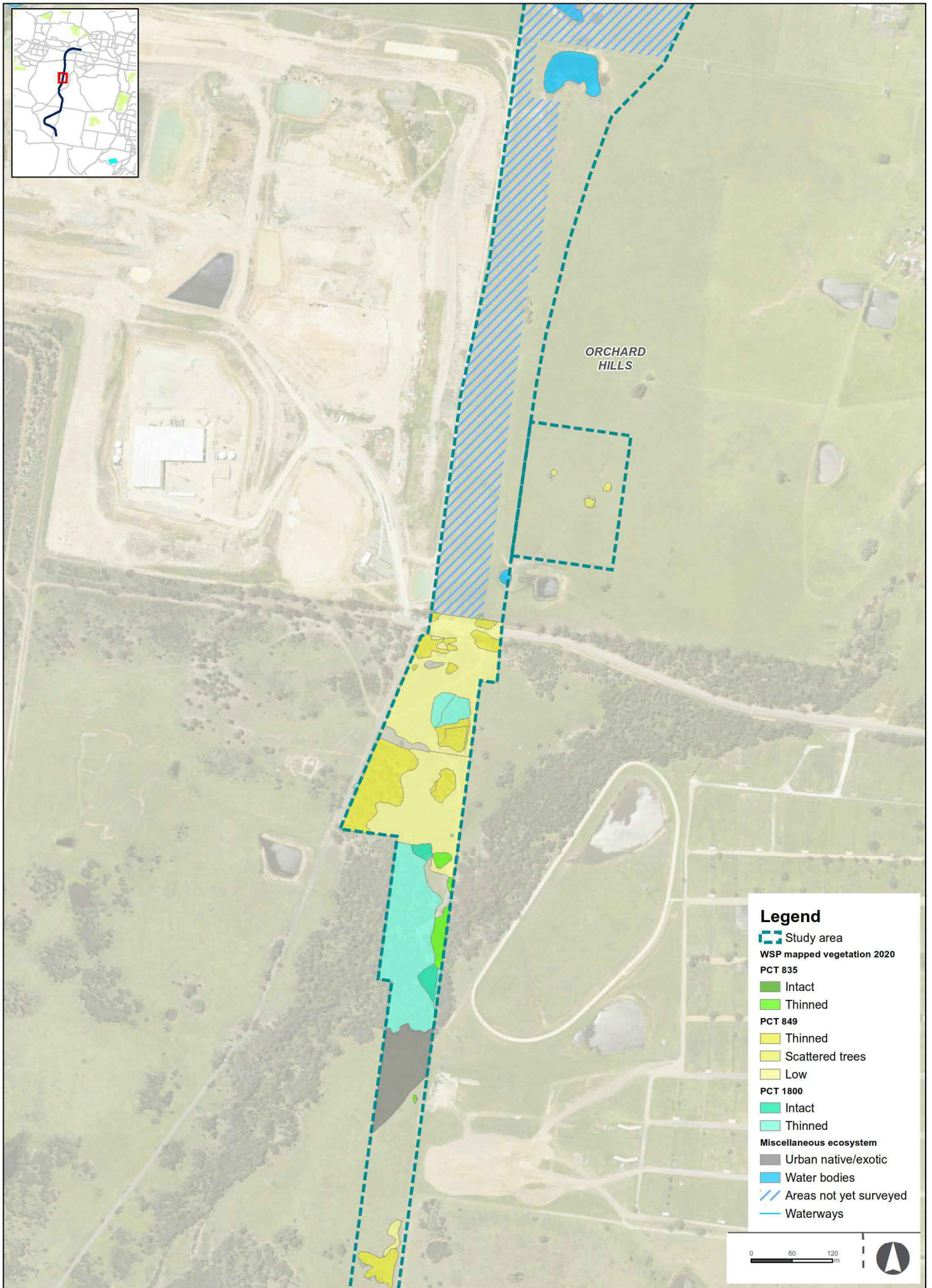
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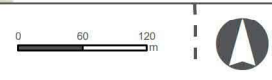
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- Study area
 - WSP mapped vegetation 2020**
 - PCT 835**
 - Intact
 - Thinned
 - Scattered trees
 - PCT 849**
 - Thinned
 - Scattered trees
 - Miscellaneous ecosystem**
 - Water bodies
 - GPEC consolidated vegetation**
 - PCT 724**
 - Thinned
 - PCT 835**
 - Intact
 - Thinned
 - Scattered trees
 - PCT 849**
 - Thinned
 - Scattered trees
 - Misc Ecosystem**
 - Urban native / exotic
 - Areas not yet surveyed
 - Waterways

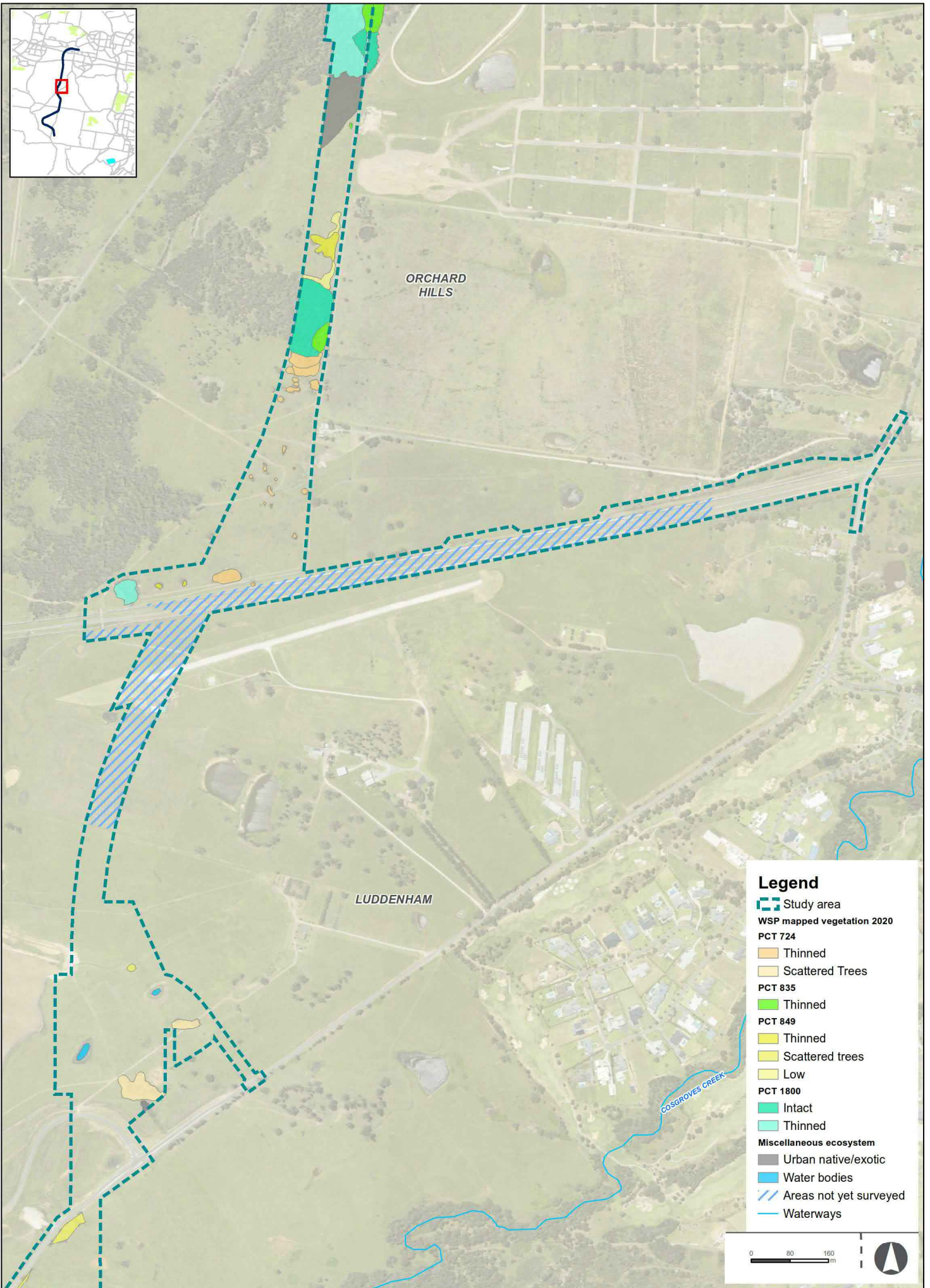




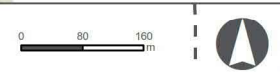
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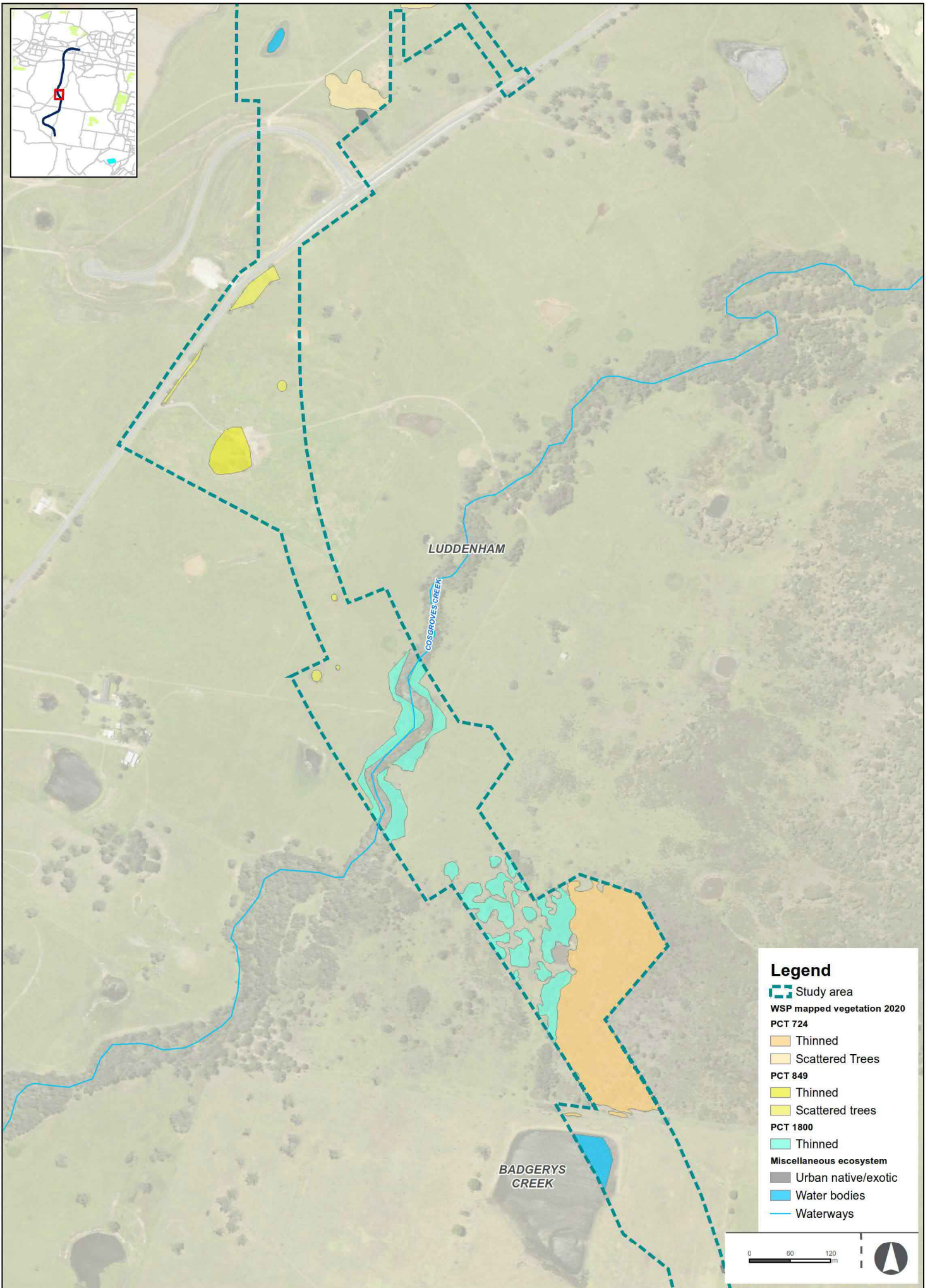
- Study area
- WSP mapped vegetation 2020
- PCT 835
 - Intact
 - Thinned
- PCT 849
 - Thinned
 - Scattered trees
 - Low
- PCT 1800
 - Intact
 - Thinned
- Miscellaneous ecosystem
 - Urban native/exotic
- Water bodies
- Areas not yet surveyed
- Waterways





