Flora and Fauna Assessment Report

Nungatta Feral-Predator-Free Area

South East National Park, Nungatta NSW 2551

Report prepared by Narla Environmental

for NSW National Parks and Wildlife Service c/o Niche Environment and Heritage

August 2022

NARLA
environmental

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Glossary

Acronym/ Term	Definition
Activity	Establishment of the Nungatta Feral Predator Free Area
ASL	Above Sea Level
BAM	Biodiversity Assessment Methodology
BC Act	New South Wales Biodiversity Conservation Act 2016
BVDCP	Bega Valley Development Control Plan 2013
BVLEP	Bega Valley Local Environmental Plan 2013
DAWE	Department of Agriculture, Water and the Environment
DEC	Department of Environment and Conservation
DEE	Department of the Environment and Energy
Disturbance Footprint	All areas associated with the Activity
DPE	Department of Planning and Environment (formally DPIE and OEH)
DPI	Department of Primary Industries
DPIE	Department of Planning, Industry and Environment (now known as the DPE)
DSEWPC	Department of Sustainability, Environment, Water, Population and Communities
EEC	Endangered Ecological Community
EP&A Act	Environmental Planning & Assessment Act 1979
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
FFA	Flora and Fauna Assessment
FM Act	Fisheries Management Act 1994
FPFA	Feral Predator Free Area
ha	Hectares
km	Kilometres
LGA	Local Government Area
m	metres
mm	millimetres
NPWS	NSW National Parks and Wildlife Service
NSW	New South Wales
OEH	Office of Environment and Heritage (now known as the DPE)
Survey Area	All areas associated with the proposed activity
SEPP	State Environmental Planning Policy
SRZ	Structural Root Zone
TEC	Threatened Ecological Community
Threatened species, populations and ecological communities	Species, populations and ecological communities specified in Schedules 1 and 2 of the BC Act 2016
TPZ	Tree Protection Zone

1. Introduction

1.1 Project Background

Narla Environmental Pty Ltd (Narla) was engaged by NSW National Parks and Wildlife Service (NPWS, 'the proponent') c/o Niche Environment and Heritage to undertake a Flora and Fauna Assessment (FFA) for the Nungatta Feral Predator Free Area (FPFA). In NSW, feral Cats (*Felis catus*) and Red Foxes (*Vulpes vulpes*) are the primary drivers of the decline and local extinction of many mammals, and have had a significant impact on bird, reptile and amphibian species. The Nungatta FPFA project is part of one of the most significant threatened-fauna and ecological restoration projects in NSW history and aims to establish an effective feral free area in South East Forest National Park (on the South Coast of NSW). The Nungatta FPFA is situated on the coastal range between the escarpment and the sea and located entirely within the South East Forest National Park, approximately 40 minutes drive south of Bombala and 60 minutes west of Eden. It is generally bounded by White Rock River to the west, Nungatta Creek Road to the east, Imlay Road to the north and Reef Road to the south.

Positioned within the extensive eucalypt forests of NSW far south coast, the site is important in that it provides habitat for many threatened, and locally extinct, species. Species that are locally extinct and considered for reintroduction include (but are not limited to):

- *Bettongia gaimardi* (Eastern Bettong);
- *Pseudomys fumeus* (Smoky Mouse);
- *Dasyurus viverrinus* (Eastern Quoll); and
- *Potorous longipes* (Long-footed potoroo).

Moreover, the site is well connected to vast areas of remnant bushland and likely to already support a range of threatened fauna species including *Ninox strenua* (Powerful Owl), *Callocephalon fimbriatum* (Gang-gang Cockatoo), *Petaurus australis* (Yellow-bellied Glider), *Petauroides volans* (Greater Glider), *Sminthopsis leucopus* (White-footed Dunnart), and *Dasyurus maculatus* (Spotted-tailed Quoll).

NPWS will work closely with a range of key stakeholders as part of a national approach to rewilding. The establishment and continued management of the Nungatta FPFA involves:

- Extensive programs to eradicate all cats, foxes and wild dogs from within the area;
- Eradication of feral herbivores including deer, pigs, and rabbits. If rabbits cannot be eradicated, they will be reduced to a level where they have negligible impact;
- Reintroduction of locally extinct animal species will be conducted following extensive assessment and completion of translocation plans; and
- Monitoring, evaluation and reporting on species response, threats and ecosystem health (a critical component of the project).

Narla has produced this report in order to assess any potential impacts associated with the establishment of the Nungatta FPFA on terrestrial ecology, particularly threatened species, populations and ecological communities listed under the Biodiversity Conservation Act 2016 (BC Act) and Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). Potential impacts to aquatic ecology associated with the establishment of the Nungatta FPFA will be assessed in a separate report. The report also recommends measures to mitigate and manage any potential impacts in line with all relevant environmental legislation.

1.2 Proposed Activity

The proposed Activity involves the establishment and ongoing operation of a 2,084ha feral-predator free area. This consists of an initial release area of 246ha and a larger breeding area of 1,838ha. The smaller release area is for intensive monitoring of translocated animals. While the larger area will support the translocated animals and the development of resilient populations. Each area will be surrounded by a cleared corridor that contains a predator proof fence, vehicle access along both sides of the fence and predator proofed crossings of streams. The Activity has a total disturbance footprint of 55.78ha that is made up of various components (**Table 1**).
The key operational components associated with the Activity are (**Figure 1**):

- **Conservation Fencing:** The perimeter of the initial release area and the larger feral-preadator free area will be constructed using a specially designed feral predator proof fence. The conservation fence is nominally 1.8m high with floppy top, mesh size/ gauge specifically designed to exclude fox, feral cats, rabbits, deer, pigs etc., two mid-height electric wires and skirt to lay flat on the ground to prevent burrowing. Specially designed gates will be placed strategically for management, emergency and public access. This consists of 8.4km of fencing for the initial release area and 24.1km of fencing along the perimeter of the Activity area. All crossings would be fitted with 30mm mesh barriers to prevent ingress by feral predators. **Figure 4** shows an example of the easement, conservation fence, and internal and external road trails arrangement.
- **Easement (vegetation clearance) / Fence Line Tracks (internal and external):** Construction of a 15m wide cleared corridor with the predator proof fence situated approximately in the centre of this corridor. The corridor will be cleared to a standard that allows for ongoing maintenance using slashers and the movement of 4WD vehicle/ all terrain vehicle or similar.
- **Fire Assets and Fire Trails (FAFT):** A network of strategic and tactical FAFTs will be constructed within the cleared corridor. The strategic FAFT (categories 1, 7 and 9) are generally located around the perimeter of the Activity area. While the tactical FAFT's are located on a section of Reef Road which links Mervs Firetrail West and Laings Road. The FAFT would be constructed and drained using *Rural Fire Service Fire Trail Guide and Manual* (Department of Industry, Soil Conservation Service 2017). New fire trails may be surfaced with crushed rock material, consistent with the existing fire trails where the natural earth surface is unsuitable.
- **Management Trail:** Approximately 16km of management trails will be constructed. The majority of the management trails are located within the cleared corridor on the inside of the conservation fence. Some of the management trails are located outside the Activity area. The management trails will be used for predator control and ecological survey work. New management trails may be surfaced with crushed rock material, consistent with the existing fire trails where the natural earth surface is unsuitable.
- **Culverts:** Installation of 17 new culverts (13 with floodways and four without floodways) and the use of three existing culverts without floodways.
- **Bridges:** Installation of two new bridges, and two existing bridges will be repaired. All bridges would be standard NPWS concrete slab bridges. Repairs or replacements to existing damaged bridges would be undertaken within the location and footprint of the existing bridges.
- **Walking Trails:** Construction of approximately 760m of walking trails.
- **Large Debris Traps with Maintenance Pad**: Twenty large debris traps and associated access tracks and maintenance pads will be constructed. A further four creek crossing locations will however only require a maintenance access pad. The large debris traps will be located upstream of the crossing. The traps would consist of several lengths of heavy steel cabling spanning the stream and fixed to trees or posts on either side and within the stream. The maintenance pads would by up to 10 x 10m wide and allow for an excavator to reach above the debris trap to remove snagged logs after flooding.
- **Site Compound**: A site compound is located in the south-western corner of the Activity area (i.e. the intersection of Mervs Firetrail East and Alex Hut Trail). The compound will contain temporary workshop, shelter, hard stand for materials and remote water and power supply. It may also include temporary overnight accommodation.

- **Visitor infrastructure sites:** Visitor infrastructure (e.g. signs, shelter, car park, observation points) is proposed at seven locations around the perimeter.
- **Supporting Ancillary Infrastructure:** Construction of ancillary infrastructure (e.g. parking, signage, bollards, drainage, remote cameras, telemetry) to support the establishment and ongoing operation of the Activity.

Table 1. Components of the Activity and their associated disturbance footprint.

Component of the Activity	Disturbance Footprint (ha)
Predator Free Fence Management Corridor. Encompasses Conservation Fencing, Easement/ Fence Line Tracks, FAFT, Gates, Culverts and Bridges	42.93
Debris Traps and Maintenance Pads	1.53
Supporting Ancillary Infrastructure (Carpark And Signage)	0.62
Site Compound	0.31
Management and Walking Trails	10.39
TOTAL	55.78

1.3 Survey Area

For the purpose of impact mitigation and minimisation, an additional 5m was added to each side of the predator free fence corridor, resulting in a 25m fence line corridor. An additional stream survey area 40m upstream from the fence and 10m either side of the stream was assessed for the in stream large debris traps. The combination of the fence line corridor survey area, stream survey area and the disturbance footprint, is hereafter referred to as the 'Survey Area' (**Figure 3**). The Survey Area covered an area of approximately 83.68ha.

1.3.1 Site Description and Location

The Survey Area is located in the southern portion of South East Forest National Park and connected to extensive areas of eucalypt forest, which are of various age classes as a result of past logging. It occurs in the locality of Nungatta within the Bega Valley Shire Council and Snowy Monaro Reginal Council Local Government Areas (LGA). Although the Survey Area was severely affected by the 2019/2020 bushfires, above average rainfall in 2020, 2021 and 2022 has supported considerable recovery. The Survey Area and surrounds are intersected by numerous fire and management trails of varying condition (**Figure 2**).

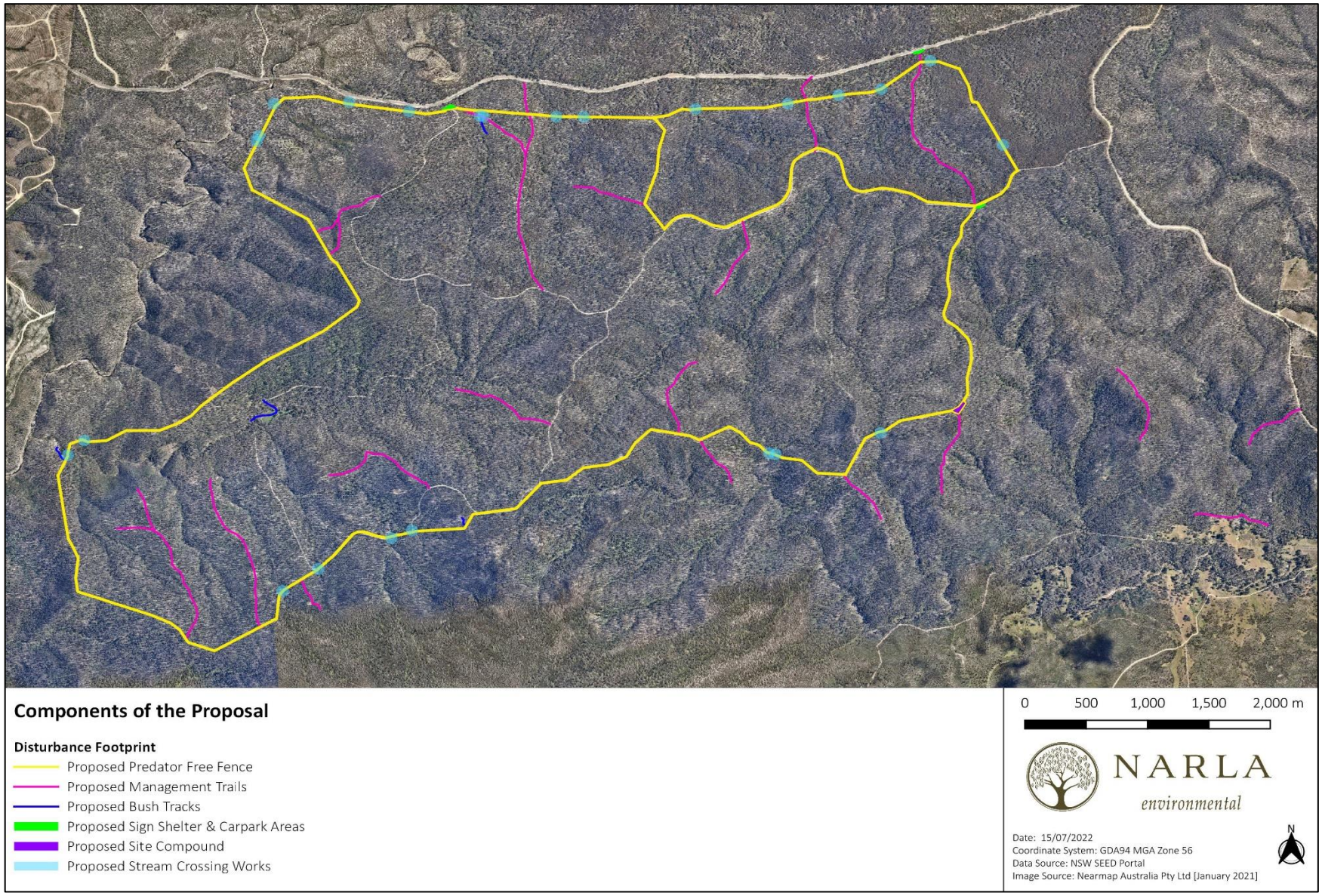


Figure 1. Components of the Proposal.

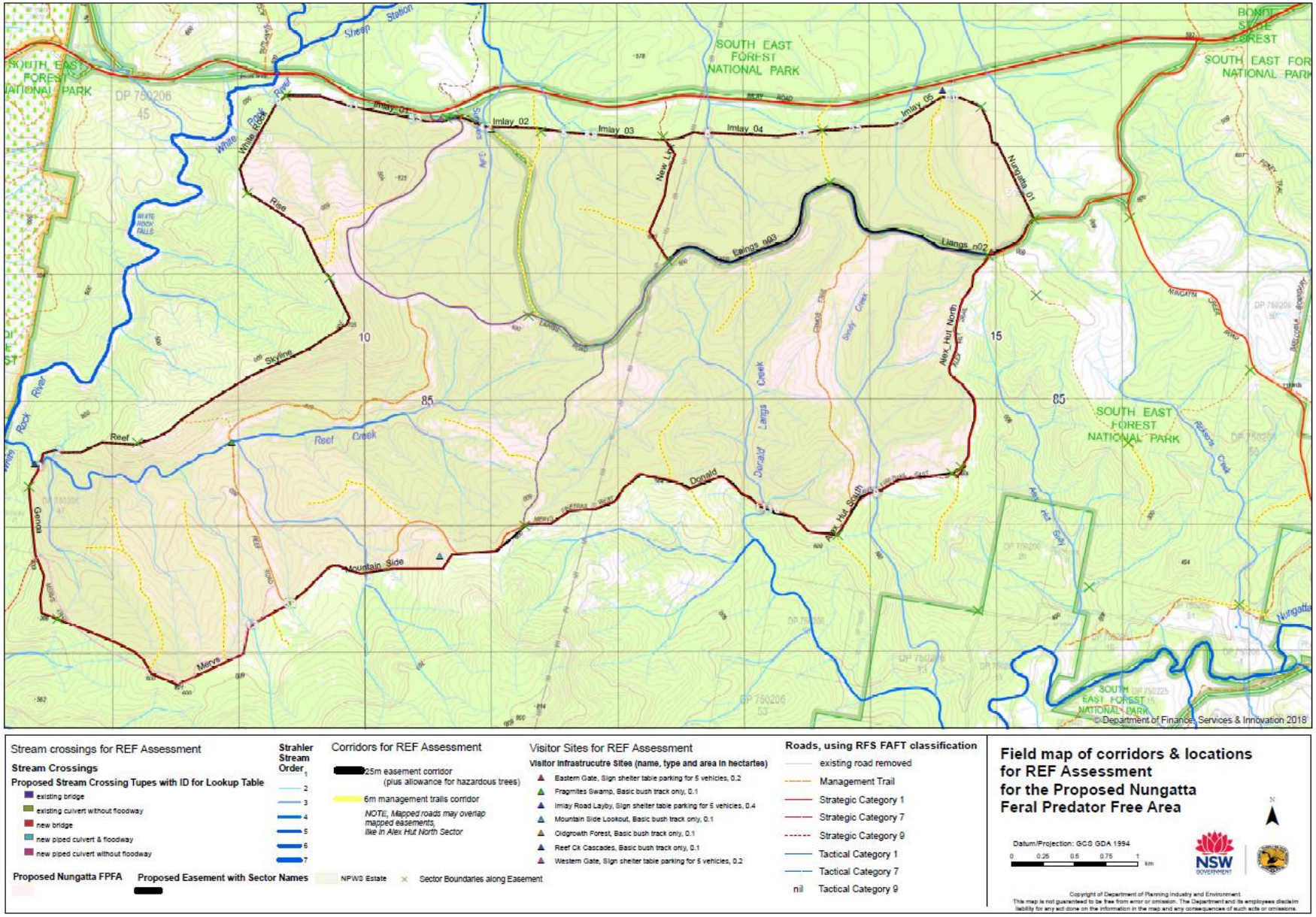


Figure 2. Proposed works and existing infrastructure (NPWS 2022).

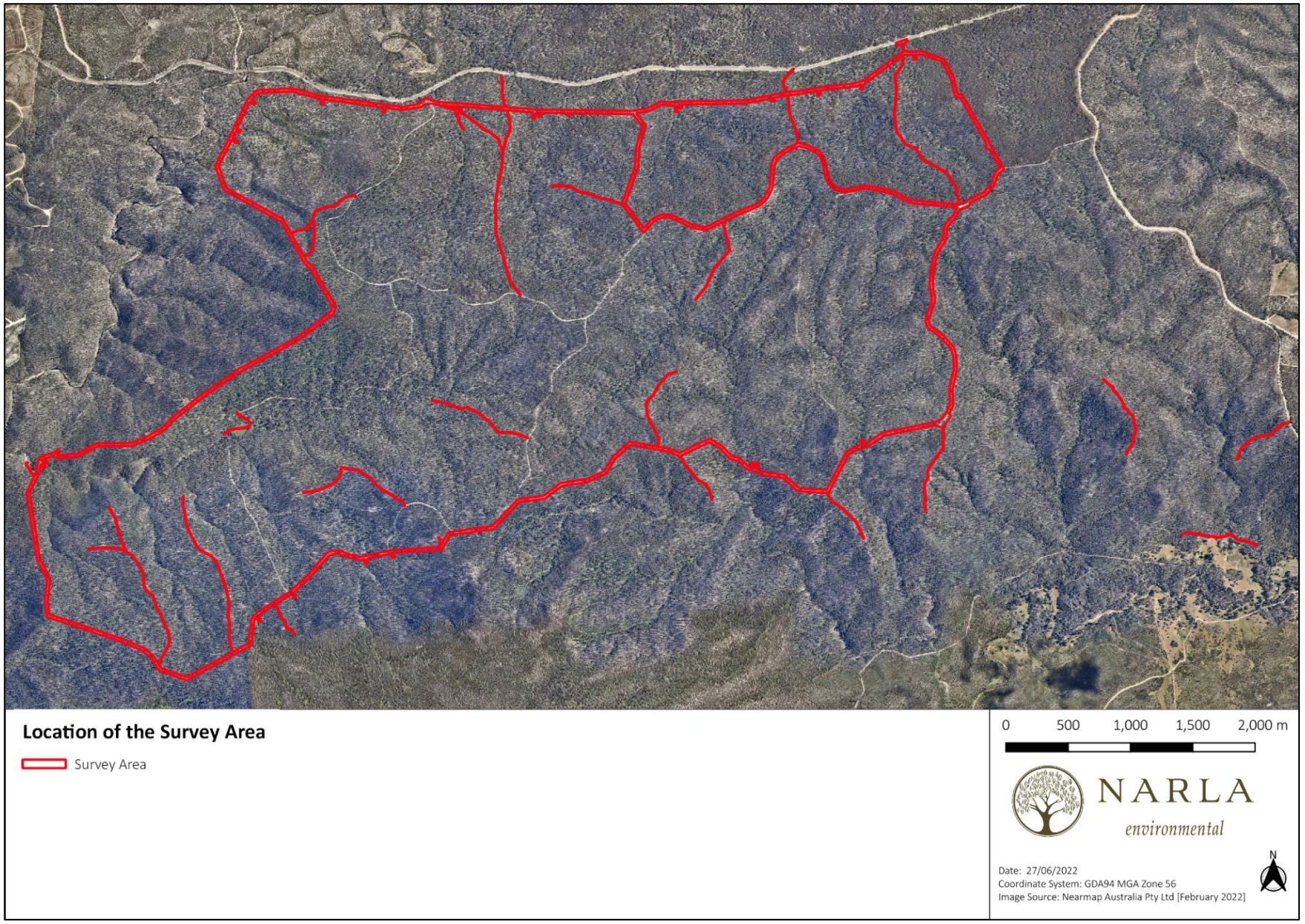


Figure 3. Location of the Survey Area.

Figure 4. Predator Proof Fence at Mallee Cliffs National Park. (Source Wayne Lawler Australian Wildlife Conservancy)

1.4 Topography, Geology and Soil

The Survey Area primarily occurs on ridgetops with elevation between 705m above sea level (asl) and 438m asl. Considering the linear nature of the Survey Area, it crosses a number of geological features.

Soil mapping of the Survey Area shows two broad soil types defined under the Australian Soil Classification (R. F. Isabell et al. 2021):

- Dermosols - non texture contrast soils that have structured subsoils (B horizons). They are found mainly in the upland areas, often in association with Kandosols which have massive B horizons. These soils can vary from stony hard setting soils to friable deeper profiles. Some may almost have some texture contrast and a bleached subsurface (A2) horizon (The State of Victoria 2022); and
- Kandosols - on texture contrast soils (with little or gradual increase in clay content with depth) that have massive (i.e. weakly to non-structured) subsoils (B horizons). They are found mainly in the upland areas, often in association with Dermosols, Chromosols and Kurosols. These soils can vary from stony hard setting soils to deeper friable soils. Some may almost be texture contrast and have a bleached subsurface (A2) horizon (The State of Victoria 2022).

1.5 Hydrology

The Survey Area contains a number of mapped watercourses including a number of 1st, 2nd, 3rd and 4th Strahler order streams (**Figure 5**).

2. Relevant Legislation and Policy

The legislation and policy that are addressed in this report are listed in **Table 2**. Relevant guidelines utilised in this report included the Matters of National Environmental Significance: Significant Impact Guidelines (Environment Protection, Biodiversity Conservation Act 1999) and Threatened Species Test of Significance Guidelines (Biodiversity Conservation Act 2016), Threatened Species Survey and Assessment: Guidelines for developments and activities. Working Draft (DEC 2004) and Surveying Threatened Plants and Their Habitats (DPIE 2020).

Table 2. Relevant legislation and policy addressed.

Legislation/Policy	Relevant Ecological Feature on Site	Triggered	Action Required
Environmental Planning and Assessment Act 1979 **(EP&A Act)**	All threatened species, populations and ecological communities and their habitat that occur or are likely to occur within the Survey Area during a part of their lifecycle.	Yes	Preparation of an FFA that addresses all relevant planning processes under Part 5 'Infrastructure and environmental impact assessment'.
Biodiversity Conservation Act 2016 (BC Act) (New South Wales)	No threatened ecological communities listed under the BC Act were identified within the Survey Area. Two (2) BC Act listed threatened fauna species were observed foraging within the Survey Area: ▪ *Callocephalon fimbriatum* (Gang-gang Cockatoo); and ▪ *Petroica boodang* (Scarlet Robin). Additionally, multiple records of the following BC Act listed threatened flora species has been historically recorded within the Survey Area (Miles 2021): ▪ *Pultenaea parrisiae* (Parris' Bush-pea). Suitable habitat for various threatened fauna species listed under the BC Act was identified. The following BC Act listed species may be impacted by the Activity: ▪ *Callocephalon fimbriatum* (Gang-gang Cockatoo);	Yes	Preparation of an FFA, particularly the likelihood tables for threatened fauna and flora species occurring or potentially occurring within the Survey Area, as well as severity of potential impacts. Tests of Significance (5-part Test) have been undertaken for the BC Act listed flora and fauna species that may be impacted by the Activity (**Appendix A – Appendix D**).

Legislation/Policy	Relevant Ecological Feature on Site	Triggered	Action Required
	▪ *Calyptorhynchus lathami* (Glossy Black Cockatoo); ▪ *Cercartetus nanus* (Eastern Pygmy-possum); ▪ *Isoodon obesulus* (Southern Brown Bandicoot) ▪ *Dasyurus maculatus* (Spotted-tailed Quoll); ▪ *Falsistrellus tasmaniensis* (Eastern False Pipistrelle); ▪ *Heleioporus australiacus* (Giant Burrowing Frog); ▪ *Mixophyes balbus* (Stuttering Frog); ▪ *Myotis macropus* (Southern Myotis); ▪ *Ninox strenua* (Powerful Owl); ▪ *Petaurus australis* (Yellow-bellied Glider); ▪ *Pultenaea parrisiae* (Parris' Bush-pea); ▪ *Scoteanax rueppellii* (Greater Broad-nosed Bat); ▪ *Sminthopsis leucopus* (White-footed Dunnart); ▪ *Tyto novaehollandiae* (Masked Owl); and ▪ *Tyto tenebricosa* (Sooty Owl).		
Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) (Commonwealth)	No threatened ecological communities listed under the EPBC Act were identified within the Survey Area. One (1) EPBC Act listed threatened fauna species was identified foraging within the Survey Area: ▪ *Callocephalon fimbriatum* (Gang-gang Cockatoo). Additionally, one (1) EPBC Act listed threatened flora species has been historically recorded within the Survey Area (Miles 2021):	Yes	Preparation of an FFA, particularly the likelihood tables for threatened fauna and flora species occurring or potentially occurring within the Survey Area, as well as severity of potential impacts. Assessments of Significant Impact Criteria have been undertaken for the EPBC Act listed flora and fauna species that may be impacted by the Activity (**Appendix E – Appendix H**).

