

Biodiversity Development Assessment Report

**for Stages 5 and 6
of a proposed road upgrade
at**

East Seaham Road

EAST SEAHAM NSW



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1 Final	25/03/2025	Nicola Mohr Dr. Kylie Bridges	Biodiversity Development Assessment Report for Stages 5 and 6 of a proposed road upgrade at East Seaham Road, EAST SEAHAM NSW.

Summary

Wildthing Environmental Consultants were engaged to undertake a Biodiversity Development Assessment Report (BDAR) using field data collected by Wildthing Environmental Consultants and Wedgetail Project Consulting for the proposed road upgrade of Stages 5 and 6 of East Seaham Road, East Seaham NSW. This report has been prepared in accordance with the Biodiversity Assessment Method (BAM) to assess the biodiversity impact and offsetting obligation of the proposal under the *Biodiversity Conservation Act 2016* (BC Act) and *Biodiversity Conservation Regulation 2017* (BC Regulation).

The study area consisted of an approximately 3km section of East Seaham Road, the associated road reservation, culverts and driveways that go into neighbouring properties with a total area of 9.58ha. Vegetation within the study area consisted of a mixture of regrowth and remnant vegetation, and cleared land within the road reserve. To the west, the study area adjoins rural properties and for the majority of the alignment the study area adjoins Wallaroo National Park to the east. The vegetation within the site is subject to continued disturbances such as road maintenance activities, dust incursion from the gravel road and noise pollution from the deteriorating gravel road. Native vegetation in the study area was determined by Wedgetail Project Consulting to align with PCT 3433 - Hunter Coast Foothills Spotted Gum – Ironbark Grassy Forest and PCT 4042 - Lower North Riverflat Eucalypt-Paperbark Forest.

The proponent proposes to upgrade East Seaham Road within stages 5 and 6. The road is currently a gravel road. The proposal will involve tarring the length of the road within the subject land, works within culverts and in some areas widening and realigning the road. Vegetation within 3m of the outer line of the road will be removed for safety and visibility. Along the majority of the road, the required impact for batter and road construction already extends this distance. The subject land includes the footprint of the development and any ancillary works, accesses or hazard reduction zones that support the construction or operation of the development or activity. Additionally, in areas where cut batter is required and where trees are present, a 1m buffer has been applied past the edge of the batter to account for the average of potential impacts to the structural root zone of trees outside of the proposed works. This 1m buffer accounts for an average impact along the length of cut batter where in some areas there may be no impact to trees in this buffer while in other areas the impact may extend past the 1m buffer. This buffer is included in the subject land giving it a total area of 5.07ha.

The majority of the subject land consisted of existing gravel road. The road reserve included areas of non-native vegetation and two Plant Community Types (PCT). PCT 3433 - Hunter Coast Foothills Spotted Gum – Ironbark Grassy Forest was found to be consistent with the State listed Endangered Ecological Community (EEC) Lower Hunter spotted Gum – Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions. PCT 4042 - Lower North Riverflat Eucalypt-Paperbark Forest was found to be consistent with State listed EEC Subtropical Coastal Floodplain Forest of the NSW North Coast bioregion and the EPBC Act 1999 listed EEC Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions.

Table E.1 PCTs and EECs identified within the subject land

PCT ID	PCT name	TEC	Subject land area (ha)
3433	Hunter Coast Foothills Spotted Gum – Ironbark Grassy Forest	Lower Hunter spotted Gum – Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions.	1.70
4042	Lower North Riverflat Eucalypt-Paperbark Forest	Subtropical Coastal Floodplain Forest of the NSW North Coast bioregion Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions	0.43
Total area			2.13

Threatened Species

Four threatened species have been assumed present. Targeted threatened species surveys identified twelve threatened species listed under the BC Act within the subject land:

- *Pterostylis chaetophora* was recorded in the subject land and will require offsetting as a Species Credit Species. Species Polygon includes all vegetation zones (PCT 3433_Forest, PCT 3433_Cleared and PCT 4042_Forest). The area of the species polygon for *Pterostylis chaetophora* is 2.13ha;
- *Ninox strenua* (Powerful Owl) was recorded in the subject land and will require offsetting as a Species Credit Species. An 800m buffer was drawn around the primary tree the Powerful Owl was observed in and all areas of vegetation zones 1 and 3 (PCT 3433_Forest and PCT 4042 Forest) within this 800m radius were counted towards the species polygon. The area of the species polygon for Powerful Owl is 1.09ha;
- *Phascogale tapoatafa* (Brush-tailed Phascogale) was recorded in the subject land and will require offsetting as a Species Credit Species. Species Polygon includes all vegetation zones containing suitable canopy species (PCT 3433_Forest and PCT 4042 Forest). The area of the species polygon for Brush-tailed Phascogale is 1.77ha;
- *Miniopterus australis* (Little Bent-winged Bat) was recorded during bat call surveys. This species is being offset as ecosystem credit species but not as a species credit species because no breeding habitat or signs of a breeding were present on site or within 100m of the subject land;
- *Pteropus poliocephalus* (Grey-headed Flying Fox) was observed feeding on flowering eucalypt trees during nocturnal surveys. This species is being offset as ecosystem credit species but not as a species credit species because no breeding camps were observed within the study area or are known to occur in the surrounding area;
- *Petaurus norfolcensis* (Squirrel Glider) has been assumed present under the precautionary principal as some remote camera images could not positively be identified as Sugar or Squirrel Glider. This species will require offsetting as a Species Credit Species. Species Polygon includes all vegetation zones containing suitable canopy species PCT 3433_Forest and PCT 4042 Forest). The area of the species polygon for Squirrel Glider is 1.77ha;
- *Phascolarctos cinereus* (Koala) has been assumed present due to the number of species records within and in proximity to the study area. This species will require offsetting as a Species Credit Species. Species Polygon includes all vegetation zones containing suitable canopy species PCT 3433_Forest and PCT 4042 Forest). The area of the species polygon for Koala is 1.77ha;
- *Micronomus norfolkensis* (Eastern Coastal Free-tailed Bat), *Falsistrellus tasmaniensis* (Eastern False Pipistrelle), *Calyptorhynchus lathami lathami* (South-eastern Glossy Black-Cockatoo), *Pomatostomus temporalis temporalis* (Grey-crowned Babbler) and *Daphoenositta chrysoptera* (Varied sittella) were observed or recorded during surveys. These species will all require offsetting as ecosystem credit species;

- *Corybas dowlingii* (Red Helmet Orchid) has been assumed present as targeted species surveys have not been carried out during the appropriate survey period. The Species Polygon will include vegetation zones PCT 3433_Forest and PCT 4042_Forest and account for a total area of 1.77ha;
- *Rutidosia heterogama* (Heath Wrinklewort) has been assumed present as flora surveys conducted did not target this species specifically. Species Polygon includes vegetation zones PCT 3433_Forest and PCT 3433_Cleared. The area of the species polygon for Heath Wrinklewort is 2.13ha.

Serious and irreversible impacts (SAIL)

One candidate SAIL entities *Miniopterus australis* (Little Bent-winged Bat) was recorded within the subject land; however no preferred breeding habitat was present on site. The closest preferred roosting habitat is Thunderbolt Cave which is located approximately 1.8km east of the subject land. This cave could provide roosting habitat for *M. australis* and other SAIL candidate species *Miniopterus orianae oceanensis* (Large Bent-wing Bat) and *Chalinolobus dwyeri* (Large-eared Pied Bat). Further assessment was given for all three species. The proposal was not found to impact these SAIL entities due to the absence of preferred roosting habitat in close proximity to the site (100m) and considering mitigating measures to reduce indirect impacts to retained vegetation. No other candidate SAIL entities were found to be present within the study area thus no obligation for proposal refusal would be applicable to this proposed subdivision area from relevant regulatory bodies.

Commonwealth Environment Protection and Biodiversity Conservation Act 1999 & Matters of National Environmental Significance

Considerations have been made under the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* & Matters of National Environmental Significance. The nationally listed EEC Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions was found to occur in the subject land and three nationally listed species *Pteropus poliocephalus* (Grey-headed Flying-fox) (Vulnerable), *Phascolarctos cinereus* (Koala) (Endangered), *Calyptorhynchus lathami* (South-eastern Glossy Black-Cockatoo) (Vulnerable) were found to occur on site due to targeted surveys.

Taking into consideration the retention of areas of Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions in the road reserve and mitigation measures to protect the retained vegetation from edge effect, the removal of 0.43ha of TEC for the proposal is unlikely to significantly impact the community.

Taking into consideration that the proposal will retain habitat for *Pteropus poliocephalus* (Grey-headed Flying-fox), *Phascolarctos cinereus* (Koala), *Calyptorhynchus lathami* (South-eastern Glossy Black-Cockatoo) within the road reserve and the presence of large areas of habitat for this species to the east of the study area, the removal of 1.77ha of native vegetation is not likely to have a significant impact on these species.

It was therefore concluded that it is unlikely that any of the nationally addressed or migratory listed species will be significantly impacted by the proposal.

Koala

The subject land was found to fall under 'Chapter 3 Koala Habitat Protection 2020' and 'Chapter 4 Koala Habitat Protection 2021' of the SEPP (Biodiversity and Conservation) 2021. These chapters were addressed under the Port Stephens Comprehensive Koala Plan of Management (CKPoM). Review and revision of koala habitat mapping under the CKPoM found the study area to be largely composed of Preferred Koala Habitat with smaller areas of '50m Buffer Over Cleared' and mainly cleared land. The proposal was assessed against the eight performance criteria. Key takeaways are the retention of preferred koala habitat within study area and 100m around the subject land, recommended measures such as koala signage along the road to ward drivers of their potential

presence and the widening of the road shoulder which will increase visibility and allow drivers to observe animals crossing the road.

Direct impacts requiring offsetting

Table E2 lists Ecosystem Credit Species requiring offsetting as a result of the proposal and Table E3 lists Species Credit Species requiring offsetting as a result of the proposal.

Table E2 Impacts that require an offset – ecosystem credits

PCT	TEC/EC	Impact area (ha)	Number of ecosystem credits required
3433 - Hunter Coast Foothills Spotted Gum-Ironbark Grassy Forest (forest)	Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions	1.34	27
3433 - Hunter Coast Foothills Spotted Gum-Ironbark Grassy Forest (cleared)	Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions	0.36	3
4042 - Lower North Riverflat Eucalypt-Paperbark Forest	Subtropical Coastal Floodplain Forest of the New South Wales North Coast Bioregion	0.43	14

Table E3 Impacts that require an offset – species credits

Common name	Scientific name	Loss of habitat (ha) or individuals	Number of species credits required
Red Helmet Orchid	<i>Corybas dowlingii</i>	1.77ha	41
Powerful Owl	<i>Ninox strenua</i>	1.09ha	25
Squirrel Glider	<i>Petaurus norfolcensis</i>	1.77ha	41
Brush-tailed Phascogale	<i>Phascogale tapoatafa</i>	1.77ha	41
Koala	<i>Phascolarctos cinereus</i>	1.77ha	41
Heath Wrinklewort	<i>Rutidosia heterogama</i>	1.70ha	30
Tall Rustyhood	<i>Pterostylis chaetophora</i>	2.13ha	44

A number of mitigation measures have been given for the construction and operational phase including:

- Clearly demarcate all trees to be removed in accordance with Biodiversity Management Guideline Protecting and managing biodiversity on Transport for NSW projects (TfNSW, March 2024).
- Installation of exclusion fencing that includes temporary fencing to protect and avoid known populations of *Pterostylis chaetophora* onsite and protect and avoid identified hollow bearing trees.
- An inspection of all hollows greater than 200 mm (including those to be retained and removed) as documented in the tree schedule in this BDAR must be conducted by a suitably qualified and experienced ecologist with the assistance of an elevated work platform.

Inspection must determine the suitability of the hollow for use by Powerful Owl. This activity must be completed prior to the nesting periods for Powerful Owl (May-October (OEH)). The consultant must provide a survey report to Council's Project Manager within 7 days of completion of the hollow survey and prior to the removal of any vegetation on site. The report must clearly identify the tree ID, species name and common name, hollow characteristics e.g. depth, height above ground, aperture width and any other relevant details for each hollow and include an assessment of the suitability of the hollow for use by threatened arboreal species. If a nest tree with evidence of use is identified, the survey report must also include recommendations for suitable buffer zones during the breeding/ nesting period and advice on scheduling of construction activities within the buffer zones. Council's Project Manager must have the report reviewed by Council's Environmental Risk or Project Support Environmental Officer or appropriately nominated persons prior to works commencing.

- A suitably qualified and experienced ecologist should be engaged to supervise removal of all significant habitat features (habitat trees, dams, ground habitat).
- Timing of vegetation clearance should occur outside the bird nesting season (late August to December) to avoid critical life cycle events for avifauna species and outside the koala breeding season (October to January).
- Compensatory fauna habitat in the form of nest boxes mounted in alternate trees will be provided with 2 nest boxes for every hollow lost. The nest boxes shall be offset, constructed and installed in accordance with the Port Stephens Council Biodiversity Technical Specification 2024. Documentary evidence of installation of the nest box must be provided in accordance with the Bushland Schedule of Rates Tender and to the Environmental Operations Team Leader or nominated representative for approval.
- Daily fauna checks will be conducted prior to works commencing. If fauna are encountered during the daily check or during works follow the procedures in Biodiversity Management Guideline Protecting and managing biodiversity on Transport for NSW projects (TfNSW, March 2024).

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Shortened forms

APZ	Asset Protection Zone
BAM	Biodiversity Assessment Method
BAM-C	Biodiversity Assessment Method Calculator
BC Act	<i>Biodiversity Conservation Act 2016 (NSW)</i>
BC Regulation	<i>Biodiversity Conservation Regulation 2017 (NSW)</i>
BDAR	Biodiversity Development Assessment Report
BCAR	Biodiversity Certification Assessment Report
BOAMS	Biodiversity Offsets and Agreement Management System
BOS	Biodiversity Offsets Scheme
CEEC	Critically Endangered Ecological Community
CKPoM	Comprehensive Koala Plan of Management
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DBH	Diameter at breast height over bark
DPE	Department of Planning and Environment
EC	Ecological Community listed under the EPBC Act
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
EP&A Act	<i>Environmental Planning and Assessment Act 1979 (NSW)</i>
EEC	Endangered Ecological Community
HTW	High Threat Weed
IBRA	Interim Biogeographic Regionalisation for Australia
LLS Act	<i>Local Land Services Act 2013 (NSW)</i>
MNES	Matters of National Environmental Significance
NPW Act	<i>National Parks and Wildlife Act 1974 (NSW)</i>
NSW	New South Wales
PCT	Plant Community Type
PSC	Port Stephens Council
SAII	Serious and Irreversible Impact
SEARS	Secretary's Environmental Assessment Requirements
TBDC	Threatened Biodiversity Data Collection
TEC	Threatened Ecological Community
VEC	Vulnerable Ecological Community
VMP	Vegetation Management Plan
Vegetation SEPP	<i>State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017 (NSW)</i>

Declarations

i. Certification under clause 6.15 *Biodiversity Conservation Act 2016*

I certify that this report has been prepared based on the requirements of, and information provided under, the Biodiversity Assessment Method and clause 6.15 of the Biodiversity Conservation Act 2016 (BC Act).

Signature:



Date: 25/03/2025

BAM Assessor Accreditation no: BAAS23007

This BDAR has been prepared to meet the requirements of BAM 2020. Appendix A provides an assessment of compliance with the minimum information requirements outlined in BAM Appendix K.

ii. Details and experience of author/s and contributors

Authors and contributors

Name	BAM Assessor Accreditation no. (if relevant)	Position/Role	Tasks performed	Relevant qualifications
Daryl Harman	BAAS17074	Senior Ecologist	Targeted threatened species surveys BAM plot surveys Report preparation	BEnvSc
Dr Kylie Bridges	BAAS20005	Ecologist	Targeted threatened species surveys. BAM plot surveys Report preparation	BEnvSc Hons PhD
Nicola Mohr	BAAS23007	Ecologist	Targeted threatened species surveys BAM plot surveys BAM-C data entry and analysis Figure preparation Report preparation	BSc & MSc

iii. Conflict of interest

I declare that I have considered the circumstances and there is no actual, perceived or potential conflict of interest OR I wish to openly declare the following actual, perceived or potential conflict of interest and the management strategies employed:

This declaration has been made in the interests of full disclosure to the decision-maker. Full disclosure has also been provided to the client.

Signature:



Date: 25/03/2025

BAM Assessor Accreditation no: BAAS23007

Stage 1: Biodiversity Assessment

1.0 Introduction

1.1 Proposed development

1.1.1 Development overview

It is proposed that East Seaham Road be upgraded within stages 5 and 6 of East Seaham Road, East Seaham. This assessment forms part of an environmental impact statement that requires consent under Part 5 of the *NSW Environmental Planning and Assessment Act 1979* (EPA Act).

1.1.2 Location and Description of the Study Area and Subject Land

The study area has a total area of total area of 9.58ha which consisted of an approximately 3km section of East Seaham Road, the associated road reservation, culverts and driveways that go into neighbouring properties. The subject land includes the footprint of the development and any ancillary works as well as accesses that support the construction or operation of the development or activity. Additionally, in areas where cut batters are required and trees are present, a 1m buffer has been applied past the edge of the batter to account for the average of potential impacts to the structural root zone of trees outside of the proposed works. This 1m buffer accounts for an average impact along the length of cut batter where in some areas there may be no impact to trees in this buffer while in other areas the impact may extend past the 1m buffer. This buffer is included in the subject land giving it a total area of 5.07ha. Vegetation within the study area consisted of a mixture of regrowth and remnant vegetation, and cleared land within the road reserve. To the west, the study area adjoins rural properties and for the majority of the alignment the study area adjoins Wallaroo National Park to the east.

Prior to European settlement the study area, and the adjoining land would have been native bushland. European settlement was first documented in area in approximately 1830, with clearing for housing, farming and agriculture commencing. East Seaham Road was constructed between 1840 and 1860. The power line easement to the east of East Seaham Road within the study area was installed between 1974 and 1976. The majority of the section of East Seaham Road within the study area adjoins Wallaroo National Park to the east. The National Park was formerly Wallaroo State Forest (reserved in 1922), it was then dedicated as Wallaroo Nature Reserve in 1999 and then reclassified as Wallaroo National Park in 2007 (Wedgetail Project Consulting 2024a).

A location map and aerial photo of the study area and subject land has been provided in Figures 1.1 and 1.2.

Figure 1.1 Location Map

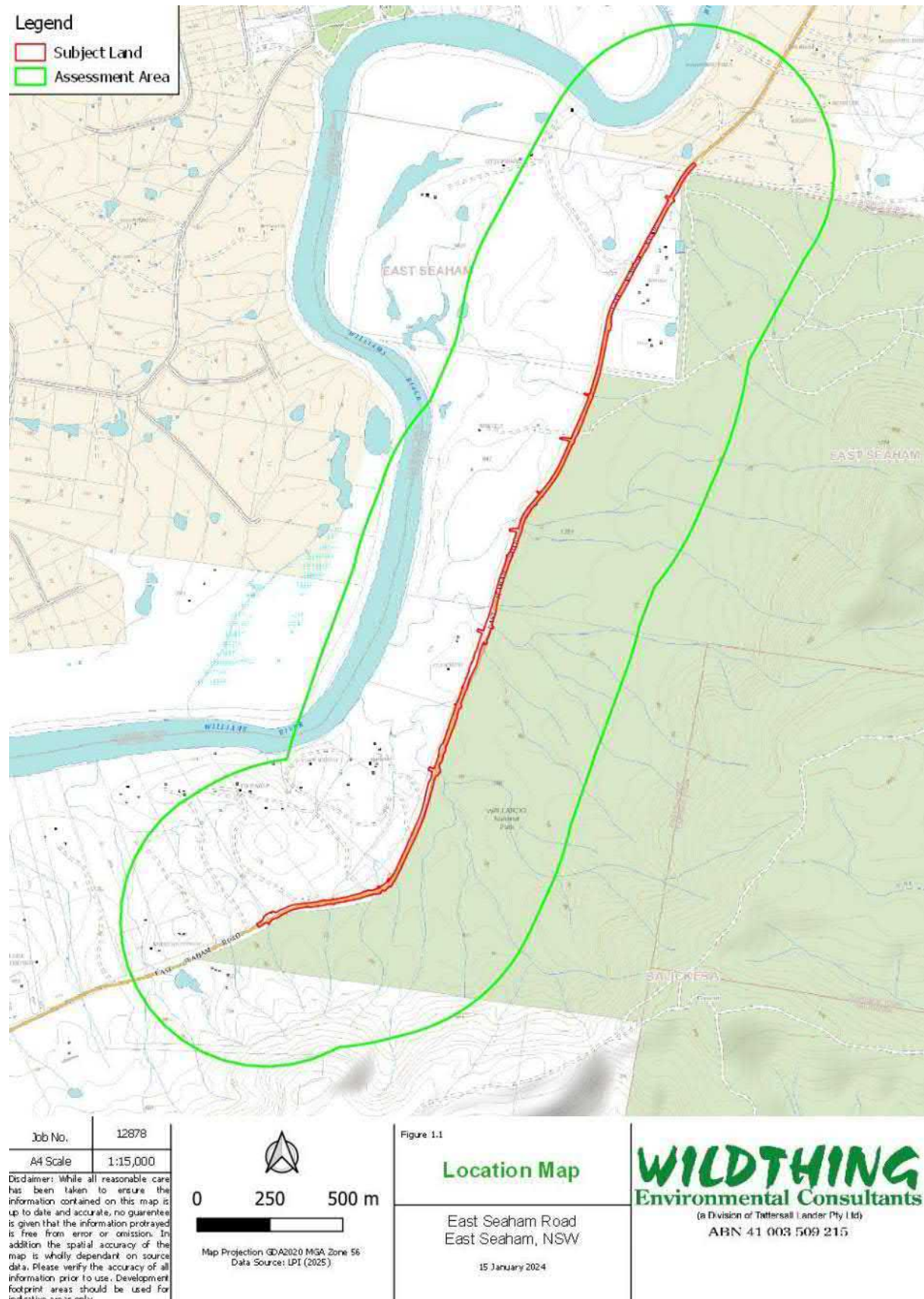


Figure 1.2 Aerial Image of Subject Land



Job No.	12878
A4 Scale	1:11,000

Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependant on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.

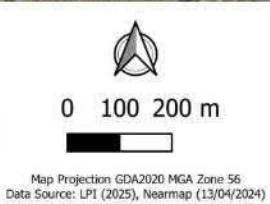


Figure 1.2

Aerial Image of Subject Land

East Seaham Road
East Seaham, NSW

28 January 2025

WILDTHING
Environmental Consultants

(a Division of Tattersall Lander Pty Ltd)
ABN 41 003 509 215

1.1.3 Development Description

The proponent proposes to upgrade East Seaham Road within stages 5 and 6. The road is currently a gravel road. The proposal will involve tarring the length of the road within the subject land, works within culverts and in some areas widening and realigning the road. Vegetation within 3m of the outer line of the road will be removed for safety and visibility. Along the majority of the road, the required impact for batter and road construction already extends this distance. The construction and operational footprint account for the same area which is the subject land.

Development plans have been provided in Figure 1.3 – 1.5.

Figure 1.3 Stage 5 Design Plans

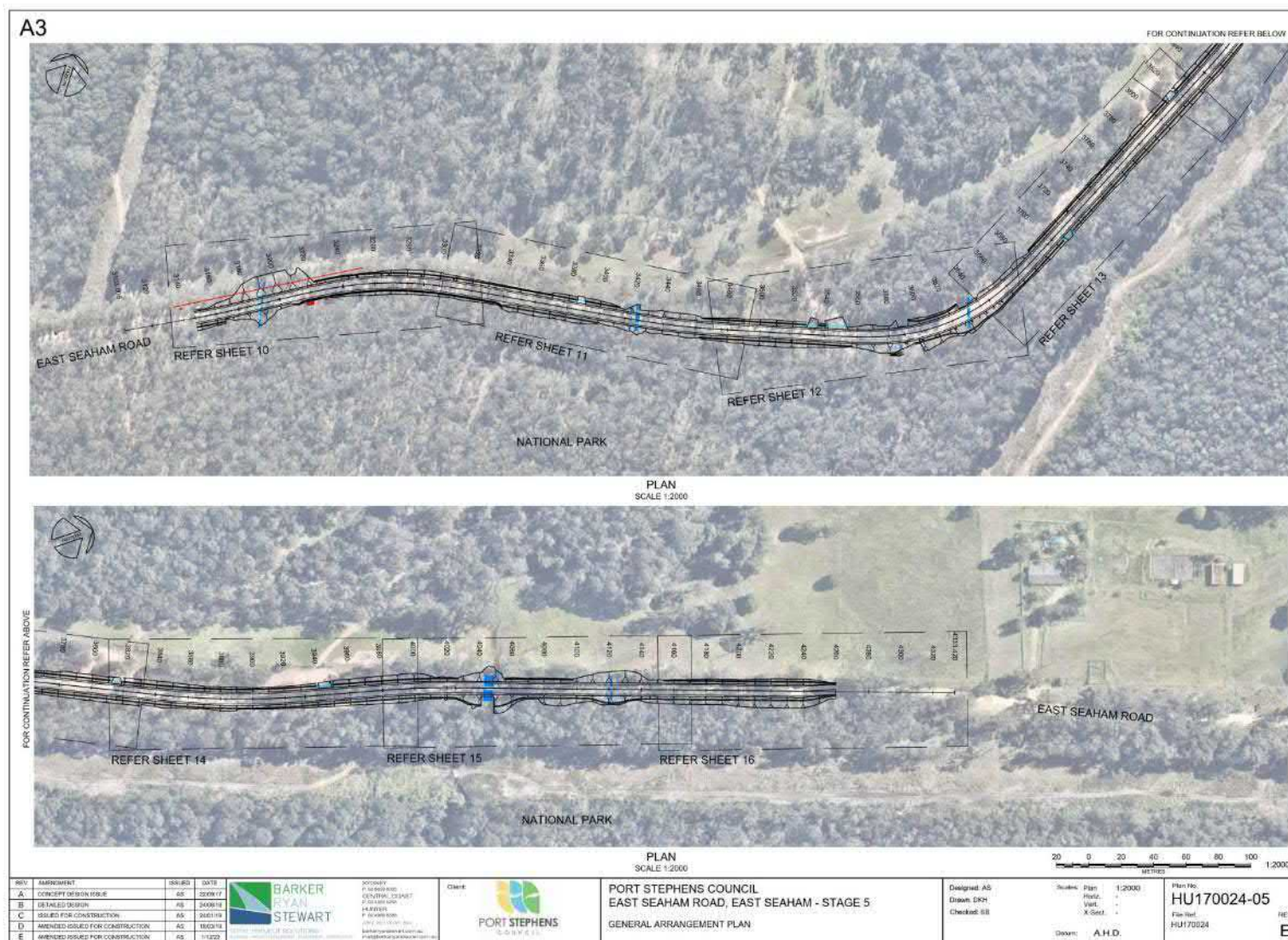


Figure 1.4 Stage 6 Design Plans part 1

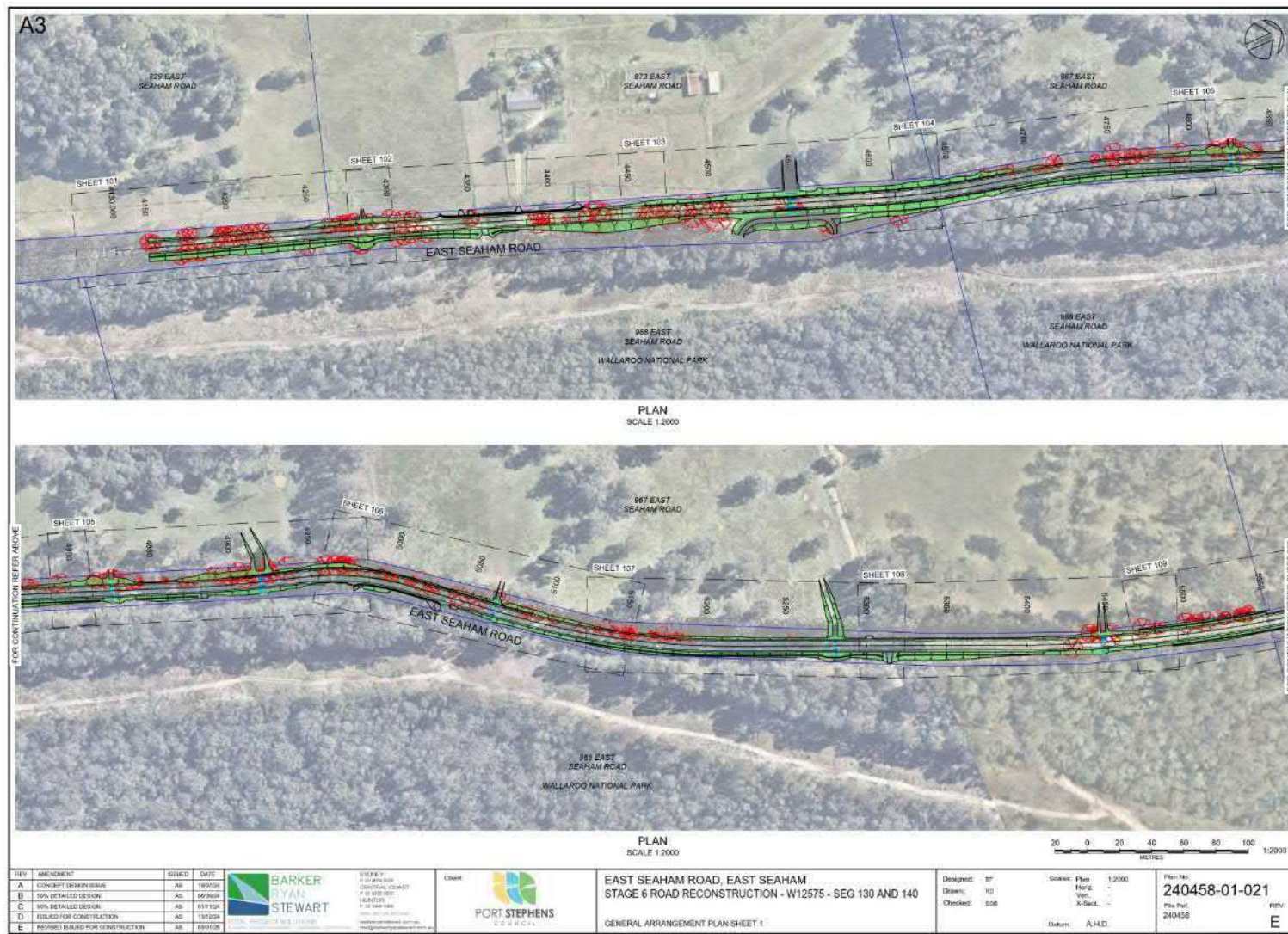
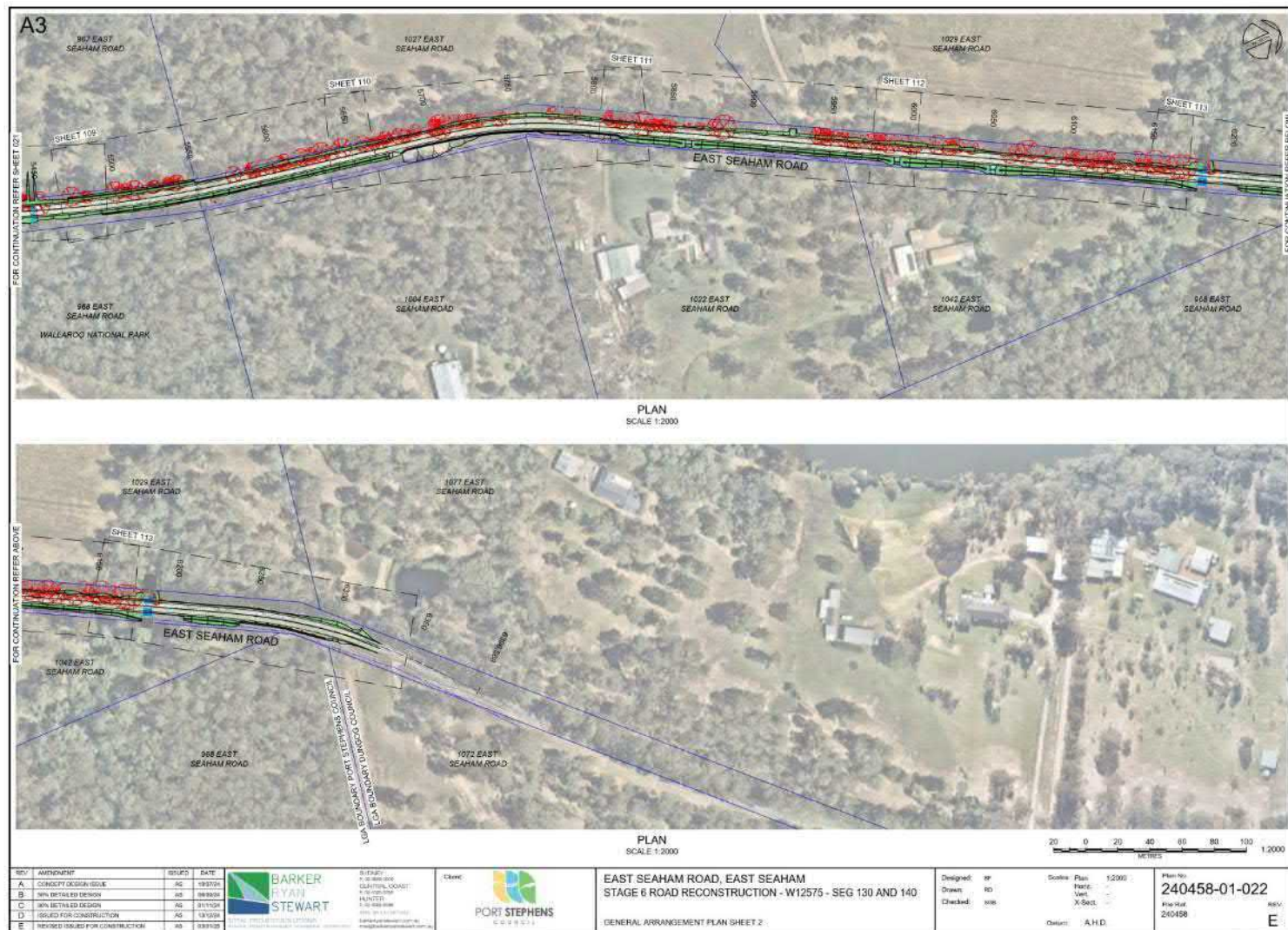


Figure 1.5 Stage 6 Design Plans part 6



1.2 Legislative Context

1.2.1 *NSW Environmental Planning and Assessment Act 2017 (EP & A Act)*

The EP&A Act was legislated to require the consideration and management of impacts of proposed development and land use change on the environment and the community.

- Part 1 Section 1.7 of the EP&A Act requires consideration of the proposed development under Part 7 of the *Biodiversity Conservation Act 2016* (BC Act).
- The EP&A Act is also supported by other statutory environmental planning instruments, including State Environmental Planning Policies (SEPPs).

1.2.2 *NSW Biodiversity Conservation Act 2016 (BC Act) & Biodiversity Offsets Scheme entry*

In accordance with the BC Act, the Biodiversity Assessment Method (BAM) (DPIE 2020a) and entry into the Biodiversity Offsets Scheme (BOS) is applicable to certain development activities based on specific criteria. Preparation of a Biodiversity Development Assessment Report (BDAR) is required for a development application that meets any of the following criteria:

- Part 4 development activities deemed to be 'State Significant' under the EP&A Act;
- Development activities that have the potential to impact Areas of Outstanding Biodiversity Value (AOBV) as listed under Part 3 of the BC Act;
- Development activities that have the potential to cause a significant impact on a threatened species, population or ecological community, listed under Schedules 1 and 2 of the BC Act, as determined by application of a five-part-test of significance in accordance with Section 7.3 of the BC Act;
- Development activities that have the potential to impact areas mapped as having 'high biodiversity value' as indicated by the NSW Biodiversity Values Map (BV Map); and
- Development activities that involve clearing of native vegetation that exceeds the Biodiversity Offset Scheme thresholds (BOS thresholds) as determined by the NSW BC regulation.

The BV map showed Biodiversity Values to occur within the subject land. The BOS clearing threshold for the subject land was 0.25ha. The area of the construction and operational footprint exceeds this threshold. The criteria in relation to the proposal's entry into the Biodiversity Offsets Scheme is shown in Table 1.1. A map of the subject land showing the location of areas of Biodiversity Value is shown in Figure 1.6.

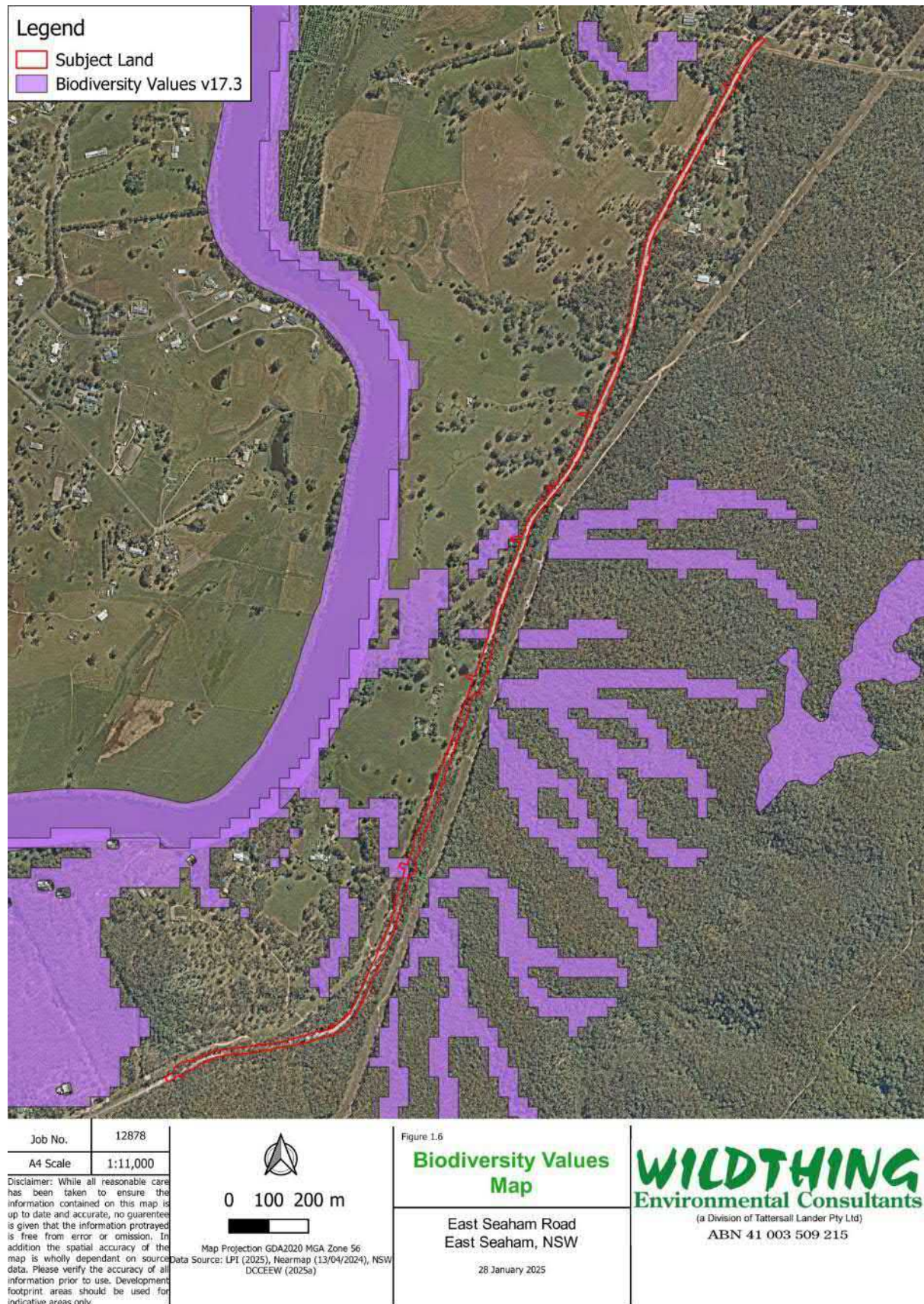
1.2.3 Serious and Irreversible Impacts

The BC Act also imposes various obligations on determining authorities in relation to impacts on biodiversity values that are serious and irreversible. For applications for development consent under Part 4 of the EP&A Act these obligations generally require a decision-maker to refuse to grant development consent. In order to provide clarity regarding what could be considered a serious and irreversible impact a guidance document has been released (NSW Gov 2017) which identifies the species and ecological communities (SAIL entities) that are likely to be the subject of serious and irreversible impacts. One candidate SAIL entities *Miniopterus australis* (Little Bent-winged Bat) was recorded within the subject land; however no preferred breeding habitat was present on site. The closest preferred roosting habitat is Thunderbolt Cave which is located approximately 1.8km east of the subject land. This cave could provide roosting habitat for *M. australis* and other SAIL candidate species *Miniopterus orianae oceanensis* (Large Bent-wing Bat) and *Chalinolobus dwyeri* (Large-eared Pied Bat). Further assessment was given for all three species. The proposal was not found to impact these SAIL entities due to the absence of preferred roosting habitat in close proximity to the site (100m) and considering mitigating measures to reduce indirect impacts to retained vegetation. No other candidate SAIL entities were found to be present within the study area thus no obligation for proposal refusal would be applicable to this proposed subdivision area from relevant regulatory bodies.

Table 1.1: Criteria for entry into the Biodiversity Offsets Scheme in relation to the proposal.

Criteria For Entry into The Biodiversity Offsets Scheme (BOS)	Section Criteria Addressed	Assessment Of Criteria
Part 4 development activities deemed to be 'State Significant' under the EP&A Act		The proposal is not recognised as State Significant
Development activities that have the potential to impact AOBV as listed under Part 3 of the BC Act.		No declared areas of outstanding biodiversity value were located within or in proximity to the subject land.
Development activities that have the potential to cause a significant impact on a threatened species, population or ecological community, listed under Schedules 1 and 2 of the BC Act, as determined by application of a five-part-test of significance in accordance with Section 7.3 of the BC Act;		No five-part test was undertaken.
Development activities that have the potential to impact areas mapped as having 'high biodiversity value' as indicated by the BV Map.	Section 1.2.2 Figure 1.6	The BV Map version 17 was last consulted on the 7 January 2025. It was found that mapped Biodiversity Values occur within subject land. Consequently, the proposed development will exceed the biodiversity offsets scheme threshold in regard to Section 7.2(b) of the BC Act and therefore a BDAR is required.
Development activities that involve clearing of native vegetation that exceeds the BOS thresholds as determined by the NSW BC regulation.		According to the BMAT Report, the clearing threshold for the subject land is 0.25ha. Up to 2.13ha of native vegetation will require clearing. Consequently, the proposed development will exceed the biodiversity offsets scheme threshold in regard to Section 7.2(b) of the BC Act and therefore a BDAR is required.

Figure 1.6 Biodiversity Values



1.2.4 State Environmental Planning Policy (Biodiversity and Conservation) 2021

The State Environmental Planning Policy (Biodiversity and Conservation) 2021 (Biodiversity and Conservation SEPP) consolidates transfers and repeals provisions of the following 11 SEPPs (or deemed SEPPs):

1. SEPP (Vegetation in Non-Rural Areas) 2017 (Vegetation SEPP);
2. SEPP (Koala Habitat Protection) 2020 (Koala SEPP 2020);
3. SEPP (Koala Habitat Protection) 2021 (Koala SEPP 2021);
4. Murray Regional Environmental Plan No 2—Riverine Land (Murray REP);
5. SEPP No 19—Bushland in Urban Areas (SEPP 19);
6. SEPP No 50—Canal Estate Development (SEPP 50);
7. SEPP (Sydney Drinking Water Catchment) 2011 (Sydney Drinking Water SEPP);
8. Sydney Regional Environmental Plan No 20 – Hawkesbury – Nepean River (No 2 – 1997); (Hawkesbury–Nepean River SREP);
9. Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005 (Sydney Harbour Catchment SREP);
10. Greater Metropolitan Regional Environmental Plan No 2 – Georges River Catchment (Georges River REP);
11. Willandra Lakes Regional Environmental Plan No 1 – World Heritage Property (Willandra Lakes REP).

Each consolidated SEPP now makes up a chapter in the SEPP (Biodiversity and Conservation) 2021. The following Chapters are relevant to Ecological Assessment reports:

- Chapter 3 Koala Habitat Protection 2020;
- Chapter 4 Koala Habitat Protection 2021'

1.2.4.1 Chapter 3 Koala Habitat Protection 2020

This Chapter aims to encourage the proper conservation and management of areas of natural vegetation that provide habitat for koalas to ensure a permanent free-living population over their present range and reverse the current trend of koala population decline—

- (a) by requiring the preparation of plans of management before development consent can be granted in relation to areas of core koala habitat, and
- (b) by encouraging the identification of areas of core koala habitat, and
- (c) by encouraging the inclusion of areas of core koala habitat in conservation zones.

Land to which Chapter applies:

- (1) This Chapter applies to land in the following land use zones, or an equivalent land use zone, in a local government area specified in Schedule 2, but not if the local government area is marked with an * in that Schedule—*
- (a) Zone RU1 Primary Production;*
 - (b) Zone RU2 Rural Landscape;*
 - (c) Zone RU3 Forestry.*

1.2.4.2 Chapter 4 Koala Habitat Protection 2021

This Chapter aims to encourage the conservation and management of areas of natural vegetation that provide habitat for koalas to support a permanent free-living population over their present range and reverse the current trend of koala population decline.

Land to which Chapter applies

- (1) *This Chapter applies to each local government area listed in Schedule 2.*
- (2) *The whole of each local government area is—*
 - (a) *in the koala management area specified in Schedule 2 opposite the local government area, or*
 - (b) *if more than 1 koala management area is specified, in each of those koala management areas.*
- (3) *Despite subsection (1), this Chapter does not apply to—*
 - (a) *land dedicated or reserved under the National Parks and Wildlife Act 1974, or acquired under Part 11 of that Act, or*
 - (b) *land dedicated under the Forestry Act 2012 as a State Forest or a flora reserve, or*
 - (c) *land on which biodiversity certification has been conferred, and is in force, under Part 8 of the Biodiversity Conservation Act 2016, or*
 - (d) *land in the following land use zones, or an equivalent land use zone, unless the zone is in a local government area marked with an * in Schedule 2—*
 - (i) *Zone RU1 Primary Production;*
 - (ii) *Zone RU2 Rural Landscape;*
 - (iii) *Zone RU3 Forestry.*

The subject land is located within Port Stephens LGA and is zoned as C1 National Parks and Nature Reserves in some areas and RU1 Primary Production in others. Therefore, both chapters apply. The Port Stephens Comprehensive Koala Plan of Management (CKPoM) has been prepared for the Port Stephens LGA in accordance with Chapter 3 Koala Habitat Protection 2020 and Chapter 4 Koala Habitat Protection 2021.

1.2.4.3 Port Stephens Comprehensive Koala Plan of Management (CKPoM)

The aim of the CKPoM is to encourage the proper conservation and management of areas of natural vegetation that provide habitat for Koalas, to ensure permanent free-living populations over their present range and to reverse the current trend of population decline. An assessment under the Port Stephens CKPoM has been undertaken in Section 13.0 of this report.

1.2.5 NSW Biosecurity Act 2015

The *NSW Biosecurity Act 2015*, amongst other considerations, provides regulatory controls and powers to manage priority weeds in NSW. For weed management, this Act divides NSW into regions based on combined LGAs and priority weeds for a region are listed. Some weeds are managed at a state level as they form part of a broader containment strategy. The legislation compliments listed Weeds of National Significance (WoNS). Further information on this matter is provided in Section 14 of this report.

1.2.6 Commonwealth Environment Protection and Biodiversity Conservation Act 1999 & Matters of National Environmental Significance

The purpose of the EPBC Act is to ensure that actions likely to cause a significant impact on Matters of National Environmental Significance (MNES) undergo a process of assessment. Under the EPBC Act, an action includes a project, undertaking, development or activity that may impact MNES. An action that 'has, will have or is likely to have a significant impact on a MNES' is deemed to be a 'controlled action' and may not be undertaken without prior approval from the commonwealth minister for the Department of Climate Change, Energy the Environment and Water (DCCEEW). MNES categories listed under the EPBC Act are:

- world heritage properties;
- national heritage places;
- wetlands of international importance (Ramsar wetlands);
- threatened species and ecological communities (Section 18 and 18A);
- migratory species;
- commonwealth marine areas;
- nuclear actions (including uranium mining); and
- a water resource, in relation to coal seam gas development and large coal mining development.

Initially, MNES protected under the EPBC Act are assessed in accordance with the Significant Impact Guidelines 1.1 - Matters of National Environmental Significance (DoE 2013). This is performed to determine if there is likelihood for an action to have a significant impact on MNES. An action will require referral to, and may require the approval of, the commonwealth minister for the Environment (in addition to any local or state government consent or approval) if that action will have, or is likely to have, a significant impact on the environment or on a MNES. An significant impact assessment has been undertaken in Appendix C of this report.

1.3 Excluded impacts

No excluded impacts (i.e., category 1-exempt land) were identified within the subject land.

1.4 Information sources

A list of the resources used to inform this BDAR, the date they were accessed and the spatial extent captured, where relevant, is provided in Table 1.2.

Table 1.2 Desktop Resources

Resource	Date Reviewed	Spatial Extent
Zoning and Regulatory Maps		
<i>Port Stephens Local Environment Plan 2013</i>	Various dates	Entire study area
Biodiversity Values and Landscape Maps		
NSW Biodiversity Values Map (NSW DCCEEW 2025a)	January 2025	Entire subject land
SIX Maps -Base Map - LPI 1:25,000 digital topographic databases (DTDB) (LPI 2025) -Cadastral data LPI digital cadastral database (DCDB) (LPI 2025)	Various dates	Entire subject land
NSW SEED Mapping (NSW Gov 2025)	Various dates	Entire subject land
BioNet NSW (Mitchell) Landscapes – Version 3.1 (NSW DCCEEW 2016)	January 2025	Entire subject land
NSW Interim Biogeographic Regions of Australia (IBRA region and sub-regions) – Version 7 (DCCEEW 2025c)	January 2025	Entire subject land
Atlas of Groundwater Dependent Ecosystems (DPE – Water 2025)	January 2025	Entire subject land
Nearmap (Nearmap 2025)	January 2025	
Threatened Species, Vegetation and Landscape Databases		
BioNet Atlas of NSW Wildlife (BioNet) (NSW DCCEEW 2025b)	January 2025	10x10km radius of subject land
Commonwealth Protected Matters Search Tool (PMST) (DCCEEW 2025a)	January 2025	10x10km radius of subject land
Commonwealth species profiles and threats database (SPRAT) (DCCEEW 2025b)	January 2025	-
NSW BioNet Threatened Biodiversity Profile Data Collection (NSW DCCEEW 2025b)	January 2025	
BioNet vegetation classification database (NSW DCCEEW 2025c)	January 2025	-
PlantNET NSW (PlantNET 2025).	January 2025	-
Directory of Important Wetlands in Australia (DIWA) (DoE 2015)	January 2025	-
Geological sites of NSW (Cartoscope 2025)	January 2025	-
Important habitat maps for a threatened species (NSW DCCEEW 2025d)	January 2025	
Survey and Reporting Methodology		
Biodiversity Assessment Method (BAM) (DPIE 2020a)	Various dates	-
Biodiversity Assessment Method Operational Manual – Stage 1 (DPIE 2020b)	Various dates	-
Biodiversity Assessment Method – Operational Manual – Stage 2 (DPIE 2019)	Various dates	-
Biodiversity Assessment Method – Operational	Various dates	-

Resource	Date Reviewed	Spatial Extent
Manual – Stage 3 (DPIE, 2020c)		
Threatened species survey and assessment guidelines: field survey methods for fauna – amphibians (DECC 2009)	Various dates	-
DPE Koala (<i>Phascolarctos cinereus</i>) Biodiversity Assessment Method Survey Guide (DPE 2022)	Various dates	
NSW Survey Guide for Threatened Frogs (DPIE 2020d)	Various dates	-
DPIE Surveying threatened plants and their habitats NSW survey guide for the Biodiversity Assessment Method (DPIE 2020)	Various dates	
NSW Guide to Surveying threatened plants and their habitats (DPIE 2020e)	Various dates	-
OEH Threatened Biodiversity Survey and Assessment Guidelines. Guidelines for Developments and Activities (DEC 2004)	Various dates	-
Biodiversity Assessment Method Credit Calculator (BAM-CC) (DPIE 2022f)	January 2025	-
Climactic Data		
BOM – 061250 Paterson NSW (Commonwealth of Australia 2024)	Various dates	-
Reports		
Biodiversity Survey for East Seaham Road Stage 5 and 6. Prepared for Port Stephens Council. (Wedgetail Project Consulting 2024a)	Various dates	-
Microchiroptera Bat Surveys. Prepared for Port Stephens Council (Wedgetail Project Consulting 2024b)	Various dates	-

2.0 Methods

2.1 Site context methods

2.1.1 Landscape features

Landscape feature extent within the subject land were determined by undertaking searches of external resources such as NSW SEED Mapping (2025), LPI (2025), and NSW Planning Portal (2025). Field reconnaissance undertaken by Wedgetail Project Consulting was also undertaken (Table 2.1) to determine the condition and extent of landscape features (Section 3.2) within the subject land and surrounding locality.

2.1.2 Native vegetation cover

The Biodiversity Assessment Method Operational Manual Stage 1 (DPIE, 2020b) defines 'Native Vegetation Cover' as:

The amount of native vegetation (woody and non-woody vegetation including regrowth and plantations comprised of plants native to New South Wales) that is estimated to remain in the landscape proximal to the assessment area. It is used:

- as a filter by the Calculator to predict threatened species likely to occur or use habitat on a site; and
- to define the intrinsic rate of increase in species richness and plant cover as part of the assessment of future vegetation condition on a biodiversity stewardship site.

The percent native vegetation cover is assessed by applying a 500metre buffer around the edge of the subject land (linear development) and digitising all native vegetation within, using GIS editing tools and recent aerial photography. The total area of native vegetation is calculated across the assessment area.

2.2 Native vegetation, threatened ecological communities and vegetation integrity methods

2.2.1 Existing information

Searches were undertaken of the BioNet VIS Database (NSW DCCEEW 2025c) and NSW SEED mapping (2025).

2.2.2 Mapping native vegetation extent

Based on the results of the review of existing information and the requirements of the BAM with respect to this BDAR, appropriate surveys were designed for the subject land. Supplementary iterations and amendments were made to the base map throughout the fieldwork period, in accordance with Section 5.2 of the BAM, via hand-held GPS units and aerial photo interpretation

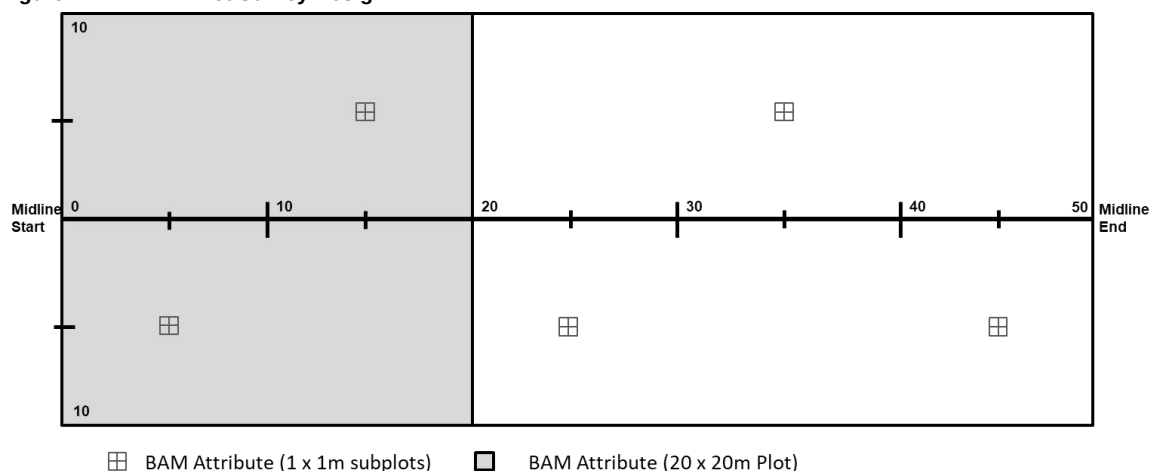
undertaken by Wedgetail Project Consulting. Iterations to the base map were based on observation of broad vegetation composition, landform, physiography and on quantitative data collection through identification of all plants encountered to the species level by both Wildthing Environmental Consultants and Wedgetail Project Consulting.

The vegetation types observed were compared to the base map and cross-referenced with the community profile descriptors (and diagnostic species tests) held within the BioNet VIS Database (NSW DCCEEW 2024c) with an assessment of consistency being conducted.

2.2.3 Plot-based vegetation survey and Vegetation integrity survey

Detailed floristic surveys were undertaken in January 2025 by Wildthing Environmental Consultants. These surveys included the establishment of three plot-based vegetation and vegetation integrity plots. Data was collected in accordance with BAM Subsection 4.2.1 and 4.3.4 (BAM, 2020b) by persons trained in the BAM and under the direction of persons accredited under the BAM (see Section 4.3.1). The field data collected during the vegetation integrity assessment can be found in Appendix D along with photos of the BAM plots. Survey plot location was selected such that it included all functional attributes relevant to the PCT and vegetation zone. The size of two plots had to be modified to fit within the narrow road reserve containing the vegetation. The modified plots had the dimensions of 8 x 125m where Function Attributes were collected. Structural and Composition Attributes were collected within an 8 x 50m strip in the beginning of the plot. 1 x 1m plots where percentage cover of leave litter, bare ground, cryptograms and bare rock was gathered was placed every 25m along the transect. Figure 2.1 demonstrates the layout of a standard plot and details the survey methodology.

Figure 2.1: Plot Survey Design



The following site attributes were recorded at each site while conducting survey plots:

- Midline start and end points (easting – northing grid type MGA 2020, Zone 56);
 - Vegetation structure and dominant species and vegetation condition.
1. Composition attributes (20 x 20m plot normally, 8 x 50m in modified plots)
 - All native species;
 - All introduced species (including high threat weeds).
 2. Structure attributes (20 x 20m plot normally, 8 x 50m in modified plots)
 - Estimate of foliage cover of every native and introduced species recorded. Foliage cover is defined as the percentage of the plot covered by a vertical projection of all attached plant material, regardless of whether it appears alive or dead, of all individuals of a species.
 3. Function attributes (20 x 50m plot normally, 8 x 125m in modified plots)
 - Presence or absence of each tree stem size class (diameter at breast height, over bark and measured at 1.3 metres above ground level). Classes include 5–9cm, 10–19cm, 20–29cm, 30–49cm;
 - Tally and DBH of large trees where DBH is between 50-79cm or equal to or above 80cm;
 - Tally and DBH of regenerating trees with a DBH below 5cm;
 - Length of all fallen logs. Fallen logs are defined as dead woody material with a diameter greater than 10cm. Where logs extend outside the plot only the length within the plot is recorded;
 - Percentage cover of leaf litter, bare ground, cryptograms and bare rock in each 1 x 1m plot. Litter is taken as plant material detached from a plant including leaves, seeds, twigs, branchlets and branches with diameter of <10cm.
 4. Other Attributes
 - Number of stems with hollows is counted in the plot (50 x 20m normally, 8 x 125m in modified plots). A tree is considered to contain a hollow if:
 - the entrance can be seen;
 - the entrance width is at least 5 centimetres;
 - the hollow appears to have depth (i.e., solid wood cannot be seen beyond the entrance); and
 - the hollow is at least 1 metre above the ground.

2.3 Threatened flora survey methods

2.3.1 Review of existing information

Habitat constraints for threatened species are identified in the BAM-CC and the Threatened Species Biodiversity Data Collection.

2.3.2 Habitat constraints assessment

Habitat constraints associated with threatened species were assessed for the subject land during field assessments.

2.3.3 Field surveys

2.3.3.1 Targeted Flora Surveys

Targeted flora surveys were undertaken by Wedgetail Project Consulting and in accordance with the NSW Guide to Surveying threatened plants and their habitats (DPIE 2020e), Draft survey guidelines

for Australia's threatened orchids (DoE, 2013a) and in correlation with local flowering reference populations for orchids. Each target threatened flora species was allocated areas of potential habitat. All vegetation communities considered to be habitat for the target species were searched. A parallel field traverse (i.e., parallel transects) were undertaken within the subject land. Surveys were conducted along parallel line transects approximately 5-10 metres apart for orchids, herbs and forbs, and 10-20m for shrubs and trees. Transects were conducted along a straight path using the tracks on a GPS to guide the surveyors. Required survey times were stated in the BAM Candidate species report. Targeted surveys were undertaken for each flora species credit species within the required survey period identified in the BAM-CC and flowering reference locations.

Details on timing of each species as follows:

- *Pterostylis chaetophora* – Surveys conducted when known reference population was flowering;
- *Asperula asthenes* – surveys were conducted within the appropriate survey period (October to December). No reference population of the species was used, as it is generally not required for *Asperula asthenes*. The species is detectable all year round, with the specific survey period targeting the flowering period to allow distinction from other *Asperula* and *Galium* species. No *Asperula* or *Galium* species were identified during field surveys;
- *Rhizanthella slateri* – surveys were conducted within the appropriate survey period (September – November). No local reference population of the species is known of;
- *Grevillea parviflora* subsp. *parviflora* – surveys for the species were conducted within the appropriate survey period (August to November). No reference population of the species was used, as it is generally not required for *Grevillea parviflora* subsp. *parviflora*. The species is detectable all year round, with the specific survey period targeting the flowering period to allow distinction from other *Grevillea* species. No *Grevillea* species were identified during field surveys;
- *Tetradlea juncea* – Surveys for the species were conducted within the appropriate survey period (September to October). No specific reference population of the species was used, as it is generally not required for *Tetradlea juncea* as September to October is recognised as peak flowering for the species across its range. Wedgetail were conducting surveys in the Karuah Region in the same period and detected *Tetradlea juncea* during those surveys;
- *Eucalyptus glaucina*, *Angophora inopina*, *Eucalyptus camaldulensis* and *Cymbidium canaliculatum* – Multiple surveys were conducted in September 2023 by Wedgetail, identifying habitat and koala feed tree species within the site. Given the conspicuous nature of this species and the extent of surveys conducted, there would be high likelihood that the species would have been detected if present within the subject land or the site.

The location of the targeted flora tracks is shown in Figure 2.2 – 2.11.

2.3.3.2 *Significant Tree Survey*

The significant tree survey was undertaken by Wedgetail Project Consulting and involved a survey for hollow-bearing trees, trees containing large stick nests within and within close proximity to the impact area and Schedule 2 Koala Feed Trees under the Port Stephens CKPoM. The ground-based survey recorded the details of each significant tree including height, diameter at breast height (dbh), hand held GPS coordinates and fauna habitat attributes such as hollows. The presence of activity in the form of scratches, scats on the trunks of trees and scats around the base were also noted. It must be noted that observations made from ground level may fail to record a small number of hollows that are obscured. Some entrances may also not lead to a cavity. The internal dimensions of the hollows are also impossible in many cases to determine from the ground.

Figure 2.2 Targeted Flora Survey Tracks conducted and mapped by Wedgetail Project Consulting (October) – Section 1



Figure 2.3 Targeted Flora Survey Tracks conducted and mapped by Wedgetail Project Consulting (October) – Section 2

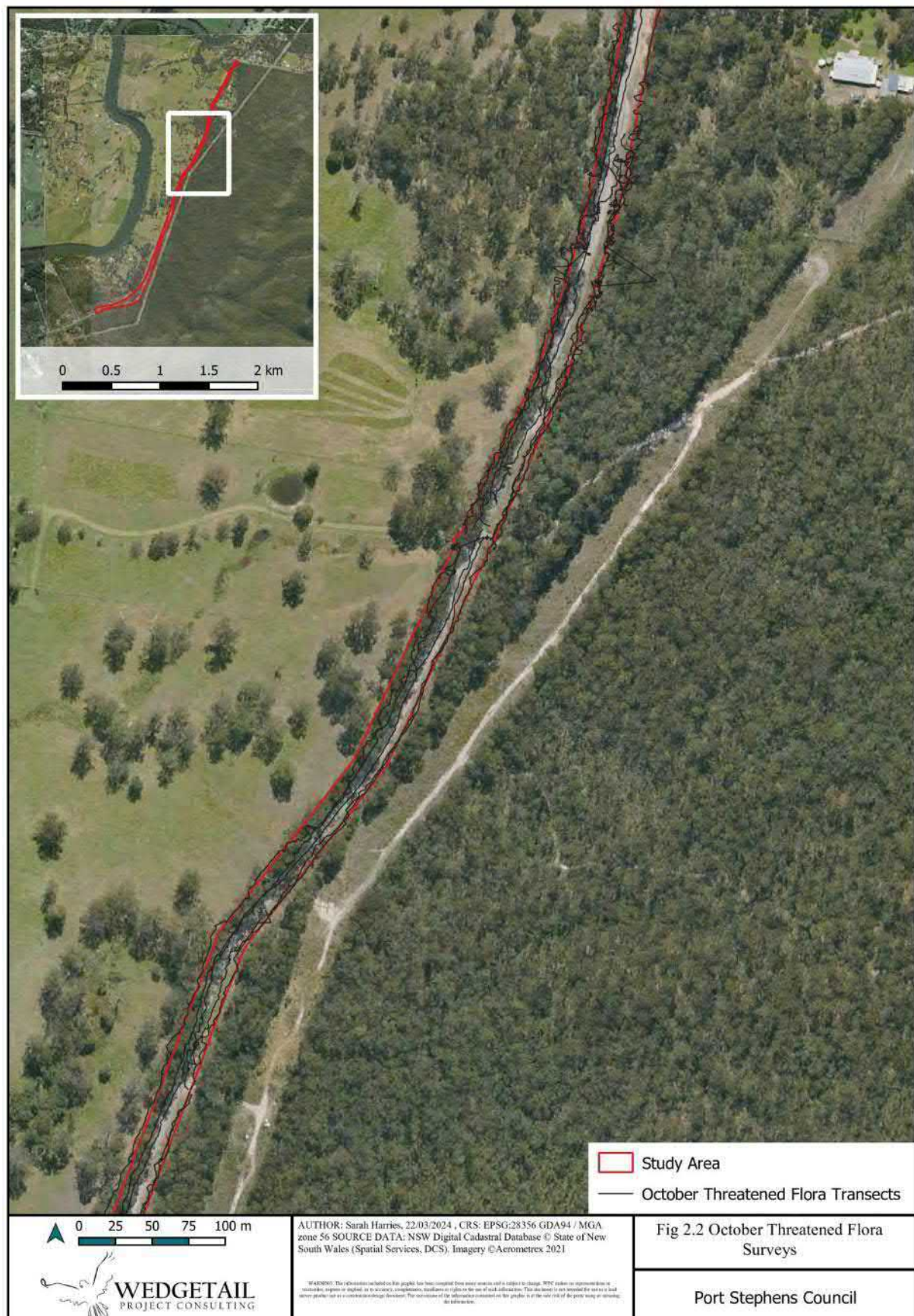


Figure 2.4 Targeted Flora Survey Tracks conducted and mapped by Wedgetail Project Consulting (October) – Section 3

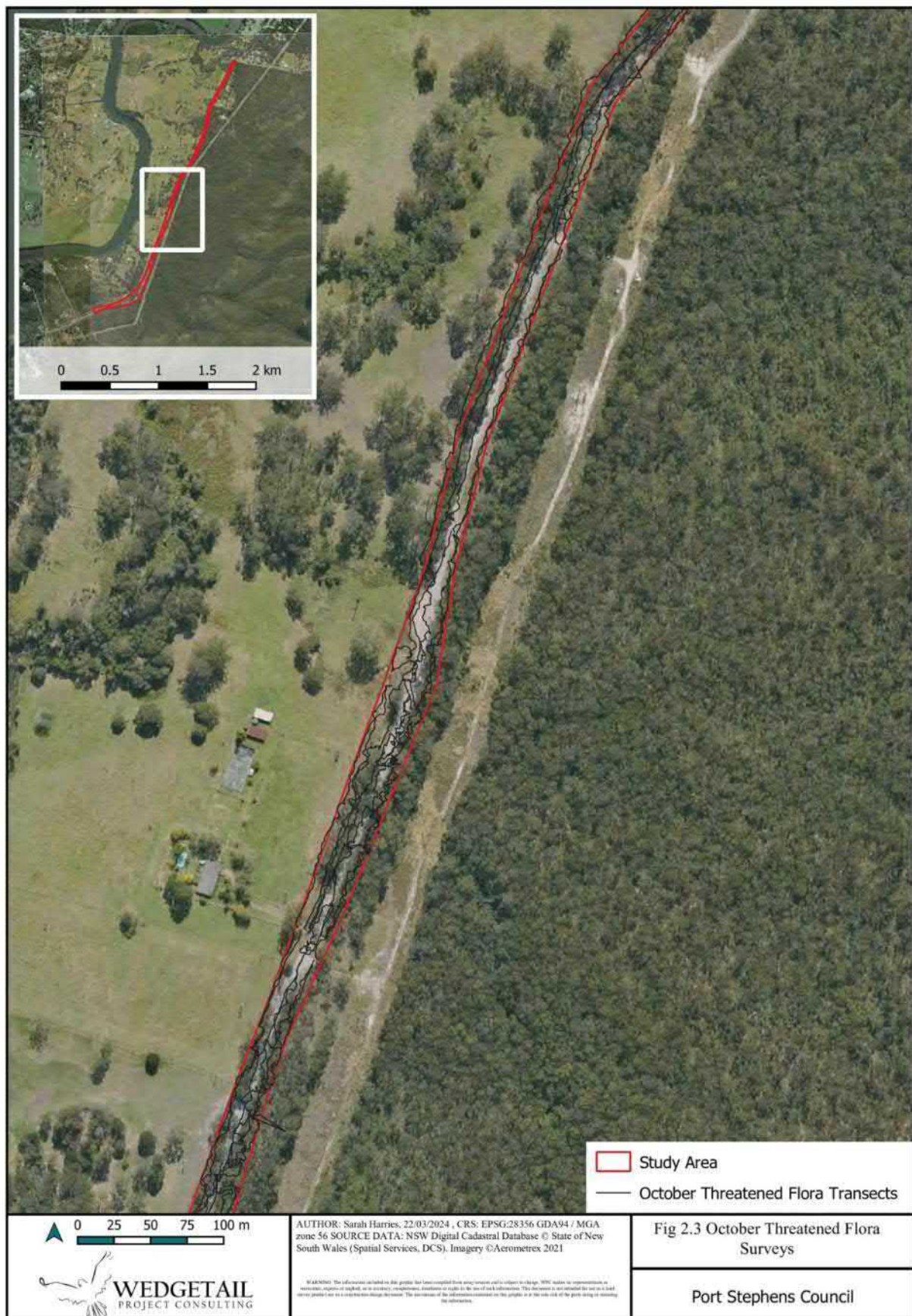


Figure 2.5 Targeted Flora Survey Tracks conducted and mapped by Wedgetail Project Consulting (October) – Section 4



Figure 2.6 Targeted Flora Survey Tracks conducted and mapped by Wedgetail Project Consulting (October) – Section 5

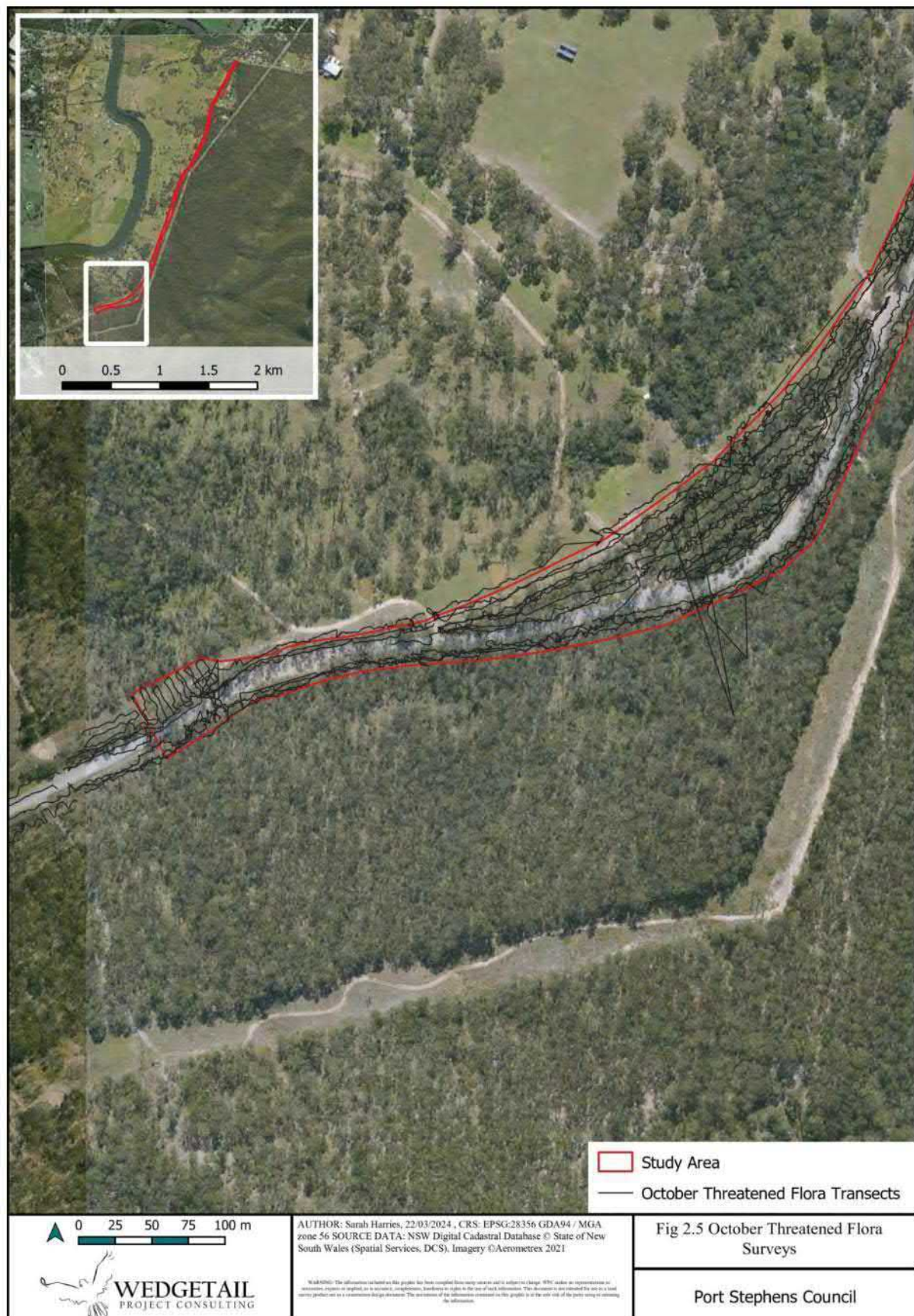


Figure 2.7 Targeted Flora Survey Tracks conducted and mapped by Wedgetail Project Consulting (November)
Section 1

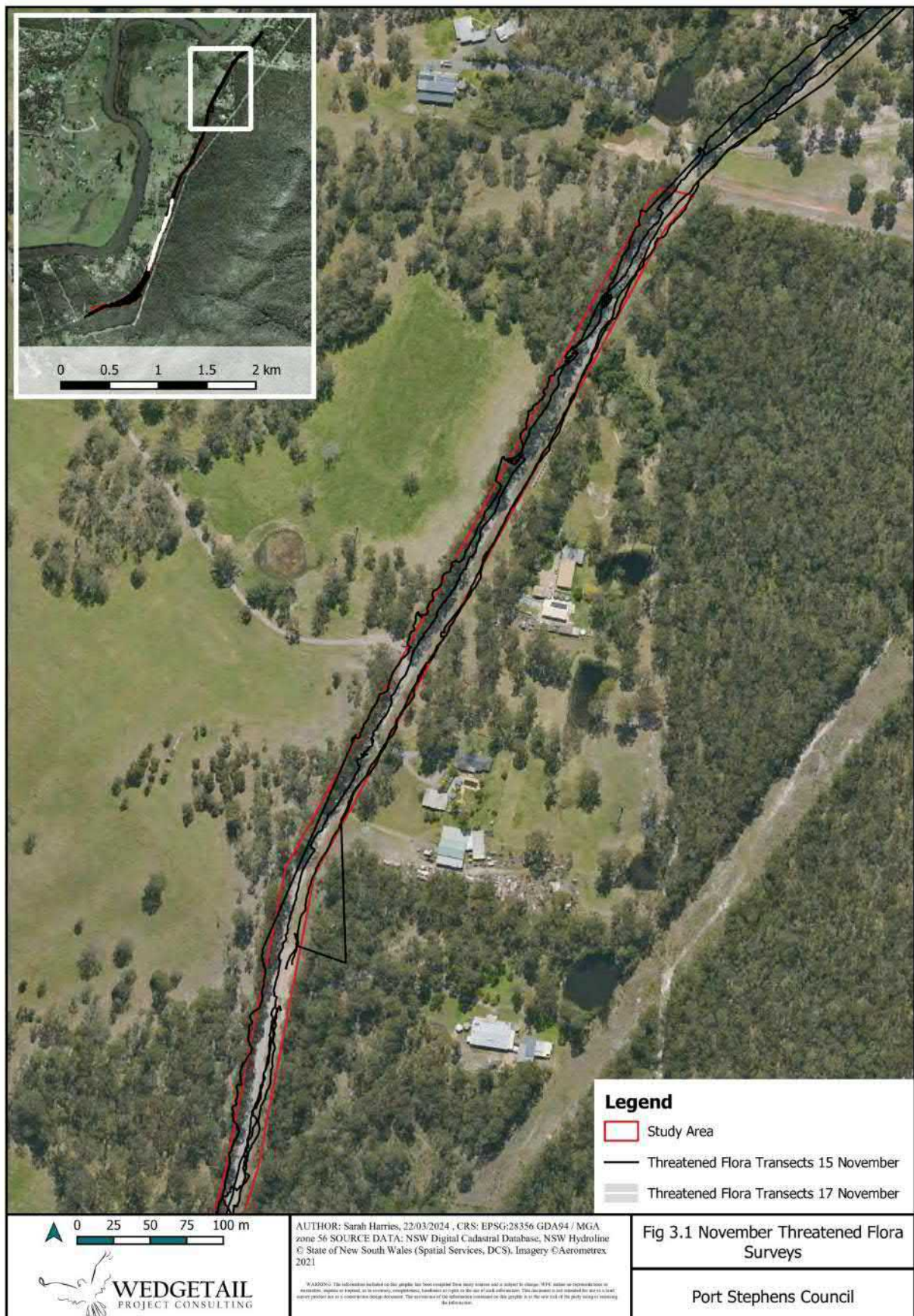


Figure 2.8 Targeted Flora Survey Tracks conducted and mapped by Wedgetail Project Consulting (November)
Section 2

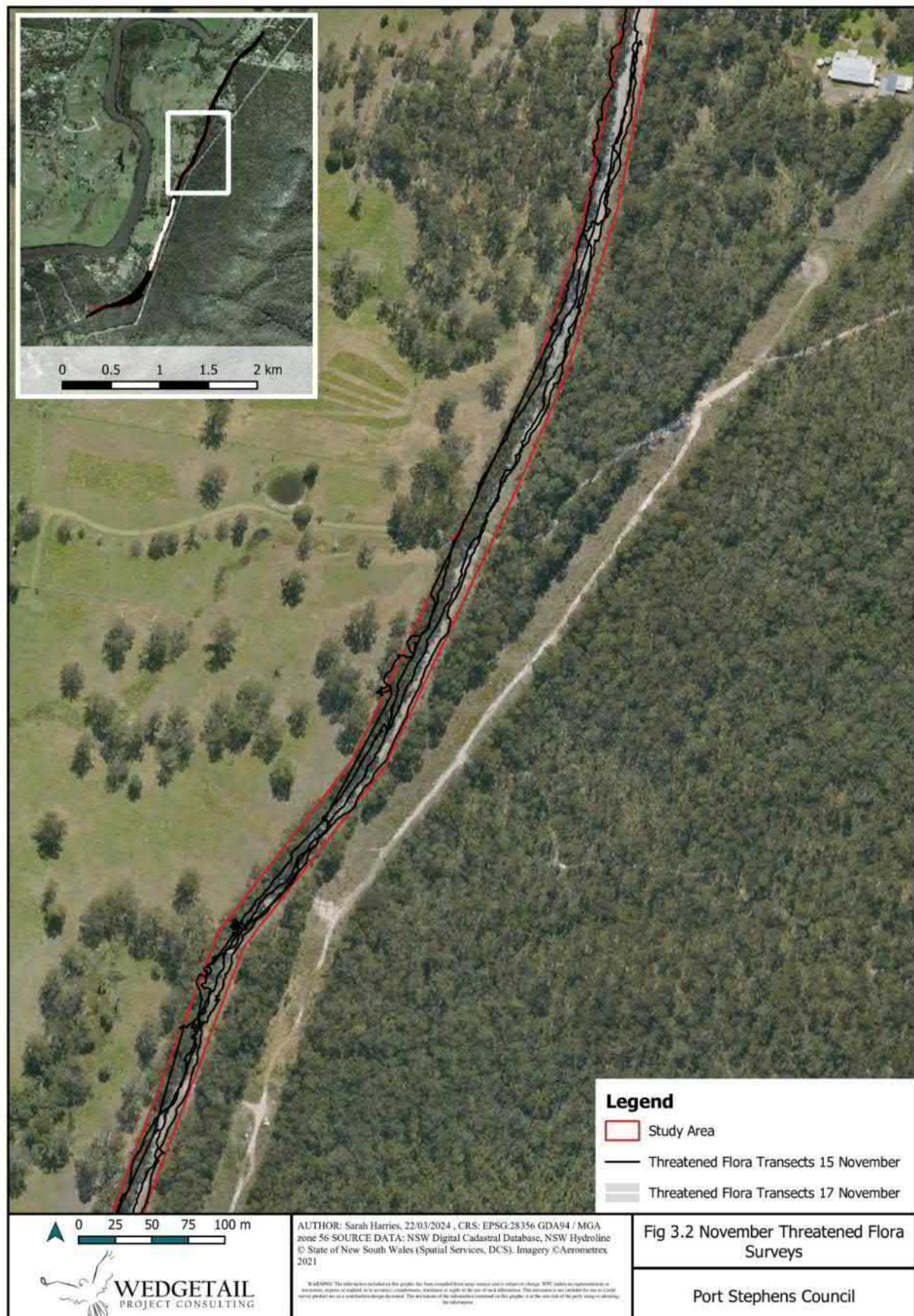


Figure 2.9 Targeted Flora Survey Tracks conducted and mapped by Wedgetail Project Consulting (November)
Section 3

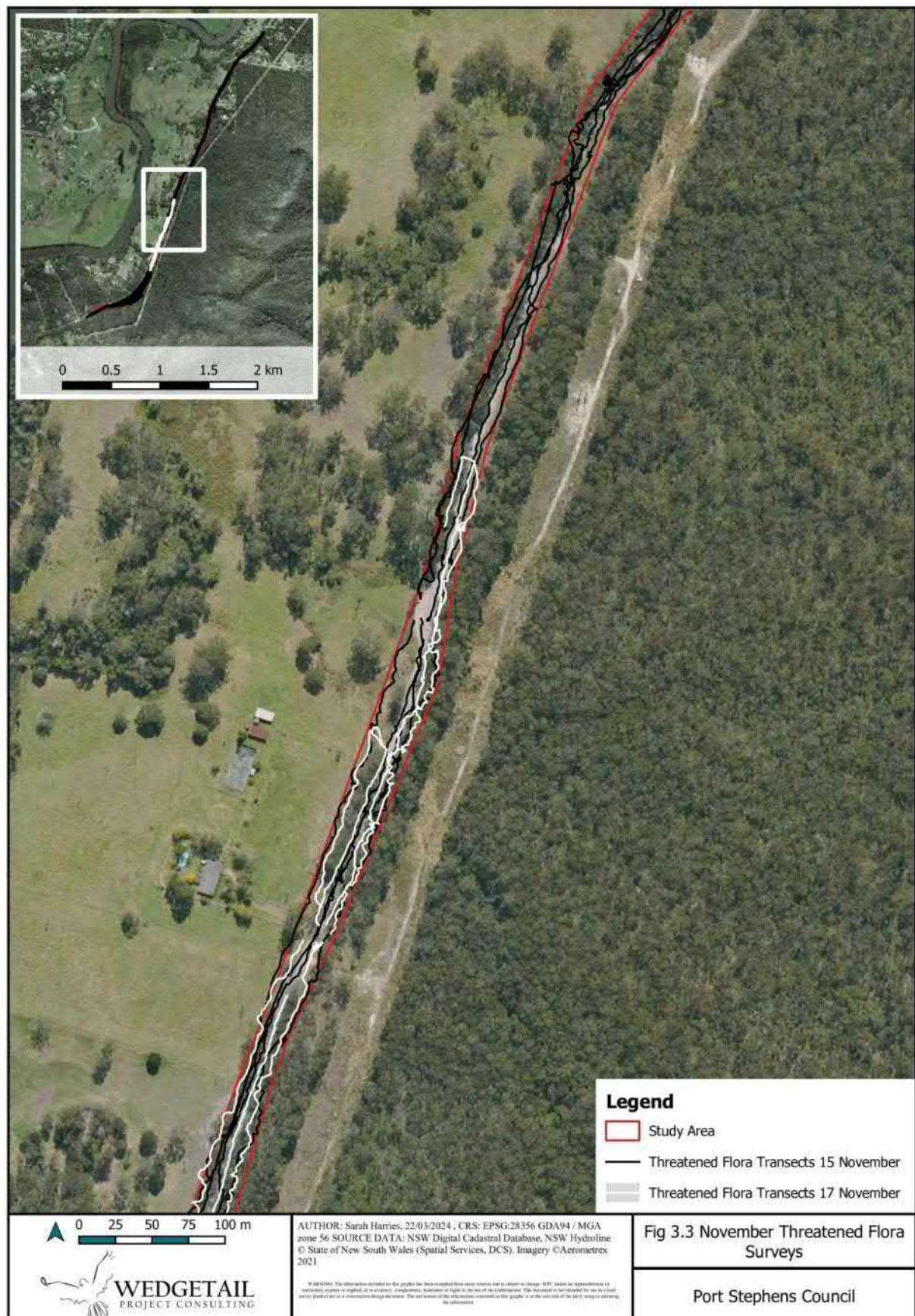


Figure 2.10 Targeted Flora Survey Tracks conducted and mapped by Wedgetail Project Consulting (November)
Section 4

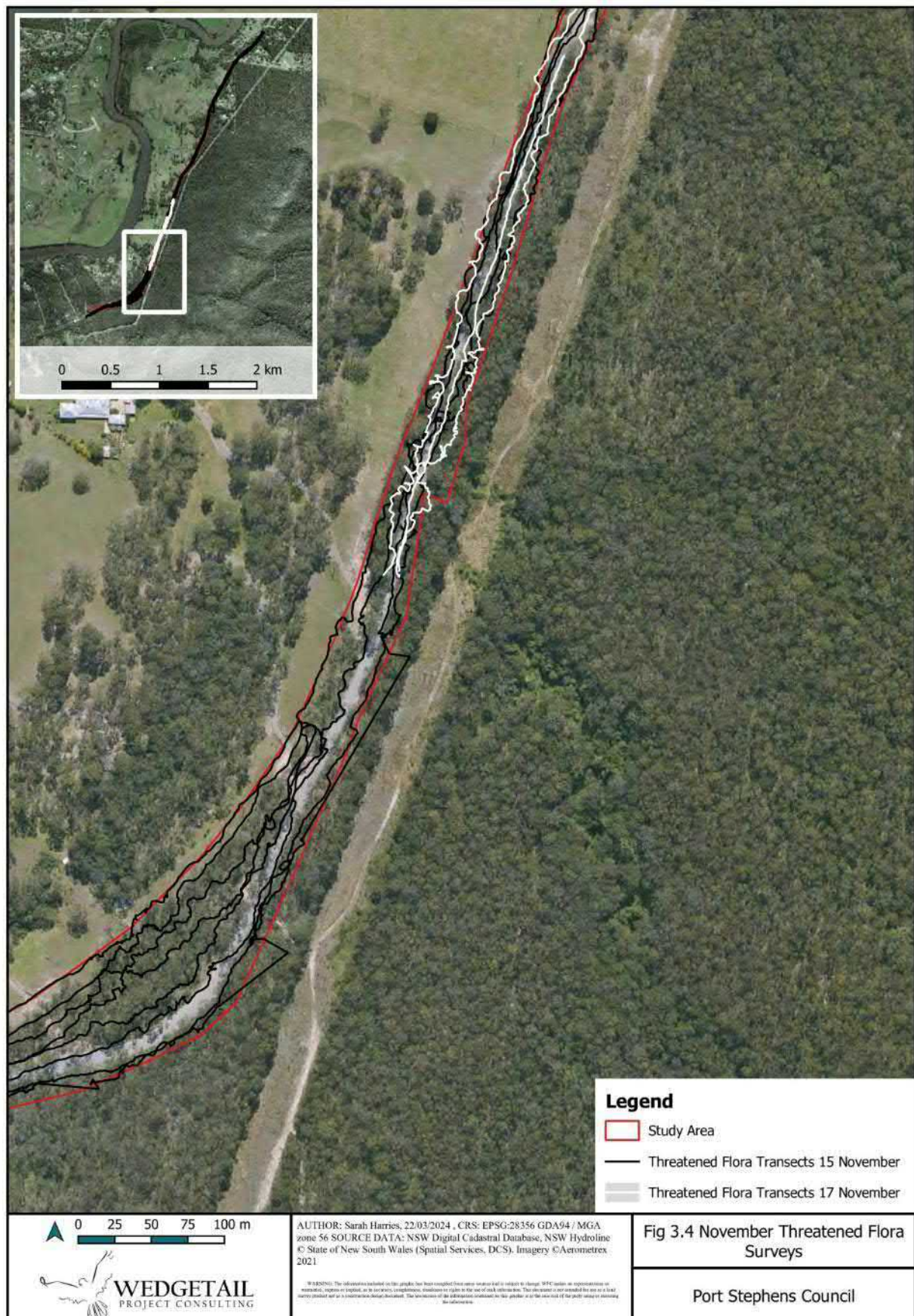
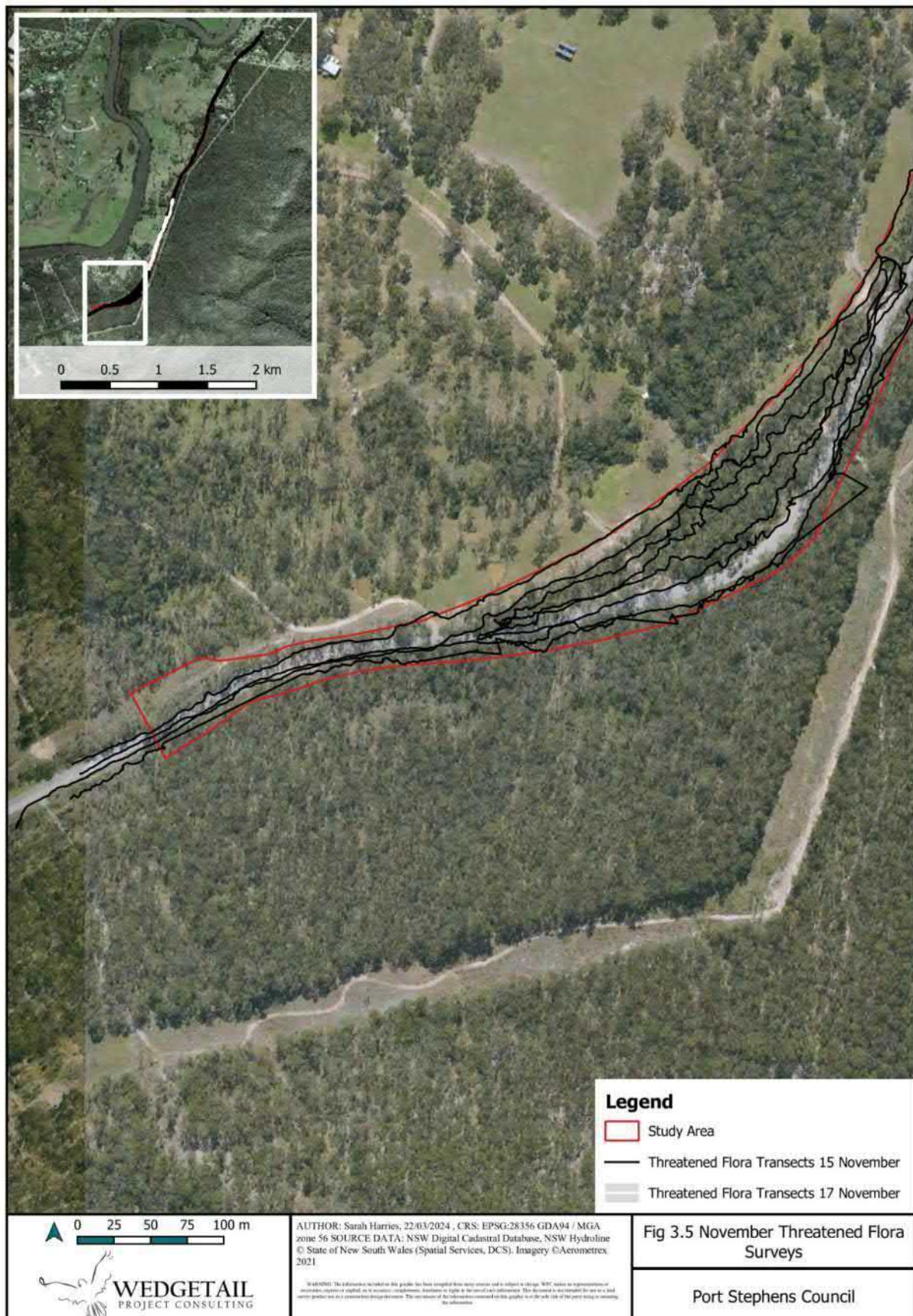


Figure 2.11 Targeted Flora Survey Tracks conducted and mapped by Wedgetail Project Consulting (November)
Section 5



2.4 Threatened fauna survey methods

2.4.1 Review of existing information

Habitat constraints for threatened fauna species are identified in the BAM-C and the Threatened Species Biodiversity Data Collection.