- Legend**
- Study area
 - WSP mapped vegetation 2020
 - PCT 724
 - Thinned
 - Scattered Trees
 - PCT 835
 - Thinned
 - PCT 849
 - Thinned
 - Scattered trees
 - Low
 - PCT 1800
 - Intact
 - Thinned
 - Miscellaneous ecosystem
 - Urban native/exotic
 - Water bodies
 - Areas not yet surveyed
 - Waterways

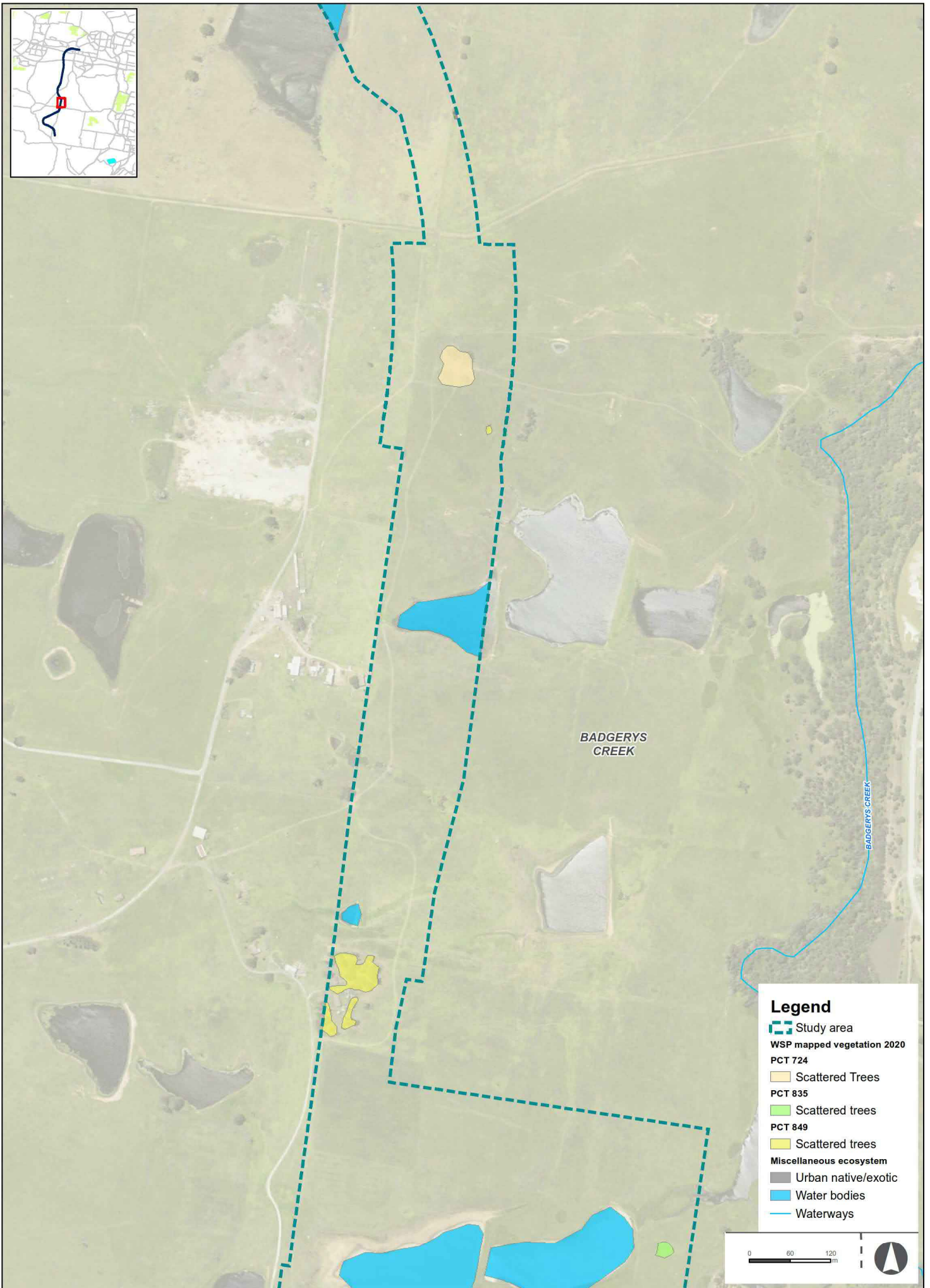
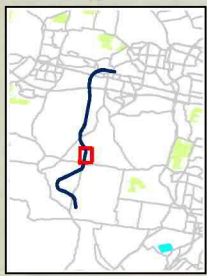




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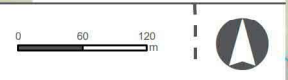
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- WSP mapped vegetation 2020**
- PCT 724**
- Thinned
- Scattered Trees
- PCT 849**
- Thinned
- Scattered trees
- PCT 1800**
- Thinned
- Miscellaneous ecosystem**
- Urban native/exotic
- Water bodies
- Waterways