Legislation/Policy	Relevant Ecological Feature on Site	Triggered	Action Required
	▪ *Pultenaea parrisiae* (Parris' Bush-pea). Suitable habitat for various other threatened fauna species listed under the EPBC Act was identified. The following EPBC Act listed species may be impacted by the Activity: ▪ *Callocephalon fimbriatum* (Gang-gang Cockatoo); ▪ *Isoodon obesulus* (Southern Brown Bandicoot) ▪ *Dasyurus maculatus* (Spotted-tailed Quoll); ▪ *Heleioporus australiacus* (Giant Burrowing Frog); ▪ *Mixophyes balbus* (Stuttering Frog); ▪ *Petauroides volans* (Greater Glider); and ▪ *Pultenaea parrisiae* (Parris' Bush-pea).		
Biosecurity Act 2015	Three (3) priority weeds for the South East were observed within the Survey Area: ▪ *Asparagus asparagoides* (Bridal Creeper); ▪ *Senecio madagascariensis* (Fireweed); and ▪ *Rubus fruticosus* species aggregate (Blackberry).	Yes	Listed priority weeds must be managed in accordance with the Biosecurity Act 2015.
State Environmental Planning Policy (Resilience and Hazards) 2021- Chapter 2 – Coastal Management	The Survey Area does not contain areas mapped as 'Coastal Wetlands', 'Littoral Rainforest' or any other areas mapped in this State Environmental Planning Policy (SEPP). As such this SEPP does not apply to the Activity.	No	None.
State Environmental Planning Policy (Biodiversity and Conservation) 2021 –	This chapter does not apply to land dedicated or reserved under the National Parks and Wildlife Act 1974, or acquired under Part 11 of that Act; therefore, this policy does not apply to the Activity.	No	None.

Legislation/Policy	Relevant Ecological Feature on Site	Triggered	Action Required
Chapter 4 Koala Habitat Protection 2021			
Water Management Act 2000	Clause 41 of the Water Management (General) Regulation 2018 states that a public authority is exempt from section 91E(1) of the Water Management Act in relation to all controlled activities that it carries out in, on or under waterfront land. No controlled activity approval is therefore required.	No	None.

2.1 Biodiversity Assessment Pathway

Activities requiring an environmental assessment under Part 5 of the EP&A Act 1979 are to consider biodiversity as part of the environmental assessment process. The test of significance (under s.7.3 of the BC Act) and/or Assessment of Significance (EPBC Act) determines whether the proposed activity is likely to significantly affect threatened species, ecological communities or their habitats. If the activity is likely to have a significant impact, or will be carried out in a declared Area of Outstanding Biodiversity Value, the proponent can opt into the Biodiversity Offsets Scheme or instead prepare a species impact statement.

The environmental impact of activities that will not have a significant impact on threatened species will continue to be assessed under Section 5.5 of the Environmental Planning and Assessment Act 1979. The Activity will not be carried out in a declared Area of Outstanding Biodiversity Value and it is considered unlikely to result in a significant impact to threatened species, ecological communities or their habitats.

2.2 Scope of Assessment

The objectives of this FFA were to:

- Record the Flora and Fauna within the Survey Area;
- Assess the likelihood of occurrence of migratory species, threatened species, endangered populations and threatened ecological communities as listed under the BC Act and/or the EPBC Act;
- Assess any potential impacts to species and/or communities listed under the BC Act and EPBC Act;
- Identify and map the distribution of Plant Community Types (PCTs) within the Survey Area;
- Record presence and the extent of any known or potential fauna habitat features such as nests, dreys, caves, crevices, culverts, pools, soaks, flowering trees, fruiting trees or hollow-bearing trees and provide recommendations for on-going management of these habitat features and any fauna present;
- Record presence and the extent of any Priority Weeds or weed infestations and provide recommendations for on-going management; and
- Recommend any controls or additional actions to be taken to avoid or minimise the ecological impacts associated with the Activity.

2.3 Study Limitations

The timing of the field survey (daylight hours in June 2022) may not have coincided with emergence times of some species of flora and fauna, such as seasonally flowering herbs, seasonal migratory fauna or nocturnal fauna. To mitigate this, detailed habitat assessments were combined with desktop research and local ecological

knowledge to establish an accurate prediction of the potential for such species to occur on or adjacent the Survey Area. As a result, the species assessed within this report include those that have been recorded within the Survey Area as well as those known or predicted to occur.

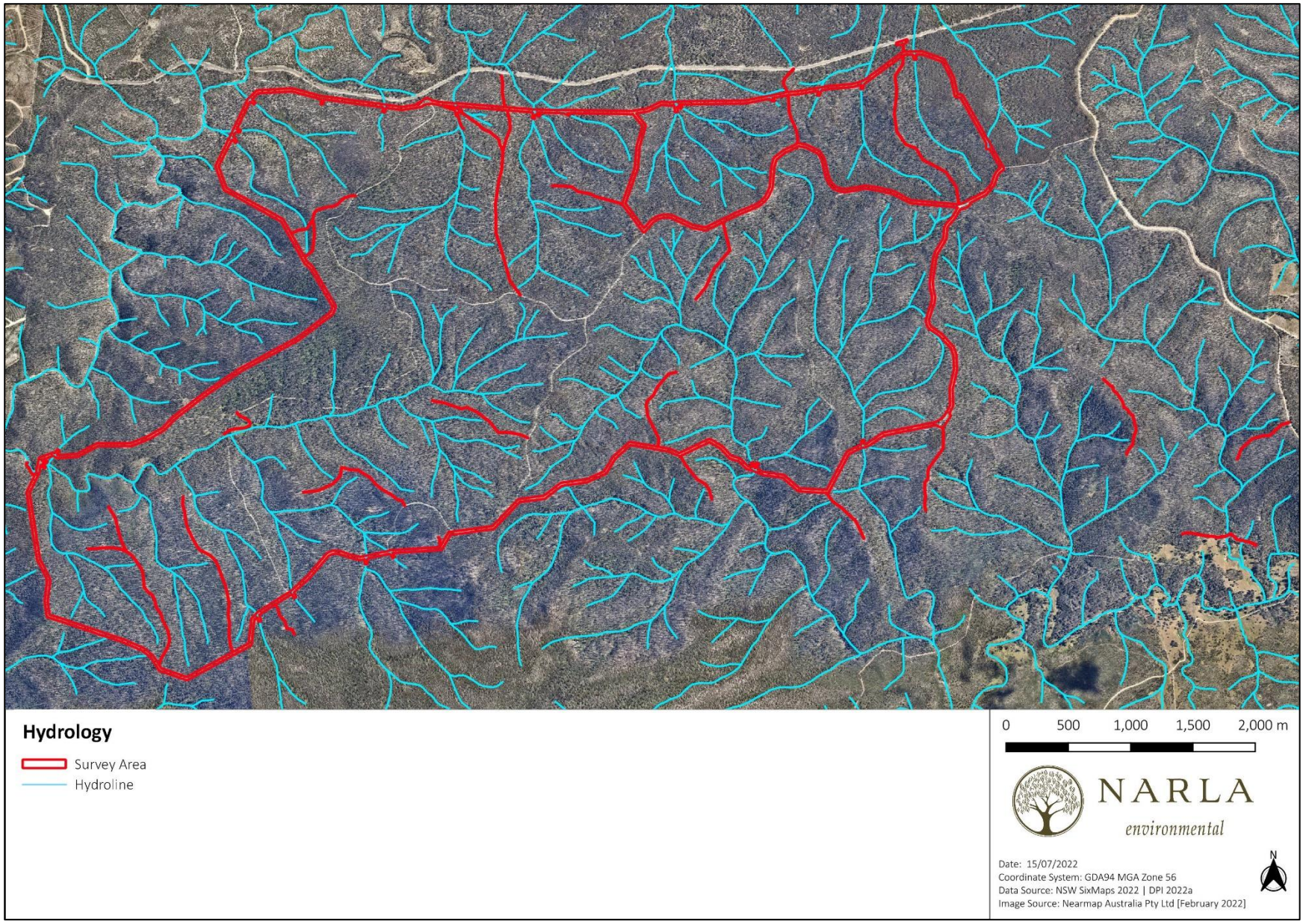


Figure 5. Hydrology of the Survey Area.

3. Methodology

3.1 Desktop Assessment and Literature Review

A thorough literature review of local information relevant to the Nungatta area was undertaken. Searches using NSW Wildlife Atlas (BioNet; DPE 2022b) and the Commonwealth Protected Matters Search Tool (DAWE 2022; **Appendix M**) were conducted in May 2022 to identify all threatened flora and fauna, as well as migratory fauna records within a 10km x 10km cell search area centred on the Survey Area. These data were used to assist in establishing the presence or likelihood of any ecological values as occurring on or adjacent to the Survey Area and helped inform our Ecologists on what to look for during the site assessment. Other State and Commonwealth Databases & Datasets reviewed in May and June 2022 included:

- NSW BioNet. Threatened Biodiversity Data Collection (DPE 2022b);
- NSW BioNet. Vegetation Classification System (DPE 2022c); and
- Six Maps Clip & Ship (NSW Government Spatial Services 2022).

Soil landscape and geological mapping was examined to gain an understanding of the environment within the Survey Area and assist in determining whether any threatened flora or ecological communities may occur there (see **Section 3.2.3**).

3.2 Ecological Site Assessment

3.2.1 General Survey

A site assessment was undertaken by experienced Narla Ecologists Angus McClelland and Gabriel James from the 12-16th of May and 1-3rd of June 2022, resulting in a total of 16 person days for the survey. During the site assessment, the following activities were undertaken:

- Identifying and recording the (PCTs present within the Survey Area. This included assessing 182 Rapid Data Points, located approximately 250m apart, to refine the PCT classification. Information recorded at each Rapid Data Point included:
    - Dominant canopy species;
    - Vegetation maturity;
    - Landscape position;
    - Characteristic mid-storey species;
    - Characteristic groundcover species; and
    - Hollow-bearing tree sampling.
- Identifying and recording any threatened ecological communities;
- Recording the flora species encountered within the Survey Area, with a focus on threatened species, species diagnostic of threatened ecological communities and Priority Weeds;
- Recording opportunistic sightings of any fauna species seen or heard within or in the immediate surrounds of the Survey Area;
- Targeted surveys for threatened flora;
- Identifying and recording the locations of notable fauna habitat such as nesting, roosting or foraging microhabitats;
- Assessing the connectivity and quality of the vegetation within the Survey Area and surrounding area; and
- Targeting the habitat of any threatened and regionally significant fauna including:

- Tree hollows (habitat for threatened large forest owls, parrots and arboreal mammals);
- Caves and crevices (habitat for threatened reptiles, small mammals and microbats);
- Soaks (habitat for threatened frogs);
- Wetlands (habitat for threatened fish, frogs and water birds);
- Drainage lines (habitat for threatened fish and frogs);
- Fruiting trees (food for threatened frugivorous birds and mammals);
- Flowering trees (food for threatened nectarivorous birds and mammals);
- Trees and shrubs supporting nest structures (habitat for threatened birds and arboreal mammals); and
- Any other habitat features that may support fauna (particularly threatened) species.

3.2.2 Weather Conditions

Weather conditions recorded at the nearest weather station (Bombala [Therry Street]) prior to and during the site assessment are provided in **Table 3** (BOM 2022a, BOM 2022b). The data revealed rainfall leading up to both of the surveys. These weather conditions may have been conducive to the emergence of annual herbs.

Table 3. Weather conditions recorded at Bombala (Therry Street; station #070005) preceding and during the site assessments (site assessment dates in bold).

Survey date	Day	Minimum Temp. (°C)	Maximum Temp. (°C)	Rainfall (mm)
5-May-22	Th	7.5	12.6	0.4
6-May-22	Fr	-1.6	12.3	0.8
7-May-22	Sa	-2.3	13	0
8-May-22	Su	2.3	12.8	0
9-May-22	Mo	0.6	16	0
10-May-22	Tu	4	16	0
11-May-22	We	4	15.9	0.4
12-May-22	**Th**	**8.5**	**15**	**7.6**
13-May-22	**Fr**	**10.5**	**20**	**5**
14-May-22	**Sa**	**8**	**20**	**0.2**
15-May-22	**Su**	**11.1**	**19**	**8.6**
16-May-22	**Mo**	**5.3**	**17.9**	**0**
25-May-22	We	0.4	15	0
26-May-22	Th	1	17.7	0
27-May-22	Fr	2.1	12.7	0.8
28-May-22	Sa	5	14.6	8.8
29-May-22	Su	1.6	12	0.4
30-May-22	Mo	-3.4	6.5	0
31-May-22	Tu	-1.4	10.3	4.4
1-Jun-22	**We**	**-1**	**6.5**	**0**
2-Jun-22	**Th**	**3**	**11.5**	**0.8**
3-Jun-22	**Fr**	**-2.4**	**10.5**	**0**

3.2.3 Mapping and Analysis of Vegetation Communities

Narla examined local satellite imagery, geological mapping, soil landscape mapping and topographic mapping, in addition to existing vegetation mapping (Tozer et al. 2010) in order to stratify the Survey Area and guide the site assessment survey efforts. The following resources were consulted during the site assessment to assist with the identification of vegetation communities present within the Survey Area:

- Vegetation and Soil Mapping
    - eSPADE v2.2 (DPE 2022e);
    - Native vegetation of southeast NSW: a revised classification and map for the coast and eastern tablelands (Tozer et al. 2010);
    - Nungatta Feral Predator Free Area Flora Survey (Miles 2021);
    - The Australian Sol Classification. Third Edition (R. F. Isabell and the National Committee of Soil and Terrain 2021); and
    - NSW WeedWise (DPI 2022b).

4. Results: Native Vegetation

4.1 Plant Community Types

The field survey conducted by the Narla Ecologists identified the vegetation within the Survey Area as best conforming to the following PCTs:

- PCT 790: Crimson Bottlebrush – Scented Paperbark wet heath in the hinterland hills, southern South East Corner Bioregion (**Table 4**);
- PCT 817: Dwarf She-oak closed heathland of escarpment ranges, South Eastern Highlands Bioregion (**Table 5**);
- PCT 929: Messmate – Mountain Grey Gum moist open forest of granitic foothills, southern South East Corner (**Table 6**);
- PCT 943: Mountain Grey Gum – Brown Barrel very tall moist forest on escarpment ranges, central and southern South East Corner Bioregion (**Table 7**);
- PCT 1228: Swamp Gum – Ribbon Gum open forest on flats of the coastal and hinterland lowlands, southern South East Corner Bioregion (**Table 8**);
- PCT 1320: White Stringybark – Maiden's Gum grassy open forest on granitic foothills, southern South East Corner Bioregion (**Table 9**);
- PCT 1322: White Stringybark – Narrow-leaved Peppermint dry open forest on hinterland hills, far south of the South East Corner Bioregion (**Table 10**); and
- PCT 1340: Yertchuk – Silvertop Ash – Blue-leaved Stringybark shrubby open forest of the Wallagaraugh catchment, far southern South East Corner Bioregion (**Table 11**).

Figure 6 identifies the location of these PCTs within the Survey Area.

Table 4. Description of PCT 790 identified within the Survey Area.

PCT 790: Crimson Bottlebrush – Scented Paperbark wet heath in the hinterland hills, southern South East Corner Bioregion	
	
Vegetation Formation/ Keith Class	Freshwater Wetlands/ Coastal Heath Swamps
Extent within Survey Area (approximate)	1.06ha
Extent to be impacted by the Activity (approximate)	0.68ha
Description of the Vegetation within the Survey Area	
This vegetation had been moderately affected by the bushfires in January 2022 and was characterised by a generally absent canopy with trees bordering the PCT encroaching from surrounding forest. Canopy species included *Eucalyptus consideniana, E. cypellocarpa* and *E. ovata*. The shrub layer was regenerating, resulting in a low but dense mid-storey that included *Leptospermum continentale, Callistemon citrinus, Allocasuarina paludosa, Acacia mearnsii, Persoonia linearis* and *Allocasuarina nana*. The ground layer was dense and included the native species *Entolasia stricta, Lomandra Longifolia, Lepidosperma filiforme, Gahnia radula, Gonocarpus tetragynus, Lindsea linearis, Drosera spatulata, Poa* spp.*, Epacris impressa, Patersonia fragilis* and *Xyris gracilis.*	
Description (DPE 2022c)	
An open shrub layer up to 2m tall, with scattered emergent trees. Restricted to small soaks on granitic substrates in the southern hinterland, typically between 150m and 500m elevation.	

PCT 790: Crimson Bottlebrush – Scented Paperbark wet heath in the hinterland hills, southern South East Corner Bioregion		
	Characteristic Flora Species	**Geology and Geography**
Justification of Vegetation Assignment	This vegetation within the Survey Area contained eight (8) species diagnostic of PCT 790 including: *Leptospermum continentale, Callistemon citrinus, Allocasuarina paludosa, Lepidosperma filiforme, Gahnia radula, Lindsea linearis, Patersonia fragilis* and *Xyris gracilis*. Furthermore, PCT 790 was the only community to account for all three (3) of the dominant mid-storey species (*Leptospermum continentale, Callistemon citrinus* and *Allocasuarina paludosa)*.	This PCT is restricted to small soaks on granitic substrates in the southern hinterland, typically between 150m and 500 m elevation. This vegetation within the Survey Area occurs at approximately 530m above sea level (asl) within soaks on granitic substrates in the southern hinterland.
BC Act 2016 Status	Nil	
EPBC Act 1999 Status	Nil	
References	Tozer, M.G., Turner, K., Keith, D.A., Tindall, D., Pennay, C., Simpson, C., MacKenzie, B., Beukers, M. and Cox, S. (2010) Native vegetation of southeast NSW: a revised classification and map for the coast and eastern tablelands. Cunninghamia 11(3): 359-406	

Table 5. Description of PCT 817 identified within the Survey Area.

PCT 817: Dwarf She-oak closed heathland of escarpment ranges, South Eastern Highlands Bioregion	
	
Vegetation Formation/ Keith Class	Heathlands/ Southern Montane Heaths
Extent within Survey Area (approximate)	0.23ha
Extent to be impacted by the Activity (approximate)	0.14ha
Description of the Vegetation within the Survey Area	
This vegetation had been severely affected by the bushfires in January 2022 and was characterised by an absent canopy and a heathy shrub layer dominated by the native species *Allocasuarina nana* and *Leptospermum continentale.* The ground layer was dominated by native species *Brachyloma daphnoides, Cassytha glabella, Stylidium armeria, Epacris impressa, Lomandra glauca, Gahnia sieberiana, Lomandra longifolia, Dillwynia glaberrima, Platysace lanceolata, Amperea xiphoclada* and *Gonocarpus tetragynus.*	
Description (DPE 2022c)	
Usually occurs on skeletal sandy loams derived from metasedimentary, acid volcanic or granitic substrates. Occurs mainly on exposed slopes and ridges of the western fall of the coastal escarpment between 600m and 800m elevation.	

PCT 817: Dwarf She-oak closed heathland of escarpment ranges, South Eastern Highlands Bioregion		
Justification of Vegetation Assignment	Characteristic Flora Species	Geology and Geography
	This vegetation within the Survey Area contained four (4) species diagnostic of PCT 817 including: *Allocasuarina nana, Brachyloma daphnoides, Lomandra glauca* and *Gonocarpus tetragynus.* Furthermore, PCT 817 was the only PCT to account for the dominance of *Allocasuarina nana* and has also been historically mapped within the Survey Area (Tozer et al. 2010).	This PCT usually occurs on skeletal sandy loams derived from metasedimentary, acid volcanic or granitic substrates. It occurs mainly on exposed slopes and ridges of the western fall of the coastal escarpment between 600m and 800m elevation. The vegetation within the Survey Area is situated at approximately 590m asl and occurs on granitic substrates.
BC Act 2016 Status	Nil	
EPBC Act 1999 Status	Nil	
References	Tozer, M.G., Turner, K., Keith, D.A., Tindall, D., Pennay, C., Simpson, C., MacKenzie, B., Beukers, M. and Cox, S. (2010) Native vegetation of southeast NSW: a revised classification and map for the coast and eastern tablelands. Cunninghamia 11(3): 359-406	

Table 6. Description of PCT 929 identified within the Survey Area.

PCT 929: Messmate – Mountain Grey Gum moist open forest of granitic foothills, southern South East Corner	
	
Vegetation Formation/ Keith Class	Wet Sclerophyll Forests (Shrubby sub-formation)/ Southern Escarpment Wet Sclerophyll Forests
Extent within Survey Area (approximate)	4.75ha
Extent to be impacted by the Activity (approximate)	3.18ha
Description of the Vegetation within the Survey Area	
This vegetation had been severely affected by the bushfires in January 2022 and was characterised by a dominant canopy of *Eucalyptus sieberi, E. obliqua, E. cypellocarpa, E. globoidea* and scattered occurrences of *E. radiata*. The mid-storey was generally sparse containing the native species *Acacia terminalis, Leucopogon lanceolatus, Daviesia mimosoides* and *Exocarpos strictus.* The ground layer was diverse, containing a number of forbs and graminoids including the native species *Gonocarpus teucrioides, Pteridium esculentum, Viola hederacea, Stellaria pungens, Hydrocotyle laxiflora, Glycine* spp., *Lomandra longifolia, Microlaena stipoides, Lomandra multiflora, Euchiton sphaericus* and exotic species *Conyza* spp. and the Priority Weed *Senecio madagascariensis.*	
Description (DPE 2022c)	
Tall to very tall open forest with an open understorey and dense ground layer. Occurs on moist sheltered granitic slopes above 500m elevation on the tableland range south from the upper Tantawangalo Creek catchment.	

PCT 929: Messmate – Mountain Grey Gum moist open forest of granitic foothills, southern South East Corner		
Justification of Vegetation Assignment	Characteristic Flora Species	Geology and Geography
	This vegetation within the Survey Area contained 11 species diagnostic of PCT 929 including *Eucalyptus obliqua, E. cypellocarpa, E. sieberi, E. globoidea, Exocarpos strictus, Leucopogon lanceolatus, Geranium potentilloides, Gonocarpus teucrioides, Lomandra longifolia, Pteridium esculentum* and *Viola hederacea.* Furthermore, this PCT has been historically mapped within the Survey Area (Tozer et al. 2010).	This PCT occurs on moist sheltered granitic slopes above 500m elevation on the tableland range south from the upper Tantawangalo Creek catchment. This vegetation within the Survey Area occurs between approximately 500m and 580m asl in moist sheltered granitic slopes.
BC Act 2016 Status	Nil	
EPBC Act 1999 Status	Nil	
References	Tozer, M.G., Turner, K., Keith, D.A., Tindall, D., Pennay, C., Simpson, C., MacKenzie, B., Beukers, M. and Cox, S. (2010) Native vegetation of southeast NSW: a revised classification and map for the coast and eastern tablelands. Cunninghamia 11(3): 359-406	

Table 7. Description of PCT 943 identified within the Survey Area.

PCT 943: Mountain Grey Gum – Brown Barrel very tall moist forest on escarpment ranges, central and southern South East Corner Bioregion		
		
Vegetation Formation/ Keith Class	Wet Sclerophyll Forests (Shrubby sub-formation)/ Southern Escarpment Wet Sclerophyll Forests	
Extent within Survey Area (approximate)	0.16ha	
Extent to be impacted by the Activity (approximate)	0.13ha	
Description of the Vegetation within the Survey Area		
This vegetation had been moderately affected by the bushfires in January 2022 and was characterised by a canopy dominated by the native species *Eucalyptus cypellocarpa* and *E. obliqua* with scattered occurrences of *E. globoidea*. The mid-storey was sparse, including the native species *Cyathea australis, Leucopogon lanceolatus* and *Goodia lotifolia.* The ground layer was densely covered primarily by fern species including *Blechnum cartilagineum, Calochlaena dubia* and *Pteridium esculentum* and included herbaceous species *Geranium potentilloides, Goodenia ovata, Viola hederacea* and *Hydrocotyle laxiflora.*		
Description (DPE 2022c)		
Tall to very tall open forest with a dense ground cover mainly of ferns. Occurs south of Clyde Mountain on steep sheltered granitic slopes at 450m – 1200m elevation on the escarpment range and outlying mountains such as Egan Peaks, Mt Poole and Deua National Park.		
Justification of Vegetation Assignment	Characteristic Flora Species	Geology and Geography

PCT 943: Mountain Grey Gum – Brown Barrel very tall moist forest on escarpment ranges, central and southern South East Corner Bioregion		
	This vegetation within the Survey Area contained 10 species diagnostic of PCT 943 including: *E. cypellocarpa, E. obliqua, Cyathea australis, Leucopogon lanceolatus, Blechnum cartilagineum, Calochlaena dubia, Geranium potentilloides, Goodenia ovata, Pteridium esculentum* and *Viola hederacea.* Furthermore, PCT 943 has been historically mapped within the Survey Area (Tozer et al. 2010).	This PCT occurs south of Clyde Mountain on steep sheltered granitic slopes at 450m – 1200m elevation on the escarpment range and outlying mountains such as Egan Peaks, Mt Poole and Deua National Park. This vegetation within the Survey Area occurs at approximately 530m asl on steep sheltered granite slopes.
BC Act 2016 Status	Partially associated with Robertson Basalt Tall Open-forest in the Sydney Basin and South Eastern Highlands Bioregions (see **Section 5.1.1**).	
EPBC Act 1999 Status	Nil	
References	Tozer, M.G., Turner, K., Keith, D.A., Tindall, D., Pennay, C., Simpson, C., MacKenzie, B., Beukers, M. and Cox, S. (2010) Native vegetation of southeast NSW: a revised classification and map for the coast and eastern tablelands. Cunninghamia 11(3): 359-406	

Table 8. Description of PCT 1228 identified within the Survey Area.