2.4.2 Habitat constraints assessment

Habitat constraints associated with threatened species were assessed for the subject land during field assessments undertaken by Wildthing Environmental Consultants and Wedgetail Project Consulting. The habitat constraints included the absence of attributes such as a lack of caves and other man-made structures as well as microhabitat features required by certain species.

2.4.3 Field surveys

The fauna survey was initiated with an assessment of the potential use of the subject land by any species credit species. Subsequently, the confirmation of the fauna species list, by way of on-site observation and recording, was carried out as described below. The survey was carried out using the Department of Environment and Conservation's (NSW) Threatened Biodiversity Survey and Assessment Guidelines – Working Draft (DEC, 2004). Survey details including dates, timing and weather conditions are displayed in Table 2.1.

2.4.3.1 Diurnal Avifauna Survey

The diurnal avifauna survey was undertaken by Wildthing Environmental Consultants and involved point assessments for 30 minutes. Additional walking transect surveys were conducted along the length of the study area. Surveys were conducted at peak activity periods (i.e., dawn and dusk). Searches were also conducted within the subject land and in close proximity for large stick nests which may indicate breeding by the candidate species. Incidental observations of avifauna were also made during other surveys. Observations were also made of secondary indications (i.e., distinctive feathers and nests) of avifauna were also recorded. The locations of the diurnal avifauna surveys are shown in Figure 2.12.

2.4.3.2 Stagwatching Survey

The stag watching survey was undertaken by Wildthing Environmental Consultants and Wedgetail Project Consulting. These surveys involved watching hollow-bearing trees within the study area, 20 minutes prior to sunset and continuing until 20 minutes after sunset. The person was in a position to allow a good view of the tree to be obtained, preferably with the tree silhouetted against the sky. The required listening period and stag watching were undertaken concurrently. Hollow trees targeted were those suitable for *Petaurus norfolcensis* (Squirrel Glider), *Calyptorhynchus lathamii* (Glossy Black-cockatoo) (Breeding) and owl species such as *Tyto novaehollandiae* (Masked Owl) and *Ninox strenua* (Powerful Owl). The location of the watched stag trees is shown in Figure 2.12 and 2.13.

Figure 2.12 Diurnal and Nocturnal Avifauna Surveys conducted by Wildthing Environmental Consultants

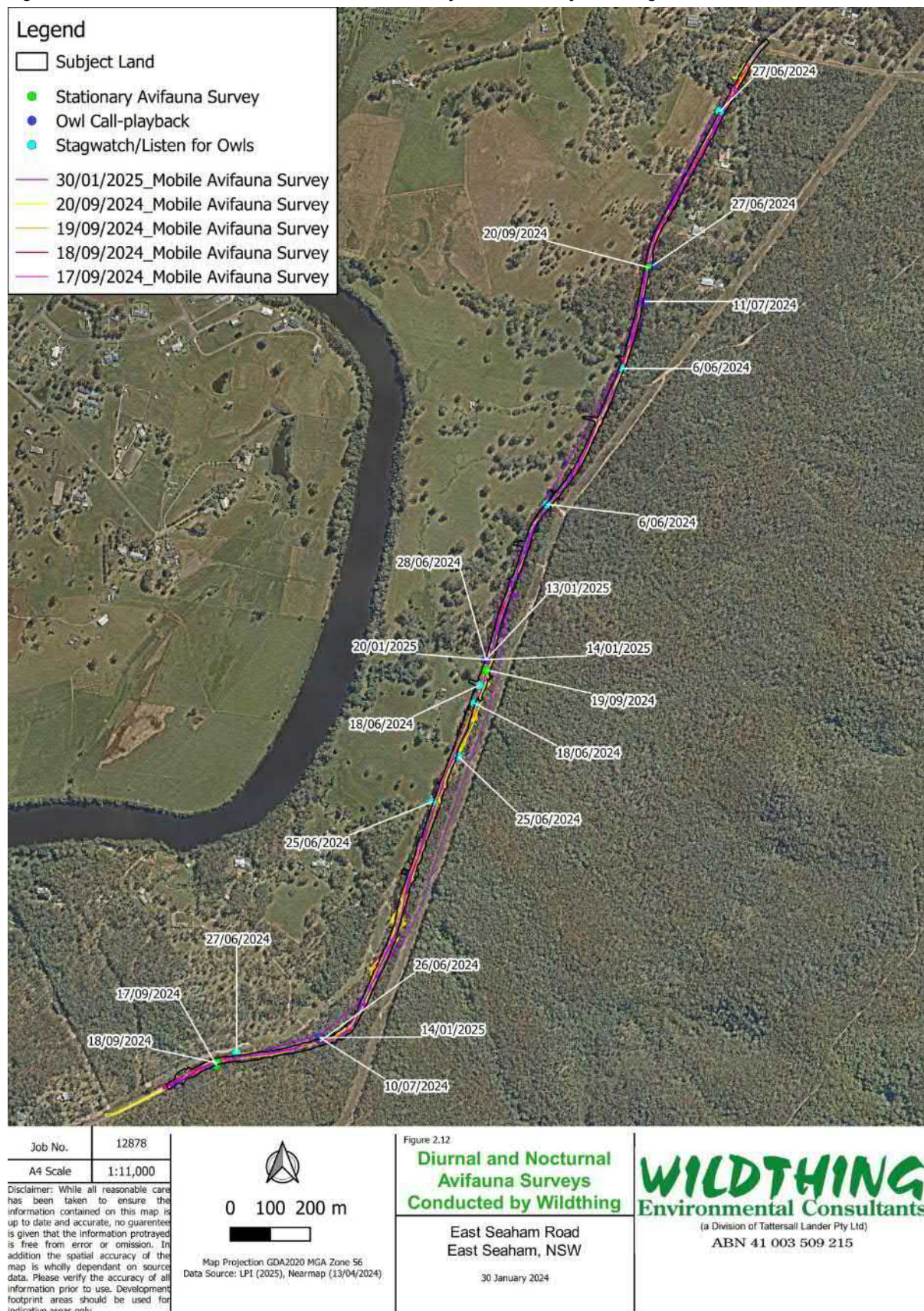


Figure 2.13 Nocturnal Avifauna Surveys conducted by Wedgetail Project Consulting



2.4.3.3 Owl Call-playback

Surveys were conducted just after dusk on calm, dry nights. Call playbacks were played after quiet listening/stagwatch or 10 minutes of listening and observing. Pre-recorded calls were broadcast for up to 15 seconds followed by at least 30 seconds of listening. During this time ecologists also watched for any appearances of owls. Broadcasting and listening were done for each owl species in the following order: Powerful Owl, Barking Owl, Sooty Owl, Masked Owl. This sequence was repeated for 1 hour (15 minutes each species) unless a target owl was detected. Call volume was gradually increased from 20% of natural volume up to 200% of natural volume with each broadcast sequence. At the end of the broadcasting, searches for owls drawn in by the calls were conducted within 60m either direction of the call location along East Seaham Road. Locations of owl-call playback surveys are shown in Figure 2.12.

2.4.3.4 Arboreal Mammals

Arboreal mammal surveys were undertaken by Wildthing Environmental Consultants and targeted the candidate species credit species *Petaurus norfolcensis* (Squirrel Glider), *Phascogale tapoatafa* (Brush-tailed Phascogale) and *Phascolarctos cinereus* (Koala). Surveys included spotlighting and camera trapping.

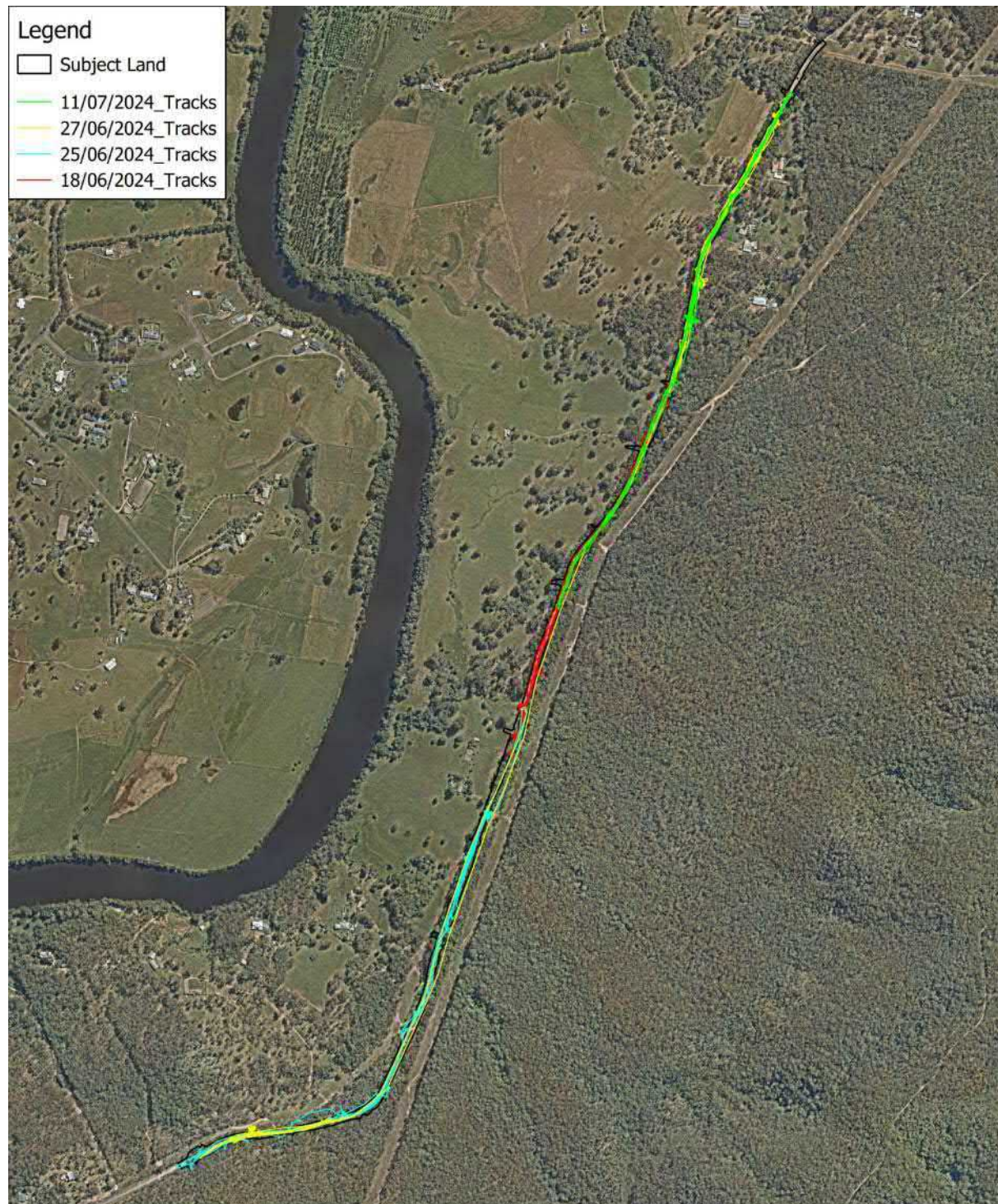
Twelve Baited Cameras were deployed for eight weeks along length of the roadside. Cameras included Swift Enduro, Reconyx Hyperfire and Browning Patriot. Each camera was positioned in a new location after five weeks. Cameras were pointed at a fixed baited canister containing a mixture of oats, peanut butter and honey. Diluted honey was sprayed around the bait station and along the trunk of the tree. Bait stations were re-sprayed with honey water after two weeks and rebaited after two or three weeks. Target trees that the cameras were pointed at were chosen based on their location (not easy to see from road and not pointing at road), evidence of fauna use (scratches on trunk) and hollow trees. The location of the camera traps within the subject land is shown in Figure 2.14.

Spotlighting was undertaken on foot using 100watt hand-held spotlights and high-powered head torches. The spotlighting involved walking at a slow pace along the edge of East Seaham Road and stopping every 2 minutes, allowing the observer to hear movements of animals. Targeted candidate species targeted included *Petaurus norfolcensis* (Squirrel Glider), *Petauroides volans* (Greater Glider), *Phascolarctos cinereus* (Koala) and *Turnix maculosus* (Red-backed Button-quail). The location of the spotlighting routes within the subject land is shown in Figure 2.15.

Figure 2.14 Arboreal Camera Locations



Figure 2.15 Spotlighting Survey Tracks



Job No.	12878
A4 Scale	1:11,000

Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependant on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.

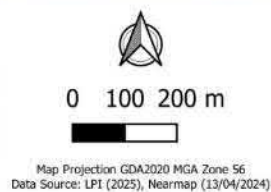


Figure 2.15

Spotlight Survey Tracks

East Seaham Road
East Seaham, NSW

28 January 2025

2.4.3.5 *Terrestrial Mammals*

To target small terrestrial mammals, small terrestrial mammal trapping was undertaken using 25 Elliott Type A traps (8x10x33cm) within the road reserve on 16 September 2024. The traps were left in place for four consecutive nights giving a total of 100 small terrestrial trap nights. The traps were hidden in thick grass, under shrubs or near fallen logs and were camouflaged with vegetation where the ground cover was sparse. The baits used for the traps were a mixture of rolled oats and honey and peanut butter. The traps were checked early each morning and, where necessary, reset and rebaited. The location of the small terrestrial traps lines is shown in Figure 2.16.

2.4.3.6 *Microchiropteran Bat Survey*

The microchiropteran bat surveys were undertaken by Wedgetail Project Consulting. AnabatTM bat-call detectors (Chorus) were used to passively record the calls of passing Microchiroptera bats. Four AnabatsTM were set up within suitable Microchiroptera bat habitat and along potential flyways and left to record for four consecutive nights between 25/01/2024 to the 30/01/2024. The calls were then analysed using Anabat Insight. The location of the microchiropteran bat call surveys is shown in Figure 2.17.

Figure 2.16 Location of Small Terrestrial Mammal Traps

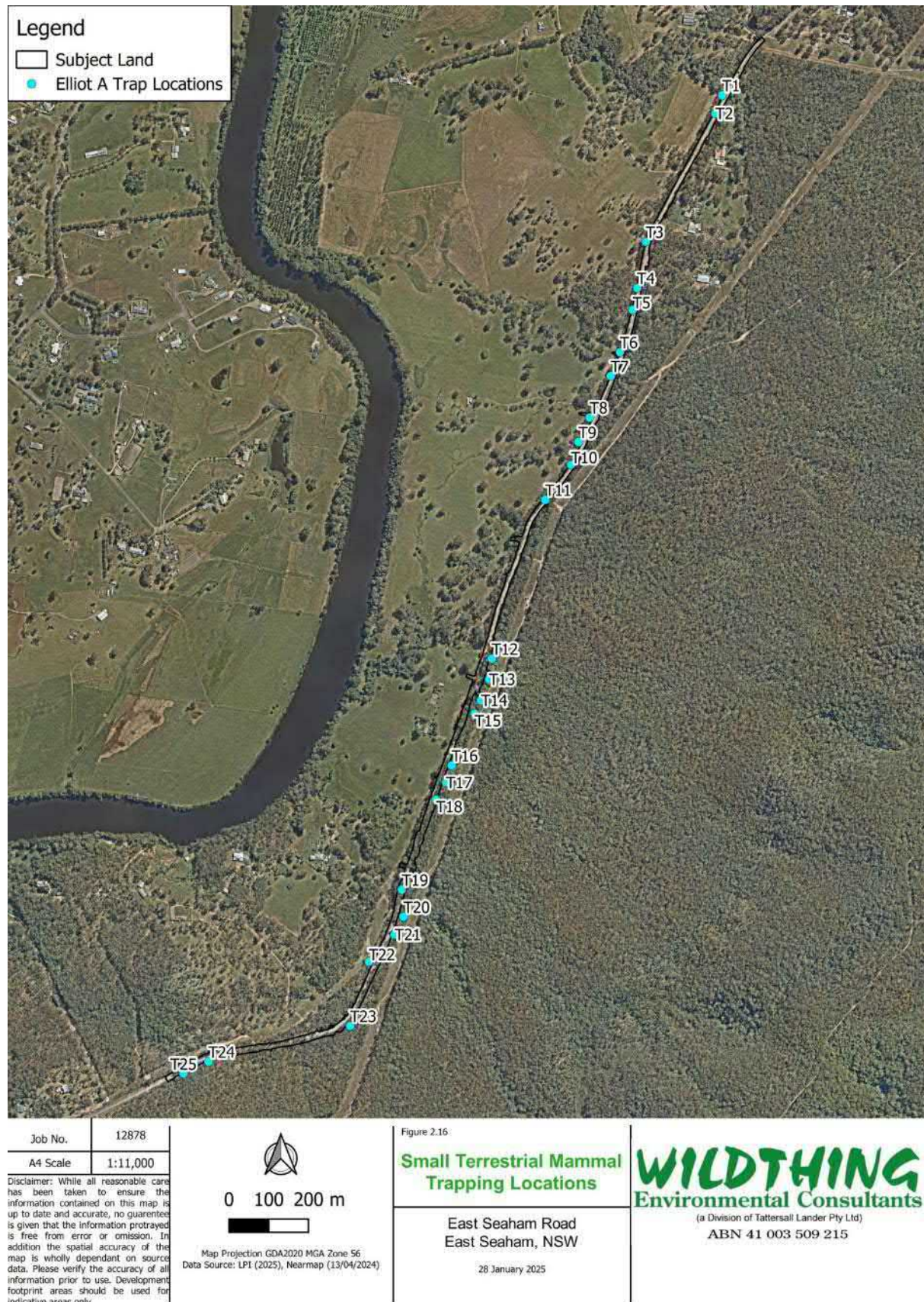
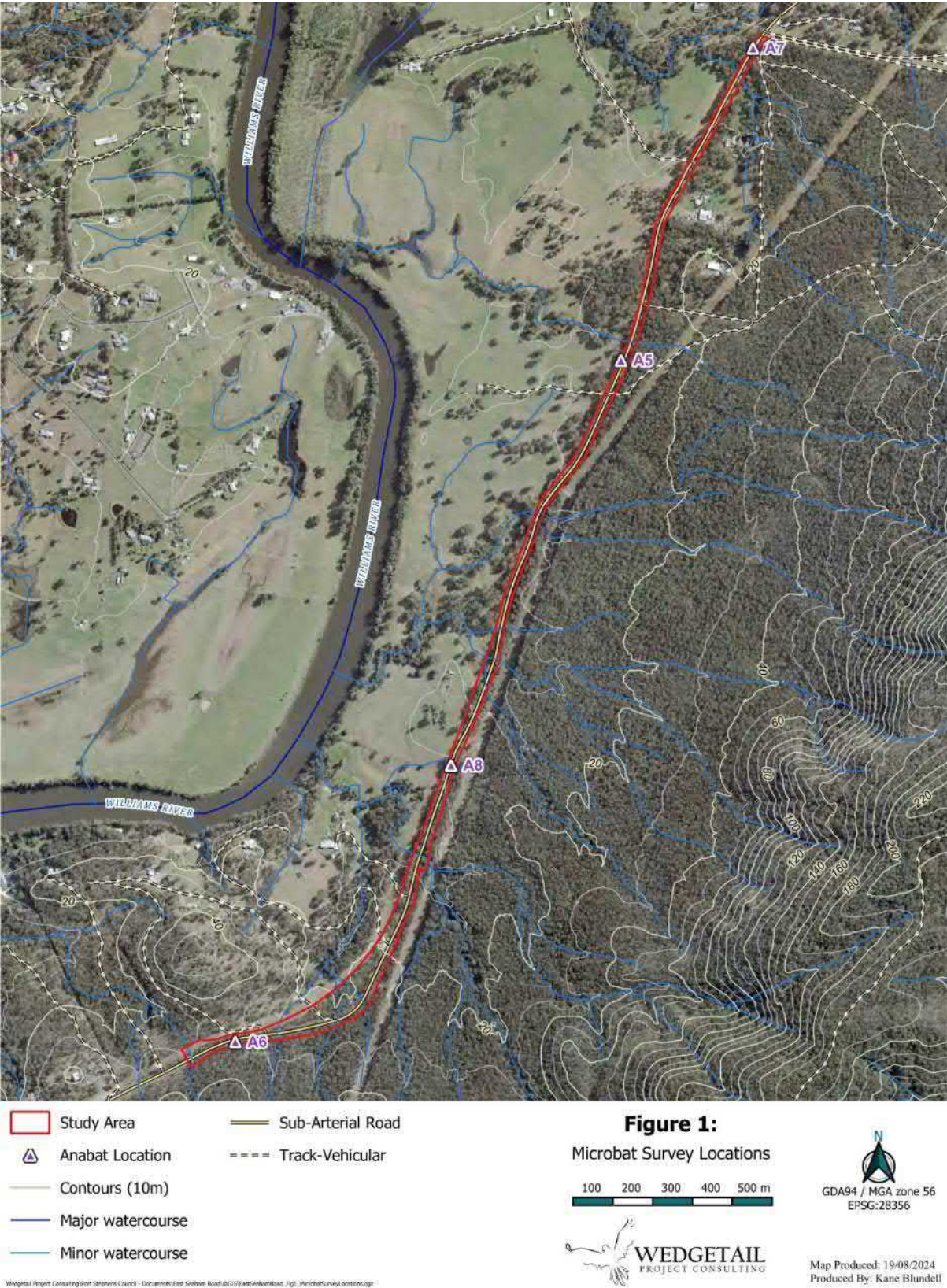


Figure 2.17 Location of Anabat Surveys conducted by Wedgetail Project Consulting



2.4.3.7 Koala Spot Assessment Technique

The Spot Assessment Technique (SAT): a tool for determining localised levels of habitat use by Koalas was undertaken by Wildthing Environmental Consultants. This method is used to obtain additional information on Koala activity within the study area. The SAT involved a radial assessment of "Koala activity" within the immediate area surrounding a tree of any species that is known to have been utilised by the species, or otherwise considered to be of some importance for Koala conservation and/or management purposes. Three assessments were undertaken within random sites of the subject land.

In the field the technique was applied as follows:

1. Locate and uniquely mark with flagging tape a tree (the centre tree) that meets one or more of the following selection criteria:
 - a. a tree of any species beneath which one or more Koala faecal pellets have been observed; and/or
 - b. a tree in which a Koala has been observed; and/or
 - c. any other tree known or considered to be potentially important for the Koala, or of interest for other assessment purposes.
2. Identify and uniquely mark the 29 nearest trees to the centre tree,
3. Undertake a search for the Koala faecal pellets beneath each of the 30 marked trees based on a cursory inspection of the undisturbed ground surface within a distance of 200 centimetres around the base of each tree, followed (if no faecal pellets are initially detected) by a more thorough inspection involving disturbance of the leaf litter and ground cover within the prescribed search area.

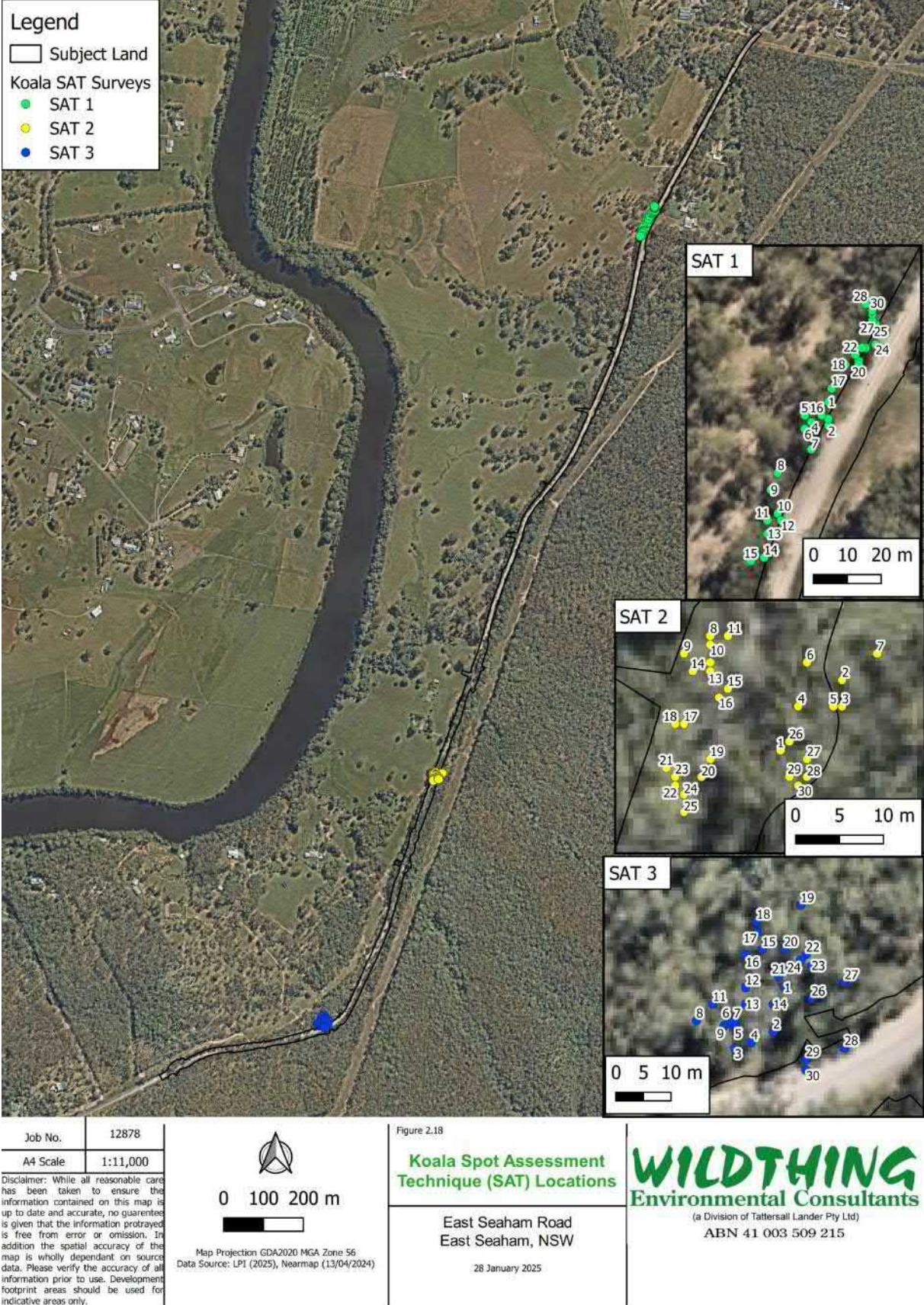
Two-person minutes per tree was dedicated to the faecal pellet search. The search of an individual tree was concluded once a single faecal pellet has been detected or when the maximum search time has expired, whichever happens first. This process was repeated until each of the 30 trees in the site had been assessed.

The location of the SAT surveys is shown in Figure 2.18.

2.4.3.8 Incidental Observations and Secondary Indications

All incidental observations and secondary indications such as the presence of scats were recorded by Wildthing Environmental Consultants and Wedgetail Project Consulting.

Figure 2.18 Spot Assessment Surveys



2.5 Weather conditions

Survey effort, dates and timing and conditions are presented in Table 2.1. It should be noted that NSW has experience a high amount of rainfall in the month leading up to surveys undertaken within the subject land. The ground was noted to be wet underfoot, with visible pooling of water in low-lying depressions.

Table 2.1 Environmental conditions during threatened species surveys

Survey undertaken (e.g. method / targeted species)	Date	Time	Survey Effort (Person Hours)	Temperature (min.)	Temperature (max.)	Wind (light, mod...)	Rainfall (mm) at weather station	Other conditions relevant to the species
Stag-watching	21/08/2023	1730 - 1900	3 h (two persons)	5.8	22.8	26km/hr WSW	0	
Stag-watching	22/08/2023	1730 - 1900	3 h (two persons)	5.2	25.3	19km/hr SE	0	
Stag-watching	23/08/2023	1730 - 1900	3 h (two persons)	9.8	21.0	33km/hr NW	0.6	
Stag-watching	24/08/2023	1730 - 1900	3 h (two persons)	10.8	20.7	24km/hr ESE	1.0	
Stag-watching	28/08/2023	1730 - 1900	3 h (two persons)	5.7	22.5	No data	0	
Stag-watching	29/08/2023	1730 - 1900	3 h (two persons)	4.7	24.1	No data	0	
Stag-watching	30/08/2023	1730 - 1900	3 h (two persons)	6.1	26.6	41km/hr SSW	0	
Threatened Flora Surveys	06/09/2023	0830 - 1430	6 h (One person)	5.4	24.2	No data	0	
Threatened Flora Surveys	07/09/2023	0830 - 1430	6 h (One person)	6.1	28.8	No data	0	
Threatened Flora Surveys	08/09/2023	0830 - 1230	4 h (One person)	15.9	20.6	No data	1.2	
Threatened Flora Surveys	13/09/2023	0930 - 1530	6 h (One person)	5.0	25.2	No data	0	
Threatened Flora Surveys	23/09/2023	0900 - 1100	2 h (One person)	5.6	20.0	28km/hr SE	0	
Threatened Flora Surveys	03/10/2023	0800 - 1500	21 h (Three persons)	11.4	37.2	No data	0	
Threatened Flora Surveys	04/10/2023	0800 - 1000	4 h (Two persons)	12.5	32.5	No data	0	

Survey undertaken (e.g. method / targeted species)	Date	Time	Survey Effort (Person Hours)	Temperature (min.)	Temperature (max.)	Wind (light, mod...)	Rainfall (mm) at weather station	Other conditions relevant to the species
Threatened Flora Surveys	18/10/2023	1130 - 1230	1 h (One person)	8.8	23.1	33km/hr SE	0.8	
Threatened Flora Surveys	15/11/2023	0830 - 1530	14 h (Two persons)	18.6	32.8	41km/hr SSE	0	
Threatened Flora Surveys	17/11/2023	1000 - 1100	2 h (Two persons)	15.9	21.9	37km/hr SSW	6.2	
Anabat detectors set	25/01/2024							
Anabat detectors retrieved	30/01/2024							
Site induction, Set Camera Traps	07/05/2024	0800 - 1400	12 h (two persons)	8	21	Calm	15.4	
Spray bait station with watered down honey	22/05/2024	1000 - 1045	0 h 45 min (One person)	9	20	17km/hr WNW	0.6	
Rebait camera traps	28/05/2024	0900 - 1045	1 h 45 min (One person)	5	21	9km/hr NW	0.2	
Stagwatch and quiet listening	06/06/2024	1650 - 1820	3 h (Two persons)	78	18	Calm	3.2	
Move Camera Traps	12/06/2024	0830 - 1215	7 h 30 min (Two persons)	10	20	20km/hr WNW	0	
Stagwatch, quiet listening and spotlight	18/06/2024	1630 - 1915	5 h 30 min (Two persons)	6	17	11km/hr WNW	0	
Rebait bait stations, Stagwatch, quiet listening and spotlight	25/06/2024	1430 - 1915	9 h 30 min (Two persons)	5	19	Calm	0.2	
Owl Call Playback	26/06/2024	1955 - 2105	1 h 10 min (One person)	5	22	Calm	0.2	
Stagwatch, quiet listening, owl call playback and spotlight	27/06/2024	1640 - 1940	6 h (Two persons)	4	19	Calm	0	
Owl Call Playback	28/06/2024	1830 - 1950	1 h 20 min (One person)	5	18	15 SE	0.2	
Retrieve cameras	03/07/2024	0945 - 1045	1 h (One person)	9	17	24 SSE	20	
Owl call-playback	10/07/2024	1700 - 1915	1 h 15 min (One person)	8	18	5 NE	0	
Owl call playback and spotlight	11/07/2024	1740 - 2055	6 h 30 min (Two persons)	6	18	Calm	0.2	

Survey undertaken (e.g. method / targeted species)	Date	Time	Survey Effort (Person Hours)	Temperature (min.)	Temperature (max.)	Wind (light, mod...)	Rainfall (mm) at weather station	Other conditions relevant to the species
Set ground traps	16/09/2024	0830 – 1245	12 h 45 min (Three persons)	6	21	20km/hr W	0	
Check traps, Avifauna survey	17/09/2024	0630 – 0815	1 h 45 min (One person)	9	19	Calm	0	
Check traps, Avifauna survey	18/09/2024	0615 - 0800	1 h 45 mins (Two persons)	7	26	Calm	0	
Check traps, Avifauna survey	19/09/2024	0615 – 0845	2 h 30 min (One person)	6	27	Calm	0	
Retrieve traps, Avifauna survey	20/09/2024	0615 - 0830	4 h 30 min (Two persons)	8	25	6km/hr NE	0	
Koala SAT survey	06/01/2025	1710 - 1830	1 h 20 min (One person)		36.8	18km/hr E	0	1/8 Cloud, 24% relative humidity
Owl Call Playback survey	13/01/2025	2115 - 2245	1h 30 min (One person)	24.1	33.2	7km/hr ENE	0	7/8 Moon, 67% relative humidity
BAM Plots, Koala SAT surveys	14/01/2025	0830 - 1400	16 h 30 min (Three persons)	19	33	7km/hr NE	0	6/8 Cloud, 80% relative humidity
Owl Call Playback survey	14/01/2025	2100 - 2230	3 h (Two persons)	20	35	9km/hr ENE	0	8/8 moon, 3/8 Cloud, 61% relative humidity. Nearby lightning ended the survey early
Owl Call Playback survey	20/01/2025	2040 - 2140	1 h (One person)	15	25	5km/hr SSE	0	0/8 moon, 0/8 Cloud, 68% relative humidity.
Avifauna Survey	30/01/2025	730 – 930	4.0 h (Two persons)	20	26	6km/hr NW	11.8	8/8 cloud, 93% relative humidity

2.6 Limitations

Limiting factors included the detection of species with large home ranges such as *Dasyurus maculatus* (Tiger Quoll) and Large Forest Owls. Climate variability may also affect the occurrence of some species such as *Lathamus discolor* (Swift Parrot) and *Anthochaera phrygia* (Regent Honeyeater). It was also noted during SAT surveys that the roadside vegetation was coated in grey dust from fine gravel spread along the road. Pluming dust was noted to be excessive when vehicles travelled the road. Excessive noise of heavy vehicles utilising the deteriorating gravel road was also observed. Heavy vehicles could be heard from a far distance, especially during nocturnal surveys.

Limitations have been overcome by applying the precautionary principle in all cases where the survey methodology may have given a false negative result. This precautionary principle was achieved by recognising that most threatened species are rare and therefore unlikely to be encountered during a survey even if they may utilise the study area at other times. These species have been assessed on the basis of the presence of their habitat and the likely significance of that habitat to a viable local population.

2.7 Licences

Fieldwork undertaken by Wildthing Environmental Consultants was carried out under the NPWS Scientific Investigation Licence SL 100345 and under Animal Care and Ethics Approval: Animal Research Authority Issue by the Director General of NSW Agriculture (File No. TRIM 13/251) for the Fauna Survey for Biodiversity and Impact Assessment.

3.0 Site context

3.1 Assessment area

This Section of the report describes the landscape context, including the landscape features present within the subject land including a 500-metre buffer (for linear shaped land) from the centre line of the road (the assessment area), as required by the BAM (DPIE 2020a). The assessment was a total area of 389.81ha. The assessment area has been presented in Figure 3.1.

3.2 Landscape features

3.2.1 IBRA bioregions and IBRA subregions

Interim Biogeographic Regionalisation for Australia (IBRA) Bioregions are large, geographically distinct areas of land with common characteristics such as geology, landform patterns, climate, ecological features, and flora and fauna communities. The subject land is located within the NSW North Coast IBRA Bioregion and the Upper Hunter IBRA Subregion (DAWE 2016). Both IBRA and IBRA Subregional Boundaries do not occur near the subject land and hence are not shown within any Figures.

3.2.2 Rivers, streams, estuaries and wetlands

The subject land occurs within the Williams River Catchment. A number of first and second order prescribed streams, and one third order prescribed stream pass through culverts within the subject land. There were also a number of dams located within close proximity to the subject land.

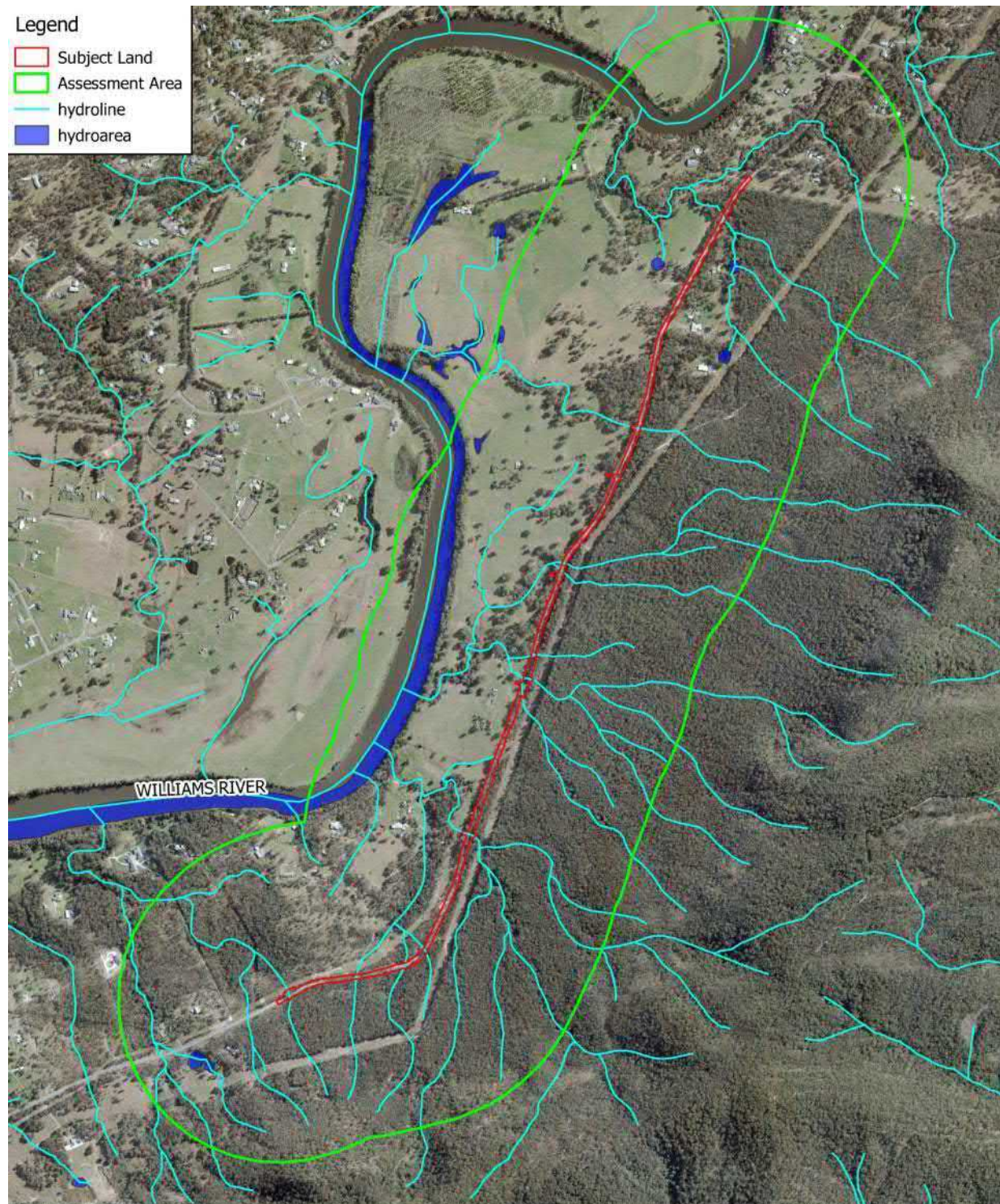
No wetlands were located within the 500m assessment area or within close proximity. Prescribed streams within the assessment area are shown in Figure 3.1.

3.2.3 Habitat connectivity

According to the Fauna Key Habitats and Corridors for North East NSW (DPIE 2011), Key Fauna Habitat is mapped within the centre and north of the subject land while Fauna Corridors are mapped along the east of the subject land, in Wallaroo National Park. A north-south connection runs along either side of the East Seaham Road however it is somewhat fragmented by driveways into residential lots and more so in the north where a 30m powerline easement runs alongside East Seaham Road. The canopy along East Seaham Road is connected to a large, continuous, forested patch of habitat as part of Wallaroo National Park in the east, north and south. To the west this habitat is connected to forested patches, scattered trees and open paddocks within residential lots. The current connection between either sides of East Seaham Road is relatively strong in the centre and south of the study area with canopies almost overlapping in some spots over the two-lane road.

Both Key Fauna Habitat and Fauna Corridors of NE NSW within the assessment area are shown in Figure 3.2.

Figure 3.1 Assessment area showing Prescribed Streams and Water Bodies



Job No.	12878
A4 Scale	1:115,000
Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependant on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.	

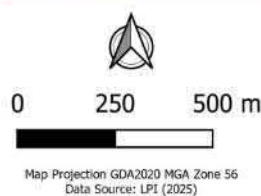


Figure 3.1

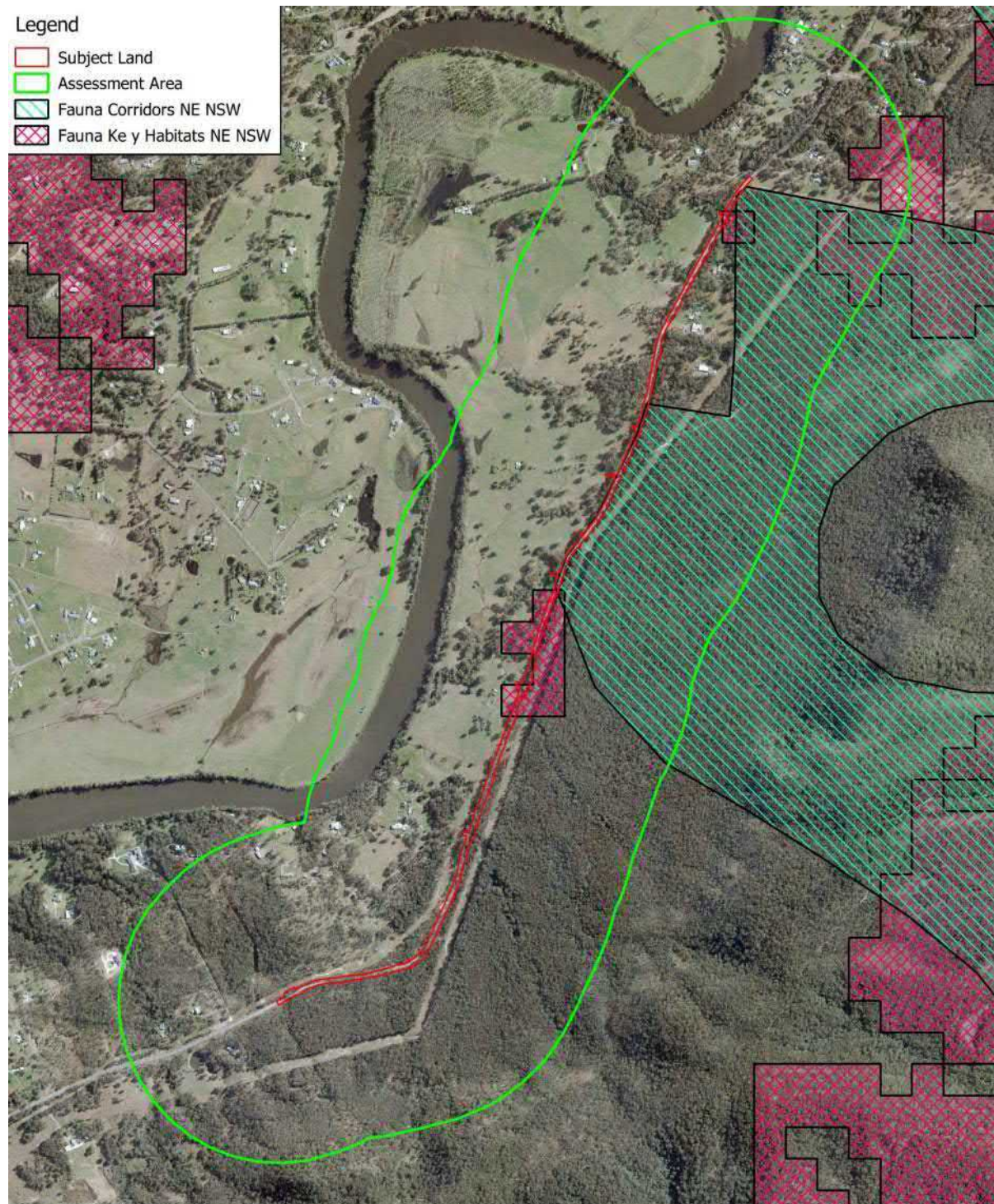
**Prescribed Streams
and Waterbodies**

East Seaham Road
East Seaham, NSW

28 January 2025

WILDTHING
Environmental Consultants
(a Division of Tattersall Lander Pty Ltd)
ABN 41 003 509 215

Figure 3.2 Key Fauna Habitat and Corridors within Assessment area



Job No.	12878
A4 Scale	1:15,000

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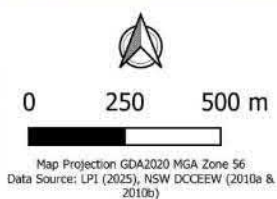


Figure 3.2

Key Fauna Habitat and Corridors

East Seaham Road
East Seaham, NSW

28 January 2025

3.2.4 Karst, caves, crevices, cliffs, rocks or other geological features of significance

No significant geological features were present within the subject land.

3.2.5 Areas of outstanding biodiversity value

No areas of outstanding biodiversity value were identified within the subject land or assessment area.

3.2.6 BioNet Landscapes NSW

The subject land fell within one BioNet Landscape (formerly Mitchell Landscapes) (DPIE 2017) Newcastle Coastal Ramp. The majority of the assessment area fell within the Newcastle Coastal Ramp while some parts fell into Lower Hunter Channels and Floodplains landscape. BioNet Landscapes occurs within subject land and assessment area are shown in Figure 3.2.

3.2.7 Geology and Soils

The subject land occurred on two Soil Landscapes, Glen William variant a in the northern 3 quarters of the subject land and Ten Mile Road in the southern quarter. Other Soil Landscapes within the assessment area include Glen William, Ten Mile Road variant a and Williams River Soil Landscapes. Glen William variant a consists of level plain to gently undulating rises comprised of footslopes and drainage plains on Carboniferous acid volcanics and sediment. Soil consists of deep (100 - <150 cm), imperfectly to poorly drained Brown Kurosols (Brown Podzolic Soils) (DPIE 2020f). Ten Mile Road Soil Landscape includes undulating low hills to rolling low hills on Carboniferous sediments and volcanics with shallow to deep (25 - <150 cm), well to imperfectly drained Brown Kurosols (Yellow Podzolic Soils and Soloths) and shallow (25 - <50 cm) well-drained Leptic Tenosols (Bleached Loams/Lithosols) (DPIE 2020f). Figure 3.3 shows the occurrence of Soil Landscapes within and in proximity to the subject land.

3.2.8 Important Areas Map

The Important Areas Map was consulted on 9 January 2025 and no important habitat mapping occurs within or in close proximity to the subject land.

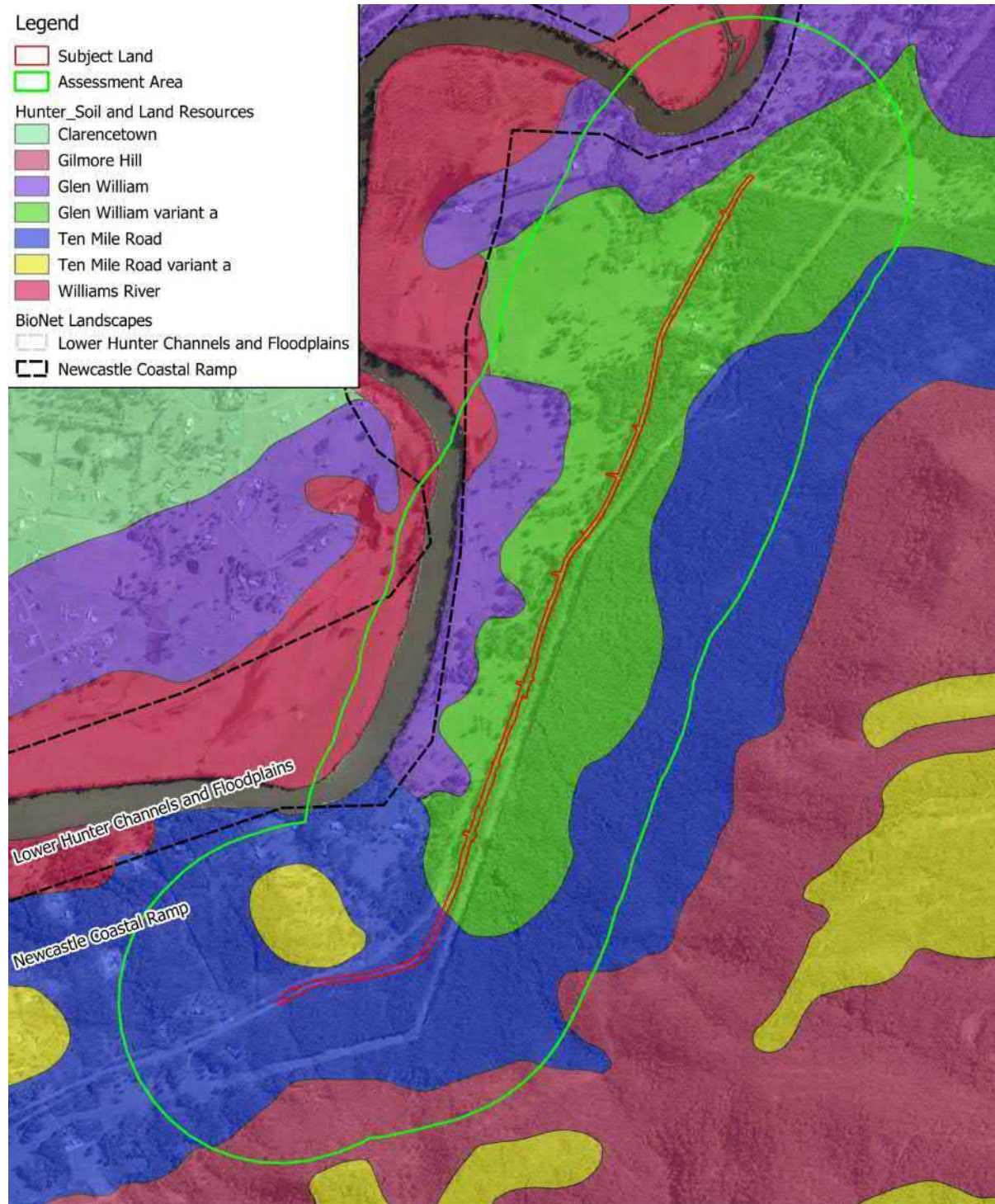
3.3 Native vegetation cover

Approximately 290.50ha of native vegetation was mapped within the 405.35ha assessment area (subject land and 500m buffer for linear development surrounding the outer boundary of the subject land). Native vegetation cover within the assessment area is approximately 71.66 (72%) and falls within class d (>70%) according to the BAM (2020c). Table 3.1 summarises the extent of native vegetation cover within the assessment area. Figure 3.4 shows native vegetation cover within the assessment area.

Table 3.1 Native vegetation cover in the assessment area

Assessment area (ha)	405.35
Total area of native vegetation cover (ha)	290.50
Percentage of native vegetation cover (%)	71.66%
Class (0-10, >10-30, >30-70 or >70%)	>70%

Figure 3.3 Occurrence of Soil Landscapes and BioNet (Mitchell) Landscapes within the Assessment area



Job No.	12878
A4 Scale	1:15,000

Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependant on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.

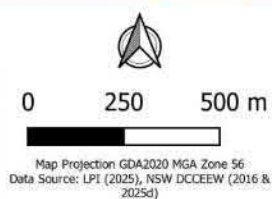
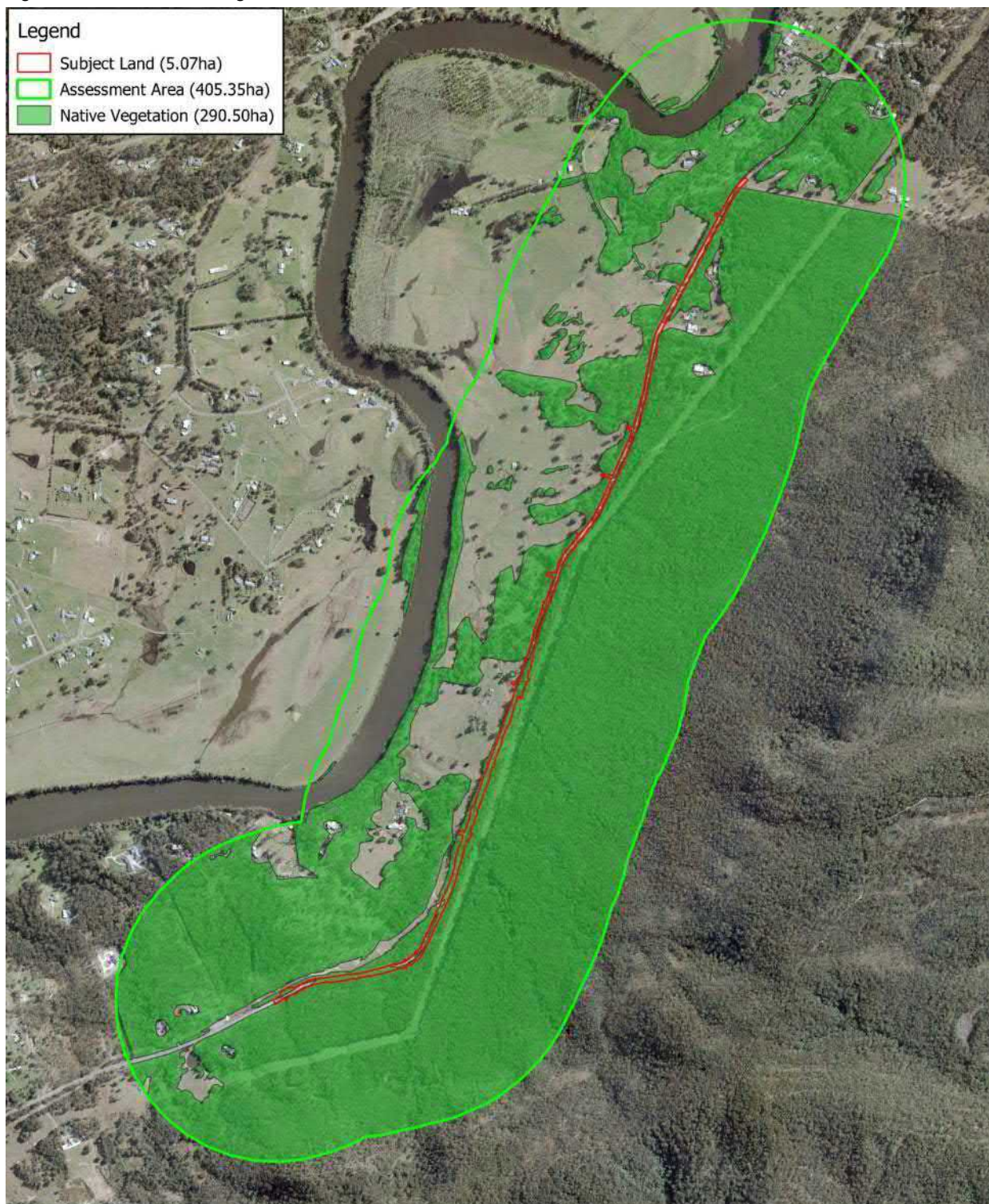


Figure 3.3
BioNet and Soil Landscapes
East Seaham Road
East Seaham, NSW
28 January 2025

Figure 3.4 Native Vegetation within the Assessment area.



Job No.	12878
A4 Scale	1:15,000
Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependant on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.	

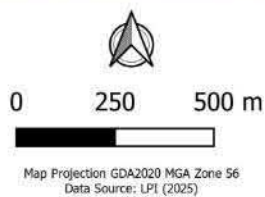


Figure 3.4

Native Vegetation

East Seaham Road
East Seaham, NSW

28 January 2025

3.4 Past and current disturbance to native vegetation

Prior to European settlement the area along the section of East Seaham Road within the subject land, and the adjoining land would have been native bushland. European settlement is first documented in area in approximately 1830 with clearing for housing, farming and agriculture commencing, East Seaham Road was constructed between 1840 and 1860. The power line easement to the east of East Seaham Road within the subject land was installed between 1974 and 1976 (Wedgetail Project Consulting 2024a).

The majority of the section of East Seaham Road within the study area adjoins Wallaroo National Park to the east. The National Park was formerly Wallaroo State Forest (reserved in 1922), It was then dedicated as Wallaroo Nature Reserve in 1999 and then reclassified as Wallaroo National Park in 2007 (Wedgetail Project Consulting 2024a).

The vegetation within the site is subject to continued disturbances such as road maintenance activities (Plates 3.1 and 3.2), dust incursion from the gravel road (Plates 3.3 and 3.4) and noise pollution from the deteriorating gravel road.



Plate 3.1: Grading and rolling of East Seaham Road within the study area.



Plate 3.2: Erosion, gravel incursion and dust from continued gravel road maintenance.



Plate 3.3: Dust from the gravel road after a vehicle had passed through.



Plate 3.4: Gravel incursion and dust from continued gravel road maintenance and vehicles passing through.

4.0 Native vegetation, threatened ecological communities and vegetation integrity

4.1 Native vegetation extent

Approximately 290.50ha of native vegetation was mapped within the 405.35ha assessment area (Native vegetation cover within the assessment area is approximately 72% and falls within Class d. >70% according to the BAM (2020c)). Figure 3.4 shows the native vegetation extent within the assessment area.

4.1.1 Changes to the mapped native vegetation extent

Native vegetation within the subject land was found to reflect the review of aerial mapping interpretation and did not appear to be recently altered, with the exception of road grading and gravel replacement.

4.1.2 Areas that are not native vegetation

Areas of non-native vegetation were present within sections of the road reserve. These areas were largely dominated by introduced grasses, *Cenchrus clandestinus* (Kikuyu), *Chloris gayana* (Rhodes Grass), *Axonopus fissifolius* (Narrow-leaved Carpet Grass), *Paspalum dilatatum* (Paspalum) and other introduced ground covers particularly *Plantago lanceolata* (Plantain) and *Senecio madagascariensis* (Fireweed). In total 0.44ha of non-native vegetation was mapped within the subject land. Examples of non-native vegetation within the subject land are presented in Plates 4.1 – 4.3.



Plate 4.1: Non-native vegetation on the western side of East Seaham Road (right of plate).



Plate 4.2: Non-native vegetation in the north of the subject land (facing south, left side of plate).



Plate 4.3: Non-native vegetation in the north of the subject land (facing north, right side of plate)

4.2 Plant Community Types

4.2.1 Overview

Vegetation within the subject land has been assessed by Wedgetail Project Consulting as aligning with the BioNet Vegetation Classification Plant Community Types (PCTs) identified within Table 4.1. BioNet Vegetation Classification bulk export data of all PCT's was downloaded and filtered. Filters (search terms) were applied to determine the most consistent PCT including flora species within each stratum within the vegetation assemblage. Detailed descriptions of each PCT are provided in the following subsections.

The extent of PCTs and areas of non-native vegetation are shown in Figures 4.1-4.4.

Table 4.1 PCTs identified within the subject land

PCT ID	PCT name	Subject land area (ha)
3433	Hunter Coast Foothills Spotted Gum – Ironbark Grassy Forest	1.70
4042	Lower North Riverflat Eucalypt-Paperbark Forest	0.43
Total area		2.13

4.2.1.1 PCT 3433 - Hunter Coast Foothills Spotted Gum – Ironbark Grassy Forest

Table 4.2 PCT 3433 - Hunter Coast Foothills Spotted Gum – Ironbark Grassy Forest

PCT 3433 - Hunter Coast Foothills Spotted Gum – Ironbark Grassy Forest	
PCT ID	PCT 3433
PCT name	Hunter Coast Foothills Spotted Gum – Ironbark Grassy Forest
Vegetation Formation	Dry Sclerophyll Forests (Shrub/grass sub-formation)
Vegetation Class	Hunter-Macleay Dry Sclerophyll Forests
Per cent cleared value (%)	68.60
Extent within subject land (ha)	1.70ha
Justification of PCT selection by Wedgetail Project Consulting (2024a)	The vegetation is a forest formation with a mixed grassy and shrubby understorey, and due to its location within the lower North Coast / Hunter Region the vegetation falls within the Hunter Macleay Dry Sclerophyll Forest vegetation class. Other possible PCT's considered A VIS Database search was conducted using the following criteria; Hunter Macleay Dry Sclerophyll Forest, Upper Hunter IBRA Sub-region and <i>Corymbia maculata</i> as a diagnostic species, and the following PCTs were identified: •3433: Hunter Coast Foothills Spotted Gum-Ironbark Grassy Forest; •3441: Lower Hunter Clay Heath; •3442: Lower Hunter Lowland Ironbark-Paperbark Forest;

PCT 3433 - Hunter Coast Foothills Spotted Gum – Ironbark Grassy Forest

- 3444: Lower Hunter Spotted Gum-Ironbark Forest;
- 3446: Lower North Foothills Ironbark-Box-Gum Grassy Forest;
- 3431: Central Hunter Ironbark Grassy Woodland;
- 3432: Hunter Coast Foothills Apple-Ironbark Grassy Forest;
- 3436: Hunter Coast Sandy Creekflat Low Paperbark Scrub.

Reason for exclusion of PCTs

- 3441: Community dominated by *Eucalyptus umbra* (Broad-leaved White Mahogany) and has a dense shrubby layer, which does not match the vegetation within the study area.
- 3442: The landform and floristic description of this PCT match the vegetation on site relatively well. However, this PCT did not list *Eucalyptus crebra* (Narrow-leaved Ironbark) as occurring.
- 3444: PCT is described as occurs between Sugarloaf to Broke.
- 3446: The landform and floristic description of this PCT match the vegetation on site relatively well. However, this PCT lacks a dominance of *Eucalyptus fibrosa* (Red Ironbark) and *Melaleuca nodosa* (Prickly-leaved Paperbark) in the floristic description.
- 3431: PCT is described as occurs between Rothbury, Wybong and Scone.
- 3432: PCT is dominated by *Angophora costata* and *Corymbia gummifera* in association with Ironbark's and *Corymbia maculata*.
- 3436: PCT is dominated by *Melaleuca* trees.

Selection of chosen PCT based on floristics

Corymbia maculata (Spotted Gum), *Eucalyptus fibrosa* (Red Ironbark), *Eucalyptus umbra* (Broad-leaved White Mahogany), *Acacia falcata* (Hickory Wattle), *Acacia ulicifolia* (Prickly Moses), *Melaleuca nodosa* (Prickly-leaved Paperbark), *Aristida vagans* (Threeawn Speargrass), *Themeda australis* (Kangaroo Grass), *Entolasia stricta* (Wiry Panic), *Lobelia purpurascens* (Whiteroot), *Lomandra multiflora* subsp. *multiflora* (Many-flowered Mat-rush).

Description of PCT 3433 within the subject land

The vegetation within the study area is dominated by *Corymbia maculata* (Spotted Gum) and *Eucalyptus fibrosa* (Red Ironbark) with *Eucalyptus paniculata* (Grey Ironbark) and *Eucalyptus crebra* (Narrow-leaved Ironbark) co-dominating in patches. *Eucalyptus tereticornis* (Forest Red Gum) also occurs throughout. *Eucalyptus umbra* (Broad-leaved White Mahogany) occurs in the south of the study area, and there is a very scattered occurrence of *Eucalyptus punctata* (Grey Gum) and occasional *Eucalyptus moluccana* (Grey Box) in the north.

The mid-storey dense to sparse in areas and is dominated by *Melaleuca nodosa* (Prickly-leaved Paperbark), with *Bursaria spinosa* (Blackthorn), *Acacia falcata*, *Acacia irrorata* (Green Wattle) *Persoonia linearis* (Narrow-leaved Geebung) also occurring.

The shrub layer is scattered and dominated by *Pultenaea villosa* (Hairy Bush-pea), *Jasminum volubile*, *Hibbertia aspera* (Rough Guinea Flower), *Leucopogon juniperinus* (Prickly Beard-heath), *Breynia oblongifolia* (Coffee Bush) and *Daviesia ulicifolia* (Grose Bitter Pea).

The ground layer is dominated by a mixture of grasses and forbs including *Aristida vagans* (Threeawn Speargrass), *Entolasia stricta* (Wiry Panic), *Imperata cylindrica* (Blady Grass), *Themeda triandra* (Kangaroo Grass), *Lobelia purpurascens* (Whiteroot), *Lomandra multiflora* subsp. *multiflora* (Many-flowered Mat-rush) and *Lepidosperma laterale* (Variable Sword-sedge).

PCT 3433 - Hunter Coast Foothills Spotted Gum – Ironbark Grassy Forest

	The climber <i>Parsonsia straminea</i> (Common Silkpod) dominates in some areas.
Condition States	The vegetation on site is in two conditions: •Good condition vegetation containing all vegetation strata. •Cleared vegetation containing only groundcover and some areas with a midstorey. These areas are actively managed under powerline easements or grazed (small area on private property in the south). Vegetation Zones are described in Section 4.4.
BC Act Status	Consistent with Lower Hunter spotted Gum – Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions.
EPBC Act Status	Not listed

Examples of PCT 3433 within the study area (Plates 4.4– 4.6).



Plate 4.4 PCT 3433 within the south of subject land on the western side of East Seaham Road.

PCT 3433 - Hunter Coast Foothills Spotted Gum – Ironbark Grassy Forest



Plate 4.5 PCT 3433 within the north of the study area (facing north)



Plate 4.6 PCT 3433 within the south of the study area (facing north)

4.2.1.2 PCT 4042 - Lower North Riverflat Eucalypt-Paperbark Forest

Table 4.3 PCT 4042 - Lower North Riverflat Eucalypt-Paperbark Forest

PCT 4042 - Lower North Riverflat Eucalypt-Paperbark Forest	
PCT ID	PCT 4042
PCT name	Lower North Riverflat Eucalypt-Paperbark Forest
Vegetation Formation	Forested Wetland
Vegetation Class	Coastal Floodplain Wetlands
Per cent cleared value (%)	73.11
Extent within subject land (ha)	0.43ha
Justification of PCT selection by Wedgetail Project Consulting (2024a)	The vegetation consists of a forest formation and occurs on the edge of the larger floodplain of the Williams River. Due to this landform location and vegetation structure the vegetation falls within the Coastal Floodplain Wetland vegetation class. Other possible PCT's considered A VIS Database search was conducted using the following criteria; Coastal Floodplain Wetland, Upper Hunter IBRA Sub-region and <i>Eucalyptus tereticornis</i> (Forest Red Gum) as a diagnostic species, and only one PCT was identified – 4042. Reason for exclusion of PCTs - Selection of chosen PCT based on floristics -
Description of PCT 3433 within the subject land	The vegetation is dominated by <i>Eucalyptus tereticornis</i> (Forest Red Gum), with <i>Corymbia maculata</i> (Spotted Gum) and <i>Eucalyptus paniculata</i> (Grey Ironbark) also occurring. There are occasional occurrences of <i>Angophora floribunda</i> (Rough-barked Apple) and <i>Eucalyptus umbra</i> (Broad-leaved White Mahogany). The midstorey is dominated by <i>Melaleuca linariifolia</i> (Flax-leaved Paperbark), <i>Melaleuca styphelioides</i> (Prickly-leaved Tea Tree), <i>Alphitonia excelsa</i> (Red Ash) and <i>Backhousia myrtifolia</i> (Grey Myrtle). The shrub and ground layer are dominated by <i>Pittosporum multiflorum</i> (Orange Thorn), <i>Breynia oblongifolia</i> (Coffee Bush), <i>Jasminum volubile</i> (Stiff Jasmine), <i>Microlaena stipoides</i> var. <i>stipoides</i> (Weeping Grass), <i>Dichondra repens</i> (Kidney Weed) and <i>Dianella caerulea</i> var. <i>producta</i>. A number of climbers and ground creepers occur within the community including <i>Parsonsia straminea</i> (Common Silkpod), which dominates in some areas, and <i>Geitonoplesium cymosum</i> (Scrambling Lily), <i>Pandorea pandorana</i> (Wonga Wonga Vine) and <i>Cissus antarctica</i> (Water Vine). The exotic species <i>Lantana camara</i> (Lantana) dominates the understorey in portions of the community.
Condition States	The vegetation is present on site in one condition: •Good condition vegetation containing all vegetation strata.

PCT 4042 - Lower North Riverflat Eucalypt-Paperbark Forest

	Vegetation Zones are described in Section 4.4.
BC Act Status	Consistent with Subtropical Coastal Floodplain Forest of the NSW North Coast bioregion
EPBC Act Status	Consistent with Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions

Examples of PCT 4042 within the study area (Plates 4.7 – 4.9).