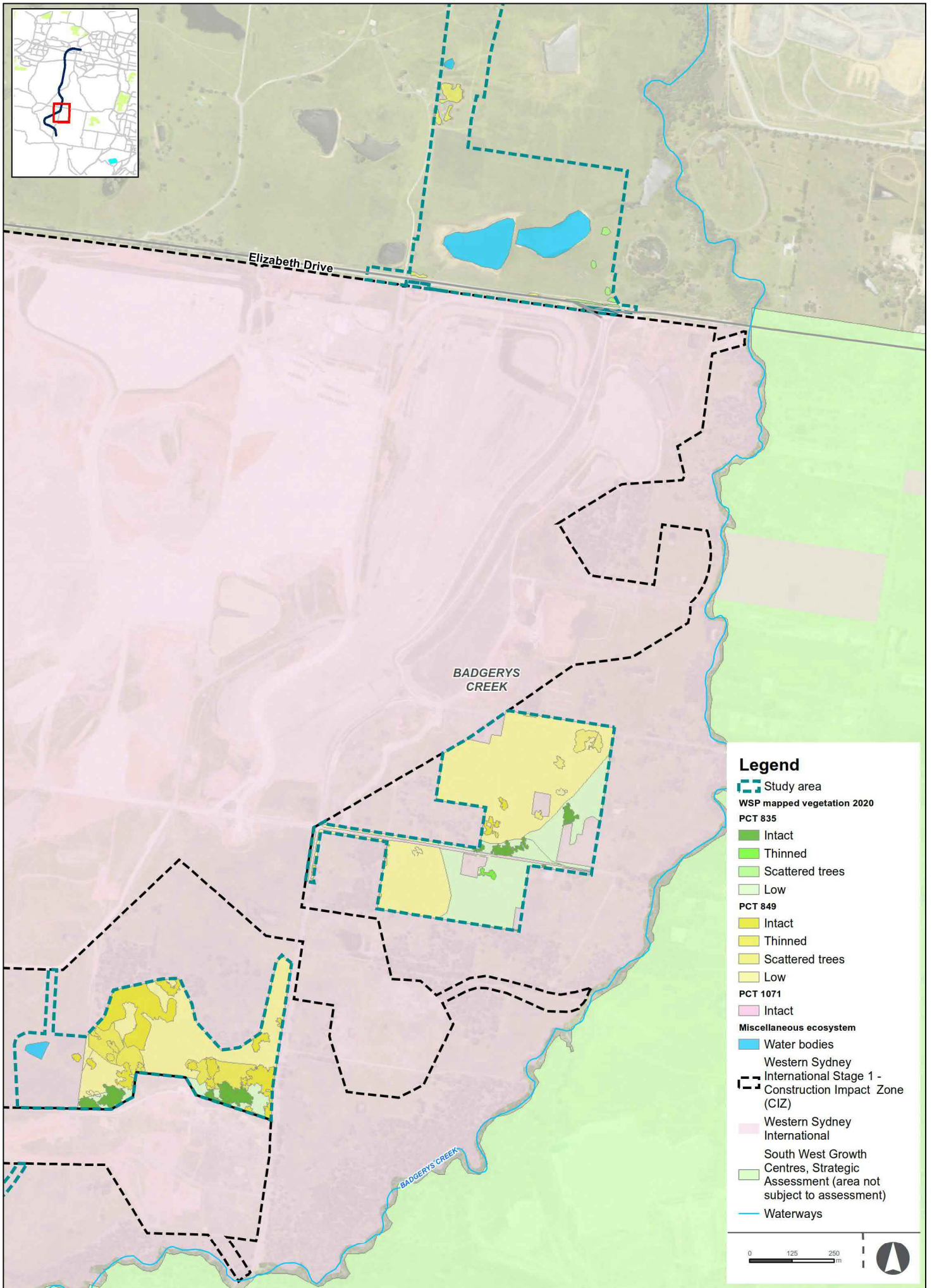


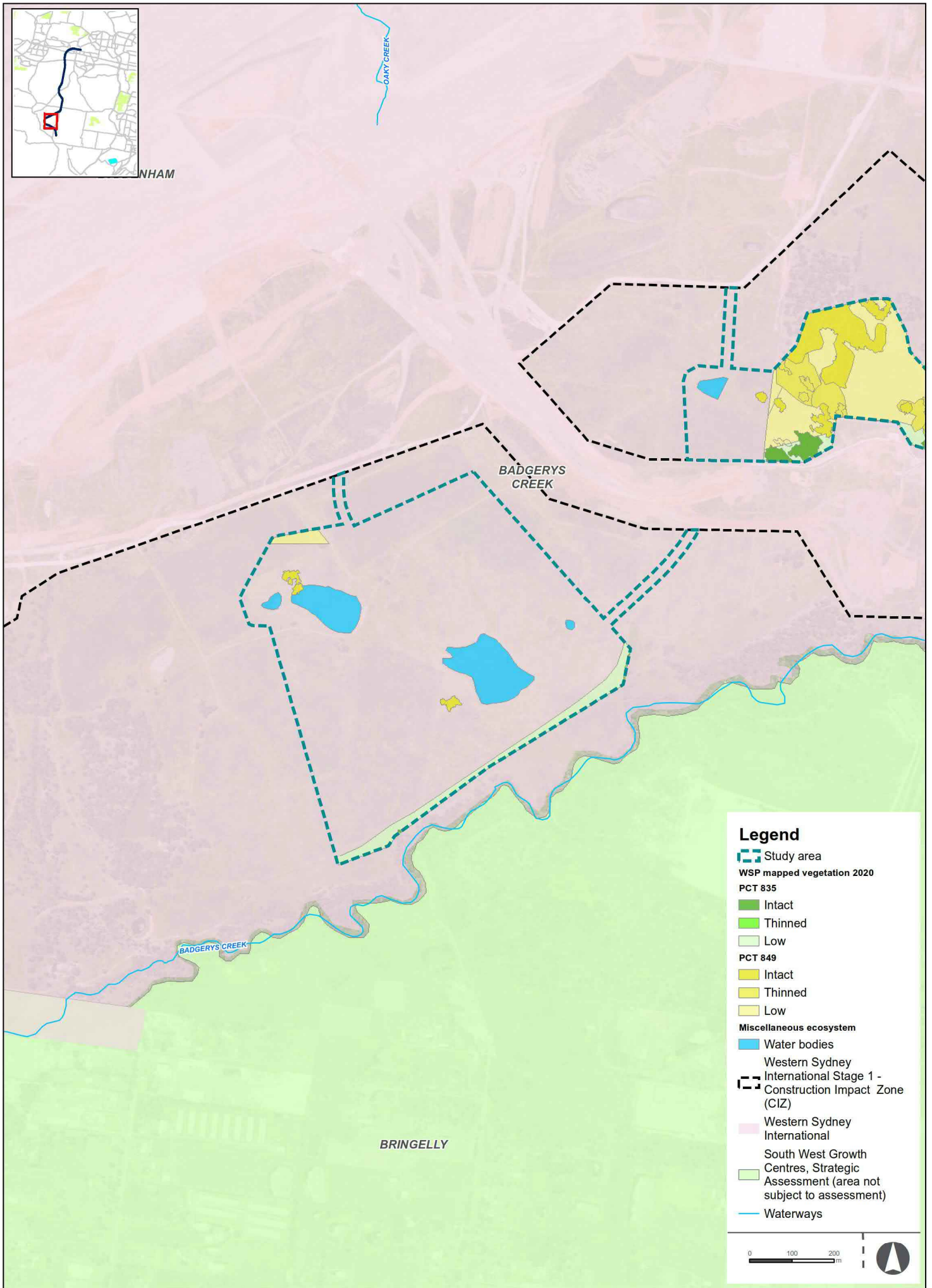


Legend

- Study area
- WSP mapped vegetation 2020
- PCT 724
- Scattered Trees
- PCT 835
- Scattered trees
- PCT 849
- Scattered trees
- Miscellaneous ecosystem
- Urban native/exotic
- Water bodies
- Waterways



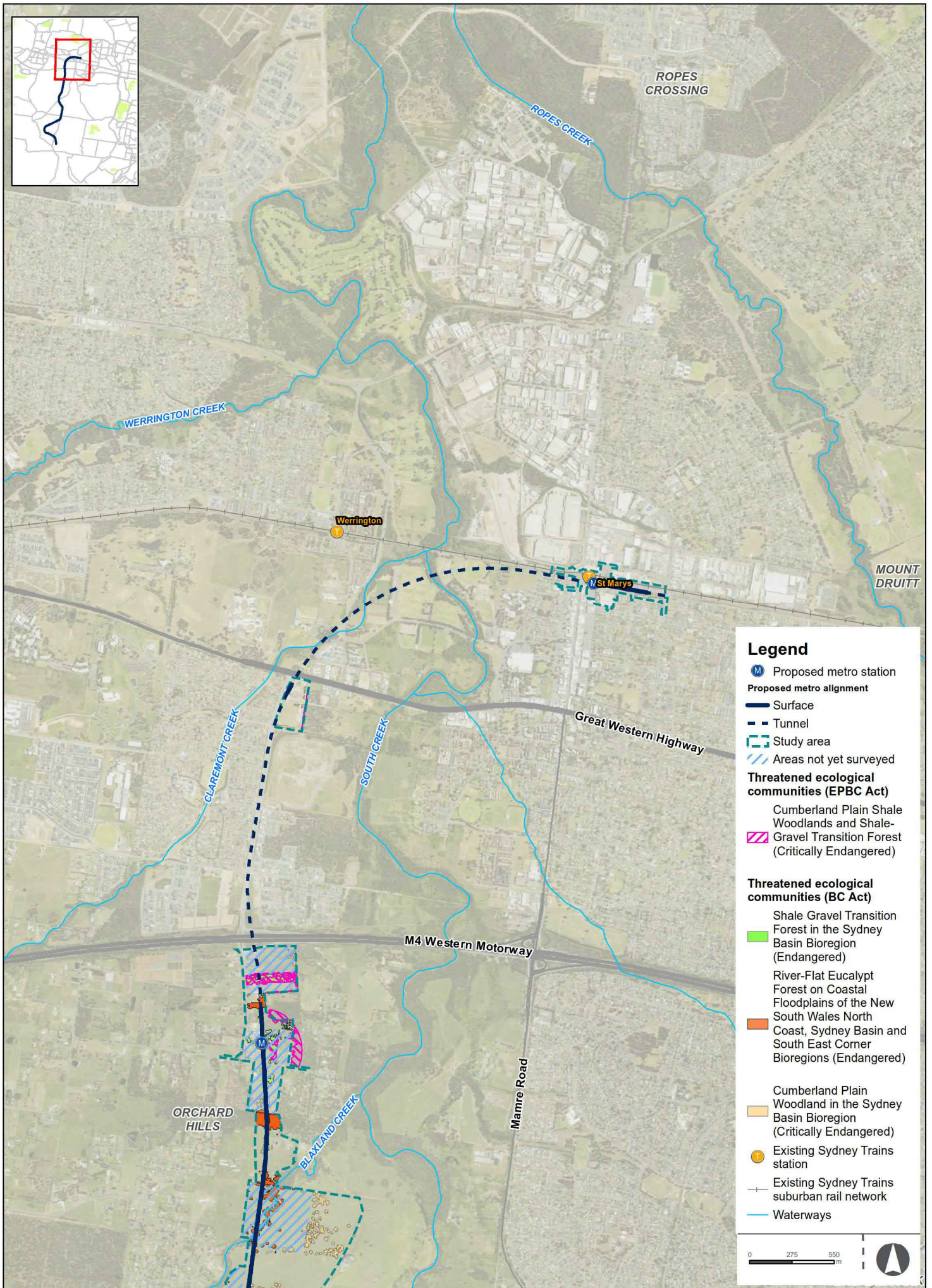




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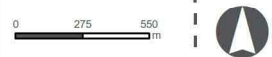
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- WSP mapped vegetation 2020**
- PCT 835**
- Intact
- Thinned
- Low
- PCT 849**
- Intact
- Thinned
- Low
- Miscellaneous ecosystem**
- Water bodies
- Western Sydney International Stage 1 - Construction Impact Zone (CIZ)
- Western Sydney International
- South West Growth Centres, Strategic Assessment (area not subject to assessment)
- Waterways