PCT 1228: Swamp Gum – Ribbon Gum open forest on flats of the coastal and hinterland lowlands, southern South East Corner Bioregion		
		
Vegetation Formation/ Keith Class	Wet Sclerophyll Forest (Shrubby Sub-form)/ South Coast Wet Sclerophyll Forest	
Extent within Survey Area (approximate)	3.16ha	
Extent to be impacted by the Activity (approximate)	2.48ha	
Description of the Vegetation within the Survey Area		
This vegetation had been moderately affected by the bushfires in January 2022 and was characterised by a canopy dominated by *Eucalyptus ovata, E. cypellocarpa* and *E. viminalis* with scattered occurrences of *E. radiata*. The mid- storey was generally intermittent and included occurrences of *Goodia lotifolia, Callistemon citrinus, Acacia melanoxylon* and *Leptospermum continentale*. The ground layer was densely covered by native species including *Pultenaea retusa, Poa* spp.*, Dichondra repens, Glycine* spp.*, Geranium potentilloides, Gonocarpus tetragynus, Hydrocotyle laxiflora, Lomandra longifolia, Pteridium esculentum* and *Viola hederacea.*		
Description (DPE 2022c)		
Open forest with an open understorey and dense ground cover. Occurs in dry, low-relief, low-rainfall areas to the east and west of the escarpment range south of the Bega Valley. Occurs on gentle slopes or flats on granitic substrates in open valleys, usually around low-order drainage lines.		
Justification of Vegetation Assignment	Characteristic Flora Species	Geology and Geography

PCT 1228: Swamp Gum – Ribbon Gum open forest on flats of the coastal and hinterland lowlands, southern South East Corner Bioregion		
	This vegetation within the Survey Area contained 11 species diagnostic of PCT 1228 including: *Eucalyptus ovata, E. viminalis, E. radiata, Leptospermum continentale, Geranium potentilloides, Gonocarpus tetragynus, Hydrocotyle laxiflora, Lomandra longifolia, Poa meionectes, Pteridium esculentum* and *Viola hederacea.* Furthermore, PCT 1288 has been historically mapped within the Survey Area (Tozer et al. 2010).	This PCT occurs on gentle slopes or flats on granitic substrates in open valleys, usually around low-order drainage lines. This vegetation within the Survey Area occurs on granitic substrates in open valleys around low-order drainage lines.
BC Act 2016 Status	Partially associated with River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions (see **Section 5.1.2**).	
EPBC Act 1999 Status	Partially associated with River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria (see **Section 5.2.1**).	
References	Tozer, M.G., Turner, K., Keith, D.A., Tindall, D., Pennay, C., Simpson, C., MacKenzie, B., Beukers, M. and Cox, S. (2010) Native vegetation of southeast NSW: a revised classification and map for the coast and eastern tablelands. Cunninghamia 11(3): 359-406	

Table 9. Description of PCT 1320 identified within the Survey Area.

PCT 1320: White Stringybark – Maiden's Gum grassy open forest on granitic foothills, southern South East Corner Bioregion	
	
Vegetation Formation/ Keith Class	Dry Sclerophyll Forests (Shrub/ Grass form)/ Southern Hinterland Dry Sclerophyll Forests
Extent within Survey Area (approximate)	28.31ha
Extent to be impacted by the Activity (approximate)	19.25ha
Description of the Vegetation within the Survey Area	
This vegetation was severely affected by the bushfires in January 2022 and was characterised by a canopy dominated by *E. angophoroides, E. cypellocarpa, E. globoidea* and *E. muelleriana* with occurrences of *E. consideniana, E. obliqua, E. elata* and *E. agglomerata.* The mid-storey was generally sparse, including *Daviesia mimosoides, Platysace lanceolata, Acacia terminalis, Persoonia linearis, Kunzea ericoides, Persoonia linearis, Cassinia longifolia, C. aculeata, Leucopogon lanceolatus* and *Hibbertia obtusifolia.* The ground layer was generally patchy containing a range of grasses, graminoids and herbs, including *Poa* spp.*, Deyeuxia decipiens, Viola hederacea, Hydrocotyle hirta, Echinopogon caespitosus, Dichondra repens, Gonocarpus tetragynus, Hypericum gramineum, Microlaena stipoides, Pteridium esculentum* and *Lomandra multiflora* with occurrences of exotic species *Conyza* spp. and the Priority Weed *Senecio madagascariensis.*	
Description (DPE 2022c)	
Open forest with a sparse shrub layer and diverse grassy ground cover. Widespread on undulating granitic terrain at 250m – 700m elevation in the hinterland and foothills mainly south of the Bega Valley.	

PCT 1320: White Stringybark – Maiden's Gum grassy open forest on granitic foothills, southern South East Corner Bioregion		
	Characteristic Flora Species	Geology and Geography
Justification of Vegetation Assignment	This vegetation within the Survey Area contained 18 species diagnostic of PCT 1320 including: *Eucalyptus angophoroides, E. cypellocarpa, E. globoidea, E. sieberi, E. elata, E. muelleriana, Cassinia aculeata, Hibbertia obtusifolia, Leucopogon lanceolatus, Senecio linearifolius, Dichondra repens, Gonocarpus tetragynus, Hypericum gramineum, Microlaena stipoides, Poa meionectes, Pteridium esculentum, Lomandra multiflora* and *Viola hederacea.* Furthermore, PCT 1320 was the only PCT to account for dominance of both *Eucalyptus angophoroides* and *E. muelleriana,* and is widely mapped within the Survey Area (Tozer et al. 2010).	This PCT is widespread on undulating granitic terrain at 250m – 700m elevation in the hinterland and foothills mainly south of the Bega Valley. This vegetation within the Survey Area occurs at approximately 550m asl within undulating granite terrain.
BC Act 2016 Status	Partially associated with Lowland Grassy Woodland in the South East Corner Bioregion (see **Section 5.1.3**).	
EPBC Act 1999 Status	Partially associated with Lowland Grassy Woodland in the South East Corner Bioregion (see **Section 5.2.2**).	
References	Tozer, M.G., Turner, K., Keith, D.A., Tindall, D., Pennay, C., Simpson, C., MacKenzie, B., Beukers, M. and Cox, S. (2010) Native vegetation of southeast NSW: a revised classification and map for the coast and eastern tablelands. Cunninghamia 11(3): 359-406	

Table 10. Description of PCT 1322 identified within the Survey Area.

PCT 1322: White Stringybark – Narrow-leaved Peppermint dry open forest on hinterland hills, far south of the South East Corner Bioregion	
	
Vegetation Formation/ Keith Class	Dry Sclerophyll Forests (Shrubby sub-formation)/ South East Dry Sclerophyll Forests
Extent within Survey Area (approximate)	36.20ha
Extent to be impacted by the Activity (approximate)	23.98ha
Description of the Vegetation within the Survey Area	
This vegetation was severely affected by the bushfires in January 2022 and was characterised by a canopy dominated by *Eucalyptus sieberi* with commonly scattered individuals of *E. cypellocarpa, E. globoidea, E. radiata* and *E. obliqua.* The mid-storey was generally sparse and included occurrences of *Daviesia latifolia, Platysace lanceolata, Exocarpos strictus, Epacris impressa, Leucopogon lanceolatus, Monotoca scoparia, Persoonia linearis* and *Acacia terminalis.* The ground layer was generally sparse including *Dianella caerulea, Dichelachne rara, Euchiton sphaericus, Gonocarpus tetragynus, Hibbertia obtusifolia, Hydrocotyle laxiflora, Hypericum gramineum, Leucopogon lanceolatus, Lissanthe strigosa, Lomandra longifolia, L. multiflora, Microlaena stipoides, Poa meionectes, Pteridium esculentum, Senecio hispidulus, Sonchus asper, Veronica plebeia, Viola hederacea* and *Wahlenbergia* spp. with occurrences of exotic species *Conyza* spp. and the Priority Weed *Senecio madagascariensis.*	
Description (DPE 2022c)	

PCT 1322: White Stringybark – Narrow-leaved Peppermint dry open forest on hinterland hills, far south of the South East Corner Bioregion		
Open to tall open forest with an open shrub layer and sparse ground cover. Occurs on ridges and dry slopes on metasediments and granitic substrates at 300m – 850m elevation in the far south.		
	Characteristic Flora Species	**Geology and Geography**
Justification of Vegetation Assignment	This vegetation within the Survey Area contained 20) species diagnostic of PCT 1322 including: *Eucalyptus cypellocarpa, E. globoidea, E. radiata, E. obliqua, Epacris impressa, Leucopogon lanceolatus, Monotoca scoparia, Persoonia linearis, Dianella caerulea, Dichelachne rara, Gonocarpus tetragynus, Hibbertia obtusifolia, Hydrocotyle laxiflora, Hypericum gramineum, Lomandra longifolia, Lomandra multiflora, Microlaena stipoides, Poa meionectes, Pteridium esculentum* and *Viola hederacea.* Furthermore, the reference for PCT 1322 accounts for the dominance of *Eucalyptus sieberi* stating "…logging followed by regeneration burns and thinning may change the relative abundance of eucalypt species, particularly *E. sieberi,"* (Tozer et al. 2010). This PCT is also widely mapped within the Survey Area (Tozer et al. 2010).	This PCT occurs on ridges and dry slopes on metasediments and granitic substrates at 300m – 850m elevation in the far south. This vegetation within the Survey Area occurs between approximately 505m and 610m asl on ridges and dry slopes on metasediments and granitic substrates.
BC Act 2016 Status	Nil	
EPBC Act 1999 Status	Nil	
References	Tozer, M.G., Turner, K., Keith, D.A., Tindall, D., Pennay, C., Simpson, C., MacKenzie, B., Beukers, M. and Cox, S. (2010) Native vegetation of southeast NSW: a revised classification and map for the coast and eastern tablelands. Cunninghamia 11(3): 359-406	

Table 11. Description of PCT 1340 identified within the Survey Area.

PCT 1340: Yertchuk – Silvertop Ash – Blue-leaved Stringybark shrubby open forest of the Wallagaraugh catchment, far southern South East Corner Bioregion	
	
Vegetation Formation/ Keith Class	Dry Sclerophyll Forests (shrub/grass sub-formation)/ South East Dry Sclerophyll Forests
Extent within Survey Area (approximate)	4.36ha
Extent to be impacted by the Activity (approximate)	2.68ha
Description of the Vegetation within the Survey Area	
This vegetation was severely burnt by the bushfires in January 2022 and was characterised by a canopy dominated by *Eucalyptus consideniana* with scattered occurrences of *E. dives, E. cypellocarpa* and *E. globoidea*. The mid-storey was dominated by the native species *Kunzea ericoides, Leptospermum scoparium, Leptospermum continentale, Acacia mearnsii, Persoonia linearis, Monotoca scoparia, Podolobium alpestre, Platysace lanceolata, Acacia gunnii, A. terminalis, Allocasuarina nana, Epacris impressa, Lomatia ilicifolia, Cassinia trinerva* and *C. longifolia*. The ground layer was similarly dominated by native species including *Pteridium esculentum, Lomandra longifolia, Amperea xiphoclada, Dillwynia glaberrima, Lomandra filiformis, Leucopogon lanceolatus, Drosera spatulata, Goodenia bellidifolia, Poa* spp., *Gonocarpus tetragynus, Microlaena stipoides, Entolasia stricta, Rhytidosporum procumbens, Lindsaea linearis, Cassytha glabella, Xanthosia dissecta, Lomandra multiflora* with occurrences of exotic *Conyza* spp..	
Description (DPE 2022c)	

PCT 1340: Yertchuk – Silvertop Ash – Blue-leaved Stringybark shrubby open forest of the Wallagaraugh catchment, far southern South East Corner Bioregion		
Open forest with a well-developed shrubby understorey and sparse ground layer. Occurs on low ridges and slopes in undulating terrain on granitic substrates at 50m – 300m elevation in the middle to lower reaches of the Wallagaraugh River catchment.		
Justification of Vegetation Assignment	**Characteristic Flora Species**	**Geology and Geography**
	This vegetation contained 13 species diagnostic of PCT 1340 including *Eucalyptus consideniana, E. sieberi, Acacia terminalis, Epacris impressa, Leucopogon lanceolatus, Lomatia ilicifolia, Monotoca scoparia, Persoonia linearis, Platylobium formosum, Platysace lanceolata, Lepidosperma laterale, Lomandra longifolia* and *Pteridium esculentum.* Plant Community Type 1340 was the only potential PCT to account for the sole dominance of *Eucalyptus consideniana.*	Occurs on low ridges and slopes in undulating terrain on granitic substrates at 50m – 300m elevation in the middle to lower reaches of the Wallagaraugh River catchment. While this vegetation occurs at approximately 550m asl, this PCT was considered the 'best fit' to accommodate the existing vegetation.
BC Act 2016 Status	Nil	
EPBC Act 1999 Status	Nil	
References	Tozer, M.G., Turner, K., Keith, D.A., Tindall, D., Pennay, C., Simpson, C., MacKenzie, B., Beukers, M. and Cox, S. (2010) Native vegetation of southeast NSW: a revised classification and map for the coast and eastern tablelands. Cunninghamia 11(3): 359-406	

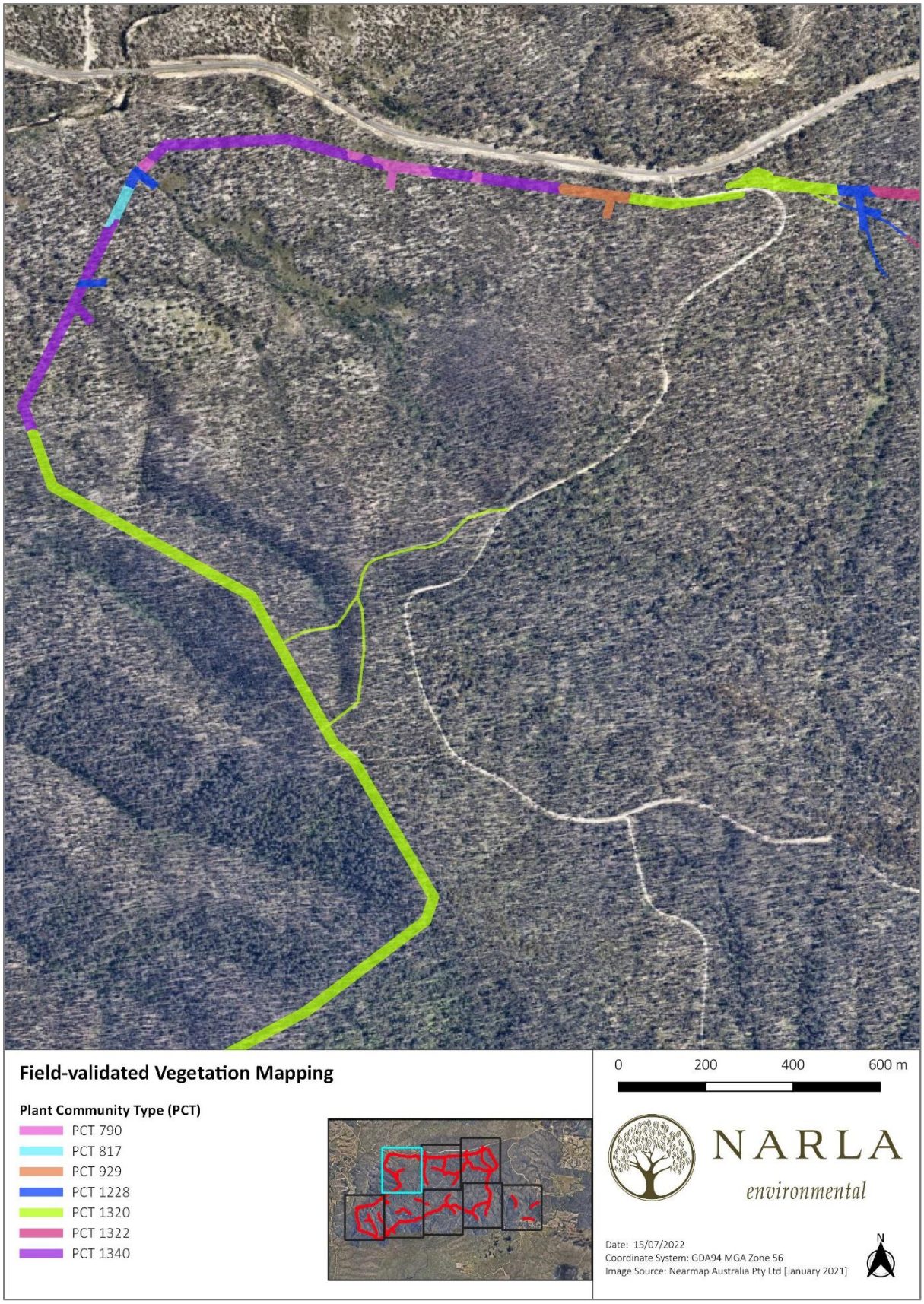
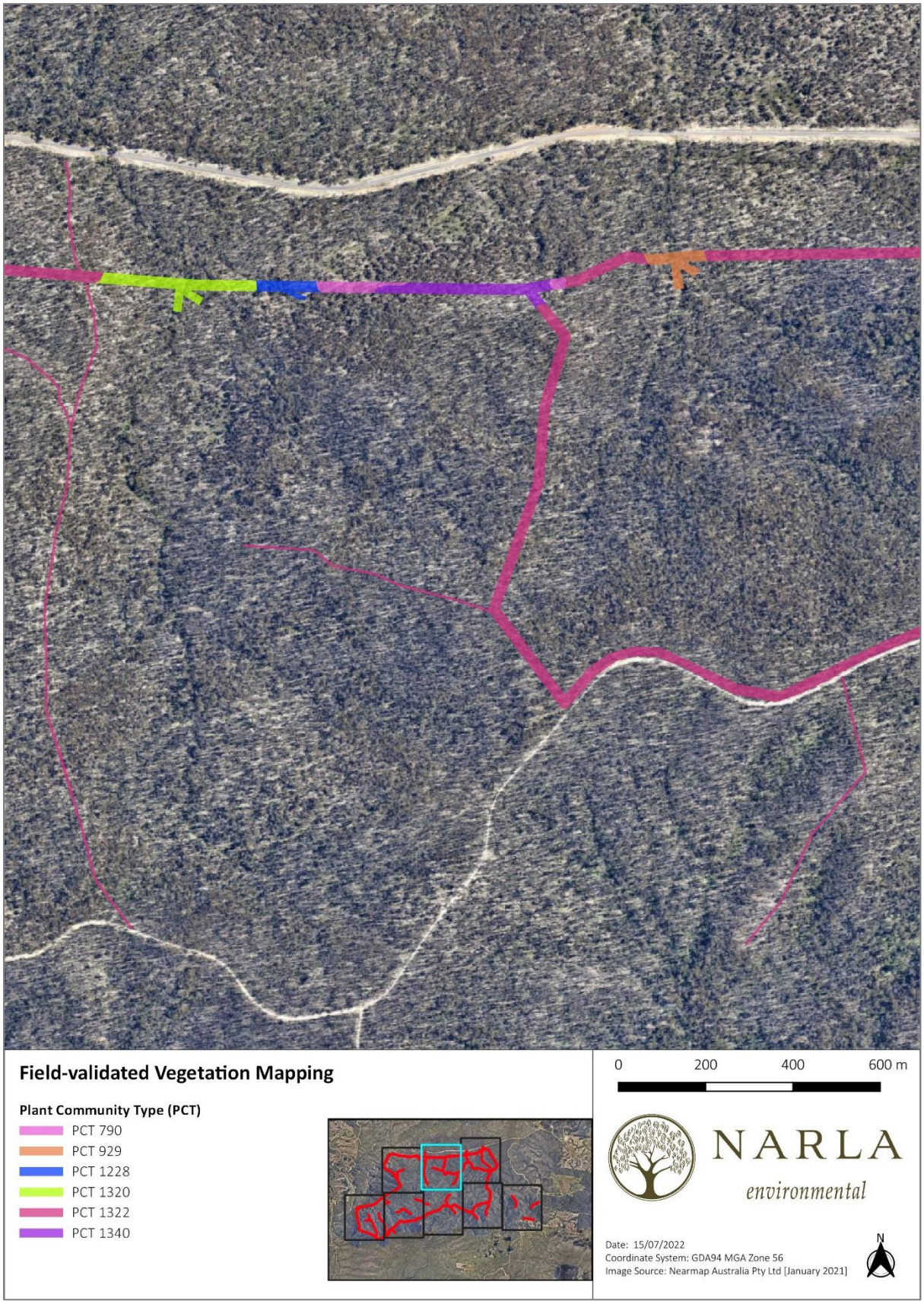
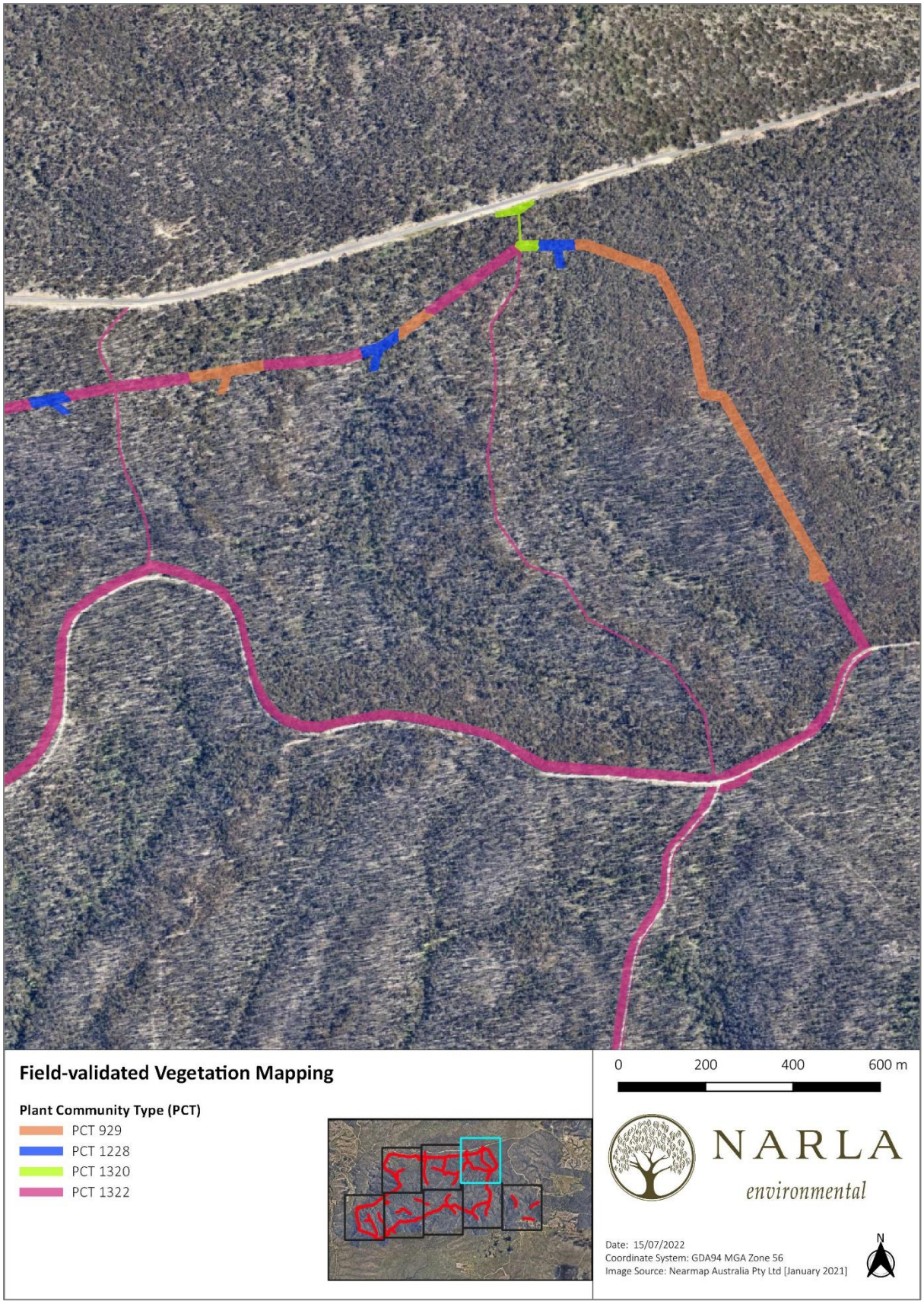


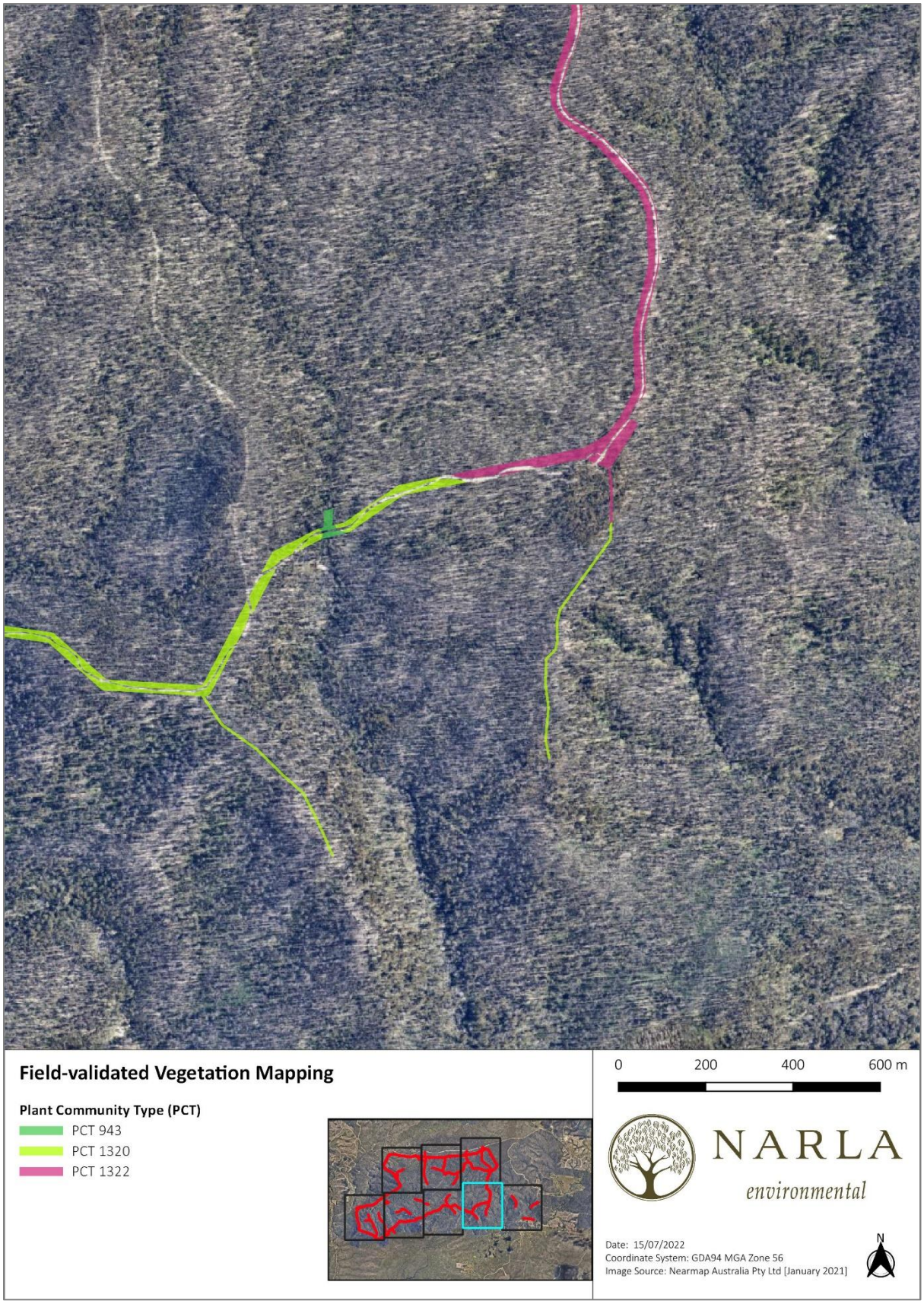
Figure 6. Narla field-validated vegetation communities within the Survey Area (map 1 of 8).