Plate 4.7 PCT 4042 within the centre of subject land (facing north)

PCT 4042 - Lower North Riverflat Eucalypt-Paperbark Forest



Plate 4.8 PCT 4042 within the centre of the study area (facing south)

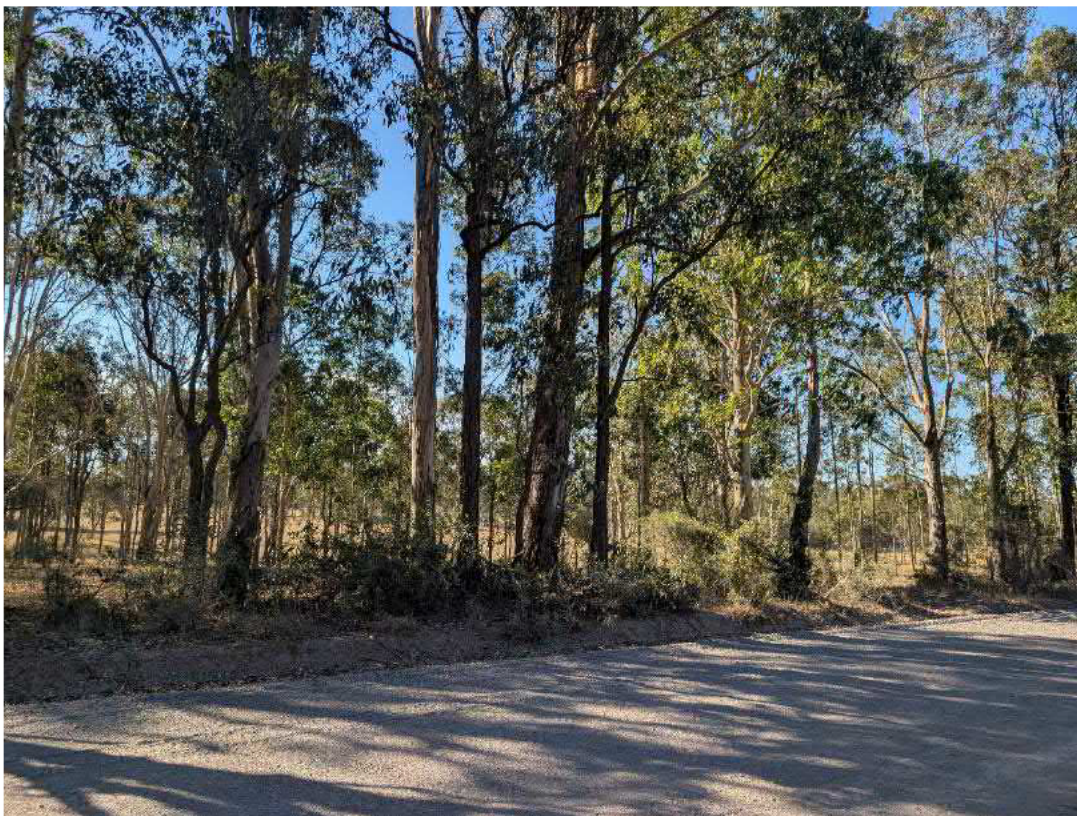


Plate 4.9 PCT 4042 within the north of the study area (facing west)

Figure 4.1 PCT's and areas of non-native vegetation within the subject land mapped by Wedgetail Project Consulting (Section 1)



Job No.	12878
A4 Scale	1:3,200

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0 50 100 m

Map Projection: GDA2020 MGA Zone 56
Data Source: LPI (2025), Nearmap (13/04/2024)

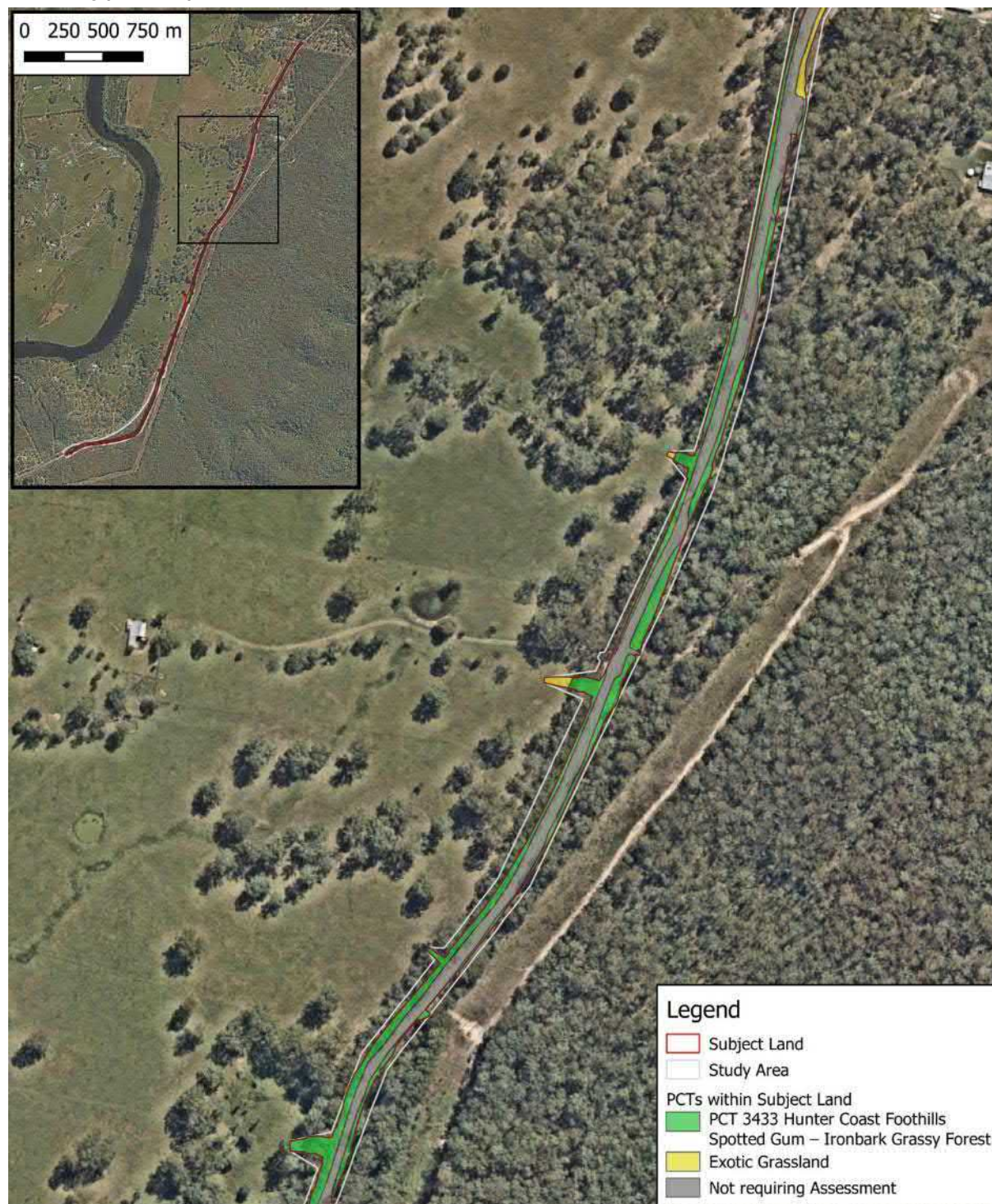
Figure 4.1
PCTs within Subject Land - Section 1

East Seaham Road
East Seaham, NSW

28 January 2025

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Environmental Consultants
(a Division of Tattersall Lander Pty Ltd)
ABN 41 003 509 215

Figure 4.2 PCT's and areas of non-native vegetation within the subject land mapped by Wedgetail Project Consulting (Section 2)



Job No.	12878
A4 Scale	1:3,200

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0 50 100 m

Map Projection: GDA2020 MGA Zone 56
Data Source: LPI (2023), Nearmap (13/04/2024)

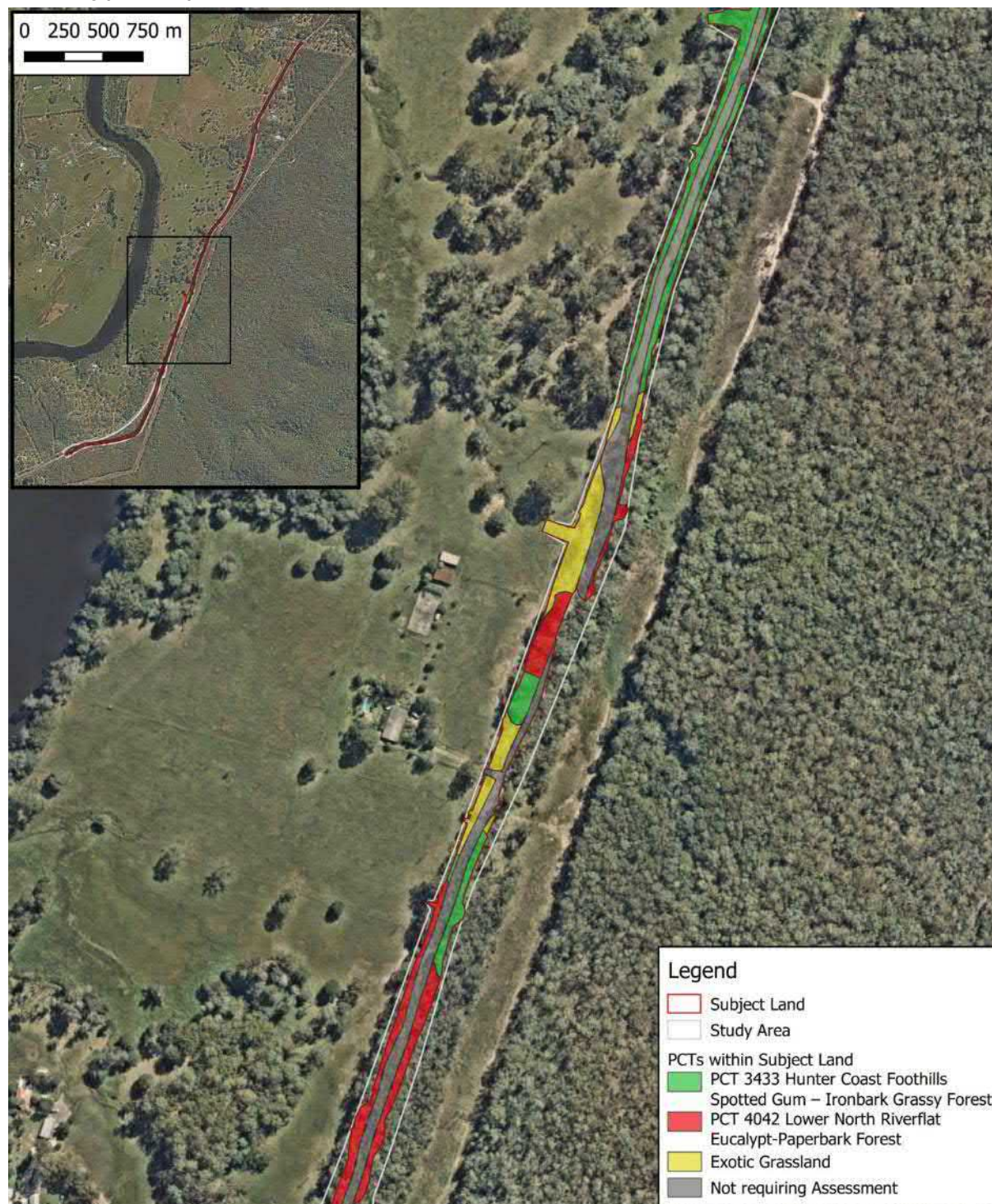
Figure 4.2
PCTs within Subject Land - Section 2

East Seaham Road
East Seaham, NSW

28 January 2025

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ABN 41 003 509 215

Figure 4.3 PCT's and areas of non-native vegetation within the subject land mapped by Wedgetail Project Consulting (Section 3)



Job No.	12878
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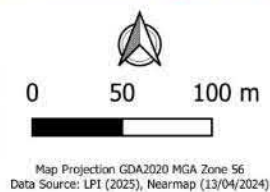
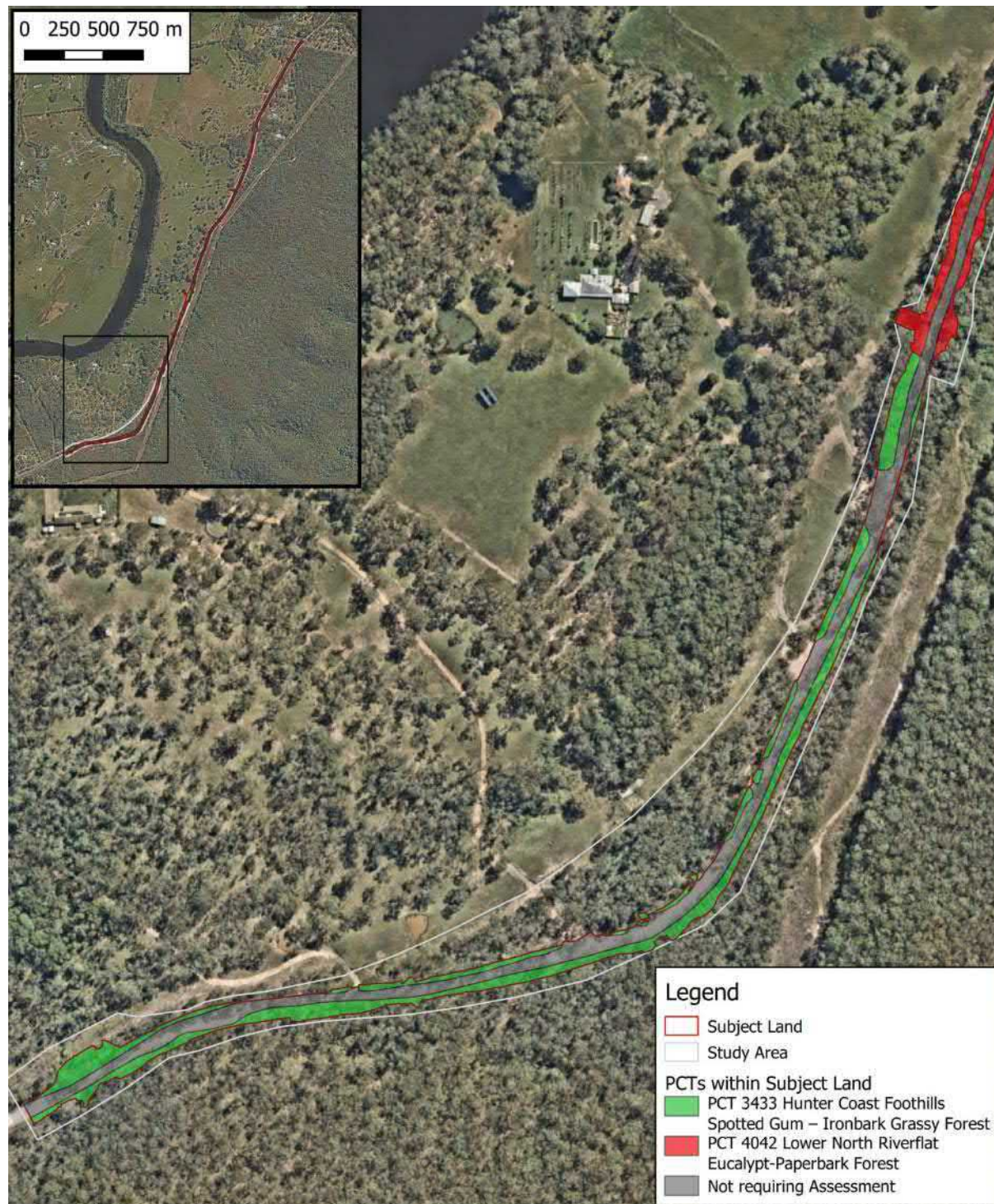


Figure 4.3
PCTs within Subject Land - Section 3

East Seaham Road
East Seaham, NSW

28 January 2025

Figure 4.4 PCT's and areas of non-native vegetation within the subject land mapped by Wedgetail Project Consulting (Section 4)



Job No.	12878
A4 Scale	1:3,200

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0 50 100 m

Map Projection: GDA2020 MGA Zone 56
Data Source: LPI (2025), Nearmap (13/04/2024)

Figure 4.4
PCTs within Subject Land - Section 4

East Seaham Road
East Seaham, NSW

28 January 2025

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4.3 Threatened ecological communities

PCT 3433 Hunter Coast Foothills Spotted Gum – Ironbark Grassy Forest was found to be consistent with the listed NSW BC Act 2016 Endangered Ecological Community (EEC) Lower Hunter spotted Gum – Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions. Some areas of mapped PCT 3433 were routinely maintained as powerline easement and lacked a canopy and mid-canopy layer. These areas are still considered to be part of the EEC because tree and shrub regeneration was present indicating that the seed bank is still mostly intact (DECC 2007). This EEC will be offset under ecosystem credits.

PCT 4042 Lower North Riverflat Eucalypt-Paperbark Forest was found to be consistent with the listed BC Act EEC Subtropical Coastal Floodplain Forest of the NSW North Coast bioregion and the EPBC Act listed EEC Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions. The BC Act listed EEC will be offset under ecosystem credits. Considerations to the EPBC Act listed EEC has been given in Appendix C.

4.4 Vegetation zones

Designation of vegetation zones was undertaken accordance with the methodology for vegetation integrity assessment outlined within Section 4.3 of the BAM (DPIE, 2020a). As described above two PCTs were identified within the subject land:

- PCT 3433 - Hunter Coast Foothills Spotted Gum – Ironbark Grassy Forest;
- PCT 4042 - Lower North Riverflat Eucalypt-Paperbark Forest.

These PCTs were assessed by Wedgetail Project Consulting to determine if each PCT could be further stratified into separate vegetation zones based on current condition state or other environmental variables. It was determined that the condition of PCT 4042 found to occur within the subject land equated to one vegetation zone and could not be further stratified based on condition or environmental variables.

PCT 3433 was stratified on the basis of the broad presence/absence of key strata over the subject land. This stratification resulted in two vegetation zones. In total three vegetation zones were determined to be present on site:

- Zone 1: PCT 3433_Forest (1.21ha);
- Zone 2: PCT 3433_Cleared (0.36ha);
- Zone 3: PCT 4042_Forest (0.38ha).

Descriptions of each vegetation zone are as follows:

Zone 1: PCT 3433_Forest

Vegetation within this zone consisted good condition vegetation containing all vegetation strata as described by Wedgetail Project Consulting (2024a) (Plates 4.10 and 4.11).



Plate 4.10: Vegetation Zone 1 PCT 3433_Forest within subject land



Plate 4.11: Vegetation Zone 1 PCT 3433_Forest within subject land on the left of the plate and Vegetation Zone 2 PCT 3433_Cleared on the right of the plate

Zone 2: PCT 3433_Cleared

As described by Wedgetail Project Consulting (2024a), this vegetation zone contained only groundcover and some areas with a midstorey. These areas are actively managed under powerline easements (Plate 4.11 – 4.13) or grazed (small area on private property in the south).



Plate 4.12: Vegetation Zone 2 PCT 3433_Cleared (0.36ha) within the subject land.



Plate 4.13: Vegetation Zone 2 PCT 3433_Cleared (0.36ha) within the north of the subject land (left side of plate).

Zone 3: PCT 4042_Forest

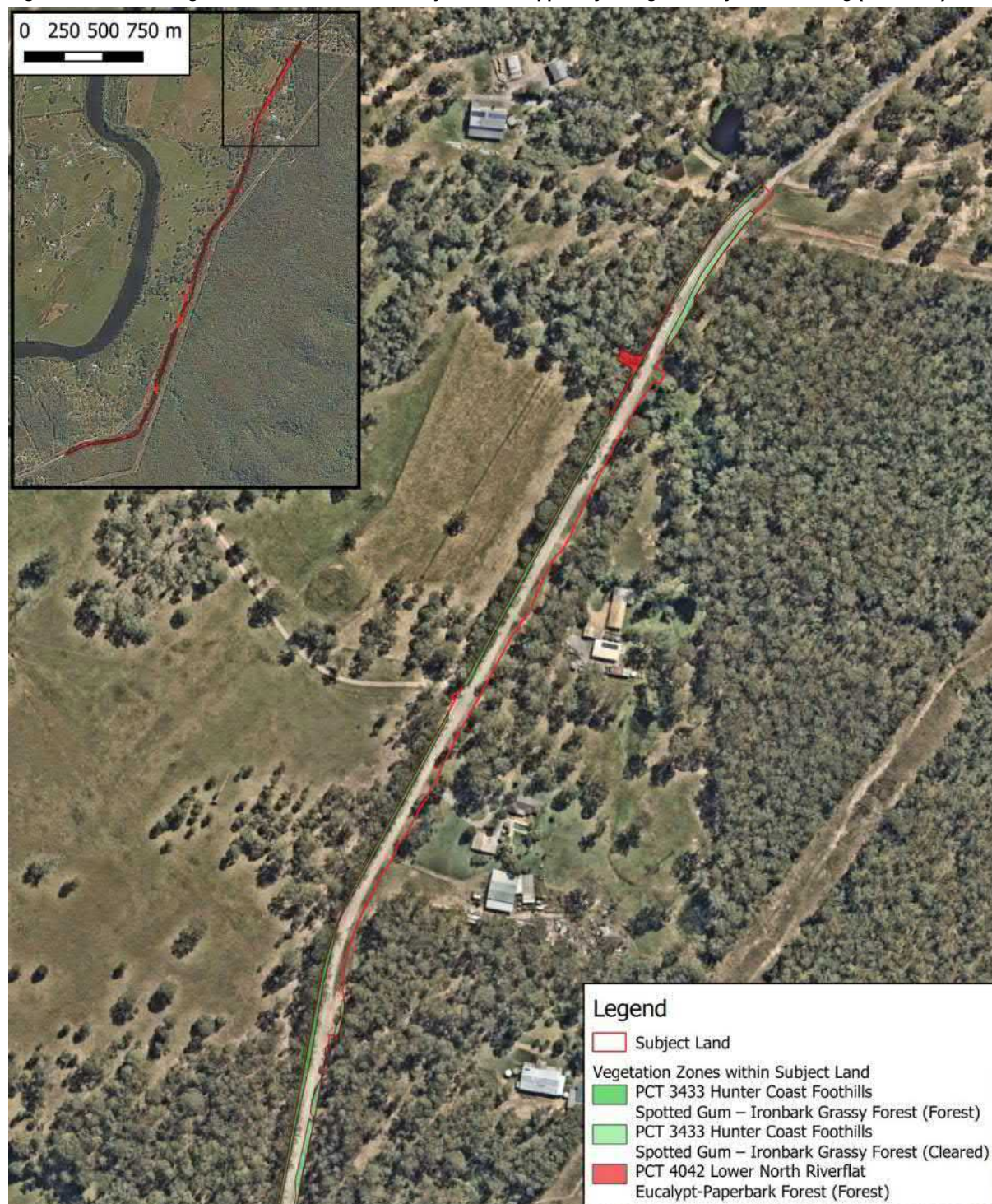
Vegetation within this zone consisted good condition vegetation containing all vegetation strata as described by Wedgetail Project Consulting (2024a) (Plate 4.14).



Plate 4.14: Vegetation Zone 3 PCT 4042_Forest

The location of vegetation zones within the subject land are shown in Figures 4.5-4.8.

Figure 4.5 Vegetation Zones within the subject land mapped by Wedgetail Project Consulting (Section 1)



Job No.	12878
A4 Scale	1:3,200

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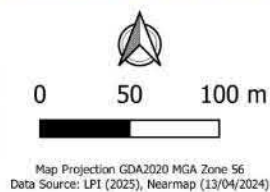


Figure 4.5
Vegetation Zones within Subject Land - Section 1

East Seaham Road
East Seaham, NSW

28 January 2025

Figure 4.6 Vegetation Zones within the subject land mapped by Wedgetail Project Consulting (Section 2)

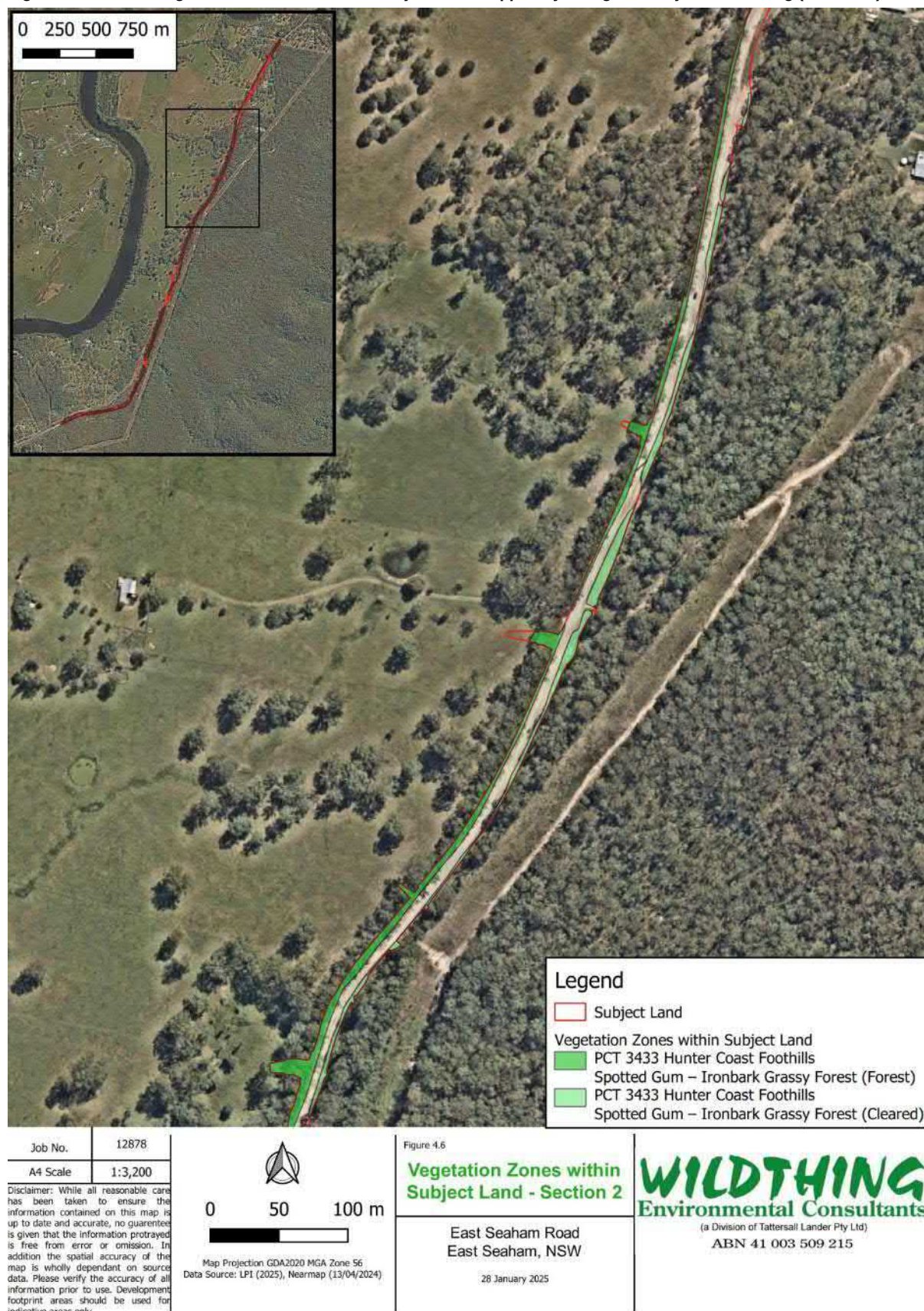
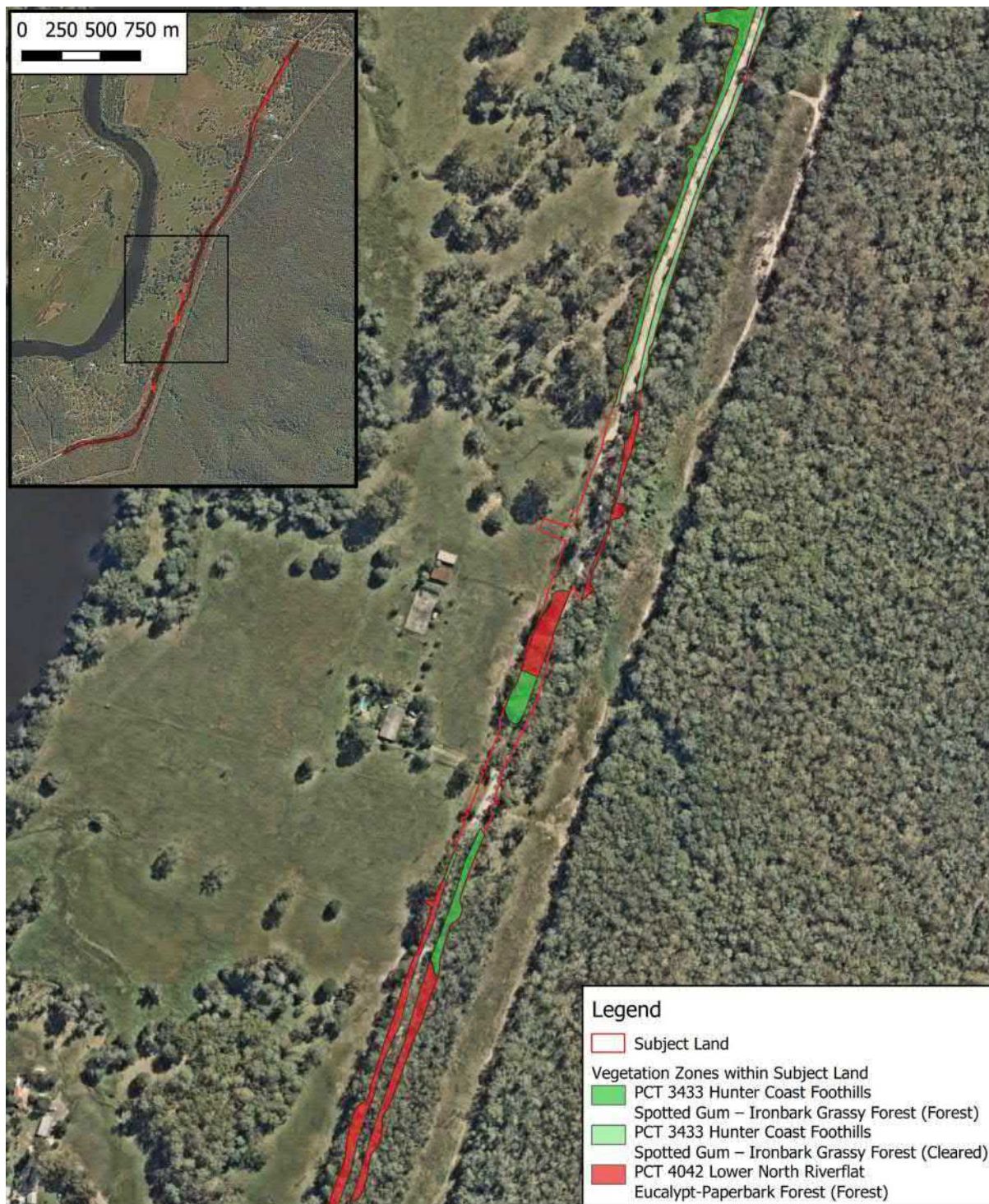


Figure 4.7 Vegetation Zones within the subject land mapped by Wedgetail Project Consulting (Section 3)



Job No.	12878
A4 Scale	1:3,200
Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependant on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.	

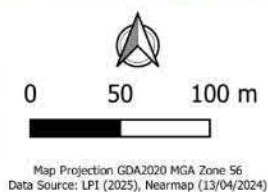
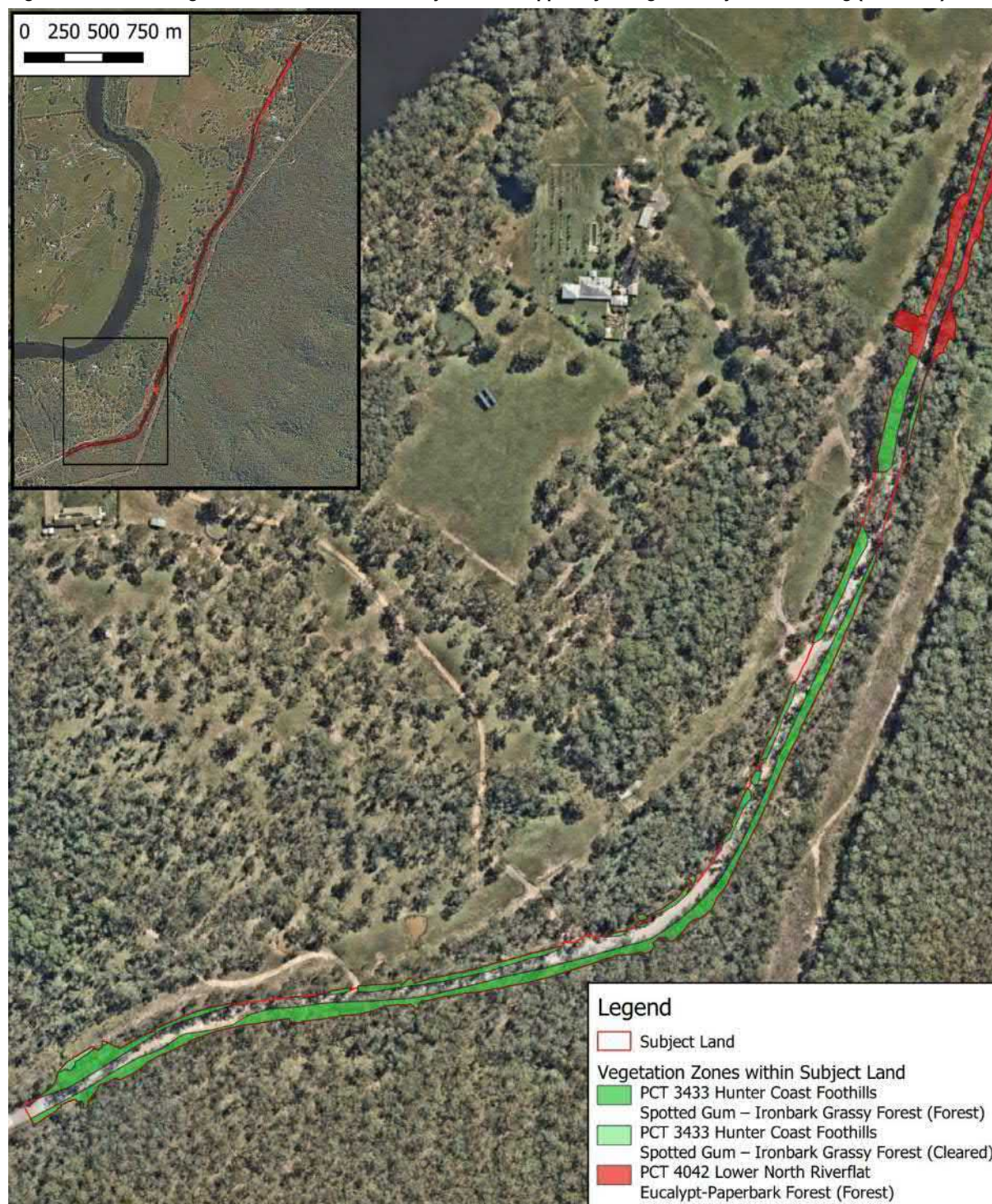


Figure 4.7
Vegetation Zones within
Subject Land - Section 3

East Seaham Road
East Seaham, NSW

28 January 2025

Figure 4.8 Vegetation Zones within the subject land mapped by Wedgetail Project Consulting (Section 4)



Job No.	12878
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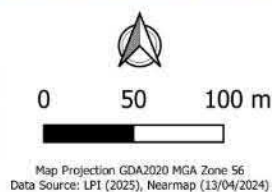


Figure 4.8
Vegetation Zones within
Subject Land - Section 4

East Seaham Road
East Seaham, NSW

28 January 2025

Table 4.4 Vegetation zones and patch sizes

Vegetation zone ID	PCT ID number and name	Condition/ other defining feature	Area (ha)	Patch size class (select multiple if areas of native vegetation are discontinuous)	No. vegetation integrity plots required	No. vegetation integrity plots completed	No. vegetation integrity plots used in assessment	Plot IDs of vegetation integrity plots used in assessment
1	PCT 3433 Hunter Coast Foothills Spotted Gum – Ironbark Grassy Forest	Forest	1.34	☐ <5 ha ☐ 5–24 ha ☐ 25–100 ha ☒ >100 ha	1	1	1	1A
2	PCT 3433 Hunter Coast Foothills Spotted Gum – Ironbark Grassy Forest	Cleared	0.36	☐ <5 ha ☐ 5–24 ha ☐ 25–100 ha ☒ >100 ha	1	1	1	2A
3	PCT 4042 Lower North Riverflat Eucalypt-Paperbark Forest	Forest	0.43	☐ <5 ha ☐ 5–24 ha ☐ 25–100 ha ☒ >100 ha	1	1	1	3A

4.5 Vegetation integrity (vegetation condition)

4.5.1 Vegetation integrity survey plots

The number of vegetation integrity plots sampled for each vegetation zone was determined by comparing the area of each vegetation zone with Table 3 of the BAM (DPIE 2020a). In all cases at least the minimum number of plots was sampled.

4.5.2 Scores

Table 4.5 Vegetation integrity scores

Vegetation zone ID	Composition condition score	Structure condition score	Function condition score (where relevant)	Vegetation integrity score	Hollow bearing trees present?
PCT 3433_Forest	57.4	20.5	54.7	40.1	Yes
PCT 3433_Cleared	48.3	5.4	22.3	18	No
PCT 4042_Forest	84.6	29.9	100	63.2	Yes

4.5.3 Management Zones

No vegetation zones were split into any management zones as total removal of vegetation is assumed to occur throughout the subject land. All other future condition values were set to 0.

4.6 Threatened Flora Surveys

One threatened flora species, [REDACTED] was recorded within the study area during targeted surveys by Wedgetail Project Consulting on 4 October 2023. [REDACTED]

[REDACTED] The proposed road upgrade has been designed to avoid known areas of the species' occurrence. Offsetting of remaining potential habitat for this species as a species credit species has been addressed in Section 5.4. A photo of *P. chaetophora* within the study area captured by Wildthing Environmental Consultants from 2024 is shown below in Plate 4.15.



Plate 4.15: *Pterostylis chaetophora* (Tall Rustyhood) within study area 16 September 2024.

4.7 Tree Survey

484 significant trees were recorded within the study area which included 61 hollow-bearing trees, 403 koala feed trees and 20 trees that were hollow-bearing and koala feed trees. 206 of these significant trees were identified as directly requiring removal for the proposal. Of the 206 significant trees, there were 37 hollow-bearing trees (example in Plate 4.16), 158 koala feed trees and 11 trees that were hollow-bearing and koala feed trees (example in Plate 4.17). In total, 48 trees requiring removal were hollow-bearing and 169 were koala feed trees. No large stick nests were found in trees within the subject land or in close proximity. The locations of significant trees that require removal and others that will be retained within the study area are shown in Figure 4.9-4.12. Detailed civil plans that show each tree that requires removal for the proposal are shown in Appendix I.



Plate 4.16: Hollow-bearing tree located within the study area.

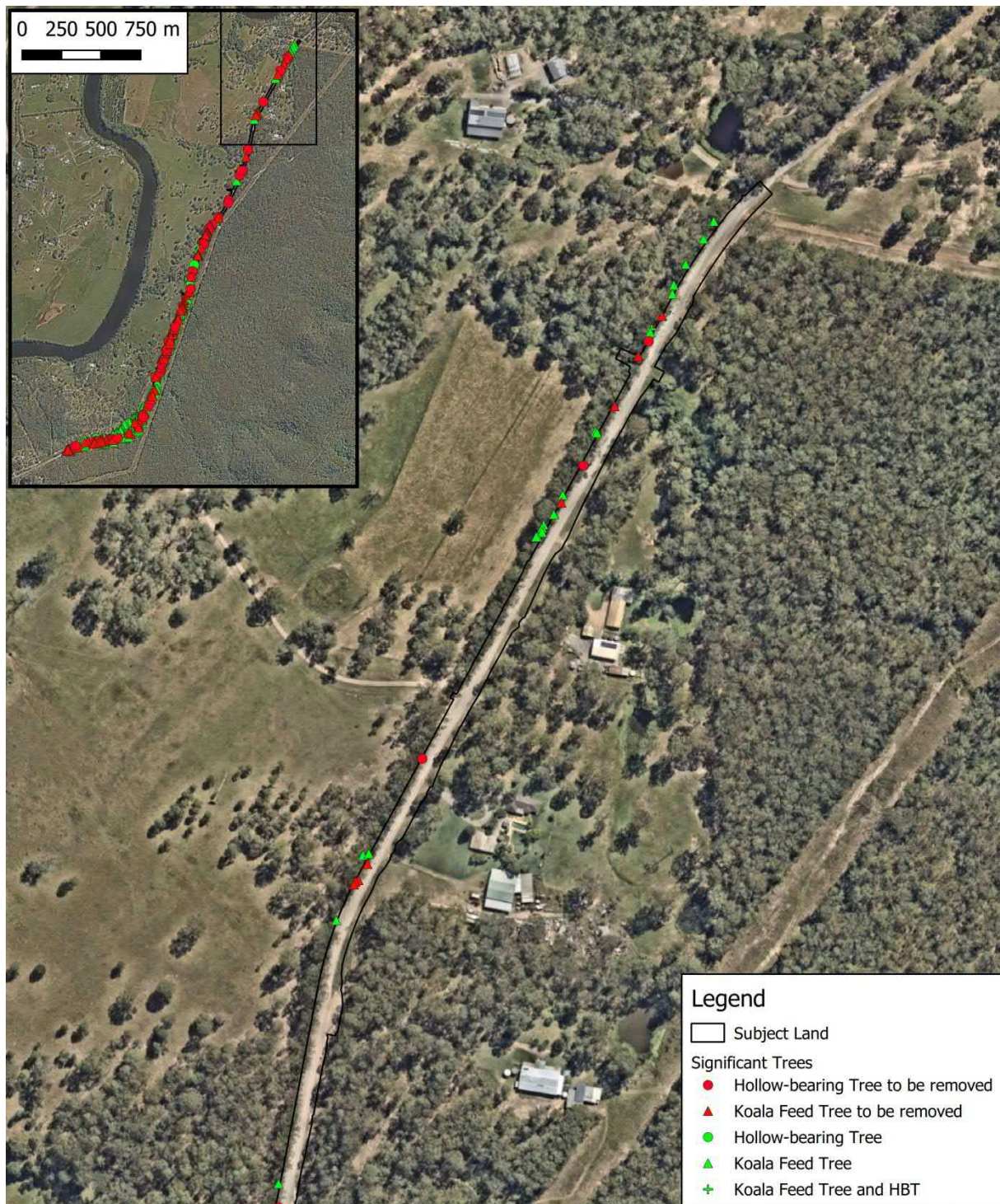


Plate 4.17: Koala Feed Tree and hollow-bearing tree within the study area.

4.8 Movement Corridors

Forested habitat was present along both sides of East Seaham Road. The north-south connection along the sides of the road was somewhat fragmented by driveways into residential lots and more so in the north where a 30m powerline easement runs alongside East Seaham Road. The canopy along East Seaham Road is connected to a large, continuous, forested patch of habitat as part of Wallaroo National Park in the east, north and south. To the west this habitat is connected to forested patches, scattered trees and open paddocks within residential lots. Existing obstructions between habitat in the east and west is East Seaham Road and a 30m wide powerline easement that runs alongside the road in the north. The current connection between either sides of East Seaham Road is relatively strong in the centre and south of the study area with canopies almost overlapping in some spots over the two-lane road. The proposal will result in a widening of this gap through the removal of trees either side of the road. This will also narrow the existing continuous habitat running along either side of East Seaham Road, particularly on the western side.

Figure 4.9 Significant trees within the study area mapped by Wedgetail Project Consulting (Section 1)



Job No.	12878
A4 Scale	1:3,200
Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependant on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.	

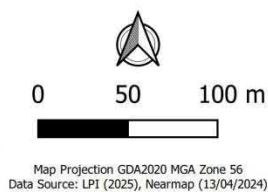


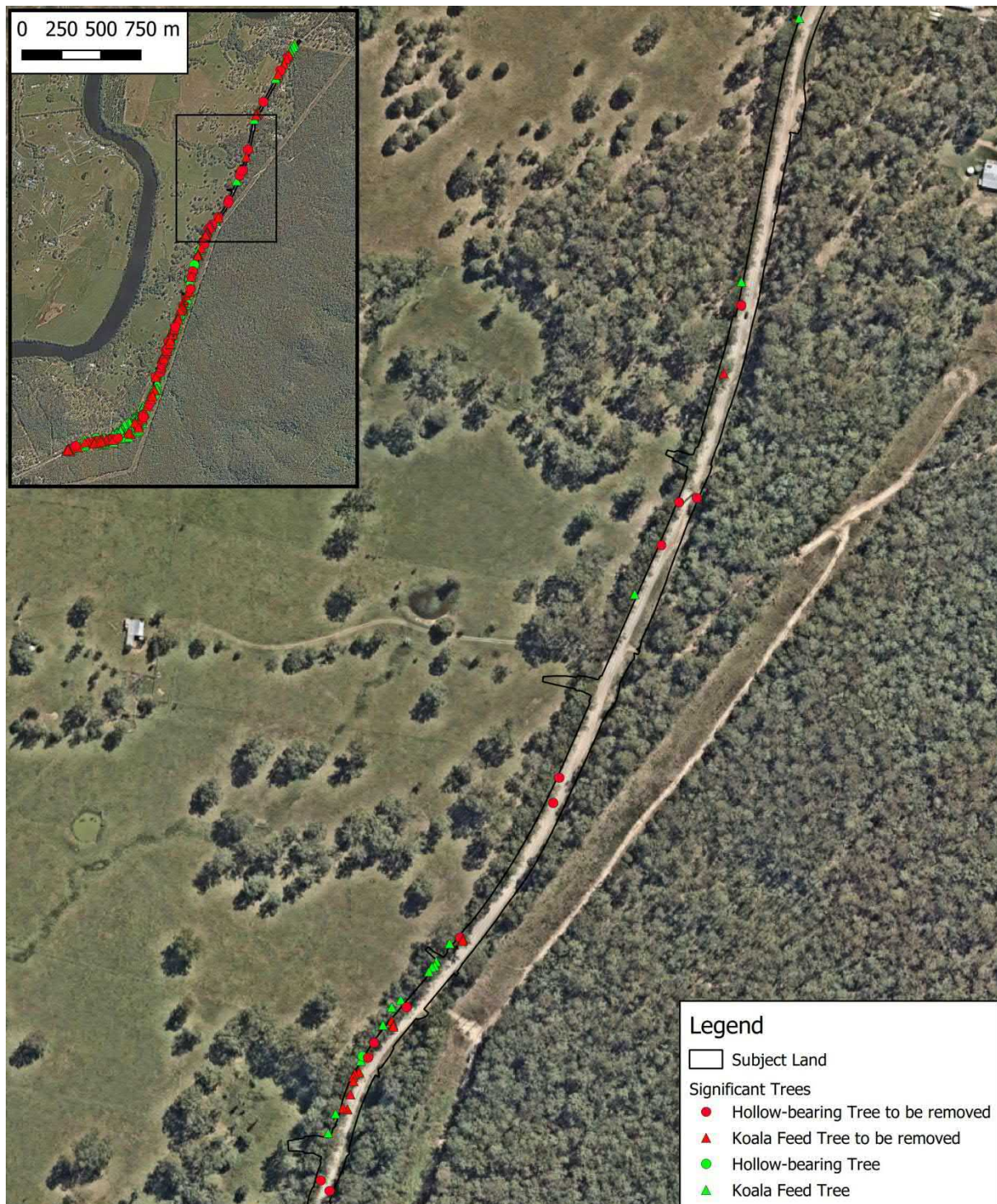
Figure 4.9

**Significant Trees -
Section 1**

East Seaham Road
East Seaham, NSW

20 March 2025

Figure 4.10 Significant trees within the study area mapped by Wedgetail Project Consulting (Section 2)



Job No.	12878
A4 Scale	1:3,200
Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependant on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.	

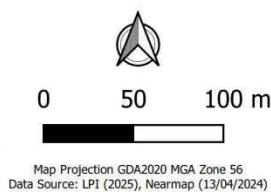


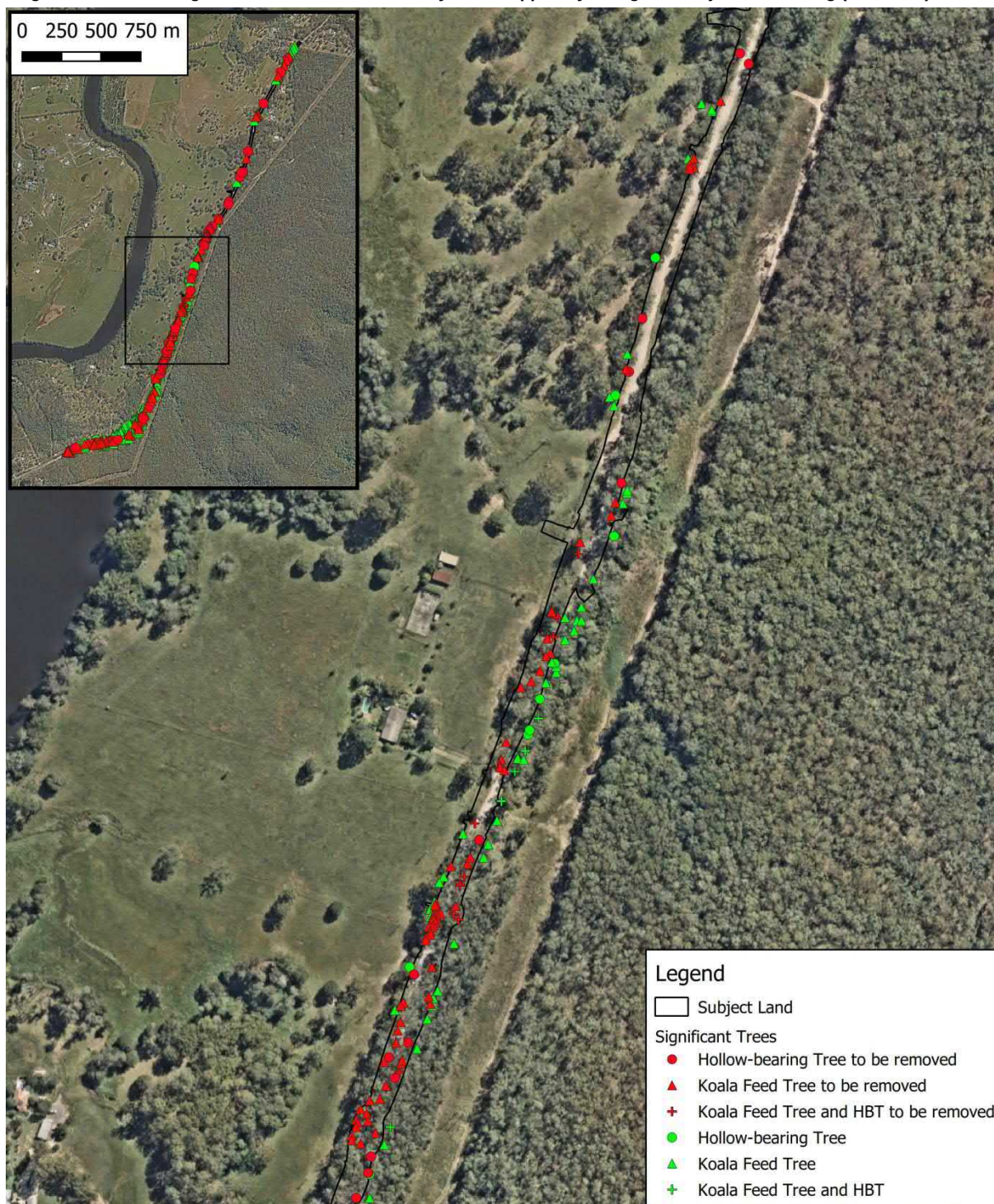
Figure 4.10

**Significant Trees -
Section 2**

East Seaham Road
East Seaham, NSW

20 March 2025

Figure 4.11 Significant trees within the study area mapped by Wedgetail Project Consulting (Section 3)



Job No.	12878
A4 Scale	1:3,200

Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependant on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.

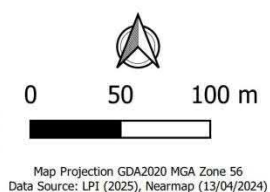
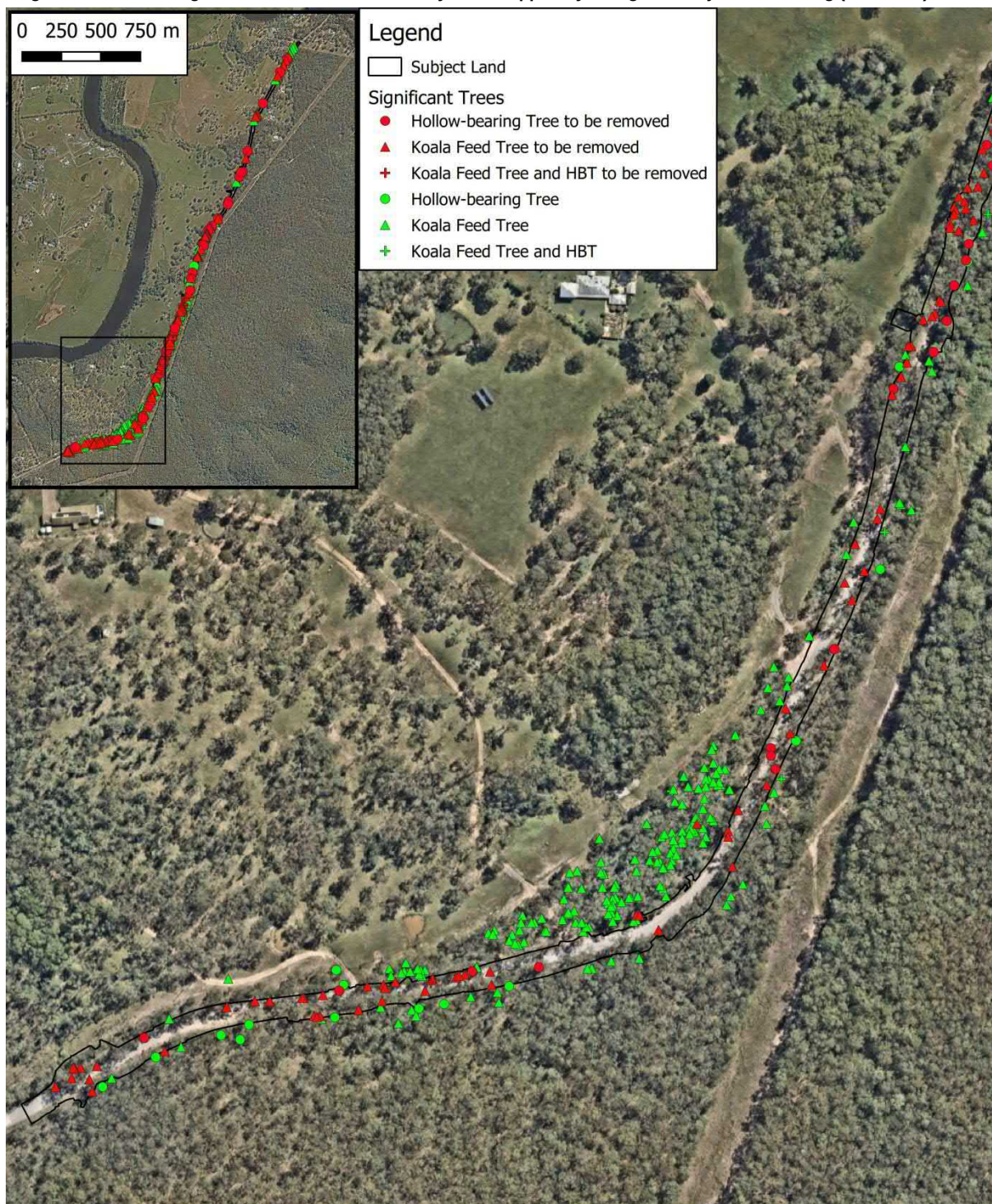


Figure 4.11
Significant Trees - Section 3
East Seaham Road
East Seaham, NSW
20 March 2025

Figure 4.12 Significant trees within the study area mapped by Wedgetail Project Consulting (Section 4)



Job No.	12878
A4 Scale	1:3,200

Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependant on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.

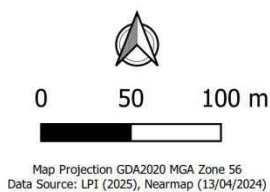


Figure 4.12

Significant Trees - Section 4

East Seaham Road
East Seaham, NSW

20 March 2025

WILDTHING
Environmental Consultants

(a Division of Tattersall Lander Pty Ltd)
ABN 41 003 509 215

5.0 Habitat suitability for threatened species

5.1 Identification of threatened species for assessment

5.1.1 Ecosystem credit species

Table 5.1 Predicted ecosystem credit species

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain class
		BC Act	EPBC Act						
Regent Honeyeater	<i>Anthochaera phrygia</i>	CE	CE	Yes	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest	High
Dusky Woodswallow	<i>Artamus cyanopterus cyanopterus</i>	V		No	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest	Moderate
Australasian Bittern	<i>Botaurus poiciloptilus</i>	E	E	No	BAM-C	No	None of the following habitat constraints were within the subject land: - Waterbodies; Brackish or freshwater wetlands	N/A	Moderate
Gang-gang Cockatoo (Foraging)	<i>Callocephalon fimbriatum</i>	V		Yes	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest	Moderate

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain class
		BC Act	EPBC Act						
Glossy Black-Cockatoo	<i>Calyptrorhynchus lathami</i>	V		Yes	BAM-C Recorded flying over site	Yes	Excluded from vegetation zone PCT 3433_cleared because none of the following habitat constraints were present within the zone: Other; Presence of Allocasuarina and casuarina species	PCT 3433_Forest PCT 4042_Forest	High
Speckled Warbler	<i>Chthonicola sagittata</i>	V		No	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest	High
Spotted Harrier	<i>Circus assimilis</i>	V		No	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest	Moderate
Brown Treecreeper (eastern subspecies)	<i>Climacteris picumnus victoriae</i>	V		No	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest	High
Varied Sittella	<i>Daphoenositta chrysoptera</i>	V		No	BAM-C Recorded on site	Yes – Recorded on site	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest	Moderate

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain class
		BC Act	EPBC Act						
Spotted-tailed Quoll	<i>Dasyurus maculatus</i>	V	E	No	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest	High
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>	E		No	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest	Moderate
Eastern False Pipistrelle	<i>Falsistrellus tasmaniensis</i>	V		Yes	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest	High
Little Lorikeet	<i>Glossopsitta pusilla</i>	V		No	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest	High
White-bellied Sea-Eagle (foraging)	<i>Haliaeetus leucogaster</i>	V		No	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest	High
Little Eagle (Foraging)	<i>Hieraetus morphnoides</i>	V		No	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest	Moderate

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain class
		BC Act	EPBC Act						
White-throated Needletail	<i>Hirundapus caudacutus</i>		V	No	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest	High
Black Bittern	<i>Ixobrychus flavicollis</i>	V		No	BAM-C	No	None of the following habitat constraints were within the subject land: - Waterbodies - Land within 40 m of freshwater and estuarine wetlands, in areas of permanent water and dense vegetation	N/A	Moderate
Swift Parrot (Foraging)	<i>Lathamus discolor</i>	E	CE	Yes	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest	Moderate
Square-tailed Kite (Foraging)	<i>Lophoictinia isura</i>	V		No	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest	Moderate
Black-chinned Honeyeater (eastern subspecies)	<i>Melithreptus gularis gularis</i>	V		No	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared	Moderate

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain class
		BC Act	EPBC Act						
Eastern Coastal Free-tailed Bat	<i>Micronomus norfolkensis</i>	V		No	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest	High
Little Bent-winged-bat (Foraging)	<i>Miniopterus australis</i>	V		No	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest	High
Large Bent-winged-bat (Foraging)	<i>Miniopterus orianae oceanensis</i>	V		No	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest	High
Turquoise Parrot	<i>Neophema pulchella</i>	V		No	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest	High
Yellow-bellied Glider	<i>Petaurus australis</i>	V		No	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest	High
Scarlet Robin	<i>Petroica boodang</i>	V		No	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared	Moderate

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain class
		BC Act	EPBC Act						
Flame Robin	<i>Petroica phoenicea</i>			No	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest	Moderate
Golden-tipped Bat	<i>Phoniscus papuensis</i>	V		No	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest	High
Grey-crowned Babbler (eastern subspecies)	<i>Pomatostomus temporalis temporalis</i>	V		No	BAM-C Recorded within close proximity to site	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest	Moderate
Eastern Chestnut Mouse	<i>Pseudomys gracilicaudatus</i>	V		No	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest	High
New Holland Mouse	<i>Pseudomys novaehollandiae</i>	V		No	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared	High
Grey-headed Flying-fox (foraging)	<i>Pteropus poliocephalus</i>	V	V	Yes	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest	High

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain class
		BC Act	EPBC Act						
Yellow-bellied Sheathtail-bat	<i>Saccolaimus flaviventris</i>	V		No	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared	High
Greater Broad-nosed Bat	<i>Scoteanax rueppellii</i>	V		No	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest	High
Diamond Firetail	<i>Stagonopleura guttata</i>	V	V	No	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest	Moderate

5.1.3 Species credit species

Table 5.2 Predicted flora species credit species

Common name	Scientific name	Listing status		Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act				
Charmhaven Apple	<i>Angophora inopina</i>	V	V	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest
Netted Bottle Brush	<i>Callistemon linearifolius</i>	V		BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest
Red Helmet Orchid	<i>Corybas dowlingii</i>	E		BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest
<i>Cymbidium canaliculatum</i> population in the Hunter Catchment	<i>Cymbidium canaliculatum</i> - endangered population	E3		BAM-C	Yes	N/A	PCT 4042_Forest
<i>Eucalyptus camaldulensis</i> population in the Hunter catchment	<i>Eucalyptus camaldulensis</i> - endangered population	E3		BAM-C	No	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest
Slaty Red Gum	<i>Eucalyptus glaucina</i>	V	V	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest

Common name	Scientific name	Listing status		Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act				
Small-flower Grevillea	<i>Grevillea parviflora subsp. parviflora</i>	V	V	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest
Tall Rustyhood	<i>Pterostylis chaetophora</i>	V		BAM-C Recorded on site	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest
Scrub Turpentine	<i>Rhodamnia rubescens</i>	CE	CE	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest
Native Guava	<i>Rhodomyrtus psidioides</i>	CE	CE	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest
Heath Wrinklewort	<i>Rutidosia heterogama</i>	V	V	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest
Black-eyed Susan	<i>Tetraloche juncea</i>	V	V	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest

Table 5.3 Predicted fauna species credit species

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
Regent Honeyeater	<i>Anthochaera phrygia</i>	CE	CE	Yes	BAM-C	No	This species was excluded as a SCS as the subject land was not within the Important Areas Map for this species.	N/A
Gang-gang Cockatoo (Breeding)	<i>Callocephalon fimbriatum</i>	V	E	Yes	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest
Glossy Black-Cockatoo (breeding)	<i>Calyptrorhynchus lathamii</i>	V		No	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest
Eastern Pygmy-possum	<i>Cercartetus nanus</i>	V		No	BAM-C	No	Habitat degraded. See habitat constraints below	N/A
Large-eared Pied Bat	<i>Chalinolobus dwyeri</i>	E	E	No	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest
Red Goshawk	<i>Erythrorhynchus radiatus</i>	E	E	No	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
White-bellied Sea-Eagle (breeding)	<i>Haliaeetus leucogaster</i>	V		No	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest
Little Eagle	<i>Hieraaetus morphnoides</i>	V		No	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest
Swift Parrot (Breeding)	<i>Lathamus discolor</i>	E	CE	Yes	BAM-C	No	This species was excluded as a SCS as the subject land was not within the Important Areas Map for this species.	N/A
Green & Golden Bell Frog	<i>Litoria aurea</i>	E	V	Yes	BAM-C	No	Habitat degraded. See habitat constraints below	N/A
Square-tailed Kite (Breeding)	<i>Lophoictinia isura</i>	V		No	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest
Little Bent-winged Bat (breeding)	<i>Miniopterus australis</i>	V		No	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
Large Bent-winged Bat (breeding)	<i>Miniopterus orianae oceanensis</i>	V		No	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest
Southern Myotis	<i>Myotis macropus</i>	V		No	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest
Barking Owl	<i>Ninox connivens</i>	V		No	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest
Powerful Owl	<i>Ninox strenua</i>	V		No	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest
Parma Wallaby	<i>Notamacropus parma</i>	V	V	No	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest
Southern Greater Glider	<i>Petauroides volans</i>	E	E	No	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
Squirrel Glider	<i>Petaurus norfolcensis</i>	V		No	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest
Brush-tailed Phascogale	<i>Phascogale tapoatafa</i>	V		No	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest
Koala	<i>Phascolarctos cinereus</i>	E	E	Yes	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest
Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	V	V	Yes	BAM-C	No	None of the following habitat constraints were within the subject land: • Breeding Camps	N/A
Red-backed Button-quail	<i>Turnix maculosus</i>	V		No	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest
Masked Owl	<i>Tyto novaehollandiae</i>	V		No	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
Sooty Owl	<i>Tyto tenebricosa</i>	V		No	BAM-C	Yes	N/A	PCT 3433_Forest PCT 3433_Cleared PCT 4042_Forest

5.1.4 Habitat Constraints

Eastern Pygmy-possum

The distribution of *Cercartetus nanus* (Eastern Pygmy-possum) within NSW is described as “coastal areas and at higher elevation in the south, but north of Newcastle at higher elevation only” (NSW Threatened Species Scientific Committee 2001). It has previously been acknowledged that records suggest *C. nanus* mostly occupies habitats >600 metres above sea level on the eastern side of the Great Dividing Range in northern NSW (Bowen and Goldingay 2000). Bionet records for *C. nanus* somewhat contradict this as the species has since been recorded at multiple locations with low elevations including 7.4km south-east of the subject land in Balickera in 2005, 25km to the east in North Arm Cove in 2023 and 36km to the east in Riverside Tea Gardens in 2007 (NSW DCCEEW 2025). More recent literature suggests the species has a strong association with the microhabitat provided by certain plant species that act as food sources (Tulloch and Dickman 2006). *C. nanus* has shown strong preference for habitat containing *Banksia*, *Doryanthes* and *Xanthorrhoea* species (Tulloch and Dickman 2006, Bradley et al. 2018, Goldingay 2023). It has not shown association with structural components of the microhabitat that are commonly linked to shelter or protection, for example trees with hollows which were present on site (Tulloch and Dickman 2006). No plants species known to be popular food sources for *C. nanus* were observed within the study area (*Banksia*, *Doryanthes* or *Xanthorrhoea*), therefore the habitat has been considered degraded due to the lack of this microhabitat features required by the species.

Green and Golden Bell Frog

Habitat for *Litoria aurea* (Green and Golden Bell Frog) was considered degraded due to the lack of microhabitat features required by the species. Suitable breeding and non-breeding shelter habitat for the species consists of any waterbody with emergent aquatic vegetation and without the plague minnow (*Gambusia holbrooki*), although the green and golden bell frog will still occasionally breed in sites with this introduced pest fish (NSW DPIE 2020). Several drainage lines and culverts were present along the study area, while some of these hold water after rain events, none of these drainage lines permanently hold water (observed to be dry during subsequent surveys) and no waterbodies with emergent vegetation were present on site. (Wedgetail Project Consultants 2024a).

Microbats

Wedgetail Project Consultants concluded that a total of 11 culverts were identified along the section of East Seaham Road within the Study Area. All culverts were not assessed as providing suitable habitat for Microbats. This was due to the small size of the culverts (small diameter and roof low to the ground), small span under East Seaham Road, obstructions over entrances and mud and debris partially filling culverts (2024a).

Wetland Avifauna Species

It was concluded by Wedgetail Project Consultants that areas around the culverts within the study area did not provide habitat for threatened wetland species due to the lack of standing water (2024a).

5.2 Presence of candidate species credit species

From the remaining lists shown in Table 5.4 (Flora) and Table 5.5 (Fauna) candidate species credit species can be determined in accordance with BAM Subsection 5.2.4 to be present or absent within the subject land based on:

- assumed presence within the subject land;
- an important habitat map (for dual credit species);
- targeted threatened species surveys, or
- an expert report.

The presence or absence of all candidate species credit species was determined by targeted threatened species surveys. No important habitat mapping for any candidate species was present within the subject land.

Table 5.4 Determining the presence of candidate flora species credit species on the subject land

Common name	Scientific name	Listing status		Method used to determine presence	Present?	Further assessment required? (BAM Subsections 5.2.5 and 5.2.6)
		BC Act	EPBC Act			
Charmhaven Apple	<i>Angophora inopina</i>	V	V	Targeted threatened species survey	No	No
Netted Bottle Brush	<i>Callistemon linearifolius</i>	V		Targeted threatened species survey	No	No
Red Helmet Orchid	<i>Corybas dowlingii</i>	E		Assumed present	Assumed present	Yes
<i>Cymbidium canaliculatum</i> population in the Hunter Catchment	<i>Cymbidium canaliculatum</i> - endangered population	E3		Targeted threatened species survey	No	No
<i>Eucalyptus camaldulensis</i> population in the Hunter catchment	<i>Eucalyptus camaldulensis</i> - endangered population	E3		Targeted threatened species survey	No	No
Slaty Red Gum	<i>Eucalyptus glaucina</i>	V	V	Targeted threatened species survey	No	No
Small-flower Grevillea	<i>Grevillea parviflora</i> subsp. <i>parviflora</i>	V	V	Targeted threatened species survey	No	No
Tall Rustyhood	<i>Pterostylis</i>	V		Targeted	Yes	Yes

Common name	Scientific name	Listing status		Method used to determine presence	Present?	Further assessment required? (BAM Subsections 5.2.5 and 5.2.6)
		BC Act	EPBC Act			
	<i>chaetophora</i>			threatened species survey		
Scrub Turpentine	<i>Rhodamnia rubescens</i>	CE	CE	Targeted threatened species survey	No	No
Native Guava	<i>Rhodomyrtus psidioides</i>	CE	CE	Targeted threatened species survey	No	No
Heath Wrinklewort	<i>Rutidosia heterogama</i>	V	V	Assumed present	Assumed present	Yes
Black-eyed Susan	<i>Tetradlea juncea</i>	V	V	Targeted threatened species survey	No	No

Table 5.5 Determining the presence of candidate fauna species credit species on the subject land

Common name	Scientific name	Listing status		Method used to determine presence	Present?	Further assessment required? (BAM Subsections 5.2.5 and 5.2.6)
		BC Act	EPBC Act			
Gang-gang Cockatoo (Breeding)	<i>Callocephalon fimbriatum</i>	V	E	Targeted threatened species survey	No	No
Glossy Black-Cockatoo (breeding)	<i>Calyptorhynchus lathami</i>	V		Targeted threatened species survey	No	No
Large-eared Pied Bat	<i>Chalinolobus dwyeri</i>	E	E	Targeted threatened species survey	No	No
Red Goshawk	<i>Erythrotriorchis radiatus</i>	E	E	Targeted threatened species survey	No	No
White-bellied Sea-Eagle (breeding)	<i>Haliaeetus leucogaster</i>	V		Targeted threatened species survey	No	No
Little Eagle	<i>Hieraaetus morphnoides</i>	V		Targeted threatened	No	No

Common name	Scientific name	Listing status		Method used to determine presence	Present?	Further assessment required? (BAM Subsections 5.2.5 and 5.2.6)
		BC Act	EPBC Act			
				species survey		
Square-tailed Kite (Breeding)	<i>Lophoictinia isura</i>	V		Targeted threatened species survey	No	No
Little Bent-winged Bat (breeding)	<i>Miniopterus australis</i>	V		Targeted threatened species survey	Yes	Yes
Large Bent-winged Bat (breeding)	<i>Miniopterus orianae oceanensis</i>	V		Targeted threatened species survey	No	No
Southern Myotis	<i>Myotis macropus</i>	V		Targeted threatened species survey	No	No
Barking Owl	<i>Ninox connivens</i>	V		Targeted threatened species survey	No	No
Powerful Owl	<i>Ninox strenua</i>	V		Targeted threatened species survey	Yes	Yes
Parma Wallaby	<i>Notamacropus parma</i>	V	V	Targeted threatened species survey	No	No
Southern Greater Glider	<i>Petauroides volans</i>	E	E	Targeted threatened species survey	No	No
Squirrel Glider	<i>Petaurus norfolcensis</i>	V		Targeted threatened species survey	Yes	Yes
Brush-tailed Phascogale	<i>Phascogale tapoatafa</i>	V		Targeted threatened species survey	Yes	Yes
Koala	<i>Phascolarctos cinereus</i>	E	E	Targeted threatened species survey	Assumed present	Yes
Red-backed Button-quail	<i>Turnix maculosus</i>	V		Targeted threatened species	No	No

Common name	Scientific name	Listing status		Method used to determine presence	Present?	Further assessment required? (BAM Subsections 5.2.5 and 5.2.6)
		BC Act	EPBC Act			
				survey		
Masked Owl	<i>Tyto novaehollandiae</i>	V		Targeted threatened species survey	No	No
Sooty Owl	<i>Tyto tenebricosa</i>	V		Targeted threatened species survey	No	No

5.3 Threatened species surveys

Candidate flora species were surveyed by Wedgetail Project Consulting in accordance with the Surveying threatened plants and their habitats – NSW survey guide for the Biodiversity Assessment Method (DPIE, 2020d). All surveys were conducted using systematic parallel transects within suitable habitat. Parallel field traverses were separated by 5-10m for orchids, herbs and forbs, 10-15m for sub-shrubs and 10-20m for tree and shrubs.

Table 5.6 Threatened species surveys for candidate flora species credit species on the subject land

Common name	Scientific name	Threatened flora species surveys				Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)
		Survey method (transects or grids)	Timing of survey – within recommended period? (BAM-C / TBDC)		Effort (hours & no. people)		
Charmhaven Apple	<i>Angophora inopina</i>	Systematic parallel transects Methods described in NSW survey guide for the Biodiversity Assessment Method (DPIE 2020e)	☒ Yes 06/09/2023 07/09/2023 08/09/2023 13/09/2023 23/09/2023	☐ No	24 hours (1 person)	No*	No
Netted Bottle Brush	<i>Callistemon linearifolius</i>	Systematic parallel transects Methods described in NSW survey guide for the Biodiversity Assessment Method (DPIE 2020e)	☒ Yes 15/11/2023	☐ No	14 hours (2 persons)	No	No
Red Helmet Orchid	<i>Corybas dowlingii</i>	Systematic parallel transects Methods described in NSW survey guide for the Biodiversity Assessment Method (DPIE 2020e)	☐ Yes	☒ No	-	Assumed Present	Yes
<i>Cymbidium canaliculatum</i> population in the Hunter Catchment	<i>Cymbidium canaliculatum</i> - endangered population	Systematic parallel transects Methods described in NSW survey guide for the Biodiversity Assessment Method (DPIE 2020e)	☒ Yes 06/09/2023 07/09/2023 08/09/2023 13/09/2023 23/09/2023	☐ No	24 hours (1 person)	No*	No
<i>Eucalyptus camaldulensis</i> population in the Hunter catchment	<i>Eucalyptus camaldulensis</i> - endangered population	Systematic parallel transects Methods described in NSW survey guide for the Biodiversity Assessment Method (DPIE	☒ Yes 06/09/2023 07/09/2023 08/09/2023	☐ No	24 hours (1 person)	No*	No

Common name	Scientific name	Threatened flora species surveys			Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)
		Survey method (transects or grids)	Timing of survey – within recommended period? (BAM-C / TBDC)	Effort (hours & no. people)		
		2020e)	13/09/2023 23/09/2023			
Slaty Red Gum	<i>Eucalyptus glaucina</i>	Systematic parallel transects Methods described in NSW survey guide for the Biodiversity Assessment Method (DPIE 2020e)	☒ Yes 06/09/2023 07/09/2023 08/09/2023 13/09/2023 23/09/2023	☐ No 24 hours (1 person)	No*	No
Small-flower Grevillea	<i>Grevillea parviflora subsp. parviflora</i>	Systematic parallel transects Methods described in NSW survey guide for the Biodiversity Assessment Method (DPIE 2020e)	☒ Yes 03/10/2023 04/10/2023 18/10/2023	☐ No 21 hours (3 persons) 4 hours (2 persons) 1 hours (1 person)	No	No
Tall Rustyhood	<i>Pterostylis chaetophora</i>	Systematic parallel transects Methods described in NSW survey guide for the Biodiversity Assessment Method (DPIE 2020e)	☒ Yes 03/10/2023 04/10/2023 18/10/2023	☐ No 21 hours (3 persons) 4 hours (2 persons) 1 hours (1 person)	Yes	Yes
Scrub Turpentine	<i>Rhodamnia rubescens</i>	Systematic parallel transects Methods described in NSW survey guide for the Biodiversity Assessment Method (DPIE 2020e)	☒ Yes 17/11/2023	☐ No 2 hours (2 persons)	No	No
Native Guava	<i>Rhodomyrtus psidioides</i>	Systematic parallel transects Methods described in NSW survey guide for the Biodiversity Assessment Method (DPIE 2020e)	☒ Yes 17/11/2023	☐ No 2 hours (2 persons)	No	No

Common name	Scientific name	Threatened flora species surveys				Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)
		Survey method (transects or grids)	Timing of survey – within recommended period? (BAM-C / TBDC)		Effort (hours & no. people)		
Heath Wrinklewort	<i>Rutidosia heterogama</i>	Systematic parallel transects Methods described in NSW survey guide for the Biodiversity Assessment Method (DPIE 2020e)	☐ Yes	☒ No	-	Assumed Present	Yes
Black-eyed Susan	<i>Tetratheca juncea</i>	Systematic parallel transects Methods described in NSW survey guide for the Biodiversity Assessment Method (DPIE 2020e)	☒ Yes 03/10/2023 04/10/2023 18/10/2023	☐ No	21 hours (3 persons) 4 hours (2 persons) 1 hours (1 person)	No	No

*Surveys conducted were habitat and koala feed tree surveys within the entire site. Given the conspicuous nature of this species and the extent of surveys conducted, there would be high likelihood that the species would have been detected if present within the subject land or the site. As such, these species are not considered present within the subject land.