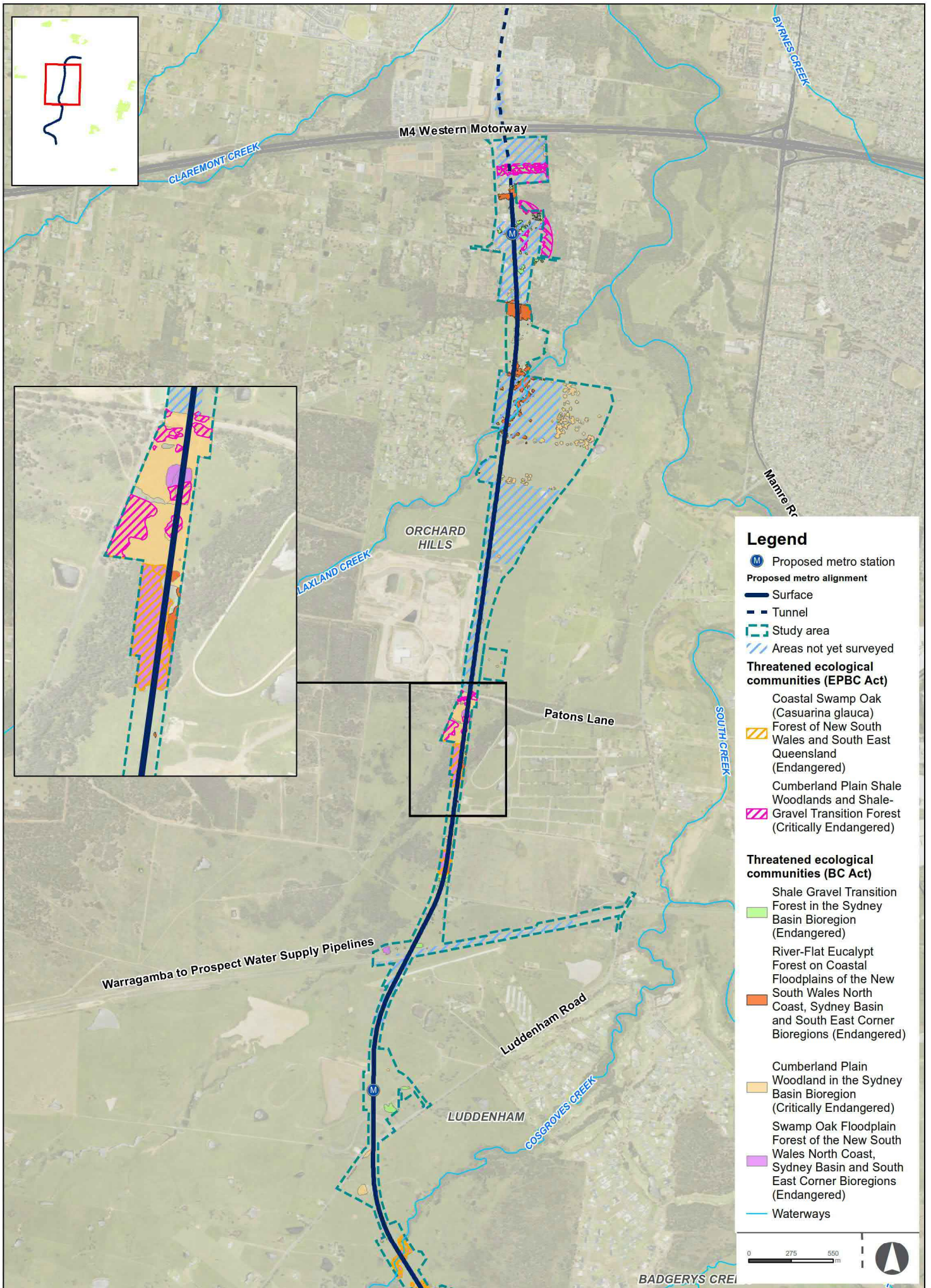
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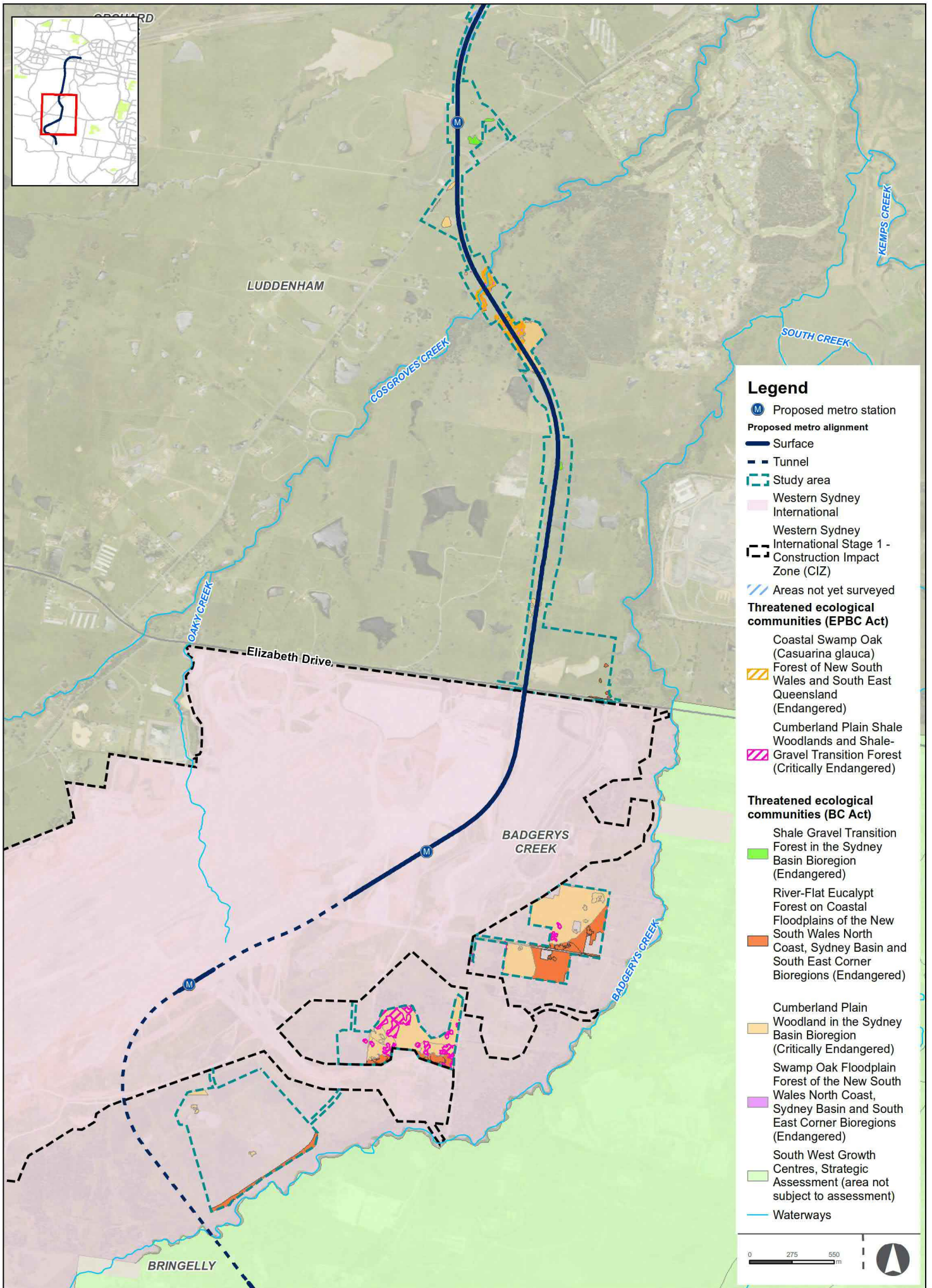


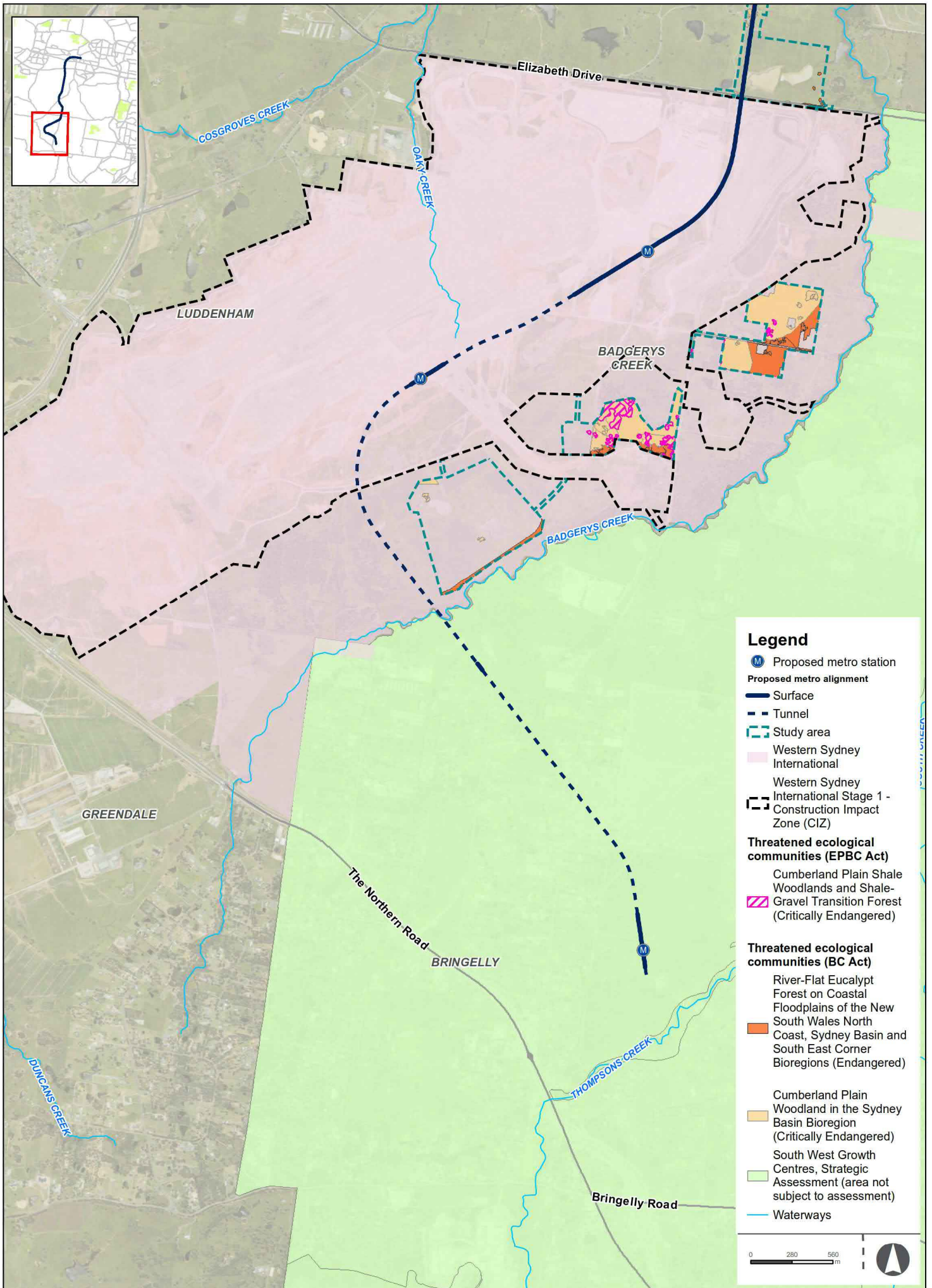
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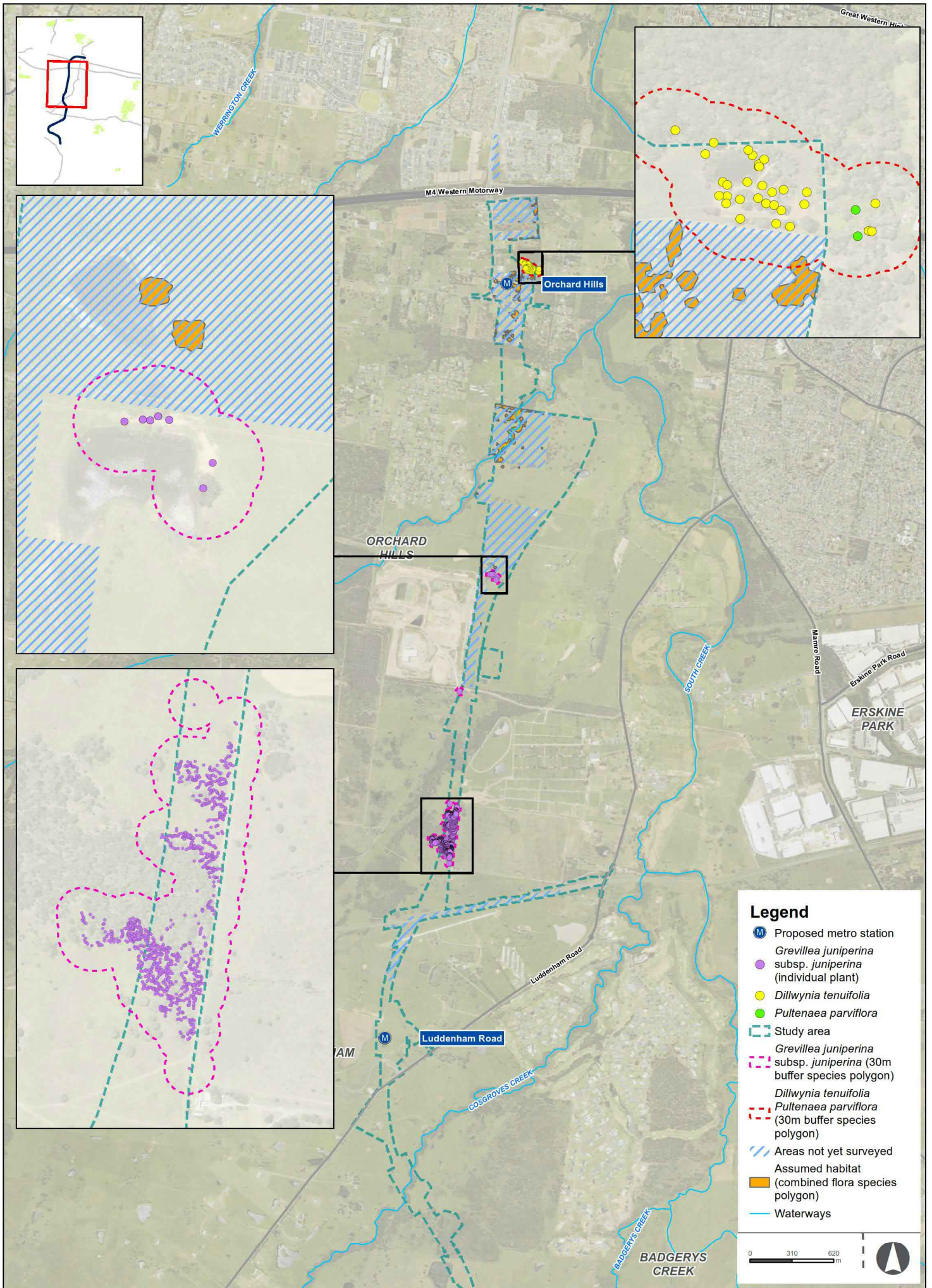
- Proposed metro station
- Proposed metro alignment**
- Surface
- Tunnel
- Study area
- Areas not yet surveyed
- Threatened ecological communities (EPBC Act)**
- Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest (Critically Endangered)
- Threatened ecological communities (BC Act)**
- 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)
- Existing Sydney Trains station
- Existing Sydney Trains suburban rail network
- Waterways