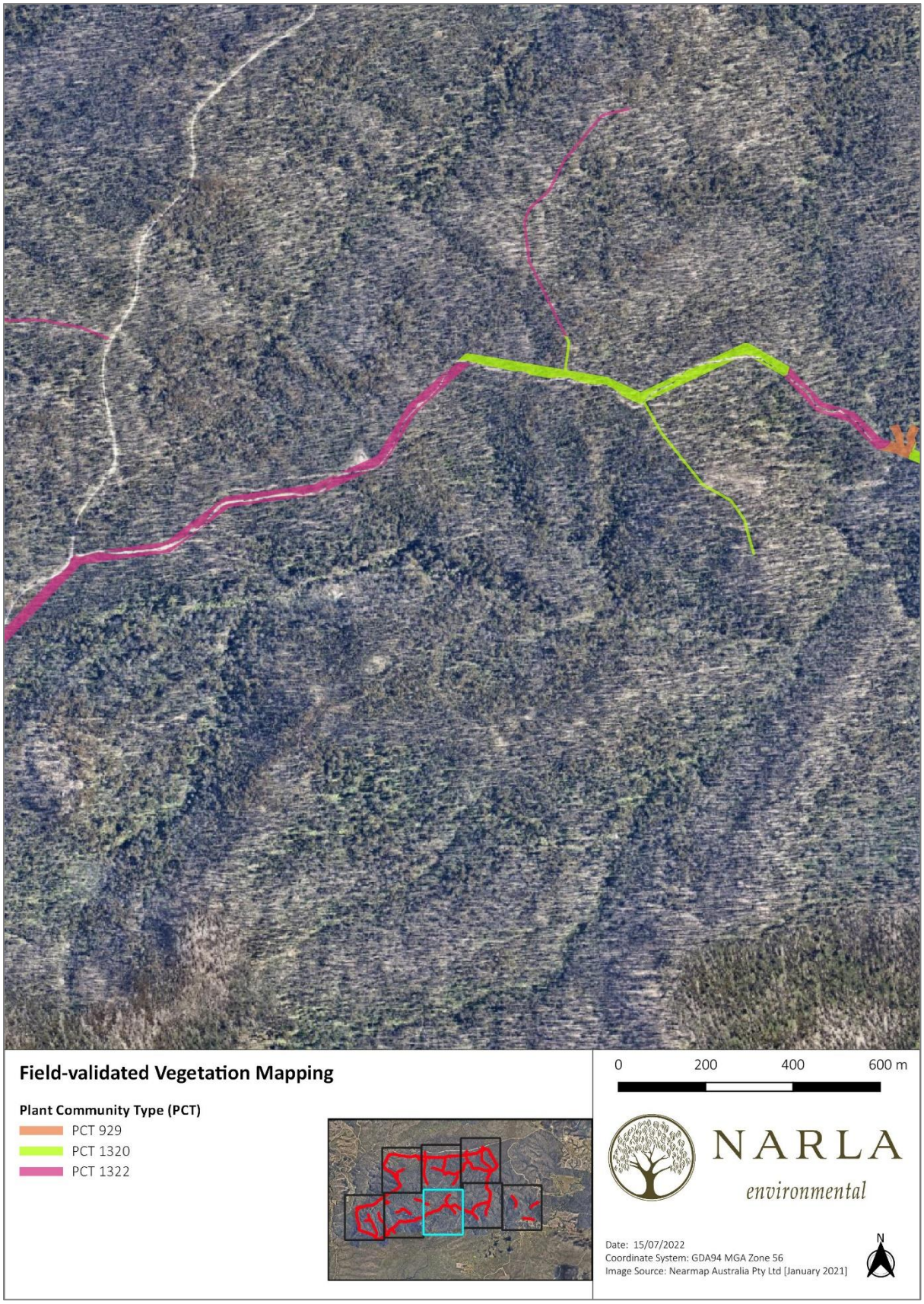
Narla field-validated vegetation communities within the Survey Area (map 2 of 8).



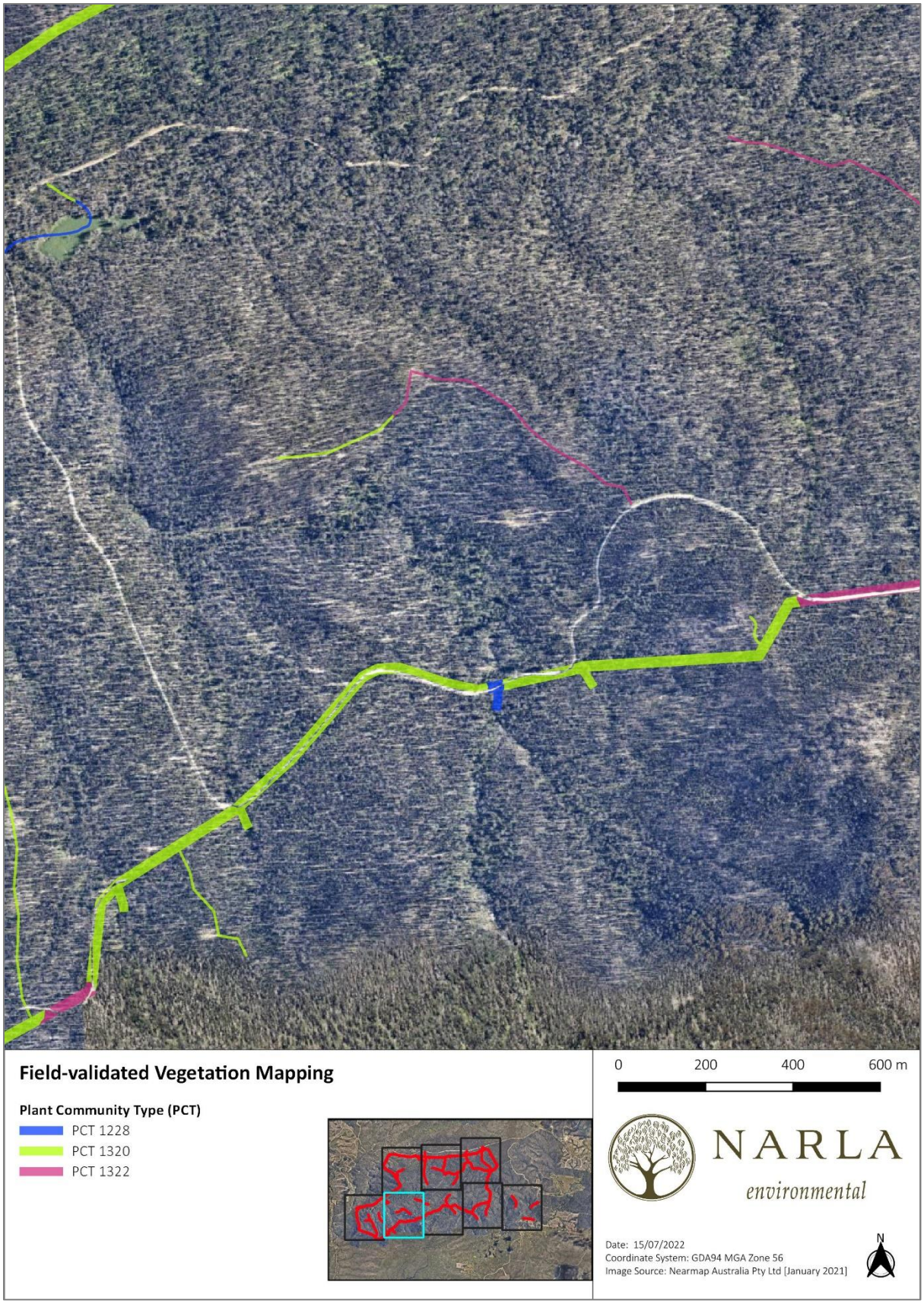
Narla field-validated vegetation communities within the Survey Area (map 3 of 8).



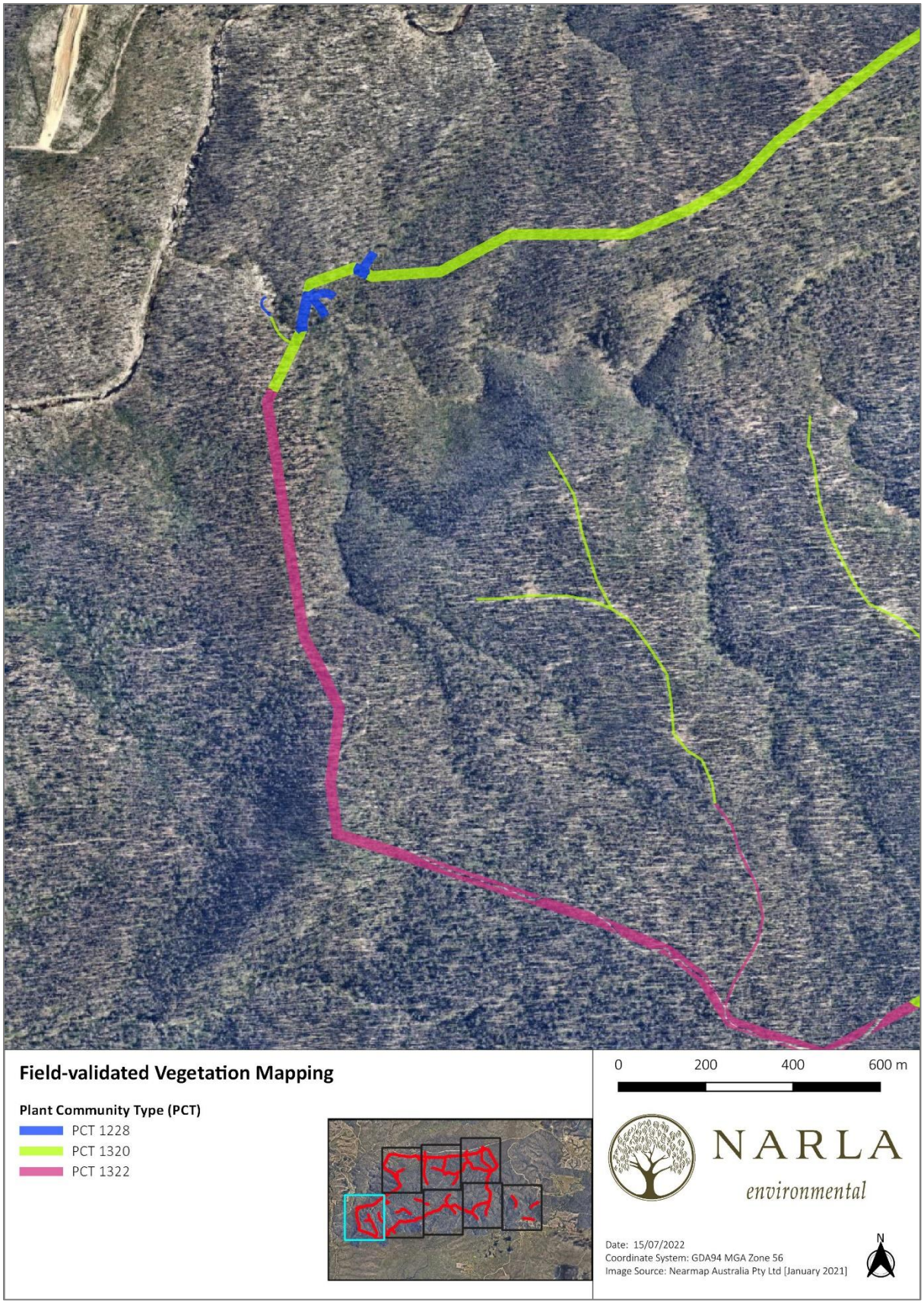
Narla field-validated vegetation communities within the Survey Area (map 4 of 8).



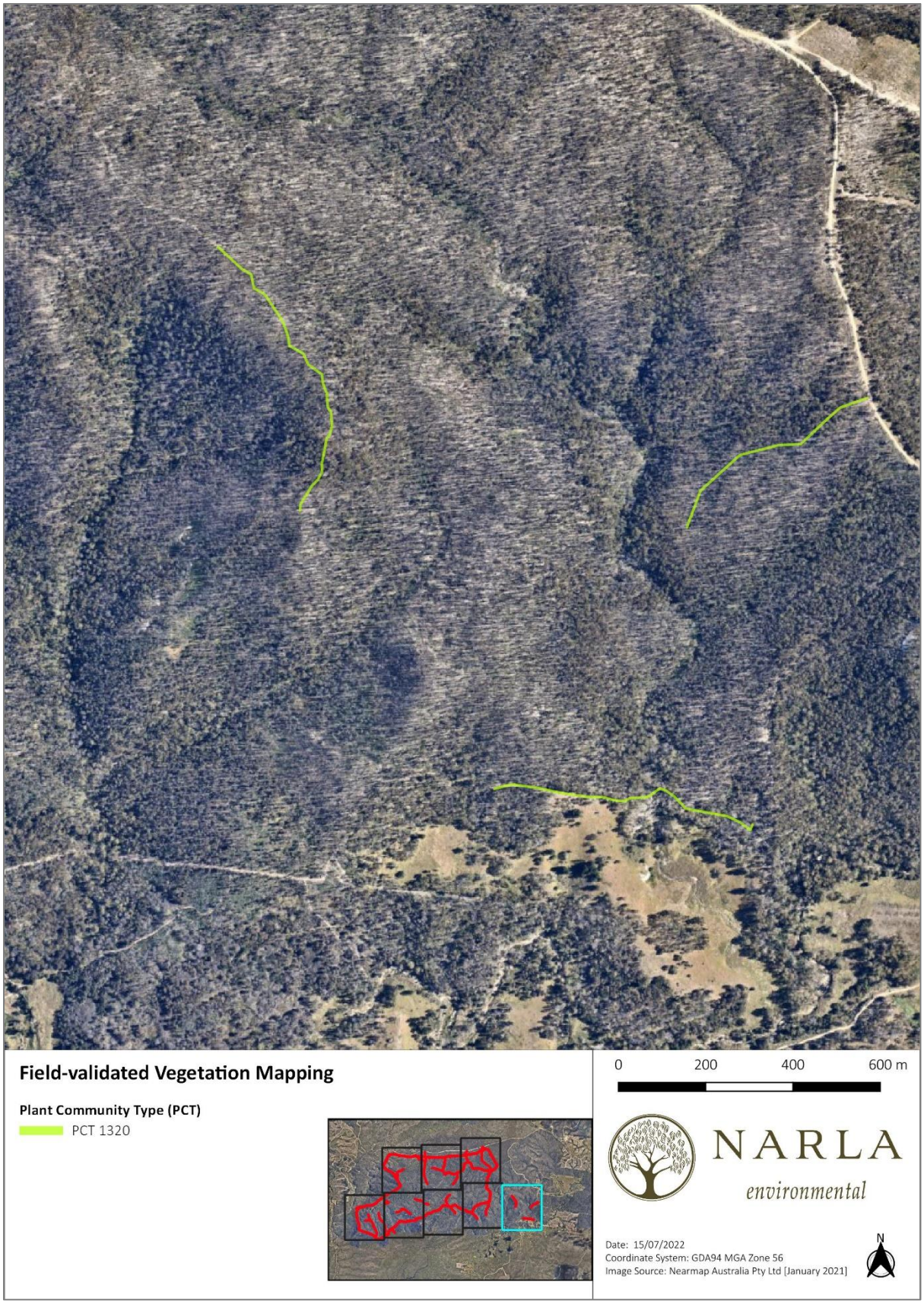
Narla field-validated vegetation communities within the Survey Area (map 5 of 8).



Narla field-validated vegetation communities within the Survey Area (map 6 of 8).



Narla field-validated vegetation communities within the Survey Area (map 7 of 8).



Narla field-validated vegetation communities within the Survey Area (map 8 of 8).

5. Results: Threatened Ecological Communities

5.1 Listing under the Biodiversity Conservation Act 2016

5.1.1 Robertson Basalt Tall Open-forest in the Sydney Basin and South Eastern Highlands Bioregions

Plant Community Type 943 is in-part associated with the Robertson Basalt Tall Open-forest in the Sydney Basin and South Eastern Highlands Bioregions Critically Endangered Ecological Community (CEEC), as listed under the BC Act. This CEEC only occurs within the Sydney Basin and South East Highlands Bioregions (NSW Scientific Committee 2016). As the Survey Area does not occur within either of these bioregions, PCT 943 does not conform to this CEEC.

5.1.2 River-Flat Eucalypt Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions

Plant Community Type 1228 is in-part associated with the River-Flat Eucalypt Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions Endangered Ecological Community (EEC), listed under the BC Act. This EEC occurs on Coastal Floodplains generally occurs below 50m elevation, but may occur on localised river flats up to 250m above sea level in the NSW North Coast, Sydney Basin and South East Corner bioregions (NSW Scientific Committee 2011b). Plant Community Type 1228 occurs between 440m and 580m asl within the Survey Area; therefore, PCT 1228 does not conform to this EEC.

5.1.3 Lowland Grassy Woodland in the South East Corner Bioregion

Plant Community Type 1320 is in-part associated with the Lowland Grassy Woodland in the South East Corner bioregion EEC, listed under the BC Act. This is the name given to the ecological community associated with rainshadow areas of the south coast and hinterland of New South Wales. These rainshadow areas receive less rainfall than more elevated terrain that partially surrounds them (NSW Scientific Committee 2011a). The Survey Area is not situated within a rainshadow area; therefore, PCT 1320 does not conform to this EEC.

5.2 Listing under the Environment Protection and Biodiversity Conservation Act 1999

5.2.1 River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria

Plant Community Type 1228 is in-part associated with the River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria, listed as Critically Endangered under the EPBC Act. The key diagnostic characteristics of this CEEC states that it occurs at elevations up to 250m asl, but most typically below 50m. Plant Community Type 1228 occurred between 440m and 580m asl within the Survey Area; therefore, PCT 1228 does not conform to this CEEC.

5.2.2 Lowland Grassy Woodland in the South East Corner Bioregion

Plant Community Type 1320 is in-part associated with the Lowland Grassy Woodland in the South East Corner Bioregion listed as Critically Endangered under the EPBC Act. The key diagnostic characteristics presented in **Table 12** were not met by the vegetation identified within the Survey Area; therefore, PCT 1320 does not conform to this CEEC.

Table 12. Key diagnostic characteristics for Lowland Grassy Woodland in the South East Corner Bioregion (DSEWPC 2013).

Key Diagnostic Characteristics	Characteristic Met?
The distribution is limited to NSW, south of (and including) the Clyde River Catchment, and primarily within the South East Corner bioregion.	Yes. This PCT is located south of the Clyde River Catchment and occurs within the South East Corner bioregion.
It typically occurs in coastal or near coastal areas with some more inland outliers around Araluen.	Yes. This PCT is located on the western edge of the South East Coastal Ranges subregion, this area may be deemed as 'near coastal areas'.
It typically occurs at elevations below 500m asl.	Yes. Some areas of PCT 1320 within the Survey Area occur below 500m asl.
The tree canopy is typically dominated by *Eucalyptus tereticornis* and/or *Angophora floribunda*. Associated tree species include *E. globoidea* and *E. bosistoana*. *Eucalyptus pauciflora* or *E. melliodora* may be dominant in some areas. The tree canopy usually has a maximum projected foliage cover of 30%. A sub-canopy or mid-layer may be present, typically with *Acacia mearnsii*.	No. The dominant species of this CEEC are not present within the vegetation identified as PCT 1320. Only (1) associated species (*E. globoidea*) is present within this PCT but is a common species that is widely distributed.
It typically includes a grassy understorey of *Themeda triandra* as well as other grasses and forbs. Occasionally it also has a shrub layer of *Bursaria spinosa*.	No. *Themeda triandra* was not identified within this PCT.
It can also occur as a derived grassland.	NA

6. Results: Threatened Species

6.1 Threatened Flora

Desktop analysis revealed seven threatened flora as occurring or having the potential to occur on or within the locality (areas adjacent) of the Survey Area (**Table 13**). Thorough targeted surveys were undertaken throughout the Survey Area for potentially occurring threatened flora. No threatened flora were identified within the Survey Area at the time of the site assessment (May & June 2022).

One (1) BC Act and EPBC Act vulnerable species, *Pultenaea parrisiae* (Parris' Bush-pea), was previously identified from one (1) location comprised of approximately 15 individuals within the Survey Area with an additional five (5) records comprising of approximately 415 individuals recorded immediately outside the survey area (in moist heathlands associated with PCT 790; Miles 2021). According to BioNet a further 58 records consisting of an approximately 2440 individual have been identified in the broader area (**Figure 7**).

However, targeted surveys did not identify this species during the May & June 2022 assessment, most likely because this species is cryptic and challenging to identify when not in flower (flowers October & November). The records are accessible from BioNet Atlas (DPE 2022b) and are presented in **Appendix L**. A BC Act 5-part Test of Significance for impacts to Parris' Bush-pea is presented in **Appendix A**. An EPBC Act Assessment of Significant Impact Criteria for impacts to Parris' Bush-pea is presented in **Appendix E**.

The following locally 'occurring species were assessed for their potential to occur within the Survey Area (**Table 13**).

Table 13. Assessment of likely occurrence of threatened flora species within the Survey Area.