Table 5.7 Threatened species surveys for candidate fauna species credit species on the subject land

Common name	Scientific name	Threatened fauna species surveys				Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)
		Survey method (e.g. harp trap, Elliott trap, bioacoustics, etc.)	Timing of survey – within recommended period? (BAM-C / TBDC)		Effort (hours & no. people)		
Gang-gang Cockatoo (Breeding)	<i>Callocephalon fimbriatum</i>	Avifauna Survey and Stagwatching Survey for signs of breeding Significant Tree Survey for habitat trees Methods described in TBDC (NSW DCCEEW 2025b)	☒ Yes <u>Avifauna Survey</u> 30/01/2025	☒ No <u>Stag Watching</u> 21/08/2023 22/08/2023 23/08/2023 24/08/2023 28/08/2023 29/08/2023 30/08/2023 06/06/2024 18/06/2024 25/06/2024 27/06/2024 <u>Avifauna Survey</u> 17/09/2024 18/09/2024 19/09/2024 20/09/2024 <u>Tree Survey</u> 06/09/2023	<u>Stag Watching</u> 33 hours (2 persons) <u>Avifauna Survey</u> 1 hour (1 Person) 2 hours (2 persons) 4 hours (2 persons) within survey period <u>Tree Survey</u> 24 hours (1	No	No

Common name	Scientific name	Threatened fauna species surveys			Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)
		Survey method (e.g. harp trap, Elliott trap, bioacoustics, etc.)	Timing of survey – within recommended period? (BAM-C / TBDC)	Effort (hours & no. people)		
				07/09/2023 08/09/2023 13/09/2023 23/09/2023 person)		
Glossy Black-Cockatoo (breeding)	<i>Calyptorhynchus lathami</i>	Avifauna Survey and Stagwatching Survey for signs of breeding Significant Tree Survey for habitat trees Methods described in TBDC (NSW DCCEEW 2025b)	☒ Yes <u>Stag Watching</u> 21/08/2023 22/08/2023 23/08/2023 24/08/2023 28/08/2023 29/08/2023 30/08/2023 06/06/2024 18/06/2024 25/06/2024 27/06/2024	☐ No <u>Avifauna Survey</u> 17/09/2024 18/09/2024 19/09/2024 20/09/2024 <u>Avifauna Survey</u> 1 hour (1 Person) 2 hours (2 persons) <u>Tree Survey</u> 06/09/2023 07/09/2023 08/09/2023 13/09/2023 23/09/2023 <u>Tree Survey</u> 24 hours (1 person)	No	No
Large-eared Pied Bat	<i>Chalinolobus dwyeri</i>	Anabat detection Methods described in TBDC at time of survey (NSW DCCEEW 2025b)	☒ Yes <u>Anabat Detection Survey</u> 25/01/2024 - 30/01/2024	☐ No <u>Anabat Detection Survey</u> 16 nights(4 anabat detectors for 4 consecutive nights)	No	No
Red Goshawk	<i>Erythrotriorchis</i>	Avifauna Survey	☒ Yes	☐ No	No	No

Common name	Scientific name	Threatened fauna species surveys			Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)
		Survey method (e.g. harp trap, Elliott trap, bioacoustics, etc.)	Timing of survey – within recommended period? (BAM-C / TBDC)	Effort (hours & no. people)		
	<i>radiatus</i>	Significant Tree Survey for large stick nests Methods described in TBDC (NSW DCCEEW 2025b)	<u>Avifauna Survey</u> 17/09/2024 18/09/2024 19/09/2024 20/09/2024 <u>Tree Survey</u> 06/09/2023 07/09/2023 08/09/2023 13/09/2023 23/09/2023	<u>Avifauna Survey</u> 1 hour (1 Person) 2 hours (2 persons) <u>Tree Survey</u> 24 hours (1 person)		
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	Avifauna Survey Significant Tree Survey for large stick nests Methods described in TBDC (NSW DCCEEW 2025b)	☒ Yes <u>Avifauna Survey</u> 17/09/2024 18/09/2024 19/09/2024 20/09/2024 <u>Tree Survey</u> 06/09/2023 07/09/2023 08/09/2023 13/09/2023 23/09/2023	☐ No <u>Avifauna Survey</u> 1 hour (1 Person) 2 hours (2 persons) <u>Tree Survey</u> 24 hours (1 person)	No	No
Little Eagle	<i>Hieraaetus</i>	Avifauna Survey	☒ Yes	☐ No	No	No

Common name	Scientific name	Threatened fauna species surveys			Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)
		Survey method (e.g. harp trap, Elliott trap, bioacoustics, etc.)	Timing of survey – within recommended period? (BAM-C / TBDC)	Effort (hours & no. people)		
	<i>morphnoides</i>	Significant Tree Survey for large stick nests Methods described in TBDC (NSW DCCEEW 2025b)	<u>Avifauna Survey</u> 17/09/2024 18/09/2024 19/09/2024 20/09/2024 <u>Tree Survey</u> 06/09/2023 07/09/2023 08/09/2023 13/09/2023 23/09/2023	<u>Avifauna Survey</u> 1 hour (1 Person) 2 hours (2 persons) <u>Tree Survey</u> 24 hours (1 person)		
Square-tailed Kite	<i>Lophoictinia isura</i>	Avifauna Survey Significant Tree Survey for large stick nests Methods described in TBDC (NSW DCCEEW 2025b)	☒ Yes <u>Avifauna Survey</u> 17/09/2024 18/09/2024 19/09/2024 20/09/2024 <u>Tree Survey</u> 06/09/2023 07/09/2023 08/09/2023 13/09/2023 23/09/2023	☐ No <u>Avifauna Survey</u> 1 hour (1 Person) 2 hours (2 persons) <u>Tree Survey</u> 24 hours (1 person)	No	No
Little Bent-	<i>Miniopterus</i>	Anabat detection	☒ Yes	☐ No	Yes	Yes

Common name	Scientific name	Threatened fauna species surveys			Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)
		Survey method (e.g. harp trap, Elliott trap, bioacoustics, etc.)	Timing of survey – within recommended period? (BAM-C / TBDC)	Effort (hours & no. people)		
winged Bat (breeding)	<i>australis</i>	Methods described in TBDC at time of survey (NSW DCCEEW 2025b)	<u>Anabat Detection Survey</u> 25/01/2024 - 30/01/2024	<u>Anabat Detection Survey</u> 16 nights(4 anabat detectors for 4 consecutive nights)		
Large Bent-winged Bat (breeding)	<i>Miniopterus orianae oceanensis</i>	Anabat detection Methods described in TBDC at time of survey (NSW DCCEEW 2025b)	☒ Yes <u>Anabat Detection Survey</u> 25/01/2024 - 30/01/2024	☐ No <u>Anabat Detection Survey</u> 16 nights(4 anabat detectors for 4 consecutive nights)	No	No
Southern Myotis	<i>Myotis macropus</i>	Anabat detection Methods described in TBDC at time of survey (NSW DCCEEW 2025b)	☒ Yes <u>Anabat Detection Survey</u> 25/01/2024 - 30/01/2024	☐ No <u>Anabat Detection Survey</u> 16 nights(4 anabat detectors for 4 consecutive nights)	No	No
Barking Owl	<i>Ninox connivens</i>	Stagwatching Owl Call Playback Significant Tree Survey for large hollows Methods described in TBDC at time of survey (NSW DCCEEW 2025b)	☒ Yes <u>Stag Watching</u> 21/08/2023 22/08/2023 23/08/2023 24/08/2023 28/08/2023 29/08/2023 30/08/2023	☐ No <u>Stag Watching</u> 33 hours (2 persons)	No	No

Biodiversity Development Assessment Report

Biodiversity Development Assessment Report

Biodiversity Development Assessment Report

Common name	Scientific name	Threatened fauna species surveys			Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)
		Survey method (e.g. harp trap, Elliott trap, bioacoustics, etc.)	Timing of survey – within recommended period? (BAM-C / TBDC)	Effort (hours & no. people)		
			21/08/2023 22/08/2023 23/08/2023 24/08/2023 28/08/2023 29/08/2023 30/08/2023 06/06/2024 18/06/2024 25/06/2024 27/06/2024	33 hours (2 persons)		
Squirrel Glider	<i>Petaurus norfolcensis</i>	Spotlighting Camera Trapping Methods as outlined in Survey guidelines for Australia's threatened mammals (DSEWPac 2011)	☒ Yes <u>Spotlighting</u> 18/06/2024 25/06/2024 27/06/2024 11/07/2024 <u>Arboreal Camera Trapping</u> 07/05/2024– 12/06/2024 (12 cameras in northern portion of site) 12/06/2024 – 03072024 (12	☒ No <u>Spotlighting</u> 8 hours (2 persons) <u>Arboreal Camera Trapping</u> <u>North</u> 36 days outside survey period x 12 cameras = 432days outside survey period <u>South</u>	Yes	Yes

Common name	Scientific name	Threatened fauna species surveys			Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)
		Survey method (e.g. harp trap, Elliott trap, bioacoustics, etc.)	Timing of survey – within recommended period? (BAM-C / TBDC)			
			cameras in southern portion of site)		22 days outside survey period x 12 cameras = 264days outside survey period	
			<u>Stag Watching</u> 21/08/2023 22/08/2023 23/08/2023 24/08/2023 28/08/2023 29/08/2023 30/08/2023 06/06/2024 18/06/2024 25/06/2024 27/06/2024		<u>Stag Watching</u> 33 hours (2 persons)	
Brush-tailed Phascogale	<i>Phascogale tapoatafa</i>	Spotlighting Camera Trapping Methods outlined in TBDC (NSW DCCEEW 2025b) and Survey guidelines for Australia's threatened mammals (DSEWPac 2011)	☒ Yes <u>Spotlighting</u> 18/06/2024 25/06/2024 27/06/2024 11/07/2024 <u>Arboreal Camera Trapping</u>	☒ No	<u>Spotlighting</u> 8 hours (2 persons) <u>Arboreal Camera Trapping</u>	Yes Yes

Common name	Scientific name	Threatened fauna species surveys			Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)
		Survey method (e.g. harp trap, Elliott trap, bioacoustics, etc.)	Timing of survey – within recommended period? (BAM-C / TBDC)			
			07/05/2024– 12/06/2024 (12 cameras in northern portion of site)		<u>North</u> 36 days outside survey period x 12 cameras = 432days outside survey period	
			12/06/2024 – 03072024 (12 cameras in southern portion of site)		<u>South</u> 22 days outside survey period x 12 cameras = 264days outside survey period	
			<u>Stag Watching</u> 21/08/2023 22/08/2023 23/08/2023 24/08/2023 28/08/2023 29/08/2023 30/08/2023 06/06/2024 18/06/2024 25/06/2024 27/06/2024		<u>Stag Watching</u> 33 hours (2 persons)	
			<u>Ground trapping</u> 16/09/2024 –		<u>Ground trapping</u>	

Common name	Scientific name	Threatened fauna species surveys				Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)
		Survey method (e.g. harp trap, Elliott trap, bioacoustics, etc.)	Timing of survey – within recommended period? (BAM-C / TBDC)		Effort (hours & no. people)		
			20/09/2024		4 consecutive nights		
Koala	<i>Phascolarctos cinereus</i>	Spotlighting Camera Trapping Spot Assessment Technique Methods outlined in Koala (Phascolarctos cinereus) Biodiversity Assessment Method Survey Guide (DPE 2022)	☒ Yes <u>Spotlighting</u> 18/06/2024 25/06/2024 27/06/2024 11/07/2024 <u>Arboreal Camera Trapping</u> 07/05/2024– 12/06/2024 (12 cameras in northern portion of site) 12/06/2024 – 03072024 (12 cameras in southern portion of site) <u>Stag Watching</u> 21/08/2023 22/08/2023 23/08/2023 24/08/2023	☒ No	<u>Spotlighting</u> 8 hours (2 persons) <u>Arboreal Camera Trapping</u> <u>North</u> 36 days outside survey period x 12 cameras = 432days outside survey period <u>South</u> 22 days outside survey period x 12 cameras = 264days outside survey period <u>Stag Watching</u> 33 hours (2 persons)	Yes	Yes

Common name	Scientific name	Threatened fauna species surveys			Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)
		Survey method (e.g. harp trap, Elliott trap, bioacoustics, etc.)	Timing of survey – within recommended period? (BAM-C / TBDC)	Effort (hours & no. people)		
			28/08/2023 29/08/2023 30/08/2023 06/06/2024 18/06/2024 25/06/2024 27/06/2024			
Red-backed Button-quail	<i>Turnix maculosus</i>	Spotlighting Methods outlined in TBDC (NSW DCCEEW 2025b)	☒ Yes <u>Avifauna Survey</u> 17/09/2024 18/09/2024 19/09/2024 20/09/2024 <u>Spotlighting</u> 18/06/2024 25/06/2024 27/06/2024 11/07/2024	☐ No <u>Avifauna Survey</u> 1 hour (1 Person) 2 hours (2 persons) <u>Spotlighting</u> 8 hours (2 persons)	No	No
Masked Owl	<i>Tyto novaehollandiae</i>	Stagwatching Owl Call-playback Significant Tree Survey for large hollows Methods described in TBDC at time of survey (NSW DCCEEW 2025b)	☒ Yes <u>Stag Watching</u> 21/08/2023 22/08/2023 23/08/2023 24/08/2023	☐ No <u>Stag Watching</u> 33 hours (2 persons)	No	No

Common name	Scientific name	Threatened fauna species surveys			Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)
		Survey method (e.g. harp trap, Elliott trap, bioacoustics, etc.)	Timing of survey – within recommended period? (BAM-C / TBDC)	Effort (hours & no. people)		
			28/08/2023 29/08/2023 30/08/2023 06/06/2024 18/06/2024 25/06/2024 27/06/2024 <u>Owl Call Playback</u> 26/06/2024 27/06/2024 28/06/2024 10/07/2024 11/07/2024 13/01/2025 14/01/2025 20/01/2025 <u>Spotlight survey</u> 18/06/2024 25/06/2024 27/06/2024 11/07/2024	Owl Call Playback 6 hours (1 person) 7 hours 30 min (2 persons) Spotlight survey 8 hours (2 persons)		
Sooty Owl	<i>Tyto tenebricosa</i>	Stagwatching Owl Call-playback Significant Tree Survey for large hollows	☒ Yes <u>Stag Watching</u> 21/08/2023	☐ No <u>Stag Watching</u> 33 hours (2 persons)	No	No

Common name	Scientific name	Threatened fauna species surveys			Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)
		Survey method (e.g. harp trap, Elliott trap, bioacoustics, etc.)	Timing of survey – within recommended period? (BAM-C / TBDC)	Effort (hours & no. people)		
		Methods described in TBDC at time of survey (NSW DCCEEW 2025b)	22/08/2023 23/08/2023 24/08/2023 28/08/2023 29/08/2023 30/08/2023 06/06/2024 18/06/2024 25/06/2024 27/06/2024 <u>Owl Call Playback</u> 26/06/2024 27/06/2024 28/06/2024 10/07/2024 11/07/2024 13/01/2025 14/01/2025 20/01/2025 <u>Spotlight survey</u> 18/06/2024 25/06/2024 27/06/2024 11/07/2024		<u>Owl Call Playback</u> 6 hours (1 person) 7 hours 30 min (2 persons) <u>Spotlight survey</u> 8 hours (2 persons)	

5.4 Expert reports

No expert reports were required.

5.5 Area or count, and location of suitable habitat for a species credit species (a species polygon)

Pterostylis chaetophora was found to occur on site and will require offsetting. The species was recorded within vegetation zones 1 and 2 (PCT 3433_Forest and PCT 3433_Cleared). In considering information within the TBDC (NSW DCCEEW 2025b), both PCT 3433 and PCT 4042 are vegetation types associated with the species, therefore the Species Polygon will include all vegetation zones and accounts for a total area of 2.13ha. Species polygon for *Pterostylis chaetophora* is shown in 5.1.

Ninox strenua (Powerful Owl) was heard calling and observed within the subject land during owl surveys and will require offsetting. As outlined in the TBDC (NSW DCCEEW 2025b):

The species polygon must be drawn to include all vegetation zones;

- 1. within 800 m (being the approximate home range) from the location of a detected owl, and*
- 2. containing a living or dead tree with a hollow >20cm diameter that occurs >4m above the ground.*

An 800m buffer was drawn around the primary tree the Powerful Owl was observed in and all areas of vegetation zones 1 and 3 (PCT 3433_Forest and PCT 4042 Forest) within this 800m radius were counted towards the species polygon. Areas of veg zone 2 (PCT 3433_Cleared) were not counted for the species polygon due to the lack of any adult trees within the zone. The total area of species polygon for Powerful Owl is 1.09ha and the species polygon is shown in 5.2.

Phascogale tapoatafa (Brush-tailed Phascogale) was recorded on remote cameras and will require offsetting. Species Polygon includes all vegetation zones containing suitable canopy species (PCT 3433_Forest and PCT 4042_Forest). The area of the species polygon for Brush-tailed Phascogale is 1.77ha. Species polygon for Brush-tailed Phascogale is shown in 5.3.

Miniopterus australis (Little Bent-winged Bat) was recorded during bat call surveys. This dual credit species is being offset as ecosystem credit species but not as a species credit species because no preferred breeding habitat or signs of a breeding were present within the subject land or within 100m of the subject land.

Pteropus poliocephalus (Grey-headed Flying Fox) was observed feeding on flowering eucalypt trees within the study area. No breeding camps were observed within the study area or are known to occur

in the surrounding area. Therefore, this dual credit species is only being offset as an ecosystem credit species.

Some images captured on remote cameras could not positively be identified as Sugar or Squirrel Glider however the precautionary principal was applied and Squirrel Gliders were assumed to be using the site. *Petaurus norfolcensis* (Squirrel Glider) will require offsetting as a species credit species. This Species Polygon includes all vegetation zones containing suitable canopy species (PCT 3433_Forest and PCT 4042_Forest). The area of the species polygon for Squirrel Glider is 1.77ha. Species polygon for Squirrel Glider is shown in 5.4.

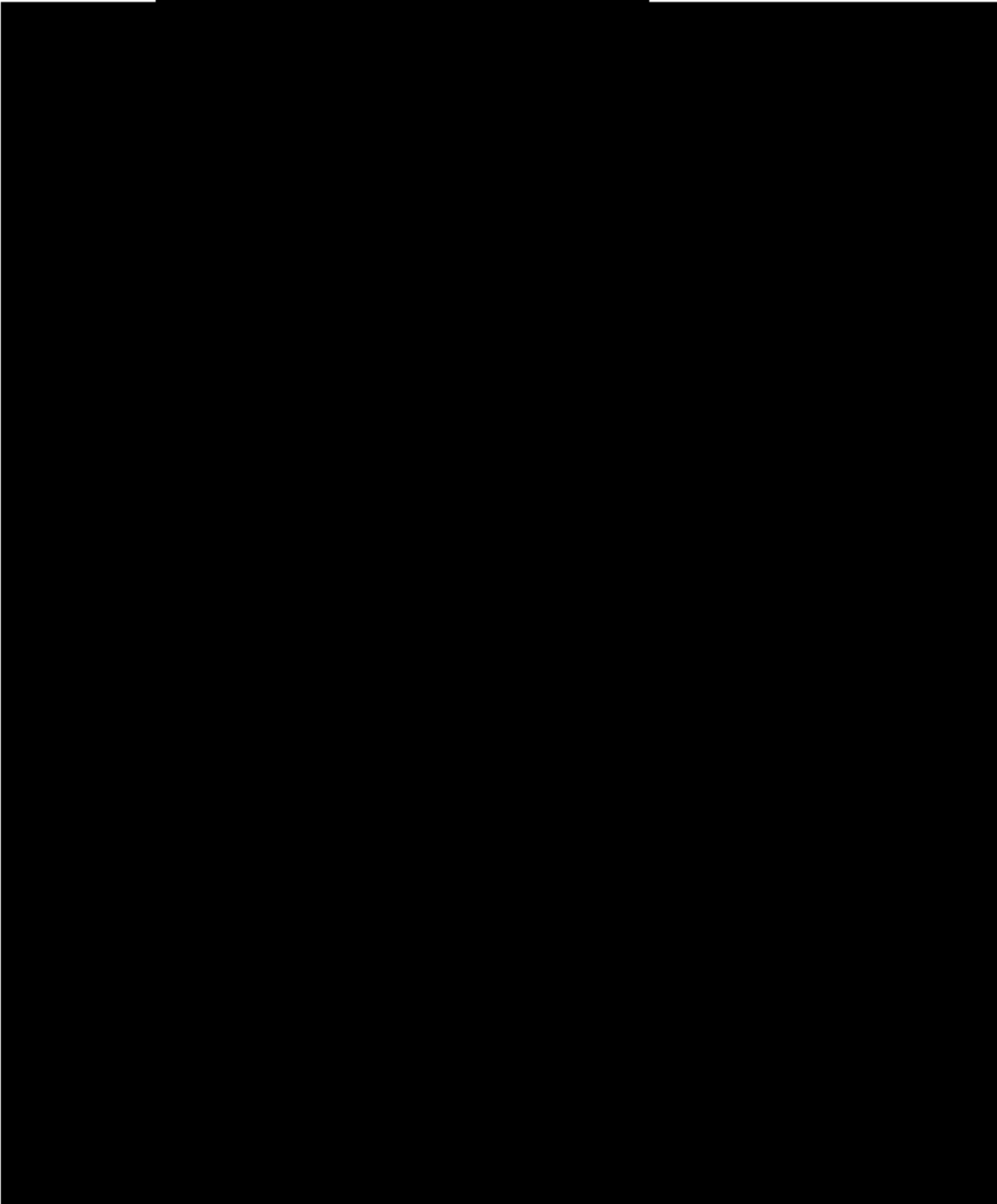
Despite targeted surveys for *Phascolarctos cinereus* (Koala), including spotlighting and SATs, no koalas or koala scats were observed within the study area. Some large pock marks that could be from *P. cinereus* were observed on a tree during SATs. *P. cinereus* has been previously recorded several times along this stretch of East Seaham Road and in neighbouring lots on all sides. (NSW DCCEEW 2025b). While no concrete evidence of koala was observed during field surveys, the species has been assumed present due to the high number of recent records within and in the vicinity of the study area and the high frequency of koala feed trees (*E. tereticornis*). This Species Polygon includes all vegetation zones containing suitable canopy species (PCT 3433_Forest and PCT 4042_Forest). The area of the species polygon for Koala is 1.77ha. Species polygon for Koala is shown in 5.5.

Candidate species credit species *Corybas dowlingii* (Red Helmet Orchid) has been assumed present as targeted species surveys have not been carried out during the appropriate survey period. Habitat for this species is described in the TDBC as “sheltered areas such as gullies and southerly slopes in tall open forest on well-drained gravelly soil...though the species has been recorded from sandy soils in swamp forest areas” (NSW DCCEEW 2025b). In considering this, forested vegetation zones within the study area would constitute potential habitat for the species. The Species Polygon will therefore include vegetation zones PCT 3433_Forest and PCT 4042_Forest and account for a total area of 1.77ha. Species polygon for *Corybas dowlingii* is shown in 5.6.

Candidate species credit species *Rutidosia heterogama* (Heath Wrinklewort) has been assumed present as flora surveys conducted did not target this species specifically. Habitat for this species is described in the TDBC as “heath on sandy soils and moist areas in open forest, and has been recorded along disturbed roadsides.” (NSW DCCEEW 2025b). The species only associated with PCT 3433 and not PCT 4042 (NSW DCCEEW 2025b). Vegetation zone PCT 4042_Forest contained dense vegetation and was not considered suitable habitat for Heath Wrinklewort. All vegetation zones of PCT 3433 were considered to contain potential habitat for the species. The Species

Polygon will therefore include vegetation zones PCT 3433_Forest and PCT 3433_Cleared and account for a total area of 1.70ha. Species polygon for *Rutidosia heterogama* is shown in 5.10.

Figure 5.1



Job No.	12878
A4 Scale	1:11,000

Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependant on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.

Map Projection: GDA2020 MGA Zone 56
Data Source: LPI (2025), Nearmap (13/04/2024), NSW DCCEEW (2025b)

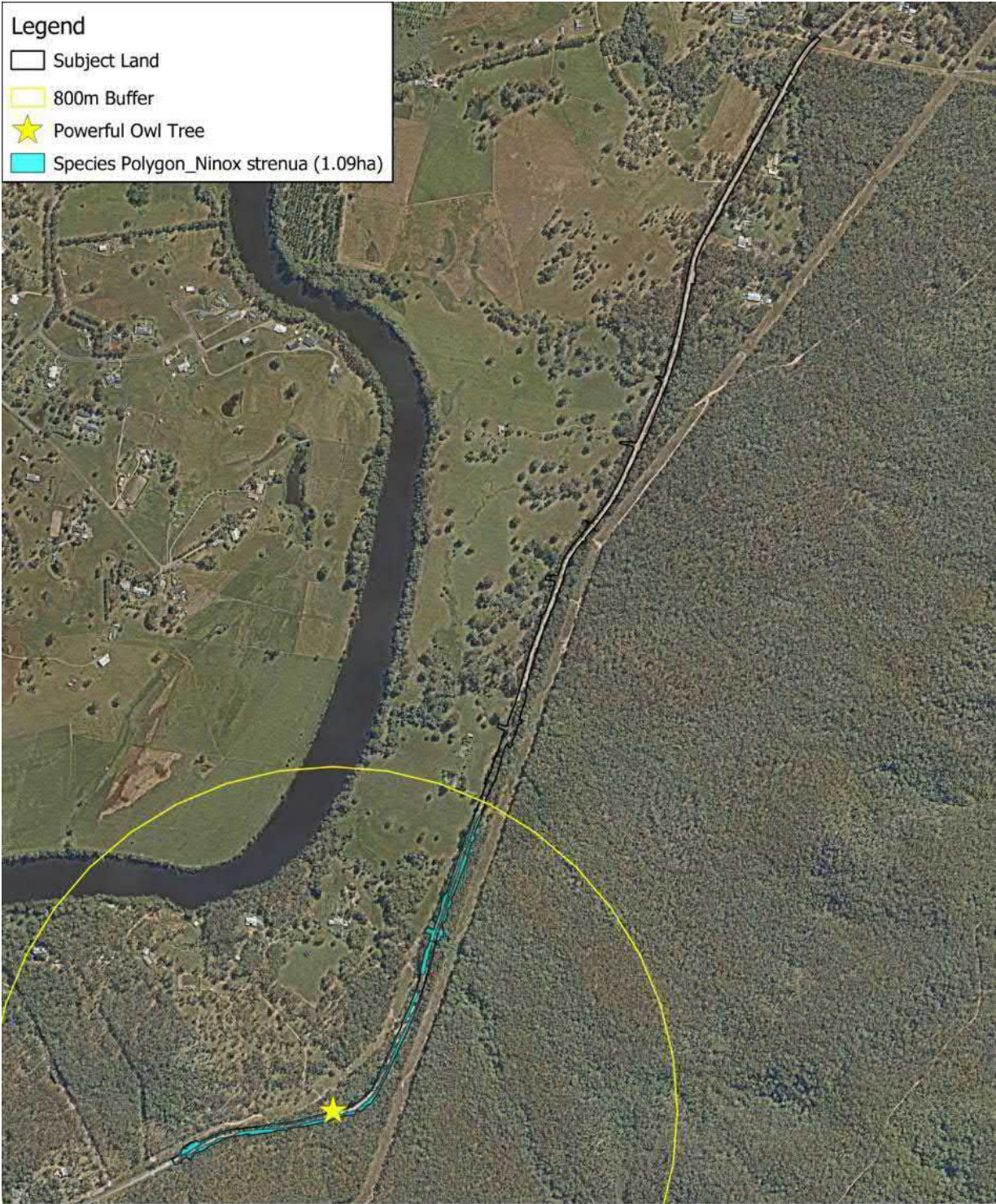
Figure 5.1

East Seaham Road
East Seaham, NSW

29 January 2025

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Environmental Consultants
(a Division of Tattersall Lander Pty Ltd)
ABN 41 003 509 215

Figure 5.2 *Ninox strenua* (Powerful Owl) Species Polygon



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A4 Scale	1:11,000

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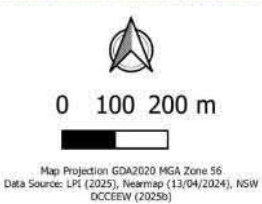


Figure 5.2

Species Polygon
Ninox strenua

East Seaham Road
East Seaham, NSW

29 January 2025

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Figure 5.3 *Phascogale tapoatafa* (Brush-tailed Phascogale) Species Polygon



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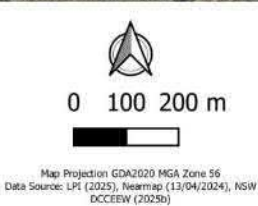


Figure 5.3
Species Polygon <i>Phascogale tapoatafa</i>
East Seaham Road East Seaham, NSW
29 January 2025

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Figure 5.4 *Petaurus norfolcensis* (Squirrel Glider) Species Polygon



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A4 Scale	1:13,000

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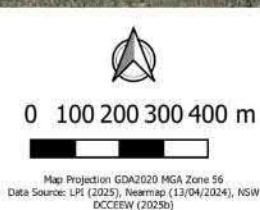


Figure 5.4

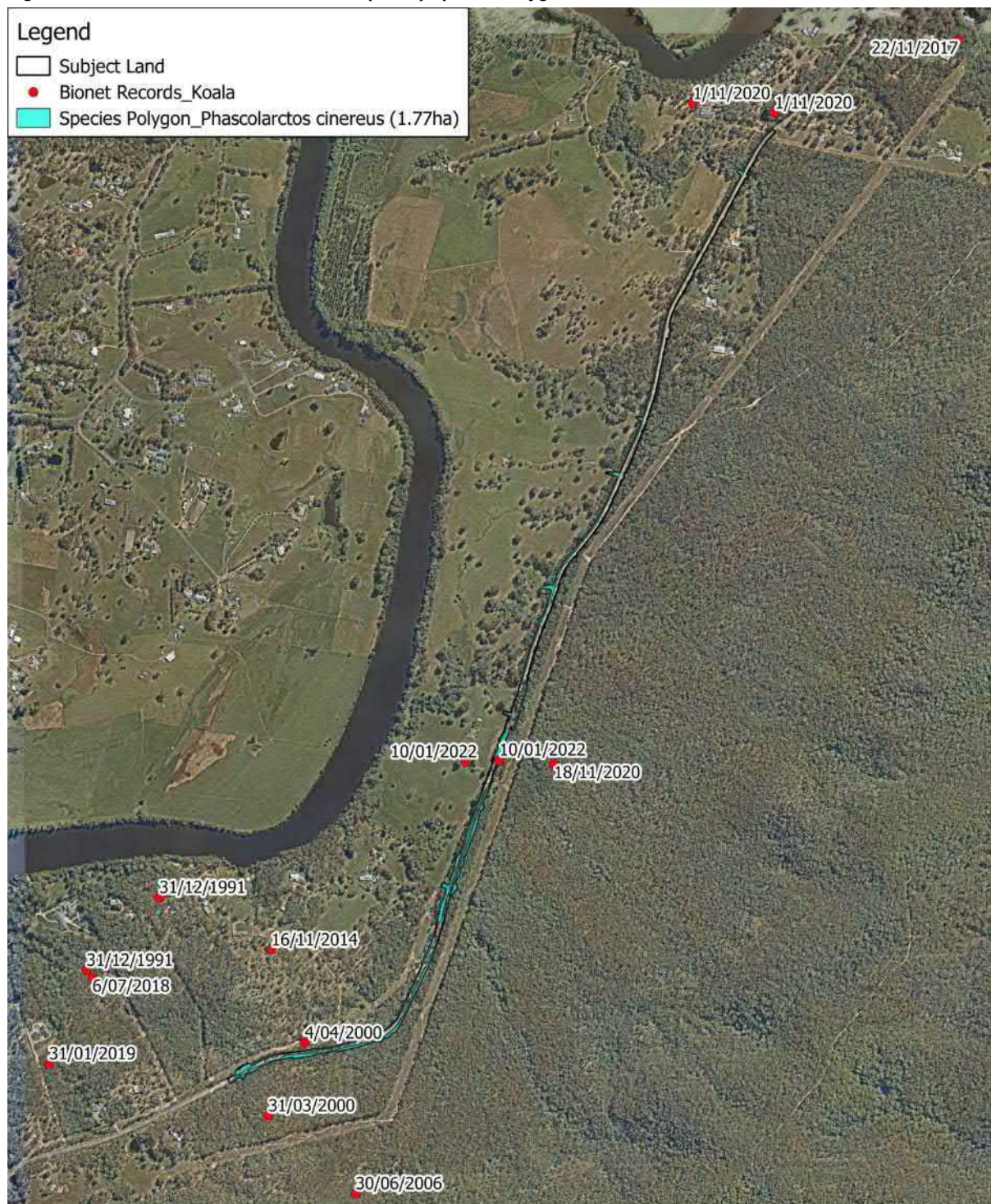
Species Polygon
Petaurus norfolcensis

East Seaham Road
East Seaham, NSW

29 January 2025

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ABN 41 003 509 215

Figure 5.5 *Phascolarctos cinereus* (Koala) Species Polygon



Job No.	12878
A4 Scale	1:13,000

Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependant on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.

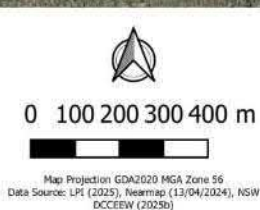


Figure 5.5

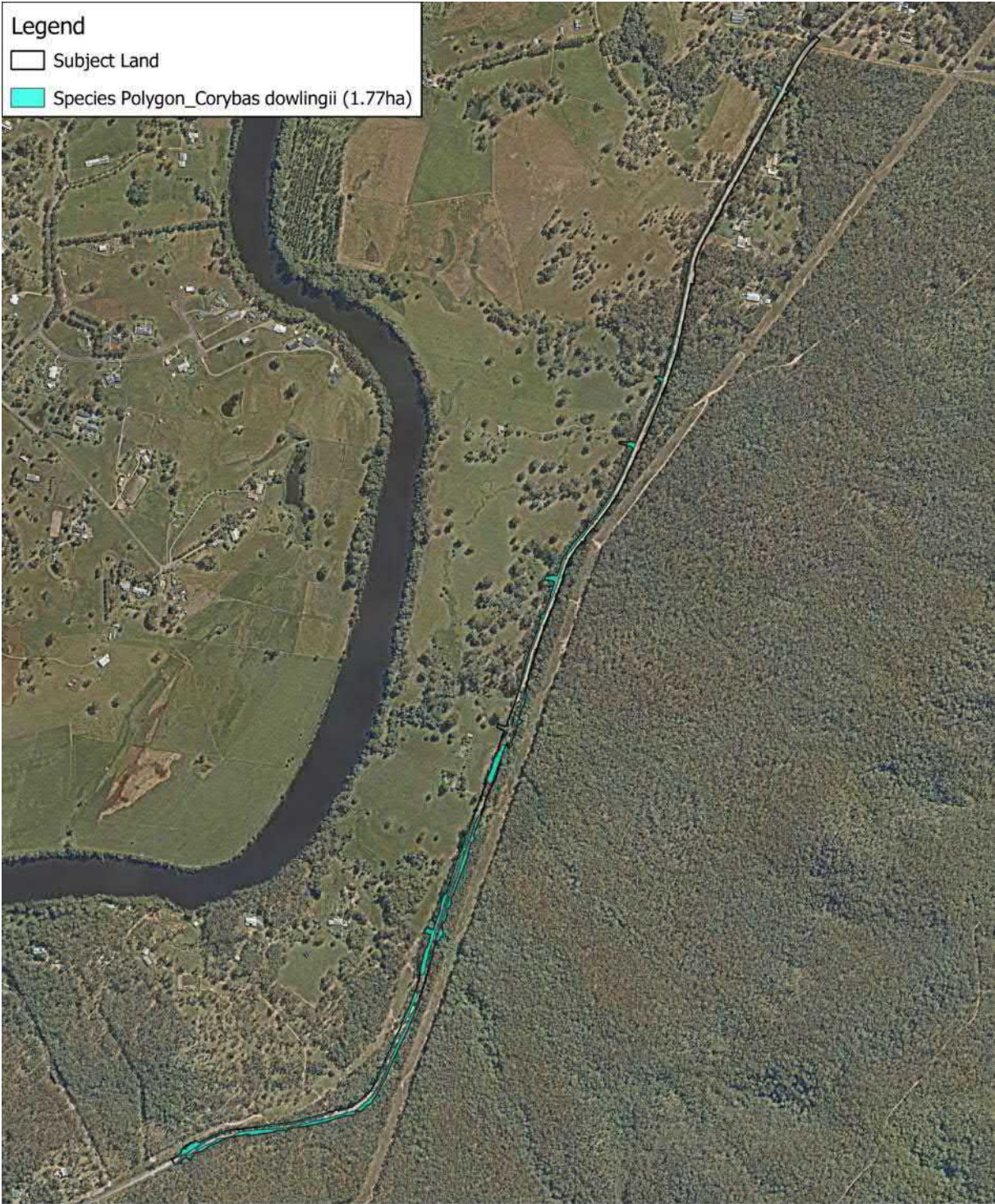
Species Polygon
Phascolarctos cinereus

East Seaham Road
East Seaham, NSW

29 January 2025

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Environmental Consultants
(a Division of Tattersall Lander Pty Ltd)
ABN 41 003 509 215

Figure 5.6 *Corybas dowlingii* (Red Helmet Orchid) Species Polygon



Job No.	12878
A4 Scale	1:11,000
Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependant on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.	

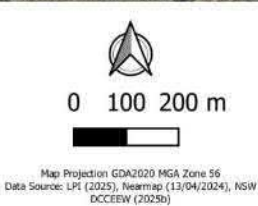
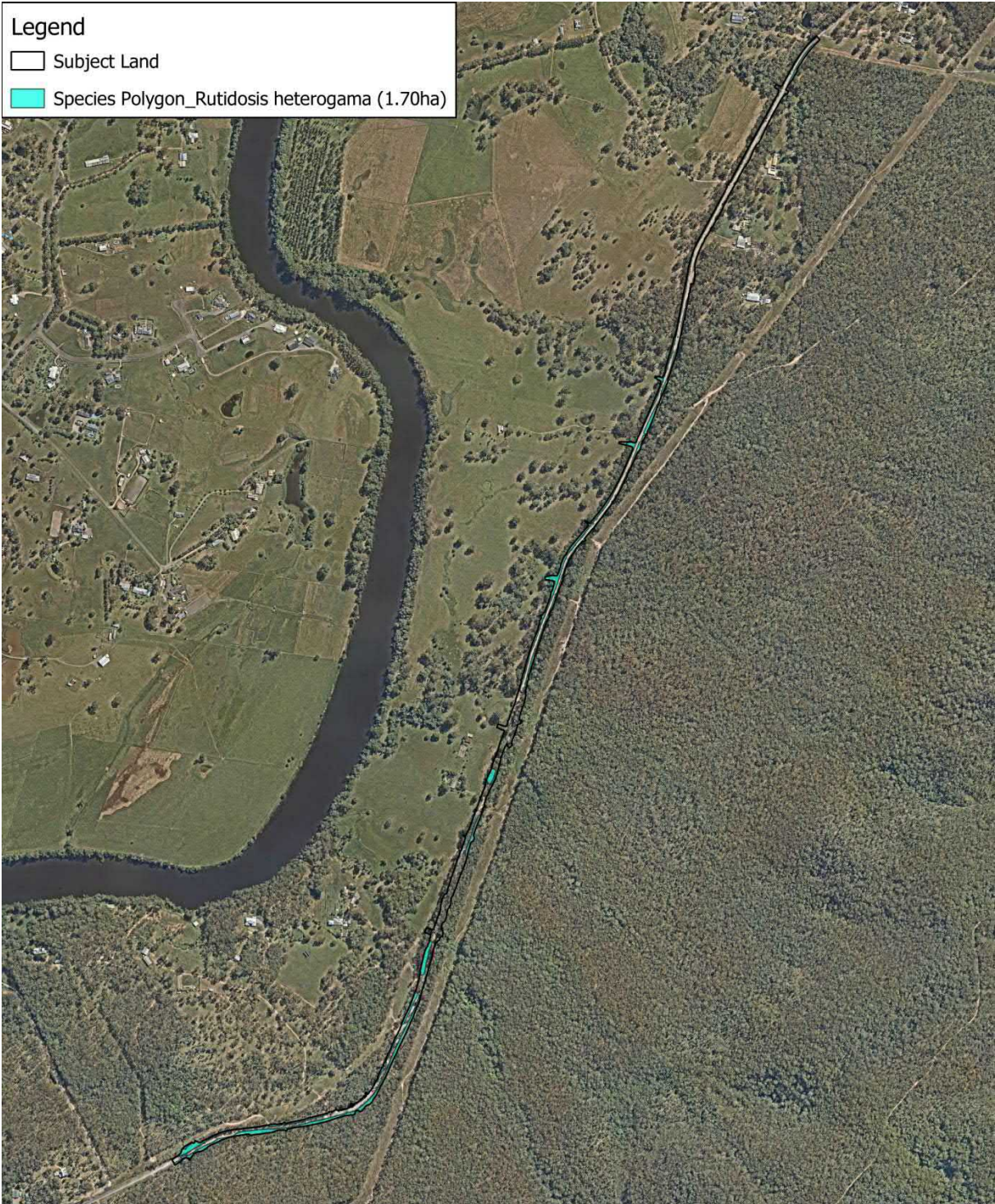


Figure 5.6
Species Polygon <i>Corybas dowlingii</i>
East Seaham Road East Seaham, NSW
29 January 2025

WILDTHING
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ABN 41 003 509 215

Figure 5.7 *Rutidosia heterogama* (Heath Wrinklewort) Species Polygon



Job No.	12878
A4 Scale	1:11,000

Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependant on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.

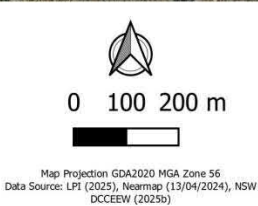


Figure 5.7

Species Polygon
Rutidosia heterogama

East Seaham Road
East Seaham, NSW

3 February 2025

6.0 Identifying prescribed impacts

The subdivision area contains the following prescribed impacts outlined in Table 6.1.

Table 6.1 Prescribed impacts identified

Feature	Present	Description of feature characteristics and location	Threatened entities that use, are likely to use, or are part of the habitat feature. Where relevant, threatened species or fauna that are part of a TEC or EC, that are at risk of vehicle strike
Karst, caves, crevices, cliffs, rocks or other geological features of significance	☐ Yes / ☒ No	N/A	N/A
Human-made structures	☒ Yes / ☐ No	Culverts, road, driveways, fences, power poles	Sheltering species, microchiropteran bats or mud nest avifauna species.
Non-native vegetation	☒ Yes / ☐ No	The subject land contained 0.44ha of non-native vegetation (Figure 4.1) mostly comprised of pasture grasses and weeds.	Hunting avifauna species such as <i>Lophoictinia isura</i> (Square-tailed Kite) (Foraging) and <i>Hieraaetus morphnoides</i> (Little Eagle) (foraging).
Habitat connectivity	☒ Yes / ☐ No	For the majority of the alignment the subject land adjoins Wallarō National Park to the east	Highly mobile threatened species such as woodland birds (e.g. <i>Glossopsitta pusilla</i> (Little Lorikeet), <i>Lathamus discolor</i> (Swift Parrot) and arboreal mammals like <i>Petaurus norfolcensis</i> (Squirrel Glider) and <i>Phascogale cinereus</i> (Koala).
Waterbodies, water quality and hydrological processes	☒ Yes / ☐ No	1 st , 2 nd and 3 rd order prescribed streams were present passing through culverts within East Seaham Road. These streams are ephemeral and surface water was only observed after rainfall events. No Groundwater Dependent Ecosystems (GDE's) were located within and surrounding the subject land.	Amphibians, aquatic avifauna and hunting avifauna as well as microchiropteran bats (foraging).
Wind turbine strikes (wind farm development only)	☐ Yes / ☒ No	N/A	N/A
Vehicle strikes	☒ Yes / ☐ No	Through the centre of the subject land is the gravel portion of East Seaham Road, East Seaham. The proposal will allow for the upgrade of this portion of road.	Mobile threatened species such as avifauna, microchiropteran bats, arboreal mammals like <i>Petaurus norfolcensis</i> (Squirrel Glider) and <i>Phascogale cinereus</i> (Koala)

Stage 2: Impact assessment (biodiversity values and prescribed impacts)

7.0 Avoid and minimise impacts

7.1 Avoid and minimise direct and indirect impacts

7.1.1 Project location

The proposal has been positioned overtop of and along both sides of a pre-existing gravel portion of East Seaham Road. The development site has been positioned within a location that has been subject to continual disturbances such as road maintenance, dust incursion from the gravel road and noise pollution from the deteriorating gravel road. Due to this placement, impacts have largely been limited to native vegetation closest to the edge of the existing road. Vegetation closest to the existing road is considered most disturbed of all vegetation in the road reserve due to edge effects such as dust pollution from traffic, compaction from vehicles pulling over and weed spraying as part of regular weed management by council. Therefore, direct and indirect impacts of the proposal have mainly been limited to the most disturbed vegetation and habitat while the majority of the better-quality potential habitat for the species will be avoided in the road reserve.

7.1.2 Project design

The proposal has been designed to largely follow the alignment of the pre-existing road and retain the majority of vegetation within the road reserve. Areas of the road consisting of blind bends will be realigned and some vegetation removed to improve visibility and safety. The proposal has been designed to avoid the direct removal of known locations of recorded *Pterostylis chaetophora*. The road speed limit will be retained at 70km/h, however signage urging vehicles to slow down due to gravel conditions will be removed.

7.2 Avoid and minimise prescribed impacts

7.2.1 Project location

The proposed portion of road to be upgraded has been subject to routine periodic grading and rolling, laying of fresh gravel and repairs of the road surface. The proposal has been positioned overtop of and along both sides of a pre-existing gravel portion of East Seaham Road which minimises the amount of vegetation/habitat requiring removal for the proposal. The proposed location of the road upgrade allows for the retention of the majority of native vegetation within the study area. This minimises impact to the east/west vegetation corridor.

7.2.2 Project design

Areas of the road will be widened to improve safety along the road. This will improve visibility and potentially minimise vehicle impacts on native fauna. Although the proposal design does include widening of the road in some areas, the proposed design will retain the majority of vegetation within the road reserve and therefore will maintain connectivity within the wider landscape. Culverts will also be upgraded to facilitate the movement of water.

7.3 Other measures considered

A SIS assessment was considered for the proposal, however the proponent has decided to opt into the biodiversity offset scheme.

7.4 Summary of measures to avoid and minimise impacts

Table 7.1 documents the measures to avoid and minimise direct, indirect and prescribed impacts associated with the development proposal.

Table 7.1 Avoidance and minimisation measures for direct, indirect and prescribed impacts

Impact	Avoidance and Minimisation Action	Outcome	Timing	Responsibility
Removal of 2.13ha of native vegetation	The proposal has been positioned overtop and along both sides of a pre-existing gravel portion of East Seaham Road. The development site has been positioned within a location that has been subject to continual disturbances such as road maintenance, dust incursion from the gravel road and noise pollution from the deteriorating gravel road. The installation of a paved road will reduce the dust incursion into native vegetation. Continued roadside maintenance in the form of weed management will increase the quality of retained native vegetation within the road reserve.	The development area has been located within the road reserve of the gravel portion of East Seaham Road to minimise impacts to higher quality native vegetation and threatened species habitat located further away from the existing road. Roadside maintenance, such as weed management will increase the quality of retained native vegetation.	During the design phase	Project designer
Connectivity (habitat fragmentation) (Design phase)	The project has been designed to retain the majority of vegetation within the road reserve. Vegetation will only be removed to allow the realignment of some sections of road and widening to increase visibility and safety. Only what is required to be removed for safety purposes is proposed to be removed.	The removal of vegetation and widening of the road for the proposal will create a wider break in the east-west corridor, however the proposal has been designed to retain the majority of vegetation within the road reserve. Therefore, it will not fragment connection to retained vegetation.	During the design and construction phase	Project designer Project manager
Loss of BC Act 2016 listed TEC Lower Hunter spotted Gum – Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions	The project has been designed to retain the majority of vegetation within the road reserve. Vegetation will only be removed to allow the realignment of some sections of road and widening to increase visibility and safety. Better quality TEC has been primarily avoided through the alignment of the new road overtop of the existing gravel road	The proposal has been designed to retain the majority of this TEC within the road reserve and avoid the majority of better-quality vegetation located further away from the existing road.	During the design and construction phase	Project designer Project manager

Impact	Avoidance and Minimisation Action	Outcome	Timing	Responsibility
	and over more degraded vegetation along its edge. A total of 1.70ha of this TEC will be removed as a result of the proposal from the 9.58ha study area. The clearance zone is to be clearly marked to eliminate any inadvertent impact to adjoining habitat.	Eliminate the inadvertent removal of this TEC to be retained within the scope of the proposal.		
Loss of BC Act 2016 listed TEC Subtropical Coastal Floodplain Forest of the NSW North Coast bioregion	The project has been designed to retain the majority of vegetation within the road reserve. Vegetation will only be removed to allow the realignment of some sections of road and widening to increase visibility and safety. Better quality TEC has been primarily avoided through the alignment of the new road overtop of the existing gravel road and over more degraded vegetation along its edge. A total of 0.43ha of this TEC will be removed as a result of the proposal from the 9.58ha study area. The clearance zone is to be clearly marked to eliminate any inadvertent impact to adjoining habitat.	The proposal has been designed to retain the majority of this TEC within the road reserve and avoid the majority of better quality vegetation located further away from the existing road. Eliminate the inadvertent removal of this TEC to be retained within the scope of the proposal.	During design and the construction phase	Project designer Project manager
Loss of <i>Pterostylis chaetophora</i> (Tall Rustyhood) habitat	The project has been designed to retain the majority of vegetation within the road reserve. Vegetation will only be removed to allow the realignment of some sections of road and widening to increase visibility and safety. Better quality habitat has been primarily avoided through the alignment of the new road overtop of the existing gravel road and over more degraded vegetation along its edge. A total of 2.13ha of Tall Rustyhood habitat will be removed as a result of the proposal	The proposal has been designed to retain the majority of Tall Rustyhood habitat within the road reserve and avoid the majority of better-quality vegetation located further away from the existing road. Avoid impact to retained specimens	During design and the construction phase	Project designer Project manager

Impact	Avoidance and Minimisation Action	Outcome	Timing	Responsibility
	from the 9.58ha study area. [REDACTED] The clearance zone is to be clearly marked to eliminate any inadvertent impact to adjoining habitat.	of <i>P. chaetophora</i>. Eliminate the inadvertent removal of habitat to be retained within the scope of the proposal.		
Loss of <i>Corybas dowlingii</i> (Red Helmet Orchid) habitat	Red Helmet Orchid has been assumed present as no species surveys have been conducted in the appropriate timeframe. <i>C. dowlingii</i> habitat is described in the TDBC as “sheltered areas such as gullies and southerly slopes in tall open forest on well-drained gravelly soil...though the species has been recorded from sandy soils in swamp forest areas” (NSW DCCEEW 2025b). In considering this, forested vegetation zones within the study area would constitute potential habitat for the species. This habitat is considered disturbed due to the high levels of <i>Lantana camara</i> (Lantana) present throughout the site which forms thickets in some locations, choking out ground layer plants. Impacts to native vegetation within the study area have been minimised as the proposal has been	The proposal has been designed to retain the majority of Red Helmet Orchid habitat within the road reserve and avoid most of the better-quality habitat located further away from the existing road.	During the design and construction phase	Project designer Project manager

Impact	Avoidance and Minimisation Action	Outcome	Timing	Responsibility
	designed to largely follow the alignment of the pre-existing road and retain the majority of vegetation within the road reserve. Areas of the road consisting of blind bends will be realigned and some vegetation removed to improve visibility and safety. Due to this design, impacts have largely been limited to native vegetation closest to the edge of the existing road. Vegetation closest to the existing road is considered most disturbed of all vegetation in the road reserve due to edge effects such as dust pollution from traffic, compaction from vehicles pulling over and weed spraying as part of regular weed management by council. Therefore, impacts of the proposal have mainly been limited to the most disturbed potential habitat for <i>C. dowlingii</i> while the majority of the better-quality potential habitat for the species will be avoided in the road reserve. A total of 1.77ha of potential Red Helmet Orchid habitat will be removed as a result of the proposal from the 9.58ha study area. The clearance zone is to be clearly marked to eliminate any inadvertent impact to adjoining habitat.			
Loss of <i>Rutidosia heterogama</i> (Heath Wrinklewort) habitat	Heath Wrinklewort has been assumed present as flora surveys conducted did not target this species specifically. <i>R. heterogama</i> habitat is described in the TDBC as "heath on sandy soils and moist areas in open forest, and has been recorded along disturbed roadsides." (NSW DCCEEW 2025b).	The proposal has been designed to retain the majority of Heath Wrinklewort habitat within the road reserve and avoid most of the better-quality habitat located further away from the existing road.	During the design and construction phase	Project designer Project manager

Impact	Avoidance and Minimisation Action	Outcome	Timing	Responsibility
	In considering this, PCT 3433 within the study area would constitute potential habitat for the species. This habitat is considered disturbed due to the high levels of <i>Lantana camara</i> (Lantana) present throughout the site which forms thickets in some locations, choking out ground layer plants. Impacts to native vegetation within the study area have been minimised as the proposal has been designed to largely follow the alignment of the pre-existing road and retain the majority of vegetation within the road reserve. Areas of the road consisting of blind bends will be realigned and some vegetation removed to improve visibility and safety. Due to this design, impacts have largely been limited to native vegetation closest to the edge of the existing road. Vegetation closest to the existing road is considered most disturbed of all vegetation in the road reserve due to edge effects such as dust pollution from traffic, compaction from vehicles pulling over and weed spraying as part of regular weed management by council. Therefore, impacts of the proposal have mainly been limited to the most disturbed potential habitat for <i>R. heterogama</i> while the majority of the better-quality potential habitat for the species will be avoided in the road reserve. A total of 1.70ha of potential Heath Wrinklewort habitat will be removed as a result of the proposal from the 9.58ha study area. The clearance zone is to be clearly marked to eliminate any inadvertent impact to adjoining	Eliminate the inadvertent removal of habitat to be retained within the scope of the proposal.		

Impact	Avoidance and Minimisation Action	Outcome	Timing	Responsibility
	habitat.			
Loss of <i>Phascolarctos cinereus</i> (Koala habitat)	Better quality habitat for Koala has been primarily avoided through the alignment of the new road overtop of the existing gravel road and over more degraded vegetation along its edge which is subject to the highest amount of disturbance through noise and dust pollution. Timing of vegetation clearance to avoid koala breeding season (October – January).	The proposal has been designed to avoid the majority of better quality/less disturbed habitat located further away from the existing road. Timing works to avoid critical life cycle events such as breeding for Koala.	During construction phase	Project manager
Loss of <i>Petaurus norfolcensis</i> (Squirrel Glider) habitat	Better quality habitat for Squirrel Glider has been primarily avoided through the alignment of the new road overtop of the existing gravel road and over more degraded vegetation along its edge which is subject to the highest amount of disturbance through noise and dust pollution. A total of 1.77ha of Squirrel Glider habitat, including 48 hollow-bearing trees will be removed as a result of the development. Compensatory fauna habitat in the form of nest boxes mounted in alternate trees will be provided with 2 nest boxes for every hollow lost. The nest boxes shall be offset, constructed and installed in accordance with the Port Stephens Council Biodiversity Technical Specification 2024. Documentary evidence of installation of the nest box must be provided in accordance with the Bushland Schedule of Rates Tender and to the Environmental Operations Team Leader or nominated representative for approval. Nest boxes should be installed prior to removal of vegetation.	The proposal has been designed to avoid the majority of better quality/less disturbed habitat located further away from the existing road. A net positive increase of squirrel glider nesting habitat within the locality, a retention of key connections.	During the construction phase	Project manager

Impact	Avoidance and Minimisation Action	Outcome	Timing	Responsibility
	Nest boxes are to be designed to specifications for Squirrel Glider, Brush-tailed Phascogale, Powerful Owl and Microchiropteran Bats. Nest boxes should not be installed within Koala Feed Trees where possible.			
Loss of <i>Phascogale tapoatafa</i> (Brush-tailed Phascogale) breeding habitat	Better quality habitat for Brush-tail Phascogale has been primarily avoided through the alignment of the new road overtop of the existing gravel road and over more degraded vegetation along its edge which is subject to the highest amount of disturbance through noise and dust pollution. A total of 1.77ha of Brush-tailed Phascogale habitat, including 48 hollow-bearing trees will be removed as a result of the development. . Compensatory fauna habitat in the form of nest boxes mounted in alternate trees will be provided with 2 nest boxes for every hollow lost. The nest boxes shall be offset, constructed and installed in accordance with the Port Stephens Council Biodiversity Technical Specification 2024. Documentary evidence of installation of the nest box must be provided in accordance with the Bushland Schedule of Rates Tender and to the Environmental Operations Team Leader or nominated representative for approval. Nest boxes should be installed prior to removal of vegetation. Nest boxes are to be designed to specifications for Squirrel Glider, Brush-tailed Phascogale, Powerful Owl and Microchiropteran Bats. Nest boxes should	The proposal has been designed to avoid the majority of better quality/less disturbed habitat located further away from the existing road. A net positive increase of Brush-tailed Phascogale nesting habitat within the locality, a retention of key connections.	During the construction phase	Project manager

Impact	Avoidance and Minimisation Action	Outcome	Timing	Responsibility
	not be installed within Koala Feed Trees where possible.			
Loss of <i>Ninox strenua</i> (Powerful Owl) breeding habitat	Better quality habitat for Powerful Owl has been primarily avoided through the alignment of the new road overtop of the existing gravel road and over more degraded vegetation along its edge which is subject to the highest amount of disturbance through noise and dust pollution. The proposal has been designed to retain five of the 15 large hollows recorded within the study area. A total of 1.09ha of Powerful Owl habitat, including 10 large hollows will be removed as a result of the development. Compensatory fauna habitat in the form of nest boxes mounted in alternate trees will be provided with 2 nest boxes for every hollow lost. The nest boxes shall be offset, constructed and installed in accordance with the Port Stephens Council Biodiversity Technical Specification 2024. Documentary evidence of installation of the nest box must be provided in accordance with the Bushland Schedule of Rates Tender and to the Environmental Operations Team Leader or nominated representative for approval. Nest boxes should be installed prior to removal of vegetation. Nest boxes are to be designed to specifications for Squirrel Glider, Brush-tailed Phascogale, Powerful Owl and Microchiropteran Bats. Nest boxes should	The proposal has been designed to avoid the majority of better quality/less disturbed habitat located further away from the existing road. A net positive increase of Powerful Owl nesting habitat within the locality, a retention of key connections.	During the construction phase	Project manager

Impact	Avoidance and Minimisation Action	Outcome	Timing	Responsibility
	not be installed within Koala Feed Trees where possible.			
Loss of <i>Pomatostomus temporalis temporalis</i> (Grey-crowned Babbler) habitat	The project has been designed to retain the majority of vegetation within the road reserve. Vegetation will only be removed to allow the realignment of some sections of road and widening to increase visibility and safety. Better quality habitat for Grey-crowned Babblers has been primarily avoided through the alignment of the new road overtop of the existing gravel road and over more degraded vegetation along its edge which is subject to the highest amount of disturbance through noise and dust pollution. A total of 2.13ha of Grey-crowned Babbler habitat will be removed as a result of the proposal from the 9.58ha study area. The clearance zone is to be clearly marked to eliminate any inadvertent impact to adjoining habitat.	The proposal has been designed to retain the majority of Grey-crowned Babbler habitat within the road reserve and avoid most of the better quality/less disturbed habitat located further away from the existing road. Eliminate the inadvertent removal of habitat to be retained within the scope of the proposal.	During the design and construction phase	Project designer Project manager
Loss of <i>Pteropus poliocephalus</i> (Grey-headed Flying Fox) foraging habitat	The project has been designed to retain the majority of vegetation within the road reserve. Vegetation will only be removed to allow the realignment of some sections of road and widening to increase visibility and safety. A total of 1.77ha of Grey-headed Flying Fox foraging habitat will be removed as a result of the proposal from the 9.58ha study area. The clearance zone is to be clearly marked to	The proposal has been designed to retain the majority of Grey-headed Flying Fox foraging habitat within the road reserve. Eliminate the inadvertent removal of habitat to be retained within the	During the design and construction phase	Project designer Project manager

Impact	Avoidance and Minimisation Action	Outcome	Timing	Responsibility
	eliminate any inadvertent impact to adjoining habitat.	scope of the proposal.		
Loss of <i>Daphoenositta chrysoptera</i> (Varied Sittella) habitat	The project has been designed to retain the majority of vegetation within the road reserve. Vegetation will only be removed to allow the realignment of some sections of road and widening to increase visibility and safety. A total of 1.77ha of Varied Sittella habitat will be removed as a result of the proposal from the 9.58ha study area. The clearance zone is to be clearly marked to eliminate any inadvertent impact to adjoining habitat.	The proposal has been designed to retain the majority of Varied Sittella habitat within the road reserve. Eliminate the inadvertent removal of habitat to be retained within the scope of the proposal.	During design and construction phase	Project designer Project manager
Loss of <i>Calyptorhynchus lathamii</i> (South-eastern Glossy Black-Cockatoo) transitory habitat	The project has been designed to retain the majority of vegetation within the road reserve. Vegetation will only be removed to allow the realignment of some sections of road and widening to increase visibility and safety. A total of 1.77ha of Glossy Black Cockatoo transitory habitat will be removed as a result of the proposal from the 9.58ha study area. The clearance zone is to be clearly marked to eliminate any inadvertent impact to adjoining habitat.	The proposal has been designed to retain the majority of Glossy Black Cockatoo transitory habitat within the road reserve. Eliminate the inadvertent removal of habitat to be retained within the scope of the proposal.	During design and construction phase	Project designer Project manager
Loss of <i>Micronomus norfolkensis</i> (Eastern Coastal Free-tailed Bat) habitat	A total of 2.13ha of Eastern Coastal Free-tailed Bat, including 48 hollow-bearing trees will be removed as a result of the development. Compensatory fauna habitat in the form of nest boxes mounted in alternate trees will be provided with 2 nest boxes for every hollow lost. The nest	A net positive increase of Eastern Coastal Free-tailed Bat roosting habitat within the locality, a retention of key connections.	During construction phase	Project manager

Impact	Avoidance and Minimisation Action	Outcome	Timing	Responsibility
	boxes shall be offset, constructed and installed in accordance with the Port Stephens Council Biodiversity Technical Specification 2024. Documentary evidence of installation of the nest box must be provided in accordance with the Bushland Schedule of Rates Tender and to the Environmental Operations Team Leader or nominated representative for approval. Nest boxes should be installed prior to removal of vegetation. Nest boxes are to be designed to specifications for Squirrel Glider, Brush-tailed Phascogale, Powerful Owl and Microchiropteran Bats. Nest boxes should not be installed within Koala Feed Trees where possible.			
Loss of <i>Falsistrellus tasmaniensis</i> (Eastern False Pipistrelle) habitat	A total of 2.13ha of Eastern False Pipistrelle habitat, including 48 hollow-bearing trees will be removed as a result of the development. Compensatory fauna habitat in the form of nest boxes mounted in alternate trees will be provided with 2 nest boxes for every hollow lost. The nest boxes shall be offset, constructed and installed in accordance with the Port Stephens Council Biodiversity Technical Specification 2024. Documentary evidence of installation of the nest box must be provided in accordance with the Bushland Schedule of Rates Tender and to the Environmental Operations Team Leader or nominated representative for approval. Nest boxes should be installed prior to removal of vegetation. Nest boxes are to be designed to specifications for	A net positive increase of Eastern False Pipistrelle roosting habitat within the locality, a retention of key connections.	During the construction phase	Project manager

Impact	Avoidance and Minimisation Action	Outcome	Timing	Responsibility
	Squirrel Glider, Brush-tailed Phascogale, Powerful Owl and Microchiropteran Bats. Nest boxes should not be installed within Koala Feed Trees where possible.			
Loss of <i>Miniopterus australis</i> (Little Bent-wing Bat) hunting and roosting habitat in the form of tree hollows	A total of 2.13ha of Little Bent-wing Bat hunting and roosting habitat, including 48 hollow-bearing trees will be removed as a result of the development. Tree limbs containing natural hollows should . Compensatory fauna habitat in the form of nest boxes mounted in alternate trees will be provided with 2 nest boxes for every hollow lost. The nest boxes shall be offset, constructed and installed in accordance with the Port Stephens Council Biodiversity Technical Specification 2024. Documentary evidence of installation of the nest box must be provided in accordance with the Bushland Schedule of Rates Tender and to the Environmental Operations Team Leader or nominated representative for approval. Nest boxes should be installed prior to removal of vegetation. Nest boxes are to be designed to specifications for Squirrel Glider, Brush-tailed Phascogale, Powerful Owl and Microchiropteran Bats. Nest boxes should not be installed within Koala Feed Trees where possible.	A net positive increase of Little Bent-wing Bat roosting habitat within the locality, a retention of key connections.	During the construction phase	Project manager
Impact on breeding populations	Timing of vegetation clearance should occur outside the bird nesting season (late August to December) to avoid critical life cycle events for avifauna species and outside the koala breeding season (October to January).	Timing works to avoid critical life cycle events such as breeding for avifauna species and koalas.	During construction phase	Project manager

Impact	Avoidance and Minimisation Action	Outcome	Timing	Responsibility
Reduced viability of adjacent habitat due to noise, dust, light spill, edge effects and weed incursion	The proposal is located along a pre-existing gravel portion of East Seaham Road. The proposal will likely eliminate dust spill onto vegetation within the road reserve and will likely minimise road noise of heavy vehicles utilising the deteriorating gravel road. The proposal does not include the erection of street lighting as part of the proposed road upgrade.	Reduce dust, noise pollution and avoid excessive light pollution affecting adjacent habitat.	During the design phase	Project designer
Impact on waterbodies, water quality and hydrological processes	Silt fencing and controls on sediment and runoff must be implemented prior to any construction within the subject land particularly around prescribed streams within and in proximity to the subject land.	Minimise impacts on surface water quality and quantity.	During the construction phase	Construction site manager
Increased risk of starvation, exposure and loss of shade or shelter	Where possible, construction works should avoid any impact to mature trees and hollow-bearing trees.	The retention of mature trees, hollow-bearing trees will provide food and shelter resources within the immediate locality.	During the design phase and construction phase	Project designer
Clearing of native vegetation	Where possible, construction works should avoid any impact to mature trees and hollow-bearing trees. Where unavoidable, works should minimise impacts to mature trees as follows: - clearing limits will be clearly marked to prevent unnecessary clearing beyond the extent of the development footprint. Tree clearing and disturbance will be limited to the development site; - where a tree must be disturbed the priority should be given to pruning rather than clearing; and	Retention of mature trees and hollow-bearing trees within the retained native vegetation in the study area will facilitate the movement of mobile threatened species and provide foraging, nesting and shelter/shade resources.	Prior to and during vegetation clearing in the construction phase	Construction site manager

Impact	Avoidance and Minimisation Action	Outcome	Timing	Responsibility
	- the clearing of any trees should be undertaken in a manner that avoids damaging adjacent vegetation i.e., all trees should be felled into disturbed areas when feasible; - Individual trees that are to be retained are to be protected during construction by temporary fence around the dripline.			
Inadvertent impact to biodiversity values	Induct all personnel working onsite including workers and contractors are aware of the mitigation measures and environmental safeguards for example through site inductions and 'toolbox talks' and by providing a summary of relevant project requirements for quick reference (such as a noticeboard). Emphasize the following: - Threatened species onsite and/ or adjacent to the site. - Endangered ecological communities onsite and/ or adjacent to the site. - Hollow bearing trees onsite and/ or adjacent to the site. Install exclusion fencing that includes temporary fencing to: - Protect and avoid known populations of <i>Pterostylis chaetophora</i> onsite. - Protect and avoid identified hollow bearing trees. Exclusion zone fencing must be installed in accordance with the requirements of Biodiversity Management Guideline Protecting and managing	Avoid inadvertent impact to biodiversity values	Prior to and during vegetation clearing, during construction phase	Construction site manager

Impact	Avoidance and Minimisation Action	Outcome	Timing	Responsibility
	biodiversity on Transport for NSW projects (TfNSW, March 2024). Exclusion zones must be identified on site map within the Construction Environmental Management Plan prepared for the site. Priority will be given during construction to avoid any inadvertent impact to significant biodiversity values within the subject land. Avoidance measures should include the following: - all material stockpiles, vehicle parking and machinery storage will be located within open areas proposed for clearing, and not in areas of native vegetation that are to be retained; - implementation of temporary stormwater controls during construction and to ensure that discharges outside the development footprint are consistent with existing conditions.			
Inadvertent impact to retained trees	Clearly demarcate all trees to be removed in accordance with Biodiversity Management Guideline Protecting and managing biodiversity on Transport for NSW projects (TfNSW, March 2024).	Avoid inadvertent impact to trees	Prior to and during vegetation clearing	Construction site manager
Clearing of Powerful Owl habitat	An inspection of all hollows greater than 200 mm (including those to be retained and removed) as documented in the tree schedule in the Biodiversity Development Assessment Report (Wildthing, 2025) must be conducted by a suitably qualified and experienced ecologist with the assistance of an elevated work platform. Inspection must determine the suitability of the hollow for use by	Avoid disturbing Powerful Owls during nesting period and avoid removing active nesting hollows	Prior to vegetation clearing	Construction site manager

Impact	Avoidance and Minimisation Action	Outcome	Timing	Responsibility
	Powerful Owl. This activity must be completed prior to the nesting periods for Powerful Owl (May-October (OEH)). The consultant must provide a survey report to Council's Project Manager within 7 days of completion of the hollow survey and prior to the removal of any vegetation on site. The report must clearly identify the tree ID, species name and common name, hollow characteristics e.g. depth, height above ground, aperture width and any other relevant details for each hollow and include an assessment of the suitability of the hollow for use by threatened arboreal species. If a nest tree with evidence of use is identified, the survey report must also include recommendations for suitable buffer zones during the breeding/ nesting period and advice on scheduling of construction activities within the buffer zones. Council's Project Manager must have the report reviewed by Council's Environmental Risk or Project Support Environmental Officer or appropriately nominated persons prior to works commencing.			
Clearing of fauna habitat, resulting in arboreal fauna injury and/or mortality	Trees within the subject land are to undergo a preclearance survey (thorough inspection of the canopy) every morning prior to tree clearance operations by a suitably qualified ecologist, particularly for arboreal species just prior to removal/trimming. If a Koala is found clearing activities are to cease until the animal has left on its own accord. If a Powerful Owl is observed breeding within a tree to be removed, then clearance operations are to cease until the young have fledged the nest.	Clearing of fauna habitat, resulting in fauna injury and/or mortality	During vegetation clearing	Construction site manager

Impact	Avoidance and Minimisation Action	Outcome	Timing	Responsibility
	Searches are also to be undertaken for bird nests that are currently being utilised for breeding. Any animals injured during construction should be taken immediately to a Vet for treatment. Any animals suspected to require rehabilitation would be delivered post-veterinary care to an appropriate animal rehabilitator.			
Clearing of fauna habitat, resulting in ground dwelling fauna injury and/or mortality.	Vegetation within the subject land is to undergo pre-clearance searches for ground dwelling species, to relocate captured specimens into neighbouring vegetation outside of the clearance zone.	Clearing of fauna habitat, resulting in fauna injury and/or mortality	During vegetation clearing	Construction site manager
Clearing of fauna habitat and displacement of resident fauna	A suitably qualified and experienced ecologist should be engaged to supervise removal of all significant habitat features, including hollow-bearing trees and maintain a vegetation clearance register which should include the location, type, size of felled habitat trees and any contact with resident fauna. The supervising ecologist will work co-operatively with the plant operator to develop an adaptive clearance methodology that should minimise impacts to potential resident fauna whilst being conducted according to safe work methods. The adaptive clearance methodology should include the following key aspects: seeking consultation with a suitably qualified ecologist to determine the best	Avoid fauna injury and/or mortality during clearing of vegetation.	During vegetation clearing	Construction site manager

Impact	Avoidance and Minimisation Action	Outcome	Timing	Responsibility
	time to schedule clearance works to avoid nesting and breeding times for resident fauna; • preclearance surveys completed on the morning of any clearance works to determine if any nesting birds or canopy dwelling mammals are within the clearance footprint; • clearing utilising a 'soft felling' technique in which trees are 'nudged' by machinery and fauna given time to leave (overnight), before slowly felling the tree the following day; • if fauna are identified within the proposed clearing area prior to clearing, or after 'nudging' the tree, operations will cease until the fauna has moved to a safe location or has been relocated. If fauna flee into a habitat tree demarcated for removal this tree should be left to fell until the following day; • any captured displaced fauna relocated to the nearest area of appropriate habitat. If arboreal, the fauna to be placed inside an artificial nest box and relocated. If the displaced fauna is nocturnal relocation to occur during dusk; and • all hollow logs and felled trees would be inspected by the ecologist before relocation into areas of similar adjacent habitat All habitat tree felling activities and results to be			

Impact	Avoidance and Minimisation Action	Outcome	Timing	Responsibility
	summarised in a tree clearance report by the supervising ecologist, including fauna injuries. Any animals injured during construction should be taken immediately to the nearest Veterinary Hospital for treatment. Any animals suspected to require rehabilitation would be delivered post-veterinary care to an appropriate animal rehabilitator associated with Wildlife In Need of Care (WINC) Rescue phone no. 1300 946 295. All fauna sightings/captures are to be recorded and uploaded to the NSW BioNet Atlas.			
Inadvertent encounters and impacts to fauna	Conduct daily fauna checks prior to works commencing. If fauna are encountered during the daily check or during works follow the procedures in Biodiversity Management Guideline Protecting and managing biodiversity on Transport for NSW projects (TfNSW, March 2024).	Minimise likelihood of unplanned interactions with fauna	Construction phase	Construction site manager
Movement barrier for mobile ground dwelling species via fencing (Operational phase)	Any new fencing required along the road reserve should use fauna friendly fencing that includes a gap of at least 30cm between the ground and the first strand of fence so wildlife can go UNDER the fence rather than having to go OVER the fence	Avoid cutting off connectivity for mobile ground dwelling species	Construction and operational phase	Construction site manager and Project manager
Transport of weeds and pathogens from the site to adjacent vegetation	The following measures are to be implemented to prevent exotic plant material from entering/exiting the subject land: no imported/exported material to be permitted unless it has been inspected and confirmed to be free of dirt and mud which	Minimise weed infestations within adjoining vegetation	Prior to and during vegetation clearing	Construction Site Manager

Impact	Avoidance and Minimisation Action	Outcome	Timing	Responsibility
	may contain weed seeds and vegetative material such as bulbs, root fragment, tubers or rhizomes; and vehicles and machinery to be clean of soils, vegetation and seeds that have been brushed off or washed down prior to entering the study area A clean down register to be maintained at the entry of the study area			
Impact to adjoining native vegetation	Erection of signage discouraging dumping was observed within the road reserve. This signage is to be retained within the scope of the proposal.	Prevent degradation of retained vegetation by dumping and other human activities.	During the construction and operational phase	Construction site manager and Project manager
Vehicle strike	Not increasing the speed limit above the pre-existing speed limit of 70km/h along the road. Widening areas and clearing vegetation to improve visibility along the road will assist in the avoidance of vehicle strike by allowing the driver opportunity to see the animal crossing the road.	Reduce the likelihood and occurrence of vehicle strikes with fauna within the locality	During the construction and operational phase	Construction site manager and Project manager

8.0 Impact assessment

8.1 Direct impacts

8.1.1 Residual direct impacts

Table 8.1 documents impact likely to occur on the subject land associated with the proposed development area after steps taken to avoid and minimise impacts.

Table 8.1 Summary of residual direct impacts

Direct impact	BC Act status	EPBC Act status	SAIL entity	Project phase/timing of impact (e.g. construction, operation, rehabilitation)	Extent (ha, number of individuals)
Removal of PCT 3433 - Hunter Coast Foothills Spotted Gum – Ironbark Grassy Forest			No	Construction and operation	1.70ha
Removal of PCT 4042 - Lower North Riverflat Eucalypt-Paperbark Forest			No	Construction and operation	0.43ha
Removal of BC Act 2016 listed Lower Hunter spotted Gum – Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions	E		No	Construction and operation	1.70ha
Removal of BC Act 2016 listed TEC Subtropical Coastal Floodplain Forest of the NSW North Coast bioregion	E		No	Construction and operation	0.43ha
Removal of EPBC Act 1999 listed Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions		E	No	Construction and operation	0.43ha
Removal of potential <i>Corybas dowlingii</i> (Red Helmet	E		No	Construction and operation	1.77ha

Direct impact	BC Act status	EPBC Act status	SAIL entity	Project phase/timing of impact (e.g. construction, operation, rehabilitation)	Extent (ha, number of individuals)
Orchid) habitat					
Removal of <i>Pterostylis chaetophora</i> (Tall Rustyhood) habitat	V	-	No	Construction and operation	2.13ha
Removal of <i>Rutidosia heterogama</i> (Heath Wrinklewort) habitat			No	Construction and operation	
Removal of <i>Phascolarctos cinereus</i> (Koala habitat)	E	E	No	Construction and operation	1.77ha
Removal of <i>Petaurus norfolcensis</i> (Squirrel Glider) habitat	V		No	Construction and operation	1.77ha
Removal of <i>Phascogale tapoatafa</i> (Brush-tailed Phascogale) breeding habitat	V		No	Construction and operation	1.77ha
Removal of <i>Ninox strenua</i> (Powerful Owl) breeding habitat	V		No	Construction and operation	1.09ha
Removal of <i>Pomatostomus temporalis temporalis</i> (Grey-crowned Babbler) habitat	V		No	Construction and operation	2.13ha
Removal of <i>Pteropus poliocephalus</i> (Grey-headed Flying Fox) foraging habitat	V	V	No	Construction and operation	1.77ha
Removal of <i>Daphoenositta chrysoptera</i> (Varied Sittella) habitat	V		No	Construction and operation	1.77ha
Removal of <i>Calyptorhynchus lathami</i> (South-eastern Glossy Black-Cockatoo) transitory habitat	V		No	Construction and operation	1.77ha
Removal of <i>Micronomus norfolkensis</i> (Eastern Coastal Free-tailed Bat) habitat	V		No	Construction and operation	2.13ha
Removal of <i>Falsistrellus tasmaniensis</i> (Eastern False Pipistrelle) habitat	V		No	Construction and operation	2.13ha

Direct impact	BC Act status	EPBC Act status	SAIL entity	Project phase/timing of impact (e.g. construction, operation, rehabilitation)	Extent (ha, number of individuals)
Removal of <i>Miniopterus australis</i> (Little Bent-wing Bat) hunting and roosting habitat in the form of tree hollows	V		Yes, however no preferred breeding habitat within subject land	Construction and operation	2.13ha

8.1.2 Change in vegetation integrity score

Table 8.2 documents change in vegetation integrity score on the subject land associated with the proposed development area.

Table 8.2 Impacts to vegetation integrity

Vegetation zone	PCT ID	Management zone	Area (ha)	Before development				After development				Change	
				Composition	Structure	Function	VI score	Composition	Structure	Function	VI score	Change in VI score	Total Change
1 PCT 3433_Forest	3433	N/A	1.34	57.4	20.5	54.7	40.1	0	0	0	0	-40.1	-33.9
2 PCT 3433_Cleared	3433	N/A	0.36	48.3	5.4	22.3	18	0	0	0	0	-18	-31.4
3 PCT 4042_Forest	4042	N/A	0.43	84.6	29.9	100	63.2	0	0	0	0	-63.2	-18.2

8.2 Residual Indirect impacts

Table 8.3 documents residual indirect impacts of the proposal (likely to occur on native vegetation, threatened entities and their habitat beyond the development footprint) as a result of any future planning proposal associated with the subdivision area.

Table 8.3 Summary of residual indirect impacts

Indirect impact	Impacted entities	Extent (ha or zone reference)	Frequency	Duration (long-term/ short-term/ medium-term)	Project phase/ timing of impact (e.g. construction, operation, rehabilitation)	Likelihood and consequences
Sedimentation and contaminated and/or nutrient rich run-off	Adjacent vegetation, including 1 st , 2 nd and 3 rd order prescribed streams	Surrounding vegetation outside the subject land boundary	During heavy rainfall or storm events	Long-term	Construction and operation phase	During the construction and operation phase, potential sediment and contaminated runoff into adjacent and retained vegetation is likely to occur during high rainfall events.
Transport of weeds and pathogens from the subject land to adjacent vegetation	Adjacent vegetation and retained vegetation within the road reserve	Surrounding vegetation outside the subject land boundary	Daily during the construction phase and ongoing during the operation phase	Long-term	Construction and operation phase	During the construction and operational phase the risk of the spread of weeds with the establishment of non-native grassed areas within the subject land.
Inadvertent impacts on adjacent habitat or vegetation	Adjacent vegetation and retained vegetation within the road reserve	Surrounding vegetation outside the subject land boundary	Daily during the construction phase and ongoing during the operation phase	Long-term	Construction and operation phase	Widening and tarring the road and removal of vegetation increases the risk of inadvertent impacts on adjacent habitat and vegetation.
Reduced viability of adjacent habitat due to edge effects	Adjacent vegetation and retained	Surrounding vegetation outside the subject land	During the life of the proposal	Long-term	Construction and operation phase	Removal of vegetation from the subject land increases the risk of edge effects occurring within

Indirect impact	Impacted entities	Extent (ha or zone reference)	Frequency	Duration (long-term/ short-term/ medium-term)	Project phase/ timing of impact (e.g. construction, operation, rehabilitation)	Likelihood and consequences
	vegetation within the road reserve	boundary				retained vegetation.
Rubbish dumping	Adjacent vegetation and retained vegetation within the road reserve	Surrounding vegetation outside the subject land boundary	During the life of the proposal	Long-term	Construction and operation phase	The road is likely to become more used as a result of the proposal. This is likely to decrease rubbish dumping within the locality.
Fragmentation of movement corridor	Mammals and reptiles	Surrounding vegetation outside the subject land boundary	During the life of the proposal	Long-term	Construction and operation phase	The proposal will widen the road in some areas and therefore create a larger distance of non-vegetated areas within the east-west corridor.

8.3 Prescribed impacts

All prescribed impacts identified in Section 6.0 assessed as occurring within the subdivision area as a result of the proposal have been addressed below. Mitigation measures for prescribed impacts are detailed within Table 8.6.

8.3.1 Non-native vegetation

8.3.1.1 Nature

Likely removal of non-native habitat.

8.3.1.2 Extent

Removal of 0.44ha of non-native vegetation in the form of introduced grasses in the north of the subject land.

8.3.1.3 Duration

The construction and operational phase.

8.3.1.4 Consequences

Reduction in grazing habitat for macropod species. Reduction in hunting habitat for highly mobile species that hunt in open areas, namely raptors and microchiropteran bats.

8.3.1.5 Residual prescribed impact

The removal of 0.44ha of non-native vegetation is unlikely to have a significant impact on these species due to the presence of open non-native grassed areas to the north, south and west of the subject land. Therefore, there is no residual prescribed impact.

8.3.2 Habitat connectivity

8.3.2.1 Nature

The removal of vegetation and widening of the road for the proposal will create a wider break in the east-west corridor.

8.3.2.2 Extent

A wider break in the east-west corridor caused by widening the road and removal of vegetation lining the road.

8.3.2.3 Duration

The construction and operational phase.

8.3.2.4 Consequences

The removal of vegetation and widening of the road for the proposal will create a wider break in the east-west corridor, however the proposal has been designed to retain the majority of vegetation within the road reserve. Therefore, it will not fragment connection to retained vegetation.

8.3.2.5 *Residual prescribed impact*

Minimisation and mitigation measures have been detailed within Table 7.1 which prioritizes the retention of vegetation within the road reserve and includes the installation of nest boxes for a net positive increase of hollow-dependent threatened species nesting/roosting habitat.

The proposed road upgrade design has been carefully considered during the design phase and does include road widening in some areas. Gaps of more than 35m wide are considered a potential barrier to crossing for Squirrel Gliders (LMCC 2015). The proposal design has considered this and the distance between retained trees on either side of the road will not exceed 35m and will still be a viable connection for the species. Therefore, the corridor will not be severed to the point that it will have significant impact on the species using it and there is no residual prescribed impact.

8.3.3 Waterbodies, water quality and hydrological processes

8.3.3.1 *Nature*

Groundwater Dependent Ecosystems (GDE's) are ecosystems that are fully or partially dependent on groundwater to maintain ecosystem function. These ecosystems occur across both surface and subsurface landscapes and are highly variable. No GDE's were found to be present within the subject land.

1st, 2nd and 3rd order prescribed streams run through the subject land. The tributaries were generally not found within defined channels except where the culverts passed the road. As a result of their ephemeral nature, no surface water was seen in any streams during the majority of field work. Surface water was only ever seen after heavy rain events.

8.3.3.2 *Extent*

No GDE's were found to be present within the subject land.

The proposal includes the upgrade and some widening of pre-existing culverts that facilitate the movement of water beneath the pre-existing road for the prescribed streams. The Vegetated Riparian Zones (VRZ) of the prescribed streams will be impacted by vegetation clearance for the proposal within the immediate vicinity of the culvert and road reserve.

8.3.3.3 *Duration*

Construction and operational phase of the subsequent subdivision

8.3.3.4 *Consequences*

Potential long-term impacts to riparian corridors and streams within and around the study area.

8.3.3.5 Maximum predicted offset liability

N/A as minimisation and mitigation measures have been detailed within Table 7.1 and Table 8.6 including temporary stormwater controls and installing silt fencing and controls on sediment and runoff.

8.3.4 Vehicle strikes

Residual predicted impacts of vehicle strike on threatened fauna recorded within the subject land are documented within Table 8.5. A recently deceased *Eurystomus orientalis* (Oriental Dollarbird) was observed within the subject land from vehicle strike. A number of macropod bones and a goat skull were also observed within the road reserve. A large number of macropod bones and recently deceased macropods were recently observed along Italia Road, East Seaham.