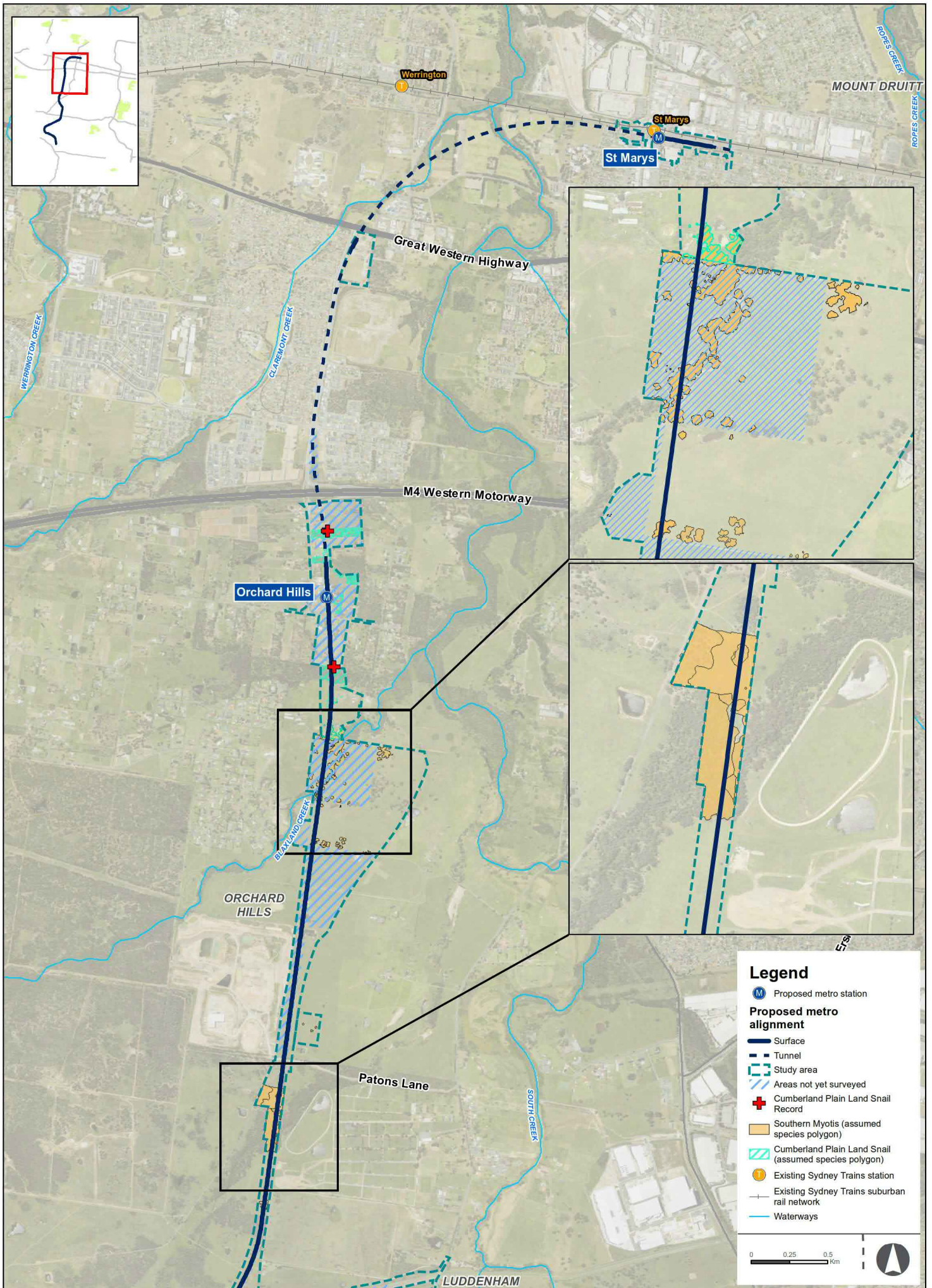








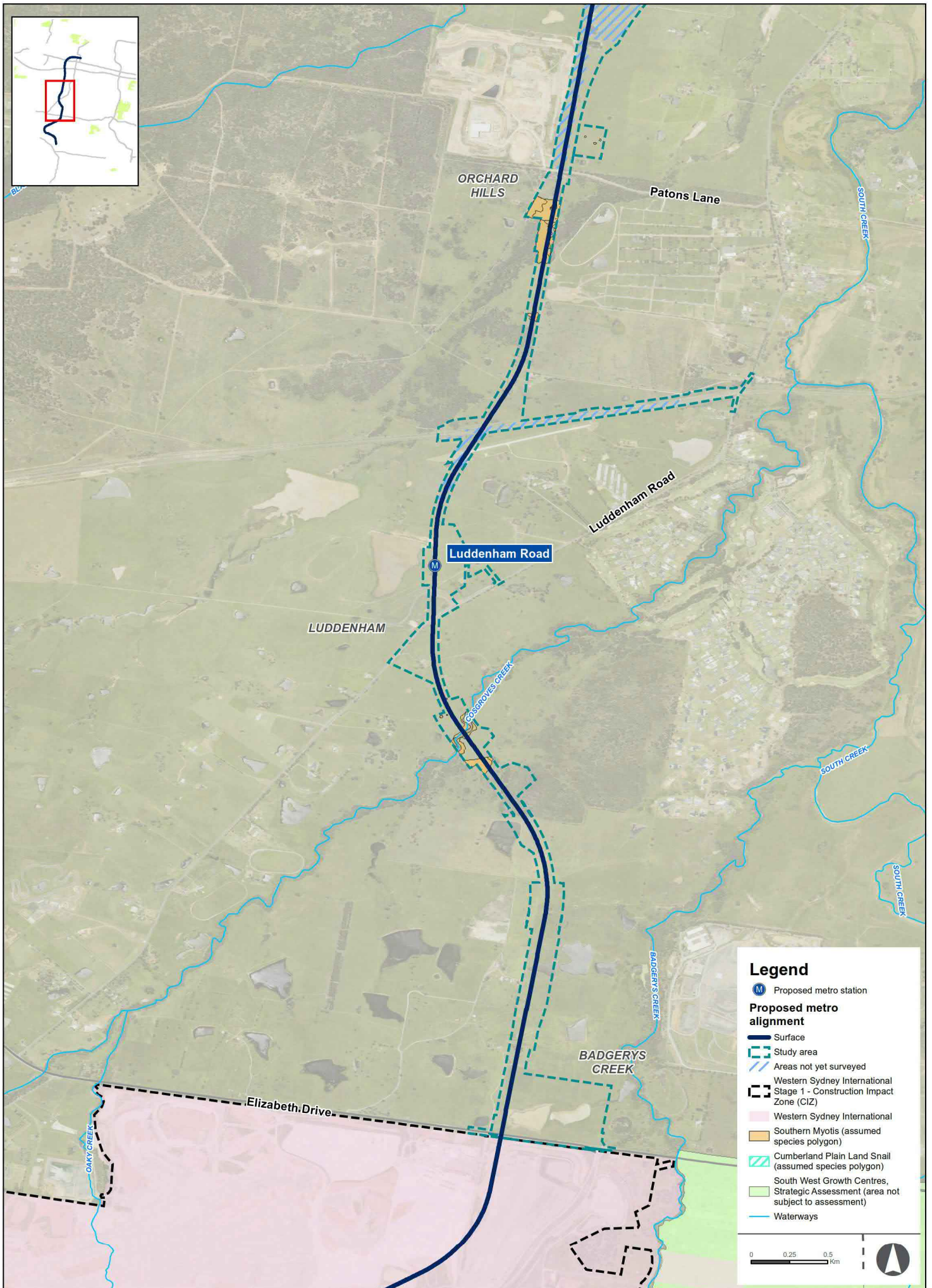




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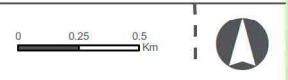
- M Proposed metro station
- Proposed metro alignment**
 - Surface
 - - - Tunnel
- Study area
- Areas not yet surveyed
- + Cumberland Plain Land Snail Record
- Southern Myotis (assumed species polygon)
- Cumberland Plain Land Snail (assumed species polygon)
- M Existing Sydney Trains station
- Existing Sydney Trains suburban rail network
- Waterways