Species	BC Act	EPBC Act	Likelihood of Occurrence within the Survey Area	Further Impact Assessment Required?
Acacia georgensis (Bega Wattle)	V	V	Low- no BioNet records within or near to the Survey Area. Typically occurs on well-drained, shallow soils at sites with considerable exposed rock. The sites where it is found represent a range of different environments with correspondingly varied vegetation; in general, other tree species are uncommon but can include Veined Olive (*Notelaea venosa*), Hickory Wattle (*Acacia implexa*), Forest Red Gum (*Eucalyptus tereticornis*), Woollybutt (*E. longifolia*), Bega Mallee (*E. spectatrix*) and Gully Gum (*E. smithii*). Although potential habitat occurred, this species was not identified within the Survey Area during the site assessment.	No

Species	BC Act	EPBC Act	Likelihood of Occurrence within the Survey Area	Further Impact Assessment Required?
Amphibromus fluitans (River Swamp Wallaby-grass)	V	V	Low- no BioNet records within or near to the Survey Area. *Amphibromus fluitans* grows mostly in permanent swamps. The species needs wetlands which are at least moderately fertile and which have some bare ground, conditions which are produced by seasonally-fluctuating water levels. Wetland habitat occurred within the Survey Area although this species was not identified within the Survey Area during the site assessment.	No
Boronia deanei (Deane's Boronia)	V	V	Low- no records within the Survey Area and only 14 in the broader locality. Grows in wet heath, often at the margins of open forest adjoining swamps or along streams. Wet heath was present within the Survey Area in areas mapped as PCT 790. A previous study conducted a random meander survey in some areas selected as being potential habitat for threatened flora species during the DPE approved survey month for this species (November) and the species was not identified (Miles 2021). Furthermore, no *Boronia* spp. were identified within the Survey Area.	No
Caladenia tessellata (Thick-lipped Spider-orchid)	E	V	Low- no BioNet records within or near to the Survey Area. Generally found in grassy sclerophyll woodland on clay loam or sandy soils. No suitable habitat occurred within the Survey Area.	No
Callistemon forresterae (Forrester's Bottlebrush)	-	V	Low- no BioNet records within or near to the Survey Area. Virtually nothing is known of the habitat of Forrester's Bottlebrush, other than it occurs on rock bars or in sand over rock adjacent to streams. The DCCEEW's Species Profile and Threats Database indicates that the distribution of this species is far outside of the Survey Area.	No
Calotis glandulosa (Mauve Burr-daisy)	V	V	Low- no BioNet records within or near to the Survey Area. Found in montane and subalpine grasslands in the Australian Alps. Found in subalpine grassland (dominated by *Poa* spp.), and montane or natural temperate grassland dominated by Kangaroo Grass (*Themeda australis*) and Snow Gum (*Eucalyptus pauciflora*) Woodlands on the Monaro and Shoalhaven area. No suitable habitat occurred within the Survey Area.	No

Species	BC Act	EPBC Act	Likelihood of Occurrence within the Survey Area	Further Impact Assessment Required?
Correa lawrenceana var. *genoensis* (Genoa River Correa)	E	E	Low- no records within the Survey Area and only nine in the broader locality. This species is found in riparian vegetation (tall open forest) dominated by *Eucalyptus cypellocarpa* and *Pomaderris aspera*. *Eucalyptus cypellocarpa* dominated riparian vegetation was present within PCT 1228, however lacked *Pomaderris aspera*. Furthermore, this species was not identified within the Survey Area during the site assessment.	No
Cryptostylis hunteriana (Leafless Tongue-orchid)	V	V	Low- no BioNet records within or near to the Survey Area. This species is known from a range of communities, having no well-defined habitat preference. The larger populations typically occur in woodland dominated by Scribbly Gum (*Eucalyptus sclerophylla*), Silvertop Ash (*E. sieberi*), Red Bloodwood (*Corymbia gummifera*) and Black Sheoak (*Allocasuarina littoralis*); appears to prefer open areas in the understorey of this community and is often found in association with the Large Tongue Orchid (*C. subulata*) and the Tartan Tongue Orchid (*C. erecta*). Although *E. sieberi* was present in some woodland areas, the habitat attributes that supports this species were not present within the Survey Area. Moreover, the are no records of a local population within >50km of the Survey Area.	No
Dodonaea procumbens (Trailing Hop-bush)	V	V	Low- no BioNet records within or near to the Survey Area. Grows in Natural Temperate Grassland or fringing eucalypt woodland of Snow Gum (*Eucalyptus pauciflora*). No suitable habitat occurred within the Survey Area.	No
Glycine latrobeana (Clover Glycine)		V	Low- no BioNet records within or near to the Survey Area. The Clover Glycine occurs mainly in grassland and grassy woodland habitats, less often in dry forests, and only rarely in heathland. The NSW population is in subalpine grassland (at about 1300m asl). No suitable habitat occurred within the Survey Area.	No
Grevillea acanthifolia subsp. *paludosa* (Bog Grevillea)	E	E	Low- no records within the Survey Area and only one in the broader locality. Bog Grevillea is found in peaty swamps. Within such habitat, it grows on densely vegetated low hummocks. Swamp vegetation is present within PCT 790 which may provide potential habitat for this species; however, this species was not identified within the Survey Area during the site assessment.	No

Species	BC Act	EPBC Act	Likelihood of Occurrence within the Survey Area	Further Impact Assessment Required?
Leionema ralstonii	V	V	Low- no BioNet records within or near to the Survey Area. The species is largely confined to dry, rocky habitats. It is most likely to be found in dry shrub communities but can also occur in open forest. Some rocky habitat occurred within the Survey Area but this species was not identified during the site assessment.	No
Lepidium hyssopifolium (Basalt Pepper-cress)	E	E	Low- no BioNet records within or near to the Survey Area. In NSW the species was known to have occurred in both woodland with a grassy understorey and in grassland. Although potential habitat occurred within the Survey Area, this species is only known from three populations that are located >100km away.	No
Leucochrysum albicans subsp. Tricolor (Hoary Sunray)	-	E	Low- no BioNet records within or near to the Survey Area. Occurs in a wide variety of grassland, woodland and forest habitats, generally on relatively heavy soils. Suitable habitat was not present within the Survey Area. Moreover, the nearest local population is over 30km away.	No
Nematolepis rhytidophylla (Nalbaugh Nematolepis)	V	V	Low- although there are 159 records in the broader locality, none of these are within or near to the Survey Area. This species grows in shrubby habitat in rocky areas or forms part of the understorey in open forest. This species is found only at a few sites on the Nalbaugh Plateau in the South-East Forests National Park, south-east of Bombala. While the habitat requirements of this species are broad, a previous study conducted a random meander survey in some areas selected as being potential habitat for threatened flora species during the DPE approved survey month for this species (November) and the species was not identified (Miles 2021). Furthermore, no *Nematolepis* spp. Were identified within the Survey Area.	No

Species	BC Act	EPBC Act	Likelihood of Occurrence within the Survey Area	Further Impact Assessment Required?
Pomaderris cotoneaster (Cotoneaster Pomaderris)	E	E	Low – no records within the Survey Area and only three in the broader locality. Cotoneaster Pomaderris has been recorded in a range of habitats in predominantly forested country. The habitats include forest with deep, friable soil, amongst rock beside a creek, on rocky forested slopes and in steep gullies between sandstone cliffs. While potential habitat for this species is present within much of the Survey Area, only one (1) *Pomaderris* species was identified (*P. ferruginea*). A previous study conducted a random meander survey in some areas selected as being potential habitat for threatened flora species during the DPE approved survey month for this species (November) and the species was not identified (Miles 2021).	No
Pomaderris elachophylla (Lacy Pomaderris)	E	-	Low- no records within the Survey Area and only one in the broader locality. This species is found in and adjacent to creeklines and gullies, or at sites with impeded drainage, often on sheltered aspects, in tall damp forest. Creek line and gully vegetation was present in large areas of the Survey Area; however, this species was not identified within the Survey Area.	No
Pomaderris parrisiae (Parris' Pomaderris)	V	V	Low- no BioNet records within or near to the Survey Area. Parris' Pomaderris is found on skeletal soils in rocky shrubland or tall open forest chiefly on escarpment ranges. Potential habitat occurred within the Survey Area however, this species was not identified within the Survey Area during the site assessment.	No
Pomaderris sericea (Bent Pomaderris)	E	V	Low- no BioNet records within or near to the Survey Area. There are only two Bent Pomaderris records in NSW that give details of habitat so it is difficult to generalise about the habitat preferences of the species. Both of these records, however, are from open forest on sandstone. The known distribution of this species in NSW is north of Sydney.	No
Prasophyllum petilum (Tarengo Leek Orchid)	E	E	Low- no BioNet records within or near to the Survey Area. Grows in open sites within Natural Temperate Grassland at the Boorowa and Delegate sites. Also grows in grassy woodland in association with River Tussock *Poa labillardieri*, Black Gum *Eucalyptus aggregata* and tea-trees *Leptospermum* spp. near Queanbeyan. Suitable habitat does not occur within the Survey Area.	No

Species	BC Act	EPBC Act	Likelihood of Occurrence within the Survey Area	Further Impact Assessment Required?
Pultenaea parrisiae (Parris' Bush-pea)	V	V	Present. Parris' Bush-pea grows in moist heathlands in loam soils, sometimes at the margins of woodlands. Also in riparian vegetation. Potential habitat for this species is present within areas mapped as PCT 790. A previous study conducted targeted surveys in some but not all suitable Parris' Bush-pea habitat patches during the DPE approved survey month for this species (November). Approximately 430 individuals of this species have been historically recorded within and immediately surrounding the Survey Area (**Figure 7**) Total population approximately 2,870.	**Yes**
Thesium austral (Austral Toadflax)	V	V	Low- no BioNet records within or near to the Survey Area. Occurs in grassland on coastal headlands or grassland and grassy woodland away from the coast. Often found in association with Kangaroo Grass (*Themeda australis*). Suitable grass; and/grassy habitat was not present within the Survey Area. Moreover, the nearest local population is >30km from the Survey Area.	No
Xerochrysum palustre (Swamp Everlasting)	-	V	Low- no BioNet records within or near to the Survey Area. Grows in swamps and bogs which are often dominated by heaths. Also grows at the edges of bog margins on peaty soils with a cover of shrubs or grasses. Although potential habitat occurred within the Survey Area, this species was not identified during the site assessment.	No

V – Vulnerable; E – Endangered;

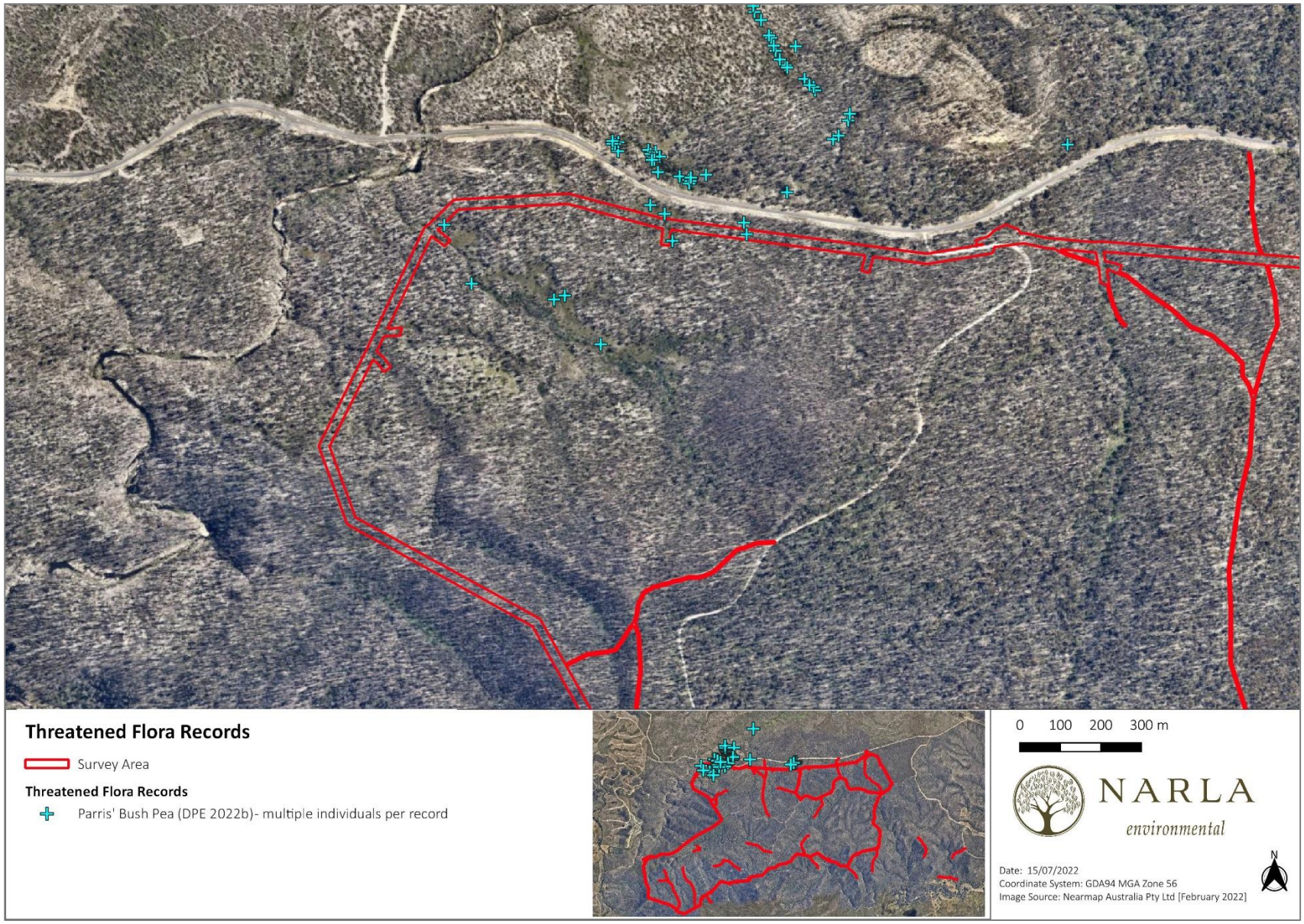


Figure 7. Historical records of Parris' Bush Pea in relation to the Survey Area.

6.2 Threatened Fauna

Details of the threatened fauna habitat recorded within the Survey Area are included in **Table 14** and displayed in **Appendix L**. The likelihood of occurrence of threatened fauna species within the Survey Area is presented in **Table 15**.

Two (2) threatened fauna species were found foraging within the Survey Area at the time of assessment (**Figure 8**):

- *Callocephalon fimbriatum* (Gang-gang Cockatoo, BC Act: Vulnerable, EPBC Act: Endangered); and
- *Petroica boodang* (Scarlet Robin, BC Act: Vulnerable).

Furthermore, two (2) microbat individuals were located within one of the culverts to be fenced by the proposed works (**Figure 8**). These individuals were not formally identified to prevent disturbance.

A suite of native, mostly avian, fauna species were identified within and surrounding the Survey Area during the site assessment. The list of fauna recorded during the site visit was produced opportunistically (**Appendix K**).

A Test of Significance (5-part test) was undertaken in accordance with Section 7.3 of the BC Act to assess potential impacts from the Activity on threatened fauna (**Appendix B** and **Appendix D**), as well as an Assessment of Significant Impact Criteria in accordance with the EPBC Act (**Appendix F; Appendix G; Appendix H**).

Table 14. Fauna habitat values identified within the Survey Area.

Habitat component	Survey Area
Burrows	Eleven (11) small burrows and seven (7) wombat burrows were identified within the Survey Area.
Microhabitat	One hundred and fifty-three (153) microhabitat logs were identified across the Survey Area.
Rock outcrops and bush rock	One (1) rock outcrop and areas of bush rock were identified within the mountainous portion of the Survey Area.
Caves, crevices and overhangs	Absent.
Culverts, bridges, mine shafts, or abandoned structures	Five (5) culverts and two (2) bridges were identified within the Survey Area that may provide habitat for microbats.
Nectar/lerp-bearing Trees	A suite of *Eucalyptus* species were recorded within the Survey Area. These trees may provide intermittent nectar sources for nectivores such as the Grey-headed Flying-fox.
Nectar-bearing shrubs	*Banksia marginata, Callistemon citrinus, Hakea eriantha* and *Kunzea ericoides* were identified within the Survey Area and may provide intermittent nectar sources for small nectivores.
Koala Use Trees	Numerous Koala use trees (Eucalypts) were present throughout the Survey Area, noting the subject area is considered to have low density koala population,
Large stick nests	Absent.
Sap sources	Native sap bearing trees (e.g. Eucalypts) were recorded within the Survey Area. These trees may provide intermittent sap sources for various fauna species.
She-oak fruit (Glossy Black Cockatoo feed)	*Allocasuarina littoralis* were present in low numbers within the Survey Area.

Habitat component	Survey Area
Seed-bearing trees and shrubs	Seed-bearing trees such as *Eucalyptus* spp. identified within the Survey Area may provide foraging habitat for Gang-gang Cockatoos.
Soft-fruit-bearing trees/shrubs	*Exocarpos strictus, Persoonia linearis* and *Polyscias sambucifolia* occur throughout the Survey Area. These shrubs may provide intermittent fruit sources for fructivores such as the Grey-headed Flying-fox.
Dense shrubbery and leaf litter	Present.
Tree hollows	Three hundred and ninety-five (395) hollow bearing trees containing 206 small, 116 medium and 73 large hollows were identified within the Survey Area that may provide breeding habitat for a number of threatened fauna species.
Decorticating bark	As a result of the January 2020 bush fires, many burnt trees within the Survey Area possessed decorticating bark.
Wetlands, soaks, and streams	A number of heath swamps (PCT 790), soaks and streams are present and intersect the Survey Area.
Open water bodies	Absent.
Estuarine, beach, mudflats, and rocky foreshores	Absent.

6.3 Migratory Fauna Species

The following EPBC Act listed migratory fauna species were considered to occasionally use habitat within or around the Survey Area for foraging or passage (DAWE 2022):

- *Hirundapus caudacutus* (White-throated Needletail);
- *Monarcha melanopsis* (Black-faced Monarch);
- *Myiagra cyanoleuca* (Satin Flycatcher); and
- *Rhipidura rufifrons* (Rufous Fantail).

The proposed activity will have low-moderate impacts to potential foraging habitat and negligible impacts to potential breeding habitat for these species given their migratory nature. In the unlikely event that these species forage within the Survey Area, the proposed removal of vegetation will have low-moderate impacts to foraging habitat given the large areas of suitable foraging habitat in the surrounding area and in their migratory range. No anticipated net loss of breeding habitat is expected as these species do not breed within or in close proximity of the Survey Area. As such, the proposed activity is unlikely to have a significant impact on these species; therefore, a Referral to the Commonwealth pursuant to the EPBC Act is not be required.

Table 15. Assessment of likely occurrence of threatened fauna species within the Survey Area.

Species	BC Act	EPBC Act	Likelihood of Occurrence	Foraging Habitat Present Within the Survey Area	Breeding Habitat Present Within the Survey Area	Anticipated Impact	Further Impact Assessment Required?
Anthochaera phrygia (Regent Honeyeater)	CE	CE	Low- zero records in proximity to the Survey Area.	The Regent Honeyeater is a generalist forager, although it feeds mainly on the nectar from a relatively small number of eucalypts that produce high volumes of nectar. Key eucalypt species include Mugga Ironbark, Yellow Box, White Box and Swamp Mahogany. These preferred feed trees were not found in the Survey Area.	There are three known key breeding areas, two of them in NSW – Capertee Valley and Bundarra-Barraba regions. Therefore, this species is highly unlikely to breed within the Survey Area.	Negligible anticipated impact to foraging and breeding habitat as these are highly unlikely to occur within the Survey Area.	No
Artamus cyanopterus cyanopterus (Dusky Woodswallow)	V	-	Moderate- 13 records within proximity to the Survey Area.	This species often inhabits dry, open eucalypt forests and woodlands with an open or sparse understorey of eucalypt saplings, acacias and other shrubs and ground-cover of grasses or sedges and fallen woody debris. Potential foraging habitat for this species was present within the majority of the Survey Area.	This species nests in dry open Eucalypt Forest. No nests were identified within the Survey Area.	Low anticipated impact to potential foraging and breeding habitat given the vast area of similar habitat connected to the Survey Area and within the greater South East Forest National Park. The site assessment in May/ June 2022 did not detect this species.	No

Species	BC Act	EPBC Act	Likelihood of Occurrence	Foraging Habitat Present Within the Survey Area	Breeding Habitat Present Within the Survey Area	Anticipated Impact	Further Impact Assessment Required?
Botaurus poiciloptilus (Australasian Bittern)	E	E	Low. No records in proximity to the Survey Area.	Hides during the day amongst dense reeds or rushes and feeds mainly at night on frogs, fish, yabbies, spiders, insects and snails. Potential foraging habitat for this species was present within parts of the Survey Area.	Nests are built in secluded places in densely vegetated wetlands on a platform of reeds. Potential breeding habitat for this species was present within parts of the Survey Area.	Low anticipated impact to potential foraging and breeding habitat given the vast area of similar habitat connected to the Survey Area and within the greater South East Forest National Park. The site assessment in May/ June 2022 did not detect this species.	No
Calidris ferruginea (Curlew Sandpiper)	E	CE	Low. No suitable habitat in survey area.	It forages in or at the edge of shallow water, occasionally on exposed algal mats or waterweed, or on banks of beach-cast seagrass or seaweed.	It roosts on shingle, shell or sand beaches; spits or islets on the coast or in wetlands; or sometimes in salt marsh, among beach-cast seaweed, or on rocky shores. No suitable breeding habitat occurred within the Survey Area.	No anticipated impact	No

Species	BC Act	EPBC Act	Likelihood of Occurrence	Foraging Habitat Present Within the Survey Area	Breeding Habitat Present Within the Survey Area	Anticipated Impact	Further Impact Assessment Required?
Callocephalon fimbriatum (Gang-gang Cockatoo)	V	E	Present. This species was observed foraging on five (5) occasions during the site assessment in May/June 2022 (**Appendix L**).	In spring and summer, generally found in tall mountain forests and woodlands, at higher elevations, 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, or in dry forest in coastal areas and often found in urban areas. Foraging habitat is present within the Survey Area.	Favours old growth forest and woodland attributes for nesting and roosting. Nests are located in hollows that are 10cm in diameter, or larger, in eucalypts. A suite of potentially suitable nesting hollows were identified within the Survey Area.	Low anticipated impact to potential foraging habitat given the vast area of similar foraging habitat connected to the Survey Area and within the greater South East Forest National Park. Moderate impact to potential breeding habitat as a number of suitable hollow- bearing trees are likely to be impacted by the Activity, noting breeding generally occurs at higher elevations in late spring and summer.	**Yes (Appendix B and Appendix F)**
Calyptorhynchus lathami (Glossy Black Cockatoo)	V	-	Moderate- two records in proximity to the Survey Area.	Inhabits open forest and woodlands of the coast and the Great Dividing Range where stands of s63heoak occur. Black Sheoak (*Allocasuarina littoralis*) and Forest Sheoak (*A. torulosa*) are important foods. The Survey Area may only provide intermittent foraging habitat for this species given the very low abundance of favoured Sheok species.	Dependent on large hollow-bearing eucalypts for nest sites. A suite of potentially suitable nesting hollows were identified within the Survey Area.	Low anticipated impact to foraging habitat given the mobility of this species and vast area of similar foraging habitat connected to the Survey Area and within the greater South East Forest National Park. Moderate impact to potential breeding habitat as a number of hollow-bearing trees are likely to be impacted by the Activity. The site assessment in May/ June 2022 did not detect this species.	**Yes (Appendix B)**

Species	BC Act	EPBC Act	Likelihood of Occurrence	Foraging Habitat Present Within the Survey Area	Breeding Habitat Present Within the Survey Area	Anticipated Impact	Further Impact Assessment Required?
Cercartetus nanus (Eastern Pygmy-possum)	V	-	Moderate- six records in proximity to the Survey Area.	Feeds largely on nectar and pollen collected from banksias, eucalypts and bottlebrushes; an important pollinator of heathland plants such as banksias; soft fruits are eaten when flowers are unavailable. Potential habitat is present within much of the Survey Area given the vast areas of *Eucalyptus* spp. and other nectar sources.	Shelters in tree hollows, rotten stumps, holes in the ground, abandoned bird-nests, Ringtail Possum dreys or thickets of vegetation, (e.g. grass-tree skirts). Potential breeding habitat was identified within the Survey Area.	Low anticipated impact to potential foraging habitat given the vast area of similar habitat connected to the Survey Area and within the greater South East Forest National Park. Moderate impact to potential breeding habitat as a number of hollow-bearing trees are likely to be impacted by the Activity.	Yes (Appendix B)
Daphoenositta chrysoptera (Varied Sittella)	V	-	Moderate- six records in proximity to the Survey Area.	This species predominantly inhabits well-connected eucalypt forests and woodlands, feeding on arthropods gleaned from crevices in rough or decorticating bark, dead branches, standing dead trees and small branches and twigs in the tree canopy. Potential foraging habitat is present.	This species builds a cup-shaped nest of plant fibres and cobwebs in an upright tree fork high in the living tree canopy. No nests were identified during the site assessment.	Low anticipated impact to potential foraging and breeding habitat given the vast area of similar habitat connected to the Survey Area and within the greater South East Forest National Park. The site assessment in May/ June 2022 did not detect this species.	No

Species	BC Act	EPBC Act	Likelihood of Occurrence	Foraging Habitat Present Within the Survey Area	Breeding Habitat Present Within the Survey Area	Anticipated Impact	Further Impact Assessment Required?
Dasyurus maculatus (Spotted-tailed Quoll)	V	E	Moderate- 14 records in proximity to the Survey Area.	A generalist predator with a preference for medium-sized (500g-5kg) mammals. Consumes a variety of prey, including gliders, possums, small wallabies, rats, birds, bandicoots, rabbits, reptiles and insects. Also eats carrion and takes domestic fowl. Prey species are likely to be present within the Survey Area.	This species uses hollow-bearing trees, fallen logs, small caves, rock outcrops and rocky-cliff faces as den sites. A suite of suitable hollow-bearing trees and microhabitat logs were identified throughout the Survey Area.	Low anticipated impact to potential foraging habitat given the vast area of similar habitat connected to the Survey Area and within the greater South East Forest National Park. Moderate impact to potential breeding habitat as a number of hollow-bearing trees are likely to be impacted by the Activity.	**Yes (Appendix B and Appendix F)**
Falco hypoleucos (Grey Falcon)	E	V	Low/Nil. No records in proximity to the Survey Area.	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. Preys primarily on birds, especially parrots and pigeons, using high-speed chases and stoops; reptiles and mammals are also taken. Suitable foraging habitat was not present within the Survey Area.	Like other falcons it utilises old nests of other birds of prey and ravens, usually high in a living eucalypt near water or a watercourse; peak laying season is in late winter and early spring. Given the lack of foraging habitat, this species is unlikely to breed within the Survey Area.	Nil anticipated impact to potential foraging and breeding habitat given this species is very unlikely to occur within the Survey Area. The site assessment in May/ June 2022 did not detect this species.	No