Table 8.4 Prescribed impacts – vehicle strikes

Threatened fauna recorded within the subject land that are that are at risk of vehicle strike	SAIL entity	Likelihood	Estimated vehicle strike rates	Consequences
<i>Phascolarctos cinereus</i> (Koala)	No	Moderate	Unknown for the locality. It is known from records supplied by the Koala Preservation Society that the majority of Koala deaths are attributed to vehicle collision. For example, a there is a large number of records of motor vehicle strike for koala between 1996 and February 2024 within Salamander Bay (Koala Preservation Society, 2024).	Injury, mortality, reduction in local population
<i>Petaurus norfolcensis</i> (Squirrel Glider)	No	Low	Unknown	Injury, mortality, reduction in local population
<i>Phascogale tapoatafa</i> (Brush-tailed phascogale)	No	Low	Unknown	Injury, mortality, reduction in local population
<i>Ninox strenua</i> (Powerful Owl)	No	Low	Unknown	Injury, mortality, reduction in local population
<i>Pomatostomus temporalis temporalis</i> (Grey-crowned Babbler)	No	Low	Unknown	Injury, mortality, reduction in local population
<i>Pteropus poliocephalus</i> (Grey-headed Flying Fox)	No	Unlikely	Unknown	Injury, mortality, reduction in local population
<i>Daphoenositta chrysoptera</i> (Varied Sittella)	No	Low	Unknown	Injury, mortality, reduction in local population
<i>Calyptrorhynchus lathamii</i> (South-eastern Glossy Black-Cockatoo)	No	Unlikely	Unknown	Injury, mortality, reduction in local population

Threatened fauna recorded within the subject land that are that are at risk of vehicle strike	SAll entity	Likelihood	Estimated vehicle strike rates	Consequences
<i>Micronomus norfolkensis</i> (Eastern Coastal Free-tailed Bat)	No	Low	Unknown	Injury, mortality, reduction in local population
<i>Falsistrellus tasmaniensis</i> (Eastern False Pipistrelle)	No	Low	Unknown	Injury, mortality, reduction in local population
<i>Miniopterus australis</i> (Little Bent-wing Bat)	Yes	Low	Unknown	Injury, mortality, reduction in local population

8.4 Mitigating residual impacts – management measures and implementation

Table 8.5 Summary of proposed mitigation and management measures for residual impacts (direct, indirect and prescribed)

Residual Impact	Mitigation measure	Method/technique	Timing	Frequency	Responsibility	Likely efficacy	MNES (when relevant)
Sedimentation and contaminated and/or nutrient rich run-off	Sediment barriers and silt fencing to prevent sediment runoff into retained and adjacent vegetation	Install sediment barriers and erosion control during construction to prevent runoff into retained and adjacent vegetation	Prior to the removal of vegetation	Duration of construction phase	Construction site manager	High. Low risk of failure when installed correctly	No
Changing surface water characteristics	The proposal includes upgrades to pre-existing culverts.	Upgrades to culverts will allow surface water to flow more efficiently within the subject land.	Design during the planning phase and construction during the construction phase	Design and Construction phase	Project designer and construction site supervisor	High. Low risk of failure when installed correctly	No
Transport of weeds and pathogens from the site to retained and adjacent vegetation	Hygiene protocols to prevent the spread of weeds or pathogens between infected areas and uninfected areas	Vehicles should be washed down before entering and exiting the site to prevent the spread of weeds and pathogens to or from the development site and adjacent vegetation. Any weed outbreaks should be controlled during the project.	During the removal of vegetation from the subject land	Construction phase	Construction site manager	High. Low risk of failure when installed correctly	No
Inadvertent impacts on retained and adjacent habitat or vegetation	Staff training and site briefing to communicate environmental features to be	All staff working on the development will undertake an environmental induction as part of their site familiarisation. Site briefings should be updated	Prior to the commencement and the duration of the construction	Construction phase	Project manager	High efficacy with a low risk of failure.	No

Residual Impact	Mitigation measure	Method/technique	Timing	Frequency	Responsibility	Likely efficacy	MNES (when relevant)
	protected and measures to be implemented	based on phase of the work. This induction will include items such as: - Site environmental procedures (vegetation management, sediment and erosion control, exclusion fencing and weeds of national significance (WoNS) and priority weeds)	phase for all new contractors				
Reduced viability of adjacent and retained habitat due to edge effects	Routine roadside maintenance targeting weeds.	Weed management during routine roadside maintenance.	The duration of the project	Design, construction and operation phase	Project manager	Moderate efficacy with a low risk of failure if management actions are undertaken	No
Vehicle strike	The proposal will increase visibility in areas along East Seaham Road.	Realignment of areas of East Seaham Road and increased visibility will allow drivers to observe animals crossing the road and potentially avoid collision	Construction phase	Construction and operational phase	Project designer, Construction site manager and Project manager	Moderate efficacy with a moderate risk of failure.	No

9.0 Serious and irreversible impacts

9.1 Assessment for serious and irreversible impacts on biodiversity values

Candidate species for a Serious and Irreversible Impact (SAIL) are listed in Table 9.1. The candidate species list has been derived from threatened species predicted to have the potential to occur based on the BAM Calculator and state and national database searches. No candidate SAIL ecological communities are present within the development area. Table 9.1 also contains analysis of whether impacts on candidate species are serious and irreversible.

Table 9.1 Entities at risk of an SAIL

Common name	Scientific name	Further SAIL assessment required?	Reason for exclusion from further assessment if no further SAIL assessment is required
Regent Honeyeater	<i>Anthochaera phrygia</i>	No	The development area was not within the Important Areas Map for this species.
Large-eared Pied Bat	<i>Chalinolobus dwyeri</i>	Yes	This species was not recorded on site and no breeding habitat in the form of caves, tunnels, mines, culverts or other structures were present within the subject land or study area however Thunderbolt Cave is located less than 2km from the subject land.
Red goshawk	<i>Erythrorhynchus radiatus</i>	No	Despite targeted searches this species was not recorded within the study area.
Swift Parrot	<i>Lathamus discolor</i>	No	The development area was not within the Important Areas Map for this species.
Little Bent-winged-bat	<i>Miniopterus australis</i>	Yes	This species was recorded on site. Breeding habitat in the form of caves, tunnels, mines, culverts or other structures were not present within the subject land or study area however Thunderbolt Cave is located less than 2km from the subject land.
Large Bent-winged-bat	<i>Miniopterus orianae oceanensis</i>	Yes	This species was not recorded on site. Breeding habitat in the form of caves, tunnels, mines, culverts or other structures were not present within the subject land or study area however Thunderbolt Cave is located less than 2km from the subject land.
Scrub Turpentine	<i>Rhodamnia rubescens</i>	No	Despite targeted searches this species was not recorded within the study area.
Native Guava	<i>Rhodomyrtus psidioides</i>	No	Despite targeted searches this species was not recorded within the study area.
Sooty Owl	<i>Tyto tenebricosa</i>	No	Despite targeted searches this species was not recorded within the study area.

9.1.1 Additional impact assessment provisions for threatened species at risk of an SAI

No threatened matter consistent with a SAI candidate species identified as likely to occur or to contain significant habitat within the study area is likely to be significantly impacted by the proposed development. Although *Miniopterus australis* (Little Bent-winged Bat) was positively identified within the study area during the microchiropteran bat call survey undertaken by Wedgetail Project Consulting (2024), which is an SAI species, the subject land was only considered to contain hunting habitat and roosting habitat in the form of tree hollows for this species. Preferred roosting habitat in the form of caves was absent within the site. Thunderbolt Cave is the nearest preferred roosting habitat located approximately 1.8km east of the subject land. This cave could provide roosting habitat for *Miniopterus australis*, *Miniopterus orianae oceanensis* or *Chalinolobus dwyeri*. Further assessment has been carried out below for these three species.

9.1.2 *Miniopterus australis* (Little Bent-winged Bat)

Miniopterus australis (Little Bent-winged Bat) was positively identified within the study area during the microchiropteran bat call survey and preferred roosting habitat is located 1.8km east of the subject land.

Assessment under Biodiversity Conservation Regulation 2017 6.7(2):

(1) An impact is to be regarded as serious and irreversible if it is likely to contribute significantly to the risk of a threatened species or ecological community becoming extinct because:

- a It will cause a further decline of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to be in a rapid rate of decline, or

The proposal requires the removal of 1.70ha of PCT 3433 Hunter Coast Foothills Spotted Gum – Ironbark Grassy Forest and 0.43ha of PCT 4042 Lower North Riverflat Eucalypt-Paperbark Forest, which would provide hunting habitat for *M. australis*. The proposal will also require the removal of 48 hollow-bearing trees. The entire site is likely to contain suitable hunting habitat for this microchiropteran bat species. Preferred roosting habitat in the form of caves was absent within the site however Thunderbolt Cave is located 1.8km east of the subject land. Mitigating measures include steps to reduce noise and light pollution that could indirectly affect habitat outside of the site. The removal of vegetation from this site may result in an incremental loss of hunting habitat in the local area. Taking into consideration the relatively large amount of suitable hunting habitat in the local area, the absence of preferred roosting habitat within the site and mitigating measures to reduce impacts in the proximity of the site, the proposal is unlikely to disrupt the life cycle of *M. australis* such that local extinction would occur.

- b It will further reduce the population size of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to have a very small population size, or

The proposal to remove 1.70ha of PCT 3433 Hunter Coast Foothills Spotted Gum – Ironbark Grassy Forest and 0.43ha of PCT 4042 Lower North Riverflat Eucalypt-Paperbark Forest is unlikely to result in the reduction of population size of Little Bent-winged Bat. This vegetation only provided suitable hunting habitat for this highly mobile species and an incremental number of hollow-bearing trees. There is suitable hunting habitat and hollow-bearing trees within close proximity to the proposed impact area. The nearest preferred roosting habitat is 1.8km east of the site. Taking into consideration the suitable hunting habitat in the local area and the distance between preferred roosting habitat and the site, the proposal is unlikely to reduce the population size of this species.

c It is an impact on the habitat of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to have a very limited geographical distribution, or

The Little Bent-winged Bat is a highly mobile species and does not have a very limited geographical distribution. The proposal will only require the removal of 2.13ha native vegetation, including 1.77ha of PCT 3433 Hunter Coast Foothills Spotted Gum – Ironbark Grassy Forest and 0.43ha of PCT 4042 Lower North Riverflat Eucalypt-Paperbark Forest.

d The impacted species or ecological community is unlikely to respond to measures to improve its habitat and vegetation integrity and therefore its members are not replaceable.

Under the Saving Our Species Strategy the key threats to the viability of landscape-managed species are loss, fragmentation and degradation of habitat, and widespread pervasive factors such as impacts of climate change and disease. Preferred roosting habitat is located 1.8km east of the subject land. This habitat will not be directly impacted by the proposal and mitigating measures outlined in this report including steps to reduce indirect impacts on retained vegetation and nearby habitat. These measures would ensure that no roosting habitat for this species is lost or impacted as a result of the proposal.

e Actions to avoid and minimise direct and indirect impacts

The proposal has been designed to retain the majority of trees within the road reserve, including 33 hollow-bearing trees within the scope of the proposal and the retention of the majority of native vegetation within the road reserve, which provides hunting habitat for this species. Preferred roosting habitat is located 1.8km east of the subject land. This habitat will not be directly impacted by the proposal and mitigating measures outlined in this report including steps to reduce indirect impacts on retained vegetation and nearby habitat.

9.1.3 *Miniopterus orianae oceanensis* (Large Bent-wing Bat)

Miniopterus orianae oceanensis (Large Bent-wing Bat) was not identified during bat call survey however preferred roosting habitat is located 1.8km east of the subject land.

Assessment under Biodiversity Conservation Regulation 2017 6.7(2):

(1) *An impact is to be regarded as serious and irreversible if it is likely to contribute significantly to the risk of a threatened species or ecological community becoming extinct because:*

- a It will cause a further decline of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to be in a rapid rate of decline, or*

The proposal requires the removal of 1.70ha of PCT 3433 Hunter Coast Foothills Spotted Gum – Ironbark Grassy Forest and 0.43ha of PCT 4042 Lower North Riverflat Eucalypt-Paperbark Forest, which would provide hunting habitat for *M. orianae oceanensis*. The proposal will also require the removal of 48 hollow-bearing trees. The entire site is likely to contain suitable hunting habitat for this microchiropteran bat species. Preferred roosting habitat in the form of caves was absent within the site however Thunderbolt Cave is located 1.8km east of the subject land. Mitigating measures include steps to reduce noise and light pollution that could indirectly affect habitat outside of the site. The removal of vegetation from this site may result in an incremental loss of hunting habitat in the local area. Taking into consideration the relatively large amount of suitable hunting habitat in the local area, the absence of preferred roosting habitat within the site and mitigating measures to reduce impacts in the proximity of the site, the proposal is unlikely to disrupt the life cycle of *M. orianae oceanensis* such that local extinction would occur.

- b It will further reduce the population size of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to have a very small population size, or*

The proposal to remove 1.70ha of PCT 3433 Hunter Coast Foothills Spotted Gum – Ironbark Grassy Forest and 0.43ha of PCT 4042 Lower North Riverflat Eucalypt-Paperbark Forest is unlikely to result in the reduction of population size of Large Bent-winged Bat. This vegetation only provided suitable hunting habitat for this highly mobile species and an incremental number of hollow-bearing trees. There is suitable hunting habitat and hollow-bearing trees within close proximity to the proposed impact area. The nearest preferred roosting habitat is 1.8km east of the site. Taking into consideration the suitable hunting habitat in the local area and the distance between preferred roosting habitat and the site, the proposal is unlikely to reduce the population size of this species.

- c It is an impact on the habitat of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to have a very limited geographical distribution, or*

The Large Bent-winged Bat is a highly mobile species and does not have a very limited geographical distribution. The proposal will only require the removal of 2.13ha native vegetation, including 1.77ha

of PCT 3433 Hunter Coast Foothills Spotted Gum – Ironbark Grassy Forest and 0.43ha of PCT 4042 Lower North Riverflat Eucalypt-Paperbark Forest.

- d The impacted species or ecological community is unlikely to respond to measures to improve its habitat and vegetation integrity and therefore its members are not replaceable.*

Under the Saving Our Species Strategy the key threats to the viability of landscape-managed species are loss, fragmentation and degradation of habitat, and widespread pervasive factors such as impacts of climate change and disease. Preferred roosting habitat is located 1.8km east of the subject land. This habitat will not be directly impacted by the proposal and mitigating measures outlined in this report including steps to reduce indirect impacts on retained vegetation and nearby habitat. These measures would ensure that no roosting habitat for this species is lost or impacted as a result of the proposal.

- e Actions to avoid and minimise direct and indirect impacts*

The proposal has been designed to retain the majority of trees within the road reserve, including 33 hollow-bearing trees within the scope of the proposal and the retention of the majority of native vegetation within the road reserve, which provides hunting habitat for this species. Preferred roosting habitat is located 1.8km east of the subject land. This habitat will not be directly impacted by the proposal and mitigating measures outlined in this report including steps to reduce indirect impacts on retained vegetation and nearby habitat.

9.1.4 *Chalinolobus dwyeri* (Large-eared Pied Bat)

Chalinolobus dwyeri (Large-eared Pied Bat) was not identified during bat call survey however roosting habitat is located 1.8km east of the subject land.

Assessment under Biodiversity Conservation Regulation 2017 6.7(2):

(1) An impact is to be regarded as serious and irreversible if it is likely to contribute significantly to the risk of a threatened species or ecological community becoming extinct because:

- a It will cause a further decline of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to be in a rapid rate of decline, or*

The proposal requires the removal of 1.70ha of PCT 3433 Hunter Coast Foothills Spotted Gum – Ironbark Grassy Forest and 0.43ha of PCT 4042 Lower North Riverflat Eucalypt-Paperbark Forest, which would provide hunting habitat for *C. dwyeri*. The entire site is likely to contain suitable hunting habitat for this microchiropteran bat species. Roosting habitat in the form of caves was absent within the site however Thunderbolt Cave is located 1.8km east of the subject land. Potential breeding habitat is described as PCTs associated with the species within 100m of the roosting habitat. No roosting habitat was within 100m of the site therefore none was present within the subject land. Mitigating measures include steps to reduce noise and light pollution that could indirectly affect habitat

outside of the site. The removal of vegetation from this site may result in an incremental loss of hunting habitat in the local area. Taking into consideration the relatively large amount of suitable hunting habitat in the local area, the absence of roosting habitat within the site and mitigating measures to reduce impacts in the proximity of the site, the proposal is unlikely to disrupt the life cycle of *C. dwyeri* such that local extinction would occur.

- b It will further reduce the population size of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to have a very small population size, or*

The proposal to remove 1.70ha of PCT 3433 Hunter Coast Foothills Spotted Gum – Ironbark Grassy Forest and 0.43ha of PCT 4042 Lower North Riverflat Eucalypt-Paperbark Forest is unlikely to result in the reduction of population size of Large-eared Pied Bat. This vegetation only provided suitable hunting habitat for this highly mobile species. No roosting habitat was present within the site or within 100m of it. The nearest roosting habitat is 1.8km east of the site. Taking into consideration the suitable hunting habitat in the local area and the distance between roosting habitat and the site, the proposal is unlikely to reduce the population size of this species.

- c It is an impact on the habitat of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to have a very limited geographical distribution, or*

The Large-eared Pied Bat is a highly mobile species and does not have a very limited geographical distribution. The proposal will only require the removal of 2.13ha native vegetation, including 1.77ha of PCT 3433 Hunter Coast Foothills Spotted Gum – Ironbark Grassy Forest and 0.43ha of PCT 4042 Lower North Riverflat Eucalypt-Paperbark Forest.

- d The impacted species or ecological community is unlikely to respond to measures to improve its habitat and vegetation integrity and therefore its members are not replaceable.*

Under the National Recovery Plan the main known cause of decline in the species is the destruction of, and interference with maternity and other roosts (Department of Environment and Resource Management, 2011). Roosts are threatened by mining of roosts; mine induced subsidence of cliff lines; disturbance from human recreational activities; habitat disturbance by introduced animals, including livestock; predation by introduced pests; vegetation clearing in the proximity of roosts; and fire in the proximity of roosts. Roosting habitat is located 1.8km east of the subject land. This habitat will not be directly impacted by the proposal and mitigating measures outlined in this report including steps to reduce indirect impacts on retained vegetation and nearby habitat. These measures would ensure that no roosting habitat for this species is lost or impacted as a result of the proposal.

- e Actions to avoid and minimise direct and indirect impacts*

The proposal has been designed to retain the majority of native vegetation within the road reserve, which provides hunting habitat for this species. Preferred roosting habitat is located 1.8km east of the subject land. This habitat will not be directly impacted by the proposal and mitigating measures outlined in this report including steps to reduce indirect impacts on retained vegetation and nearby habitat.

10.0 Impact summary

10.1 Determine an offset requirement for impacts

10.1.1 Impacts on native vegetation and TECs or ECs (ecosystem credits)

Table 10.1 identifies impacts that require an offset (as per BAM Subsection 9.2.1(1.)). An offset is not required for impacts where the vegetation integrity score is below those as per BAM Subsection 9.2.1(3.) for impacts on native vegetation. This is not applicable to the Proposal.

Table 10.1 Impacts that require an offset – ecosystem credits

Vegetation zone	PCT name	TEC	Impact area (ha)	Current VI score	Future VI score	Change in VI score	Biodiversity risk weighting	Number of ecosystem credits required
PCT 3433_Forest	Hunter Coast Foothills Spotted Gum-Ironbark Grassy Forest	Yes	1.34	40.1	0	-40.1	2	27
PCT 3433_Cleared	Hunter Coast Foothills Spotted Gum-Ironbark Grassy Forest	Yes	0.36	18	0	-18	2	3
PCT 4042_Forest	Lower North Riverflat Eucalypt-Paperbark Forest	Yes	0.43	63.2	0	-63.2	2	14
Total								44

10.1.2 Impacts on threatened species and their habitat (species credits)

Table 10.2 identifies impacts on threatened species (species credits) that require an offset (as per BAM Subsection 9.2.2(2.)).

Table 10.2 Impacts that require an offset – species credits

Vegetation Zone	Common name	Scientific name	BC Act status	EPBC Act status	Loss of habitat (ha) or individuals	Biodiversity risk weighting	Number of species credits required
PCT 3433_Forest	Red Helmet Orchid	<i>Corybas dowlingii</i>	E1	Not listed	1.34ha	2	27
PCT 4042_Forest	Red Helmet Orchid	<i>Corybas dowlingii</i>	E1	Not listed	0.43ha	2	14
						Total	41
PCT 3433_Forest	Powerful Owl	<i>Ninox strenua</i>	V	Not listed	0.80ha	2	16
PCT 4042_Forest	Powerful Owl	<i>Ninox strenua</i>	V	Not listed	0.29ha	2	9
						Total	25
PCT 3433_Forest	Squirrel Glider	<i>Petaurus norfolcensis</i>	V	Not listed	1.34ha	2	27
PCT 4042_Forest	Squirrel Glider	<i>Petaurus norfolcensis</i>	V	Not listed	0.43ha	2	14
						Total	41
PCT 3433_Forest	Brush-tailed Phascogale	<i>Phascogale tapoatafa</i>	V	Not listed	1.34ha	2	27
PCT 4042_Forest	Brush-tailed Phascogale	<i>Phascogale tapoatafa</i>	V	Not listed	0.43ha	2	14
						Total	41
PCT 3433_Forest	Koala	<i>Phascolarctos cinereus</i>	E	E	1.34ha	2	27
PCT 4042_Forest	Koala	<i>Phascolarctos cinereus</i>	E	E	0.43ha	2	14
						Total	41
PCT 3433_Forest	Pterostylis chaetophora	<i>Pterostylis chaetophora</i>	V	Not listed	1.34ha	2	27

Vegetation Zone	Common name	Scientific name	BC Act status	EPBC Act status	Loss of habitat (ha) or individuals	Biodiversity risk weighting	Number of species credits required
PCT 3433_Cleared	Pterostylis chaetophora	<i>Pterostylis chaetophora</i>	V	Not listed	0.36ha	2	3
PCT 4042_Forest	Pterostylis chaetophora	<i>Pterostylis chaetophora</i>	V	Not listed	0.43ha	2	14
						Total	44
PCT 3433_Forest	Heath Wrinklewort	<i>Rutidosia heterogama</i>	V	V	1.34ha	2	27
PCT 3433_Cleared	Heath Wrinklewort	<i>Rutidosia heterogama</i>	V	V	0.36ha	2	3
						Total	30

10.1.3 Indirect and prescribed impacts

No indirect and prescribed impacts remain after measures to avoid, minimise and mitigate have been applied.

10.1.4 Serious and Irreversible Impacts (SII)

No threatened matter consistent with a SII candidate species identified as likely to occur or to contain significant habitat within the study area is likely to be impacted by the proposal.

10.1.5 Areas not requiring assessment

Areas not requiring assessment are shown in Figures 4.1-4.4. These areas consist of the existing gravel road along East Seaham Road and driveways into residential lots.

10.1.6 Impact on biodiversity values

Small areas of the subject land overlapped with mapped biodiversity values on the BV map. A total of 0.06ha of mapped biodiversity values will be directly impacted by this proposal.

11.0 Biodiversity credit report

Table 11.1 contains offset ecosystem credit details and Table 11.2 contains offset species credit details. Also see Appendix H Credit reports.

11.1 Ecosystem credits

Table 11.1 Ecosystem credit class and matching credit profile

Ecosystem credit	Attributes shared with matching credits						
	PCT name	PCT vegetation class	PCT vegetation formation	Associated TEC or EC	Offset trading group (BAM Section 10.2, Tables 4 & 5)	Hollow bearing trees present?	IBRA subregion (in which proposal is located)
27	3433 - Hunter Coast Foothills Spotted Gum-Ironbark Grassy Forest	Hunter Macleay Dry Sclerophyll Forests	Dry Sclerophyll Forests (Shrubby sub/grass-formation)	Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions	Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions	Yes	Upper Hunter
3	3431-Central Hunter Ironbark Grassy Woodland	Hunter Macleay Dry Sclerophyll Forests	Dry Sclerophyll Forests (Shrubby sub/grass-formation)	Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions	Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions	No	Upper Hunter
14	4042 - Lower North Riverflat Eucalypt-Paperbark Forest	Coastal Floodplain Wetlands	Forested Wetland	Subtropical Coastal Floodplain Forest of the New South Wales North Coast Bioregion	Subtropical Coastal Floodplain Forest of the New South Wales North Coast Bioregion	Yes	Upper Hunter

11.2 Species credits

Table 11.2 Species credit class and matching credit profile

Common name	Scientific name	BC Act status	EPBC Act status	Loss of habitat (ha) or individuals	Biodiversity risk weighting	Number of species credits required
Red Helmet Orchid	<i>Corybas dowlingii</i>	E1	Not listed	1.77ha	2	41
Powerful Owl	<i>Ninox strenua</i>	V	Not listed	1.09ha	2	25
Squirrel Glider	<i>Petaurus norfolcensis</i>	V	Not listed	1.77ha	2	41
Brush-tailed Phascogale	<i>Phascogale tapoatafa</i>	V	Not listed	1.77ha	2	41
Koala	<i>Phascolarctos cinereus</i>	E	E	1.77ha	2	41
Heath Wrinklewort	<i>Rutidosia heterogama</i>	V	V	1.70ha	2	30
Tall Rustyhood	<i>Pterostylis chaetophora</i>	V	Not listed	2.13ha	2	44

12.0 Considerations under the Port Stephens

Comprehensive Koala Plan of Management CKPoM

The Port Stephens Comprehensive Koala Plan of Management (CKPoM) has been prepared for the Port Stephens LGA in accordance with SEPP 44 – ‘Koala Habitat Protection’. The Koala SEPP 2021 replicates the objectives and provisions of SEPP 44. The principal aim of the Port Stephens CKPoM is to encourage the proper conservation and management of areas of natural vegetation that provide habitat for Koalas to ensure a permanent free-living population over their present range and to reverse the current trend of Koala population decline.

Koala Habitat Assessments under the Port Stephens CKPoM involve four stages: preliminary assessment, vegetation mapping, Koala habitat identification and assessment of the proposal. A Koala habitat assessment has been completed below specifically for the development of this site.

12.1 Preliminary Assessment

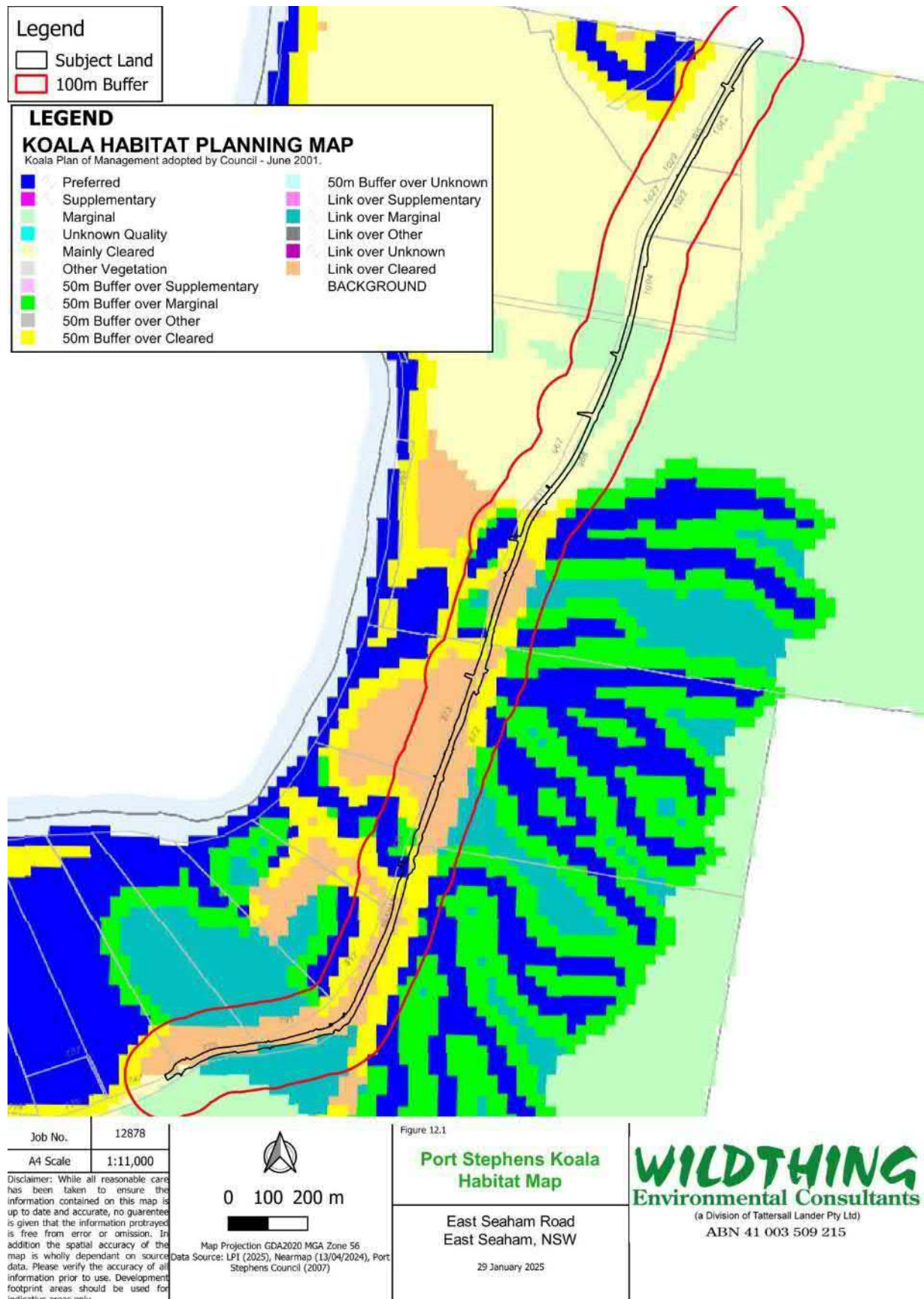
The preliminary assessment for the subject land involves reviewing the Koala Habitat Planning Map for the area as contained in the CKPoM and undertaking a site inspection to determine whether the subject land contains individuals of Koala trees outside areas marked as ‘Preferred Koala Habitat’. Review of the Koala Habitat Planning Map (Figure 12.1) showed the site to contain seven Koala habitat categories:

- ‘Preferred Koala Habitat’;
- ‘Marginal’;
- ‘50m Buffer Over Cleared’;
- ‘50m Buffer Over Marginal’;
- ‘Link Over Marginal’;
- ‘Link Over Cleared’;
- ‘Mainly Cleared’.

According to the Koala Habitat Planning Map, the majority of the subject land has been designated as ‘Link Over Cleared’ in the south of the subject land and ‘Mainly Cleared’ in the north of the subject land. Small patches of ‘Preferred Koala Habitat’ with small areas of ‘50m Buffer Over Cleared’, ‘50m Buffer Over Marginal’ and ‘Link Over Cleared’ are mapped as occurring in the south and centre of the subject land and generally followed the hydrodynamic system mapped within the locality. An area of Marginal habitat was mapped towards the north of the subject land.

Within the CKPoM there are three species of Eucalypt identified as Koala food trees, being *Eucalyptus robusta* (Swamp Mahogany), *Eucalyptus parramattensis* subsp. *decadens* (Drooping Red Gum) and *Eucalyptus tereticornis* (Forest Red Gum). One Koala food tree species; *Eucalyptus tereticornis* was identified within the subject land. Specimens of *E. tereticornis* were identified throughout the subject land and were located in the forested zones of both PCTs identified. The specimens identified were clumped in the south and centre of the subject land, scattered within the north of the subject land and clumped on the western side of East Seaham Road in the far north of the subject land.

Figure 12.1 Port Stephens Koala Habitat Mapping



12.2 Vegetation Mapping

The next step in the Koala Habitat Assessment is to provide a description of the vegetation assemblages present within the subject land and to compare the results of the vegetation survey conducted for this report with the LGA wide vegetation map (Figure 2.4 - 'Western Section Vegetation' in Part 2 of the Port Stephens CKPoM).

As detailed in Section 4.2, two vegetation assemblages were found to be present within the subject land as a result of an on-ground assessment:

- PCT 3433 - Hunter Coast Foothills Spotted Gum – Ironbark Grassy Forest;
- PCT 4042 - Lower North Riverflat Eucalypt-Paperbark Forest.

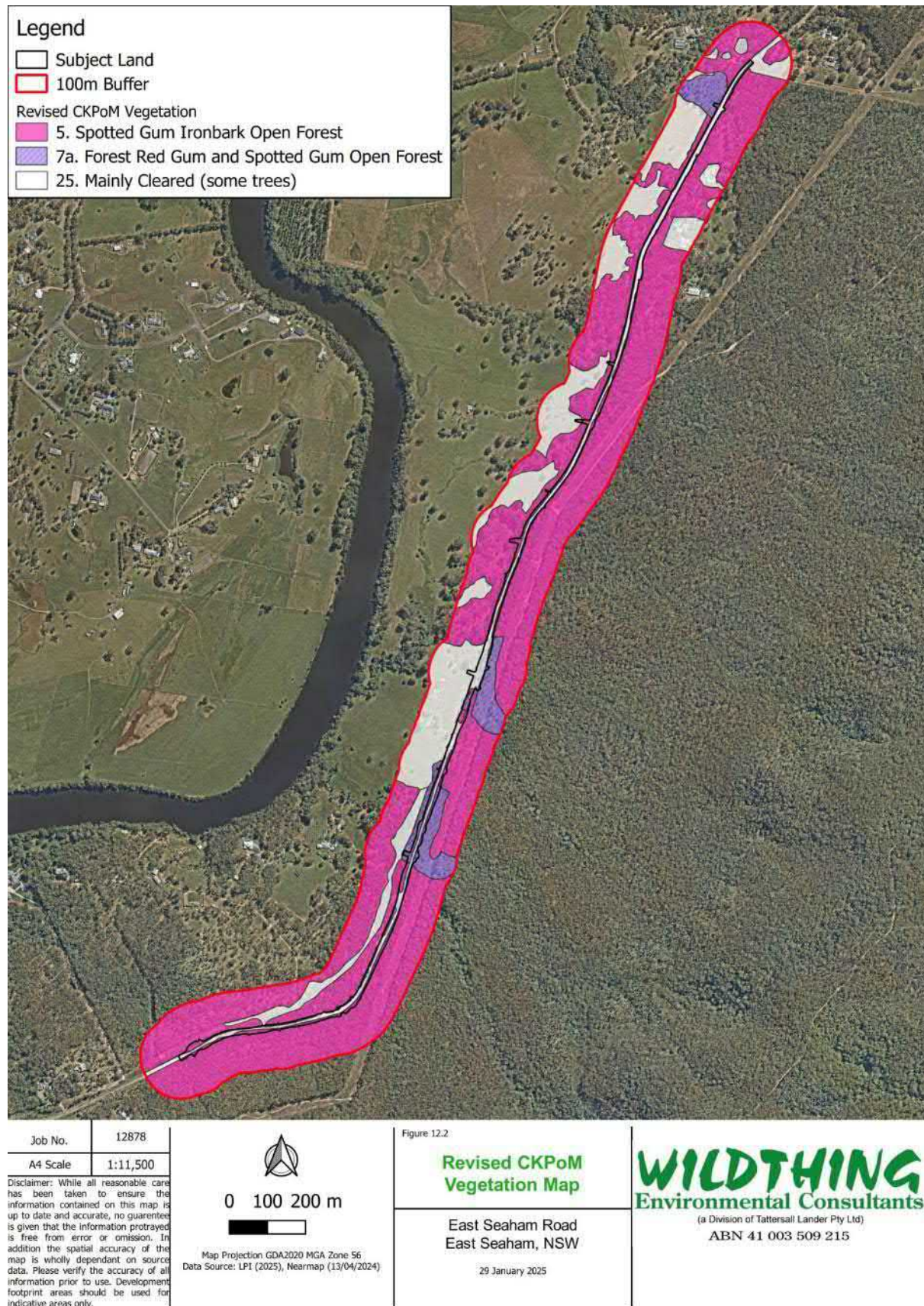
Review of the relevant LGA vegetation map (Figure 2.4 in Part 2: CKPoM Resource Document) showed vegetation on the site as being composed of four vegetation assemblages:

- 5. Spotted Gum Ironbark Open Forest;
- 7a. Forest Red Gum and Spotted Gum Open Forest;
- 7b. Forest Red Gum and Grey Box Open Forest;
- 25. Mainly Cleared (some trees).

The LGA map was found to be inconsistent with the on-ground assessment. Whilst containing some areas of 'Mainly Cleared' Land, the majority of the subject land would contain native vegetation most consistent with 5. Spotted Gum Ironbark Open Forest and 7a. Forest Red Gum and Spotted Gum Open Forest in the Part 2: CKPoM Resource Document. Vegetation mapped during the on-ground assessment as PCT 3433 most aligns with 5. Spotted Gum Ironbark Open Forest and vegetation mapped during the on-ground assessment as PCT 4042 aligns with 7a. Forest Red Gum and Spotted Gum Ironbark Forest. Although there were scattered occurrences of *Eucalyptus moluccana* (Grey Box) in the north of the subject land, the dominant canopy species was *Corymbia maculata* (Spotted Gum) together with *Eucalyptus tereticornis* (Forest Red Gum).

An updated map showing native vegetation consistent with the LGA CKPoM mapping, occurring within the subject land and in a 100m buffer from the boundary is shown in Figure 12.2.

Figure 12.2 Updated Vegetation Assemblages within the subject land & within 100m buffer



12.3 Koala Habitat Identification

Koala Habitat Identification involves:

- the application of the definitions of Preferred and Supplementary Koala Habitat detailed by Lunney *et al.* (1998) to the study area;
- the application of Habitat Buffers to all areas of Preferred Koala Habitat; and
- approximation of Habitat Linking Areas between all patches of Preferred Koala Habitat that occur within 800m of each other.

Under the definitions provided by Lunney *et al.* (1998):

- Preferred Koala Habitat is defined as a combination of the all-field survey Primary, Secondary and Community Survey category A/B (regardless of whether or not they overlap);
- Supplementary Habitat – where field survey Marginal and Community Survey Category C/D overlap;
- Marginal Koala Habitat – where field survey Marginal and Community Survey Category E overlap

Primary Koala habitat vegetation associations are those where the dominant or co-dominant tree species were preferred by Koalas and showed a level of use that was density independent. Secondary Koala Habitat vegetation associations occur where preferred tree species constituted between 10% and 35% of the overstorey vegetation. Marginal Koala Habitat vegetation associations are those which contain low densities of species known to be preferred by Koalas.

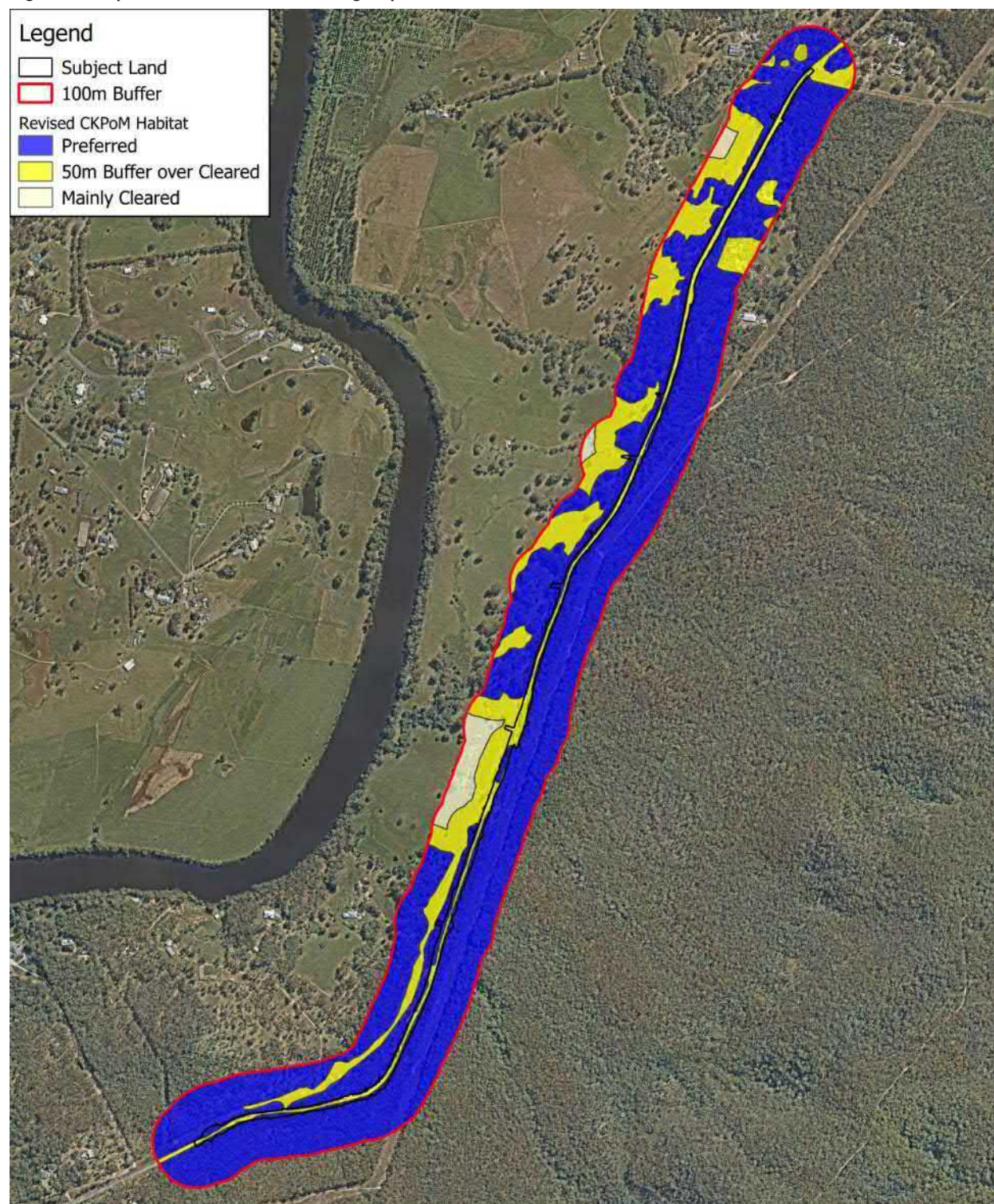
Field Survey

Areas of PCT 3433 - Hunter Coast Foothills Spotted Gum – Ironbark Grassy Forest occurring within the north, south and central parts of the site was found to be most consistent with Community Survey Category E – Spotted Gum and Ironbark Forest. Under the definition provided by Lunney *et al.* (1998) based on field work, PCT 3433 within the study area is most consistent with the Map based survey - Secondary Koala Habitat category “vegetation associations on erosional landscapes supporting *E. tereticornis* as a sub-dominant component of the overstorey.” When the map survey Secondary and Community Survey - E overlap, under the definitions provided by Lunney *et al.* (1998), Preferred Koala Habitat is obtained.

PCT 4042 - Lower North Riverflat Eucalypt-Paperbark Forest occurring in the centre and north of the study area were found to be most consistent with Community Survey Category E - Open Forest Redgum and Spotted Gum Forest. Under the definition provided by Lunney *et al.* (1998) based on field work, PCT 4042 within the study area is most consistent with the Map based survey - Secondary Koala Habitat category “vegetation associations on erosional landscapes supporting *E. tereticornis* as a sub-dominant component of the overstorey.” When the map survey Secondary and Community Survey - E overlap, under the definitions provided by Lunney *et al.* (1998), Preferred Koala Habitat is obtained.

The CKPoM assessment therefore found the study area to be largely composed of Preferred Koala Habitat with smaller areas of '50m Buffer Over Cleared' and 'mainly cleared land'. An updated Koala Habitat Map is shown in Figure 12.3.

Figure 12.3 Updated Koala Habitat Planning Map



Job No.	12878
A4 Scale	1:11,500

Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependant on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.



Figure 12.3

**Revised CKPoM Koala
Habitat Map**

East Seaham Road
East Seaham, NSW

29 January 2025

WILDTHING
Environmental Consultants
(a Division of Tattersall Lander Pty Ltd)
ABN 41 003 509 215

An assessment was conducted in the subject land to assess the level of current koala activity. No Koalas were observed within the study area during fieldwork (Figure 5.3). According to BioNet Records (DCCEEW, 2025a) a number of recent records of Koalas occur within and in proximity to the subject land.

12.4 Assessment of the Proposal

There are eight performance criteria applied to developments proposed on sites that contain or are adjacent to 'Preferred Koala Habitat', 'Supplementary Koala Habitat', 'Habitat Buffers', 'Habitat Linking Areas' or areas that contain preferred Koala feed tree species. Each criterion is displayed in *italics* followed by the site-specific answer.

The proposed development must:

- a) *Minimise the removal or degradation of native vegetation within Preferred Koala Habitat or Habitat Buffers.*

Preferred Koala Habitat occupied 2.13ha of the subject land (Figure 12.3). Habitat buffers consisting of 50m buffer over cleared occupied a total of 2.92ha of the subject land. (Figure 12.3). The proposal will allow the removal of all 2.13ha of preferred koala habitat within the subject land as the result of the proposed road upgrade. The remaining vegetation within the road reserve will be retained within the scope of the proposal. Furthermore, within the 100m buffer around the subject land approximately 54.05ha of Preferred Koala Habitat will be retained in the scope of the proposal. Surrounding vegetation of the subject land, including vegetation retained within the road reserve may be indirectly impacted by changes to road conditions as a result of the proposal, however mitigating measures have been outlined in Section 7.0 and 8.0 of this report.

- b) *Maximise retention and minimise degradation of native vegetation within Supplementary Koala Habitat and Habitat Linking Areas;*

No areas of Supplementary Koala Habitat or Habitat Linking Areas were identified within the site.

- c) *Minimise the removal of any individuals of preferred Koala food trees, wherever they occur on a development site. In the Port Stephens LGA these tree species are Eucalyptus robusta (Swamp Mahogany), Eucalyptus parramattensis (Parramatta Red Gum) and Eucalyptus tereticornis (Forest Red Gum);*

One species of recognised Preferred Koala Food Tree, *Eucalyptus tereticornis* (Forest Red Gum) was found to be present within the subject land (Figure 12.3). The road upgrade will result in the removal of 169 specimens of *E. tereticornis*.

- d) *Make provisions, where appropriate, for restoration or rehabilitation of areas identified as Koala Habitat including Habitat Buffers and Habitat Linking Areas over Mainly Cleared Land;*

Due to the nature of the subject land being a road reserve and the electrical easement within the subject land, there is little scope for the restoration of koala habitat within the subject land. The proponent, Port Stephens Council has opted into the offset scheme under the BC Act 2016 for the proposed road upgrade, and therefore all native vegetation removed, including koala habitat will be offset for the proposal.

- e) *Make provisions for long term management and protection of Koala habitat including both existing and restored habitat;*

Vegetation within the road reserve will be subject to on-going road side maintenance, including weed management by Port Stephens Council. The proponent, Port Stephens Council has opted into the offset scheme under the BC Act 2016, and therefore all native vegetation removed, including koala habitat will be offset for the proposal.

- f) *Not compromise the potential for safe movement of Koalas across the site. This should include maximising tree retention generally and minimising the likelihood that the proposal would result in the creation of barriers to Koala movement, such as would be imposed by certain types of fencing;*

To allow for the safe movement of Koalas, the proposal has retained the majority of native vegetation within the scope of the proposal. It is also recommended that the proposal contains the following:

- Remain free of any barriers or impediments to Koala movement;
- On-going weed Control within the road reserve;
- Retained speed limit of 70km/h;
- Koala signage along the road to ward drivers of their potential presence.

- g) *Be restricted to identified envelopes which contain all buildings and infrastructure and fire fuel reduction zone;*

During the construction phase of the proposal, the development footprint should be clearly marked to prevent disturbance to remaining habitat.

- h) *Include measures to effectively minimise the threat posed by Koalas by dogs, motor vehicles and swimming pools.*

A number of measures will be implemented within any future planning proposal to minimise the threat to Koalas. These measures will include:

- Retain the current speed limit along the road;
- Koala warning signage be placed along the road to reduce the chance of vehicle collision.

13.0 NSW Biosecurity Act 2015

Five priority weed species listed under the Biosecurity Act 2015 were identified on site and are listed below in Table 14.1. The site lies within the Hunter Local Land Services Region.

Table 13.1 Priority Weed species found within the subject land.

WEED Species	Legal Requirements	ADDITIONAL SIGNIFICANCE
<i>Asparagus aethiopicus</i> Ground Asparagus	General Biosecurity Duty Prohibition on dealings Regional Recommended Measure	
<i>Asparagus asparagoides</i> Bridal Creeper	General Biosecurity Duty Prohibition on dealings Regional Recommended Measure (Hunter)	T
<i>Senecio madagascariensis</i> Fireweed	General Biosecurity Duty Regional Recommended Measure	N
<i>Lantana camara</i> Lantana	General Biosecurity Duty Prohibition on dealings Regional Recommended Measure (Hunter)	N, T
<i>Rubus fruticosus</i> species aggregate Blackberry	General Biosecurity Duty Prohibition on dealings Regional Recommended Measure	

T – Listed as a Threatening Process under the NSW BC Act 2016.

N – Weed of National Significance.

*Priorities under the Biosecurity Act 2015

General Biosecurity Duty - any person dealing with plant matter must take measures to prevent, minimise or eliminate the biosecurity risk (as far as is reasonably practicable).

Prohibition on dealings - Must not be imported into the State or sold

It is recommended that weed control be implemented as part of the proposal. It is also recommended that the spread of weeds be minimised through recommended mitigation measures during the construction phase.

14.0 Commonwealth Environment Protection and Biodiversity Conservation Act 1999 & Matters of National Environmental Significance

The EPBC Act establishes a process for assessing the environmental impact of activities and developments where “Matters of National Environmental Significance” (MNES) may be affected. Under the Act, any action which “has, will have, or is likely to have a significant impact on a matter of MNES” is defined as a “controlled action”, and requires approval from the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW), which is responsible for administering the EPBC Act. The process includes conducting a Significant Impact Criteria assessment for listed threatened species and ecological communities that represent a matter of MNES that will be impacted as a result of the proposed action. Guidelines that outline of the significant impact criteria have been developed by the Commonwealth and help decide whether or not a referral to the Minister is required. The likelihood of occurrence for EPBC listed threatened species is shown in Appendix C.

The assessment in Appendix C has been undertaken in accordance with significant impact guidelines 1.1 under the EPBC Act (DoEE, 2013) to address the significant impact criteria for following EPBC listed threatened TEC and species;

- Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions – Endangered;
- *Phascolarctos cinereus* (Koala)– Endangered;
- *Pteropus poliocephalus* (Grey-headed Flying Fox) – Vulnerable;
- *Calyptorhynchus lathami* (South-eastern Glossy Black-Cockatoo) – Vulnerable.

The significant impact criteria found that there will not likely to be a significant impact for the Nationally listed TEC and species located within the subject land.

15.0 References

- Bell SAJ, Rockley C, Llewellyn A. (2019). Flora of the Hunter Region, Endemic Trees and Larger Shrubs. March 2019. CSIRO Publishing.
- Bowen, M., and Goldingay, R. L. (2000). Distribution and status of the eastern pygmy possum (*Cercartetus nanus*) in New South Wales. *Australian Mammalogy* 21, 153–164.
- Bradley, L., Mark, C., Alf, B. and Caragh, T. (2018) Comparison of microhabitat use in young regrowth and unlogged forest by the eastern pygmy-possum (*Cercartetus nanus*). *Australian Mammalogy* 40, 1-9.
- Cartoscope (2025). Geological sites of NSW. Accessed via <<https://www.cartoscope.com.au/scripts/hinterland.php>>
- Churchill, S. (2008). *Australian Bats* (2nd edn). Allen & Unwin Australia.
- Cogger, H.G. (2014). *Reptiles and Amphibians of Australia* (7th edn.). CSIRO Publishing.
- Commonwealth of Australia (2024) Bureau of Meteorology.
- Commonwealth of Australia (2016). Central Hunter Valley eucalypt forest and woodland: a nationally protected ecological community
- Cropper, S. (1993). *Management of Endangered Plants*. CSIRO Publications, East Melbourne.
- DCCEEW (Department of Climate Change, Energy, the Environment and Water) (2025a). EPBC Act Protected Matters Report for a 10 Kilometre radius search from the centre of the Subject site. Department of the Environment, Commonwealth of Australia. Accessed via, <https://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl>> (Report created 16 October 2024).
- DCCEEW (Department of Climate Change, Energy, the Environment and Water) (2025b). Commonwealth species profiles and threats database (SPRAT). Department of the Environment, Commonwealth of Australia.
- DCCEEW (Department of Climate Change, Energy, the Environment and Water) (2025c). Interim Biogeographic Regionalisation for Australia (IBRA), Version 7 (Regions). Data package accessed via <<https://datasets.seed.nsw.gov.au/dataset/interim-biogeographic-regionalisation-for-australia-ibra-version-7-regions>>
- DoE (Department of the Environment) (2013a). Draft survey guidelines for Australia's threatened orchids
- DoE (Department of the Environment) (2013b). Matters of National Significance. Significant Impact Guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999.
- DoE (Department of the Environment) (2015a). Directory of Important Wetlands in Australia (DIWA) Spatial Database (Public). Bioregional Assessment Source Dataset. Accessed via <<https://datasets.seed.nsw.gov.au/dataset/directory-of-important-wetlands-in-australia>>
- DoE (Department of the Environment) (2015b). Approved Conservation Advice (including listing advice) for the Central Hunter Valley eucalypt forest and woodland ecological community. Commonwealth of Australia, 2015.
- DECC (Department of Environment and Climate Change) (2007) Identification Guidelines for Endangered Ecological Communities. Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin Bioregion
- Department of Environment and Conservation, (2004). Threatened biodiversity survey and assessment Guidelines for developments and activities (2004 working draft).
- Department of Environment and Resource Management. 2011. National recovery plan for the large-eared pied bat *Chalinolobus dwyeri*. Report to the Department of Sustainability, Environment, Water, Population and Communities, Canberra.
- Department of the Environment, Water, Heritage and the Arts, 2013. Significant Impact Guidelines 1.1 - Matters of National Environmental Significance.

DPE – Water (Department of Planning and Environment - Water) (2025). Atlas of Groundwater Dependent Ecosystems

DPE (Department of Planning and Environment) (2023a). Biodiversity Assessment Method Operational Manual – Stage 2. State of New South Wales and Department of Planning, Industry and Environment

DPE (Department of Planning and Environment) (2022a) Koala (*Phascolarctos cinereus*) Biodiversity Assessment Method Survey Guide

DPE (Department of Planning and Environment) (2022b) Threatened reptiles Biodiversity Assessment Method survey guide

DPIE (Department of Planning, Industry and Environment) (2020a). Biodiversity Assessment Method. State of New South Wales and Department of Planning, Industry and Environment.

DPIE (Department of Planning, Industry and Environment) (2020b). Biodiversity Assessment Method Operational Manual – Stage 1. State of New South Wales and Department of Planning, Industry and Environment

DPIE (Department of Planning, Industry and Environment) (2020c). Biodiversity Assessment Method Operational Manual – Stage 3. State of New South Wales and Department of Planning, Industry and Environment

DPIE (Department of Planning, Industry and Environment) (2020d). NSW Survey Guide for Threatened Frogs. A guide for the survey of threatened frogs and their habitats for the Biodiversity Assessment Method.

DPIE (Department of Planning, Industry and Environment) (2020e). NSW Guide to Surveying threatened plants and their habitats.

DPIE (Department of Planning, Industry and Environment) (2020f). Soil and Land Resources of the Hunter Region, version 1.5, NSW Department of Planning, Industry and Environment, Parramatta.

DPIE (Department of Planning, Industry and Environment) (2011) Fauna Key Habitats for North East NSW. accessed via <https://datasets.seed.nsw.gov.au/dataset/fauna-key-habitats-for-north-east-nsw/e01b8>.

Goldingay, R. L. (2023) Habitat use by the eastern pygmy-possum in a coastal woodland–heathland mosaic. Australian Mammalogy 45, 275-284.

Harden, G (1991-2000). Flora of New South Wales. Vols 1-4. NSW University Press.

Landcom (2004). Managing Urban Stormwater: Soils and Construction. National Library of Australia, Canberra, Australia

Leonard, G. (2007). Eucalypts: A Bushwalker's Guide. Second Edition New South Wales University Press, Sydney.

LMCC (Lake Macquarie City Council) (2015) *Lake Macquarie Squirrel Glider Planning and Management Guidelines*. Lake Macquarie City Council November 2015.

LPI (Land and Property Information NSW), (2025). NSW Imagery Web Services.

Mahony, S.V., Cutajar, T. and Rowley, J. J.L. (2022). A new species of *Delma* Gray 1831 (Squamata: Pygopodidae) from the Hunter Valley and Liverpool Plains of New South Wales

Nearmap (2025) Aerial Imagery.

NPWS (National Parks and Wildlife Service) (2000). Vegetation Survey, Classification and Mapping: Lower Hunter and Central Coast Region. A project undertaken for the Lower Hunter and Central Coast Regional Environment Management Strategy, April 2000.

NSW DCCEEW NSW (Department of Climate Change, Energy, the Environment and Water) (2025a) NSW Biodiversity Values Map v17 accessed via <https://www.lmcc.nsw.gov.au/Maps/index.html?viewer=BOSETMap> (Data extracted 20 May 2022)

NSW DCCEEW (NSW Department of Climate Change, Energy, the Environment and Water) (2025b). BioNet Atlas NSW Wildlife Database selected area [North: -32.15 West: 150.78 East: 150.02 South: -32.34].

NSW DCCEEW (NSW Department of Climate Change, Energy, the Environment and Water) (2025c). BioNet vegetation classification database. Accessed via <
<http://www.environment.nsw.gov.au/research/Visclassification.htm>>

NSW DCCEEW (NSW Department of Climate Change, Energy, the Environment and Water) (2025d). Important Mapped Areas – The Biodiversity Offsets and Agreement Management System.

NSW DCCEEW (NSW Department of Climate Change, Energy, the Environment and Water) (2025e). NSW BioNet Threatened Biodiversity Profile Data Collection. State of New South Wales and Department of Planning, Industry and Environment

NSW DCCEEW (NSW Department of Climate Change, Energy, the Environment and Water) (2016). BioNet NSW (Mitchell) Landscapes – Version 3.1

NSW Government (2025). NSW SEED Mapping. Accessed via <https://www.seed.nsw.gov.au/>

NSW Rural Fire Service (2019) Planning for Bush Fire Protection. A guide for councils, planners, fire authorities and developers

OEH (Office of Environment and Heritage) (2018a). 'Species credit' threatened bats and their habitats. NSW survey guide for the Biodiversity Assessment Method

OEH (Office of Environment and Heritage) (2018b). Threatened Species Test of Significance Guidelines. State of New South Wales and Office of Environment and Heritage 2018.

OEH (Office of Environment and Heritage) (2004). Threatened biodiversity survey and assessment Guidelines for developments and activities (2004 working draft)

Pizzey, G. & Knight, F. (2012). The field guide to the birds of Australia. (9th edn). HarperCollins Publishers, Australia.

PlantNET (The NSW Plant Information Network System) (2025) The Royal Botanic Gardens and Domain Trust, Sydney. Accessed via <http://plantnet.rbgsyd.nsw.gov.au>.

Robinson, L. (2003). Field Guide to the Native Plants of Sydney. 3rd edn. Kangaroo Press Pty. Ltd., New South Wales.

Sainty, G. R. & Jacobs, S. W. (2003). Waterplants of Australia. 4th edition, Sainty & Associates, Sydney.

Triggs, B. (1996). Mammal Tracks and Signs-A Field Guide for South-eastern Australia. Oxford University Press, Melbourne.

Tulloch, A.I., and Dickman, C.R. (2006) Floristic and structural components of habitat use by the eastern pygmy-possum (*Cercartetus nanus*) in burnt and unburnt habitats. *Wildlife Research*, 33, 627–637

Van Dyck, S. & Strahan, R. (Ed) (2008). The Mammals of Australia. 3rd edn. New Holland Publishers, Australia.

Wedgetail Project Consulting (2024a). Biodiversity Survey for East Seaham Road Stage 5 and 6. Prepared for Port Stephens Council.

Wedgetail Project Consulting (2024b). Microchiroptera Bat Surveys. Prepared for Port Stephens Council.

Appendix A: BDAR requirements compliance

Table A 1 Assessment of compliance with BDAR minimum information requirements

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
Introduction	Chapters 2 and 3	Information	
		Introduction to the biodiversity assessment including:	–
		☒ brief description of the proposal	1.1.1
		☒ identification of subject land boundary, including:	1.1.3
		☒ operational footprint	
		☒ construction footprint indicating clearing associated with temporary/ancillary construction facilities and infrastructure	
		☒ general description of the subject land	
		☒ sources of information used in the assessment, including reports and spatial data	Table 1.2
		☒ identification and justification for entering the BOS	1.2.2
		Maps and tables	
		☒ Map of the subject land boundary showing the final proposal footprint, including the construction footprint for any clearing associated with temporary/ancillary construction facilities and infrastructure	Figure 1.3
Landscape	Sections 3.1 and 3.2, Appendix E	Information	
		Identification of site context components and landscape features, including:	–
		☒ general description of subject land topographic and hydrological setting, geology and soils	3.2.7
		☒ per cent native vegetation cover in the assessment area (as described in BAM Section 3.2)	3.3
		☒ IBRA bioregions and subregions (as described in BAM Subsection 3.1.3(2.))	3.2.1

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		☒ rivers and streams classified according to stream order (as described in BAM Subsection 3.1.3(3.) and Appendix E)	
		☒ wetlands within, adjacent to and downstream of the site (as described in BAM Subsection 3.1.3(3.))	
		☒ connectivity of different areas of habitat (as described in BAM Subsection 3.1.3(5–6.))	3.2.3
		☒ karst, caves, crevices, cliffs, rocks and other geological features of significance and for vegetation clearing proposals, soil hazard features (as described in BAM Subsections 3.1.3(7.) and 3.1.3(12.))	3.2.4
		☒ areas of outstanding biodiversity value occurring on the subject land and assessment area (as described in BAM Subsection 3.1.3(8–9.))	3.2.5
		☒ NSW (Mitchell) landscape on which the subject land occurs	3.2.4
		☒ details of field reconnaissance undertaken to confirm the extent and condition of landscape features and native vegetation cover (as described in Operational Manual Stage 1 Section 2.4)	2.1
		Maps and tables	
		☒ Site Map	Figure 1.2
		☒ Property boundary	
		☒ Boundary of subject land	
		☒ Cadastre of subject land (including labelling of Lot and DP or section plan if relevant)	
		☐ Landscape features identified in BAM Subsection 3.1.3	
		☒ Location Map	
		☒ Digital aerial photography at 1:1,000 scale or finer	
		☒ Boundary of subject land	
		☒ Assessment area (i.e. the subject land and either 1500 m buffer area or 500 m buffer for linear development)	
		☐ Landscape features identified in BAM Subsection 3.1.3	
		☐ Additional detail (e.g. local government area boundaries) relevant at this scale	
		Landscape features identified in BAM Subsection 3.1.3 and to be shown on the Site Map and/or Location	–

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		Map include:	
		☐ IBRA bioregions and subregions	Figure 3.1
		☒ rivers, streams and estuaries	Figure 3.2
		☒ wetlands and important wetlands	
		☒ connectivity of different areas of habitat	
		☐ karst, caves, crevices, cliffs, rocks and other geological features of significance and if required, soil hazard features	
		☐ areas of outstanding biodiversity value occurring on the subject land and assessment area	
		☐ any additional landscape features identified in any SEARs for the proposal	
		☒ NSW (Mitchell) landscape on which the subject land occurs	
		Data	
		☐ All report maps as separate jpeg files	–
		Individual digital shape files of:	–
		☐ subject land boundary	–
		☐ assessment area (i.e. subject land and 1500 m buffer area) boundary	–
		☐ cadastral boundary of subject land	–
		☐ areas of native vegetation cover	–
		☐ landscape features	–
Native vegetation	Chapter 4, Appendix A and Appendix H	Information	
		☒ Identify native vegetation extent within the subject land, including cleared areas and evidence to support differences between mapped vegetation extent and aerial imagery (as described in BAM Section 4.1(1–3.) and Subsection 4.1.1)	4.1

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		☒ Provide justification for all parts of the subject land that do not contain native vegetation (as described in BAM Subsection 4.1.2)	4.1
		☒ Review of existing information on native vegetation including references to previous vegetation maps of the subject land and assessment area (described in BAM Section 4.1(3.) and Subsection 4.1.1)	
		☒ Describe the systematic field-based floristic vegetation survey undertaken in accordance with BAM Section 4.2	2.3.2
		☐ Where relevant, describe the use of more appropriate local data, provide reasons that support the use of more appropriate local data and include the written confirmation from the decision-maker that they support the use of more appropriate local data (as described in BAM Subsection 1.4.2 and Appendix A)	
		For each PCT within the subject land, describe:	–
		☒ PCT name and ID	4.2.1
		☒ vegetation class	4.2.1.1
		☒ extent (ha) within subject land	4.2.1.1
		☒ evidence used to identify a PCT including any analyses undertaken, references/sources, existing vegetation maps (BAM Section 4.2(1–3.))	
		☒ plant species relied upon for identification of the PCT and relative abundance of each species	
		☒ if relevant, TEC status including evidence used to determine vegetation is the TEC (BAM Subsection 4.2.2(1–2.))	
		☒ estimate of per cent cleared value of PCT (BAM Subsection 4.2.1(5.))	4.2.1.1
		Describe the vegetation integrity assessment of the subject land, including:	–
		☒ identification and mapping of vegetation zones (as described in BAM Subsection 4.3.1)	
		☒ description of vegetation zones within the subject land (as described in Operational Manual Stage 1 Table 2 and Subsection 3.3.2)	Table 4.2

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		☒ area (ha) of each vegetation zone	Table 4.2
		☒ assessment of patch size (as described in BAM Subsection 4.3.2)	Table 4.2
		☒ survey effort (i.e., number of vegetation integrity survey plots) as described in BAM Subsection 4.3.4(1–2.)	Table 4.2
		☐ use of relevant benchmark data from BioNet Vegetation Classification (as described in BAM Subsection 4.3.3(5.))	
		Where use of more appropriate local benchmark data is proposed (as described in BAM Subsection 1.4.2, BAM Subsection 4.3.3(5.) and BAM Appendix A):	–
		☐ identify the PCT or vegetation class for which local benchmark data will be applied	
		☐ identify published sources of local benchmark data (if benchmarks obtained from published sources)	
		☐ describe methods of local benchmark data collection (if reference plots used to determine local benchmark data)	
		☐ provide justification for use of local data rather than BioNet Vegetation Classification benchmark values	
		☐ provide written confirmation from the decision-maker that they support the use of local benchmark data	
		Maps and tables	
		☒ Map of native vegetation extent within the subject land at scale not greater than 1:10,000 including identification of all areas of native vegetation including areas that are ground cover only, cleared areas (as described in BAM Section 4.1(1–3.)) and all parts of the subject land that do not contain native vegetation (BAM Subsection 4.1.2)	
		☒ Map of PCTs within the subject land (as described in BAM Section 4.2(1.))	Figure 4.2
		☒ Map of vegetation zones within the subject land (as described in BAM Subsection 4.3.1)	
		☒ Map the location of floristic vegetation survey plots and vegetation integrity survey plots relative to PCT boundaries	Figure D
		☒ Map of TEC distribution on the subject land and table of TEC listing, status and area (ha)	
		☒ Map of patch size locations for each native vegetation zone and table of patch size areas (as described	

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		in BAM Subsection 4.3.2)	
		Table of current vegetation integrity scores for each vegetation zone within the site and including:	–
		☒ composition condition score	Table 4.
		☒ structure condition score	
		☒ function condition score	
		☒ presence of hollow bearing trees	
		Data	
		☐ All report maps as separate jpeg files	–
		☐ Plot field data (MS Excel format)	
		☐ Plot field datasheets	Appendix D
		Digital shape files of:	–
		☐ PCT boundaries within subject land	–
		☐ TEC boundaries within subject land	–
		☐ vegetation zone boundaries within subject land	–
		☐ floristic vegetation survey and vegetation integrity plot locations	–
Threatened species	Chapter 5	Information	
		Identify ecosystem credit species likely to occur on the subject land, including:	–
		☒ list of ecosystem credit species derived from the BAM-C (as described in BAM Subsection 5.1.1 and Section 5.2(1.))	Table 5.1
		☒ justification and supporting evidence for exclusion of any ecosystem credit species based on geographic limitations, habitat constraints or vagrancy (as described in BAM Subsections 5.2.1 and 5.2.2)	Table 5.1
		☒ justification for addition of any ecosystem credit species to the list	Table 5.1

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		Identify species credit species likely to occur on the subject land, including:	–
		☒ list of species credit species derived from the BAM-C (as described in BAM Subsection 5.1.1)	Table 5.2 Table 5.3
		☒ justification and supporting evidence for exclusions based on geographic limitations, habitat constraints or vagrancy (as described in BAM Subsections 5.2.1 and 5.2.2)	Table 5.2 Table 5.3
		☒ justification and supporting evidence for exclusions based on degraded habitat constraints and/or microhabitats on which the species depends (as described in BAM Subsection 5.2.2)	Table 5.2 Table 5.3
		☒ justification for addition of any species credit species to the list	Table 5.2 Table 5.3
		From the list of candidate species credit species, identify:	–
		☒ species assumed present within the subject land (if relevant) (as described in BAM Subsection 5.2.4(2. a.))	Table 5.4
		☒ species present within the subject land on the basis of being identified on an important habitat map for a species (as described in BAM Subsection 5.2.4(2.d.))	Table 5.5
		☒ species for which targeted surveys are to be completed to determine species presence (BAM Subsection 5.2.4(2.b.))	
		☒ species for which an expert report is to be used to determine species presence (BAM Subsection 5.2.4(2.c.))	
		Present the outcomes of species credit species assessments from:	–
		☒ threatened species survey (as described in BAM Section 5.2.4)	Table 5.6 Table 5.7
		☐ expert reports (if relevant) including justification for presence of the species and information used to make this determination (as described in BAM Subsection 5.2.4, Section 5.3, Box 3)	
		Where survey has been undertaken include detailed information on:	–
		☒ survey method and effort (as described in BAM Section 5.3)	Table 5.6 Table 5.7

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		☒ justification of survey method and effort (e.g. citation of peer-reviewed literature) if approach differs from the department's taxa-specific survey guides or where no relevant guideline has been published	2.3.3.1 2.4.3
		☒ timing of survey in relation to requirements in the TBDC or the department's taxa-specific survey guides. Where survey was undertaken outside these guides include justification for the timing of surveys	Table 5.6 Table 5.7
		☐ survey personnel and relevant experience	Declarations
		☐ describe any limitations to surveys and how these were addressed/overcome	
		Where an expert report has been used in place of survey (as described in BAM Section 5.3, Box 3), include:	–
		☐ justification of the use of an expert report	
		☐ identify the expert, provide evidence of their expert credentials and departmental approval of expert status	
		☐ all requirements of Box 3 have been addressed in the expert report	
		Where use of local data is proposed (BAM Subsection 1.4.2):	–
		☐ identify relevant species	
		☐ identify data to be amended	
		☐ identify source of information for local data, e.g., published literature, additional survey data, etc.	
		☐ justify use of local data in preference to VIS Classification or TBDC data	
		☐ provide written confirmation from the decision-maker that they support the use of local data	
		Species polygon completed for species credit species present within the subject land (assumed present or determined on the basis of survey, expert report or important habitat map) ensuring that:	–
		☒ the unit of measure for each species is documented	
		for species assessed by area:	–
		☒ the polygon includes the extent of suitable habitat for the target species within the subject land	Figure 5.1

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		(as described in BAM Subsection 5.2.5)	Figure 5.2
		☐ a description of, and evidence-based justification for, the habitat constraints, features or microhabitats used to map the species polygon including reference to information in the TBDC for that species and any buffers applied	
		for species assessed by counts of individuals:	–
		☒ the number of individual plants present on the subject land (as described in BAM Subsection 5.2.5(3.))	
		☐ the method used to derive this number (i.e. threatened species survey or expert report) and evidence-based justification for the approach taken	
		☐ the polygon includes all individuals located on the subject land with a buffer of 30 m around the individuals or groups of individuals on the subject land	
		☒ Identify the biodiversity risk weighting for each species credit species identified as present within the subject land (as described in BAM Section 5.4)	Table 10.2
		Maps and tables	
		☒ Table showing ecosystem credit species in accordance with BAM Subsection 5.1.1, and identifying:	Table 5.1
		☒ the ecosystem credit species removed from the list	Table 5.1
		☒ the sensitivity to gain class of each species	Table 5.1
		☒ Table detailing species credit species in accordance with BAM Section 5.2 and identifying:	Table 5.2 Table 5.3 Table 5.6 Table 5.7
		☒ the species credit species removed from the list of species because the species is considered vagrant, out of geographic range or the habitat or microhabitat features are not present	Table 5.2 Table 5.3
		☒ the candidate species credit species not recorded on the subject land as determined by targeted survey, expert report or important habitat map	Table 5.6 Table 5.7
		☐ Table detailing species credit species recorded or assumed as present within the subject land, habitat	Table 5.6

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		constraints or microhabitats associated with the species, counts of individuals (flora)/extent of suitable habitat (flora and fauna) (as described in BAM Subsection 5.2.6) and biodiversity risk weighting (BAM Section 5.4)	Table 5.7
		☐ Map indicating the GPS coordinates of all individuals of each species recorded within the subject land and the species polygon for each species (as described in BAM Subsection 5.2.5)	Figure 5.1

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
Biodiversity Development Assessment Report			

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		Data	
		☐ Digital shape files of suitable habitat identified for survey for each candidate species credit species	–
		☐ Survey locations including GPS coordinates of any plots, transects, grids	
		☐ Digital shape files of each species polygon including GPS coordinates of located individuals	–
		☐ Species polygon map in jpeg format	–
		☐ Expert reports and any supporting data used to support conclusions of the expert report	
		☐ Field datasheets detailing survey information including prevailing conditions, date, time, equipment used, etc.	
Prescribed impacts	Chapter 6	Information	
		Identify potential prescribed biodiversity impacts on threatened entities, including:	–
		☒ karst, caves, crevices, cliffs, rocks and other geological features of significance (as described in BAM Subsection 6.1.1)	Table 6.1
		☒ occurrences of human-made structures and non-native vegetation (as described in BAM Subsection 6.1.2)	
		☒ corridors or other areas of connectivity linking habitat for threatened entities (as described in BAM Subsection 6.1.3)	
		☒ waterbodies or any hydrological processes that sustain threatened entities (as described in BAM Subsection 6.1.4)	
		☒ where the proposed development may result in vehicle strike on threatened fauna or on animals that are part of a threatened ecological community (as described in BAM Subsection 6.1.6)	Table 6.1
		☒ Identify a list of threatened entities that may be dependent upon or may use habitat features associated with any of the prescribed impacts	Table 6.1
		☒ Describe the importance of habitat features to the species including, where relevant, impacts on life cycle or movement patterns (e.g., Subsection 6.1.3)	Table 6.1
		Maps and tables	

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		☐ Map showing location of any prescribed impact features (i.e. karst, caves, crevices, cliffs, rocks, human-made structures, etc.)	
		☐ Map showing location of potential vehicle strike locations	
		Data	
		☐ Digital shape files of prescribed impact feature locations	–
		☐ Prescribed impact features map in jpeg format	–
Avoid and minimise impacts	Chapter 7	Information	
		Demonstration of efforts to avoid and minimise impacts on biodiversity values (including prescribed impacts) associated with the proposal location in accordance with Chapter 7, including an analysis of alternative:	–
		☒ modes or technologies that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed mode or technology	Figure 7.1 Table 7.1
		☒ routes that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed route	Figure 7.1 Table 7.1
		☒ alternative locations that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed location	7.1.1 7.2.1
		☒ alternative sites within a property on which the proposal is located that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed site	7.1.2 7.2.2
		☒ Describe efforts to avoid and minimise impacts (including prescribed impacts) to biodiversity values through proposal design (as described in BAM Sections 7.1 and 7.2)	Figure 7.1 Table 7.1
		☒ Identification of any other site constraints that the proponent has considered in determining the location	Figure 7.1

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		and design of the proposal (as described in BAM Subsection 7.2.1(3.))	Table 7.1
		☐ Detail measures or options considered but not implemented because they are not feasible and/or practical (e.g., due to site constraints)	
		Maps and tables	
		☒ Table of measures to be implemented to avoid and minimise the impacts of the proposal, including action, outcome, timing and responsibility	Figure 7.1 Table 7.1
		☒ Map of alternative footprints considered to avoid or minimise impacts on biodiversity values; and of the final proposal footprint, including construction and operation	
		☐ Maps demonstrating indirect impact zones where applicable	
		Data	
		Digital shape files of:	–
		☐ alternative and final proposal footprint	–
		☐ direct and indirect impact zones	–
		☐ Maps in jpeg format	–
Assessment of impacts	Chapter 8, Sections 8.1 and 8.2	Information	
		☒ Determine the impacts on native vegetation and threatened species habitat, including a description of direct impacts of clearing of native vegetation, threatened ecological communities and threatened species habitat (as described in BAM Section 8.1)	Table 8.1 Table 8.2
		Assessment of indirect impacts on vegetation and threatened species and their habitat including (as described in BAM Section 8.2):	–
		☒ description of the nature, extent, frequency, duration and timing of indirect impacts of the proposal	Table 8.3

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		☒ documenting the consequences to vegetation and threatened species and their habitat including evidence-based justifications	Table 8.1 Table 8.2
		☒ reporting any limitations or assumptions, etc. made during the assessment	Table 8.3
		☒ identification of the threatened entities and their habitat likely to be affected	Table 8.1 Table 8.2
		Assessment of prescribed biodiversity impacts (as described in BAM Section 8.3) including:	–
		assessment of the nature, extent frequency, duration and timing of impacts on the habitat of threatened species or ecological communities associated with:	–
		☐ karst, caves, crevices, cliffs, rocks and other features of geological significance	
		☐ human-made structures	
		☒ non-native vegetation	8.3.1
		☒ connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range	Table 8.3
		☐ movement of threatened species that maintains their life cycle	
		☒ water quality, waterbodies and hydrological processes that sustain threatened species and threatened ecological communities	8.3.3
		☒ assessment of the impacts of vehicle strikes on threatened species of animals or on animals that are part of a TEC	8.3.4
		☒ evaluate the consequences of prescribed impacts	Table 8.3
		☐ describe impacts that are uncertain	
		☐ document limitations to data, assumptions and predictions	
		Maps and tables	
		☐ Table showing change in vegetation integrity score for each vegetation zone as a result of identified impacts	Table 8.2

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		Data	
		N/A	–
Mitigation and management of impacts	Chapter 8, Sections 8.4 and 8.5	Information	
		Identification of measures to mitigate or manage impacts in accordance with the recommendations in BAM Sections 8.4 and 8.5 including:	–
		☒ techniques, timing, frequency and responsibility	Table 8.3 Table 8.
		☐ identify measures for which there is risk of failure	
		☒ evaluate the risk and consequence of any residual impacts	
		☐ document any adaptive management strategy proposed	
		Identification of measures for mitigating impacts related to:	–
		☒ displacement of resident fauna (as described in BAM Subsection 8.4.1(2.))	Table 8.
		☒ indirect impacts on native vegetation and habitat (as described in BAM Subsection 8.4.1(3.))	
		☒ mitigating prescribed biodiversity impacts (as described in BAM Subsection 8.4.2)	
		☐ Details of the adaptive management strategy proposed to monitor and respond to impacts on biodiversity values that are uncertain (BAM Section 8.5)	
		Maps and tables	
		☒ Table of measures to be implemented before, during and after construction to mitigate and manage impacts of the proposal, including action, outcome, timing and responsibility	Table 8.
		Data	
		N/A	–
Impact summary	Chapter 9	Information	

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		Identification and assessment of impacts on TECs and threatened species that are at risk of a serious and irreversible impacts (SAIL, in accordance with BAM Section 9.1) including:	–
		☒ addressing all criteria in Subsection 9.1.1 for each TEC listed as at risk of an SAIL present on the subject land	
		☐ for each TEC, report the extent of the TEC in NSW	
		☐ addressing all criteria in Subsection 9.1.2 for each threatened species at risk of an SAIL present on the subject land	
		☐ for each threatened species, report the population size in NSW	
		☒ documenting assumptions made and/or limitations to information	
		☒ documenting all sources of data, information, references used or consulted	
		☐ clearly justifying why any criteria could not be addressed	
		☒ Identification of impacts requiring offset in accordance with BAM Section 9.2	
		☒ Identification of impacts not requiring offset in accordance with BAM Subsection 9.2.1(3.)	
		☒ Identification of areas not requiring assessment in accordance with BAM Section 9.3	
		Maps and tables	
		☐ Map showing the extent of TECs at risk of an SAIL within the subject land	
		☐ Map showing location of threatened species at risk of an SAIL within the subject land	
		Map showing location of:	–
		☐ impacts requiring offset	
		☐ impacts not requiring offset	
		☐ areas not requiring assessment	
		Data	
		Digital shape files of:	–

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		☐ extent of TECs at risk of an SAIL within the subject land	–
		☐ location of threatened species at risk of an SAIL within the subject land	–
		☐ boundary of impacts requiring offset	–
		☐ boundary of impacts not requiring offset	–
		☐ boundary of areas not requiring assessment	–
		☐ Maps in jpeg format	–
Impact summary	Chapter 10	Information	
		Ecosystem credits and species credits that measure the impact of the development on biodiversity values, including:	–
		☒ future vegetation integrity score for each vegetation zone within the subject land (Equation 25 and Equation 26 in BAM Appendix H)	Table 10.1
		☒ change in vegetation integrity score (BAM Subsection 8.1.1)	
		☒ number of required ecosystem credits for the direct impacts of the proposal on each vegetation zone within the subject land (BAM Subsection 10.1.2)	
		☒ biodiversity risk weighting for each	Table 10.1 Table 10.2
		☒ number of required species credits for each candidate threatened species that is directly impacted on by the proposal (BAM Subsection 10.1.3)	Table 10.2
		Maps and tables	
		☒ Table of PCTs requiring offset and the number of ecosystem credits required	Table 10.1
		☒ Table of threatened species requiring offset and the number of species credits required	Table 10.2
		Data	
		☐ Submitted proposal in the BAM Calculator	–

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
Biodiversity credit report	Chapter 10	Information	
		☒ Description of credit classes for ecosystem credits and species credits at the development or clearing site or land to be biodiversity certified (BAM Section 10.2)	Table 11.1 Table 11.2
		☐ BAM credit report in pdf format	<Appendix E>
		Maps and tables	
		☒ Table of credit class and matching credit profile	Table 11.1 Table 11.2
		Data	
		☐ BAM credit report in pdf format	<Appendix E>

Appendix B: Biodiversity Values Map and Threshold tool report



Department of Planning and Environment

Biodiversity Values Map and Threshold Report

This report is generated using the Biodiversity Values Map and Threshold (BMAT) tool. The BMAT tool is used by proponents to supply evidence to your local council to determine whether or not a Biodiversity Development Assessment Report (BDAR) is required under [the Biodiversity Conservation Regulation 2017 \(Cl. 7.2 & 7.3\)](#).

The report provides results for the proposed development footprint area identified by the user and displayed within the blue boundary on the map.

There are two pathways for determining whether a BDAR is required for the proposed development:

1. Is there Biodiversity Values Mapping?
2. Is the 'clearing of native vegetation area threshold' exceeded?

Biodiversity Values Map and Threshold Report		
Date of Report Generation		30/01/2025 7:31 PM
1. Biodiversity Values (BV) Map - Results Summary (Biodiversity Conservation Regulation Section 7.3)		
1.1	Does the development Footprint intersect with BV mapping?	yes
1.2	Was <u>ALL</u> BV Mapping within the development footprinted added in the last 90 days? (dark purple mapping only, no light purple mapping present)	no
1.3	Date of expiry of dark purple 90 day mapping	N/A
1.4	Is the Biodiversity Values Map threshold exceeded?	yes
2. Area Clearing Threshold - Results Summary (Biodiversity Conservation Regulation Section 7.2)		
2.1	Size of the development or clearing footprint	19,854.9 sqm
2.2	Native Vegetation Area Clearing Estimate (NVACE) (within development/clearing footprint)	18,769.4 sqm
2.3	Method for determining Minimum Lot Size	LEP
2.4	Minimum Lot Size (10,000sqm = 1ha)	400,000 sqm
2.5	Area Clearing Threshold (10,000sqm = 1ha)	10,000 sqm
2.6	Does the estimate exceed the Area Clearing Threshold? (NVACE results are an estimate and can be reviewed using the Guidance)	yes
REPORT RESULT: Is the Biodiversity Offset Scheme (BOS) Threshold exceeded for the proposed development footprint area? (Your local council will determine if a BDAR is required)		yes

Page 1 of 4



Department of Planning and Environment

What do I do with this report?