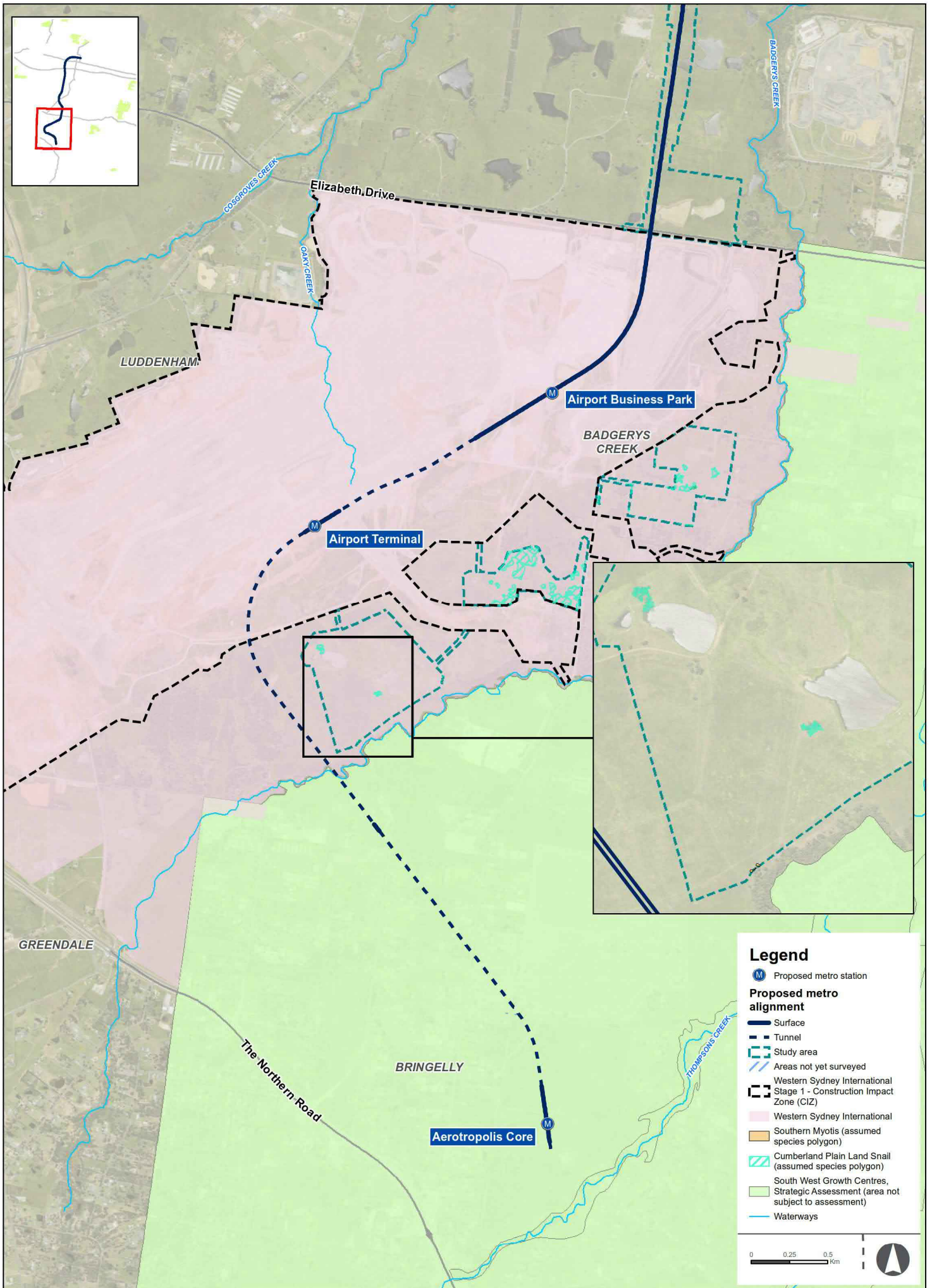


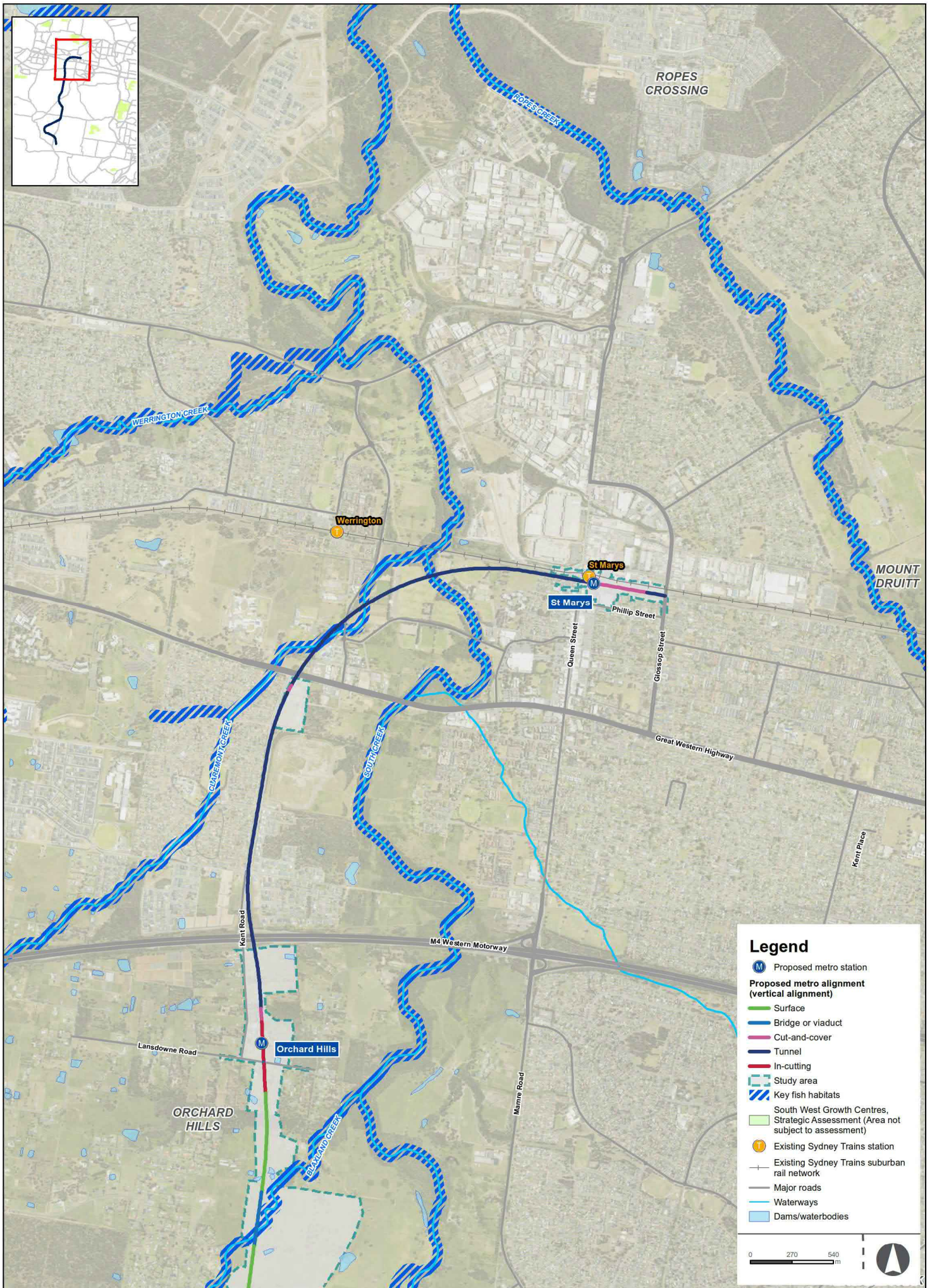


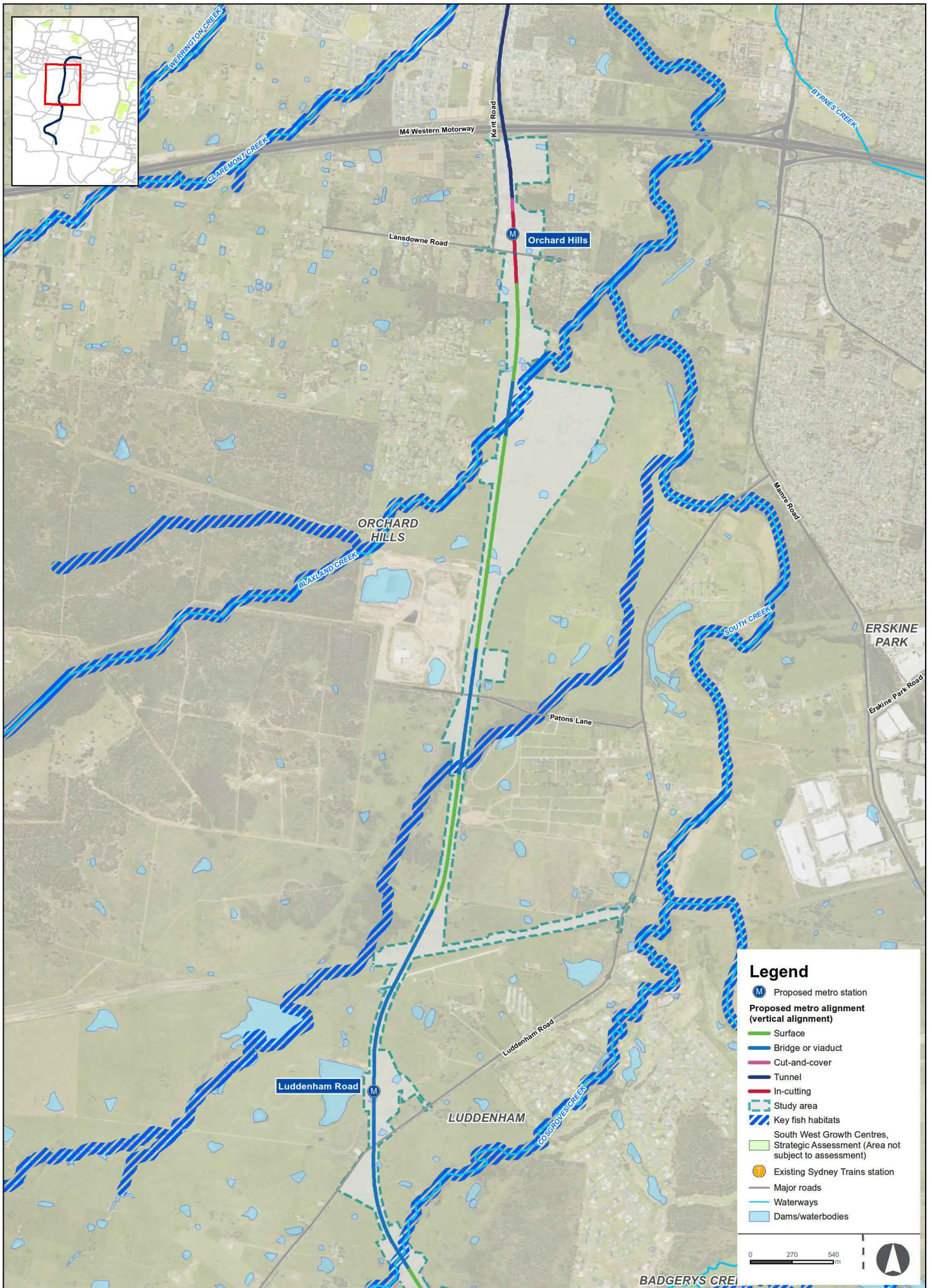
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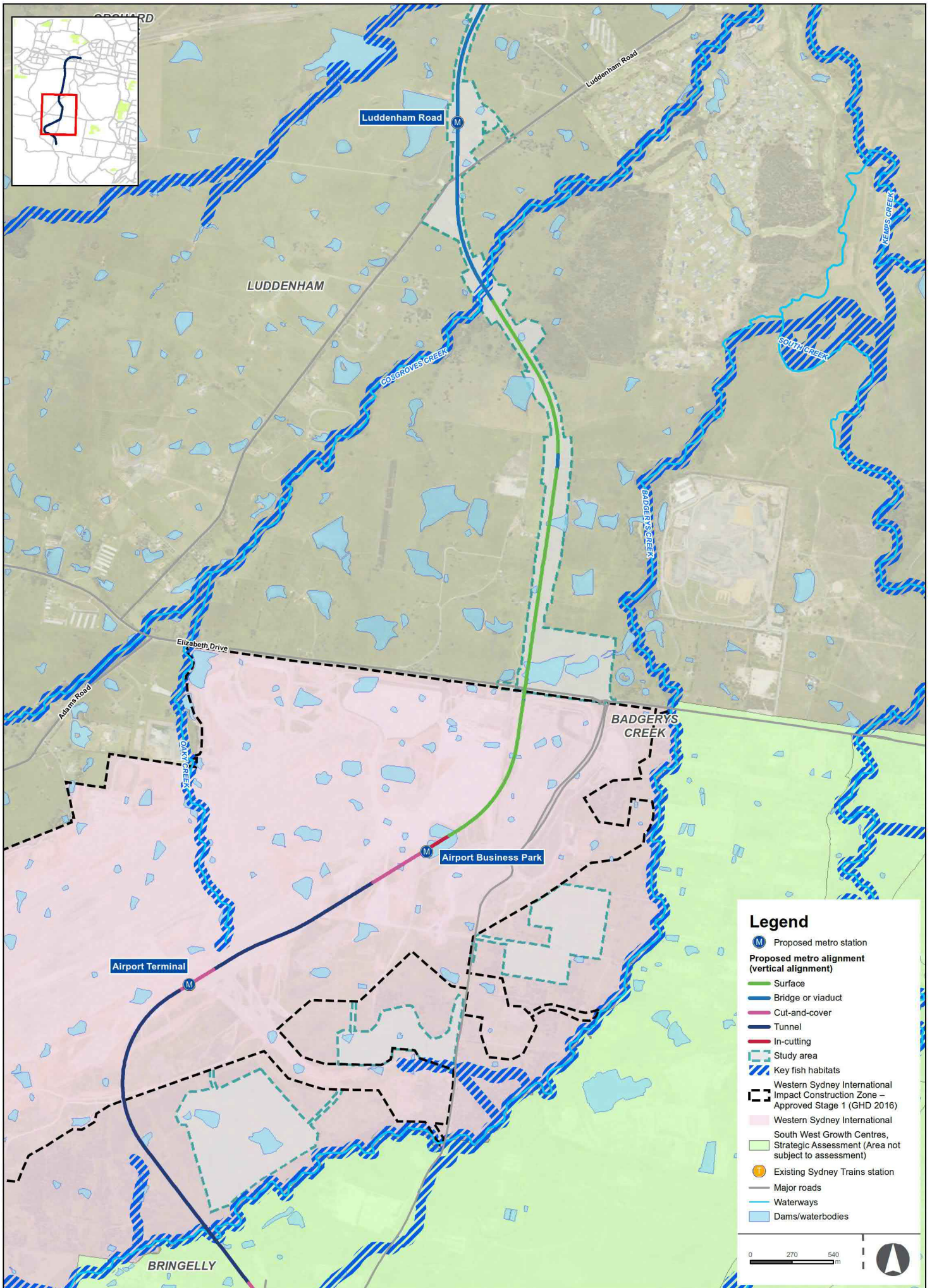
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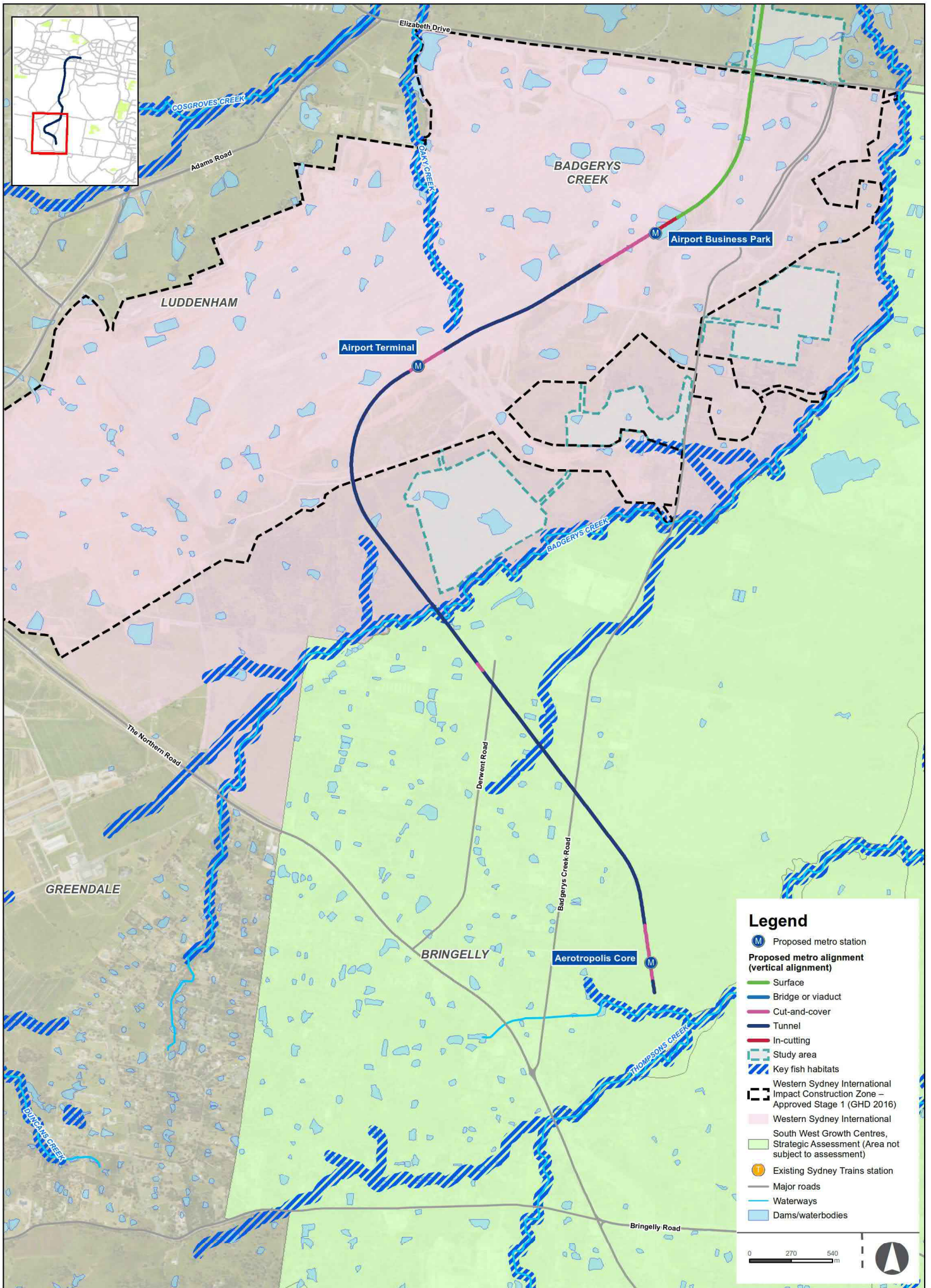












Appendix G Fauna Relocation Record

FAUNA RELOCATION RECORD



Project:

Date:

FRR No:

Located by:

Company:

Phone No:

Area located:

Chainage/GPS

GENERAL

What is the species of animal?

Time located/reported:

Is it a juvenile?

Is it injured?

NOTE: Fauna should only be handled by a licenced ecologist, wildlife carer or vet.

INJURIES

Describe injury:

Time wildlife carer/vet contacted:

Outcome of contact:

NOTE: Where possible, allow fauna to leave the area without intervention

RELOCATION

Who was contacted to relocate the animal?

Phone:

Is a valid NPWS licence held?

What time was the fauna rescue agency ecologist called?

What time did the fauna rescue agency/ecologist arrive?

Where was the animal released/relocated?

Comments

Appendix H Nest Box Strategy



Nest Box Strategy

Parklife Metro D&C

Document Approval

Revision	Author	Date	Comments	Reviewed by	Approved by