Species	BC Act	EPBC Act	Likelihood of Occurrence	Foraging Habitat Present Within the Survey Area	Breeding Habitat Present Within the Survey Area	Anticipated Impact	Further Impact Assessment Required?
Falsistrellus tasmaniensis (Eastern False Pipistrelle)	V	-	Moderate- nine records in proximity to the Survey Area.	This species prefers moist habitats with trees taller than 20m. Feeds on insects. Potential foraging habitat in the form of large areas of wet sclerophyll forest are present within the Survey Area.	Generally, roosts in Eucalypt hollows, but has also been found under loose bark on trees or in buildings nearby foraging habitat. A suite of potential roosting hollows are present within the Survey Area.	Low anticipated impact to potential foraging habitat given the vast area of similar habitat connected to the Survey Area and within the greater South East Forest National Park. Moderate impact to potential breeding habitat as a number of hollow-bearing trees are likely to be impacted by the Activity.	Yes (Appendix B)
Grantiella picta (Painted Honeyeater)	V	V	Low. No records in proximity to the Survey Area.	A specialist feeder on the fruits of mistletoes growing on woodland eucalypts and acacias. Prefers mistletoes of the genus *Amyema*. Insects and nectar from mistletoe or eucalypts are occasionally eaten. Potential foraging habitat was present within the Survey Area.	Nest from spring to autumn in a small, delicate nest hanging within the outer canopy of drooping eucalypts, she-oak, paperbark or mistletoe branches. Potential breeding habitat was present within the Survey Area.	Low anticipated impact to potential foraging and breeding habitat given the vast area of similar habitat connected to the Survey Area and within the greater South East Forest National Park. The site assessment in May/ June 2022 did not detect this species.	No
Haliaeetus leucogaster (White-bellied Sea-Eagle)	V	-	Low- one record in proximity to the Survey Area.	Foraging habitats are characterised by the presence of large areas of open water including larger rivers, swamps, lakes, and the sea. No such habitat is present within the Survey Area.	Breeding habitat is live large old trees within 1km of a rivers, lakes, large dams or creeks, wetlands and coastlines. No nests were identified within the Survey Area at the time of the site assessment.	Negligible, no anticipated net loss of foraging or breeding habitat. The site assessment in May/ June 2022 did not detect this species.	No

Species	BC Act	EPBC Act	Likelihood of Occurrence	Foraging Habitat Present Within the Survey Area	Breeding Habitat Present Within the Survey Area	Anticipated Impact	Further Impact Assessment Required?
Heleioporus australiacus (Giant Burrowing Frog)	V	V	Low- two old records in proximity to the Survey Area.	Found in heath, woodland and open dry sclerophyll forest on a variety of soil types except those that are clay based. Spends more than 95% of its time in non-breeding habitat in areas up to 300m from breeding sites (soaks or pools within first or second order streams). Whilst in non-breeding habitat it burrows below the soil surface or in the leaf litter. Potential foraging habitat present within areas of the Survey Area within 300m of first and second order streams.	Breeding habitat of this species is generally soaks or pools within first or second order streams. They are also commonly recorded from 'hanging swamp' seepage lines and where small pools form from the collected water. Breeding habitat for this species is present within first and second order streams and swamp seepage lines within the Survey Area.	Low anticipated impact to potential foraging habitat given the vast area of similar habitat connected to the Survey Area and within the greater South East Forest National Park. Low anticipated impact to potential breeding habitat given only small areas of works are proposed within waterways however, the feral-predator-proof fence may act as a barrier to movement from non-breeding to breeding habitat but these barriers are likely to be localised and movement along streams will not be impeded by in-stream structures and anticipated impacts are low.	**Yes (Appendix D** and **Appendix H)**
Hirundapus caudacutus (White-throated Needletail)	-	V	Low- four records in proximity to the Survey Area.	This species has been recorded eating a wide variety of insects, including beetles, cicadas, flying ants, bees, wasps, flies, termites, moths, locusts and grasshoppers. Prey items may be present within the Survey Area; however, foraging habitat of this species is aerial.	N/A. This species does not breed in Australia.	Low anticipated impact to potential foraging habitat given the ecology of this species. No impact to breeding habitat.	No

Species	BC Act	EPBC Act	Likelihood of Occurrence	Foraging Habitat Present Within the Survey Area	Breeding Habitat Present Within the Survey Area	Anticipated Impact	Further Impact Assessment Required?
Isoodon obesulus obesulus (Southern Brown Bandicoot-eastern)	E	E	High- 65 records in proximity to the Survey Area.	They are generally only found in heath or open forest with a heathy understorey on sandy or friable soils. They feed on a variety of ground-dwelling invertebrates and the fruit-bodies of hypogeous (underground-fruiting) fungi. Their searches for food often create distinctive conical holes in the soil. Potential foraging habitat present within the Survey Area with the presence of heath and open forest. Furthermore, conical holes were observed during site assessment.	Nest during the day in a shallow depression in the ground covered by leaf litter, grass or other plant material. Nests may be located under Grass trees Xanthorrhoea spp., blackberry bushes and other shrubs, or in rabbit burrows. Potential breeding habitat present within the Survey Area with the presence of areas of dense shrubbery and rabbit burrows.	Low anticipated impact to potential foraging and breeding habitat given the vast area of similar habitat connected to the Survey Area and within the greater South East Forest National Park. Fence may create a barrier to movement of individuals, but impact of this is likely to be outweighed by benefits of reduced predation resulting from feral eradication inside the fence.	Yes (**Appendix C** and **Appendix I**)
Lathamus discolor (Swift Parrot)	E	CE	Low- one record in proximity to the Survey Area.	On the mainland they occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations. Sub-optimal foraging habitat present within the Survey Area given the lack of favoured *Eucalyptus* species.	N/A. The Swift Parrot breeds in Tasmania.	Low anticipated impact to potential foraging habitat given the vast area of similar habitat connected to the Survey Area and within the greater South East Forest National Park. No anticipated impact to breeding habitat. The Survey Area is not mapped as an important area for the species. The site assessment in May/ June 2022 did not detect this species.	No

Litoria castanea (Yellow-spotted Tree Frog)	CE	CE	Not applicable. No records in proximity to the Survey Area. Historically, this species occurred in two separate highland ranges: on the New England Tableland, and on the southern and central tablelands from Bathurst to Bombala. Following the chytrid virus pandemic in the 1970s, this species went unrecorded for 30 years and was believed to be extinct, until it was rediscovered	Require large permanent ponds or slow flowing 'chain-of-ponds' streams with abundant emergent vegetation such as bulrushes and aquatic vegetation. Move and forage at night on grassy banks or float on the water's surface. Potential foraging habitat was present within the Survey Area.	Eggs are laid amongst aquatic vegetation. Potential breeding habitat was present within the Survey Area.	No anticipated impacts.	No

Species	BC Act	EPBC Act	Likelihood of Occurrence	Foraging Habitat Present Within the Survey Area	Breeding Habitat Present Within the Survey Area	Anticipated Impact	Further Impact Assessment Required?
			in 2009 on the Southern Tablelands. This population - near Yass - remains the only known extant site of the species.				

Litoria raniformis (Growling Grass Frog)	E	V	Not applicable. No records in proximity to the Survey Area. In NSW the species was once distributed along the Murray and Murrumbidgee Rivers and their tributaries, the southern slopes of the Monaro district and the central southern tablelands as far north as Tarana, near Bathurst. Currently, the species is known to exist only in isolated populations in the Coleambally Irrigation Area, the	Usually found in or around permanent or ephemeral Black Box/Lignum/Nitre Goosefoot swamps, Lignum/Typha swamps and River Red Gum swamps or billabongs along floodplains and river valleys. They are also found in irrigated rice crops, particularly where there is no available natural habitat. These types of habitat are not present in the Survey area.	During the breeding season animals are found floating amongst aquatic vegetation (especially cumbungi or Common Reeds) within or at the edge of slow-moving streams, marshes, lagoons, lakes, farm dams and rice crops. Tadpoles require standing water for at least 4 months for development and metamorphosis to occur but can take up to 12 months to develop. Marginal potential breeding habitat was present within the Survey Area.	No anticipated impact to potential foraging habitat. . Low anticipated impact to potential breeding habitat given only small areas of works are proposed within waterways, which only provide marginal habitat for this species..	No

Species	BC Act	EPBC Act	Likelihood of Occurrence	Foraging Habitat Present Within the Survey Area	Breeding Habitat Present Within the Survey Area	Anticipated Impact	Further Impact Assessment Required?
			Lowbidgee floodplain and around Lake Victoria.				

Species	BC Act	EPBC Act	Likelihood of Occurrence	Foraging Habitat Present Within the Survey Area	Breeding Habitat Present Within the Survey Area	Anticipated Impact	Further Impact Assessment Required?
Litoria watsoni (Watson's Tree Frog) - formerly part of *L. littlejohni*	-	E	Low. No records in proximity to the Survey Area.	Watson's Tree Frog is a forest-dependent species, being recorded from a range of natural forest vegetation types at low to high elevations. The species forages in wet and dry forest, woodland, bushland, and heathland. Potential foraging habitat is present within the Survey Area.	Most breeding sites are along lentic water bodies, including ephemeral and permanent ponds, both natural and man-made. Potential breeding habitat is present within the Survey Area.	Low anticipated impact to potential foraging habitat given the vast area of similar habitat connected to the Survey Area and within the greater South East Forest National Park. Low anticipated impact to potential breeding habitat given only small areas of works are proposed within waterways however, the feral-predator-proof fence may act as a barrier to movement from non-breeding to breeding habitat but these barriers are likely to be localised and movement along streams will not be impeded by in-stream structures and anticipated impacts are low.	Yes (Appendix H)

Species	BC Act	EPBC Act	Likelihood of Occurrence	Foraging Habitat Present Within the Survey Area	Breeding Habitat Present Within the Survey Area	Anticipated Impact	Further Impact Assessment Required?
Mastacomys fuscus mordicus (Broad-toothed Rat)	V	V	Low. No records in proximity to the Survey Area.	The Broad-toothed Rat lives in a complex of runways through the dense vegetation of its wet grass, sedge or heath environment, and under the snow in winter. This relatively warm under-snow space enables it to be active throughout winter. The diet consists almost solely of greenery – grass and sedge stems, supplemented by seeds and moss spore cases. Potential foraging habitat was present within the Survey Area.	Sheltering nests of grass are built in the understorey or under logs, where two or three young are born in summer. Potential breeding habitat was present within the Survey Area.	Low anticipated impact to potential foraging and breeding habitat given the vast area of similar habitat connected to the Survey Area and within the greater South East Forest National Park.	No
Miniopterus orianae oceanensis (Large Bent-winged Bat)	V	-	Low- two records in proximity to the Survey Area.	Hunt in forested areas, catching moths and other flying insects above the treetops. Potential prey items may occur within the Survey Area.	This species only breeds in caves. No such habitat was identified within, or in close proximity to, the Survey Area.	Low anticipated impact to potential foraging habitat given the vast area of similar habitat connected to the Survey Area and within the greater South East Forest National Park. No anticipated impact to breeding habitat.	No

Species	BC Act	EPBC Act	Likelihood of Occurrence	Foraging Habitat Present Within the Survey Area	Breeding Habitat Present Within the Survey Area	Anticipated Impact	Further Impact Assessment Required?
Mixophyes balbus (Stuttering Frog)	E	V	Low- one old record in proximity to the Survey Area. Very few records of this species south of Sydney in the last 20 years. Very unlikely to currently occur in the Survey Area.	Found in rainforest and wet, tall open forest in the foothills and escarpment on the eastern side of the Great Dividing Range. Outside the breeding season adults live in deep leaf litter and thick understorey vegetation on the forest floor. Potential foraging habitat within the Survey Area with the presence of wet tall open forest.	Breed in streams during summer after heavy rain. Eggs are laid on rock shelves or shallow riffles in small, flowing streams. Potential breeding habitat in the form of numerous streams intersect the Survey Area.	Low anticipated impact to potential foraging habitat given the vast area of similar habitat connected to the Survey Area and within the greater South East Forest National Park. Low anticipated impact to potential breeding habitat given only small areas of works are proposed within waterways and the low likelihood of occurrence in the Survey Area..	**Yes (Appendix D** and **Appendix H)**
Myotis macropus (Southern Myotis)	V	-	Moderate- two records in proximity to the Survey Area.	This species forages over streams and pools catching insects and small fish by raking their feet across the water surface. Potential foraging habitat in the form of numerous streams intersect the Survey Area.	Generally, roost in groups of 10 – 15 close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, under bridges and in dense foliage. Potential breeding habitat is present in the form of hollow-bearing trees, culverts, bridges and dense foliage within the Survey Area.	Low anticipated impact to potential foraging habitat given the vast area of similar habitat connected to the Survey Area and within the greater South East Forest National Park. Moderate impact to potential breeding habitat as bridges, culverts and a number of hollow-bearing trees are likely to be impacted by the Activity.	**Yes (Appendix B)**

Species	BC Act	EPBC Act	Likelihood of Occurrence	Foraging Habitat Present Within the Survey Area	Breeding Habitat Present Within the Survey Area	Anticipated Impact	Further Impact Assessment Required?
Ninox strenua (Powerful Owl)	V	-	Moderate- 38 records within proximity to the Survey Area.	Main prey items are medium-sized arboreal marsupials, particularly the Greater Glider, Common Ringtail Possum and Sugar Glider. Potential prey items are likely to occur within the Survey Area.	This species nest in large tree hollows (at least 0.5m deep), in large eucalypts (diameter at breast height of 80-240 cm) that are at least 150 years old. Large hollows in large old trees were observed within the Survey Area.	Low anticipated impact to potential foraging habitat given the vast area of similar habitat connected to the Survey Area and within the greater South East Forest National Park. Moderate impact to potential breeding habitat as a number of hollow-bearing trees are likely to be impacted by the Activity.	Yes (Appendix B)
Numenius madagascariensis (Eastern Curlew)	-	CE	Low. No records in proximity to the Survey Area and no suitable habitat present within it.	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. It forages in or at the edge of shallow water, occasionally on exposed algal mats or waterweed, or on banks of beach-cast seagrass or seaweed. No suitable foraging habitat was present within the Survey Area.	NA. This species does not breed in Australia.	Negligible, no anticipated net loss of foraging or breeding habitat. The site assessment in May/ June 2022 did not detect this species.	No

Species	BC Act	EPBC Act	Likelihood of Occurrence	Foraging Habitat Present Within the Survey Area	Breeding Habitat Present Within the Survey Area	Anticipated Impact	Further Impact Assessment Required?
Pachycephala olivacea (Olive Whistler)	V	-	Moderate- 13 records in proximity to the Survey Area.	Mostly inhabit wet forests above about 500m. During the winter months they may move to lower altitudes. Forages in trees and shrubs and on the ground, feeding on berries and insects. Potential foraging habitat is present within the Survey Area.	Makes nests of twigs and grass in low forks of shrubs. Although no nests were observed within the Survey Area, potential breeding habitat is present.	Low anticipated impact to potential foraging and breeding habitat given the vast area of similar habitat connected to the Survey Area and within the greater South East Forest National Park. The site assessment in May/ June 2022 did not detect this species.	No
Petauroides volans (Greater Glider)	-	V	High- 37 records in proximity to the Survey Area.	This species is typically found in taller, montane, moist eucalypt forests with relatively old trees and abundant hollows. Potential foraging habitat is present within the Survey Area.	During the day this species shelters in tree hollows, with a particular preference for large hollows (diameter >10 cm) in large, old trees. Both live and standing dead trees are used for denning. Suitable breeding habitat is present within the Survey Area.	Low anticipated impact to potential foraging habitat given the vast area of similar habitat connected to the Survey Area and within the greater South East Forest National Park. Moderate impact to potential breeding habitat as a number of hollow-bearing trees are likely to be impacted by the Activity.	Yes (Appendix G)

Species	BC Act	EPBC Act	Likelihood of Occurrence	Foraging Habitat Present Within the Survey Area	Breeding Habitat Present Within the Survey Area	Anticipated Impact	Further Impact Assessment Required?
Petaurus australis (Yellow-bellied Glider)	V	-	High- 152 records in proximity to the Survey Area.	Occur in tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils. Feed primarily on plant and insect exudates, including nectar, sap, honeydew and manna with pollen and insects providing protein. Extract sap by incising (or biting into) the trunks and branches of favoured food trees, often leaving a distinctive 'V'-shaped scar. Potential foraging habitat is present within the Survey Area. Glider scars were observed but not in the distinctive 'V' shape.	Den, often in family groups, in hollows of large trees. Potential breeding habitat is present in the form of large hollow-bearing trees.	Low anticipated impact to potential foraging habitat given the vast area of similar habitat connected to the Survey Area and within the greater South East Forest National Park. Moderate impact to potential breeding habitat as a number of hollow-bearing trees are likely to be impacted by the Activity.	Yes (Appendix B)
Petrogale penicillata (Brush-tailed Rock-wallaby)	E	V	Low. No records in proximity to the Survey Area.	Occupy rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges, often facing north. Browse on vegetation in and adjacent to rocky areas eating grasses and forbs as well as the foliage and fruits of shrubs and trees. No suitable foraging habitat is present within the Survey Area.	This species breeds close to foraging habitat in rock crevices, caves and overhangs. No suitable breeding habitat is present within the Survey Area.	Negligible, no anticipated net loss of foraging or breeding habitat.	No

Species	BC Act	EPBC Act	Likelihood of Occurrence	Foraging Habitat Present Within the Survey Area	Breeding Habitat Present Within the Survey Area	Anticipated Impact	Further Impact Assessment Required?
Petroica boodang (Scarlet Robin)	V	-	Present. This species was observed foraging on six (6) occasions during the site assessment in May/June 2022 (**Appendix L**).	The Scarlet Robin lives in dry eucalypt forests and woodlands. The understorey is usually open and grassy with few scattered shrubs. Scarlet Robin habitat usually contains abundant logs and fallen timber: these are important components of its habitat. Foraging habitat occurs within the Survey Area.	The Scarlet Robin breeds on ridges, hills and foothills of the western slopes, the Great Dividing Range and eastern coastal region. Potential nesting habitat is present within the Survey Area; however, no nests were identified.	Low anticipated impact to potential foraging and breeding habitat given the vast area of similar habitat connected to the Survey Area and within the greater South East Forest National Park.	No
Petroica phoenicea (Flame Robin)	V	-	Moderate- 10 records in proximity to the Survey Area.	In winter lives in dry forests, open woodlands and in pastures and native grasslands, with or without scattered trees. In winter, occasionally seen in heathland or other shrublands in coastal areas. Birds forage from low perches, from which they sally or pounce onto small invertebrates which they take from the ground or off tree trunks, logs and other coarse woody debris. Potential foraging habitat is present within the Survey Area.	Breeds in upland tall moist eucalypt forests and woodlands, often on ridges and slopes. Nests are often near the ground and are built in sheltered sites, such as shallow cavities in trees, stumps or banks. Potential breeding habitat is present within the Survey Area although no nests were identified during the site assessment.	Low anticipated impact to potential foraging and breeding habitat given the vast area of similar habitat connected to the Survey Area and within the greater South East Forest National Park. The site assessment in May/ June 2022 did not detect this species.	No

Species	BC Act	EPBC Act	Likelihood of Occurrence	Foraging Habitat Present Within the Survey Area	Breeding Habitat Present Within the Survey Area	Anticipated Impact	Further Impact Assessment Required?
Phascolarctos cinereus (Koala)	V	V	Low- 15 old records in proximity to the Survey Area.	Inhabit eucalypt woodlands and forests. Feed on the foliage of more than 70 eucalypt species and 30 non-eucalypt species, but in any one area will select preferred browse species. Potential foraging habitat is present within the Survey Area.	Potential breeding habitat present within the Survey Area given the expanse of eucalypt woodlands and forests.	Low anticipated impact to potential foraging and breeding habitat given the vast area of similar habitat connected to the Survey Area and within the greater South East Forest National Park. The site assessment in May/ June 2022 did not detect this species, which has not been recorded in the locality for over 15 years	No
Potorous longipes (Long-footed Potoroo)	CE	E	Low/Nil- 62 old records in proximity to the Survey Area.	The Long-footed Potoroo typically inhabits moist forest types from montane wet sclerophyll forests over 1000m altitude to lowland forests at 150m. Makes small conical pits in the ground as it searches at night for fungal fruit-bodies. During the day it shelters in a crude nest under dense understorey vegetation. Potential foraging habitat is present within the Survey Area.	During the day it shelters in a crude nest under dense understorey vegetation. Potential breeding habitat is present within the Survey Area.	As this species is considered to be locally extinct, there is a negligible level of anticipated impact to potential foraging and breeding habitat.	No

Species	BC Act	EPBC Act	Likelihood of Occurrence	Foraging Habitat Present Within the Survey Area	Breeding Habitat Present Within the Survey Area	Anticipated Impact	Further Impact Assessment Required?
Potorous tridactylus (Long-nosed Potoroo)	V	V	Low- three old records in proximity to the Survey Area.	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. Potential foraging habitat is present within the Survey Area.	Hides by day in dense vegetation – however, during the winter months animals may forage during daylight hours. Potential breeding habitat is present within the Survey Area.	Low anticipated impact to potential foraging and breeding habitat given the vast area of similar habitat connected to the Survey Area and within the greater South East Forest National Park.	No
Pseudomys fumeus (Smoky Mouse)	CE	E	Low/Nil- 24 old records in proximity to the Survey Area.	The Smoky Mouse appears to prefer heath habitat on ridge tops and slopes in sclerophyll forest, heathland and open-forest to sub-alpine regions of up to 1800m, but sometimes occurs in ferny gullies. Seeds and fruits from leguminous shrubs form the main summer and autumn diet, with some invertebrates, in the high country. Hypogeal (fungi predominate in winter and spring, with some flowers, seeds and soil invertebrates. Potential foraging habitat is present within the Survey Area.	Nesting burrows have been found in rocky localities among tree roots and under the skirts of Grass Trees. Suitable breeding habitat is present within the Survey Area.	As this species is considered to be locally extinct, there is a negligible level of anticipated impact to potential foraging and breeding habitat.	No

Species	BC Act	EPBC Act	Likelihood of Occurrence	Foraging Habitat Present Within the Survey Area	Breeding Habitat Present Within the Survey Area	Anticipated Impact	Further Impact Assessment Required?
Pteropus poliocephalus (Grey-headed Flying-fox)	V	V	Low. No records in proximity to the Survey Area.	Feed on the nectar and pollen of native trees, in particular Eucalyptus, Melaleuca and Banksia, and fruits of rainforest trees and vines. Potential foraging habitat is present within the Survey Area.	Roosting camps are generally located within 20km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy. Potential breeding habitat is present within the Survey Area although no camps were identified during the site assessment.	Low anticipated impact to potential foraging and breeding habitat given the vast area of similar habitat connected to the Survey Area and within the greater South East Forest National Park. The site assessment in May/ June 2022 did not detect this species.	No
Pycnoptilus floccosus (Pilotbird)	-	V	Low. No records in proximity to the Survey Area.	Pilotbirds are a common resident of mountain gullies, on the coast and inland to the Great Divide. Pilotbirds only feed from the ground, often taking food uncovered by foraging Superb Lyrebirds as they scratch the forest floor. Their food is usually insects but occasionally includes seeds and fruits. Potential foraging habitat is present within the Survey Area.	Pilotbirds nest in a bulky dome of twigs, bark and leaves hidden in vegetation on, or close to, the ground. Potential breeding habitat is present within the Survey Area.	Low anticipated impact to potential foraging and breeding habitat given the vast area of similar habitat connected to the Survey Area and within the greater South East Forest National Park. The site assessment in May/ June 2022 did not detect this species.	No

Species	BC Act	EPBC Act	Likelihood of Occurrence	Foraging Habitat Present Within the Survey Area	Breeding Habitat Present Within the Survey Area	Anticipated Impact	Further Impact Assessment Required?
Rostratula australis (Australian Painted Snipe)	E	E	Low. No records in proximity to the Survey Area.	Prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber. Forages nocturnally on mud-flats and in shallow water. Feeds on worms, molluscs, insects and some plant-matter. Suitable foraging habitat is present within the Survey Area.	Nests on the ground amongst tall vegetation, such as grasses, tussocks or reeds. Suitable breeding habitat is present within the Survey Area.	Low anticipated impact to potential foraging and breeding habitat given the vast area of similar habitat connected to the Survey Area and within the greater South East Forest National Park. The site assessment in May/ June 2022 did not detect this species.	No
Scoteanax rueppellii (Greater Broad-nosed Bat)	V	-	Moderate- six records in proximity to the Survey Area.	Forages after sunset, flying slowly and directly along creek and river corridors. Potential foraging habitat is present within the Survey Area.	This species usually roosts in tree hollows surrounding creek and river corridors. Potential breeding habitat is present within the Survey Area with numerous potential roosting hollows in proximity to streams.	Low anticipated impact to potential foraging habitat given the vast area of similar habitat connected to the Survey Area and within the greater South East Forest National Park. Moderate impact to potential breeding habitat as a number of hollow-bearing trees are likely to be impacted by the Activity.	Yes (Appendix B)