- If the result above indicates the BOS Threshold has been exceeded, your local council **may require** a Biodiversity Development Assessment Report with your development application. Seek further advice from Council. An accredited assessor can apply the Biodiversity Assessment Method and prepare a BDAR for you. For a list of accredited assessors go to: <https://customer.lmbc.nsw.gov.au/assessment/AccreditedAssessor>.
- If the result above indicates the BOS Threshold has not been exceeded, you may not require a Biodiversity Development Assessment Report. This BMAT report can be provided to Council to support your development application. Council can advise how the area clearing threshold results should be considered. Council will review these results and make a determination if a BDAR is required. Council may ask you to review the area clearing threshold results. You may also be required to assess whether the development is "likely to significantly affect threatened species" as determined under the test in Section 7.3 of the *Biodiversity Conservation Act 2016*.
- If a BDAR is not required by Council, you may still require a permit to clear vegetation from your local council.
- If all Biodiversity Values mapping within your development footprint was less than 90 days old, i.e. areas are displayed as dark purple on the BV map, a BDAR may not be required if your Development Application is submitted within that 90 day period. Any BV mapping less than 90 days old on this report will expire on the date provided in Line item 1.3 above.

For more detailed advice about actions required, refer to the **Interpreting the evaluation report** section of the [Biodiversity Values Map Threshold Tool User Guide](#).

Review Options:

- If you believe the Biodiversity Values mapping is incorrect please refer to our [BV Map Review webpage](#) for further information.
- If you or Council disagree with the area clearing threshold estimate results from the NVACE in Line Item 2.6 above (i.e. area of Native Vegetation within the Development footprint proposed to be cleared), review the results using the [Guide for reviewing area clearing threshold results from the BMAT Tool](#).

Acknowledgement

I, as the applicant for this development, submit that I have correctly depicted the area that will be impacted or likely to be impacted as a result of the proposed development.

Signature: _____

(Typing your name in the signature field will be considered as your signature for the purposes of this form)

Date: _____

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Department of Planning and Environment

Biodiversity Values Map and Threshold Tool

The Biodiversity Values (BV) Map and Threshold Tool identifies land with high biodiversity value, particularly sensitive to impacts from development and clearing.

The BV map forms part of the Biodiversity Offsets Scheme threshold, which is one of the factors for determining whether the Scheme applies to a clearing or development proposal. You have used the Threshold Tool in the map viewer to generate this BV Threshold Report for your nominated area. This report calculates results for your proposed development footprint and indicates whether Council may require you to engage an accredited assessor to prepare a Biodiversity Development Assessment Report (BDAR) for your development.

This report may be used as evidence for development applications submitted to councils. You may also use this report when considering native vegetation clearing under the State Environmental Planning Policy (Biodiversity and Conservation) 2021 - Chapter 2 vegetation in non-rural areas.

What's new? For more information about the latest updates to the Biodiversity Values Map and Threshold Tool go to the updates section on the [Biodiversity Values Map webpage](#).

Map Review: Landholders can request a review of the BV Map where they consider there is an error in the mapping on their property. For more information about the map review process and an application form for a review go to the [Biodiversity Values Map Review webpage](#).

If you need help using this map tool see our [Biodiversity Values Map and Threshold Tool User Guide](#) or contact the Map Review Team at map.review@environment.nsw.gov.au or on 1800 001 490.

Biodiversity Values Map



5,944.5 0 2,972.27 5,944.5 Metres

WGS_1984_Web_Mercator_Auxiliary_Sphere

Legend

- Biodiversity Values that have been mapped for more than 90 days
- Biodiversity Values added within last 90 days
- Native Vegetation Area Clearing Estimate (NVACE)
- Development area selected by proponent

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This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

Imagery © Airbus DS/Spot Image 2016

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The results provided in this tool are generated using the best available mapping and knowledge of species habitat requirements.

This map is valid as at the date the report was generated. Checking the [Biodiversity Values Map viewer](#) for mapping updates is recommended.

Appendix C: Commonwealth Environment Protection and Biodiversity Conservation Act 1999 & Matters of National Environmental Significance

Considerations have been made to the Commonwealth Environment Protection and Biodiversity Conservation (EPBC) Act 1999. Assessments have been made to determine whether or not the proposal or activity has, will have, or is likely to have a significant impact on a matter of National Environmental Significance. The matters of National Environmental Significance and the appropriate responses are listed below:

- World Heritage properties;

The proposed development does not affect any World Heritage properties.

- Wetlands recognised under the Ramsar convention as having international significance;

The subject land is located 10-20km upstream from the Hunter Estuary. The proposal is unlikely to have any impact on this Ramsar site.

- Listed threatened species and communities;

Threatened Communities

One nationally threatened ecological community; Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions was identified within the subject land. An assessment on the impact of this EEC has been addressed below.

Significant Impact Criteria EPBC Act - Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions

An action is likely to have a significant impact on a critically endangered ecological community or EEC if there is a real chance or possibility that it will:

a. Reduce the extent of an ecological community

The project will result in the removal of 0.43ha of vegetation identified as EEC Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions. Areas of this EEC occur within the western road reserve in the north and on both sides of the road reserve in the southern central portion of the study area and in connecting vegetation to these areas in neighboring land. A total of 0.8ha of this EEC was located within the study area. The proposal will result in the retention of 0.44ha of this EEC within the road reserve. Due to the roadside location and small proportion of EEC to be impacted within the locality, it is considered unlikely that the proposed action would have an adverse effect on the extent of the EEC or significantly modify the composition of the EEC such that its local occurrence is likely to be placed at risk of extinction.

- b. fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines*

Although the proposal will result in the removal of 0.43ha of this EEC for the widening of a road, the road is the pre-existing East Seaham Road. Increased fragmentation of this EEC is unlikely to occur due to the retention of 0.44ha of this EEC within the road reserve, as well as the retained EEC within adjoining properties. The proposal will not further isolate any patches of this EEC and therefore the proposal is unlikely to impede any genetic transfer between retained patches.

- c. Adversely affect habitat critical to the survival of an ecological community*

The project will adversely affect 0.43ha of habitat considered to be critical to the survival of the community, however it is unlikely to result in any substantial change to the community locally such that its local occurrence is likely to be placed at risk of extinction.

- d. Modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns*

Considering mitigation measures including temporary stormwater controls, installing silt fencing and controls on sediment and runoff the proposal is unlikely to affect any abiotic processes necessary for the community's survival.

- e. Cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting*

The project will remove 0.43ha of the EEC. Mitigation measures within Table 7.1 have been outlined to reduce impacts on the retained EEC. Mitigation measures include edge effect management through routine roadside maintenance activities such as weeding and retain pre-existing signage discouraging human activities and dumping within the retained vegetation and clearly marking the clearance zone to eliminate any inadvertent impact to adjoining habitat. Removing the gravel road by tarring the road will also eliminate impacts such as dust spill and gravel incursion onto the retained TEC. Considering the mitigation measures, it is unlikely the proposal will result in any substantial change to the community species composition locally.

- f. Cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to:*
- assisting invasive species, that are harmful to the listed ecological community, to become established, or*

– causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community

Mitigation measures to reduce edge effects through routine roadside maintenance and weeding and retention of pre-existing signage discouraging human activities and dumping within the retained vegetation have been outlined within Table 7.1 of this report. This will reduce the risk of spread or establishment of invasive weeds. Considering these measures the project will unlikely assist the establishment of any invasive species or cause any increased mobilisation of fertilisers which would kill or inhibit the growth of species in the ecological Community.

g. Interfere with the recovery of an ecological community.

The proposal involves removing the pre-existing gravel road by permanently resurfacing the road with tar. This will eliminate impacts such as dust spill and gravel incursion onto the retained EEC. Mitigation measures to reduce edge effects through routine roadside maintenance and weeding and retention of pre-existing signage discouraging human activities and dumping within the retained vegetation have been outlined within Table 7.1 of this report. Considering these measures the proposal is not likely to interfere with any current recovery programs.

Conclusion

Taking into consideration the retention of areas of Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions in the remaining road reserve and neighbouring land, mitigation measures to protect the retained vegetation from impacts such as edge effect and the minimisation of dust and gravel incursion from the pre-existing gravel road in retained areas of the EEC, the removal of 0.38ha of EEC for the proposal is unlikely to significantly impact areas identified as Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions.

Threatened Species

Sixty-one nationally threatened species were recorded on the DCCEEW database as occurring or having potential habitat available within 10km of the site, these being:

<i>Lathamus discolor</i>	Swift Parrot
<i>Calidris ferruginea</i>	Curlew Sandpiper
<i>Anthochaera phrygia</i>	Regent Honeyeater
<i>Numenius madagascariensis</i>	Eastern Curlew
<i>Limosa lapponica baueri</i>	Nunivak Bar-tailed Godwit
<i>Callocephalon fimbriatum</i>	Gang-gang Cockatoo
<i>Melanodryas cucullata cucullata</i>	South-eastern Hooded Robin
<i>Tringa nebularia</i>	Common Greenshank
<i>Botaurus poiciloptilus</i>	Australasian Bittern
<i>Erythrorhynchus radiatus</i>	Red Goshawk
<i>Rostratula australis</i>	Australian Painted Snipe
<i>Charadrius leschenaultii</i>	Greater Sand Plover

<i>Calidris acuminata</i>	Sharp-tailed Sandpiper
<i>Grantiella picta</i>	Painted Honeyeater
<i>Pycnoptilus floccosus</i>	Pilotbird
<i>Calidris canutus</i>	Red Knot
<i>Sternula nereis nereis</i>	Australian Fairy Tern
<i>Falco hypoleucos</i>	Grey Falcon
<i>Neophema chrysostoma</i>	Blue-winged Parrot
<i>Hirundapus caudacutus</i>	White-throated Needletail
<i>Climacteris picumnus victoriae</i>	Brown Treecreeper (south-eastern)
<i>Calyptorhynchus lathami lathami</i>	South-eastern Glossy Black-Cockatoo
<i>Gallinago hardwickii</i>	Latham's Snipe
<i>Stagonopleura guttata</i>	Diamond Firetail
<i>Uperoleia mahonyi</i>	Mahony's Toadlet
<i>Mixophyes balbus</i>	Stuttering Frog
<i>Mixophyes iteratus</i>	Giant Barred Frog
<i>Litoria aurea</i>	Green and Golden Bell Frog
<i>Saltuarius moritzi</i>	New England Leaf-tailed Gecko
<i>Dasyurus maculatus maculatus</i>	Spot-tailed Quoll
<i>Petauroides volans</i>	Greater Glider (southern and central)
<i>Phascolarctos cinereus</i>	Koala
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox
<i>Petaurus australis australis</i>	Yellow-bellied Glider (south-eastern)
<i>Pseudomys novaehollandiae</i>	New Holland Mouse
<i>Notamacropus parma</i>	Parma Wallaby
<i>Potorous tridactylus tridactylus</i>	Long-nosed Potoroo (northern)
<i>Petrogale penicillata</i>	Brush-tailed Rock-wallaby
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat
<i>Euphrasia arguta</i>	
<i>Rhodamnia rubescens</i>	Scrub Turpentine
<i>Prasophyllum</i> sp. <i>Wybong</i>	a leek-orchid
<i>Rhodomyrtus psidioides</i>	Native Guava
<i>Rhizanthella slateri</i>	Eastern Underground Orchid
<i>Cynanchum elegans</i>	White-flowered Wax Plant
<i>Cryptostylis hunteriana</i>	Leafless Tongue-orchid
<i>Angophora inopinata</i>	Charmhaven Apple
<i>Asperula asthenes</i>	Trailing Woodruff
<i>Tetratheca juncea</i>	Black-eyed Susan
<i>Grevillea parviflora</i> subsp. <i>parviflora</i>	Small-flower Grevillea
<i>Diuris praecox</i>	Newcastle Doubletail
<i>Eucalyptus parramattensis</i> subsp. <i>decadens</i>	Earp's Gum
<i>Dichanthium setosum</i>	bluegrass
<i>Thesium australe</i>	Austral Toadflax
<i>Melaleuca biconvexa</i>	Biconvex Paperbark
<i>Caladenia tessellata</i>	Thick-lipped Spider-orchid
<i>Syzygium paniculatum</i>	Magenta Lilly Pilly
<i>Persicaria elatior</i>	Tall Knotweed
<i>Eucalyptus glaucina</i>	Slaty Red Gum
<i>Arthraxon hispidus</i>	Hairy-joint Grass
<i>Eucalyptus camfieldii</i>	Camfield's Stringybark

Three Nationally listed threatened species were recorded within the subject area during fieldwork or assumed to be present, being:

- *Pteropus poliocephalus* (Grey-headed Flying-fox) (Vulnerable);
- *Phascolarctos cinereus* (Koala) (Endangered);
- *Calyptorhynchus lathami* (South-eastern Glossy Black-Cockatoo) (Vulnerable);

An assessment of each threatened species recorded is located below Table C1.

No other threatened species were recorded within the subject area during fieldwork. Of the remaining species, the site would likely provide foraging trees for woodland bird species. Given the

recommendations in Section 7.0, 8.0 and 9.0 of this report the proposal would not likely result in the modification or loss of any suitable habitat that would significantly affect the life cycle of woodland birds or any of the remaining fauna species or place any viable local populations of these species at risk of extinction.

Table C1 Assessment of likelihood of occurrence of threatened species recorded on the DCCEEW database

Scientific Name	Common Name	EPBC Act Status	Distribution and Habitat	Likelihood of occurrence	Justification	Impact Assessment Required
<i>Prasophyllum</i> sp. <i>Wybong</i>	A Leek Orchid	CE	Leek orchids are generally found in shrubby and grassy habitats in dry to wet soil (Jones 2006). Known to occur in open eucalypt woodland and grassland. Is known from near Ilford, Premer, Muswellbrook, Wybong, Yeoval, Inverell, Tenterfield, Currabubula and the Pilliga area.	Unlikely	Marginal habitat was present however outside of known areas of occurrence. No nearby species records.	No
<i>Angophora inopina</i>	Charmhaven Apple	V	Endemic to the Central Coast region of NSW. The known northern limit is near Karuah where a disjunct population occurs; to the south populations extend from Toronto to Charmhaven with the main population occurring between Charmhaven and Morisset. Occurs most frequently in four main vegetation communities: (i) <i>Eucalyptus haemastoma</i> – <i>Corymbia gummifera</i> – <i>Angophora inopina</i> woodland/forest; (ii) <i>Hakea teretifolia</i> – <i>Banksia oblongifolia</i> wet heath; (iii) <i>Eucalyptus resinifera</i> – <i>Melaleuca sieberi</i> – <i>Angophora inopina</i> sedge woodland; (iv) <i>Eucalyptus capitellata</i> – <i>Corymbia gummifera</i> – <i>Angophora inopina</i> woodland/forest.	Marginal	No associated vegetation communities present. Known to occur within the Wallaroo National Park 5.2-11.3km east of study area	No
<i>Arthraxon hispidus</i>	Hairy-joint Grass	V	Occurs over a wide area in south-east Queensland, and on the northern tablelands and north coast of NSW, but is never common. Moisture and shade-loving grass, found in or on the edges of rainforest and in wet eucalypt forest, often near creeks or swamps.	Unlikely	No nearby records within the locality.	No
<i>Dichanthium setosum</i>	Blue Grass	V	Occurs on the New England Tablelands, Northwest Slopes and Plains and the Central Western Slopes of NSW, extending to northern Queensland. Associated with heavy basaltic black soils and red-brown loams with clay subsoil.	Unlikely	Outside known area of occurrence. No suitable habitat was present. Presence of species was not identified during surveys.	No

Scientific Name	Common Name	EPBC Act Status	Distribution and Habitat	Likelihood of occurrence	Justification	Impact Assessment Required
<i>Asperula asthenes</i>	Trailing Woodruff	V	It is found in scattered locations from the Central Coast (Mandalong area) north to near Kempsey, with several records from the Port Stephens / Karuah / Wallis Lakes area / Forster (including Myall Lakes NP, New England NP, Wallingat NP and Darawnk NR). Occurs in damp sites, often along river banks.	Low	Potential habitat was present. Presence of species was not identified during targeted surveys.	No
<i>Caladenia tessellata</i>	Thick-lipped Spider-orchid, Daddy Long-legs	V	Generally found in grassy sclerophyll woodland on clay loam or sandy soils, though the population near Braidwood is in low woodland with stony soil.	Low	No suitable habitat was present. No records of the species in the locality. Species not known from the region.	No
<i>Cryptostylis hunteriana</i>	Leafless Tongue Orchid	V	The Leafless Tongue Orchid has been recorded from as far north as Gibraltar Range National Park south into Victoria around the coast as far as Orbost. Recorded at Munmorah State Conservation Area, Nelson Bay, Wyee, Washpool National Park, Nowendoc State Forest, Ku-Ring-Gai Chase National Park and Ben Boyd National Park. Does not appear to have well defined habitat preferences and is known from a range of communities, including swamp-heath and woodland.	Low	Marinal habitat was present. No records of the species in the locality.	No
<i>Cynanchum elegans</i>	White-flowered Wax Plant	E	Restricted to eastern NSW where it is distributed from Brunswick Heads on the north coast to Gerroa in the Illawarra region. The species has been recorded as far west as Merriwa in the upper Hunter River valley. On the edge of dry rainforest vegetation. Other associated vegetation types include littoral rainforest; Coastal Tea-tree <i>Leptospermum laevigatum</i> – Coastal <i>Banksia integrifolia</i> subsp. <i>integrifolia</i> coastal scrub; Forest Red Gum <i>Eucalyptus tereticornis</i> aligned open forest and woodland; Spotted Gum <i>Corymbia</i>	Low	Marinal habitat was present. No records of the species in the locality.	No

Scientific Name	Common Name	EPBC Act Status	Distribution and Habitat	Likelihood of occurrence	Justification	Impact Assessment Required
			maculata aligned open forest and woodland; and Bracelet Honey Myrtle Melaleuca armillaris scrub to open scrub.			
<i>Diuris praecox</i>	Rough Doubletail	V	Known from between Bateau Bay and Smiths Lake. Grows on hills and slopes of near-coastal districts in open forests which have a grassy to fairly dense understorey.	Low	Marinal habitat was present. No records of the species in the locality.	No
<i>Eucalyptus camfieldii</i>	Camfield's Stringybark	V	Two separate meta-populations: one bordered by Cessnock—Kurri Kurri in the north and Mulbring—Aberdare in the south, and the other bounded by Salt Ash and Tanilba Bay in the north and Williamtown and Tomago in the south. Found in dry sclerophyll woodland, wet or dry heath on deep, low-nutrient sands, often subject to periodic inundation.	Unlikely	No suitable habitat was present. No records of the species in the locality.	No
<i>Eucalyptus glaucina</i>	Slaty Red Gum	V	Grows in grassy woodland and dry eucalypt forest, usually on deep, moderately fertile and well-watered soils. This species has only been recorded on the north coast of NSW and in small populations from Taree to Broke and west of Maitland.	Potential	Habitat was present. Species has been recorded within 1.5km of the subject land. Presence of species was not identified during surveys.	No
<i>Eucalyptus parramattensis</i> subsp. <i>decadens</i>	Drooping Red Gum	V	There are two separate meta-populations The Kurri Kurri meta-population is bordered by Cessnock—Kurri Kurri in the north and Mulbring—Aberdare in the south. Large aggregations of the subspecies are located in the Tomalpin area. The Tomago Sandbeds meta-population is bounded by Salt Ash and Tanilba Bay in the north and Williamtown and Tomago in the south.	Low	Marinal habitat was present. No records of the species in the locality.	No
<i>Euphrasia arguta</i>	Eyebright	CE	Rediscovered in Nundle. Historically, has only been recorded from relatively few places within an area extending from Sydney to Bathurst and north to Walcha. The Royal Botanic Gardens Specimen	Unlikely	No suitable habitat was present. No records of the species in the locality.	No

Scientific Name	Common Name	EPBC Act Status	Distribution and Habitat	Likelihood of occurrence	Justification	Impact Assessment Required
			Register records an additional location reported and vouchered in 2002 from near the Hastings River and the Barrington Tops in 2012. Historically found in the open forest country around Bathurst in sub humid places', 'on the grassy country near Bathurst', and 'in meadows near rivers'. from the Nundle area have been reported from eucalypt forest with a mixed grass and shrub understorey.			
<i>Grevillea parviflora</i> subsp. <i>parviflora</i>	Small-flowered Grevillea	V	Sporadically distributed throughout the Sydney Basin with sizeable populations around Picton, Appin and Bargo (and possibly further south to the Moss Vale area) and in the Hunter at in the Cessnock - Kurri Kurri area (particularly Werakata NP). Separate populations are also known from Putty to Wyong and Lake Macquarie on the Central Coast and Port Stephens. Grows in sandy or light clay soils usually over thin shales, often with lateritic ironstone gravels and nodules.	Low	Potential habitat was present. Presence of species was not recorded during surveys.	No
<i>Melaleuca biconvexa</i>	Biconvex Paperbark	V	Is only found in NSW, with scattered and dispersed populations found in the Jervis Bay area in the south and the Gosford-Wyong area in the north.	Unlikely	No suitable habitat was present. No records of the species in the locality.	No
<i>Persicaria elatior</i>	Tall Knotweed	V	Recorded in south-eastern NSW (Mt Dromedary (an old record), Moruya State Forest near Turlinjah, the Upper Avon River catchment north of Robertson, Bermagui, and Picton Lakes. In northern NSW it is known from Raymond Terrace (near Newcastle) and the Grafton area (Cherry Tree and Gibberagee State Forests).	Unlikely	No suitable habitat was present. No records of the species in the locality.	No
<i>Rhizanthella slateri</i>	Eastern Underground Orchid	E	Occurs from south-east Queensland to south-east NSW. In NSW, currently known from fewer than 10 locations, including near Bulahdelah, the Watagan Mountains, the Blue Mountains, Wiseman's Ferry area,	Low	Marinal habitat was present. No records of the species in the locality. Presence of species was not identified during targeted	No

Scientific Name	Common Name	EPBC Act Status	Distribution and Habitat	Likelihood of occurrence	Justification	Impact Assessment Required
			Agnes Banks and near Nowra. Habitat requirements are poorly understood, and no particular vegetation type has been associated with the species, although it is known to occur in sclerophyll forest.		surveys.	
<i>Rhodamnia rubescens</i>	Scrub Turpentine	CE	Occurs in coastal districts north from Batemans Bay in New South Wales, approximately 280km south of Sydney, to areas inland of Bundaberg in Queensland. Found in littoral, warm temperate and subtropical rainforest, and wet sclerophyll forest usually on volcanic and sedimentary soils.	Low	Potential habitat was present. Presence of species was not identified during targeted surveys.	No
<i>Rhodomirtus psidioides</i>	Native Guava	CE	Occurs from Broken Bay NSW, to Maryborough Qld in Queensland. Typically restricted to coastal and sub-coastal areas of low elevation however the species does occur up to c. 120km inland in the Hunter and Clarence River catchments and along the Border Ranges in NSW. Found in littoral, warm temperate and subtropical rainforest, and wet sclerophyll forest often near creeks and drainage lines.	Low	Marinal habitat was present. Presence of species was not identified during targeted surveys.	No
<i>Syzygium paniculatum</i>	Magenta Lilly Pilly	V	Found only in NSW, in a narrow, linear coastal strip from Upper Lansdowne to Conjola State Forest. On the central coast occurs on gravels, sands, silts and clays in riverside gallery rainforests and remnant littoral rainforest communities.	Unlikely	No suitable habitat was present. No records of the species in the locality. .	No
<i>Tetradlea juncea</i>	Black-eyed Susan	V	Confined to the northern portion of the Sydney Basin bioregion and the southern portion of the North Coast bioregion in the Wyong, Lake Macquarie, Newcastle,	Low	Potential habitat was present. Presence of species was not identified during targeted surveys.	No

Scientific Name	Common Name	EPBC Act Status	Distribution and Habitat	Likelihood of occurrence	Justification	Impact Assessment Required
			Port Stephens, Great Lakes, and Cessnock LGA's.			
<i>Thesium australe</i>	Austral Toadflax		Found in very small populations scattered across eastern NSW, along the coast, and from the Northern to Southern Tablelands. Occurs in grassland on coastal headlands or grassland and grassy woodland away from the coast. Is often found in association with Kangaroo Grass.	Unlikely	No suitable habitat was present. No records of the species in the locality. .	No
<i>Litoria aurea</i>	Green and Golden Bell Frog	V	Formerly distributed from the NSW north coast near Brunswick Heads, southwards along the NSW coast to Victoria where it extends into east Gippsland. Records from west to Bathurst, Tumut and the ACT region. Inhabits marshes, dams and stream-sides, particularly those containing bullrushes (<i>Typha</i> spp.) or spikerushes (<i>Eleocharis</i> spp.).	Unlikely	Habitat degraded	No
<i>Mixophyes iterates</i>	Giant Barred Frog	E	Distributed along the coast and ranges from Eumundi in south-east Queensland to Warrimoo in the Blue Mountains. Found along freshwater streams with permanent or semi-permanent water, generally (but not always) at lower elevation. Favours moist riparian habitats such as rainforest or wet sclerophyll forest that provide deep leaf litter for shelter and foraging, as well as open perching sites on the forest floor. They will also sometimes occur in other riparian habitats, such as those in drier forest or degraded riparian remnants, and even occasionally around dams.	Unlikely	No preferred habitat was present. No local records.	No
<i>Uperoleia mahonyi</i>	Mahony's Toadlet	E	Endemic to the mid-north coast of New South Wales (NSW) and to date has been found between Kangy Angy and Seal Rocks.	Unlikely	Habitat degraded. No suitable habitat in the form of leached white sand.	No

Scientific Name	Common Name	EPBC Act Status	Distribution and Habitat	Likelihood of occurrence	Justification	Impact Assessment Required
			Inhabits ephemeral and semi-permanent swamps and swales on the coastal fringe of its range. Known records occur in heath or wallum habitats almost exclusively associated with leached (highly nutrient impoverished) white sand. Commonly associated with acid paperbark swamps. Also is known to occur in wallum heath, swamp mahogany-paperbark swamp forest, heath shrubland and Sydney red gum woodland.			
<i>Mixophyes balbus</i>	Stuttering Frog	V	Found in rainforest and wet, tall open forest in the foothills and escarpment on the eastern side of the Great Dividing Range.	Unlikely	No suitable habitat due to lack of rainforest and wet, tall open forest	No
<i>Saltuarius moritzi</i>	New England Leaf-tailed Gecko		Moritz's leaf-tailed gecko occurs in rainforest, wet sclerophyll forest, gorges and along wetter drainage lines in dry sclerophyll forest. The species occasionally uses rock outcrops and boulders to forage but is most frequently observed on larger trees and fallen logs that contain crevices and hollows in which it presumably takes shelter during the day.	Unlikely	No suitable habitat due to lack of rainforest, wet sclerophyll forest, gorges and along wetter drainage lines in dry sclerophyll forest.	No
<i>Anthochaera phrygia</i>	Regent Honeyeater	CE	Mainly inhabits temperate woodlands and open forests of the inland slopes of south-east Australia. Also found in drier coastal woodlands and forests in some years. Inhabits dry open forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River Sheoak. Non-breeding flocks are seen foraging in flowering coastal Swamp Mahogany and Spotted Gum forests.	Low	Marinal habitat was present. No records of the species in the locality. .	No
<i>Botaurus poiciloptilus</i>	Australasian Bittern	V	Widespread but uncommon over south-eastern Australia. In NSW they may be found over most of the state except for the far north-west.	Unlikely	Presence of species was not identified during targeted surveys. No preferred habitat.	No

Scientific Name	Common Name	EPBC Act Status	Distribution and Habitat	Likelihood of occurrence	Justification	Impact Assessment Required
			Favours permanent freshwater wetlands with tall, dense vegetation, particularly bullrushes (<i>Typha</i> spp.) and spikerushes (<i>Eleocharis</i> spp.).			
<i>Sternula nereis nereis</i>	Australian Fairy Tern	V	The Fairy Tern (Australian) nests on sheltered sandy beaches, spits and banks above the high tide line and below vegetation. The subspecies has been found in embayments of a variety of habitats including offshore, estuarine or lacustrine (lake) islands, wetlands and mainland coastline (Higgins & Davies 1996; Lindsey 1986a). The bird roosts on beaches at night (Higgins & Davies 1996)	Unlikely	Presence of species was not identified during targeted surveys. No preferred habitat.	No
<i>Numenius madagascariensis</i>	Eastern Curlew	CE	It generally occupies coastal lakes, inlets, bays and estuarine habitats, and in New South Wales is mainly found in intertidal mudflats and sometimes saltmarsh of sheltered coasts.	Unlikely	Presence of species was not identified during targeted surveys. No preferred habitat.	No
<i>Limosa lapponica baueri</i>	Nunivak Bar-tailed Godwit	V	It is found mainly in coastal habitats such as large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays. Less frequently it occurs in salt lakes and brackish wetlands, sandy ocean beaches and rock platforms.	Unlikely	Presence of species was not identified during targeted surveys. No preferred habitat.	No
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	V & M	Widespread in both inland and coastal locations and in both freshwater and saline habitats.	Unlikely	Presence of species was not identified during targeted surveys. No preferred habitat.	No
<i>Calidris canutus</i>	Red Knot	E	In NSW the Red Knot mainly occurs in small numbers on intertidal mudflats, estuaries, bays, inlets, lagoons, harbours and sandflats and sandy beaches of sheltered coasts. It is occasionally found on sandy ocean beaches or shallow pools on exposed wave-cut rock platforms and is a rare visitor to terrestrial saline wetlands and freshwater swamps.	Unlikely	Presence of species was not identified during targeted surveys. No preferred habitat.	No
<i>Calidris ferruginea</i>	Curlew Sandpiper	CE	Tidal mudflats; saltmarsh; fresh, brackish or saline wetlands; sewage ponds.	Unlikely	Presence of species was not identified during targeted surveys.	No

Scientific Name	Common Name	EPBC Act Status	Distribution and Habitat	Likelihood of occurrence	Justification	Impact Assessment Required
					No preferred habitat.	
<i>Charadrius leschenaultii</i>	Greater Sand Plover	V	Almost entirely restricted to coastal areas in NSW, occurring mainly on sheltered sandy, shelly or muddy beaches or estuaries with large intertidal mudflats or sandbanks.	Unlikely	Presence of species was not identified during targeted surveys. No preferred habitat.	No
<i>Tringa nebularia</i>	Common Greenshank	E & M	Inhabits a wide variety of inland permanent and temporary wetlands and sheltered coastal habitats of varying salinity.	Unlikely	Presence of species was not identified during targeted surveys. No preferred habitat.	No
<i>Gallinago hardwickii</i>	Latham's Snipe	M	Utilises a variety of habitat, such as soft wet ground or shallow water with tussock and other green and dead vegetation, and scrub or open wetland from sea-level to alpine bogs.	Unlikely	Presence of species was not identified during targeted surveys. No preferred habitat.	No
<i>Callocephalon fimbriatum</i>	Gang-gang Cockatoo	V	Distributed from southern Victoria through south- and central-eastern New South Wales. In New South Wales, the Gang-gang Cockatoo is distributed from the south-east coast to the Hunter region, and inland to the Central Tablelands and south-west slopes. In spring and summer, generally found in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. In autumn and winter, the species often moves to lower altitudes in drier more open eucalypt forests and woodlands, particularly box-gum and box-ironbark assemblages, or in dry forest in coastal areas and often found in urban areas.	Low	Marinal habitat was present. No records of the species in the locality. Presence of species was not identified during targeted surveys.	No
<i>Calyptrorhynchus lathamii</i>	Glossy Black-Cockatoo	V	Lowland coastal forests, dense mountain forests, semi-arid woodland and trees bordering watercourses, with (Allo)Casuarina trees for foraging.	Recorded flying over site	Foraging habitat was present in the form of Allocasuarina species. Presence of species was not identified during surveys.	No
<i>Neophema chrysostoma</i>	Blue-winged Parrot	V	Found in western NSW. They favour grasslands and grassy woodlands. They are often found near wetlands both near the coast and in semi-arid zones. Blue-	Unlikely	No suitable habitat was present. No records of the species in the locality.	No

Scientific Name	Common Name	EPBC Act Status	Distribution and Habitat	Likelihood of occurrence	Justification	Impact Assessment Required
			winged Parrots can also be seen in altered environments such as airfields, golf-courses and paddocks.			
<i>Hirundapus caudacutus</i>	White-throated Needletail	V & M	Inhabits the airspace above forests, woodlands, farmlands, plains, lakes, coasts and towns.	Moderate	Suitable aerial foraging habitat was present. Presence of species was not identified during surveys.	No
<i>Melanodryas cucullata cucullata</i>	Hooded Robin (south-eastern form)	E	Eucalypt woodlands, Acacia scrublands, Banksia dominated coastal scrubs and open forests.	Low	Suitable habitat was present. No nearby records. Presence of species was not identified during surveys.	No
<i>Climacteris picumnus victoriae</i>	Brown Treecreeper	V	This species is a medium sized insectivorous bird that occupies Eucalypt woodlands, particularly open woodlands lacking a dense understorey, River Red Gums on watercourses and around lakeshores. It is sedentary and nests in tree hollows within permanent territories.	Low	Marginal habitat was present. Presence of species was not identified during surveys.	No
<i>Stagonopleura guttata</i>	Diamond Firetail	V	Inhabits areas with a grassy, shrubby understorey including Eucalypt woodlands, forests, Acacia scrubs and mallee.	Unlikely	No suitable habitat was present. No records of the species in the locality. Presence of species was not identified during surveys.	No
<i>Erythroriorchis radiatus</i>	Red Goshawk	E	Sparsely through northern and eastern Australia, from the western Kimberley Division of northern Western Australia to north-eastern Queensland and south to far north-eastern NSW, and with scattered records in central Australia. Inhabits open woodland and forest, preferring a mosaic of vegetation types, a large population of birds as a source of food, and permanent water, and are often found in riparian habitats along or near watercourses or wetlands. In NSW, preferred habitats include mixed subtropical rainforest, Melaleuca swamp forest and riparian Eucalyptus Forest of coastal rivers.	Low	Marinal habitat was present. No records of the species in the locality. Presence of species was not identified during targeted surveys.	No

Scientific Name	Common Name	EPBC Act Status	Distribution and Habitat	Likelihood of occurrence	Justification	Impact Assessment Required
<i>Falco hypoleucos</i>	Grey Falcon	V	Distributed in NSW, chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range. Usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast. Also occurs near wetlands where surface water attracts prey	Low	Marinal habitat was present. No records of the species in the locality. Presence of species was not identified during targeted surveys.	No
<i>Grantiella picta</i>	Painted Honeyeater	V	Nomadic and occurs at low densities throughout its range. The greatest concentrations and almost all breeding occurs on the inland slopes of the Great Dividing Range in NSW, Victoria and southern Queensland. During the winter it is more likely to be found in the north of its distribution. Inhabits Boree/ Weeping Myall (<i>Acacia pendula</i>), Brigalow (<i>A. harpophylla</i>) and Box-Gum Woodlands and Box-Ironbark Forests. A specialist feeder on the fruits of mistletoes growing on woodland eucalypts and acacias. Prefers mistletoes of the genus <i>Amyema</i>.	Low	Marinal habitat was present. No records of the species in the locality. Presence of species was not identified during targeted surveys.	No
<i>Lathamus discolor</i>	Swift Parrot	CE	Breeds in Tasmania during spring and summer, migrating in the autumn and winter months to south-eastern Australia from Victoria and the eastern parts of South Australia to south-east Queensland. In NSW mostly occurs on the coast and south west slopes. Occurs in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations. Favoured feed trees include winter flowering species such as Swamp Mahogany <i>Eucalyptus robusta</i>, Spotted Gum <i>Corymbia maculata</i>, Red Bloodwood <i>C. gummifera</i>, Forest Red Gum <i>E. tereticornis</i>, Mugga Ironbark <i>E.</i>	Moderate	Suitable foraging habitat was present. Presence of species was not identified during targeted surveys.	No

Scientific Name	Common Name	EPBC Act Status	Distribution and Habitat	Likelihood of occurrence	Justification	Impact Assessment Required
			<i>sideroxylon</i> , and White Box <i>E. albens</i> .			
<i>Pycnoptilus floccosus</i>	Pilotbird		Pilotbirds are endemic to south-east Australia. Upland Pilotbirds occur above 600 m in the Brindabella Ranges in the Australian Capital Territory, and in the Snowy Mountains in NSW and NE Victoria. Lowland Pilotbirds occur in forests from the Blue Mountains west of Newcastle, around the wetter forests of eastern Australia, to Dandenong near Melbourne. Strictly terrestrial, living on the ground in dense forests with heavy undergrowth.	Low	Marinal habitat was present. No records of the species in the locality. Presence of species was not identified during targeted surveys.	No
<i>Rostratula australis</i>	Australian Painted Snipe	E	In NSW many records are from the Murray-Darling Basin. Other important locations with recent records include wetlands on the Hawkesbury River and the Clarence and lower Hunter Valleys. Prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber.	Unlikely	No suitable habitat was present. No records of the species in the locality. Presence of species was not identified during targeted surveys.	No
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	V	Found mainly in areas with extensive cliffs and caves, from Rockhampton in Queensland south to Bungonia in the NSW Southern Highlands. Roosts in caves (near their entrances), crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy Martin (<i>Petrochelidon ariel</i>), frequenting low to mid-elevation dry open forest and woodland close to these features.	Low	Presence of species was not identified during surveys. No suitable roosting habitat was present. Suitable foraging habitat was present.	No
<i>Dasyurus maculatus maculatus</i>	Tiger Quoll	E	Now found in eastern NSW, eastern Victoria, south-east and north-eastern Queensland, and Tasmania. Recorded across a range of habitat types, including	Moderate	Potential habitat was present. Presence of species was not identified during surveys.	No

Scientific Name	Common Name	EPBC Act Status	Distribution and Habitat	Likelihood of occurrence	Justification	Impact Assessment Required
			rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline.			
<i>Petrogale penicillata</i>	Brush-tailed Rock-wallaby	V	Found in steep rocky sites in sclerophyll forests with a grassy understorey.	Unlikely	No suitable habitat was present. No nearby records. Presence of species was not identified during surveys.	No
<i>Notamacropus parma</i>	Parma Wallaby		Range is now confined to the coast and ranges of central and northern NSW from the Gosford district to south of the Bruxner Highway between Tenterfield and Casino. Preferred habitat is moist eucalypt forest with thick, shrubby understorey, often with nearby grassy areas, rainforest margins and occasionally drier eucalypt forest.	Unlikely	No suitable habitat was present. No nearby records. Presence of species was not identified during surveys.	No
<i>Petauroides volans</i>	Greater Glider	V	Occurs in eastern Australia, where it has a broad distribution from around Proserpine in Qld, south through NSW and the ACT, to central Vic. Largely restricted to eucalypt forests and woodlands of eastern Australia. It is typically found in highest abundance in taller, montane, moist eucalypt forests on fertile soils, with relatively old trees and abundant hollows.	Low	Marinal habitat was present. No records of the species in the locality. Presence of species was not identified during targeted surveys.	No
<i>Petaurus australis</i>	Yellow-bellied Glider	V	Found along the eastern coast to the western slopes of the Great Dividing Range, from southern Queensland to Victoria. Occur in tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils.	Low	Marinal habitat was present. No records of the species in the locality. Presence of species was not identified during targeted surveys.	No
<i>Phascolarctos cinereus</i>	Koala	E	Has a fragmented distribution throughout eastern Australia. In New South Wales, koala populations are found on the central and north coasts, southern	Known	Recent Bionet records within the subject land (DCCEEWS, 2025a)	Yes

Scientific Name	Common Name	EPBC Act Status	Distribution and Habitat	Likelihood of occurrence	Justification	Impact Assessment Required
			highlands, southern and northern tablelands, Blue Mountains, southern coastal forests, with some smaller populations on the plains west of the Great Dividing Range. Inhabits eucalypt woodlands and forests.			
<i>Potorous tridactylus tridactylus</i>	Long-nosed Potoroo	V	In NSW it is generally restricted to coastal heaths and forests east of the Great Dividing Range, with an annual rainfall exceeding 760 mm. Inhabits coastal heaths and dry and wet sclerophyll forests. Dense understorey with occasional open areas is an essential part of habitat, and may consist of grass-trees, sedges, ferns or heath, or of low shrubs of tea-trees or melaleucas. A sandy loam soil is also a common feature.	Unlikely	No suitable habitat was present. No records of the species in the locality. Presence of species was not identified during targeted surveys.	No
<i>Pseudomys novaehollandiae</i>	New Holland Mouse	V	Has a fragmented distribution across Tasmania, Victoria, New South Wales and Queensland. Known to occur on the Tomaree Peninsula. Known to inhabit open heathlands, woodlands and forests with a heathland understorey and vegetated sand dunes	Moderate	Potential habitat was present. Presence of species was not identified during targeted surveys.	Yes
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	V	Generally found within 200km of the eastern coast of Australia, from Rockhampton in Queensland to Adelaide in South Australia. Occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops.	Known	Foraging individuals recorded within the subject land. No roost colonies present.	Yes

EPBC Assessment of Significance Under the EPBC Act Policy Statement 1.1 – Significant Impact Guidelines for Vulnerable species present within the subject land.

Pteropus poliocephalus (Grey-headed Flying-fox)

- a) *lead to a long-term decrease in the size of a population.*

A number of individual Grey-headed Flying-foxes were recorded foraging within the subject land during spotlighting surveys. The Grey-headed Flying-fox is considered one population as a result of movement between camps throughout its entire range. No maternity or other roosting habitat which is important habitat for this species was present within the subject land. Suitable foraging habitat in the form of flowering myrtaceous and proteaceous species was present over the subject land. The proposal will result in the removal of up to 1.77ha of foraging habitat of varying quality resulting in an incremental reduction of habitat within the local area. Given the proximity of large areas of similar habitat outside the subject land the proposal is unlikely to lead to a long-term decrease in the size of an important population of this species.

- b) *reduce the area of occupancy of the species*

The proposal will result in a reduction of up to 1.77ha of foraging habitat for the Grey-headed Flying-fox. Considering the large amount of similar habitat within proximity to the subject land the proposal is unlikely to significantly reduce the extent of the occupancy of an important population.

- c) *fragment an existing population into two or more populations*

As the Grey-headed Flying-fox is a highly mobile species the removal of up to 1.77ha of foraging habitat is unlikely to fragment an existing population into two or more populations.

- d) *adversely affect habitat critical to the survival of a species*

As a result of the absence of a maternity or other roost within the subject site or in close proximity the proposal is unlikely to adversely affect habitat critical to the survival of a species

- e) *disrupt the breeding cycle of a population*

Given that there was no maternity or other roost within the subject site or in close proximity the proposal is unlikely to disrupt the breeding cycle of a population.

- f) *modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*

The proposal will result in a reduction of up to 1.77ha of foraging habitat, however taking into considering the large amount of similar habitat within proximity to the subject land and the high mobility of the Grey-headed Flying-fox no significant areas are to be modified, destroyed, removed, isolated or decreased to the extent that the species is likely to decline.

- g) result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat*

The proposal is unlikely to result in the establishment of invasive species that is harmful to this species.

- h) introduce disease that may cause the species to decline, or*

The proposal is unlikely to result in the introduction of a disease that may cause the species to decline.

- i) interfere substantially with the recovery of the species.*

Considering the above factors, the proposal is unlikely to interfere with the recovery of the Grey-headed Flying-fox.

Conclusion

Considering the above factors, the proposal is unlikely to have a significant impact on the Grey-headed Flying-fox and therefore referral would not be required.

EPBC Assessment of Significance Under the EPBC Act Policy Statement 1.1 – Significant Impact Guidelines for Endangered species present within the subject land.

Phascolarctos cinereus (Koala)

- a. lead to a long-term decrease in the size of a population.*

Tenuous evidence and recent records of *Phascolarctos cinereus* (Koala) was recorded within the subject land. The proposal will result in the removal of 1.77ha of Koala habitat within the subject land. The subject land is dissected by East Seaham Road, which runs through the middle. Beyond this road supports a larger area of vegetation, including Wallaroo National Park and is interspersed with rural properties and an electrical easement. The fringing vegetation along the boundaries of the subject land would assist in facilitating the movement of mobile fauna such as koalas. The study area supports Preferred koala habitat according to the Port Stephens CKPoM, as do adjacent Lots to the west and east. The study area is likely to be providing a connectivity function for the local koala population due to the recent koala records but lack of koala usage evidence observed during targeted surveys. The proposal will result in an incremental reduction of koala habitat within the locality.

- b. reduce the area of occupancy of the species*

The proposal will result in a reduction of up to 1.77ha of habitat for the Koala. This will result in an incremental reduction in the occupancy potential of the Koala within the locality, however it is noted that this habitat is lining a road with a speed limit of 70km/h and limited visibility due to the nature of the road.

- c. fragment an existing population into two or more populations*

The removal of 1.77km of koala habitat along an almost 3km stretch of the pre-existing East Seaham Road is unlikely to fragment an existing population of Koala.

- d. adversely affect habitat critical to the survival of a species*

The proposal will result in the removal of specimens of *E. tereticornis*, a preferred Koala Feed Tree Species and Preferred Koala Habitat determined under the Port Stephens CKPoM. Whilst resulting in the incremental reduction of Preferred Koala Habitat and buffers within the locality, given the amount of adjoining habitat it is unlikely to affect critical habitat in the case of the Koala.

- e. disrupt the breeding cycle of a population*

The proposal will result in an incremental reduction in Koala habitat and some likely disruption to the movement of Koalas. Given the amount of adjoining habitat, it is unlikely to disrupt the breeding cycle of a population.

- f. modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*

The proposal will result in the removal of specimens of *E. tereticornis*, preferred Koala Feed Tree Species and Preferred Koala Habitat determined under the Port Stephens CKPoM. Whilst resulting in

an incremental reduction of habitat within the local area, it is unlikely the action would result in Koala decline in the locality given the action.

- g. result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat*

The proposal is unlikely to result in the establishment of invasive species that is harmful to this species.

- h. introduce disease that may cause the species to decline, or*

The proposal is unlikely to result in further introduction of a disease that may cause the Koala to decline.

- i. interfere with the recovery of the species.*

Considering the above factors, the proposal is unlikely to interfere with the recovery of the Koala.

Conclusion

Considering the above factors, the proposal is unlikely to result in a significant impact on the Koala and therefore referral would not be required.

EPBC Assessment of Significance Under the EPBC Act Policy Statement 1.1 – Significant Impact Guidelines for Vulnerable species present within the subject land.

Calyptrorhynchus lathamii (South-eastern Glossy Black-Cockatoo)

- a. lead to a long-term decrease in the size of a population.*

A number of individual South-eastern Glossy Black-Cockatoo were heard calling as they flew over the study area. No individuals were observed foraging or breeding within the study area. Suitable foraging habitat in the form of *Casuarina glauca* (Swamp She-oak) was sparsely present over the subject land. The proposal will result in the removal of up to 1.77ha of foraging habitat of varying quality resulting in an incremental reduction of habitat within the local area. Given the proximity of large areas of similar habitat outside the subject land the proposal is unlikely to lead to a long-term decrease in the size of an important population of this species.

- b. reduce the area of occupancy of the species*

The proposal will result in a reduction of up to 1.77ha of foraging habitat for the South-eastern Glossy Black-Cockatoo. Considering the large amount of similar habitat within proximity to the subject land the proposal is unlikely to significantly reduce the extent of the occupancy of an important population.

- c. fragment an existing population into two or more populations*

As the South-eastern Glossy Black-Cockatoo is a highly mobile species the removal of up to 1.77ha of foraging habitat is unlikely to fragment an existing population into two or more populations.

- d. adversely affect habitat critical to the survival of a species*

As a result of the absence of breeding within the subject site or in close proximity despite targeted surveys, the proposal is unlikely to adversely affect habitat critical to the survival of a species.

- e. disrupt the breeding cycle of a population*

Given that there was no evidence observed of South-eastern Glossy Black-Cockatoo breeding within the subject site or in close proximity the proposal despite targeted surveys is unlikely to disrupt the breeding cycle of a population.

- f. modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*

The proposal will result in a reduction of up to 1.77ha of foraging habitat, however taking into considering the large amount of similar habitat within proximity to the subject land and the high mobility of the South-eastern Glossy Black-Cockatoo no significant areas are to be modified, destroyed, removed, isolated or decreased to the extent that the species is likely to decline.

- g. result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat*

The proposal is unlikely to result in the establishment of invasive species that is harmful to this species.

h. introduce disease that may cause the species to decline, or

The proposal is unlikely to result in the introduction of a disease that may cause the species to decline.

i. interfere substantially with the recovery of the species.

Considering the above factors, the proposal is unlikely to interfere with the recovery of the South-eastern Glossy Black-Cockatoo.

Conclusion

Considering the above factors, the proposal is unlikely to have a significant impact on the South-eastern Glossy Black-Cockatoo therefore referral would not be required.

- migratory species protected under international agreements;

Fifteen nationally listed migratory species were recorded on the DoEE on-line database as occurring or having potential habitat available within 10km of the subject land, these being:

Migratory Terrestrial Species:

- *Hirundapus caudacutus* (White-throated Needletail)
- *Motacilla flava* (Yellow Wagtail)
- *Cuculus optatus* (Oriental Cuckoo)
- *Limosa lapponica* (Bar-tailed Godwit)
- *Numenius madagascariensis* (Eastern Curlew)

Migratory Wetland Species:

- *Charadrius leschenaultii* (Greater Sand Plover)
- *Tringa nebularia* (Common Greenshank)
- *Actitis hypoleucos* (Common Sandpiper)
- *Pandion haliaetus* (Osprey)
- *Calidris acuminata* (Sharp-tailed Sandpiper)
- *Gallinago hardwickii* (Latham's Snipe)
- *Calidris ferruginea* (Curlew Sandpiper)
- *Calidris melanotos* (Pectoral Sandpiper)
- *Calidris canutus* (Red Knot)

Migratory Marine Birds

- *Apus pacificus* (Fork-tailed Swift)

Under the EPBC Act Policy Statement 1.1 – Significant Impact Guidelines (Department of the Environment, Water, Heritage and the Arts, 2009) an action is likely to have a significant impact on a migratory species if there is a real chance or possibility that it will:

- Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species.

- Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species, or
- Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.

No threatened migratory species were recorded within the site. Potential habitat was considered present for a few of the listed migratory species. The proposal is unlikely to have a significant impact on any of these species.

- j. nuclear activities;

The proposal does not involve any type of nuclear activity.

- k. the Commonwealth marine environment;

The proposal does not involve the modification of the Commonwealth marine environment.



Australian Government

Department of Climate Change, Energy,
the Environment and Water

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 16-Jan-2025

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar):	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	6
Listed Threatened Species:	61
Listed Migratory Species:	15

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <https://www.dcceew.gov.au/parks-heritage/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	2
Commonwealth Heritage Places:	None
Listed Marine Species:	26
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	7
Regional Forest Agreements:	1
Nationally Important Wetlands:	None
EPBC Act Referrals:	8
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	1
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar Wetlands)		[Resource Information]
Ramsar Site Name	Proximity	Buffer Status
Hunter estuary wetlands	10 - 20km upstream from Ramsar site	In feature area

Listed Threatened Ecological Communities	[Resource Information]
For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps. Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.	

Community Name	Threatened Category	Presence Text	Buffer Status
Central Hunter Valley eucalypt forest and woodland	Critically Endangered	Community may occur within area	In feature area
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community	Endangered	Community likely to occur within area	In feature area
Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland	Endangered	Community likely to occur within area	In feature area
Lowland Rainforest of Subtropical Australia	Critically Endangered	Community likely to occur within area	In feature area
River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria	Critically Endangered	Community likely to occur within area	In buffer area only
Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions	Endangered	Community likely to occur within area	In feature area

Listed Threatened Species	[Resource Information]		
Status of Conservation Dependent and Extinct are not MNES under the EPBC Act. Number is the current name ID.			
Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			

Scientific Name	Threatened Category	Presence Text	Buffer Status
<u>Anthochaera phrygia</u> Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area	In feature area
<u>Botaurus poiciloptilus</u> Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area	In feature area
<u>Calidris acuminata</u> Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area
<u>Calidris canutus</u> Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<u>Calidris ferruginea</u> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
<u>Callocephalon fimbriatum</u> Gang-gang Cockatoo [768]	Endangered	Species or species habitat likely to occur within area	In feature area
<u>Calyptorhynchus lathami lathami</u> South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat known to occur within area	In feature area
<u>Charadrius leschenaultii</u> Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<u>Climacteris picumnus victoriae</u> Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat known to occur within area	In feature area
<u>Erythrotriorchis radiatus</u> Red Goshawk [942]	Endangered	Species or species habitat may occur within area	In feature area
<u>Falco hypoleucos</u> Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
<u>Gallinago hardwickii</u> Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area	In feature area
<u>Grantiella picta</u> Painted Honeyeater [470]	Vulnerable	Species or species habitat known to occur within area	In feature area
<u>Hirundapus caudacutus</u> White-throated Needle-tail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
<u>Lathamus discolor</u> Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area	In feature area
<u>Limosa lapponica baueri</u> Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Endangered	Species or species habitat known to occur within area	In buffer area only
<u>Melanodryas cucullata cucullata</u> South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat likely to occur within area	In feature area
<u>Neophema chrysostoma</u> Blue-winged Parrot [726]	Vulnerable	Species or species habitat may occur within area	In feature area
<u>Numenius madagascariensis</u> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
<u>Pycnoptilus floccosus</u> Pilotbird [525]	Vulnerable	Species or species habitat may occur within area	In feature area
<u>Rostratula australis</u> Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area	In feature area
<u>Stagonopleura guttata</u> Diamond Firetail [59398]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
<u>Sternula nereis nereis</u> Australian Fairy Tern [82950]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<u>Tringa nebularia</u> Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area	In buffer area only
FROG			
<u>Litoria aurea</u> Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<u>Mixophyes balbus</u> Stuttering Frog, Southern Barred Frog (in Victoria) [1942]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<u>Mixophyes iteratus</u> Giant Barred Frog, Southern Barred Frog [1944]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<u>Uperoleia mahonyi</u> Mahony's Toadlet [89189]	Endangered	Species or species habitat may occur within area	In buffer area only
MAMMAL			
<u>Chalinolobus dwyeri</u> Large-eared Pied Bat, Large Pied Bat [183]	Endangered	Species or species habitat known to occur within area	In feature area
<u>Dasyurus maculatus maculatus</u> (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area	In feature area
<u>Notamacropus parma</u> Parma Wallaby [89289]	Vulnerable	Species or species habitat may occur within area	In feature area
<u>Petauroides volans</u> Greater Glider (southern and central) [254]	Endangered	Species or species habitat likely to occur within area	In feature area
<u>Petaurus australis australis</u> Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
<u>Petrogale penicillata</u> Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<u>Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)</u> Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat known to occur within area	In feature area
<u>Potorous tridactylus tridactylus</u> Long-nosed Potoroo (northern) [66645]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<u>Pseudomys novaehollandiae</u> New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat known to occur within area	In feature area
<u>Pteropus poliocephalus</u> Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area	In feature area
PLANT			
<u>Angophora inopina</u> Charmhaven Apple [64832]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
<u>Arthraxon hispidus</u> Hairy-joint Grass [9338]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<u>Asperula asthenes</u> Trailing Woodruff [14004]	Vulnerable	Species or species habitat known to occur within area	In feature area
<u>Caladenia tessellata</u> Thick-lipped Spider-orchid, Daddy Long-legs [2119]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<u>Cryptostylis hunteriana</u> Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<u>Cynanchum elegans</u> White-flowered Wax Plant [12533]	Endangered	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
<u>Dichanthium setosum</u> bluegrass [14159]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<u>Diuris praecox</u> Newcastle Doubletail [55086]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
<u>Eucalyptus camfieldii</u> Camfield's Stringybark [15460]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<u>Eucalyptus glaucina</u> Slaty Red Gum [5670]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<u>Eucalyptus parramattensis subsp. decadens</u> Earp's Gum, Earp's Dirty Gum [56148]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<u>Euphrasia arguta</u> [4325]	Critically Endangered	Species or species habitat may occur within area	In feature area
<u>Grevillea parviflora subsp. parviflora</u> Small-flower Grevillea [64910]	Vulnerable	Species or species habitat known to occur within area	In feature area
<u>Melaleuca biconvexa</u> Biconvex Paperbark [5583]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<u>Persicaria elatior</u> Knotweed, Tall Knotweed [5831]	Vulnerable	Species or species habitat known to occur within area	In feature area
<u>Prasophyllum sp. Wybong (C. Phelps ORG 5269)</u> a leek-orchid [81964]	Critically Endangered	Species or species habitat may occur within area	In buffer area only
<u>Rhizanthella slateri</u> Eastern Underground Orchid [11768]	Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
<u>Rhodamnia rubescens</u> Scrub Turpentine, Brown Malletwood [15763]	Critically Endangered	Species or species habitat known to occur within area	In feature area
<u>Rhodomyrtus psidioides</u> Native Guava [19162]	Critically Endangered	Species or species habitat known to occur within area	In feature area
<u>Syzygium paniculatum</u> Magenta Lilly Pilly, Magenta Cherry, Daguba, Scrub Cherry, Creek Lilly Pilly, Brush Cherry [20307]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<u>Tetratheca juncea</u> Black-eyed Susan [21407]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
<u>Thesium australe</u> Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat likely to occur within area	In feature area

REPTILE

<u>Saltuarius moritzi</u> New England Leaf-tailed Gecko, Moritz's Leaf-tailed Gecko [89490]	Endangered	Species or species habitat likely to occur within area	In feature area
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Listed Migratory Species

[Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
<u>Apus pacificus</u> Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			
<u>Cuculus optatus</u> Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat known to occur within area	In feature area
<u>Hirundapus caudacutus</u> White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
<u>Motacilla flava</u> Yellow Wagtail [644]		Species or species habitat likely to occur within area	In feature area

Migratory Wetlands Species

Scientific Name	Threatened Category	Presence Text	Buffer Status
<u>Actitis hypoleucos</u> Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
<u>Calidris acuminata</u> Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area
<u>Calidris canutus</u> Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<u>Calidris ferruginea</u> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
<u>Calidris melanotos</u> Pectoral Sandpiper [858]		Species or species habitat known to occur within area	In feature area
<u>Charadrius leschenaultii</u> Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<u>Gallinago hardwickii</u> Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area	In feature area
<u>Limosa lapponica</u> Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In buffer area only
<u>Numenius madagascariensis</u> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
<u>Pandion haliaetus</u> Osprey [952]		Species or species habitat likely to occur within area	In buffer area only
<u>Tringa nebularia</u> Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area	In buffer area only

Other Matters Protected by the EPBC Act

Commonwealth Lands [\[Resource Information \]](#)

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State	Buffer Status
Communications, Information Technology and the Arts - Telstra Corporation Limited		
Commonwealth Land - Australian Telecommunications Commission [11424]NSW		In buffer area only
Commonwealth Land - Australian Telecommunications Commission [11602]NSW		In buffer area only

Listed Marine Species [\[Resource Information \]](#)

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Apus pacificus			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Bubulcus ibis as Ardea ibis			
Cattle Egret [66521]		Breeding likely to occur within area overfly marine area	In feature area
Calidris acuminata			
Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris canutus			
Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area overfly marine area	In buffer area only
Calidris ferruginea			
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
<u>Calidris melanotos</u> Pectoral Sandpiper [858]		Species or species habitat known to occur within area overfly marine area	In feature area
<u>Charadrius leschenaultii</u> Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<u>Gallinago hardwickii</u> Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
<u>Haliaeetus leucogaster</u> White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area	In feature area
<u>Hirundapus caudacutus</u> White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
<u>Lathamus discolor</u> Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
<u>Limosa lapponica</u> Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In buffer area only
<u>Merops ornatus</u> Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
<u>Monarcha melanopsis</u> Black-faced Monarch [609]		Species or species habitat known to occur within area overfly marine area	In feature area
<u>Motacilla flava</u> Yellow Wagtail [644]		Species or species habitat likely to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
<u>Myiagra cyanoleuca</u> Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area	In feature area
<u>Neophema chrysostoma</u> Blue-winged Parrot [726]	Vulnerable	Species or species habitat may occur within area overfly marine area	In feature area
<u>Numenius madagascariensis</u> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
<u>Pandion haliaetus</u> Osprey [952]		Species or species habitat likely to occur within area	In buffer area only
<u>Pterodroma cervicalis</u> White-necked Petrel [59642]		Species or species habitat may occur within area	In feature area
<u>Rhipidura rufifrons</u> Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area	In feature area
<u>Rostratula australis</u> as <u>Rostratula benghalensis</u> (<i>sensu lato</i>) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
<u>Sterna striata</u> White-fronted Tern [799]		Migration route may occur within area	In feature area
<u>Symposiachrus trivirgatus</u> as <u>Monarcha trivirgatus</u> Spectacled Monarch [83946]		Species or species habitat known to occur within area overfly marine area	In feature area
<u>Tringa nebularia</u> Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area overfly marine area	In buffer area only

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	Buffer Status
Cumbey	State Conservation Area	NSW	In buffer area only
Cumbey	National Park	NSW	In buffer area only
Karuah	National Park	NSW	In buffer area only
Medowie	State Conservation Area	NSW	In buffer area only
Seaham Swamp	Nature Reserve	NSW	In buffer area only
Wallaroo	Flora Reserve	NSW	In buffer area only
Wallaroo	National Park	NSW	In feature area

Regional Forest Agreements	[Resource Information]
Note that all areas with completed RFAs have been included. Please see the associated resource information for specific caveats and use limitations associated with RFA boundary information.	

RFA Name	State	Buffer Status
North East NSW RFA	New South Wales	In feature area

EPBC Act Referrals				[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Brandy Hill Battery Energy Storage System Project	2023/09523		Completed	In buffer area only
Eagleton Quarry Project	2024/09967		Assessment	In buffer area only
Seaham Quarry Project	2023/09575		Assessment	In buffer area only
Stone Ridge Quarry	2022/09368		Assessment	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Brandy Hill rock quarry extension, Seaham, Port Stephens, NSW	2015/7453	Controlled Action	Post-Approval	In buffer area only
Gloucester Coal Seam Methane Gas Project	2008/4432	Controlled Action	Post-Approval	In feature area
Not controlled action				
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
Tomago to Tomaree Electricity Supply Upgrade	2003/1023	Not Controlled Action	Completed	In buffer area only
Bioregional Assessments			[Resource Information]	
SubRegion	BioRegion	Website	Buffer Status	
Hunter	Northern Sydney Basin	BA website	In buffer area only	

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data is available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance on the contents of this report.

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions when time permits.

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded breeding sites; and
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [Office of Environment and Heritage, New South Wales](#)
- [Department of Environment and Primary Industries, Victoria](#)
- [Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [Department of Environment, Water and Natural Resources, South Australia](#)
- [Department of Land and Resource Management, Northern Territory](#)
- [Department of Environmental and Heritage Protection, Queensland](#)
- [Department of Parks and Wildlife, Western Australia](#)
- [Environment and Planning Directorate, ACT](#)
- [Birdlife Australia](#)
- [Australian Bird and Bat Banding Scheme](#)
- [Australian National Wildlife Collection](#)
- [Natural history museums of Australia](#)
- [Museum Victoria](#)
- [Australian Museum](#)
- [South Australian Museum](#)
- [Queensland Museum](#)
- [Online Zoological Collections of Australian Museums](#)
- [Queensland Herbarium](#)
- [National Herbarium of NSW](#)
- [Royal Botanic Gardens and National Herbarium of Victoria](#)
- [Tasmanian Herbarium](#)
- [State Herbarium of South Australia](#)
- [Northern Territory Herbarium](#)
- [Western Australian Herbarium](#)
- [Australian National Herbarium, Canberra](#)
- [University of New England](#)
- [Ocean Biogeographic Information System](#)
- [Australian Government, Department of Defence Forestry Corporation, NSW](#)
- [Geoscience Australia](#)
- [CSIRO](#)
- [Australian Tropical Herbarium, Cairns](#)
- [eBird Australia](#)
- [Australian Government – Australian Antarctic Data Centre](#)
- [Museum and Art Gallery of the Northern Territory](#)
- [Australian Government National Environmental Science Program](#)
- [Australian Institute of Marine Science](#)
- [Reef Life Survey Australia](#)
- [American Museum of Natural History](#)
- [Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact us](#) page.

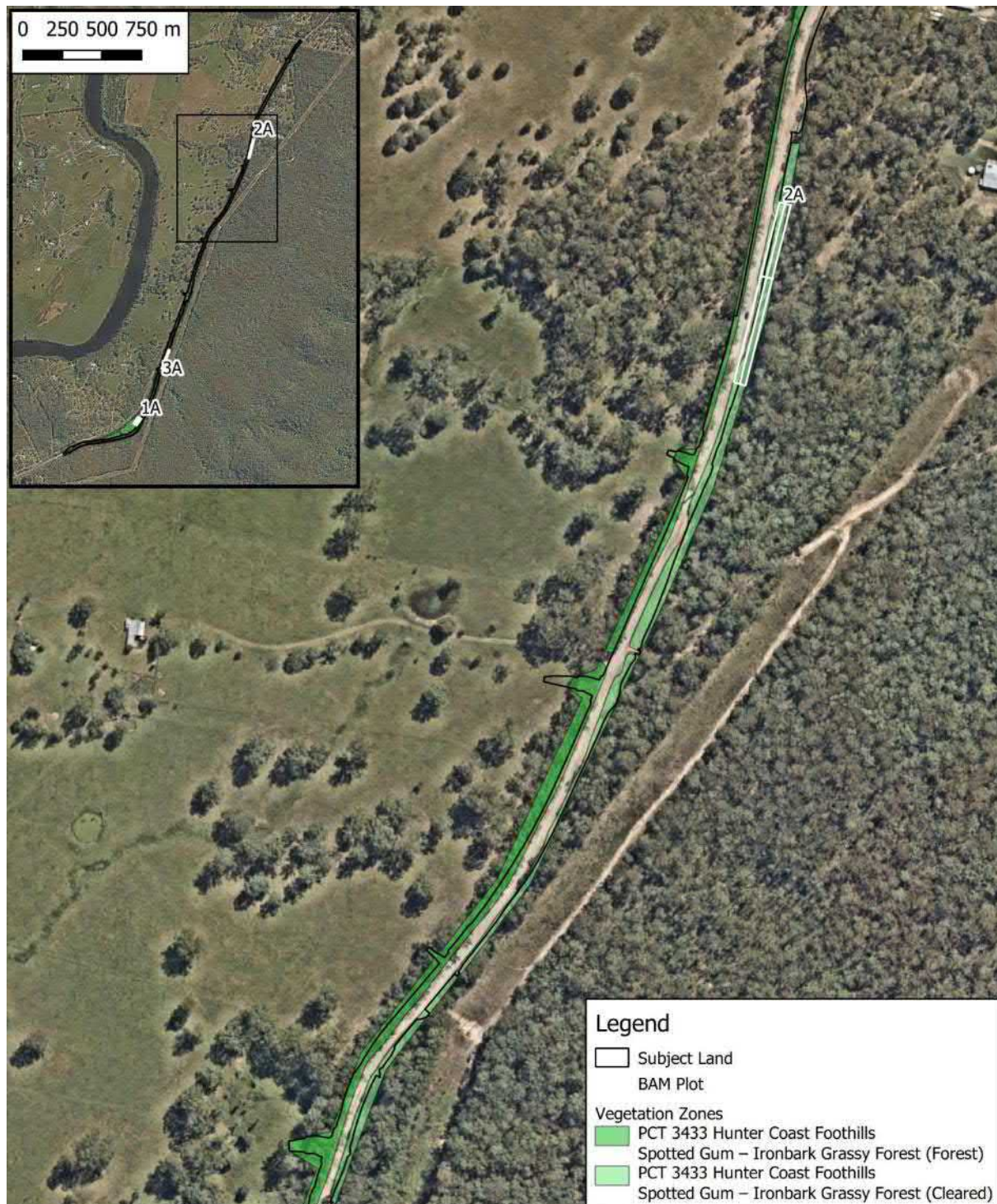
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GPO Box 3090
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+61 2 6274 1111

Appendix D: Vegetation survey data

Table D1 Vegetation BAM Plot survey data and locations

plot	pct	area	patchsize	condition class	zone	easting	northing	bearing	compTree	compShrub	compGrass	compForbs	compFerns	compOther	strucTree	strucShrub	strucGrass	strucForbs	strucFerns	strucOther	funLargeTrees	funHollowtrees	funLitterCover	funLenFallenLogs	funTreeStem5to9	funTreeStem10to19	funTreeStem20to29	funTreeStem30to49	funTreeStem50to79	funTreeRegen	funHighThreatExotic	Plot-based vegetation survey?	Vegetation integrity survey?
1A	3433	1.34	101	Forest	56	385484	6390511.0	215	3	9	6	3	1	4	20.0	19.0	162	0.4	0.1	1.3	1	1	90.0	0.5	1	1	1	1	1	1	3	☒ Yes ☐ No	☒ Yes ☐ No
2A	3433	0.36	101	Cleared	56	386195	6392276.0	178	1	6	9	4	1	1	0.2	8.8	11.5	0.5	0.1	0.1	0	0	31.0	22	0	0	0	0	0	1	4.8	☒ Yes ☐ No	☒ Yes ☐ No
3A	4042	0.43	101	Forest	56	385620	6390828.0	10	7	4	5	4	3	12	29.1	30.4	5.6	0.6	0.3	29.1	6	2	87.0	20.7	1	1	1	1	1	1	10.2	☒ Yes ☐ No	☒ Yes ☐ No

Figure D1 Vegetation BAM Plot locations (Section 2).



Job No.	12878
A4 Scale	1:3,200
Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependant on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.	

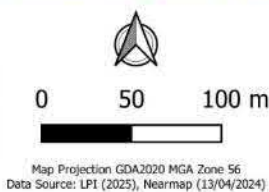


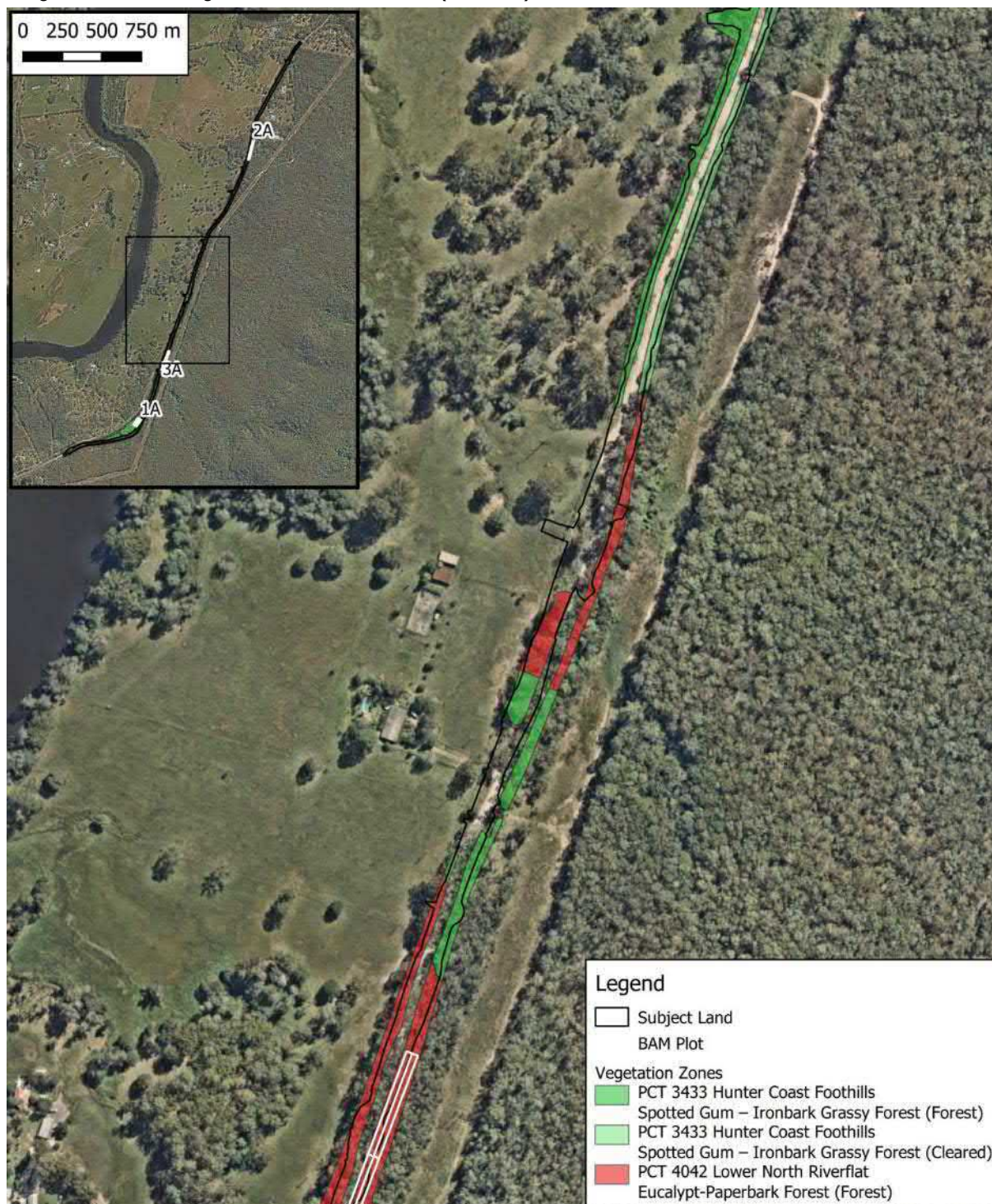
Figure D1

**BAM Plot Locations-
Section 2**

East Seaham Road
East Seaham, NSW

29 January 2025

Figure D2 Vegetation BAM Plot locations (Section 3).



Job No.	12878
A4 Scale	1:3,200

Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependent on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.

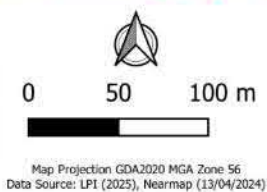


Figure D2

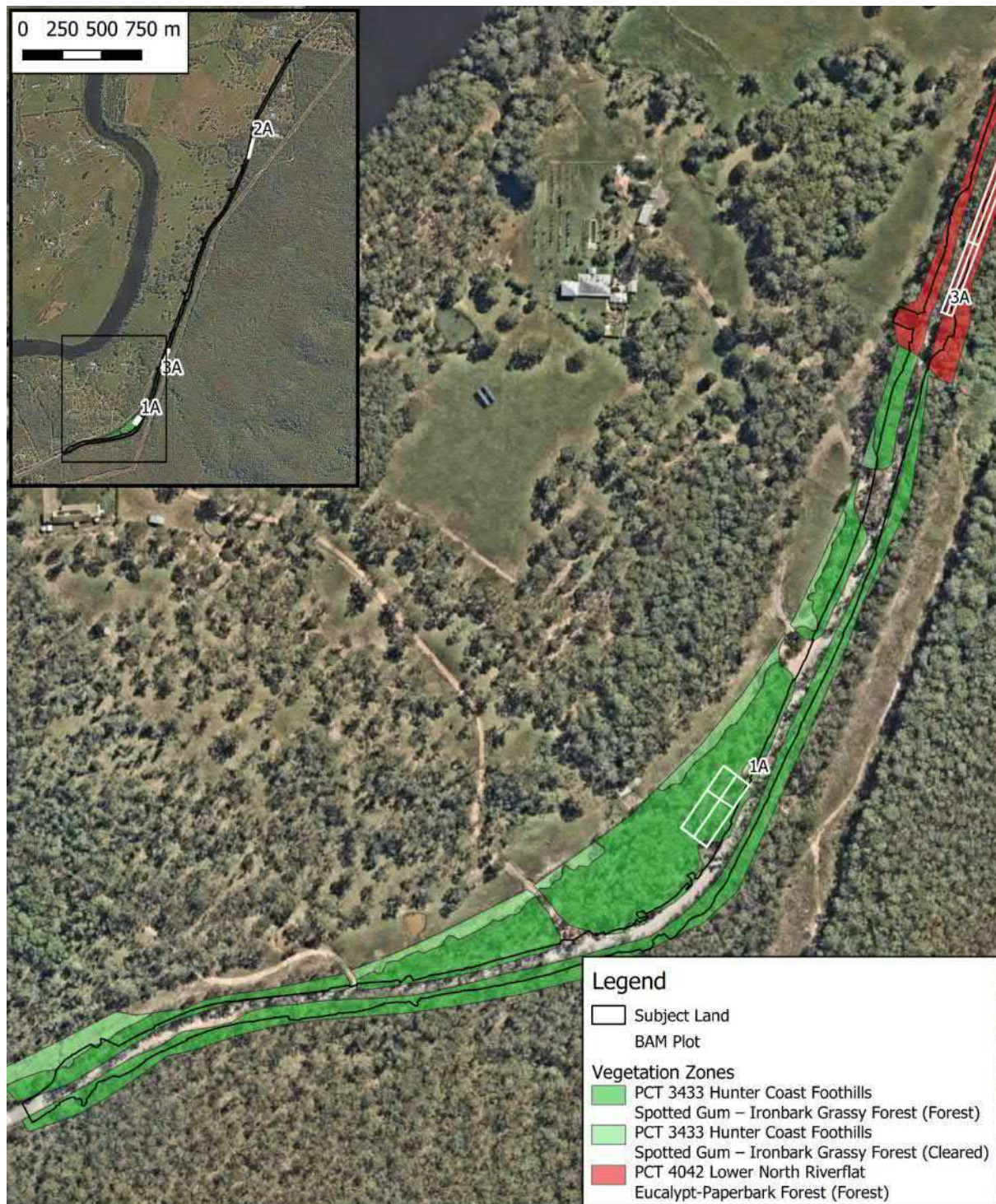
**BAM Plot Locations -
Section 3**

East Seaham Road
East Seaham, NSW

29 January 2025

WILDTHING
Environmental Consultants
(a Division of Tattersall Lander Pty Ltd)
ABN 41 003 509 215

Figure D3 Vegetation BAM Plot locations (Section 4).



Job No.	12878
A4 Scale	1:3,200

Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependent on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.

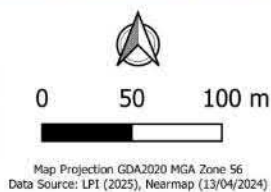


Figure D3

**BAM Plot Locations -
Section 4**

East Seaham Road
East Seaham, NSW

29 January 2025

Wildthing Environmental Consultants - Office # (02) 49513311

BAM Site – Field Survey Form Plot Identifier: 1A

Midline start	Midline end	Plot Size	Date	Plot Waypoint ID		Recorders
E-385484 N-6390511	E-385447 N-6390469	20 x 50	14/11/2025	Start -	End -	DART NICOLA
Photo# H7927	Photo# H7932	IBRA region	NSW			
Bearing 215°	Bearing 6°	Vegetation Class	Hunter-Maclean Dry Sclerophyll Forest			
		Vegetation Zone	(Forest)			
PCT #	3433	PCT Name	Hunter Coast Foothills - Spotted Gum Ironbark Grassy Forest			
Consistent BC ACT TEC?			Lower Hunter Spotted Gum - Ironbark Forest			

BAM Attribute (400 m ² plot)		Sum values
Count of Native Richness	Trees	3
	Shrubs	9
	Grasses etc.	6
	Forbs	3
	Ferns	1
	Other	4
Sum of Cover of native vascular plants by growth form group	Trees	20
	Shrubs	19
	Grasses etc.	16.2
	Forbs	0.4
	Ferns	0.1
	Other	1.3
High Threat Weed cover		3

BAM Attribute (1000 m ² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm		1
50 - 79 cm	0.64	
30 - 49 cm	✓	
20 - 29 cm	✓	
10 - 19 cm	✓	
5 - 9 cm	✓	
Regeneration < 5 cm	✓	
Length of logs (m) (≥10 cm diameter, >50 cm in length)		0.5m

Large Tree Sizes
Dry Sclerophyll Forests - ≥50, Forested Wetlands - ≥50, Freshwater Wetlands - NA, Grasslands - NA, Grassy Woodlands - ≥50, Heathlands - ≥30, Rainforests - ≥50, Saline Wetlands - NA, Semi-arid Woodland (grassy sub-formation) ≥30, Semi-arid woodlands (shrubby sub-formation) ≥30, Wet sclerophyll forests (grassy sub-formation) ≥79, Wetland sclerophyll forests (shrubby sub-formation) ≥79

BAM Attribute (1 x 1 m plots)	Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)	95 85 90 95 85	0 10 0 0 0	0 0 2 0 0	0 0 0 0 0
Average of the 5 subplots	90	2	0.4	0

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type	Landform Element	Landform Pattern	Microrelief
Lithology	Soil Surface Texture	Soil Colour	Soil Depth
Slope	Aspect	Site Drainage	Distance to nearest water and type

Additional Plot Comments

Macrapod scats,
Bandicoot digging
Skull of a goat?