00	E. Chan	20/12/2023	Initial revision for incorporation into FFMP Rev 02	Jenny Bradford	Colm Kennedy

Signature



Contents

1	Nest Box Strategy	5
1.1	Introduction	5
1.2	Pre-clearing	6
1.3	Post-clearing	6
1.4	Number and Type.....	6
1.5	Location.....	6
1.6	Timing	6
1.7	Nest Box Details.....	7
1.8	Monitoring	7

Glossary/Abbreviations

Abbreviation	Expanded Text
CEMF	Construction Environmental Management Framework
CEMP	Construction Environmental Management Plan
CSSI	Critical State Significant Infrastructure
EIS	Environmental Impact Statement
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Cth)
FFMP	Flora & Fauna Management Sub-plan
REMMs	Revised Environmental Mitigations Measures
SSTOM	Stations, Systems, Trains, Operations and Maintenance

1 Nest Box Strategy

1.1 Introduction

This Nest Box Strategy is an appendix of the Flora and Fauna Management Sub-Plan (FFMP), and forms part of the Construction Environmental Management Plan (CEMP) for the SSTOM Works. This Strategy has been prepared to meet the requirements of the:

- Critical State Significant Infrastructure (CSSI) 10051 Planning Approval (dated 23 July 2021)
- Environmental Impact Statement (EIS) and the Submissions Report, including the Revised Environmental Mitigation Measures (REMMs)
- Applicable legislation.