Species	BC Act	EPBC Act	Likelihood of Occurrence	Foraging Habitat Present Within the Survey Area	Breeding Habitat Present Within the Survey Area	Anticipated Impact	Further Impact Assessment Required?
Sminthopsis leucopus (White-footed Dunnart)	V	-	High- nine records in proximity to the Survey Area, and two additional, confirmed records (May 2022) from NPWS surveys within the the area	Found in a range of different habitats across its distribution, including coastal dune vegetation, coastal forest, tussock grassland and sedgeland, heathland, woodland and forest. An opportunistic carnivore that feeds on a variety of ground-dwelling invertebrates and, occasionally, small lizards. Potential foraging habitat is present within the Survey Area.	They shelter in bark nests in hollows under standing or fallen timber, burrows in the ground, piles of logging debris, in the 'skirts' of grass trees and cycads. And rock crevices. Potential breeding habitat is present with a suite of microhabitat logs and small burrows identified within the Survey Area.	Low anticipated impact to potential foraging habitat given the vast area of similar habitat connected to the Survey Area and within the greater South East Forest National Park. Moderate impact to potential breeding habitat given microhabitat logs are likely to be impacted by the Activity.	Yes (Appendix C)
Tyto novaehollandiae (Masked Owl)	V	-	Low- six records in proximity to the Survey Area.	The Masked Owl inhabits forests, woodlands, timbered waterways and open country on the fringe of these areas. The main requirements are tall trees with suitable hollows for nesting and roosting and adjacent areas for foraging. Potential foraging habitat is present within the Survey Area. Prey species are likely to be present within the Survey Area.	Roosts and breeds in moist eucalypt forested gullies, using large tree hollows or sometimes caves for nesting. Dead stags are especially popular for roosting/breeding habitat and are a limited resource due to natural attrition. Potential breeding habitat is present within the Survey Area.	Low anticipated impact to potential foraging habitat given the vast area of similar habitat connected to the Survey Area and within the greater South East Forest National Park. Moderate impact to potential breeding habitat as a number of hollow-bearing trees are likely to be impacted by the Activity.	Yes (Appendix B)

Species	BC Act	EPBC Act	Likelihood of Occurrence	Foraging Habitat Present Within the Survey Area	Breeding Habitat Present Within the Survey Area	Anticipated Impact	Further Impact Assessment Required?
Tyto tenebricosa (Sooty Owl)	V	-	Low- eight records in proximity to the Survey Area.	Occurs in rainforest, including dry rainforest, subtropical and warm temperate rainforest, as well as moist eucalypt forests, hunts by night for small ground mammals or tree-dwelling mammals such as the Common Ringtail Possum or Sugar Glider. Potential foraging habitat is present within the Survey Area. Prey species are likely to be present within the Survey Area.	Nests in very large tree-hollows. Potential breeding habitat is present within the Survey Area.	Low anticipated impact to potential foraging habitat given the vast area of similar habitat connected to the Survey Area and within the greater South East Forest National Park. Moderate impact to potential breeding habitat as a number of hollow-bearing trees are likely to be impacted by the Activity.	Yes (Appendix B)

V – Vulnerable; E – Endangered; EP – Endangered Population; CE – Critically Endangered

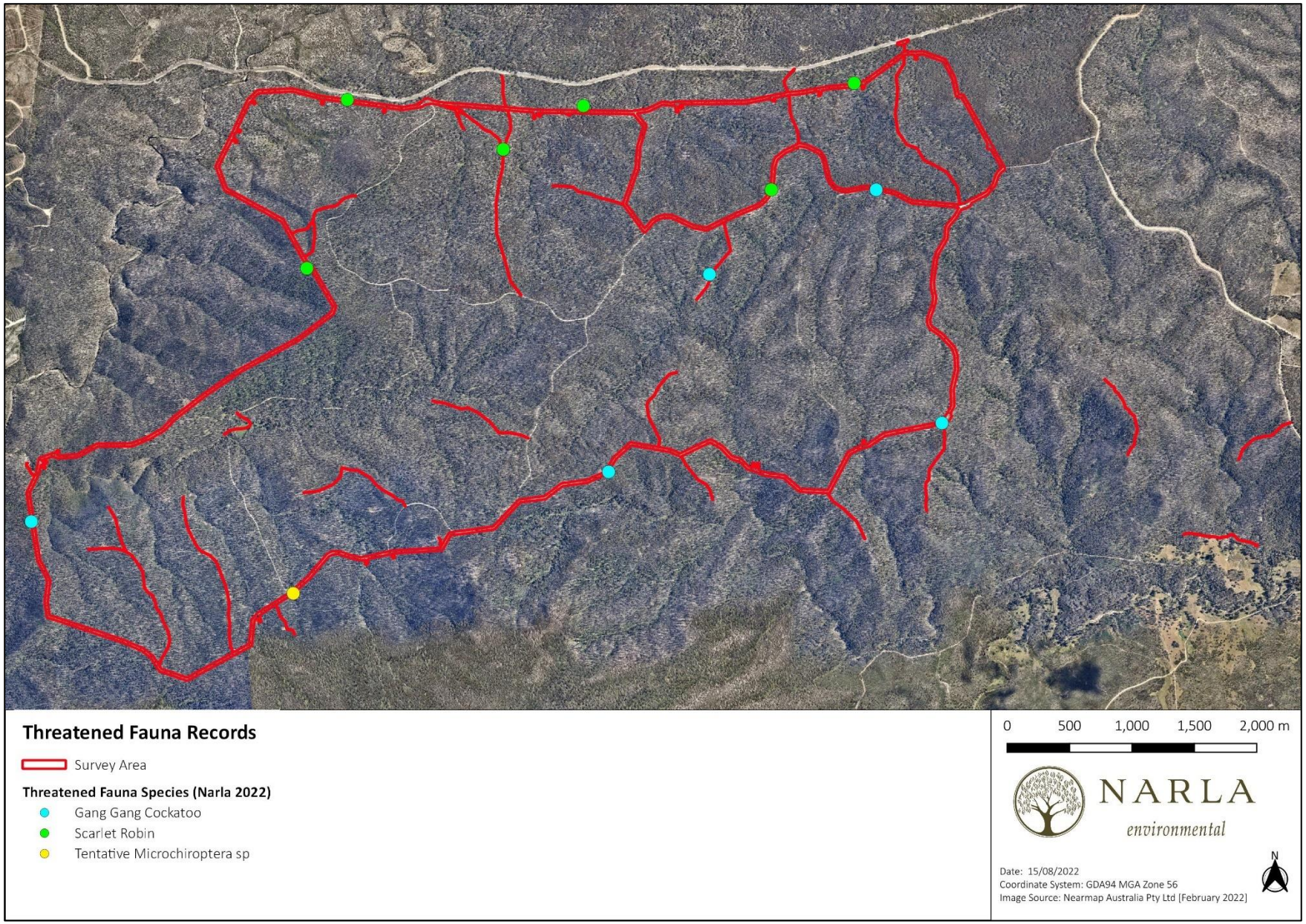


Figure 8. Threatened fauna recorded within the Survey Area during the site assessment.

7. Direct Impacts

7.1 Vegetation Loss

The proposed activity could result in impacts to approximately 52.52ha of native vegetation, as outlined in **Table 16**. However, the including of already cleared active and dormant roads and tracks will reduce the total area of vegetation cleared to approximately 32 ha.

Table 16. Vegetation impacts per infrastructure component.

Infrastructure Component	PCT 790	PCT 817	PCT 929	PCT 943	PCT 1228	PCT 1320	PCT 1322	PCT 1340	TOTAL Veg Impact (ha)
Predator Free Fence Management Corridor	0.59	0.14	2.47	0.04	1.07	13.55	18.73	2.57	39.16
Debris Traps and Maintenance Pads	0.09	0	0.71	0.09	1.00	0.50	0	0.11	2.5
Supporting Ancillary Infrastructure	0	0	0	0	0	0.38	0.15	0	0.53
Site Compound	0	0	0	0	0	0	0.09	0	0.09
Management and Walking Trails	0	0	0	0	0.41	4.82	5.01	0	10.24
TOTAL (ha)	**0.68**	**0.14**	**3.18**	**0.13**	**2.48**	**19.25**	**23.98**	**2.68**	**52.52**

7.1.1 Threatened Ecological Communities

The vegetation identified within the Survey Area does not conform to a BC or EPBC Act listed Threatened Ecological Community. As such, no Threatened Ecological Communities will be impacted by the Activity.

7.2 Threatened Fauna Habitat

7.2.1 Hollow-bearing Trees

A total of 279 hollow-bearing trees (26 of which were stags) containing 176 small, 149 medium and 54 large hollows were identified within the disturbance footprint of the proposed Activity (**Appendix L**). These hollow-bearing trees may provide breeding habitat for a number of threatened fauna species (**Table 15**). 116 additional hollow-bearing trees were identified in the buffer area around the disturbance footprint. Since hollow-bearing trees will be impacted by the Activity, the following locally occurring hollow-dwelling fauna may be impacted:

- *Callocephalon fimbriatum* (Gang-gang Cockatoo) – Vulnerable under the BC Act and Endangered under the EPBC Act;
- *Calyptorhynchus lathami* (Glossy Black Cockatoo) – Vulnerable under the BC Act;
- *Cercartetus nanus* (Eastern Pygmy-possum) – Vulnerable under the BC Act;

- *Dasyurus maculatus* (Spotted-tailed Quoll) – Vulnerable under the BC Act and Endangered under the EPBC Act;
- *Falsistrellus tasmaniensis* (Eastern False Pipistrelle) – Vulnerable under the BC Act;*Myotis macropus* (Southern Myotis) – Vulnerable under the BC Act;
- *Ninox strenua* (Powerful Owl) – Vulnerable under the BC Act;
- *Petauroides volans* (Greater Glider) – Vulnerable under the EPBC Act;
- *Petaurus australis* (Yellow-bellied Glider) – Vulnerable under the BC Act;
- *Scoteanax rueppellii* (Greater Broad-nosed Bat) – Vulnerable under the BC Act;
- *Tyto novaehollandiae* (Masked Owl) – Vulnerable under the BC Act; and
- *Tyto tenebricosa* (Sooty Owl) – Vulnerable under the BC Act.

Wherever possible, Narla recommends the avoidance of hollow-bearing trees within the disturbance footprint/ Survey Area. Further mitigation measures are provided in **Table 18**. A Test of Significance (5-part test; BC Act) and an Assessment of Significant Impact Criteria (EPBC Act) were undertaken to assess potential impacts from the Activity on hollow-dwelling fauna (**Appendix A**, **Appendix F** and **Appendix G**).

7.2.2 Culverts, Bridges, Creeks and Riparian Areas

The proposed Activity will impact twenty-seven (27) streams that intersect the Survey Area. These streams may provide habitat for four (4) potentially locally occurring threatened species:

- *Heleioporus australiacus* (Giant Burrowing Frog) – Vulnerable under the BC and EPBC Act;
- *Mixophyes balbus* (Stuttering Frog) – Endangered under the BC Act and Vulnerable under the EPBC Act;
- *Litoria watsoni* (Watson's Tree Frog) – Endangered under the EPBC Act;
- *Myotis macropus* (Southern Myotis) – Vulnerable under the BC Act;

Impacts may arise from the repair of existing bridges, removal of vegetation, and the construction of culverts. Impact avoidance and mitigation measures for threatened species associated with culverts, bridges, creeks and riparian habitats are provided in **Table 18**.

A Test of Significance (5-part test; BC Act) and an Assessment of Significant Impact Criteria (EPBC Act) were undertaken to assess potential impacts from the Activity on these threatened fauna (**Appendix D**, **Appendix H**).

7.2.3 Additional Fauna Habitat

Various areas containing course woody debris, burrows and rock outcrops were also identified within the Survey Area (**Appendix L**). Measures have been outlined in **Table 18** to avoid or minimise any impacts associated with these habitat features. This microhabitat may be important for two (2) locally occurring threatened species:

- *Sminthopsis leucopus (*White-footed Dunnart) – Vulnerable under the BC Act.
- Isoodon obesulus obesulus (Southern Brown Bandicoot (eastern) -Endangered under the BC and EPBC Act.

7.3 Threatened Flora

One (1) BC Act and EPBC Act Vulnerable species, *Pultenaea parrisiae* (Parris' Bush-pea), is known to occur within the Survey Area (Miles 2021). This species was not identified or mapped as part of this assessment, likely due to the cryptic nature of this species when not in flower. Any individuals that are located within the Survey Area are at risk from the proposed Activity and should be retained where possible, or translocated outside of the impact area. Records from the November 2021 survey (Miles 2021) are presented in **Appendix L**. Further impact avoidance and mitigation measures are discussed in **Table 18**.

A Test of Significance (5-part test) was undertaken in accordance with Section 7.3 of the BC Act to assess potential impacts from the Activity on this species (**Appendix A**), as well as an Assessment of Significant Impact Criteria in accordance with the EPBC Act (**Appendix E**).

7.4 Migratory Species

The Activity will have low impacts to potential foraging habitat and negligible impacts to potential breeding habitat for potentially occurring migratory species given their migratory nature. In the unlikely event that migratory threatened species forage within the Survey Area, the proposed removal of vegetation will have low impacts to foraging habitat given the large areas of suitable foraging habitat in the surrounding area and in their migratory range. No anticipated net loss of breeding habitat is expected as these species do not breed within or in close proximity of the Survey Area. The Activity is unlikely to significantly impact these species; therefore, a Referral to Commonwealth pursuant to the EPBC Act is not required.

7.5 Key Threatening Processes

The Activity will result in the following Key Threatening Processes (KTPs) listed under the BC Act:

- Bushrock removal;
- Clearing of native vegetation;
- Loss of hollow-bearing trees;
- Infection of frogs by amphibian chytrid causing the disease chytridiomycosis;
- Infection of native plants by *Phytophthora cinnamomi*; and
- Removal of dead wood and dead trees.

Small areas of bushrock may need to be removed to facilitate construction of infrastructure elements such as the conservation fence. If practical, bushrock should be relocated to nearby areas instead of wholesale removal however, this will be dependent on whether this can be achieved without further disturbance to vegetation and habitat. Although the clearing of native vegetation cannot be avoided due to the nature of the project, Narla recommends the avoidance of hollow-bearing trees wherever possible. Such trees provide significant habitat, potentially for threatened fauna species. Moreover, dead trees (stags) should be retained and any coarse woody debris strategically relocated to mitigate the loss of this habitat type. Where possible, felled trees (>20cm DBH) should be strategically placed (avoiding further disturbance) to increase coarse woody debris habitat. All personnel must practice good hygiene and follow appropriate hygiene procedures to avoid introducing pathogens into the area. Good hygiene practices typically aim to remove soil and plant material from people, equipment or vehicles prior to entering an 'at risk' area.

The Activity will result in the following Key Threatening Processes (KTPs) listed under the EPBC Act:

- Dieback caused by the root-rot fungus (*Phytophthora cinnamomi*);
- Infection of amphibians with chytrid fungus resulting in chytridiomycosis; and
- Land clearance.

Although the clearing of native vegetation cannot be avoided due to the nature of the project, the Activity has been designed to reduce the need for such land clearance as much as possible. All personnel must practice good hygiene and follow appropriate hygiene procedures to avoid introducing pathogens into the area. Good hygiene practices typically aim to remove soil and plant material from people, equipment or vehicles prior to entering an 'at risk' area.

It is not anticipated that any of the KTPs will significantly impact on any threatened species, populations and ecological communities that occur or have the potential to occur within the Subject Area.

During operation, the project's explicit aims are to remove cats, foxes, rabbits, deer and pigs and reintroduce locally extinct animals, thus improving their plight and restoring ecosystem processes which are also of benefit to other threatened species found in the area, which provides a positive impact. This also has a positive contribution to minimising the effects of the following key threatening processes listed under the BC Act.

- Competition and grazing by the feral European rabbit (*Oryctolagus cuniculus*);
- Herbivory and environmental degradation caused by feral deer
- Predation by the European red fox (*Vulpes vulpes*);
- Predation by the feral cat (*Felis catus*); and
- Predation, habitat degradation, competition disease transmission by feral pigs (*Sus scrofa*).

8. Indirect Impacts

Indirect impacts occur when the actions relating to the construction or operation of the Activity affect native vegetation, threatened ecological communities and threatened species habitat beyond the disturbance footprint. Impacts may also result from changes to land-use patterns, such as an increase in vehicular access and human activity on native vegetation, threatened ecological communities and threatened species habitat. For the proposed Activity. The conservation fence has the greatest potential to indirectly impact a range of threatened fauna primarily by way or inhibiting movement. Indirect impacts from the proposed Activity are further discussed below in **Table 17**.

Table 17. Indirect impacts associated with the proposed Activity.

Indirect Impact	Nature, extent and duration	Threatened Species and their habitat likely to be impacted	Consequences of the impacts for the bioregional persistence of the threatened species and their habitats.
Inadvertent impacts on adjacent habitat or vegetation	Vegetation and habitat directly adjacent to the Survey Area have the potential to experience ongoing indirect impacts as a result of the proposed Activity. Disturbance caused during construction may increase weed infestations within adjacent vegetation, which in turn may decrease its habitat value. Furthermore, the proposed development has the potential to alter the natural hydrology occurring within the area, due to an increase in hard surfaces.	There are a range of threatened species that occur, or might occur, adjacent to the Survey Area (see **Table 13** & **Table 15**). There is also likely to be important habitat (e.g. hollow-bearing trees, streams) for these threatened species adjacent to the Survey Area.	While changes to vegetation condition and hydrology may have a localised impact to threatened species and their habitats, this is not expected to impact on their bioregional persistence given vast areas of bushland connected to the area.
Entrapment	Some fauna may attempt to traverse the fence by climbing over, digging under or pushing through it, notably in times of stress caused by predation, drought, foraging pressures or fleeing wildfires and/or flood (Bradby et al. 2014, Jakes et al. 2018). According to the review conducted by Long and Robley (2004): 'Most fence managers indicated that native animals had been injured or killed in their exclusion fence. However, in all cases this occurred infrequently and is not considered to constitute a significant impact on resident fauna populations.'	There are a range of threatened species that occur, or might occur, adjacent to the Survey Area (see **Table 13** & **Table 15**). There is also likely to be important habitat (e.g. hollow-bearing trees, streams) for these threatened species adjacent to the Survey Area.	While entrapment may have a localised impact to threatened species, this is not expected to impact on their bioregional persistence given the infrequent nature of occurrence

Indirect Impact	Nature, extent and duration	Threatened Species and their habitat likely to be impacted	Consequences of the impacts for the bioregional persistence of the threatened species and their habitats.
Funnelling	Fauna may follow the fence into a blind corner, or away from resources, without reaching a gap or opportunity to traverse which may result in prey-trapping or resource pressure (Davies-Mostert et al. 2013).	There are a range of threatened species that occur, or might occur, adjacent to the Survey Area (see **Table 13** & **Table 15**). There is also likely to be important habitat (e.g. hollow-bearing trees, streams) for these threatened species adjacent to the Survey Area.	While funnelling may have a localised impact to threatened species, this is not expected to impact on their bioregional persistence given the infrequent nature of occurrence and the vast areas of bushland connected to the area.
Genetic Fragmentation	Restriction of movement and dispersal, and therefore genetic exchange, is likely to increase the functional isolation of populations, with ramifications for genetic differentiation and species adaptability (for example, Lacy 1997, Holderegger and Di Giulio 2010, Bradby et al. 2014, Ascensão et al. 2016). For those species subject to the direct barrier impact, restricting dispersal among metapopulations may result in reduced genetic diversity and greater risk of extinction where isolated populations exist (for example, Lacy 1997, van der Ree et al. 2015, Crawford et al. 2016, Crooks et al. 2017).	There are a range of threatened species that occur, or might occur, adjacent to the Survey Area (see **Table 13** & **Table 15**). There is also likely to be important habitat (e.g. hollow-bearing trees, streams) for these threatened species adjacent to the Survey Area.	While genetic fragmentation may have a localised impact to threatened species, this is not expected to impact on their bioregional persistence.
Barriers	Loss of connectivity via an open-space or fixed barrier may result in increased predation, loss of habitat resources, interruption of migration, dispersal and seasonal movement patterns as well as access to breeding opportunities (Krausman and Harris 2011), resulting in direct mortality, genetic differentiation and potentially limiting the ability of species to shift distributions in relation to climate change (Krosby et al. 2010).	There are a range of threatened species that occur, or might occur, adjacent to the Survey Area (see **Table 13** & **Table 15**). There is also likely to be important habitat (e.g. hollow-bearing trees, streams) for these threatened species adjacent to the Survey Area.	While barriers may have a localised impact to threatened species, this is not expected to impact on their bioregional persistence.

Indirect Impact	Nature, extent and duration	Threatened Species and their habitat likely to be impacted	Consequences of the impacts for the bioregional persistence of the threatened species and their habitats.
Altered Ecosystem Functioning	The exclusion of predators has been shown to have impacts on ecosystem functioning via a trophic cascade. A trophic cascade is triggered where the removal of an apex predator (Red Fox, wild cats and dogs, etc.) results in changes in predator-prey relationships through the food change, often resulting in alterations in overall ecosystem functioning and nutrient cycles.	There are a range of threatened species that occur, or might occur, adjacent to the Survey Area (see **Table 13** & **Table 15**). There is also likely to be important habitat (e.g. hollow-bearing trees, streams) for these threatened species adjacent to the Survey Area.	While altered ecosystem functioning may have a localised impact to threatened species, this is not expected to impact on their bioregional persistence. The reintroduction of small-medium sized mammals will restore a number of important ecological processes including herbivory, seed and spore dispersal, soil engineering and predation and is predicted to improve ecosystem functioning.
Reduced viability of adjacent habitat due to edge effects	The proposed Activity may lead to an increase in weed infiltration into adjacent habitat due to enhanced edge effects. Any impacts are expected to be restricted to the immediate surrounds of the Survey Area.	There are a range of threatened species that occur, or might occur, adjacent to the Survey Area (see **Table 13** & **Table 15**). There is also likely to be important habitat (e.g. hollow-bearing trees, streams) for these threatened species adjacent to the Survey Area.	While edge effects may have a localised impact to threatened species and their habitats, this is not expected to impact on their bioregional persistence given vast areas of bushland connect to the area.
Transport of weeds and pathogens from the site to adjacent vegetation	As previously discussed, the proposed Activity may lead to an increase in weed infiltration into adjacent habitat due to enhanced edge effects. There is also the potential for personnel to introduce pathogens to the area.	There are a range of threatened species that occur, or might occur, adjacent to the Survey Area (see **Table 13** & **Table 15**). Threatened frogs and plants are particularly at risk of disease via introduced pathogens.	While weeds may have a localised impact to threatened species and their habitats, pathogens may impact on their bioregional persistence given vast areas of relatively intact bushland connect to the area.

Indirect Impact	Nature, extent and duration	Threatened Species and their habitat likely to be impacted	Consequences of the impacts for the bioregional persistence of the threatened species and their habitats.
Increased risk of starvation, exposure and loss of shade or shelter	The conservation fence is likely to inhibit the movement of some species (that are inside the fence) and therefore, their ability to access resources. These impacts are likely to be most noticeable in the larger mammal species (macropods) but may impact some medium-sized mammals (possums). The impacts will be ongoing.	No threatened species or their habitats are likely to be impacted.	N/A
Loss of breeding habitats	The conservation fence may inhibit some species from moving between foraging and breeding habitats. This impact is likely to be ongoing unless mitigation measures can be implemented.	Threatened frogs (see **Table 15**).	Conservation fencing may impact movement between non-breeding and breeding habitat but this impact is expected to be localised as instream structures will not impede movement of threatened frogs, and will not have an overall impact on the bioregional persistence of any species.
Entanglement in the conservation fence	Birds and mammals (including insectivorous bats) can become entangled in mesh fences. It is not expected that this would occur very often however, is an ongoing risk.	Threatened birds and insectivorous microbats (see **Table 15**).	This impact is expected to be localised and will not have an overall impact on the bioregional persistence of any species.
Trampling of threatened flora species	There is a minor risk of threatened flora outside of the disturbance footprint to be impacted however, this will largely be confined to the construction period and areas immediately adjacent to the disturbance footprint.	Threatened plants (see **Table 13**), particularly *Pultenaea parrisiae* (Parris' Bush-pea) which is known to occur adjacent to the Survey Area.	This impact is expected to be localised and will not have an overall impact on the bioregional persistence of *Pultenaea parrisiae*.

9. Recommendations

9.1 Impact Mitigation and Minimisation Recommendations

This section of the report details recommended efforts to avoid and minimise impacts on biodiversity values associated with the proposed Activity. Measures to be implemented before, during, and post construction are detailed in **Table 18.**

Table 18. Measures to be implemented before, during, and after construction to avoid and minimise the impacts of the proposed Activity.