Wildthing Environmental Consultants - Office # (02) 49513311

400 m ² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date 14/1/2025		1A	DARYL FYLIE NICOLA

GF	Species	Cover	Abund	voucher
TG	1 Eucalyptus zardana	5	10	
TG	2 Eucalyptus tereticornis	8	8	
SG	3 Melaleuca nodosa	12	30 20	
SG	4 Bursaria spinosa	4	30	
SG	5 Acacia falcata	0.3	8	
OG	6 Jasminum volubile	1	5	
GG	7 Thymea triandra	15	300	
SG	8 Dodonaea triquetra	1	10	
SG	9 Acacia ulicifolia	1	20	
FG	10 Dianella caerulea prostrata	0.1	2	
SG	11 Leucopogon juniperinus	0.2	12	
HTW	12 Lantana camara	3	20	
FG	13 Chryscephalum apiculatum	0.2	20	
EG	14 Chelanthus sieberi	0.1	10	
OG	15 Eustrophia latifolia	0.1	5	
GG	16 Echinopogon caespitosus	0.2	20	
GG	17 Dieckmannia micrantha	0.2	10	
FG	18 Dianella caerulea caerulea	0.1	3	
OG	19 Parsonsia straminea	0.1	2	
GG	20 Entolasia stricta	0.3	100	
SG	21 Acacia longissima	0.1	1	
GG	22 Microlasia stipoides	0.4	200	
SG	23 Breytia oblongifolia	0.3	3	
SG	24 Polyscias sambucifolia	0.1	1	
GG	25 Lepidosperma laterale	0.1	10	
OG	26 Pandanus pandorana	0.1	2	
TG	27 Corymbia maculata	7	2	
	28			
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Wildthing Environmental Consultants - Office # (02) 49513311

BAM Site - Field Survey Form Plot Identifier: 2A

Midline start	Midline end	Plot Size	Date	Plot Waypoint ID		Recorders
E 386195 N 6392276	E 386166 N 6392158	8x125	14/1/2025	Start -	End -	PAUL NICKA
Photo# #7934	Photo# #7936	IBRA region	NSW North Coast			
Bearing 178°	Bearing 7°	Vegetation Class	Hunter-Macleay Dry Sclerophyll Forest			
PCT # 3433	PCT Name	Hunter Coast Foothills - Spotted Gum - Ironbark Grass Forest				
Consistent BC ACT TEC? yes	Lower Hunter Spotted Gum - Ironbark Forest					

BAM Attribute (400 m ² plot)		Sum values
Count of Native Richness	Trees	1
	Shrubs	6
	Grasses etc.	9
	Forbs	4
	Ferns	1
	Other	1
Sum of Cover of native vascular plants by growth form group	Trees	0.2
	Shrubs	8.8
	Grasses etc.	11.5
	Forbs	0.5
	Ferns	0.1
	Other	0.1
High Threat Weed cover		4.8

BAM Attribute (1000 m ² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm	0	1-4 0
50 - 79 cm	0	
30 - 49 cm	0	
20 - 29 cm	0	
10 - 19 cm	0	
5 - 9 cm	0	
Regeneration < 5 cm	✓	
Length of logs (m) (≥10 cm diameter, >50 cm in length)		1.4m 0.8m = 2.2m

Large Tree Sizes
Dry Sclerophyll Forests - ≥50, Forested Wetlands - ≥50, Freshwater Wetlands - NA, Grasslands - NA, Grassy Woodlands - ≥50, Heathlands - ≥30, Rainforests - ≥50, Saline Wetlands - NA, Semi-arid Woodland (grassy sub-formation) ≥30, Semi-arid woodlands (shrubby sub-formation) ≥30, Wet sclerophyll forests (grassy sub-formation) ≥79, Wetland sclerophyll forests (shrubby sub-formation) ≥79

BAM Attribute (1 x 1 m plots)	Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)	20 30 15 60 30 30	0 0 0 15 0 10	0 50 0 0 0 0	0 0 0 0 0 0
Average of the 5 subplots	31	9	3	0

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type	Landform Element	Landform Pattern	Microrelief
Lithology	Soil Surface Texture	Soil Colour	Soil Depth
Slope	Aspect	Site Drainage	Distance to nearest water and type

Additional Plot Comments

Wildthing Environmental Consultants - Office # (02) 49513311

400 m ² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date 14/1/2025		2A	DARCY, NICOLA, KYLIE

GF	Species	Cover	Abund	voucher
SG	1 <i>Makaleuca nodosa</i>	8	24	
SG	2 <i>Pultenaea villosa</i>	0.2	2	
GG	3 <i>Themeda triandra</i>	10	50	
FG	4 <i>Pterostylis chaetophora</i>	0.1	~ 4	
FG	5 <i>Canyscephalum apiculata</i>	0.2	15	
SG	6 <i>Ozothamnus diosmifolius</i>	0.2	3	
EG	7 <i>Chelanthus sieberi</i>	0.1	10	
HTW	8 <i>Paspalum dilatatum</i>	4	50	
HTW	9 <i>Senecio madagascariensis</i>	0.2	15	
GG	10 <i>Cynodon dactylon</i>	0.1	100	
GG	11 <i>Lomandra multiflora</i>	0.2	10	
GG	12 <i>Panicum simile</i>	0.3	50	
OG	13 <i>Hardenbergia violacea</i>	0.1	2	
E	14 <i>*Cenaurium erythraea</i>	0.1	10	
SG	15 <i>Dillwynia retorta</i>	0.1	1	
GG	16 <i>Eragrostis leptostachya</i>	0.2	50	
GG	17 <i>Juncus usitatus</i>	0.1	2	
SG	18 <i>Pultenaea echinifolia</i>	0.1	1	
FG	19 <i>Dianella revoluta</i>	0.1	5	
HTW	20 <i>Axonopus fissifolius</i>	0.3	20	
GG	21 <i>Lomandra obliqua</i>	0.1	1	
SG	22 <i>Bursaria spinosa</i>	0.2	3	
FG	23 <i>Sphaeromorphaca australis</i>	0.1	5	
HTW	24 <i>Briza subaristata</i>	0.3	30	
GG	25 <i>Rhytidospenna fulvum</i>	0.2	10	
TG	26 <i>Eucalyptus fibrosa</i>	0.2	5	
GG	27 <i>Entolasia stricta</i>	0.3	40	
E	28 <i>Plantago lanceolata</i>	0.1	5	
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Wildthing Environmental Consultants - Office # (02) 49513311

BAM Site – Field Survey Form Plot Identifier: 3A

Midline start	Midline end	Plot Size	Date	Plot Waypoint ID		Recorders
E 385620 N 6390828	E 385660 N 6390938	8 x 125	14/1/2025	Start -	End -	DARYL NICOLA
Photo# # 7921	Photo# # 7925	IBRA region	NSW North Coast			
Bearing 10°	Bearing 191°	Vegetation Class	Coastal Floodplain Wetlands			
PCT # 4042	PCT Name	Lower North River Plant Eucalypt Paperbark Forest				
Consistent BC ACT TEC?	NSW subtropical Coastal Floodplain Forest					

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	7
	Shrubs	4
	Grasses etc.	5
	Forbs	4
	Ferns	3
	Other	12
Sum of Cover of native vascular plants by growth form group	Trees	29.1
	Shrubs	30.4
	Grasses etc.	5.6
	Forbs	0.6
	Ferns	0.3
	Other	29.1
High Threat Weed cover		10.2

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm	0	Two dead trees with hollow (1100) 2 stems with hollow
50 – 79 cm	0.56, 0.56, 0.51 0.74, 0.57, 0.54	
30 – 49 cm	✓	
20 – 29 cm	✓	
10 – 19 cm	✓	
5 – 9 cm	✓	
Regeneration < 5 cm	✓	
Length of logs (m) (≥10 cm diameter, >50 cm in length)		2.6, 1.6, 3, 3.6 7.1, 2.8 = 20.7m

Large Tree Sizes
Dry Sclerophyll Forests - ≥50, Forested Wetlands - ≥50, Freshwater Wetlands - NA, Grasslands - NA, Grassy Woodlands - ≥50, Heathlands - ≥30, Rainforests - ≥50, Saline Wetlands - NA, Semi-arid Woodland (grassy sub-formation) ≥30, Semi-arid woodlands (shrubby sub-formation) ≥30, Wet sclerophyll forests (grassy sub-formation) ≥79, Wetland sclerophyll forests (shrubby sub-formation) ≥79

BAM Attribute (1 x 1 m plots)	Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)	90 80 95 95 75	2 0 0 0 0	0 0 0 0 0	0 0 0 0 0
Average of the 5 subplots	87	0.4	0	0

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type	Landform Element	Landform Pattern	Microrelief
Lithology	Soil Surface Texture	Soil Colour	Soil Depth
Slope	Aspect	Site Drainage	Distance to nearest water and type

Additional Plot Comments

8 x 50m
Species square

Wildthing Environmental Consultants - Office # (02) 49513311

400 m² plot: Sheet of

Date	Survey Name	Plot Identifier	Recorders
14/1/2025		3A	DARYL, NICOLA

GF	Species	Cover	Abund	voucher
SG	1 Melaleuca styphelioides	20	10	
TG	2 Corymbia maculata	7	2	
OG	3 Smilax australis	2	20	
HTW	4 Lantana camara	10	20	
OG	5 Stephania japonica	0.2	10	
OG	6 Pandorea pandorana	0.1	3	
OG	7 Gnetinoplerum cyrenum	0.5	20	
TG	8 Alphitonia excelsa	2	3	
GG	9 Oplismenus imbricatus	3	500	
TG	10 Nolea longifolia	1	7	
GG	11 Gahnia aspera	0.2	10	
TG	12 Clerodendrium bitorquatum	0.1	2	
OG	13 Eostrepis latifolia	0.1	10	
TG	14 Eucalyptus tereticornis	10	2	
FG	15 Dianella caerulea prostrata	0.1	10	
OG	16 Cissus antarctica	0.5	7	
OG	17 Gynochthodes jasminoides	0.3	10	
OG	18 Parsonsia straminea	25	20	
TG -	19 Glechidium ferdinandi	3	6	
SG	20 Melaleuca linariifolia	10	3	
GG	21 Entolasia marginata	2	200	
FG	22 Commelina cyanea	0.2	20	
FG	23 Phyllanthus virgatus	0.2	10	
FG	24 Dianella caerulea caerulea	0.1	2	
SG	25 Breynia oblongifolia	0.2	6	
OG	26 Dioscorea transversa	0.1	2	
EG	27 Adiantum hispidulum	0.1	6	
TG	28 Eucalyptus staerophos	6	2	
EG	29 Adiantum aethiopicum	0.1	3	
OG	30 Convolvulus erubescens	0.1	1	
GG	31 Imperata cylindrica	0.3	20	
GG	32 Comandra longifolia	0.1	2	
OG	33 Jasminum volubile	0.1	2	
EG	34 Pellaea paradoxa	0.1	5	
HTW	35 Bidens pilosa	0.2	10	
OG	36 Cayratia clematidea	0.1	5	
SG	37 Rubus parviflorus	0.2	3	
	38	0.1	1	
	39			
	40			
	41			
	42			
	43			
	44			



Plate D1: Plot 1A-PCT 3433_Forest Front Peg.



Plate D2: Plot 1A-3433_Forest Back Peg.



Plate D3: Plot 2A-PCT 3433_Cleared Front Peg.



Plate D4: Plot 2A-PCT 3433_Cleared Back Peg.



Plate D5: Plot 3A-PCT 4042_Forest Front Peg.



Plate D6: Plot 3A-PCT 4042_Forest Back Peg.

Appendix E: Credit reports



BAM Credit Summary Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00054395/BAAS23007/25/00054396	East Seaham Road_BDAR Linear	28/10/2024
Assessor Name	Report Created	BAM Data version *
Nicola Mohr	25/03/2025	Current classification (live - default) (80)
Assessor Number	BAM Case Status	Date Finalised
BAAS23007	Finalised	25/03/2025
Assessment Revision		Assessment Type
4		Part 5 Activities

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Ecosystem credits for plant communities types (PCT), ecological communities & threatened species habitat

Zone	Vegetation zone name	TEC name	Current Vegetation integrity score	Change in Vegetation integrity (loss / gain)	Area (ha)	Sensitivity to loss (Justification)	Species sensitivity to gain class	BC Act Listing status	EPBC Act listing status	Biodiversity risk weighting	Potential SAIL	Ecosystem credits
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BAM Credit Summary Report

Hunter Coast Foothills Spotted Gum-Ironbark Grassy Forest											
1	3433_Forest	Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions	40.1	40.1	1.3	Biodiversity Conservation Act listing status	High Sensitivity to Gain	Endangered Ecological Community	Not Listed	2.00	27
2	3433_Cleared	Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions	18	18.0	0.36	Biodiversity Conservation Act listing status	High Sensitivity to Gain	Endangered Ecological Community	Not Listed	2.00	3
										Subtotal	30
Lower North Riverflat Eucalypt-Paperbark Forest											
3	4042_Forest	Subtropical Coastal Floodplain Forest of the New South Wales North Coast Bioregion	63.2	63.2	0.43	Biodiversity Conservation Act listing status	High Sensitivity to Gain	Endangered Ecological Community	Not Listed	2.00	14
										Subtotal	14
										Total	44



BAM Credit Summary Report

Species credits for threatened species

Vegetation zone name	Habitat condition (Vegetation Integrity)	Change in habitat condition	Area (ha)/Count (no. individuals)	Sensitivity to loss (Justification)	Sensitivity to gain (Justification)	BC Act Listing status	EPBC Act listing status	Potential SAI	Species credits
<i>Corybas dowlingii</i> / Red Helmet Orchid (Flora)									
3433_Forest	40.1	40.1	1.3	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Not Listed	False	27
4042_Forest	63.2	63.2	0.43	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Not Listed	False	14
								Subtotal	41
<i>Ninox strenua</i> / Powerful Owl (Fauna)									
3433_Forest	40.1	40.1	0.8	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	16
4042_Forest	63.2	63.2	0.29	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	9
								Subtotal	25



BAM Credit Summary Report

<i>Petaurus norfolcensis / Squirrel Glider (Fauna)</i>									
3433_Forest	40.1	40.1	1.3	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	27
4042_Forest	63.2	63.2	0.43	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	14
								Subtotal	41
<i>Phascogale tapoatafa / Brush-tailed Phascogale (Fauna)</i>									
3433_Forest	40.1	40.1	1.3	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	27
4042_Forest	63.2	63.2	0.43	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	14
								Subtotal	41
<i>Phascolarctos cinereus / Koala (Fauna)</i>									
3433_Forest	40.1	40.1	1.3	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	27



BAM Credit Summary Report

4042_Forest	63.2	63.2	0.43	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	14
Subtotal									41
<i>Pterostylis chaetophora / Pterostylis chaetophora (Flora)</i>									
3433_Forest	40.1	40.1	1.3	Geographic Distribution	Effectiveness of management in controlling threats	Vulnerable	Not Listed	False	27
3433_Cleared	18.0	18.0	0.36	Geographic Distribution	Effectiveness of management in controlling threats	Vulnerable	Not Listed	False	3
4042_Forest	63.2	63.2	0.43	Geographic Distribution	Effectiveness of management in controlling threats	Vulnerable	Not Listed	False	14
Subtotal									44
<i>Rutidosia heterogama / Heath Wrinklewort (Flora)</i>									
3433_Forest	40.1	40.1	1.3	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	27

Assessment Id

00054395/BAAS23007/25/00054396

Proposal Name

East Seaham Road_BDAR Linear

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BAM Credit Summary Report

3433_Cleared	18.0	18.0	0.36	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	3
								Subtotal	30



BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id
00054395/BAAS23007/25/00054396

Assessor Name
Nicola Mohr

Proponent Names
Samuel Harvey

Assessment Revision
4

Date Finalised
25/03/2025

Proposal Name
East Seaham Road_BDAR Linear

Assessor Number
BAAS23007

Report Created
25/03/2025

BAM data last updated *
28/10/2024

BAM Data version *
Current classification (live - default)
(80)

BAM Case Status
Finalised

Assessment Type
Part 5 Activities

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Potential Serious and Irreversible Impacts

Name of threatened ecological community	Listing status	Name of Plant Community Type/ID
Nil		
Species		
Nil		

Additional Information for Approval

Assessment Id	Proposal Name
00054395/BAAS23007/25/00054396	East Seaham Road_BDAR Linear



BAM Biodiversity Credit Report (Like for like)

PCT Outside Ibra Added
None added

PCTs With Customized Benchmarks

PCT
No Changes

Predicted Threatened Species Not On Site

Name
Botaurus poiciloptilus / Australasian Bittern
Ixobrychus flavicollis / Black Bittern

Ecosystem Credit Summary (Number and class of biodiversity credits to be retired)

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	HBT Cr	No HBT Cr	Total credits to be retired
3433-Hunter Coast Foothills Spotted Gum-Ironbark Grassy Forest	Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions	1.7	27	3	30
4042-Lower North Riverflat Eucalypt-Paperbark Forest	Subtropical Coastal Floodplain Forest of the New South Wales North Coast Bioregion	0.4	14	0	14

Assessment Id

00054395/BAAS23007/25/00054396

Proposal Name

East Seaham Road_BDAR Linear

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BAM Biodiversity Credit Report (Like for like)

3433-Hunter Coast Foothills Spotted Gum-Ironbark Grassy Forest	Like-for-like credit retirement options					
	Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region
	Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions This includes PCT's: 3433, 3442, 3443, 3444, 4158	-	3433_Forest	Yes	27	Upper Hunter, Ellerston, Hunter, Karuah Manning, Mummel Escarpment and Tomalla. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
	Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions This includes PCT's: 3433, 3442, 3443, 3444, 4158	-	3433_Cleared	No	3	Upper Hunter, Ellerston, Hunter, Karuah Manning, Mummel Escarpment and Tomalla. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
4042-Lower North Riverflat Eucalypt-Paperbark Forest	Like-for-like credit retirement options					
	Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region

Assessment Id

00054395/BAAS23007/25/00054396

Proposal Name

East Seaham Road_BDAR Linear

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BAM Biodiversity Credit Report (Like for like)

	Subtropical Coastal Floodplain Forest of the New South Wales North Coast Bioregion This includes PCT's: 621, 3067, 3102, 3420, 3428, 3574, 3984, 4002, 4003, 4005, 4032, 4033, 4036, 4042, 4045, 4046	-	4042_Forest	Yes	14	Upper Hunter, Ellerston, Hunter, Karuah Manning, Mummel Escarpment and Tomalla. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Species Credit Summary

Species	Vegetation Zone/s	Area / Count	Credits
Corybas dowlingii / Red Helmet Orchid	3433_Forest, 4042_Forest	1.8	41.00
Ninox strenua / Powerful Owl	3433_Forest, 4042_Forest	1.1	25.00
Petaurus norfolcensis / Squirrel Glider	3433_Forest, 4042_Forest	1.8	41.00
Phascogale tapoatafa / Brush-tailed Phascogale	3433_Forest, 4042_Forest	1.8	41.00
Phascolarctos cinereus / Koala	3433_Forest, 4042_Forest	1.8	41.00
Pterostylis chaetophora / Pterostylis chaetophora	3433_Forest, 3433_Cleared, 4042_Forest	2.1	44.00
Rutidosia heterogama / Heath Wrinklewort	3433_Forest, 3433_Cleared	1.7	30.00

Assessment Id

00054395/BAAS23007/25/00054396

Proposal Name

East Seaham Road_BDAR Linear

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BAM Biodiversity Credit Report (Like for like)

Credit Retirement Options	Like-for-like credit retirement options	
Corybas dowlingii / Red Helmet Orchid	Spp	IBRA subregion
	Corybas dowlingii / Red Helmet Orchid	Any in NSW
Ninox strenua / Powerful Owl	Spp	IBRA subregion
	Ninox strenua / Powerful Owl	Any in NSW
Petaurus norfolcensis / Squirrel Glider	Spp	IBRA subregion
	Petaurus norfolcensis / Squirrel Glider	Any in NSW
Phascogale tapoatafa / Brush-tailed Phascogale	Spp	IBRA subregion
	Phascogale tapoatafa / Brush-tailed Phascogale	Any in NSW
Phascolarctos cinereus / Koala	Spp	IBRA subregion
	Phascolarctos cinereus / Koala	Any in NSW
Pterostylis chaetophora / Pterostylis chaetophora	Spp	IBRA subregion
	Pterostylis chaetophora / Pterostylis chaetophora	Any in NSW

Assessment Id

00054395/BAAS23007/25/00054396

Proposal Name

East Seaham Road_BDAR Linear

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BAM Biodiversity Credit Report (Like for like)

Rutidosia heterogama / Heath Wrinklewort	Spp	IBRA subregion
	Rutidosia heterogama / Heath Wrinklewort	Any in NSW

Assessment Id

00054395/BAAS23007/25/00054396

Proposal Name

East Seaham Road_BDAR Linear

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BAM Biodiversity Credit Report (Variations)

Proposal Details

Assessment Id

00054395/BAAS23007/25/00054396

Assessor Name

Nicola Mohr

Proponent Name(s)

Samuel Harvey

Assessment Revision

4

Date Finalised

25/03/2025

Proposal Name

East Seaham Road_BDAR Linear

Assessor Number

BAAS23007

Report Created

25/03/2025

BAM data last updated *

28/10/2024

BAM Data version *

Current classification (live - default) (80)

BAM Case Status

Finalised

Assessment Type

Part 5 Activities

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Potential Serious and Irreversible Impacts

Name of threatened ecological community	Listing status	Name of Plant Community Type/ID
Nil		
Species		
Nil		

Additional Information for Approval

PCT Outside Ibra Added

None added

Assessment Id

00054395/BAAS23007/25/00054396

Proposal Name

East Seaham Road_BDAR Linear

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BAM Biodiversity Credit Report (Variations)

PCTs With Customized Benchmarks

PCT

No Changes

Predicted Threatened Species Not On Site

Name

Botaurus poiciloptilus / Australasian Bittern

Ixobrychus flavicollis / Black Bittern

Ecosystem Credit Summary (Number and class of biodiversity credits to be retired)

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	HBT Cr	No HBT Cr	Total credits to be retired
3433-Hunter Coast Foothills Spotted Gum-Ironbark Grassy Forest	Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions	1.7	27	3	30.00
4042-Lower North Riverflat Eucalypt-Paperbark Forest	Subtropical Coastal Floodplain Forest of the New South Wales North Coast Bioregion	0.4	14	0	14.00

3433-Hunter Coast Foothills Spotted Gum-Ironbark Grassy Forest	Like-for-like credit retirement options					
	Class	Trading group	Zone	HBT	Credits	IBRA region
	Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions This includes PCT's: 3433, 3442, 3443, 3444, 4158	-	3433_Forest	Yes	27	Upper Hunter, Ellerston, Hunter, Karuah Manning, Mummel Escarpment and Tomalla. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

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BAM Biodiversity Credit Report (Variations)

	Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions This includes PCT's: 3433, 3442, 3443, 3444, 4158	-	3433_Clear ed	No		3 Upper Hunter, Ellerton, Hunter, Karuah Manning, Mummel Escarpment and Tomalla. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
	Variation options					
	Formation	Trading group	Zone	HBT	Credits	IBRA region
	Dry Sclerophyll Forests (Shrub/grass sub-formation)	Tier 3 or higher threat status	3433_Fores t	Yes (includi ng artificia l)	27	IBRA Region: NSW North Coast, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
4042-Lower North Riverflat Eucalypt-Paperbark Forest	Dry Sclerophyll Forests (Shrub/grass sub-formation)	Tier 3 or higher threat status	3433_Clear ed	No	3	IBRA Region: NSW North Coast, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
	Like-for-like credit retirement options					
	Class	Trading group	Zone	HBT	Credits	IBRA region



BAM Biodiversity Credit Report (Variations)

	Subtropical Coastal Floodplain Forest of the New South Wales North Coast Bioregion This includes PCT's: 621, 3067, 3102, 3420, 3428, 3574, 3984, 4002, 4003, 4005, 4032, 4033, 4036, 4042, 4045, 4046	-	4042_Forest	Yes	14	Upper Hunter, Ellerton, Hunter, Karuah Manning, Mummel Escarpment and Tomalla. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Variation options						
Formation	Trading group	Zone	HBT	Credits	IBRA region	
Forested Wetlands	Tier 3 or higher threat status	4042_Forest	Yes (including artificial)	14	IBRA Region: NSW North Coast, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.	

Species Credit Summary

Species	Vegetation Zone/s	Area / Count	Credits
Corybas dowlingii / Red Helmet Orchid	3433_Forest, 4042_Forest	1.8	41.00
Ninox strenua / Powerful Owl	3433_Forest, 4042_Forest	1.1	25.00
Petaurus norfolcensis / Squirrel Glider	3433_Forest, 4042_Forest	1.8	41.00
Phascogale tapoatafa / Brush-tailed Phascogale	3433_Forest, 4042_Forest	1.8	41.00
Phascolarctos cinereus / Koala	3433_Forest, 4042_Forest	1.8	41.00
Pterostylis chaetophora / Pterostylis chaetophora	3433_Forest, 3433_Cleared, 4042_Forest	2.1	44.00
Rutidosia heterogama / Heath Wrinklewort	3433_Forest, 3433_Cleared	1.7	30.00



BAM Biodiversity Credit Report (Variations)

Credit Retirement Options	Like-for-like options		
Corybas dowlingii/ Red Helmet Orchid	Spp		IBRA region
	Corybas dowlingii/Red Helmet Orchid		Any in NSW
	Variation options		
	Kingdom	Any species with same or higher category of listing under Part 4 of the BC Act shown below	IBRA region
	Flora	Endangered	Upper Hunter, Ellerston, Hunter, Karuah Manning, Mummel Escarpment and Tomalla. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Ninox strenua/ Powerful Owl	Spp		IBRA region
	Ninox strenua/Powerful Owl		Any in NSW
	Variation options		
	Kingdom	Any species with same or higher category of listing under Part 4 of the BC Act shown below	IBRA region



BAM Biodiversity Credit Report (Variations)

	Fauna	Vulnerable	Upper Hunter, Ellerston, Hunter, Karuah Manning, Mummel Escarpment and Tomalla. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Petaurus norfolcensis / Squirrel Glider	Spp		IBRA region
	Petaurus norfolcensis /Squirrel Glider		Any in NSW
	Variation options		
	Kingdom	Any species with same or higher category of listing under Part 4 of the BC Act shown below	IBRA region
	Fauna	Vulnerable	Upper Hunter, Ellerston, Hunter, Karuah Manning, Mummel Escarpment and Tomalla. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Phascogale tapoatafa / Brush-tailed Phascogale	Spp		IBRA region
	Phascogale tapoatafa /Brush-tailed Phascogale		Any in NSW
	Variation options		
	Kingdom	Any species with same or higher category of listing	IBRA region

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BAM Biodiversity Credit Report (Variations)

		under Part 4 of the BC Act shown below	
	Fauna	Vulnerable	Upper Hunter, Ellerston, Hunter, Karuah Manning, Mummel Escarpment and Tomalla. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Phascolarctos cinereus/ Koala	Spp		IBRA region
	Phascolarctos cinereus/Koala		Any in NSW
	Variation options		
	Kingdom	Any species with same or higher category of listing under Part 4 of the BC Act shown below	IBRA region
	Fauna	Endangered	Upper Hunter, Ellerston, Hunter, Karuah Manning, Mummel Escarpment and Tomalla. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Pterostylis chaetophora/ Pterostylis chaetophora	Spp		IBRA region
	Pterostylis chaetophora/Pterostylis chaetophora		Any in NSW
	Variation options		



BAM Biodiversity Credit Report (Variations)

	Kingdom	Any species with same or higher category of listing under Part 4 of the BC Act shown below	IBRA region
	Flora	Vulnerable	Upper Hunter, Ellerston, Hunter, Karuah Manning, Mummel Escarpment and Tomalla. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Rutidosia heterogama/ Heath Wrinklewort	Spp		IBRA region
	Rutidosia heterogama/ Heath Wrinklewort		Any in NSW
	Variation options		
	Kingdom	Any species with same or higher category of listing under Part 4 of the BC Act shown below	IBRA region
	Flora	Vulnerable	Upper Hunter, Ellerston, Hunter, Karuah Manning, Mummel Escarpment and Tomalla. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Appendix F: Total Flora List

Introduced species are indicated by an asterisk (“*”).

The following standard abbreviations are used to indicate subspecific taxa:

- subsp.** subspecies
- var.-** variety
- x -** hybrid between the two indicated species

Threatened Species - NSW Biodiversity Conservation Act 2016 (BC Act)

- V** Vulnerable
- E1** Endangered
- E2** Endangered Population
- E4A** Critically Endangered Population

Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

- V** Vulnerable
- E** Endangered
- CE** Critically Endangered

Serious and Irreversible Impact SAI

Regional Significance (Hunter Rare Plants Database – Version 1 2003)

- L** endemic to Hunter Region
- DA** disjunct in the Hunter Region, rare or localized (aggregated)
- DB** disjunct in the Hunter Region, widespread and uncommon (broad)
- R** rare but extends beyond the Hunter Region
- U** everywhere uncommon
- N** at northern distributional limit in the Hunter
- E** at eastern distributional limit in the Hunter
- S** at southern distributional limited in the Hunter
- W** at western distributional limited in the Hunter
- T** may be threatened in the Hunter Region
- S** Probably secure in the Hunter Region

Weeds

Priorities under the Biosecurity Act 2015

- G** General Biosecurity Duty - any person dealing with plant matter must take measures to prevent, minimise or eliminate the biosecurity risk (as far as is reasonably practicable).
- P** Prohibition on dealings - Must not be imported into the State or sold.
- R** Regional Recommended Measure - Land managers mitigate the risk of the plant being introduced to their land. Land managers reduce impacts from the plant on priority assets. Land managers prevent spread from their land where feasible. The plant or parts of the plant are not traded, carried, grown or released into the environment.

NSW BC Act 2016

- T** Listed as a Threatening Process under the NSW BC Act 2016.
- N** Weed of National Significance (WoNS)

Table F1 Total Flora List

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SAII	REGIONALLY SIGNIFICANT	BIOSECURITY ACT 2015	FLOWERING PERIOD	OBSERVER
CLASS FILICOPSIDA (Ferns)								
Davalliaceae								
<i>Nephrolepis cordifolia</i>	Fishbone Fern							Wedgetail
Dryopteridaceae								
<i>Polystichum australiense</i>	Harsh Shield Fern							Wedgetail
Polypodiaceae								
<i>Platycerium superbum</i>	Staghorn Fern							Wildthing
Pteridaceae								
<i>Adiantum aethiopicum</i>	Common Maidenhair Fern							Wildthing
<i>Adiantum hispidulum</i>	Rough Maiden Hair Fern							Wildthing
<i>Cheilanthes sieberi</i> ssp. <i>sieberi</i>	Mulga Fern							Wedgetail, Wildthing
<i>Pellaea paradoxa</i>								Wildthing
MAGNOLIOPSIDA: Magnoliidae								
LILOPSIDA: (Monocotyledons)								
Asparagaceae								
* <i>Asparagus asparagoides</i>	Bridal Creeper							Wedgetail
* <i>Asparagus aethiopicus</i>	Asparagus Fern							Wedgetail
<i>Eustrephus latifolius</i>	Wombat Berry							Wedgetail, Wildthing
<i>Lomandra longifolia</i>	Spiny Mat Rush						Aug, Sept	Wedgetail
<i>Lomandra multiflora</i> subsp. <i>multiflora</i>	Many-flowered Mat-rush						Sept	Wedgetail, Wildthing I
<i>Lomandra obliqua</i>	Fish Bones						Sept	Wildthing

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SAIL	REGIONALLY SIGNIFICANT	BIOSECURITY ACT 2015	FLOWERING PERIOD	OBSERVER
Asphodelaceae								
<i>Dianella caerulea</i> var. <i>caerulea</i>	Blue Flax-lily							Wildthing
<i>Dianella caerulea</i> var. <i>producta</i>	Blue Flax-lily							Wedgetail, Wildthing
<i>Dianella longifolia</i>	Smooth Flax Lily							Wedgetail
<i>Dianella revoluta</i>	Blue Flax-lily							Wildthing
<i>Geitonoplesium cymosum</i>	Scrambling Lily							Wedgetail, Wildthing
Commelinaceae								
<i>Commelina cyanea</i>	Scurvy Weed							Wildthing
Cyperaceae								
<i>Fimbristylis dichotoma</i>	Common Fringe Sedge							Wedgetail
<i>Gahnia aspera</i>	Rough Saw Sedge							Wedgetail, Wildthing
<i>Lepidosperma laterale</i>	Sword Sedge							Wedgetail, Wildthing
<i>Schoenus brevifolius</i>	Zig-zag Bog-rush							Wedgetail
Iridaceae								
* <i>Freesia</i> hybrid	Freesia							Wedgetail
Juncaceae								
<i>Juncus usitatus</i>	Common Rush							Wedgetail, Wildthing
Orchidaceae								
<i>Dendrobium linguiforme</i>	Tongue Orchid							Wedgetail
<i>Pterostylis chaetophora</i>	Tall Rustyhood	V - prelim						Wedgetail, Wildthing
Poaceae								
* <i>Andropogon virginicus</i>	Whisky Grass							Wedgetail
<i>Aristida vagans</i>	Three-awn Speargrass							Wedgetail
* <i>Axonopus fissifolius</i>	Narrow-leaved Carpet Grass							Wildthing

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SAIL	REGIONALLY SIGNIFICANT	BIOSECURITY ACT 2015	FLOWERING PERIOD	OBSERVER
* <i>Briza maxima</i>	Quaking Grass							Wedgetail
* <i>Briza subaristata</i>	Perennial Quaking Grass							Wildthing
* <i>Bromus catharticus</i>	Prairie Grass							Wedgetail
* <i>Cenchrus clandestinus</i> syn <i>Pennisetum clandestinum</i>	Kikuyu							Wildthing
* <i>Chloris gayana</i>	Rhodes Grass							Wedgetail, Wildthing
<i>Cynodon dactylon</i>	Common Couch							Wedgetail, Wildthing
<i>Cymbopogon refractus</i>	Barbed Wire Grass							Wedgetail
<i>Dichelachne micrantha</i>	Plume Grass							Wildthing
<i>Digitaria parviflora</i>	Smallflower Fingergrass							Wedgetail
<i>Echinopogon caespitosus</i> var. <i>caespitosus</i>	Hedgehog Grass							Wedgetail, Wildthing
* <i>Ehrharta erecta</i>	Panic Veldt Grass							Wedgetail
<i>Entolasia marginata</i>	Bordered Panic							Wedgetail, Wildthing
<i>Entolasia stricta</i>	Wiry Panic							Wedgetail, Wildthing
<i>Eragrostis leptostachya</i>	Paddock Lovegrass							Wedgetail, Wildthing
<i>Imperata cylindrica</i> var. <i>major</i>	Blady Grass							Wedgetail, Wildthing
* <i>Megathyrsus maximus</i> syn. <i>Panicum maximum</i>	Guinea Grass							Wedgetail
<i>Microlaena stipoides</i> var. <i>stipoides</i>	Weeping Meadow Grass							Wedgetail, Wildthing
<i>Oplismenus aemulus</i>	Basket Grass							Wedgetail
<i>Oplismenus imbecillis</i>	Basket Grass							Wildthing
<i>Panicum simile</i>	Two Colour Panic							Wedgetail, Wildthing
* <i>Paspalum dilatatum</i>	Paspalum							Wildthing
<i>Rytidosperma fulvum</i>	Wallaby Grass							Wildthing
* <i>Setaria palmifolia</i>	Palm Grass							Wedgetail
* <i>Setaria sphacelata</i>	South African Pigeon Grass							Wedgetail
* <i>Sporobolus africanus</i>	Parramatta Grass							Wedgetail
<i>Sporobolus creber</i>	Slender Rats Tail							Wedgetail

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SAIL	REGIONALLY SIGNIFICANT	BIOSECURITY ACT 2015	FLOWERING PERIOD	OBSERVER
<i>Themeda triandra</i> syn. <i>Themeda australis</i>	Kangaroo Grass						Oct, Nov	Wedgetail, Wildthing
Smilacaceae								
<i>Smilax australis</i>	Smilax							Wildthing
MAGNOLIIDAE (Dicotyledons)								
Apocynaceae								
<i>Parsonsia straminea</i> var. <i>straminea</i>	Common Silkpod/Monkey Rope				W?			Wedgetail, Wildthing
Araliaceae								
<i>Hydrocotyle laxifolia</i>	Stinking Pennywort							Wedgetail
<i>Polyscias sambucifolia</i>	Elderberry Panax							Wildthing
Asteraceae								
* <i>Aster subulatus</i> syn. <i>Aster squamatus</i>	Bushy Starwort							Wedgetail
* <i>Bidens pilosa</i>	Cobblers Pegs							Wedgetail, Wildthing
<i>Carduus pycnocephalus</i>	Slender Thistle							Wedgetail
<i>Chrysocephalum apiculatum</i>	Yellow Buttons							Wildthing
* <i>Cirsium vulgare</i>	Spear Thistle						Sept	Wedgetail
* <i>Conyza bonariensis</i>	Flax-leaved Fleabane							Wedgetail
<i>Lagenophora gracilis</i>	Slender Lagenophora							Wedgetail
<i>Ozothamnus diosmifolium</i>	White Dogwood						Sept	Wedgetail, Wildthing
* <i>Senecio madagascariensis</i>	Fireweed						Sept, Oct	Wedgetail, Wildthing
<i>Sphaeromorphaea australis</i> syn. <i>Epaltes australis</i>	Spreading Nut-heads							Wildthing
Bignoniaceae								
<i>Pandorea pandorana</i>	Wonga-wonga Vine						Aug, Sept	Wedgetail, Wildthing
Campanulaceae								

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SAIL	REGIONALLY SIGNIFICANT	BIOSECURITY ACT 2015	FLOWERING PERIOD	OBSERVER
<i>Lobelia purpurascens</i>	White Root							Wedgetail
Cannabaceae								
<i>Trema tomentosa</i> var. <i>viridis</i>	Poison Peach							Wedgetail
Cassythaceae								
<i>Cassytha pubescens</i>	Common Devils Twine							Wedgetail
Casuarinaceae								
<i>Casuarina glauca</i>	Swamp She-oak							Wedgetail
Celastraceae								
<i>Denhamia silvestris</i> syn. <i>Maytenus silvestris</i>	Narrow leaved Orangebark				U		Oct, April	Wedgetail
Convolvulaceae								
<i>Convolvulus erubescens</i>	Australian Bindweed							Wildthing
<i>Dichondra repens</i>	Kidney Weed							Wedgetail
Dilleniaceae								
<i>Hibbertia aspera</i>	Rough Guinea Flower						Nov	Wedgetail
Dioscoreaceae								
<i>Dioscorea transversa</i>	Native Yam							Wildthing
Ericaceae formerly Epacridaceae								
<i>Leucopogon juniperinus</i>	Prickly Beared Heath						July, Aug	Wedgetail, Wildthing
Fabaceae Subfamily (Faboideae)								
<i>Daviesia genistifolia</i>	Broom Bitter Pea							Wedgetail
<i>Daviesia ulicifolia</i>	Gorse Bitter Pea						Aug	Wedgetail
<i>Dillwynia retorta</i> subsp. <i>retorta</i>	Heathy Parrot Pea						July, Aug, Sept	Wedgetail, Wildthing
<i>Glycine clandestina</i> subsp. <i>complex</i>	Love Creeper						Sept	Wedgetail
<i>Hardenbergia violacea</i>	False Sarsaparilla						Aug, Sept	Wedgetail,

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SAIL	REGIONALLY SIGNIFICANT	BIOSECURITY ACT 2015	FLOWERING PERIOD	OBSERVER
<i>Kennedia rubicunda</i>	Dusky Coral Pea						Sept, Oct	Wildthing
<i>Maekawaea rhytidophylla</i> syn. <i>Desmodium rhytidophyllum</i>	Tick-treefoil						Dec	Wedgetail
<i>Medicago minima</i>	Woolly Burr Medic							Wedgetail
<i>Pultenaea euchila</i>							Oct	
<i>Pultenaea villosa</i>	Hairy Bush Pea						Sept, Oct	Wedgetail, Wildthing
* <i>Trifolium repens</i>	White Clover						Sept, Oct	Wedgetail
* <i>Vicia sativa</i>	Common Vetch							Wedgetail
Fabaceae (Subfamily Mimosoideae)								
<i>Acacia falcata</i>	Falcata Wattle				W			Wedgetail, Wildthing
<i>Acacia irrorata</i> subsp. <i>irrorata</i>	Green Wattle						Nov, Dec	Wedgetail
<i>Acacia longissima</i>	Long-leaf wattle							Wedgetail, Wildthing
<i>Acacia ulicifolia</i>	Prickly Moses						Mar, Apr	Wedgetail, Wildthing
Gentianaceae								
* <i>Centaurium erythraea</i>	Common Centaury							Wildthing
Geraniaceae								
<i>Geranium solanderi</i>	Native Geranium							Wedgetail
Goodeniaceae								
<i>Goodenia heterophylla</i>	Variable-leaved Goodenia							Wedgetail
Haloragaceae								
<i>Haloragis heterophylla</i>	Variable Raspwort							Wedgetail
Lamiaceae								
<i>Clerodendrum tomentosum</i>	Hairy Clerodendrum						Oct, Nov	Wildthing
Malvaceae								

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SAIL	REGIONALLY SIGNIFICANT	BIOSECURITY ACT 2015	FLOWERING PERIOD	OBSERVER
<i>*Sida rhombifolia</i>	Paddys Lucerne							Wedgetail
Menispermaceae								
<i>Stephania japonica</i> var. <i>japonica</i>	Snake Vine							Wedgetail, Wildthing
Moraceae								
<i>Ficus rubiginosa</i>	Port Jackson Fig							Wedgetail
Myrtaceae								
<i>Angophora floribunda</i>	Rough-barked Apple						Nov, Dec	Wedgetail
<i>Backhousia mytifolia</i>	Grey Myrtle							Wedgetail
<i>Corymbia maculata</i>	Spotted Gum						Mar, Apr	Wedgetail, Wildthing
<i>Eucalyptus crebra</i>	Narrow-leaved Ironbark						Sept, Oct	Wedgetail
<i>Eucalyptus fibrosa</i> subsp. <i>fibrosa</i>	Broad-leaved Ironbark							Wedgetail, Wildthing
<i>Eucalyptus moluccana</i>	Grey Box						Mar	Wedgetail
<i>Eucalyptus paniculata</i> subsp. <i>paniculata</i>	Grey Ironbark							Wedgetail
<i>Eucalyptus punctata</i>	Grey Gum							Wedgetail, Wildthing
<i>Eucalyptus siderophloia</i>	Grey Ironbark							Wildthing
<i>Eucalyptus tereticornis</i>	Forest Red Gum						May, Aug, Sept, Oct	Wedgetail, Wildthing
<i>Eucalyptus umbra</i>	Thick-leaved White Mahogany							Wedgetail
<i>Melaleuca decora</i>	White Feather Honey myrtle						Nov, Dec	Wedgetail
<i>Melaleuca lineariifolia</i>	Snow in Summer						Oct, Nov	Wedgetail, Wildthing
<i>Melaleuca nodosa</i>	Ball Honey myrtle						Late Sept, Oct	Wedgetail, Wildthing
<i>Melaleuca styphelioides</i>	Prickly-leaved Paperbark							Wedgetail, Wildthing
Oleaceae								
<i>Jasminum volubile</i>	Stiff Jasmine							Wedgetail,

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SAIL	REGIONALLY SIGNIFICANT	BIOSECURITY ACT 2015	FLOWERING PERIOD	OBSERVER
<i>Notelaea longifolia</i>	Mock Olive							Wildthing Wedgetail, Wildthing
Oxalidaceae								
<i>Oxalis perennans</i>	-							Wedgetail
Phyllanthaceae								
<i>Breynia oblongifolia</i>	Coffee Bush							Wedgetail, Wildthing
<i>Glochidion ferdinandi</i> var. <i>ferdinandi</i>	Cheese Tree							Wedgetail, Wildthing
<i>Phyllanthus virgatus</i>	Spurge							Wedgetail, Wildthing
Pittosporaceae								
<i>Bursaria spinosa</i> subsp. <i>spinosa</i>	Blackthorn						Jan	Wedgetail, Wildthing
<i>Pittosporum multiflorum</i> syn. <i>Citriobatus pauciflorus</i>	Orange Thorn							Wedgetail
<i>Pittosporum revolutum</i>	Rough-fruit Pittosporum							Wedgetail
Plantaginaceae								
* <i>Plantago lanceolata</i>	Plantain							Wedgetail, Wildthing
Primulaceae								
* <i>Lysimachia arvensis</i> syn. <i>Anagallis arvensis</i>	Scarlet Pimpernel							Wedgetail
Proteaceae								
<i>Persoonia linearis</i>	Narrow-leaved Geebung							Wedgetail
Ranunculaceae								
<i>Clematis glycinoides</i> var. <i>glycinoides</i>	Headache Vine						Aug, Sept	Wedgetail
Rhamnaceae								
<i>Alphitonia excelsa</i>	Red Ash							Wedgetail,

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SAIL	REGIONALLY SIGNIFICANT	BIOSECURITY ACT 2015	FLOWERING PERIOD	OBSERVER
								Wildthing
Rosaceae								
<i>Rubus anglocandicans</i>	Blackberry							Wedgetail
<i>Rubus parvifolius</i>	Native Raspberry							Wedgetail, Wildthing
Rubiaceae								
<i>Gynochthodes jasminoides</i> syn. <i>Morinda jasminoides</i>	Sweet Morinda							Wildthing
Rutaceae								
<i>Boronia pinnata</i>								Wedgetail
Santalaceae								
<i>Exocarpus cupressiformis</i>	Cherry Ballart							Wedgetail
Sapindaceae								
<i>Dodonaea triquetra</i>	Hop Bush							Wedgetail, Wildthing
Solanaceae								
* <i>Solanum nigrum</i>	Blackberry Nightshade							Wedgetail
Verbenaceae								
* <i>Lantana camara</i>	Lantana						Noxious	Wedgetail, Wildthing
* <i>Verbena bonariensis</i>	Purple Top							Wedgetail
* <i>Verbena rigida</i> var. <i>rigida</i>	Veined Verbena							Wedgetail
Vitaceae								
<i>Cayratia clematidea</i>	Slender Grape							Wedgetail, Wildthing
<i>Cissus antarctica</i>					W			Wildthing

Appendix G: Fauna Survey Results

Amphibian

Crinia signifera (Common eastern Froglet) and *Limnodynastes tasmaniensis* (Spotted Grass Frog) were heard calling in neighbouring properties during nocturnal field work. Two other species were heard calling incidentally during surveys conducted after heavy a rainfall event. *Litoria latopalmata* (Broad-palmed Frog) and *Limnodynastes peronei* (Striped Marsh Frog) were heard calling in neighbouring properties to the west and within culverts within study area during nocturnal surveys in January 2025.

No species listed as threatened under the BC Act 2016 or EPBC Act 1999 were recorded within the subject land

Avifauna

During stagwatch surveys a bird considered likely to be *Ninox boobook* (Boobook Owl) was observed exiting a hollow in significant tree no. 91. Multiple Boobook Owls were heard calling within proximity to this tree and to the west during owl call-playback surveys in January 2025. A pair of *Podargus strigoides* (Tawny Frogmouth) were also heard calling to each other during call-playback surveys. During call-playback surveys in January 2025 a *Ninox strenua* (Powerful Owl) was heard calling to the south and west in response to broadcast calls. During subsequent surveys a Powerful Owl was heard calling as it moved into the south of the subject land from the west and was observed within the study area. The individual primarily stayed in one large Ironbark tree near significant tree no. 300. *Ninox strenua* (Powerful Owl) is listed as Vulnerable under the BC Act 2016. A photo of the individual is presented in Plate G1.



Plate G1 *Ninox strenua* (Powerful Owl) within study area (15/01/2025)

BC Act 2016 and EPBC Act 1999 listed Vulnerable species *Calyptorhynchus lathami lathami* (South-eastern Glossy Black-Cockatoo) was heard calling as they flew over the study area. No individuals were observed foraging or breeding within the study area.

A family group of *Pomatostomus temporalis temporalis* (Grey-crowned Babblers) were observed within a neighbouring residential lot (Lot 1 DP 247568). No spherical stick nest associated with the species were observed within the study area however it is likely the species use the space as foraging habitat. *Pomatostomus temporalis temporalis* (Grey-crowned Babblers) are listed as Vulnerable under the BC Act 2016.

No other avifauna species listed as threatened under the BC Act 2016 or EPBC Act 1999 were recorded within the subject land. Common bird species observed within the study area include *Meliphaga lewinii* (Lewin's Honeyeater), *Dacelo novaeguineae* (Laughing Kookaburra), *Trichoglossus moluccanus* (Rainbow Lorikeet), *Lichenostomus chrysops* (Yellow-faced honeyeater), *Platycercus eximius* (Eastern Rosella), *Gerygone olivacea* (White-throated gerygone), *Cormobates leucophaea* (White-throated treecreeper) and *Coracina novaehollandiae* (Black-faced Cuckoo-shrike). Complete list of avifauna species detected on site have been presented in Table H1.

Reptiles

No reptile species were observed during field surveys.

Arboreal Mammals

Several *Trichosurus vulpecula* (Common Brushtail Possum) were observed in hollow bearing trees and surrounding trees during stagwatch and spotlight surveys and on many arboreal camera traps that were set. *Pseudocheirus peregrinus* (Common ringtail Possum) was observed during spotlighting and on one arboreal camera trap. A *Petaurus breviceps* (Sugar Glider) was observed once during spotlighting and captured several times on arboreal camera traps. Some images captured could not positively be identified as Sugar Glider or Squirrel Glider however the precautionary principal was applied and Squirrel Gliders were assumed to be using the site. *Petaurus norfolcensis* (Squirrel Glider) is listed as Vulnerable under the BC Act. Photos of potential Squirrel Glider specimens compared to definite Sugar Glider images are presented in Figures G2-G5.

Images of BC Act 2016 listed Vulnerable species *Phascogale tapoatafa* (Brush-tailed phascogale) were recorded on one arboreal camera trap (No. 22). A photo of the individual is presented in Plate G6.



Plate G2 Photo of Sugar Glider from Camera 5



Plate G3 Photo of potential Squirrel Glider on Camera 5 (14/06/2024)



Plate G4 Photo of Sugar Glider on Camera 11 (29/05/2024)



Plate G5 Photo of potential Squirrel Glider on Camera 11 (05/06/2024)



Plate G6. Brush-tailed Phascogale on Camera 22 - 23/06/2024 (Date on Camera is incorrect)

Other mammals commonly caught on arboreal camera traps were *Antechinus stuartii* (Brown Antechinus) and introduced species *Rattus rattus* (Black Rat). Photos of other species captured are shown in Plates G7 – G8. Complete results of camera trapping have been presented in Table G1 & G2.

Terrestrial Mammals

Diggings attributed to bandicoot were commonly observed within the study area and an individual determined to likely be *Isodon macrourus* (Northern Brown Bandicoot) was observed crossing the road. Individual *Macropus giganteus* (Eastern Grey Kangaroo) and *Macropus rufogriseus* (Red-necked Wallaby) were captured in the background of arboreal camera traps. A *Canis lupus dingo* (Dingo) was also captured investigating the bait station of arboreal camera no. 1.

Two species were captured during terrestrial trapping: *Antechinus stuartii* (Brown Antechinus) and introduced species *Rattus rattus* (Black Rat). Trapping results are presented in Table G3.

No terrestrial mammal species listed as threatened under the BC Act 2016 or EPBC Act 1999 were recorded within the subject land.



Plate G7 Feathertail Glider on Camera 6 (30/05/2024)



Plate G8 Brushtail Possum on Camera 4 (07/05/2024)

Table G1 Results of the Arboreal Camera Trapping Surveys within the study area (Cameras 1-12).

Species	1 Swift Enduro	2 Browning	3 Reconyx	4 Reconyx	5 Browning	6 Reconyx	7 Browning	8 Reconyx	9 Swift Enduro	10 Swift Enduro	11 Swift Enduro	12 Browning
Date Set/ Date Retrieved	07/05/2025 12/06/2024	07/05/2025 12/06/2024	07/05/2025 12/06/2024	07/05/2025 12/06/2024	07/05/2025 12/06/2024	07/05/2025 12/06/2024	07/05/2025 12/06/2024	07/05/2025 12/06/2024	07/05/2025 12/06/2024	07/05/2025 12/06/2024	07/05/2025 12/06/2024	07/05/2025 12/06/2024
Trapping days	36	36	36	36	36	36	36	36	36	36	36	36
<i>Trichosurus vulpecula</i> Common Brushtail Possum	X		X	X	X				X	X	X	X
<i>Pseudocheirus peregrinus</i> Ringtail Possum					X							
<i>Petaurus breviceps</i> Sugar Glider					X						X	
<i>Petaurus norfolcensis</i> Squirrel Glider					X						X	
<i>Acrobates pygmaeus</i> (Feathertail Glider)				X	X	X						
<i>Antechinus stuartii</i> (Brown Antechinus)		X	X	X	X	X		X	X	X		X
<i>Rattus rattus</i> Black Rat	X	X	X	X	X		X	X	X			X
<i>Mus musculus</i> (Mouse)												
<i>Macropus giganteus</i> Eastern Grey Kangaroo							X					
<i>Macropus rufogriseus</i> (Red-necked Wallaby)												
<i>Canis lupus dingo</i> (Dingo)	X											
<i>Bos taurus</i> (Cow)				X								
<i>Meliphaga lewinii</i> (Lewin's Honeyeater)												X
<i>Eopsaltria australis</i> (Yellow Robin)								X				

Table G2 Results of the Arboreal Camera Trapping Surveys within the study area (Cameras 13-24).

Species	13 Reconyx	14 Reconyx	15 Swift Enduro	16 Browning	17 Swift Enduro	18 Reconyx	19 Browning	20 Browning	21 Reconyx	22 Browning	23 Swift Enduro	24 Swift Enduro
Date Set/ Date Retrieved	12/05/2025 – 3/07/2024	12/05/2025 – 3/07/2024	12/05/2025 – 3/07/2024	12/05/2025 – 3/07/2024	12/05/2025 – 3/07/2024	12/05/2025 – 3/07/2024	12/05/2025 – 3/07/2024	12/05/2025 – 3/07/2024	12/05/2025 – 3/07/2024	12/05/2025 – 3/07/2024	12/05/2025 – 3/07/2024	12/05/2025 – 3/07/2024
Trapping days	21	21	21	21	21	21	21	21	21	21	21	21
<i>Trichosurus vulpecula</i> Common Brushtail Possum	X	X				X		X				
<i>Pseudocheirus peregrinus</i> Ringtail Possum												
<i>Petaurus breviceps</i> Sugar Glider		X		X	X	X	X		X			
<i>Petaurus norfolcensis</i> Squirrel Glider						X						
<i>Acrobates pygmaeus</i> (Feathertail Glider)												
<i>Antechinus stuartii</i> (Brown Antechinus)	X	X	X			X	X			X	X	X
<i>Rattus rattus</i> Black Rat	X	X	X		X	X	X			X	X	X
<i>Mus musculus</i> (Mouse)							X		X			
<i>Macropus giganteus</i> Eastern Grey Kangaroo												
<i>Macropus rufogriseus</i> (Red-necked Wallaby)							X		X			
<i>Canis lupus dingo</i> (Dingo)												
<i>Bos taurus</i> (Cow)												
<i>Meliphaga lewinii</i> (Lewin's Honeyeater)												
<i>Eopsaltria australis</i> (Yellow Robin)												

Table G3. Terrestrial trapping results

DATE	TRAP NO	SPECIES	SEX
Trapping period 16-20 September 2024			
Tuesday 17/09/2024	T16	<i>Rattus rattus</i> (Black Rat)	
	T17	<i>Antechinus stuartii</i> (Brown Antechinus)	Female with young
Wednesday 18/09/2024	T13	<i>Antechinus stuartii</i> (Brown Antechinus)	Female with young
Thursday 19/09/2024	T10	<i>Rattus rattus</i> (Black Rat)	Female
	T13	<i>Rattus rattus</i> (Black Rat)	Female
	T15	<i>Rattus rattus</i> (Black Rat)	Male
Friday 20/09/2024	T15	<i>Antechinus stuartii</i> (Brown Antechinus)	Female with young

Microchiropteran Bats

The following species were identified by Wedgetail Project Consulting (2024b) from Anabat recordings:

- *Chalinolobus gouldii* (Gould's wattled bat)
- *Chalinolobus morio* (Chocolate wattled bat)
- *Falsistrellus tasmaniensis* (Eastern False Pipistrelle) or *Scotorepens orion* (Eastern broad-nosed bat)
- *Micronomus norfolkensis* (Eastern Coastal Free-tailed Bat)
- *Miniopterus australis* (Little Bent-winged Bat)
- *Ozimops ridei* (Ride's Free-Tailed Bat)
- *Rhinolophus megaphyllus* (Eastern Horseshoe Bat)
- *Vespadelus pumilus* (Eastern Forest Bat)
- *Vespadelus vulturnus* (Little Forest Bat)

Falsistrellus tasmaniensis (Eastern False Pipistrelle), *Micronomus norfolkensis* (Eastern Coastal Free-tailed Bat) and *Miniopterus australis* (Little Bent-winged Bat) are listed as Vulnerable under the BC Act.

Koala Spot Assessment Technique

Survey results have been presented in Tables G5, G6 and G7. No Koala scats or evidence of koalas was observed. Results of the assessment are presented below:

Table G4. Categorisation of Koala activity into Low, Medium (normal) and High use categories based on use of mean activity level $\pm$ 99 per cent confidence intervals (nearest percentage equivalents) from each of the three area/population density categories.

Activity category	Low use	Medium (normal) use	High use
Area (density)			
East Coast (low)		$\geq 3.33\%$ but $\leq 12.59\%$	$> 12.59\%$
East Coast (med – high)	$< 22.52\%$	22.52% but $\leq 32.84\%$	$> 32.84\%$
Western Plains (med – high)	$< 35.84\%$	$\geq 35.84\%$ but $\leq 46.72\%$	$> 46.72\%$

The activity level for a SAT site is simply expressed as the percentage equivalent of the proportion of surveyed trees within the site that had Koala faecal pellet recorded within the prescribed search area. Given a sample of 90 trees with no Koala scats present, the activity category would be 0. The categorisation of Koala activity is shown in Table G4. Considering that no Koala Pellets were recorded, Koala usage would be likely very low at the time of survey. This low activity may be associated with a low-density Koala population.

Table G5: Results of the Spot Assessment Technique (SAT) survey #1 (0/01/2025).

SAT Tree No	Easting	Northing	DBH	Tree species	Result
1	386220	6392435	0.81	<i>Eucalyptus tereticornis</i>	No evidence
2	386220	6392428	0.34	<i>Eucalyptus fibrosa</i>	No evidence
3	386220	6392430	0.42	<i>Eucalyptus tereticornis</i>	No evidence
4	386215	6392429	0.51	<i>Eucalyptus tereticornis</i>	No evidence
5	386213	6392431	0.18, 0.16	<i>Eucalyptus fibrosa</i>	No evidence
6	386213	6392427	0.28	<i>Corymbia maculata</i>	No evidence
7	386215	6392421	0.38, 0.22	<i>Eucalyptus fibrosa</i>	No evidence
8	386205	6392414	0.19	<i>Corymbia maculata</i>	Macropod scat
9	386203	6392409	0.70	<i>Eucalyptus tereticornis</i>	No evidence. No evidence
10			0.15, 0.14, 0.10	<i>Corymbia maculata</i>	No evidence
11	386202	6392400	0.18, 0.10	<i>Corymbia maculata</i>	No evidence
12			0.17, 0.15, 0.10	<i>Corymbia maculata</i>	No evidence
13	386206	6392400			
14	386202	6392396	0.22	<i>Eucalyptus fibrosa</i>	No evidence
15	386201	6392389	0.39	<i>Corymbia maculata</i>	No evidence, larger pock marks (Plate G1)
16	386197	6392388	0.97	<i>Eucalyptus fibrosa</i>	No evidence
17	386218	6392431	0.49	<i>Corymbia maculata</i>	No evidence
18	386221	6392439	0.45	<i>Eucalyptus tereticornis</i>	No evidence
19	386225	6392446	0.53	<i>Eucalyptus tereticornis</i>	No evidence
20	386229	6392447	0.32	<i>Eucalyptus tereticornis</i>	No evidence
21	386229	6392446	0.29	<i>Eucalyptus fibrosa</i>	No evidence. Old Common Brushtail Possum scat
22	386231	6392451	0.19	<i>Corymbia maculata</i>	No evidence
23	386228	6392449	0.24	<i>Corymbia maculata</i>	No evidence
24	386230	6392451	0.28	<i>Eucalyptus fibrosa</i>	No evidence
25	386234	6392452	0.28	<i>Eucalyptus fibrosa</i>	No evidence
26	386234	6392458	0.27	<i>Eucalyptus fibrosa</i>	No evidence
27	386233	6392459	0.18	<i>Eucalyptus fibrosa</i>	No evidence
28	386233	6392459	0.35	<i>Eucalyptus siderophloia</i>	No evidence
29	386231	6392464	0.24	<i>Eucalyptus fibrosa</i>	No evidence
30	386233	6392461	0.32	<i>Eucalyptus siderophloia</i>	No evidence
		6392462	0.33	<i>Eucalyptus fibrosa</i>	No evidence. Macropod scat

Table G6: Results of the Spot Assessment Technique (SAT) survey #2 (14/01/2025).

SAT Tree No	Easting	Northing	DBH	Tree species	Result
1	385690	6391034	0.72	<i>Eucalyptus tereticornis</i>	No evidence. Deep scratches observed on trunk, however were not consistent with Koala
2	385697	6391042	0.18	<i>Corymbia maculata</i>	No evidence
3	385697	6391039	0.10	<i>Eucalyptus siderophloia</i>	No evidence
4	385692	6391039	0.12	<i>Eucalyptus tereticornis</i>	No evidence
5	385696	6391039	0.30	<i>Eucalyptus tereticornis</i>	No evidence
6	385693	6391044	0.26	<i>Eucalyptus tereticornis</i>	No evidence. Bird scat observed.
7	385701	6391045	0.84	<i>Eucalyptus fibrosa</i>	No evidence
8	385682	6391047	0.29	<i>Eucalyptus tereticornis</i>	No evidence
9	385679	6391045	0.14	<i>Eucalyptus tereticornis</i>	No evidence
10	385682	6391046	0.11	<i>Eucalyptus tereticornis</i>	No evidence
11	385684	6391047	0.21	<i>Eucalyptus tereticornis</i>	No evidence
12	385682	6391044	0.38	<i>Eucalyptus tereticornis</i>	No evidence
13	385682	6391043	0.24	<i>Eucalyptus tereticornis</i>	No evidence
14	385680	6391043	0.10	<i>Eucalyptus tereticornis</i>	No evidence
15	385684	6391041	0.13	<i>Eucalyptus tereticornis</i>	No evidence
16	385683	6391040	0.35	<i>Eucalyptus tereticornis</i>	No evidence
17	385679	6391037	0.27	<i>Eucalyptus tereticornis</i>	No evidence
18	385678	6391037	0.22	<i>Eucalyptus tereticornis</i>	No evidence
19	385682	6391033	0.24	<i>Eucalyptus tereticornis</i>	No evidence. Fine scratches on trunk.
20	385681	6391031	0.39	<i>Eucalyptus tereticornis</i>	No evidence
21	385677	6391032	0.18	<i>Eucalyptus tereticornis</i>	No evidence
22	385678	6391030	0.39	<i>Eucalyptus tereticornis</i>	No evidence. Fine scratches on trunk.
23	385678	6391031	0.19	<i>Eucalyptus tereticornis</i>	No evidence
24	385679	6391029	0.14	<i>Eucalyptus tereticornis</i>	No evidence
25	385679	6391027	0.27	<i>Corymbia maculata</i>	No evidence
26	385691	6391035	0.25	<i>Corymbia maculata</i>	No evidence
27	385693	6391033	0.54	<i>Eucalyptus tereticornis</i>	No evidence
28	385693	6391031	0.47	<i>Corymbia maculata</i>	No evidence
29	385691	6391031	0.12	<i>Corymbia maculata</i>	No evidence
30	385692	6391030	0.18	<i>Corymbia maculata</i>	No evidence. Fine scratches on trunk.

Table G7: Results of the Spot Assessment Technique (SAT) survey #3 (29/08/2024).

SAT Tree No	Easting	Northing	DBH	Tree species	Result
1	385404	6390424	0.46	<i>Eucalyptus tereticornis</i>	No evidence
2	385402	6390416	0.40, 0.22	<i>Corymbia maculata</i>	No evidence
3	385395	6390413	0.13, 0.19	<i>Eucalyptus tereticornis</i>	No evidence
4	385398	6390414	0.24	<i>Eucalyptus umbra</i>	No evidence
5	385395	6390417	0.14	<i>Corymbia maculata</i>	No evidence
6	385394	6390418	0.31, 0.12	<i>Eucalyptus tereticornis</i>	No evidence
7	385395	6390418	0.32	<i>Corymbia maculata</i>	No evidence
8	385388	6390418	0.17, 0.12	<i>Eucalyptus siderophloia</i>	No evidence
9	385393	6390417	0.11	<i>Corymbia maculata</i>	No evidence
10	385393	6390417	0.32	<i>Eucalyptus tereticornis</i>	No evidence
11	385391	6390421	0.10	<i>Eucalyptus tereticornis</i>	No evidence
12	385397	6390424	0.24	<i>Eucalyptus tereticornis</i>	No evidence
13	385397	6390421	0.24	<i>Eucalyptus siderophloia</i>	No evidence
14	385402	6390421	0.11	<i>Eucalyptus tereticornis</i>	No evidence
15	385400	6390431	0.34	<i>Eucalyptus siderophloia</i>	No evidence
16	385397	6390430	0.26	<i>Eucalyptus tereticornis</i>	No evidence
17	385399	6390434	0.29	<i>Eucalyptus tereticornis</i>	No evidence
18	385399	6390436	0.17	<i>Eucalyptus tereticornis</i>	No evidence
19	385407	6390439	0.12	<i>Eucalyptus siderophloia</i>	No evidence
20	385404	6390431	0.35	<i>Eucalyptus siderophloia</i>	No evidence
21	385403	6390426	0.28	<i>Eucalyptus tereticornis</i>	No evidence
22	385408	6390430	0.24	<i>Corymbia maculata</i>	No evidence
23	385409	6390428	0.36	<i>Eucalyptus tereticornis</i>	No evidence
24	385407	6390429	0.25	<i>Eucalyptus siderophloia</i>	No evidence
25	385407	6390429	0.14	<i>Corymbia maculata</i>	No evidence
26	385409	6390422	0.30	<i>Eucalyptus umbra</i>	No evidence. Common Brushtail Possum scat
27	385415	6390425	0.33	<i>Eucalyptus siderophloia</i>	No evidence
28	385415	6390413	0.14	<i>Eucalyptus tereticornis</i>	No evidence
29	385408	6390411	0.22	<i>Eucalyptus tereticornis</i>	No evidence
30	385408	6390409	0.18	<i>Eucalyptus tereticornis</i>	No evidence



Plate G1: Larger pock marks observed on trunk.

INCIDENTIAL OBSERVATIONS AND SECONDARY INDICATIONS

A number of incidental observations and secondary indications of fauna were observed during the survey and included:

- A large number of diggings attributed to bandicoot were commonly found throughout the study area.
- Scats consistent with that of a macropod were found occasionally throughout the site.

Appendix H: Total Vertebrate Fauna List

Family sequencing and taxonomy follow for each fauna class:

Fish

Allen, G.R., Midgley, S.H. & Allen, M. (2002). *Field Guide to the Freshwater Fishes of Australia*. Western Australian Museum, Perth.

Herpetofauna

Cogger, H.G. (2014). *Reptiles and Amphibians of Australia* (7th edn.). CSIRO Publishing.

Birds

Pizzey and Knight (2012) (9th edn).

Mammals

Van Dyck, S. and Strahan, R. (Ed) (2008). *The Mammals of Australia* (3rd edn). New Holland Publishers, Australia – Churchill, S. (2008). *Australian Bats*. (2nd edn.). Allen & Unwin Australia.

(?) - Indicates a species identified without certainty or to a Genus level only.

* - Indicates an introduced species.

Threatened species addressed within this assessment appear in **bold** font.

Introduced species are indicated by an asterisk ("*").

The following standard abbreviations are used to indicate subspecific taxa:

subsp. -subspecies

var.- variety

x - hybrid between the two indicated species

Biodiversity Conservation Act 2016 (BC Act)

V Vulnerable

E1 Endangered

E2 Endangered Population

E4A Critically Endangered Population

Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

V **Vulnerable**

E **Endangered**

CE **Critically Endangered Population**

M **Migratory**

Regionally Significant Fauna Species.

+ Region includes Gosford, Wyong, Cessnock, Maitland, Lake Macquarie, Newcastle and Port Stephens LGA's. Produced from Stage 1 of the LHCCREMS – Regional Biodiversity Conservation Strategy.

Observation Type

O - Observed (sighted)

W - Heard call

OW – Observed and heard call

X - In scat

P – Scat

T - Trapped or netted

H – Hair, feathers or skin

A - Stranded/Beached

G – Crushed cones

R – Road Kill

D – Dog Kill

Q – Camera

C – Cat Kill

V – Fox Kill

K – Dead

S – Shot

I – Fossil/subfossil

FB – Burrow

F – Tracks, scratching

Z – In raptor/owl Pellet

U – Ultrasonic recording

M - Miscellaneous

E – Nest/roost

B - Burnt

Y – Bones, teeth or shell

N – Not located

AR – Acoustic Recording

Table H1 Total Vertebrate Fauna List

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	REGIONALLY SIGNIFICANT	OBSERVATION TYPE
Phylum - Chordata					
Subphylum - Vertebrata					
Class Amphibia - Amphibians					
Order Salientia - Frogs					
Family Myobatrachidae - 'Southern Frogs'					
<i>Crinia signifera</i>	Common Eastern Froglet				W ^{Wildthing}
<i>Limnodynastes peronii</i>	Striped Marsh Frog				W ^{Wildthing}
<i>Limnodynastes tasmaniensis</i>	Spotted Grass Frog			+	W ^{Wildthing}
Family Hylidae - Tree Frogs					
<i>Litoria latopalmata</i>	Broad-palmed Frog				OW ^{Wildthing}
Class Aves - Birds					
Family Anatidae - Ducks, Swans and Geese					
<i>Chenonetta jubata</i>	Australian Wood Duck				O ^{Wildthing}
<i>Columba leucomela</i>	White-headed Pigeon				W ^{Wildthing}
<i>Leucosarcia melanoleuca</i>	Wonga Pigeon				W ^{Wildthing}
Family Falconidae - Falcons					
<i>Falco peregrinus</i>	Peregrine Falcon			+	OW ^{Wildthing}
Family Charadriidae Plover, Dotterels, Lapwings					
<i>Vanellus miles</i>	Masked Lapwing				OW ^{Wildthing}
Family Cacatuidae - Cockatoos and Corellas					

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	REGIONALLY SIGNIFICANT	OBSERVATION TYPE
<i>Cacatua sanguinea</i>	Little Corella				OW ^{Wedgetail}
<i>Calyptrorhynchus lathamii</i>	Glossy Black-Cockatoo	V			OW ^{Wildthing}
Family Psittacidae - Parrots, Rosellas and Lorikeets					
<i>Alisterus scapularis</i>	King Parrot				OW ^{Wildthing}
<i>Platycercus eximius</i>	Eastern Rosella				OW ^{Wildthing}
<i>Trichoglossus haematodus</i>	Rainbow Lorikeet				OW ^{Wildthing, Wedgetail}
Family Cuculidae - Cuckoos					
<i>Cacomantis flabelliformis</i>	Fan-tailed Cuckoo				OW ^{Wildthing}
<i>Scythrops novaehollandiae</i>	Channel-billed Cuckoo				OW ^{Wildthing}
Family Podargidae - Frogmouth					
<i>Podargus strigoides</i>	Tawny Frogmouth				
Family Strigidae - Hawk-Owls					
<i>Ninox connivens</i>	Barking Owl	V			
<i>Ninox novaeseelandiae</i>	Southern Boobook				OW ^{Wildthing, Wedgetail}
<i>Ninox strenua</i>	Powerful Owl	V			OW ^{Wildthing}
Family Halcyonidae - Tree Kingfishers					
<i>Dacelo novaeguineae</i>	Laughing Kookaburra				OW ^{Wildthing}
Family Climacteridae - Treecreepers					
<i>Cormobates leucophaea</i>	White-throated Treecreeper				OW ^{Wildthing}
Family Neosittidae – Sittella					
<i>Daphoenositta chrysoptera</i>	Varied Sittella	V			OW ^{Wildthing}
Family Ptilonorhynchidae - Bowerbirds					
<i>Ptilonorhynchus violaceus</i>	Satin Bowerbird				E ^{Wedgetail}

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	REGIONALLY SIGNIFICANT	OBSERVATION TYPE
Family Maluridae					
<i>Malurus cyaneus</i>	Superb Fairy-wren				OW ^{Wildthing}
Family Pardalotidae - Pardalotes, Gerygones, Scrubwrens, Heathwrens and Thornbills					
<i>Acanthiza pusilla</i>	Brown Thornbill				OW ^{Wildthing}
<i>Gerygone olivacea</i>	White-throated Gerygone				W ^{Wildthing}
<i>Pardalotus punctatus</i>	Spotted Pardalote				W ^{Wildthing}
Family Meliphagidae - Honeyeaters					
<i>Acanthorhynchus tenuirostris</i>	Eastern Spinebill				OW ^{Wildthing}
<i>Caligavis chrysops</i>	Yellow-faced Honeyeater				OW ^{Wildthing}
<i>Meliphaga lewinii</i>	Lewin's Honeyeater				OW ^{Wildthing}
<i>Philemon corniculatus</i>	Noisy Friarbird				OW ^{Wildthing}
Family Pomatostomidae Australian Babblers					
<i>Pomatostomus temporalis temporalis</i>	Grey-crowned Babbler	V		+	OW ^{Wildthing}
Family Petroicidae - Robins and Jacky Winter					
<i>Eopsaltria australis</i>	Eastern Yellow Robin				OW ^{Wildthing}
Family Pachycephalidae - Whistlers, Shrike-tit and Shrike-thrushes					
<i>Colluricincla harmonica</i>	Grey Shrike-thrush				W ^{Wildthing}
<i>Pachycephala pectoralis</i>	Golden Whistler				W ^{Wildthing}
Family Monarchidae - Monarchs, Flycatchers and Magpie-Lark					
<i>Grallina cyanoleuca</i>	Magpie-lark				OW ^{Wildthing}
Family Rhipiduridae - Fantails					

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	REGIONALLY SIGNIFICANT	OBSERVATION TYPE
<i>Rhipidura albiscapa</i> syn. <i>Rhipidura fuliginosa</i>	Grey Fantail				OW ^{Wildthing}
Family Campephagidae - Cuckoo-shrikes and Trillers					
<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike				OW ^{Wildthing}
Family Artamidae - Wood-swallows, Butcherbirds, Magpie and Currawongs					
<i>Cracticus nigrogularis</i>	Pied Butcherbird				OW ^{Wildthing}
<i>Cracticus tibicen</i> syn. <i>Gymnorhina tibicen</i>	Australian Magpie				OW ^{Wildthing, Wedgetail}
Family Corvidae - Crows, Raven					
<i>Corvus orru</i>	Torresian Crow				OW ^{Wildthing}
Class Mammalia - Mammals					
Subclass Marsupialia - Marsupials					
Order Dasyuromorphia – Carnivorous Marsupials					
Family Dasyuridae - Dasyurids					
<i>Antechinus stuarti</i>	Brown Antechinus				QT ^{Wildthing}
<i>Phascogale tapoatafa</i>	Brush-tailed Phascogale	V			Q ^{Wildthing}
Order Peramelemorphia					
Family Peramelidae - Bandicoots					
<i>Isodon macrourus</i>	Northern Brown Bandicoot				OF ^{Wildthing}
Order Diprotodontia					
Suborder Phalangerida					
Superfamily - Petauroidea					
Family Petauridae					

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	REGIONALLY SIGNIFICANT	OBSERVATION TYPE
<i>Petaurus breviceps</i>	Sugar Glider			+	QO ^{Wildthing}
<i>Petaurus norfolcensis</i>	Squirrel Glider	V			Q ^{Wildthing}
Family Pseudocheiridae - Ringtail Possums and Greater Glider					
<i>Pseudocheirus peregrinus</i>	Common Ringtail Possum				QO ^{Wildthing}
Family - Acrobatidae					
<i>Acrobates pygmaeus</i>	Narrow-toed Feathertail Glider			+	Q ^{Wildthing}
Superfamily - Phalangeroidea					
Family Phalangeridae - Brushtail Possums					
<i>Trichosurus vulpecula</i>	Common Brushtail Possum				QO ^{Wildthing, Wedgetail}
Family Macropodidae - Kangaroos, Wallabies					
<i>Macropus giganteus</i>	Eastern Grey Kangaroo			+	QO ^{Wildthing}
<i>Notamacropus rufogriseus</i> syn. <i>Macropus rufogriseus</i>	Red-necked Wallaby			+	Q ^{Wildthing}
Subclass Eutheria - Eutherian Mammals					
Order Chiroptera					
Suborder Megachiroptera - Megabats					
Family Pteropodidae - Fruit Bats					
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	V	V		OW ^{Wildthing}
Suborder Microchiroptera					
Family Rhinolophidae - Horseshoe-bats					
<i>Rhinolophus megaphyllus</i>	Eastern Horseshoe-bat			+	
Family Molossidae - Freetail-bats					
<i>Micronomus norfolkensis</i>	Eastern Freetail-bat	V			

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	REGIONALLY SIGNIFICANT	OBSERVATION TYPE
<i>Ozimops ridei</i> syn. <i>Mormopterus</i> sp. 2					
Family Vespertilionidae - Plain-nosed Bats					
<i>Chalinolobus gouldii</i>	Gould's Wattled Bat				U ^{Wedgetail}
<i>Chalinolobus morio</i>	Chocolate Wattled Bat				U ^{Wedgetail}
<i>Falsistrellus tasmaniensis</i>	Eastern Falsistrelle	V			U ^{Wedgetail}
<i>Miniopterus australis</i>	Little Bentwing-bat	V			U ^{Wedgetail}
<i>Scotorepens orion</i>	Eastern Broad-nosed Bat				U ^{Wedgetail}
<i>Vespadelus pumilus</i>	Eastern Forest Bat			+	U ^{Wedgetail}
<i>Vespadelus vulturnus</i>	Little Forest Bat				U ^{Wedgetail}
Order Rodentia					
* <i>Mus musculus</i>	House Mouse				Q ^{Wildthing}
* <i>Rattus rattus</i>	Black Rat			T	QT ^{Wildthing}
Order Carnivora					
Family Canidae					
* <i>Canis familiaris</i>	Dog				O ^{Wedgetail}
<i>Canis familiaris dingo</i>	Dingo				Q ^{Wildthing}
Family Bovidae					
* <i>Bos taurus</i>	Cattle				QO ^{Wildthing}
* <i>Capra hircus</i>	Goat			O	Y ^{Wildthing}

Appendix I Tree Survey Results

Tree Data Key for Table I1.

- **DBH** – Diameter at Breast Height. Tree trunk diameter measured at breast height (1.4 metres above ground level). Fabric diameter tape used which assumes a circular cross section.
- **Tree Height** – Estimated with the use of an inclinometer and rangefinder (metres).
- **Coordinates - GDA - 2020**
- **Habitat/Hollows** –
 - Small** – <8cm suitable for species such as microchiropteran bats and small gliders
 - Medium** – 8-20cm suitable for species such as Gliders and Possums
 - Large** - >20cm suitable for species such as Owls
 - Spout:** Hollow opening towards sky offering little protection from the weather.

Table I1: Details of significant trees within the subject land and within close proximity (Wedgetail 2024a).