The purpose of the Nest Box Strategy is to minimise habitat loss for hollow dependent fauna. In the event tree clearing is required and hollow bearing trees, microbat habitat or existing nest boxes are within the clearing boundary, this Nest Box Strategy will provide the guideline for installing, monitoring, and maintaining newly installed nest boxes, during construction. Conditions of Approval, REMMs, CEMF Requirements and EPBC Conditions Relevant to this Nest Box Strategy are outlined in Table 1.

TABLE 1 REVELANT REQUIREMENTS AND CONDITIONS TO THIS NEST BOX STRATEGY

Relevant Requirements and Conditions		
Reference	Description	Document Reference
CoA E11	Nest Boxes must be installed one (1) month prior to any removal of existing tree hollows and/or the release of any captured hollow dependent fauna.	Section 1.6
REMM FF2	A Nest Box Strategy would be prepared to minimise habitat loss to hollow-dependent fauna in accordance with the Flora and Fauna Management Plan and would include the following requirements: <ul style="list-style-type: none"> • hollow-bearing trees would be marked/tagged and mapped prior to their removal. The size, type, number and location of nest boxes required would be based on the results of the pre-clearing survey • about 70 per cent of nest boxes would be installed about one month prior to any vegetation removal to provide alternate habitat for hollow-dependent fauna displaced during clearing 	Appendix C Clearing and Grubbing Procedure
CEMF 10.2aiv	iv. Details on the locations, monitoring program and use of nest boxes by fauna;	Section 1.8
CEMF 10.2b	Principal Contractors would undertake the following ecological monitoring as a minimum: <ol style="list-style-type: none"> A pre-clearing inspection will be undertaken prior to any native vegetation clearing by a suitable qualified ecologist and the Contractor’s Environmental Manager (or delegate). The pre-clearing inspection will include, as a minimum: <ul style="list-style-type: none"> • Identification of hollow bearing trees or other habitat features; • Identification of any threatened flora and fauna; • A check on the physical demarcation of the limit of clearing; • An approved erosion and sediment control plan for the worksite; and • The completion of any other pre-clearing requirements required by any project approvals, permits or licences. 	Appendix C Clearing and Grubbing Procedure

- ii. The completion of the pre-clearing inspection will form a HOLD POINT requiring sign-off from the Contractor's Environmental Manager (or delegate) and a qualified ecologist; and
- iii. A post clearance report, including any relevant Geographical Information System files, will be produced that validates the type and area of vegetation cleared including confirmation of the number of hollows impacted and the corresponding nest box requirements to offset these impacts.

1.2 Pre-clearing

A pre-clearing inspection is undertaken prior to any native vegetation clearing by a suitable qualified ecologist and the Contractor's Environment Manager (or delegate). The pre-clearing inspection will include identification of hollow bearing trees or other habitat features.

1.3 Post-clearing

On completion of clearing, a post clearance report will be prepared to validate the area of vegetation cleared, including confirmation of the type of vegetation cleared, any relevant Geographic Information System files, the number of hollows impacted and whether the nest box requirements to offset these impacts have been met. The post clearance report will be submitted to Sydney Metro.

1.4 Number and Type

Nest boxes will be installed as per project ecologist advice sought during pre-clearing surveys regarding sizing, type and quantity appropriate to mitigate the removal of identified hollow bearing trees, stags with deep fissures and/or vegetation or structure suitable for microbats.

The number of habitat features identified during clearing supervision will inform the number and type of additional nest boxes required. If additional hollows or habitat features are identified, the project ecologist will provide advice on whether the installation of additional nest boxes is appropriate based on the suitability of remaining vegetation within the SSTOM Works areas or an alternate location adjacent to the project corridor that would provide an ecological benefit to the surrounding environment.

1.5 Location

Where possible, nest boxes will be installed within the nearest accessible area of vegetation close to where the habitat feature to be removed is located that is deemed suitable by the Project Ecologist for the type of nest box proposed. The Project Ecologist will provide direction on each nest box location.

If there is no vegetation available within the project footprint, or the density of required nest boxes is determined to be too high for the remaining vegetation, attempts will be made to identify and access vegetation outside of the project footprint, prioritising locations directly adjacent to the project area.

Parklife Metro D&C will identify if opportunities exist to use nest boxes to improve habitat connectivity for hollow dwelling fauna in areas outside the project boundary. This could include locating nest boxes along native vegetation, drainage or creek lines adjacent to the SSTOM Works with consideration of future access and monitoring requirements.

1.6 Timing

In accordance with E11 any nest box installation will occur, where possible, within one month of the identification of any hollows identified by the project ecologist during the pre-clearing survey.

1.7 Nest Box Details

Nest box type and size will be dependent on the species that they are targeting. The size of the nest box and its entrance will be determined based on estimates of structure and size undertaken during preclearing surveys. Where possible, nest boxes will be installed at a similar height and aspect to those they are replacing or if not possible, at least 4 metres high. Nest boxes will be made from hard durable materials (eg appropriately treated timber which provides a resistance to termites, insects and fungal decay, and poses no health risks to fauna) and will be installed utilising the Habisure method detailed in Figure 1. If the nest box or salvaged hollow is not suitable for this hanging system (e.g. heavy and dangerous to install), high quality stainless steel fixings can be used to attach the artificial hollow to the tree (e.g. Figure 2).

1.8 Monitoring

Nest boxes will be monitored annually for the duration of construction of the SSTOM Works. Monitoring will be undertaken using ground-based observation and/or the use of fibre-optic cameras to check for occupancy and/or evidence of use. Monitoring will evaluate nest box use and the condition of nest boxes as well as check for occupancy of the targeted species.

Where fallen, damaged or degraded nest boxes are detected, a replacement nest box will be installed. The data collected during nest box monitoring would be used to guide better use of the nest boxes (i.e. remove pest fauna) and facilitate a better conservation outcome. Nest boxes that are deteriorating prior to the completion of construction will be repaired or replaced. Should the nest box be occupied by pest species such as the European Honeybee (*Apis mellifera*), Common Myna (*Acridotheres tristis*), or Common Starling (*Sturnus vulgaris*) efforts will be made to evict the pest species.

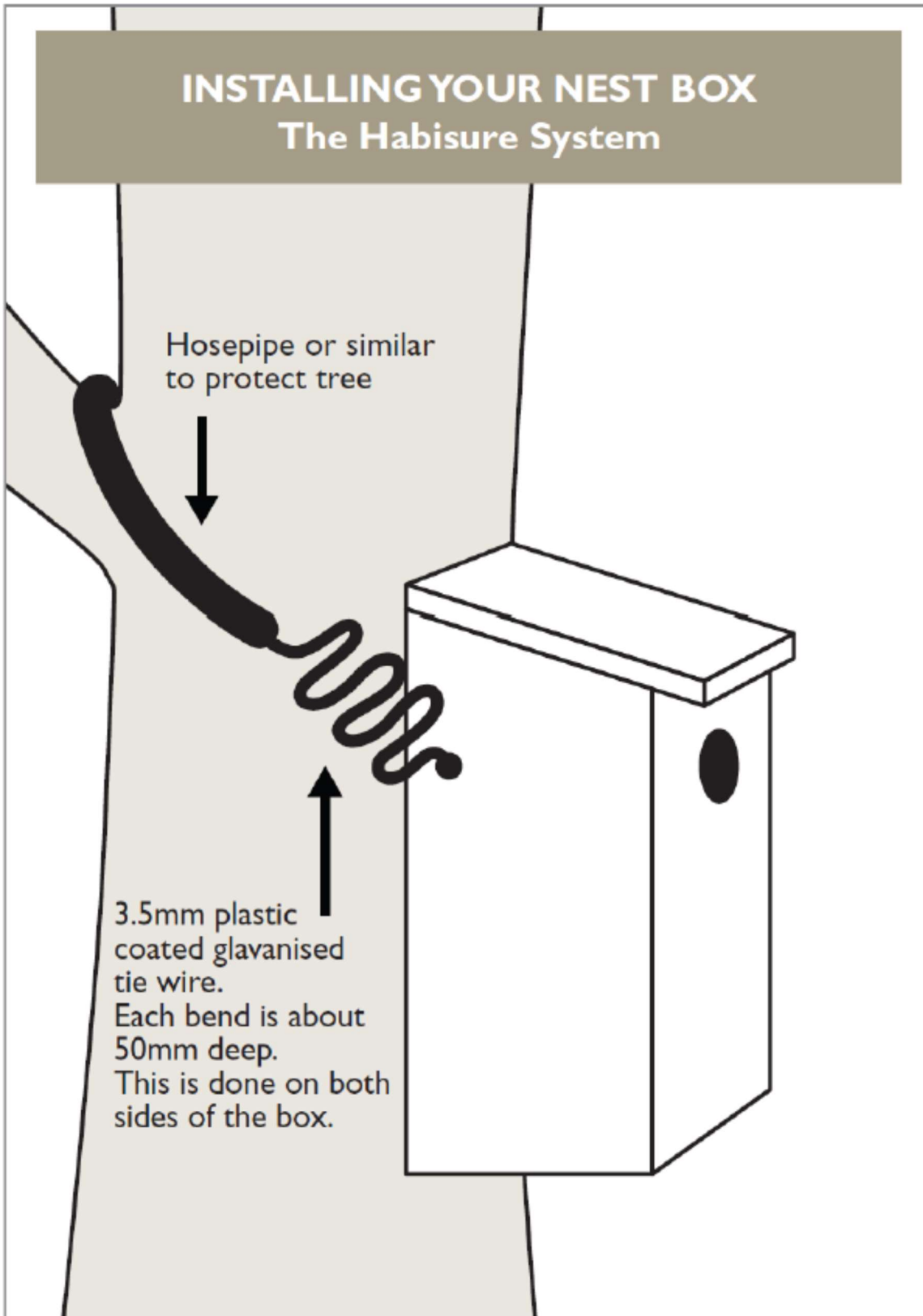


FIGURE 1 – HABISURE © METHOD FOR INSTALLING NEST BOXES (SOURCE: FRANKS & FRANKS 2006)



FIGURE 2 - INSTALLATION OF CARVED HOLLOW LOGS USING STAINLESS STEEL FIXINGS (SOURCE: STEVE GRIFFITHS)