No.	Species of Tree	Easting	Northing	DBH (m)	Hollow Type			Comments	Removal Required?
					Small	Medium	Large		
1	<i>Eucalyptus tereticornis</i> Forest Red Gum	386461	6392874	58				Koala Feed Tree	Unlikely
2	<i>Eucalyptus tereticornis</i>	386454	6392862	33				Koala Feed Tree	Unlikely
3	<i>Eucalyptus tereticornis</i>	386442	6392845	5				Koala Feed Tree	Unlikely
4	<i>Eucalyptus tereticornis</i>	386434	6392831	26				Koala Feed Tree	Unlikely
5	<i>Eucalyptus tereticornis</i>	386433	6392825	32				Koala Feed Tree	Unlikely
6	<i>Eucalyptus tereticornis</i>	386426	6392810	64.5				Koala Feed Tree	Yes
7	<i>Eucalyptus tereticornis</i>	386419	6392801	106	1			Koala Feed Tree	Unlikely
8	<i>Eucalyptus tereticornis</i>	386418	6392799	78				Koala Feed Tree	Unlikely
9	<i>Melaleuca styphelioides</i> Prickly-leaved Tea Tree	386417	6392793	35.5	1	1			Yes
10	<i>Eucalyptus tereticornis</i>	386410	6392783	48				Koala Feed Tree	Yes
11	<i>Eucalyptus tereticornis</i>	386410	6392783	28				Koala Feed Tree	Yes
12	<i>Eucalyptus tereticornis</i>	386394	6392749	47				Koala Feed Tree	Yes
13	<i>Eucalyptus tereticornis</i>	386382	6392732	11.5				Koala Feed Tree	Unlikely
14	<i>Eucalyptus tereticornis</i>	386381	6392732	11.5				Koala Feed Tree	Unlikely
15	<i>Eucalyptus tereticornis</i>	386382	6392731	27.5				Koala Feed Tree	Unlikely
16	<i>Eucalyptus paniculata</i> Grey Ironbark	386373	6392709	58	1	1	1		Yes
17	<i>Eucalyptus tereticornis</i>	386359	6392689	6.5				Koala Feed Tree	Unlikely
18	<i>Eucalyptus tereticornis</i>	386358	6392684	20				Koala Feed Tree	Yes
19	<i>Eucalyptus tereticornis</i>	386353	6392676	80				Koala Feed Tree	Unlikely
20	<i>Eucalyptus tereticornis</i>	386346	6392669	21				Koala Feed Tree	Unlikely
21	<i>Eucalyptus tereticornis</i>	386345	6392667	34				Koala Feed Tree	Unlikely
22	<i>Eucalyptus tereticornis</i>	386345	6392664	24				Koala Feed Tree	Unlikely
23	<i>Eucalyptus tereticornis</i>	386342	6392661	6.5				Koala Feed Tree	Unlikely

No.	Species of Tree	Easting	Northing	DBH (m)	Hollow Type			Comments	Removal Required?
					Small	Medium	Large		
24	<i>Eucalyptus tereticornis</i>	386341	6392661	6.5				Koala Feed Tree	Unlikely
25	<i>Eucalyptus fibrosa</i> Broad-leaved Ironbark	386264	6392511	92				Small stick nest in tree	Yes
26	<i>Eucalyptus tereticornis</i>	386224	6392446	56				Koala Feed Tree	Unlikely
27	<i>Eucalyptus tereticornis</i>	386228	6392447	30				Koala Feed Tree	Unlikely
28	<i>Eucalyptus tereticornis</i>	386227	6392440	43				Koala Feed Tree	Yes
29	<i>Eucalyptus tereticornis</i>	386221	6392429	74				Koala Feed Tree	Yes
30	<i>Eucalyptus tereticornis</i>	386219	6392428	44				Koala Feed Tree	Yes
31	<i>Eucalyptus tereticornis</i>	386218	6392426	46				Koala Feed Tree	Yes
32	<i>Eucalyptus tereticornis</i>	386206	6392402	60				Koala Feed Tree	Unlikely
33	<i>Eucalyptus tereticornis</i>	386167	6392224	36				Koala Feed Tree	Unlikely
34	<i>Eucalyptus fibrosa</i>	386167	6392208	55.5	1				Yes
35	<i>Eucalyptus tereticornis</i>	386155	6392162	11.5				Koala Feed Tree	Yes
36	<i>Eucalyptus fibrosa</i>	386137	6392078	107.5	4	1	1		Yes
37	<i>Eucalyptus tereticornis</i>	386095	6392013	39				Koala Feed Tree	Unlikely
38	<i>Eucalyptus fibrosa</i>	386113	6392046	48.5	1				Yes
39	Stag	386044	6391889	73	2				Yes
40	<i>Corymbia maculata</i> Spotted Gum	386040	6391872	55.5	1				Yes
41	Stag	385977	6391781	38.5		1			Yes
42	<i>Eucalyptus punctata</i>	385979	6391780	34.5				Koala Feed Tree	Yes
43	<i>Eucalyptus punctata</i>	385979	6391779	19				Koala Feed Tree	Yes
44	<i>Eucalyptus tereticornis</i>	385970	6391777	127				Koala Feed Tree	Unlikely
45	<i>Eucalyptus tereticornis</i>	385961	6391765	36				Koala Feed Tree	Unlikely
46	<i>Eucalyptus tereticornis</i>	385960	6391762	73				Koala Feed Tree	Unlikely
47	<i>Eucalyptus tereticornis</i>	385958	6391761	60				Koala Feed Tree	Unlikely

No.	Species of Tree	Easting	Northing	DBH (m)	Hollow Type			Comments	Removal Required?
					Small	Medium	Large		
48	<i>Eucalyptus tereticornis</i>	385956	6391758	33.5				Koala Feed Tree	Unlikely
49	Stag	385941	6391734	173	5	1			Yes
50	<i>Eucalyptus punctata</i>	385931	6391734	35.5				Koala Feed Tree	Unlikely
51	<i>Eucalyptus punctata</i>	385937	6391739	40				Koala Feed Tree	Unlikely
52	<i>Eucalyptus tereticornis</i>	385931	6391725	52				Koala Feed Tree	Yes
53	<i>Eucalyptus tereticornis</i>	385932	6391722	14.5				Koala Feed Tree	Yes
54	<i>Eucalyptus tereticornis</i>	385932	6391721	18.5				Koala Feed Tree	Yes
55	<i>Eucalyptus tereticornis</i>	385925	6391722	31				Koala Feed Tree	Unlikely
56	Stag	385919	6391710	58.5		1		Koala Feed Tree Bower bird nest at base of tree	Yes
57	<i>Eucalyptus tereticornis</i>	385910	6391698	69				Koala Feed Tree	Unlikely
58	Stag	385911	6391701	28.5	3				Unlikely
59	Stag	385915	6391700	29.5	1				Yes
60	<i>Eucalyptus tereticornis</i>	385909	6391690	45				Koala Feed Tree	Yes
61	<i>Eucalyptus tereticornis</i>	385906	6391689	16				Koala Feed Tree	Yes
62	<i>Eucalyptus tereticornis</i>	385905	6391687	32				Koala Feed Tree	Yes
63	<i>Eucalyptus tereticornis</i>	385905	6391684	44.5				Koala Feed Tree	Yes
64	<i>Eucalyptus tereticornis</i>	385903	6391675	61				Koala Feed Tree	Yes
65	<i>Eucalyptus tereticornis</i>	385901	6391665	74.5				Koala Feed Tree	Yes
66	<i>Eucalyptus tereticornis</i>	385898	6391666	39				Koala Feed Tree	Yes
67	<i>Eucalyptus tereticornis</i>	385893	6391662	40				Koala Feed Tree	Unlikely
68	<i>Eucalyptus tereticornis</i>	385888	6391649	46.5				Koala Feed Tree	Unlikely
69	Stag	385883	6391617	56	3				Yes
70	<i>Eucalyptus umbra</i> Broad-leaved White Mahogany	385889	6391610	31.5	1				Yes

No.	Species of Tree	Easting	Northing	DBH (m)	Hollow Type			Comments	Removal Required?
					Small	Medium	Large		
71	<i>Eucalyptus tereticornis</i>	385870	6391585	26.5				Koala Feed Tree	Yes
72	<i>Eucalyptus tereticornis</i>	385864	6391578	13.5				Koala Feed Tree	Unlikely
73	<i>Eucalyptus tereticornis</i>	385864	6391579	43.5				Koala Feed Tree	Unlikely
74	<i>Eucalyptus tereticornis</i>	385857	6391583	45				Koala Feed Tree	Unlikely
75	<i>Eucalyptus tereticornis</i>	385852	6391546	47.5				Koala Feed Tree	Yes
76	<i>Eucalyptus tereticornis</i>	385848	6391546	29				Koala Feed Tree	Unlikely
77	<i>Eucalyptus tereticornis</i>	385852	6391540	57.5				Koala Feed Tree	Yes
78	<i>Eucalyptus tereticornis</i>	385849	6391542	32.5				Koala Feed Tree	Yes
79	<i>Eucalyptus tereticornis</i>	385849	6391539	26.5				Koala Feed Tree	Yes
80	<i>Corymbia maculata</i>	385826	6391479	73	1				Unlikely
81	<i>Corymbia maculata</i>	385817	6391438	63.5	1				Yes
82	<i>Eucalyptus tereticornis</i>	385807	6391414	16				Koala Feed Tree	Unlikely
83	<i>Corymbia maculata</i>	385808	6391402	76.5	3				Yes
84	<i>Eucalyptus tereticornis</i>	385806	6391404	23.5				Koala Feed Tree	Yes
85	<i>Eucalyptus paniculata</i>	385799	6391386	57	1				Unlikely
86	<i>Eucalyptus tereticornis</i>	385795	6391385	71.5				Koala Feed Tree	Unlikely
87	<i>Eucalyptus tereticornis</i>	385798	6391379	21.5				Koala Feed Tree	Unlikely
88	<i>Eucalyptus tereticornis</i>	385775	6391287	24.5				Koala Feed Tree	Yes
89	<i>Eucalyptus tereticornis</i>	385774	6391279	123				Koala Feed Tree	Yes
90	<i>Eucalyptus tereticornis</i>	385756	6391240	41				Koala Feed Tree	Yes
91	<i>Eucalyptus tereticornis</i>	385760	6391236	141	1	1	2	Koala Feed Tree	Yes
92	<i>Eucalyptus tereticornis</i>	385757	6391223	61	1			Koala Feed Tree	Yes
93	<i>Eucalyptus tereticornis</i>	385753	6391222	18.5				Koala Feed Tree	Yes
94	<i>Eucalyptus tereticornis</i>	385755	6391212	23.5				Koala Feed Tree	Yes
95	<i>Eucalyptus tereticornis</i>	385752	6391210	50				Koala Feed Tree	Yes

No.	Species of Tree	Easting	Northing	DBH (m)	Hollow Type			Comments	Removal Required?
					Small	Medium	Large		
96	<i>Eucalyptus tereticornis</i>	385748	6391200	92				Koala Feed Tree	Yes
97	<i>Eucalyptus tereticornis</i>	385742	6391193	38				Koala Feed Tree	Yes
98	<i>Eucalyptus tereticornis</i>	385735	6391189	110				Koala Feed Tree	Yes
99	<i>Eucalyptus tereticornis</i>	385725	6391152	45				Koala Feed Tree	Yes
100	<i>Eucalyptus tereticornis</i>	385722	6391140	14				Koala Feed Tree	Yes
101	<i>Eucalyptus tereticornis</i>	385721	6391136	39				Koala Feed Tree	Yes
102	<i>Eucalyptus tereticornis</i>	385721	6391135	30				Koala Feed Tree	Yes
103	<i>Eucalyptus tereticornis</i>	385724	6391133	44				Koala Feed Tree	Yes
104	<i>Eucalyptus tereticornis</i>	385704	6391097	118.5				Koala Feed Tree	Yes
105	<i>Eucalyptus tereticornis</i>	385696	6391090	14.5				Koala Feed Tree	Unlikely
106	<i>Eucalyptus tereticornis</i>	385688	6391068	54				Koala Feed Tree	Yes
107	<i>Eucalyptus tereticornis</i>	385683	6391061	52				Koala Feed Tree	Unlikely
108	<i>Eucalyptus tereticornis</i>	385680	6391057	119				Koala Feed Tree	Unlikely
109	<i>Eucalyptus tereticornis</i>	385679	6391039	28.5				Koala Feed Tree	Yes
110	<i>Eucalyptus tereticornis</i>	385678	6391043	12.5				Koala Feed Tree	Yes
111	<i>Eucalyptus tereticornis</i>	385677	6391044	11.5				Koala Feed Tree	Unlikely
112	<i>Eucalyptus tereticornis</i>	385678	6391040	19.5				Koala Feed Tree	Yes
113	<i>Eucalyptus tereticornis</i>	385678	6391041	38				Koala Feed Tree	Yes
114	<i>Eucalyptus tereticornis</i>	385677	6391042	22.5				Koala Feed Tree	Yes
115	<i>Eucalyptus tereticornis</i>	385681	6391036	12				Koala Feed Tree	Yes
116	<i>Eucalyptus tereticornis</i>	385674	6391039	25				Koala Feed Tree	Unlikely
117	<i>Eucalyptus tereticornis</i>	385676	6391038	13.5				Koala Feed Tree	Unlikely
118	<i>Eucalyptus tereticornis</i>	385678	6391035	30.5				Koala Feed Tree	Yes
119	<i>Eucalyptus tereticornis</i>	385678	6391033	25				Koala Feed Tree	Yes
120	<i>Eucalyptus tereticornis</i>	385676	6391035	19.5				Koala Feed Tree	Yes

No.	Species of Tree	Easting	Northing	DBH (m)	Hollow Type			Comments	Removal Required?
					Small	Medium	Large		
121	<i>Eucalyptus tereticornis</i>	385676	6391033	16				Koala Feed Tree	Yes
122	<i>Eucalyptus tereticornis</i>	385674	6391034	18				Koala Feed Tree	Unlikely
123	<i>Eucalyptus tereticornis</i>	385677	6391030	24.5				Koala Feed Tree	Yes
124	<i>Eucalyptus tereticornis</i>	385677	6391031	23.5				Koala Feed Tree	Yes
125	<i>Eucalyptus tereticornis</i>	385678	6391030	37				Koala Feed Tree	Yes
126	<i>Eucalyptus tereticornis</i>	385675	6391032	13.5				Koala Feed Tree	Yes
127	<i>Eucalyptus tereticornis</i>	385677	6391030	16.5				Koala Feed Tree	Yes
128	<i>Eucalyptus tereticornis</i>	385676	6391032	37				Koala Feed Tree	Yes
129	<i>Eucalyptus tereticornis</i>	385675	6391030	129				Koala Feed Tree	Yes
130	<i>Eucalyptus tereticornis</i>	385676	6391028	12				Koala Feed Tree	Yes
131	<i>Eucalyptus tereticornis</i>	385673	6391027	20				Koala Feed Tree	Yes
132	<i>Eucalyptus tereticornis</i>	385675	6391027	39.5				Koala Feed Tree	Yes
133	<i>Eucalyptus tereticornis</i>	385674	6391024	18				Koala Feed Tree	Yes
134	<i>Eucalyptus tereticornis</i>	385674	6391024	39				Koala Feed Tree	Yes
135	<i>Eucalyptus tereticornis</i>	385674	6391022	46				Koala Feed Tree	Yes
136	<i>Eucalyptus tereticornis</i>	385671	6391020	16				Koala Feed Tree	Yes
137	<i>Eucalyptus tereticornis</i>	385671	6391018	9				Koala Feed Tree	Yes
138	Stag	385660	6391000	84.5		3			Unlikely
139	<i>Corymbia maculata</i>	385663	6390995	82.5		1	2		Yes
140	<i>Eucalyptus tereticornis</i>	385656	6390976	44.5				Koala Feed Tree	Yes
141	<i>Eucalyptus tereticornis</i>	385654	6390974	15				Koala Feed Tree	Yes
142	<i>Eucalyptus tereticornis</i>	385650	6390971	14				Koala Feed Tree	Unlikely
143	<i>Eucalyptus tereticornis</i>	385654	6390963	34.5				Koala Feed Tree	Yes
144	<i>Eucalyptus tereticornis</i>	385652	6390957	44.5				Koala Feed Tree	Yes
145	<i>Eucalyptus tereticornis</i>	385651	6390949	59				Koala Feed Tree	Yes

No.	Species of Tree	Easting	Northing	DBH (m)	Hollow Type			Comments	Removal Required?
					Small	Medium	Large		
146	<i>Eucalyptus paniculata</i>	385646	6390939	101.5	2	1	1		Yes
147	<i>Eucalyptus tereticornis</i>	385643	6390936	70				Koala Feed Tree	Yes
148	<i>Eucalyptus tereticornis</i>	385640	6390911	67				Koala Feed Tree	Yes
149	<i>Eucalyptus tereticornis</i>	385633	6390910	55.5				Koala Feed Tree	Yes
150	<i>Eucalyptus tereticornis</i>	385627	6390904	21				Koala Feed Tree	Yes
151	<i>Eucalyptus tereticornis</i>	385631	6390901	43				Koala Feed Tree	Yes
152	<i>Eucalyptus tereticornis</i>	385632	6390896	30				Koala Feed Tree	Yes
153	<i>Eucalyptus tereticornis</i>	385624	6390897	37				Koala Feed Tree	Yes
154	<i>Eucalyptus tereticornis</i>	385625	6390895	17				Koala Feed Tree	Yes
155	<i>Eucalyptus tereticornis</i>	385624	6390892	34				Koala Feed Tree	Yes
156	<i>Eucalyptus tereticornis</i>	385627	6390881	36				Koala Feed Tree	Yes
157	<i>Eucalyptus tereticornis</i>	385621	6390886	36				Koala Feed Tree	Yes
158	<i>Eucalyptus tereticornis</i>	385621	6390883	13.5				Koala Feed Tree	Yes
159	<i>Eucalyptus tereticornis</i>	385614	6390834	66.5				Koala Feed Tree	Yes
160	<i>Eucalyptus tereticornis</i>	385611	6390825	68				Koala Feed Tree	Yes
161	<i>Eucalyptus tereticornis</i>	385609	6390823	51				Koala Feed Tree	Yes
162	<i>Eucalyptus tereticornis</i>	385603	6390821	104				Koala Feed Tree	Yes
163	<i>Eucalyptus tereticornis</i>	385595	6390803	80				Koala Feed Tree	Yes
164	<i>Eucalyptus tereticornis</i>	385593	6390803	83				Koala Feed Tree	Yes
165	<i>Eucalyptus tereticornis</i>	385592	6390792	41				Koala Feed Tree	Yes
166	<i>Eucalyptus tereticornis</i>	385591	6390797	66				Koala Feed Tree	Unlikely
167	<i>Corymbia maculata</i>	385587	6390789	83				1	Unlikely
168	<i>Eucalyptus tereticornis</i>	385588	6390782	42				Koala Feed Tree	Yes
169	<i>Eucalyptus umbra</i>	385583	6390774	80				2	Yes
170	<i>Eucalyptus tereticornis</i>	385582	6390770	18				Koala Feed Tree	Yes

No.	Species of Tree	Easting	Northing	DBH (m)	Hollow Type			Comments	Removal Required?
					Small	Medium	Large		
171	<i>Eucalyptus tereticornis</i>	385574	6390693	56.5				Koala Feed Tree	Yes
172	<i>Eucalyptus tereticornis</i>	385572	6390686	33				Koala Feed Tree	Yes
173	<i>Eucalyptus tereticornis</i>	385556	6390684	26.5				Koala Feed Tree	Unlikely
174	<i>Eucalyptus tereticornis</i>	385557	6390669	12				Koala Feed Tree	Yes
175	<i>Eucalyptus tereticornis</i>	385551	6390662	26.5				Koala Feed Tree	Unlikely
176	<i>Eucalyptus tereticornis</i>	385550	6390643	13				Koala Feed Tree	Yes
177	<i>Eucalyptus tereticornis</i>	385526	6390607	20				Koala Feed Tree	Unlikely
178	<i>Eucalyptus tereticornis</i>	385512	6390579	53				Koala Feed Tree	Unlikely
179	<i>Eucalyptus tereticornis</i>	385502	6390586	25.5				Koala Feed Tree	Unlikely
180	<i>Eucalyptus tereticornis</i>	385511	6390573	25.5				Koala Feed Tree	Unlikely
181	<i>Eucalyptus tereticornis</i>	385506	6390563	27				Koala Feed Tree	Unlikely
182	<i>Eucalyptus tereticornis</i>	385498	6390572	22				Koala Feed Tree	Unlikely
183	<i>Eucalyptus tereticornis</i>	385510	6390558	16				Koala Feed Tree	Yes
184	<i>Eucalyptus tereticornis</i>	385493	6390557	33				Koala Feed Tree	Unlikely
185	<i>Corymbia maculata</i>	385500	6390531	45.5			1		Yes
186	<i>Corymbia maculata</i>	385500	6390526	50.5	1				Yes
187	<i>Eucalyptus tereticornis</i>	385476	6390540	18				Koala Feed Tree	Unlikely
188	<i>Eucalyptus tereticornis</i>	385461	6390533	42.5				Koala Feed Tree	Unlikely
189	<i>Eucalyptus tereticornis</i>	385460	6390530	15.5				Koala Feed Tree	Unlikely
190	<i>Eucalyptus tereticornis</i>	385472	6390503	18				Koala Feed Tree	Unlikely
191	<i>Eucalyptus tereticornis</i>	385466	6390506	19				Koala Feed Tree	Unlikely
192	<i>Eucalyptus tereticornis</i>	385464	6390506	7.5				Koala Feed Tree	Unlikely
193	<i>Eucalyptus tereticornis</i>	385465	6390508	8.5				Koala Feed Tree	Unlikely
194	<i>Eucalyptus tereticornis</i>	385458	6390510	22.5				Koala Feed Tree	Unlikely
195	<i>Eucalyptus tereticornis</i>	385469	6390517	10				Koala Feed Tree	Unlikely

No.	Species of Tree	Easting	Northing	DBH (m)	Hollow Type			Comments	Removal Required?
					Small	Medium	Large		
196	<i>Eucalyptus tereticornis</i>	385465	6390517	26.5				Koala Feed Tree	Unlikely
197	<i>Eucalyptus tereticornis</i>	385463	6390514	8				Koala Feed Tree	Unlikely
198	<i>Eucalyptus tereticornis</i>	385461	6390521	11.5				Koala Feed Tree	Unlikely
199	<i>Eucalyptus tereticornis</i>	385455	6390518	15				Koala Feed Tree	Unlikely
200	<i>Eucalyptus tereticornis</i>	385455	6390518	33				Koala Feed Tree	Unlikely
201	<i>Eucalyptus tereticornis</i>	385461	6390508	17.5				Koala Feed Tree	Unlikely
202	<i>Eucalyptus tereticornis</i>	385456	6390510	20.5				Koala Feed Tree	Unlikely
203	<i>Eucalyptus tereticornis</i>	385478	6390489	65				Koala Feed Tree	Yes
204	<i>Eucalyptus tereticornis</i>	385471	6390475	43				Koala Feed Tree	Yes
205	<i>Eucalyptus tereticornis</i>	385471	6390471	47.5				Koala Feed Tree	Yes
206	<i>Eucalyptus tereticornis</i>	385456	6390471	17				Koala Feed Tree	Unlikely
207	<i>Eucalyptus tereticornis</i>	385454	6390467	35				Koala Feed Tree	Unlikely
208	<i>Eucalyptus tereticornis</i>	385461	6390482	9.5				Koala Feed Tree	Unlikely
209	<i>Eucalyptus tereticornis</i>	385459	6390484	18				Koala Feed Tree	Unlikely
210	<i>Eucalyptus tereticornis</i>	385454	6390490	13				Koala Feed Tree	Unlikely
211	<i>Eucalyptus tereticornis</i>	385455	6390497	21.5				Koala Feed Tree	Unlikely
212	<i>Eucalyptus tereticornis</i>	385456	6390505	13.5				Koala Feed Tree	Unlikely
213	<i>Eucalyptus tereticornis</i>	385451	6390504	12				Koala Feed Tree	Unlikely
214	<i>Eucalyptus tereticornis</i>	385441	6390512	32.5				Koala Feed Tree	Unlikely
215	<i>Eucalyptus tereticornis</i>	385444	6390505	14				Koala Feed Tree	Unlikely
216	<i>Eucalyptus tereticornis</i>	385433	6390502	40			1	Koala Feed Tree	Unlikely
217	<i>Eucalyptus tereticornis</i>	385434	6390503	18				Koala Feed Tree	Unlikely
218	<i>Eucalyptus tereticornis</i>	385435	6390495	25				Koala Feed Tree	Unlikely
219	<i>Eucalyptus tereticornis</i>	385440	6390493	16				Koala Feed Tree	Unlikely
220	<i>Eucalyptus tereticornis</i>	385449	6390484	11				Koala Feed Tree	Unlikely

No.	Species of Tree	Easting	Northing	DBH (m)	Hollow Type			Comments	Removal Required?
					Small	Medium	Large		
221	<i>Eucalyptus tereticornis</i>	385450	6390484	5				Koala Feed Tree	Unlikely
222	<i>Eucalyptus tereticornis</i>	385454	6390477	17.5				Koala Feed Tree	Unlikely
223	<i>Eucalyptus tereticornis</i>	385450	6390480	13.5				Koala Feed Tree	Yes
224	<i>Eucalyptus tereticornis</i>	385447	6390480	10				Koala Feed Tree	Unlikely
225	<i>Eucalyptus tereticornis</i>	385449	6390484	9				Koala Feed Tree	Unlikely
226	<i>Eucalyptus tereticornis</i>	385445	6390477	42				Koala Feed Tree	Unlikely
227	<i>Eucalyptus tereticornis</i>	385449	6390474	11				Koala Feed Tree	Unlikely
228	<i>Eucalyptus tereticornis</i>	385448	6390475	18				Koala Feed Tree	Unlikely
229	<i>Eucalyptus tereticornis</i>	385446	6390476	14.5				Koala Feed Tree	Unlikely
230	<i>Eucalyptus tereticornis</i>	385445	6390473	17				Koala Feed Tree	Unlikely
231	<i>Eucalyptus tereticornis</i>	385591	6390735	52				Koala Feed Tree	Unlikely
232	<i>Eucalyptus tereticornis</i>	385609	6390786	19				Koala Feed Tree	Unlikely
233	<i>Eucalyptus tereticornis</i>	385607	6390793	34				Koala Feed Tree	Unlikely
234	Stag	385610	6390799	44	4				Yes
235	Stag	385619	6390820	85			1		Yes
236	<i>Eucalyptus tereticornis</i>	385615	6390833	60.5				Koala Feed Tree	Yes
237	<i>Eucalyptus tereticornis</i>	385633	6390844	39				Koala Feed Tree	Unlikely
238	<i>Eucalyptus umbra</i>	385624	6390844	32	2				Yes
239	Stag	385633	6390860	29	4				Unlikely
240	<i>Eucalyptus tereticornis</i>	385440	6390475	26.5				Koala Feed Tree	Unlikely
241	<i>Eucalyptus tereticornis</i>	385440	6390467	45				Koala Feed Tree	Unlikely
242	<i>Eucalyptus tereticornis</i>	385435	6390467	18.5				Koala Feed Tree	Unlikely
243	<i>Eucalyptus tereticornis</i>	385440	6390470	12.5				Koala Feed Tree	Unlikely
244	<i>Eucalyptus tereticornis</i>	385433	6390474	29.5				Koala Feed Tree	Unlikely
245	<i>Eucalyptus tereticornis</i>	385426	6390471	16				Koala Feed Tree	Unlikely

No.	Species of Tree	Easting	Northing	DBH (m)	Hollow Type			Comments	Removal Required?
					Small	Medium	Large		
246	<i>Eucalyptus tereticornis</i>	385428	6390473	12				Koala Feed Tree	Unlikely
247	<i>Eucalyptus tereticornis</i>	385434	6390469	27				Koala Feed Tree	Unlikely
248	<i>Eucalyptus tereticornis</i>	385434	6390463	15				Koala Feed Tree	Unlikely
249	<i>Eucalyptus tereticornis</i>	385432	6390460	46.5				Koala Feed Tree	Unlikely
250	<i>Eucalyptus tereticornis</i>	385433	6390455	46				Koala Feed Tree	Unlikely
251	<i>Eucalyptus tereticornis</i>	385436	6390459	26				Koala Feed Tree	Unlikely
252	<i>Eucalyptus tereticornis</i>	385432	6390452	28				Koala Feed Tree	Unlikely
253	<i>Eucalyptus tereticornis</i>	385424	6390408	10				Koala Feed Tree	Yes
254	<i>Eucalyptus tereticornis</i>	385428	6390450	14.5				Koala Feed Tree	Unlikely
255	<i>Eucalyptus tereticornis</i>	385429	6390431	15				Koala Feed Tree	Unlikely
256	<i>Eucalyptus tereticornis</i>	385427	6390436	5.5				Koala Feed Tree	Unlikely
257	<i>Eucalyptus tereticornis</i>	385425	6390438	14.5				Koala Feed Tree	Unlikely
258	<i>Eucalyptus tereticornis</i>	385423	6390462	26				Koala Feed Tree	Unlikely
259	<i>Eucalyptus tereticornis</i>	385425	6390454	18				Koala Feed Tree	Unlikely
260	<i>Eucalyptus tereticornis</i>	385427	6390451	13				Koala Feed Tree	Unlikely
261	<i>Eucalyptus tereticornis</i>	385427	6390450	13.5				Koala Feed Tree	Unlikely
262	<i>Eucalyptus tereticornis</i>	385423	6390454	9				Koala Feed Tree	Unlikely
263	<i>Eucalyptus tereticornis</i>	385420	6390461	25				Koala Feed Tree	Unlikely
264	<i>Eucalyptus tereticornis</i>	385418	6390455	27				Koala Feed Tree	Unlikely
265	<i>Eucalyptus tereticornis</i>	385408	6390456	22				Koala Feed Tree	Unlikely
266	<i>Eucalyptus tereticornis</i>	385416	6390480	27.5				Koala Feed Tree	Unlikely
267	<i>Eucalyptus tereticornis</i>	385409	6390448	9.5				Koala Feed Tree	Unlikely
268	<i>Eucalyptus tereticornis</i>	385405	6390430	34				Koala Feed Tree	Unlikely
269	<i>Eucalyptus tereticornis</i>	385410	6390431	5.5				Koala Feed Tree	Unlikely
270	<i>Eucalyptus tereticornis</i>	385404	6390430	26.5				Koala Feed Tree	Unlikely

No.	Species of Tree	Easting	Northing	DBH (m)	Hollow Type			Comments	Removal Required?
					Small	Medium	Large		
271	<i>Eucalyptus tereticornis</i>	385395	6390439	15				Koala Feed Tree	Unlikely
272	<i>Eucalyptus tereticornis</i>	385394	6390437	34.5				Koala Feed Tree	Unlikely
273	<i>Eucalyptus tereticornis</i>	385395	6390430	25.5				Koala Feed Tree	Unlikely
274	<i>Eucalyptus tereticornis</i>	385399	6390427	43.5				Koala Feed Tree	Unlikely
275	<i>Eucalyptus tereticornis</i>	385409	6390418	9				Koala Feed Tree	Yes
276	<i>Eucalyptus tereticornis</i>	385409	6390415	15				Koala Feed Tree	Unlikely
278	<i>Eucalyptus tereticornis</i>	385407	6390414	19				Koala Feed Tree	Unlikely
279	<i>Eucalyptus tereticornis</i>	385411	6390418	11.5				Koala Feed Tree	Yes
280	<i>Eucalyptus tereticornis</i>	385396	6390418	17				Koala Feed Tree	Unlikely
281	<i>Eucalyptus tereticornis</i>	385392	6390420	21.5				Koala Feed Tree	Unlikely
282	<i>Eucalyptus tereticornis</i>	385390	6390419	27.5				Koala Feed Tree	Unlikely
283	<i>Eucalyptus tereticornis</i>	385393	6390414	28.5				Koala Feed Tree	Unlikely
284	<i>Eucalyptus tereticornis</i>	385390	6390426	5				Koala Feed Tree	Unlikely
285	<i>Eucalyptus tereticornis</i>	385393	6390429	9				Koala Feed Tree	Unlikely
286	<i>Eucalyptus tereticornis</i>	385393	6390425	7				Koala Feed Tree	Unlikely
287	<i>Eucalyptus tereticornis</i>	385392	6390424	7.5				Koala Feed Tree	Unlikely
288	<i>Eucalyptus tereticornis</i>	385389	6390428	5.5				Koala Feed Tree	Unlikely
289	<i>Eucalyptus tereticornis</i>	385386	6390437	17.5				Koala Feed Tree	Unlikely
290	<i>Eucalyptus tereticornis</i>	385387	6390446	18				Koala Feed Tree	Unlikely
291	<i>Eucalyptus tereticornis</i>	385385	6390447	8				Koala Feed Tree	Unlikely
292	<i>Eucalyptus tereticornis</i>	385385	6390454	9				Koala Feed Tree	Unlikely
293	<i>Eucalyptus tereticornis</i>	385384	6390470	20				Koala Feed Tree	Unlikely
294	<i>Eucalyptus tereticornis</i>	385369	6390448	23				Koala Feed Tree	Unlikely
295	<i>Eucalyptus tereticornis</i>	385364	6390447	32				Koala Feed Tree	Unlikely
296	<i>Eucalyptus tereticornis</i>	385363	6390438	21				Koala Feed Tree	Unlikely

No.	Species of Tree	Easting	Northing	DBH (m)	Hollow Type			Comments	Removal Required?
					Small	Medium	Large		
297	<i>Eucalyptus tereticornis</i>	385363	6390437	21				Koala Feed Tree	Unlikely
298	<i>Eucalyptus tereticornis</i>	385372	6390436	15.5				Koala Feed Tree	Unlikely
299	<i>Eucalyptus tereticornis</i>	385377	6390410	16.5				Koala Feed Tree	Unlikely
300	<i>Eucalyptus tereticornis</i>	385373	6390407	22				Koala Feed Tree	Unlikely
301	<i>Eucalyptus tereticornis</i>	385375	6390410	18.5				Koala Feed Tree	Unlikely
302	<i>Eucalyptus tereticornis</i>	385368	6390413	23				Koala Feed Tree	Unlikely
303	<i>Eucalyptus tereticornis</i>	385372	6390413	15				Koala Feed Tree	Unlikely
304	<i>Eucalyptus tereticornis</i>	385367	6390421	16.5				Koala Feed Tree	Unlikely
305	<i>Eucalyptus tereticornis</i>	385363	6390419	14				Koala Feed Tree	Unlikely
306	<i>Eucalyptus tereticornis</i>	385363	6390420	14				Koala Feed Tree	Unlikely
307	<i>Eucalyptus tereticornis</i>	385359	6390415	10.5				Koala Feed Tree	Unlikely
308	<i>Eucalyptus tereticornis</i>	385360	6390429	13				Koala Feed Tree	Unlikely
309	<i>Eucalyptus tereticornis</i>	385345	6390416	17				Koala Feed Tree	Unlikely
310	<i>Eucalyptus tereticornis</i>	385332	6390418	18.5				Koala Feed Tree	Unlikely
311	<i>Eucalyptus tereticornis</i>	385340	6390413	13				Koala Feed Tree	Unlikely
312	<i>Eucalyptus tereticornis</i>	385338	6390413	16				Koala Feed Tree	Unlikely
313	<i>Eucalyptus tereticornis</i>	385347	6390407	14				Koala Feed Tree	Unlikely
314	<i>Eucalyptus tereticornis</i>	385348	6390407	10.5				Koala Feed Tree	Unlikely
315	<i>Eucalyptus tereticornis</i>	385333	6390400	13				Koala Feed Tree	Unlikely
316	<i>Eucalyptus tereticornis</i>	385330	6390408	12				Koala Feed Tree	Unlikely
317	<i>Eucalyptus tereticornis</i>	385331	6390413	22.5				Koala Feed Tree	Unlikely
318	<i>Eucalyptus tereticornis</i>	385325	6390405	8.5				Koala Feed Tree	Unlikely
319	<i>Eucalyptus tereticornis</i>	385323	6390401	12.5				Koala Feed Tree	Unlikely
320	<i>Eucalyptus tereticornis</i>	385313	6390408	27				Koala Feed Tree	Unlikely
321	<i>Eucalyptus tereticornis</i>	385309	6390406	18				Koala Feed Tree	Unlikely

No.	Species of Tree	Easting	Northing	DBH (m)	Hollow Type			Comments	Removal Required?
					Small	Medium	Large		
322	<i>Eucalyptus tereticornis</i>	385312	6390405	13				Koala Feed Tree	Unlikely
323	<i>Eucalyptus tereticornis</i>	385312	6390405	11.5				Koala Feed Tree	Unlikely
324	<i>Eucalyptus tereticornis</i>	385329	6390398	20				Koala Feed Tree	Unlikely
325	<i>Eucalyptus tereticornis</i>	385327	6390399	22.5				Koala Feed Tree	Unlikely
326	<i>Eucalyptus tereticornis</i>	385310	6390380	59				Koala Feed Tree	Yes
327	<i>Eucalyptus tereticornis</i>	385301	6390383	40				Koala Feed Tree	Unlikely
328	Stag	385298	6390380	44		1			Yes
329	<i>Eucalyptus tereticornis</i>	385293	6390378	60				Koala Feed Tree	Yes
330	<i>Eucalyptus tereticornis</i>	385287	6390376	29				Koala Feed Tree	Yes
331	<i>Eucalyptus tereticornis</i>	385289	6390377	78				Koala Feed Tree	Yes
332	<i>Eucalyptus tereticornis</i>	385271	6390375	53				Koala Feed Tree	Yes
333	<i>Eucalyptus tereticornis</i>	385270	6390372	53				Koala Feed Tree	Yes
334	<i>Eucalyptus tereticornis</i>	385266	6390367	56				Koala Feed Tree	Yes
335	<i>Eucalyptus tereticornis</i>	385246	6390373	50				Koala Feed Tree	Yes
336	<i>Eucalyptus tereticornis</i>	385238	6390371	44				Koala Feed Tree	Yes
337	<i>Eucalyptus tereticornis</i>	385239	6390369	35				Koala Feed Tree	Yes
338	<i>Eucalyptus tereticornis</i>	385227	6390370	47				Koala Feed Tree	Yes
339	<i>Eucalyptus crebra</i>	385208	6390367	76		1			Yes
340	<i>Eucalyptus tereticornis</i>	385197	6390364	30.5				Koala Feed Tree	Yes
341	<i>Eucalyptus tereticornis</i>	385184	6390362	48.5				Koala Feed Tree	Yes
342	<i>Eucalyptus tereticornis</i>	385183	6390362	33				Koala Feed Tree	Yes
343	<i>Eucalyptus tereticornis</i>	385161	6390360	13.5				Koala Feed Tree	Yes
344	<i>Eucalyptus tereticornis</i>	385151	6390360	23.5				Koala Feed Tree	Yes
345	<i>Eucalyptus tereticornis</i>	385132	6390356	31				Koala Feed Tree	Yes
346	<i>Eucalyptus crebra</i>	385128	6390337	82	2				Unlikely

No.	Species of Tree	Easting	Northing	DBH (m)	Hollow Type			Comments	Removal Required?
					Small	Medium	Large		
347	<i>Eucalyptus crebra</i>	385141	6390334	55		1			Unlikely
348	<i>Eucalyptus crebra</i>	385147	6390344	52	1				Unlikely
349	<i>Eucalyptus tereticornis</i>	385191	6390350	39.5				Koala Feed Tree	Yes
350	<i>Eucalyptus tereticornis</i>	385195	6390350	34.5				Koala Feed Tree	Yes
351	<i>Eucalyptus tereticornis</i>	385193	6390349	39				Koala Feed Tree	Yes
352	<i>Eucalyptus tereticornis</i>	385196	6390348	35				Koala Feed Tree	Unlikely
353	<i>Eucalyptus crebra</i>	385205	6390349	31.5	1				Unlikely
354	<i>Eucalyptus tereticornis</i>	385221	6390354	34				Koala Feed Tree	Yes
355	<i>Eucalyptus tereticornis</i>	385242	6390382	29				Koala Feed Tree	Unlikely
356	<i>Eucalyptus tereticornis</i>	385243	6390377	22.5				Koala Feed Tree	Unlikely
357	<i>Eucalyptus tereticornis</i>	385252	6390380	14.5				Koala Feed Tree	Unlikely
358	<i>Eucalyptus tereticornis</i>	385250	6390379	26.5				Koala Feed Tree	Unlikely
359	<i>Eucalyptus tereticornis</i>	385256	6390380	31				Koala Feed Tree	Unlikely
360	<i>Eucalyptus tereticornis</i>	385253	6390386	31				Koala Feed Tree	Unlikely
361	<i>Eucalyptus tereticornis</i>	385266	6390381	31				Koala Feed Tree	Unlikely
362	<i>Eucalyptus tereticornis</i>	385264	6390377	11.5				Koala Feed Tree	Unlikely
363	<i>Eucalyptus tereticornis</i>	385263	6390381	11.5				Koala Feed Tree	Unlikely
364	<i>Eucalyptus tereticornis</i>	385262	6390378	30.5				Koala Feed Tree	Unlikely
365	<i>Eucalyptus tereticornis</i>	385261	6390382	34.5				Koala Feed Tree	Unlikely
366	<i>Eucalyptus tereticornis</i>	385236	6390356	46				Koala Feed Tree	Unlikely
367	<i>Eucalyptus tereticornis</i>	385237	6390360	63				Koala Feed Tree	Yes
368	<i>Eucalyptus tereticornis</i>	385248	6390345	29				Koala Feed Tree	Unlikely
369	<i>Eucalyptus tereticornis</i>	385257	6390354	43				Koala Feed Tree	Unlikely
370	<i>Eucalyptus tereticornis</i>	385260	6390350	27				Koala Feed Tree	Unlikely
371	<i>Eucalyptus fibrosa</i>	385262	6390355	75	3				Unlikely

No.	Species of Tree	Easting	Northing	DBH (m)	Hollow Type			Comments	Removal Required?
					Small	Medium	Large		
372	Stag	385279	6390358	63	1				Unlikely
373	<i>Eucalyptus tereticornis</i>	385297	6390363	10				Koala Feed Tree	Unlikely
374	<i>Eucalyptus tereticornis</i>	385311	6390371	14.5				Koala Feed Tree	Yes
375	<i>Eucalyptus tereticornis</i>	385315	6390366	20				Koala Feed Tree	Unlikely
376	<i>Eucalyptus tereticornis</i>	385316	6390359	57				Koala Feed Tree	Unlikely
377	<i>Eucalyptus fibrosa</i>	385323	6390370	77.5		2			Unlikely
378	<i>Corymbia maculata</i>	385343	6390383	60.5	4				Yes
379	<i>Eucalyptus tereticornis</i>	385379	6390382	30.5				Koala Feed Tree	Unlikely
380	<i>Eucalyptus tereticornis</i>	385376	6390382	48				Koala Feed Tree	Unlikely
381	<i>Eucalyptus tereticornis</i>	385392	6390387	24.5				Koala Feed Tree	Unlikely
382	<i>Eucalyptus tereticornis</i>	385411	6390389	20				Koala Feed Tree	Unlikely
383	<i>Eucalyptus tereticornis</i>	385470	6390425	59				Koala Feed Tree	Unlikely
384	<i>Eucalyptus tereticornis</i>	385473	6390431	31				Koala Feed Tree	Unlikely
385	<i>Eucalyptus tereticornis</i>	385481	6390439	38				Koala Feed Tree	Unlikely
386	<i>Eucalyptus tereticornis</i>	385474	6390451	53				Koala Feed Tree	Yes
387	<i>Eucalyptus tereticornis</i>	385497	6390480	20.5				Koala Feed Tree	Unlikely
388	<i>Eucalyptus tereticornis</i>	385496	6390492	16.5				Koala Feed Tree	Unlikely
389	<i>Eucalyptus tereticornis</i>	385497	6390506	29				Koala Feed Tree	Yes
390	<i>Eucalyptus tereticornis</i>	385507	6390510	43	1			Koala Feed Tree	Unlikely
391	<i>Eucalyptus tereticornis</i>	385513	6390541	37				Koala Feed Tree	Yes
392	<i>Eucalyptus crebra</i>	385517	6390536	60		1			Unlikely
393	<i>Eucalyptus tereticornis</i>	385536	6390587	27				Koala Feed Tree	Yes
394	<i>Eucalyptus crebra</i>	385543	6390598	78.5	2				Yes
395	<i>Eucalyptus tereticornis</i>	385555	6390631	42				Koala Feed Tree	Yes
396	<i>Corymbia maculata</i>	385574	6390652	80		1			Unlikely

No.	Species of Tree	Easting	Northing	DBH (m)	Hollow Type			Comments	Removal Required?
					Small	Medium	Large		
397	<i>Eucalyptus tereticornis</i>	385577	6390677	57	2			Koala Feed Tree	Unlikely
398	<i>Eucalyptus tereticornis</i>	385588	6390696	10				Koala Feed Tree	Unlikely
399	<i>Eucalyptus tereticornis</i>	385595	6390692	10.5				Koala Feed Tree	Unlikely
400	<i>Eucalyptus tereticornis</i>	385587	6390697	11.5				Koala Feed Tree	Unlikely
401	Stag	385632	6390861	21	1				Yes
402	<i>Eucalyptus paniculata</i>	385634	6390872	78	1				Yes
403	<i>Eucalyptus tereticornis</i>	385643	6390880	60				Koala Feed Tree	Unlikely
404	<i>Eucalyptus tereticornis</i>	385637	6390888	49.5				Koala Feed Tree	Yes
405	<i>Eucalyptus tereticornis</i>	385647	6390892	58.5	1			Koala Feed Tree	Unlikely
406	<i>Eucalyptus tereticornis</i>	385644	6390920	35				Koala Feed Tree	Yes
407	<i>Eucalyptus tereticornis</i>	385653	6390929	70			1	Koala Feed Tree	Yes
408	Stag	385650	6390925	50	2	1			Yes
409	<i>Eucalyptus tereticornis</i>	385654	6390935	50				Koala Feed Tree	Yes
410	<i>Eucalyptus tereticornis</i>	385655	6390937	23				Koala Feed Tree	Yes
411	<i>Eucalyptus tereticornis</i>	385665	6390945	32				Koala Feed Tree	Unlikely
412	Stag	385659	6390949	60	5				Yes
413	<i>Eucalyptus tereticornis</i>	385672	6390965	29				Koala Feed Tree	Unlikely
414	<i>Eucalyptus tereticornis</i>	385674	6390975	25.5				Koala Feed Tree	Yes
415	<i>Eucalyptus tereticornis</i>	385675	6390974	33				Koala Feed Tree	Unlikely
416	<i>Eucalyptus tereticornis</i>	385676	6390979	21				Koala Feed Tree	Unlikely
417	<i>Eucalyptus tereticornis</i>	385673	6390980	30.5				Koala Feed Tree	Yes
418	<i>Eucalyptus tereticornis</i>	385679	6390984	41				Koala Feed Tree	Unlikely
419	<i>Eucalyptus tereticornis</i>	385675	6391000	44				Koala Feed Tree	Yes
420	<i>Eucalyptus tereticornis</i>	385675	6391000	14				Koala Feed Tree	Yes
421	<i>Eucalyptus tereticornis</i>	385690	6391016	19.5				Koala Feed Tree	Unlikely

No.	Species of Tree	Easting	Northing	DBH (m)	Hollow Type			Comments	Removal Required?
					Small	Medium	Large		
422	<i>Eucalyptus tereticornis</i>	385690	6391036	70	1			Koala Feed Tree	Yes
423	<i>Eucalyptus tereticornis</i>	385693	6391032	51	1			Koala Feed Tree	Yes
424	<i>Eucalyptus tereticornis</i>	385691	6391041	24				Koala Feed Tree	Yes
425	<i>Eucalyptus tereticornis</i>	385691	6391041	32				Koala Feed Tree	Yes
426	<i>Eucalyptus tereticornis</i>	385694	6391055	52	1			Koala Feed Tree	Yes
427	<i>Eucalyptus tereticornis</i>	385694	6391056	83	1			Koala Feed Tree	Yes
428	<i>Eucalyptus tereticornis</i>	385697	6391061	99	3			Koala Feed Tree	Yes
429	<i>Eucalyptus tereticornis</i>	385699	6391070	21				Koala Feed Tree	Yes
430	<i>Eucalyptus tereticornis</i>	385701	6391074	9				Koala Feed Tree	Yes
431	<i>Eucalyptus crebra</i>	385707	6391086	102	3	2	1		Yes
432	<i>Eucalyptus tereticornis</i>	385713	6391083	20				Koala Feed Tree	Unlikely
433	<i>Eucalyptus tereticornis</i>	385710	6391074	11				Koala Feed Tree	Unlikely
434	<i>Eucalyptus tereticornis</i>	385719	6391099	15				Koala Feed Tree	Unlikely
435	<i>Eucalyptus tereticornis</i>	385722	6391112	110	1	2	1	Koala Feed Tree	Unlikely
436	<i>Eucalyptus tereticornis</i>	385731	6391132	100	2	1	1	Koala Feed Tree	Unlikely
437	<i>Eucalyptus tereticornis</i>	385733	6391141	26				Koala Feed Tree	Unlikely
438	<i>Eucalyptus tereticornis</i>	385737	6391140	26				Koala Feed Tree	Unlikely
439	<i>Eucalyptus tereticornis</i>	385738	6391146	106			1	Koala Feed Tree	Unlikely
440	<i>Corymbia maculata</i>	385740	6391157	69.5	2	1			Unlikely
441	<i>Corymbia maculata</i>	385741	6391160	53	1				Unlikely
442	<i>Eucalyptus tereticornis</i>	385747	6391168	34.5	1			Koala Feed Tree	Unlikely
443	<i>Eucalyptus paniculata</i>	385748	6391181	94	1				Unlikely
444	<i>Eucalyptus tereticornis</i>	385752	6391192	43				Koala Feed Tree	Unlikely
445	<i>Eucalyptus tereticornis</i>	385759	6391199	36				Koala Feed Tree	Unlikely
446	<i>Eucalyptus tereticornis</i>	385759	6391203	11				Koala Feed Tree	Unlikely

No.	Species of Tree	Easting	Northing	DBH (m)	Hollow Type			Comments	Removal Required?
					Small	Medium	Large		
447	Stag	385758	6391205	91	2				Unlikely
448	<i>Eucalyptus tereticornis</i>	385756	6391206	20				Koala Feed Tree	Unlikely
449	<i>Eucalyptus tereticornis</i>	385765	6391221	68				Koala Feed Tree	Unlikely
450	<i>Eucalyptus tereticornis</i>	385771	6391227	59.5				Koala Feed Tree	Unlikely
451	<i>Eucalyptus tereticornis</i>	385773	6391234	31				Koala Feed Tree	Unlikely
452	<i>Eucalyptus tereticornis</i>	385776	6391234	57				Koala Feed Tree	Unlikely
453	<i>Eucalyptus tereticornis</i>	385776	6391243	91				Koala Feed Tree	Unlikely
454	<i>Eucalyptus tereticornis</i>	385784	6391262	18				Koala Feed Tree	Unlikely
455	<i>Eucalyptus tereticornis</i>	385796	6391305	30				Koala Feed Tree	Yes
456	<i>Eucalyptus paniculata</i>	385798	6391291	84	1	1			Unlikely
457	<i>Eucalyptus tereticornis</i>	385799	6391314	65.5				Koala Feed Tree	Yes
458	<i>Eucalyptus paniculata</i>	385803	6391327	95	3				Yes
459	Stag	386125	6392075	0					Yes
460	<i>Eucalyptus tereticornis</i>	385804	6391313	74.5				Koala Feed Tree	Unlikely
461	<i>Eucalyptus tereticornis</i>	385807	6391320	22				Koala Feed Tree	Unlikely
462	<i>Eucalyptus punctata</i>	385807	6391322	28.5				Koala Feed Tree	Unlikely
463	<i>Eucalyptus tereticornis</i>	385765	6391236	45.5				Koala Feed Tree	Unlikely
464	<i>Eucalyptus tereticornis</i>	385563	6390651	30.5				Koala Feed Tree	Yes
465	<i>Eucalyptus fibrosa</i>	385503	6390517	44				Nest Tree	Yes
466	<i>Eucalyptus tereticornis</i>	385502	6390501	34.5				Koala Feed Tree	Unlikely
467	<i>Corymbia maculata</i>	385211	6390371	69		1			Unlikely
468	<i>Eucalyptus crebra</i>	385206	6390381	62					Unlikely
469	<i>Eucalyptus tereticornis</i>	385101	6390329	24				Koala Feed Tree Double stem	Unlikely
470	<i>Eucalyptus tereticornis</i>	385090	6390326	11				Koala Feed Tree	Yes

No.	Species of Tree	Easting	Northing	DBH (m)	Hollow Type			Comments	Removal Required?
					Small	Medium	Large		
471	<i>Eucalyptus crebra</i>	385084	6390322	67			1		Unlikely
472	<i>Eucalyptus tereticornis</i>	385054	6390308	30				Koala Feed Tree	Unlikely
473	<i>Corymbia maculata</i>	385048	6390302	32	2				Unlikely
474	<i>Eucalyptus tereticornis</i>	385041	6390299	14				Koala Feed Tree	Yes
475	<i>Eucalyptus tereticornis</i>	385016	6390302	30				Koala Feed Tree	Yes
476	<i>Eucalyptus tereticornis</i>	385039	6390307	49				Koala Feed Tree	Yes
477	<i>Eucalyptus crebra</i>	385076	6390335	88.5	1	1			Yes
478	<i>Eucalyptus tereticornis</i>	385093	6390348	11				Koala Feed Tree	Unlikely
479	<i>Eucalyptus tereticornis</i>	385133	6390375	23				Koala Feed Tree	Unlikely
480	<i>Eucalyptus tereticornis</i>	385044	6390316	18.5				Koala Feed Tree	Yes
481	<i>Eucalyptus tereticornis</i>	385033	6390315	20				Koala Feed Tree	Yes
482	<i>Eucalyptus tereticornis</i>	385029	6390315	16				Koala Feed Tree	Yes
483	<i>Eucalyptus tereticornis</i>	385029	6390314	14				Koala Feed Tree	Yes
484	<i>Eucalyptus tereticornis</i>	385028	6390315	24				Koala Feed Tree	Yes
485	<i>Eucalyptus tereticornis</i>	385027	6390308	18				Koala Feed Tree	Yes

Figure I1: Detailed plans of trees requiring removal – page 1

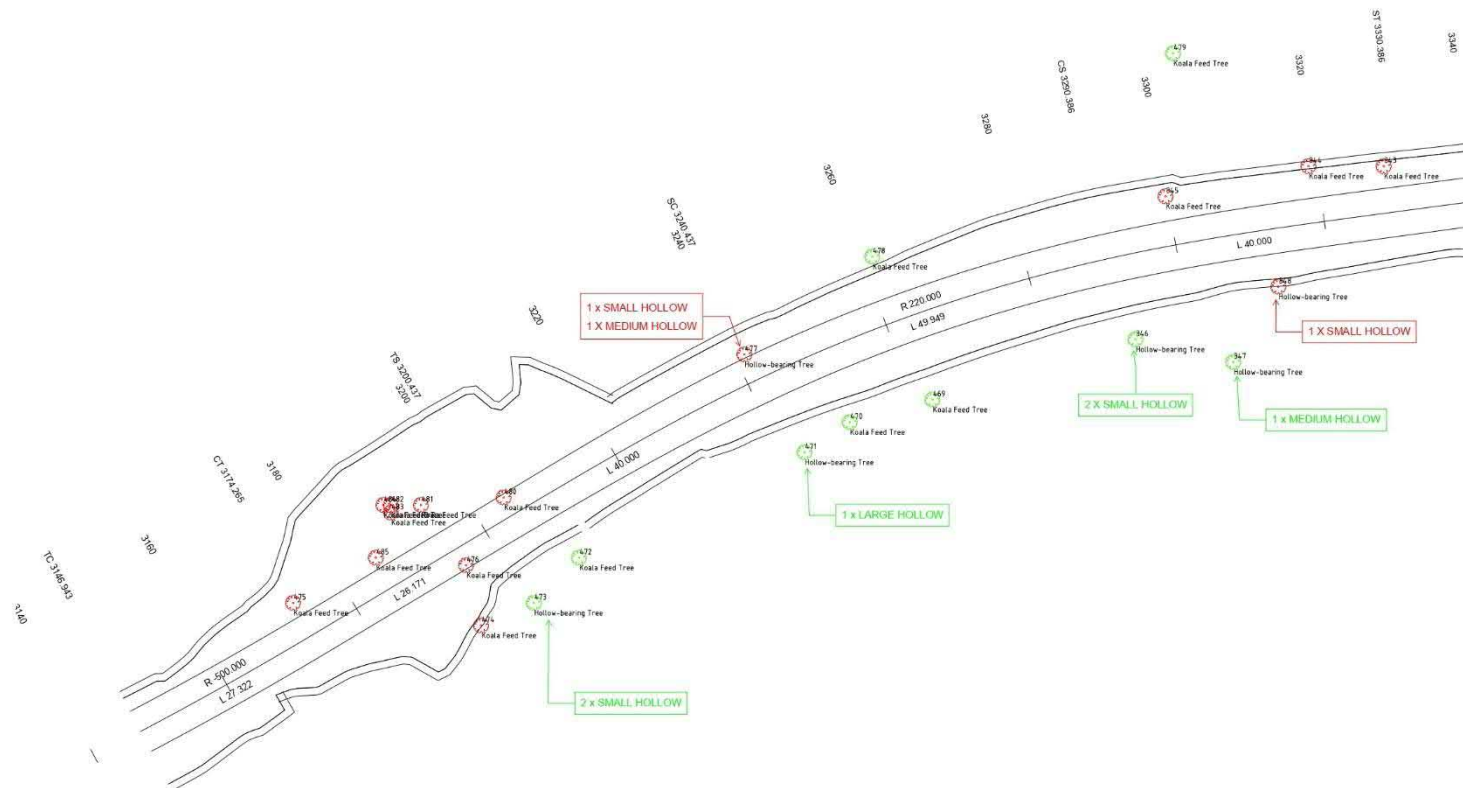


Figure I2: Detailed plans of trees requiring removal – page 2

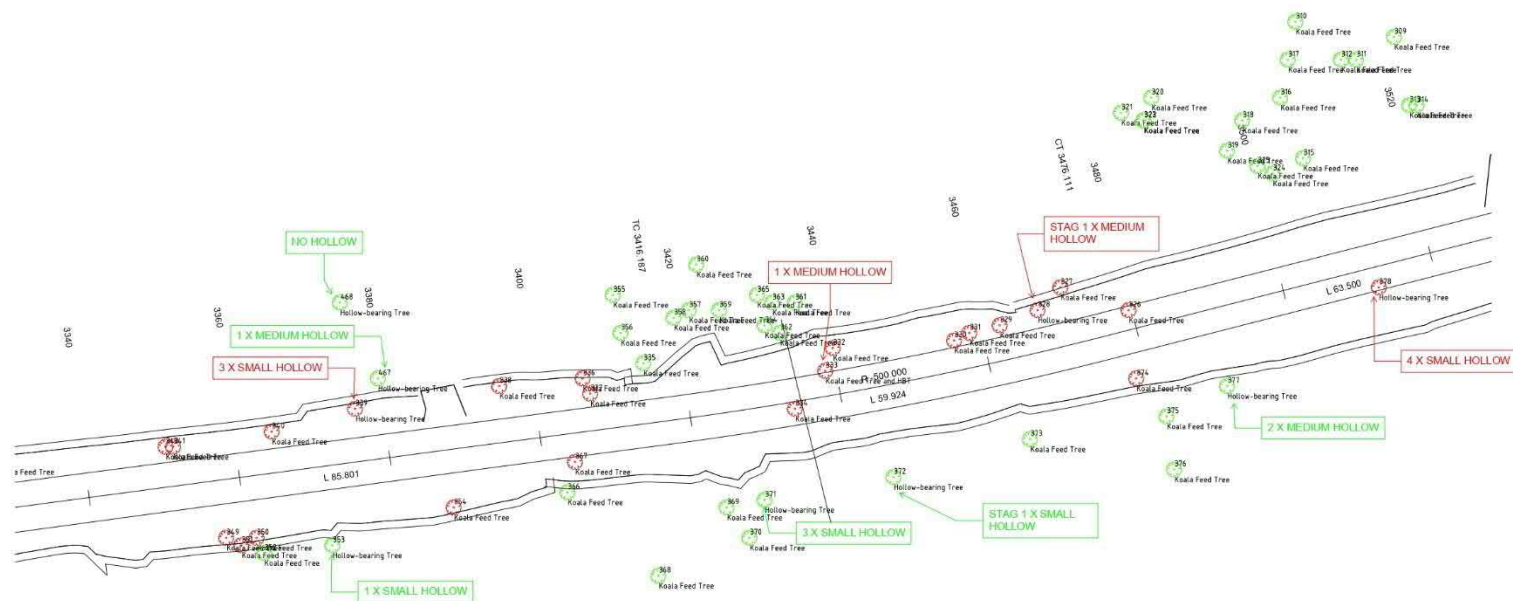


Figure I3: Detailed plans of trees requiring removal – page 3



Figure I4: Detailed plans of trees requiring removal – page 4

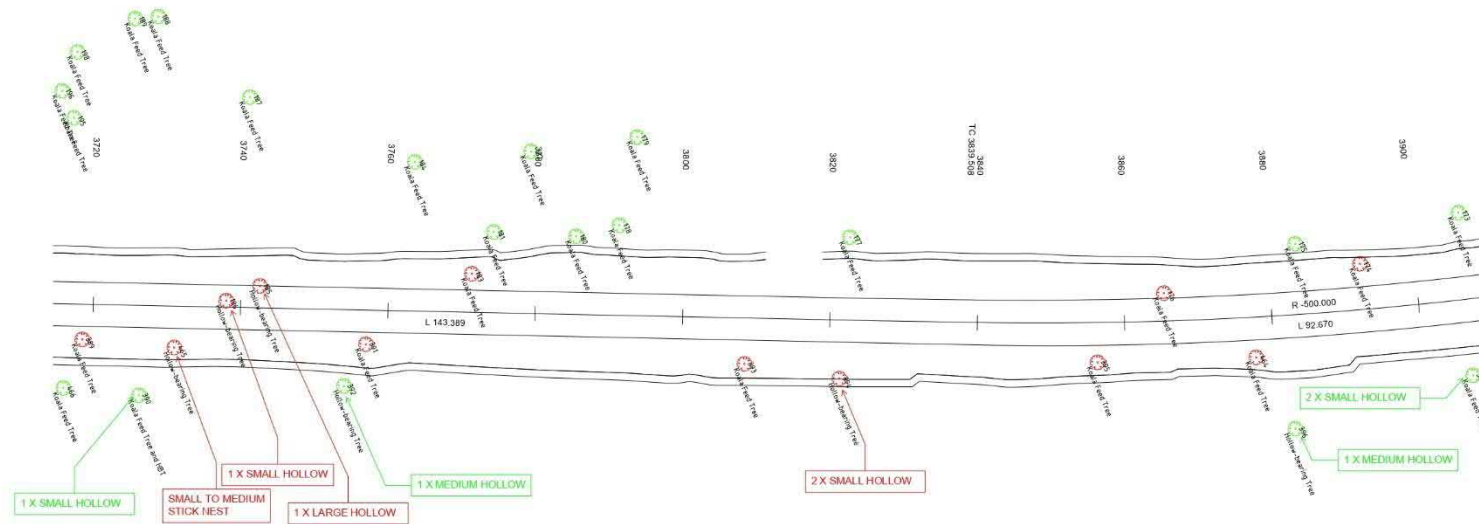
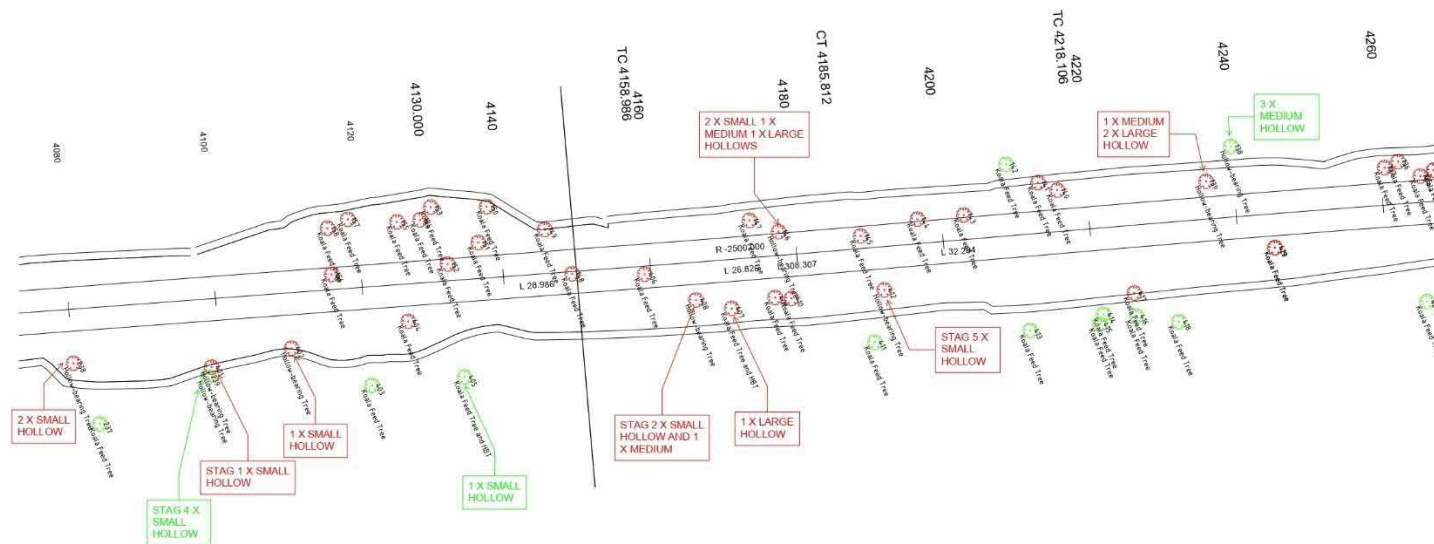


Figure I6: Detailed plans of trees requiring removal – page 6



[illegible]

Figure I8: Detailed plans of trees requiring removal – page 8

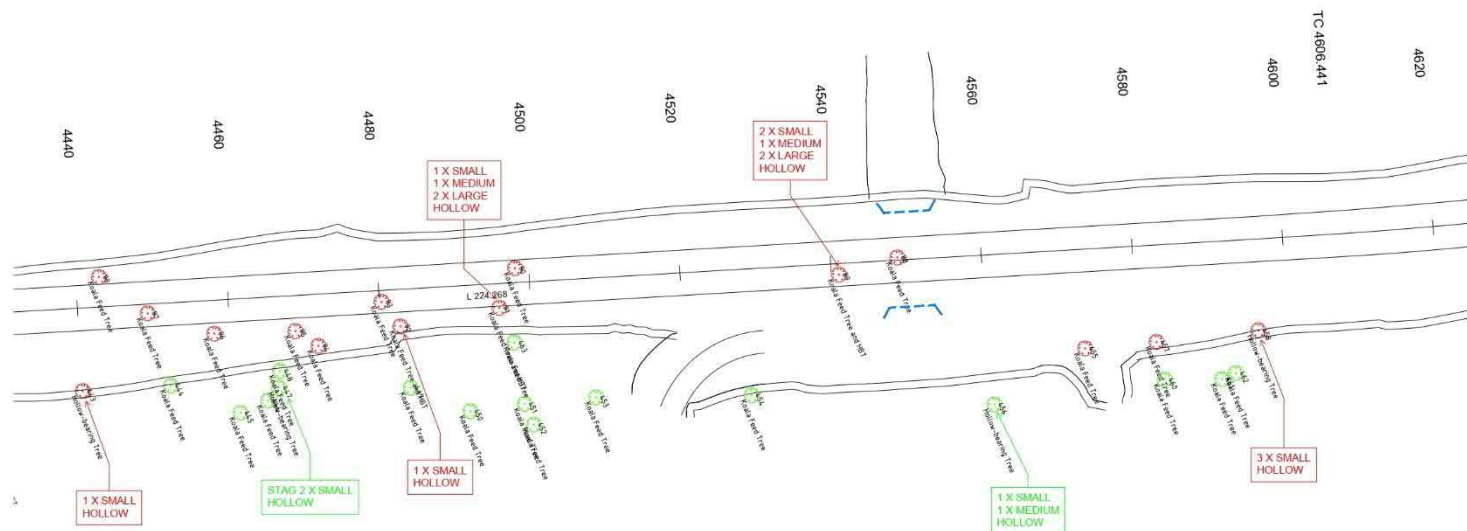


Figure I9: Detailed plans of trees requiring removal – page 9



Figure I10: Detailed plans of trees requiring removal – page 10

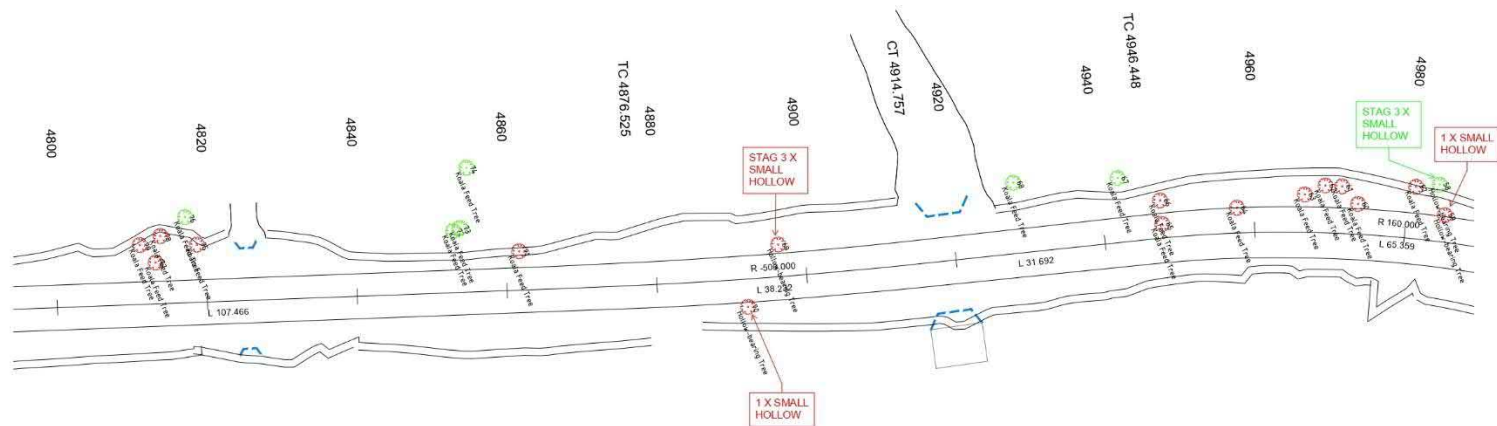


Figure I11: Detailed plans of trees requiring removal – page 11

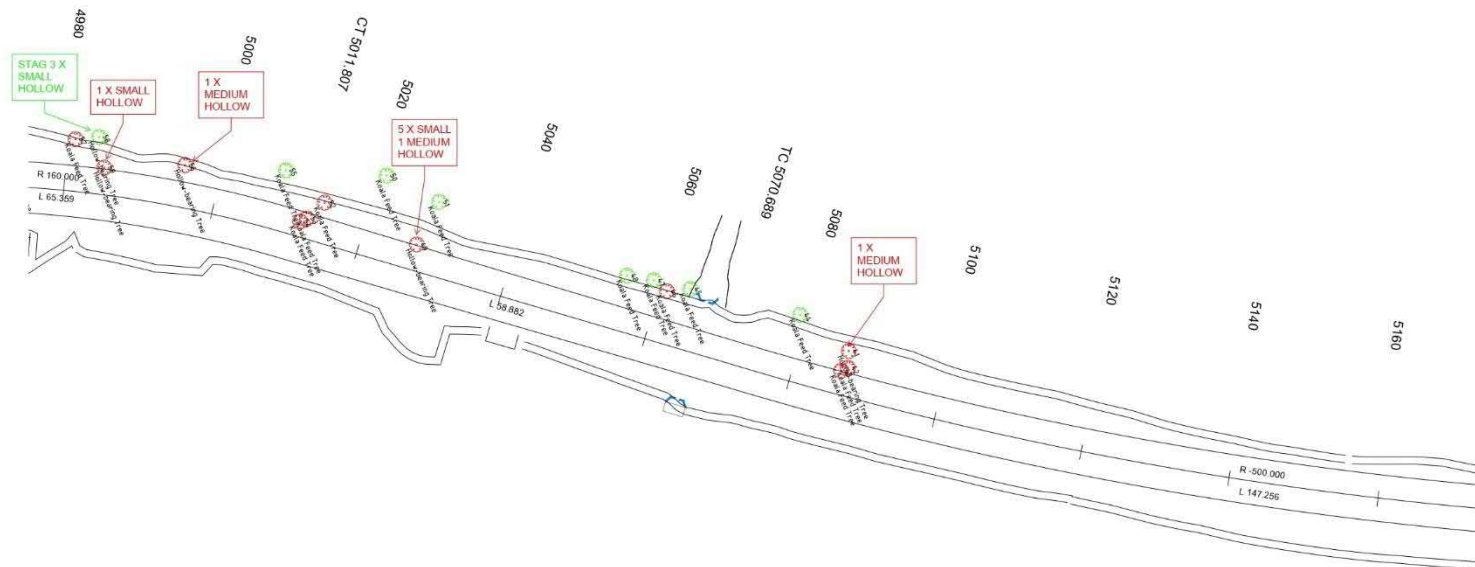


Figure I12: Detailed plans of trees requiring removal – page 12

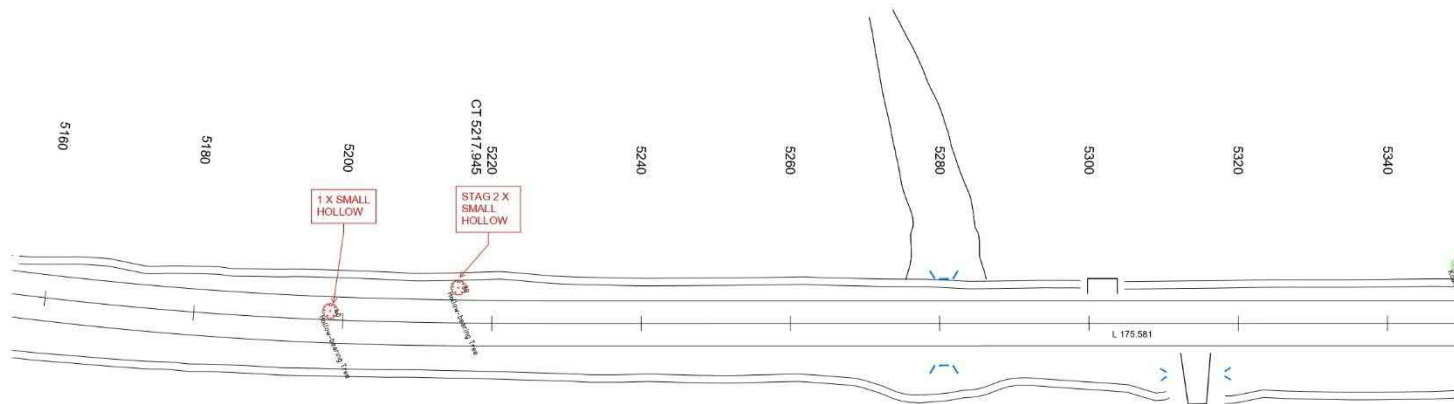


Figure I13: Detailed plans of trees requiring removal – page 13

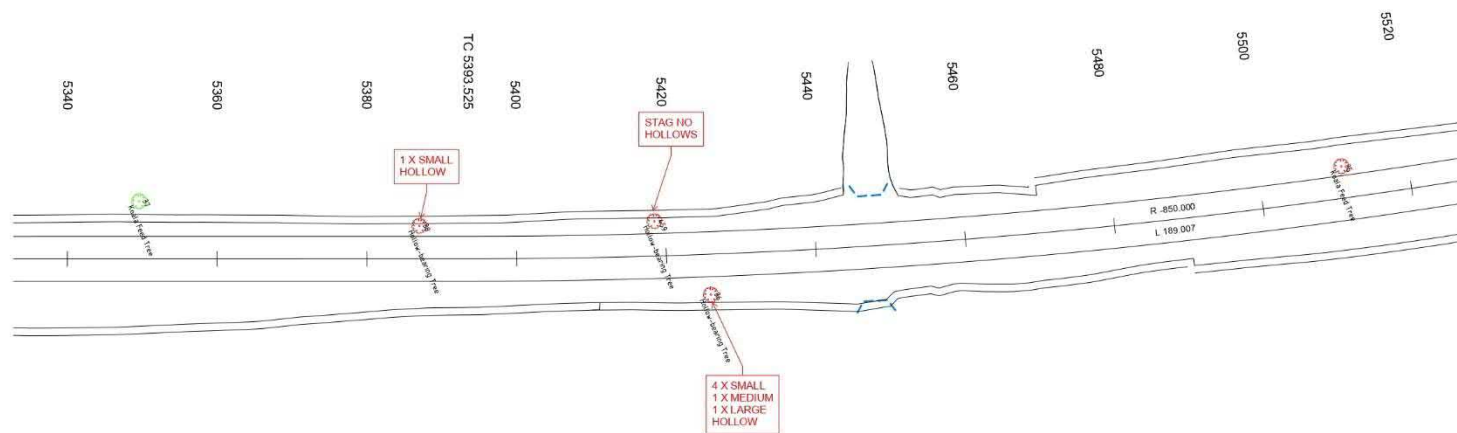


Figure I14: Detailed plans of trees requiring removal – page 14

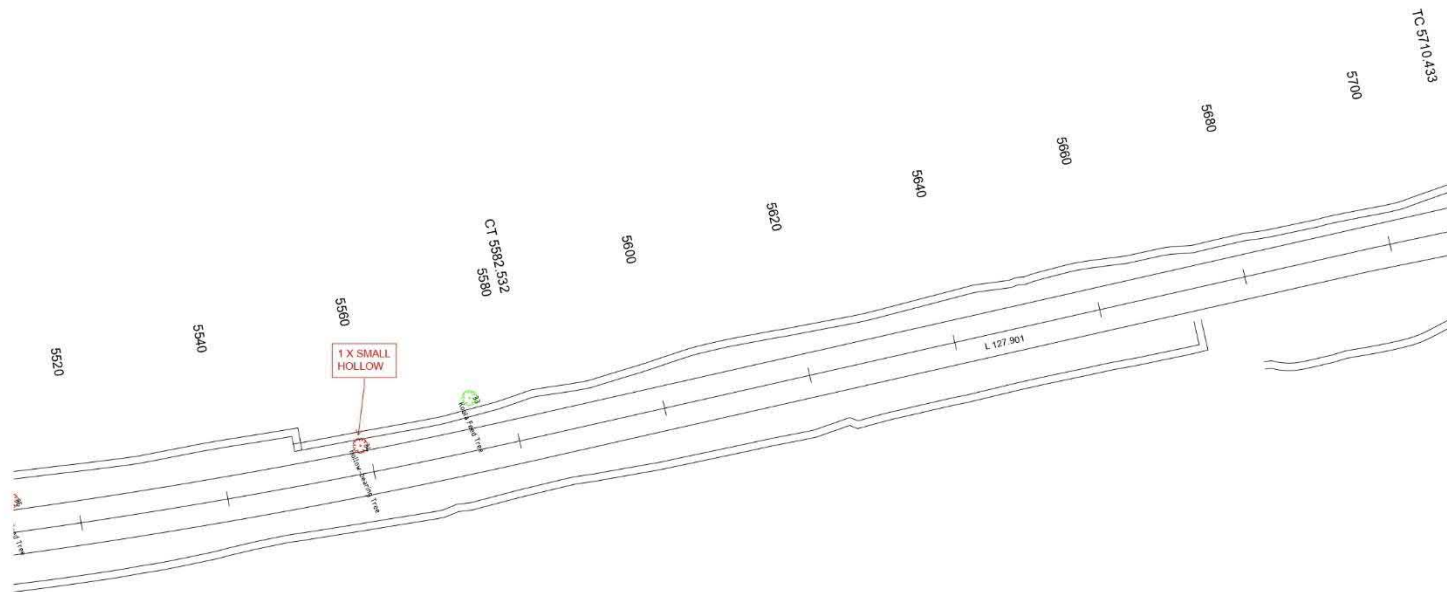


Figure I15: Detailed plans of trees requiring removal – page 15

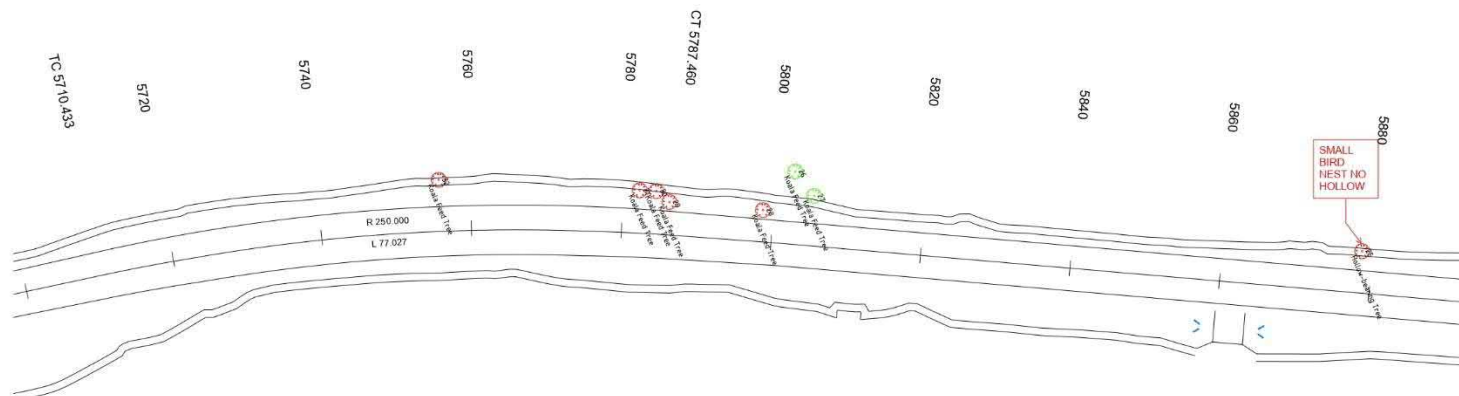


Figure I16: Detailed plans of trees requiring removal – page 16

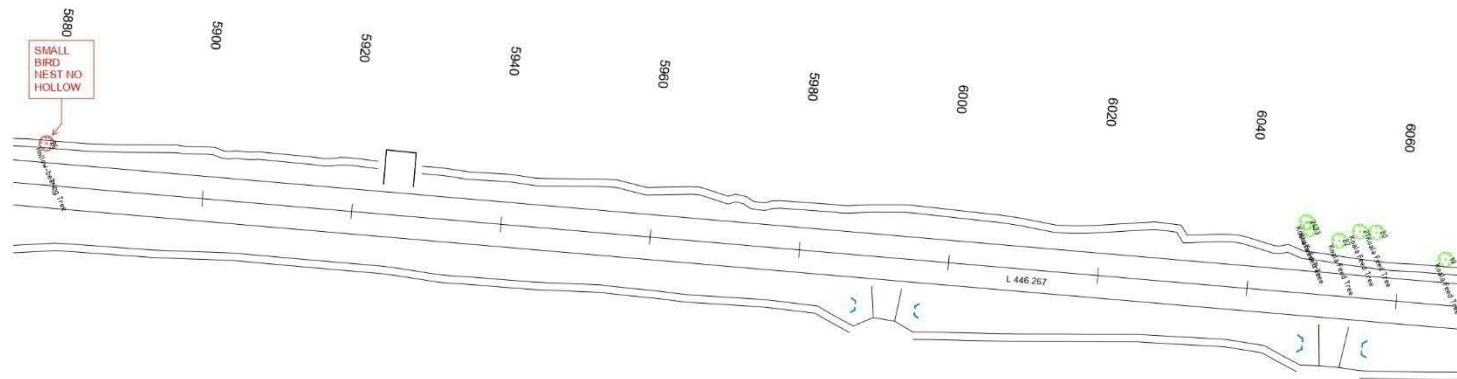


Figure I17: Detailed plans of trees requiring removal – page 17

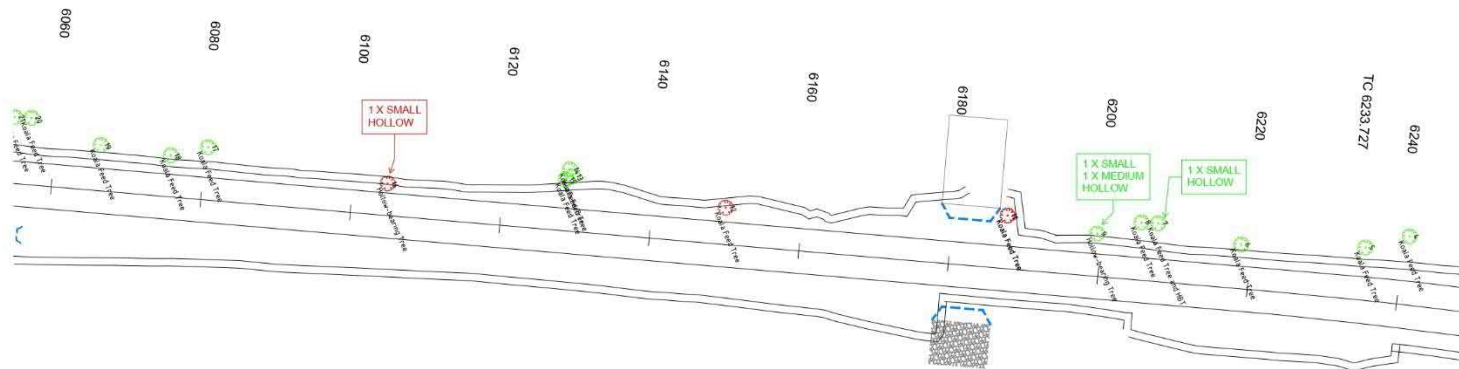


Figure I18: Detailed plans of trees requiring removal – page 18