Action	Outcome	Timing	Responsibility
Project Location, Design and Planning	Owing to the vegetated nature of the proposed works area, impacts to native vegetation cannot be completely avoided. However, the proposed Activity has utilised, where possible, existing fire trails and tracks to minimise impacts to vegetation and habitat. Impacts to waterways are being mitigated by the installation of culverts and bridges that aim to maintain the site's natural flow regimes. The exact location of the disturbance footprint will be refined during detailed design in order to include considerations from the findings of this report. Such considerations will focus on realignment to avoid important habitat features such as hollow-bearing trees, rocky outcrops and actively used microhabitat.	Pre-construction phase	Proponent
Tree Protections	Trees to be retained, including trees adjacent but outside of the impact area, require an adequate Tree Protection Zone (TPZ) for the duration of works to ensure they survive. Details for calculating TPZs are provided within Australian Standard 4970-2009 – Protection of trees on development sites. If the TPZ cannot be avoided during works, the Structural Root Zones (SRZ) of trees will be retained. Details for calculating the SRZs are provided within Australian Standard 4970. The SRZ of hollow-bearing trees should be prioritised for protection.	Pre-construction phase	Proponent Arborist
Microbat Management Plan	Prior to the commencement of works, the proponent is to survey existing bridges to be repaired and culverts for evidence of frequent roosting by microbats. Where required, a Microbat Management Plan will be developed outlining the procedures to minimise and mitigate any potential impacts to microbats roosting under bridges or culverts during the proposed works and the proponent is to adhere to the outlined procedures.	Pre Construction	Proponent
Vegetation removal/ Hollow-bearing Trees	Vegetation removal will use a broadacre forestry mulcher to remove understory and trees up to 40cm DBH. An excavator with a mulching or falling head, dozer or chainsaw or similar to remove trees with a DBH of greater than 40 cm.	Pre-construction &	Proponent

Action	Outcome	Timing	Responsibility
	The removal of hollow-bearing trees will be avoided where possible. Where necessary, hollow-bearing tees will be removed under the following guidelines: ▪ Clearing of all habitat trees proposed for removal should be supervised by a suitable qualified person experienced in fauna capture and relocation and animal first aid. ▪ Hollow-bearing trees to be removed will be clearly marked prior to works. ▪ Vegetation and non-hollow bearing trees will be removed at least 24 hours before falling of hollow bearing tree. ▪ Fauna should be removed passively (i.e. ushering) from the zone of disturbance prior to the entering of machinery. The tree will be shaken using excavator/bulldozer for >30 seconds and left in-situ for one night to allow the fauna to move on before being felled. ▪ Immediately before felling, the tree should be shaken again, for greater than 30sec, using an excavator, to usher any remaining fauna out of the tree. ▪ Following felling, hollows and the surrounding area are to be checked again to ensure no trapped or injured fauna are present. ▪ If the tree is being removed in stages, the hollow-bearing branch should be the last to be removed. Where practical, trees to be removed with a DBH of 40 cm or greater, and those with hollows, should be retained and repurposed as coarse woody debris/ hollow-bearing logs on the ground to provide habitat. This will be done in accordance with the following specifications: ▪ Any native trees with a DBH greater than 40 cm will be identified. ▪ These native trees with a DBH greater than 40 cm (hereby referred to as target trees) will be felled either by pushing over to extract the root ball or leaving the root ball in place to prevent erosion. ▪ The remaining stump will then be ground down using the forestry mulcher. ▪ The felled target tree will then be cut into sections. ▪ These sections will then be relocated, either by loaded onto truck using an excavator (or similar) or directly by excavator only.	construction phase	

Action	Outcome	Timing	Responsibility
	▪ Relocated the debris will be placed in suitable predefined locations within 50m edge of cleared corridor using an excavator. ▪ The coarse woody debris will be distributed in piles of 3-5 logs, with piles at least 15 m apart. Windrows will be avoided.		
Wombat managements	Impacts of the Activity on wombats: ▪ The activity may act as a barrier and restrict movement and dispersal of wombats. ▪ The activity may impact on a number of existing wombat burrows within the construction footprint. Impact of wombats on the fence infrastructure: ▪ Wombats follow set trails to preferred feeding areas. Wombats are known to bull doze their way through obstacles including fences. ▪ Wombats regularly dig holes in the sandy soil under the apron of a predator exclusion fence, necessitating regular maintenance. Proposed mitigating measures: ▪ NPWS will adopt an adaptive management approach to minimising the impact of the Activity on wombats and minimising damage from wombats on fence infrastructure. ▪ Wombats are highly territorial and removal of animals from within the fenced area may result in another animal replacing its territory and burrow. Wombats will be relocated if there are continued issues in identified areas of the fence. ▪ Wombat burrows within the construction footprint will be marked on ground (and mapped), and then closed ensuring animals have left but can not return. ▪ Long and Robley, 2004 recommend the installation of 'wombat gates', increased apron width, and/or low electric wires to minimise the impact of wombats on conservation fences. o The success of wombat gates is variable between sites. It is recommended that these be constructed on known pathways where possible and monitored to determine their success. Wombat gates will be designed using pipes or other surfaces or structures that other species avoid.	Construction phase	Proponent

Action	Outcome	Timing	Responsibility
	▪ Lighter gauge wire netting may be used in areas where wombats frequently damage fences. Again, this will be monitored and installed as required. ▪ Marks (1998) has shown the conditioned avoidance of wombats to electric fences. This will be trialled in affected areas to determine its probability of success. ▪ The adopted fence design is considered to be best practice and has been proven to be effective. It has a skirt / apron which lies flat on the ground surface or is pinned where there are uneven surfaces. Consideration to increasing the width of the fence apron in selected areas will be given only after other listed options have been demonstrated to be unsuccessful ▪ InfraBuild and Waratah fencing have advised that in some situations (wet soils, acid sulphate soils) the burial of wire netting may lead to increased corrosion and shorter life expectancy of their products. See attached information from AS4534:2006 regarding guidance on corrosion protection. For this reason, the fence apron will not be buried.		
Disturbance of Creeks and Riparian Areas	The following will be implemented to minimise impacts to habitat important to amphibians, freshwater species or resident species in bridges or culverts: ▪ Programming of work to ensure that it takes place during low flow periods; ▪ Ensure sediment and erosion controls are implemented during in-stream works to avoid impacts on water quality and fish passage; ▪ Where the fence alignment crosses creeks lines and gullies nstall temporary erosion management infrastructure to minimise sediment run-off into creek lines. These should remain in place and maintained until more formal trail construction sediment control measures are installed at creek crossings. ▪ Stockpiling of materials is to be conducted outside of the riparian zone, and appropriately cordoned off to prevent sediment entrainment of surface water runoff; ▪ Minimising the area of disturbance; ▪ Frog friendly mesh used at ground level (i.e. mesh with a big enough gauge to allow passage of frogs); ▪ A suitably qualified Ecologist or NPWS staff member is to supervise the removal or repair of culverts and bridges to safely capture and relocate resident fauna. ▪	Construction phase	Proponent

Action	Outcome	Timing	Responsibility
Pultenaea parrisiae (Parris' Bush-pea)	Targeted surveys should be conducted prior to vegetation clearing to clearly mark and delineate any individuals within the works area. Works should aim to avoid any individuals if practical.	Construction phase	Proponent
Relocation of microhabitat logs	Tree felling - relocation of microhabitat logs: ▪ Where practical, trees to be removed with a DBH of 40 cm or greater, and those with hollows, should be retained and repurposed as coarse woody debris/ hollow-bearing logs on the ground to provide habitat. This will be done in accordance with the following specifications: o Any native trees with a DBH greater than 40 cm will be identified. o These native trees with a DBH greater than 40 cm (hereby referred to as target trees) will be felled either by pushing over to extract the root ball or leaving the root ball in place to prevent erosion. o The remaining stump will then be ground down using the forestry mulcher. o The felled target tree will then be cut into sections. o These sections will then be relocated, either by loaded onto truck using an excavator (or similar) or directly by excavator only. o Relocated the debris will be placed in suitable predefined locations within 50m edge of cleared corridor using an excavator. o The coarse woody debris will be distributed in piles of 3-5 logs, with piles at least 15 m apart. Windrows will be avoided.	Construction phase	Proponent
Erosion and Sedimentation	Appropriate erosion and sediment control should be erected and maintained at all times during construction in order to avoid the potential of incurring indirect impacts on biodiversity values. As a minimum, such measures should comply with the relevant industry guidelines such as 'the Blue Book' (Landcom 2004), the Soil Conservation Service (2018). NSW Rural Fire Service Fire Trail Design, Construction and Maintenance Manual. .	Construction phase	Proponent Construction Contractor

Action	Outcome	Timing	Responsibility
Storage and Stockpiling (Soil and Materials)	Allocate all storage, stockpile, and laydown sites away from any vegetation that is planned to be retained (within the approved disturbance footprint). Avoid importing any soil from outside the site in order to avoid the potential of incurring indirect impacts on biodiversity values as this can introduce weeds and pathogens to the site. If materials are required to be imported for landscaping works, they are to be sterilised according to industry standards prior to importation to site.	Construction phase	Construction Contractors
Ecological Monitoring Regime	A detailed ecological monitoring regime has been outlined in the draft Nungatta ecological health monitoring framework (DPE 2022a), which sets out annual monitoring methods which will be used to document and describe changes to threatened species abundance and populations, plus detect new species that may visit or establish. Most small and medium-sized mammals are expected to benefit from release of predation by feral cats and foxes inside the fenced area, resulting in a population increase. Nevertheless, populations may still be sufficiently small to be subject to loss of genetic diversity. In these cases, occasional manual dispersal through translocation (capture and release) across the fence will maintain connectivity between populations. The required rate of dispersal to maintain genetic diversity is likely to be low: a widely accepted number is one individual per generation from either side of the fence (depending on which side is the larger population).	Post Construction Phase	Proponent

10. Conclusion

This FFA has assessed the impacts to terrestrial ecology associated with the proposed Activity. The assessment revealed eight (8) PCTs within the Survey Area will be impacted:

- PCT 790: Crimson Bottlebrush – Scented Paperbark wet heath in the hinterland hills, southern South East Corner Bioregion;
- PCT 817: Dwarf She-oak closed heathland of escarpment ranges, South Eastern Highlands Bioregion;
- PCT 929: Messmate – Mountain Grey Gum moist open forest of granitic foothills, southern South East Corner;
- PCT 943: Mountain Grey Gum – Brown Barrel very tall moist forest on escarpment ranges, central and southern South East Corner Bioregion;
- PCT 1228: Swamp Gum – Ribbon Gum open forest on flats of the coastal and hinterland lowlands, southern South East Corner Bioregion;
- PCT 1320: White Stringybark – Maiden's Gum grassy open forest on granitic foothills, southern South East Corner Bioregion;
- PCT 1322: White Stringybark – Narrow-leaved Peppermint dry open forest on hinterland hills, far south of the South East Corner Bioregion; and
- PCT 1340: Yertchuk – Silvertop Ash – Blue-leaved Stringybark shrubby open forest of the Wallagaraugh catchment, far southern South East Corner Bioregion.

The Activity will not impact any BC or EPBC Act listed TECs, as none were found to occur within the Survey Area.

One (1) threatened flora species, *Pultenaea parrisiae* (Parris' Bush-pea; Vulnerable under the BC And EPBC Act) has been historically recorded within and immediately surrounding the Survey Area (Miles 2021) and is likely to be impacted by the proposed works. *Phytophthora cinnamomi* is a root rot fungi known to occur beside *Pultenaea parrisae* sites at Nungatta. *Pultenaea parrisae* is highly susceptible to infection and mortality by *Phytophthora cinnamomi.* Where feasible, Narla recommends pre-works inspections to be completed within known locations of these species to assess whether realignment of the conservation fence, preferencing of light plant and equipment over heavy plant adjacent to sites and the application of a hygiene plan to reduce impact of *Phytophthora cinnamomi.* Owing to majority of *Pulenaea parrisae* population at Nungatta occurring outside of the disturbance footprint, the Activity is unlikely to significantly impact this species.The Activity has the potential to impact 279 hollow-bearing trees with hollows ranging in size from small to large. Hollow dependent threatened species may be impacted as a result of this removal. This includes the threatened fauna species that was observed foraging within and adjacent to the Survey Area: *Callocephalon fimbriatum* (Gang-gang Cockatoo - Vulnerable under the BC Act and Endangered under the EPBC Act). Additional hollow dependent fauna that may be impacted by the Activity include:

- *Calyptorhynchus lathami* (Glossy Black Cockatoo) – Vulnerable under the BC Act;
- *Cercartetus nanus* (Eastern Pygmy-possum) – Vulnerable under the BC Act;
- *Dasyurus maculatus* (Spotted-tailed Quoll) – Vulnerable under the BC Act and Endangered under the EPBC Act;
- *Falsistrellus tasmaniensis* (Eastern False Pipistrelle) – Vulnerable under the BC Act;
- *Myotis macropus* (Southern Myotis) – Vulnerable under the BC Act;
- *Ninox strenua* (Powerful Owl) – Vulnerable under the BC Act;
- *Petauroides volans* (Greater Glider) – Vulnerable under the EPBC Act;
- *Petaurus australis* (Yellow-bellied Glider) – Vulnerable under the BC Act;
- *Scoteanax rueppellii* (Greater Broad-nosed Bat) – Vulnerable under the BC Act;
- *Tyto novaehollandiae* (Masked Owl) – Vulnerable under the BC Act; and

- *Tyto tenebricosa* (Sooty Owl) – Vulnerable under the BC Act.

When hollow-bearing tree removal is unavoidable, a suitably qualified Ecologist or NPWS staff member is to supervise the clearing of the hollow-bearing trees to safely capture and relocate resident fauna. A Test of Significance (5-part test) was undertaken in accordance with the BC Act, and an Assessment of Significant Impact Criteria was undertaken in accordance with the EPBC Act, to assess potential impacts from the Activity on these hollow-dwelling species. These assessments concluded that the Activity is unlikely to have a significant impact on these species if the mitigation measures outlined in this report are adhered to.

The Activity also has the potential to impact habitat for the following species:

- *Heleioporus australiacus* (Giant Burrowing Frog) – Vulnerable under the BC and EPBC Act;
- *Isoodon obesulus obesulus* (Southern Brown Bandicoot – eastern) - Endangered under the BC Act and EPBC Act
- *Mixophyes balbus* (Stuttering Frog) – Endangered under the BC Act and Vulnerable under the EPBC Act;
- *Litoria watsoni* (Watson's Tree Frog) - Endangered under the EPBC Act;
- *Myotis macropus* (Southern Myotis) – Vulnerable under the BC Act; and
- *Sminthopsis leucopus (*White-footed Dunnart) – Vulnerable under the BC Act.

The mesh used in the stream beds is frog friendly and allows for their passage upstream to breed. A suitably qualified Ecologist or NPWS staff member is to supervise the removal or repair of culverts and bridges to safely capture and relocate resident fauna. A Test of Significance (5-part test) was undertaken in accordance with the BC Act, and an Assessment of Significant Impact Criteria was undertaken in accordance with the EPBC Act, to assess potential impacts from the Activity on these species. These assessments concluded that the Activity is unlikely to have a significant impact on these species if the mitigation measures outlined in this report are adhered to.

The proposed activity has the potential to directly impact on native flora and fauna species through vegetation and habitat removal during construction, as well as indirectly impact species through the creation of potential movement and genetic barriers. The long-term benefits to biodiversity and ecosystem processes of the region however, by creating a predator free area, is expected to vastly outweigh these impacts and will allow native species to re-establish in these areas which previously wasn't possible.

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12. Appendices

Appendix A. Biodiversity Conservation Act 2016 Test of Significance (5-part Test) for *Pultenaea parrisiae* (Parris' Bush-pea).
Appendix B. Biodiversity Conservation Act 2016 Test of Significance (5-part Test) for hollow-dwelling fauna.
Appendix C. Biodiversity Conservation Act 2016 Test of Significance (5-part Test) for White-footed Dunnart and Southern Brown Bandicoot
Appendix D. Biodiversity Conservation Act 2016 Test of Significance (5-part Test) for threatened amphibians.
Appendix E. EPBC Act 1999 Assessment of Significant Impact Criteria for *Pultenaea parrisiae* (Parris' Bush-pea).
Appendix F. EPBC Act 1999 Assessment of Significant Impact Criteria for *Callocephalon fimbriatum* (Gang-gang Cockatoo) and *Dasyurus maculatus* (Spotted-tailed Quoll).
Appendix G. EPBC Act 1999 Assessment of Significant Impact Criteria for *Petauroides volans* (Greater Glider).
Appendix H. EPBC Act 1999 Assessment of Significant Impact Criteria for threatened amphibians.
Appendix I. EPBC Act 1999 Assessment of Significant Impact Criteria for *Isoodon obsesulus obesulus* (Southern Brown Bandicoot - eastern).
Appendix J. Flora species identified during Narla's Site Assessment (May/June 2022) within the Survey Area.
Appendix K. Fauna species identified during Narla's Site Assessment (May/June 2022) within the Survey Area.
Appendix L. Threatened species and habitat features identified within the Survey Area (Map 1 of 22).
Appendix M. Protected Matters Search Tool.

Appendix A. Biodiversity Conservation Act 2016 Test of Significance (5-part Test) for *Pultenaea parrisiae* (Parris' Bush-pea).

Biodiversity Conservation Act 2016 – Test of Significance (5-part Test) for *Pultenaea parrisiae* (Parris' Bush-pea)		
BC Act Status: Vulnerable		
(a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,	This species has been historically recorded within and surrounding the Survey Area (Miles 2021). This species was not identified during Narla's site assessment in May / June 2022, likely owing to the species' cryptic nature when not in flower (October / November). The proposed Activity is likely to have a low impact on this population given approx. 15 individuals were found to occur (Miles 2021) within areas proposed for vegetation removal / modification, with an additional 415 individuals historically recorded immediately adjacent to the Survey Area. Approximately 2,440 exist outside of the areas likely to be impacted. It is therefore recommended targeted pre-clearance surveys within suitable habitat (e.g. PCT 790) be undertaken prior to any clearing works to identify with the aim to clearly marking out any individuals present within the works area. Marked individuals should be avoided where possible. The root-rot fungus, *Phytophthora cinnamomi*, is known to be present across the north, centre and southwest of the Activity area. *Phytophthora cinnamom*i spreads to uninfected areas through the soil in water. It is also moved in soil and plant material carried by animals, people, machinery, equipment and quarry material. *Pultenaea parrisae* is highly susceptible to *Phytophthora cinnamomi* infection. NSW DPE hygiene guidelines will be applied to reduce impact of *Phytophthora cinnamomi* on *Pultenaea parrisae.*	
(b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:	**(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or**	Not applicable.
	(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,	Not applicable.
(c) in relation to the habitat of a threatened species or ecological community:	**(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and**	Approximately 0.68ha of PCT 790 will be impacted by the proposed works which may provide habitat for this species (Miles 2021).

Biodiversity Conservation Act 2016 – Test of Significance (5-part Test) for *Pultenaea parrisiae* (Parris' Bush-pea)		
BC Act Status: Vulnerable		
	(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and	The individuals historically mapped within and surrounding the survey area have the potential to be fragmented by the creation of the 15m conservation fence management corridor. This fragmentation however will only separate approx. 430 mapped individuals from the larger population (approx. 2,440) mapped outside the impact area.
	(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,	Only a small area of suitable habitat is being removed (less than approx. 0.68ha) and with it, only approx. 15 individuals. The bulk of suitable habitat for the population (including the bulk of the population) is outside of the disturbance footprint.
(d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),	No Areas of Outstanding Biodiversity Value (AOBV) occur within the locality of the Activity and therefore, it will not have an adverse effect, directly or indirectly. Areas of Outstanding Biodiversity Value are: ▪ Gould's Petrel – critical habitat declaration; ▪ Little penguin population in Sydney's North Harbour – critical habitat declaration; ▪ Mitchell's Rainforest Snail in Stotts Island Nature Reserve – critical habitat declaration; and ▪ Wollemi Pine – critical habitat declaration.	
(e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.	The following KTPs listed under Schedule 4 of the BC Act are relevant to the Activity: ▪ Clearing of native vegetation ▪ Infection of native plants by *Phytophthora cinnamomi* Although the clearing of vegetation and movement of earth is unavoidable to achieve the desired outcomes of the project. It is recommended that the proposed mitigation measures outlined in this report are adhered to, in order to avoid any significant impacts to a potential population. In addition, the proposed Activity will conserve habitat for this species and thus mitigate the initial impact.	
Conclusion	The Activity has the potential to impact several individuals of this species that occur within the Survey Area. However, the bulk of the local population occurs outside of the Survey Area and will not be impacted by	

Biodiversity Conservation Act 2016 – Test of Significance (5-part Test) for *Pultenaea parrisiae* (Parris' Bush-pea)	
BC Act Status: Vulnerable	
	the Activity. Moreover, only a small amount of suitable habitat (0.68ha) is likely to be impacted. Therefore, the proposed Activity will not result in a significant impact to this species.

Appendix B. Biodiversity Conservation Act 2016 Test of Significance (5-part Test) for hollow-dwelling fauna.

<table>
<tr><td colspan="3">Biodiversity Conservation Act 2016 – Test of Significance (5-part Test)

For Hollow-dwelling Fauna:

Callocephalon fimbriatum (Gang-gang Cockatoo)
Calyptorhynchus lathami (Glossy Black Cockatoo)
Cercartetus nanus (Eastern Pygmy-possum)
Dasyurus maculatus (Spotted-tailed Quoll)
Falsistrellus tasmaniensis (Eastern False Pipistrelle)
Myotis macropus (Southern Myotis)
Ninox strenua (Powerful Owl)
Petaurus australis (Yellow-bellied Glider)
Scoteanax rueppellii (Greater Broad-nosed Bat)
Tyto novaehollandiae (Masked Owl)
Tyto tenebricosa (Sooty owl)</td></tr>
<tr><td colspan="3">BC Act Status: Vulnerable</td></tr>
<tr><td>(a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,</td><td colspan="2">The proposed activity is not likely to have an adverse effect on the life cycle of these species such that a viable population of the species is likely to be placed at risk of extinction.

Gang-gang cockatoos were identified on multiple days foraging within and surrounding the Survey Area. Two unidentified microbat individuals were also observed within a culvert within the Survey Area, but these may not have been threatened species. All other species were deemed to have potential breeding habitat within the Survey Area.

Two hundred and seventy-nine hollow-bearing trees with hollows ranging in size from small to large were located within the Survey Area, which may require removal to facilitate the proposed Activity. These hollow-bearing trees may provide roosting and/or breeding habitat for these species. The design of the conservation fence and stream crossings allows some flexibility in order to reduce, where possible, impacts to hollow-bearing trees and existing culverts. In the event that hollow-bearing tree or culvert removal is unavoidable, a suitably qualified Ecologist or NPWS staff member will be present to supervise the removal of habitat to ensure that no individuals are impacted from the clearing works. Extensive areas of breeding habitat will also remain within the surrounding area which will continue to provide breeding habitat for these species.</td></tr>
<tr><td rowspan="2">(b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:</td><td>(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or</td><td>Not applicable.</td></tr>
<tr><td>(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,</td><td>Not applicable.</td></tr>
<tr><td></td><td>(i) the extent to which habitat is likely to be removed or modified</td><td>Two hundred and seventy-nine hollow-bearing trees with hollows ranging in size from small to large</td></tr>
</table>

Biodiversity Conservation Act 2016 – Test of Significance (5-part Test) For Hollow-dwelling Fauna: *Callocephalon fimbriatum* (Gang-gang Cockatoo) *Calyptorhynchus lathami* (Glossy Black Cockatoo) *Cercartetus nanus* (Eastern Pygmy-possum) *Dasyurus maculatus* (Spotted-tailed Quoll) *Falsistrellus tasmaniensis* (Eastern False Pipistrelle) *Myotis macropus* (Southern Myotis) *Ninox strenua* (Powerful Owl) *Petaurus australis* (Yellow-bellied Glider) *Scoteanax rueppellii* (Greater Broad-nosed Bat) *Tyto novaehollandiae* (Masked Owl) *Tyto tenebricosa* (Sooty owl)		
BC Act Status: Vulnerable		
(c) in relation to the habitat of a threatened species or ecological community:	as a result of the proposed development or activity, and	were located within the Survey Area may require removal to facilitate the proposed activity
	(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and	The area of habitat is not likely to become fragmented or isolated from other areas of habitat as a result of the Activity. Large areas of contiguous habitat will continue to exist on all sides of the proposed works which will continue to provide habitat connectivity to the surrounding area.
	(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,	Two hundred and seventy-nine hollow-bearing trees with hollows ranging in size from small to large were located within the disturbance footprint which may require removal to facilitate the proposed Activity. Whilst the removal of these trees may impact these species, it is unlikely to be significant owing to the vast area of habitat that will continue to exist all around the works area. The Nungatta FPFA will also aim to increase the amount and quality of vegetation and habitat available to these species. The proponent will aim to retain these hollow-bearing trees as much as possible. In the event that hollow-bearing tree removal is unavoidable, a suitably qualified Ecologist or NPWS staff member will be present to supervise the clearing of these trees to ensure that no individuals are impacted from the clearing works.

Biodiversity Conservation Act 2016 – Test of Significance (5-part Test) For Hollow-dwelling Fauna: *Callocephalon fimbriatum* (Gang-gang Cockatoo) *Calyptorhynchus lathami* (Glossy Black Cockatoo) *Cercartetus nanus* (Eastern Pygmy-possum) *Dasyurus maculatus* (Spotted-tailed Quoll) *Falsistrellus tasmaniensis* (Eastern False Pipistrelle) *Myotis macropus* (Southern Myotis) *Ninox strenua* (Powerful Owl) *Petaurus australis* (Yellow-bellied Glider) *Scoteanax rueppellii* (Greater Broad-nosed Bat) *Tyto novaehollandiae* (Masked Owl) *Tyto tenebricosa* (Sooty owl)	
BC Act Status: Vulnerable	
(d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),	No Areas of Outstanding Biodiversity Value (AOBV) occur within the locality of the Activity and therefore, it will not have an adverse effect, directly or indirectly. Areas of Outstanding Biodiversity Value are: ▪ Gould's Petrel – critical habitat declaration; ▪ Little penguin population in Sydney's North Harbour – critical habitat declaration; ▪ Mitchell's Rainforest Snail in Stotts Island Nature Reserve – critical habitat declaration; and ▪ Wollemi Pine – critical habitat declaration.
(e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.	The following Key Threatening Process (KTP) listed under Schedule 4 of the BC Act is relevant to the Activity: ▪ Loss of hollow-bearing trees. ▪ Removal of dead wood and dead trees Although the clearing of hollow-bearing trees and stags is unavoidable to achieve the desired outcomes of the project. It is recommended that the proposed mitigation measures outlined in this report are adhered to, to avoid any significant impacts to a potential population. In addition, the proposed Activity will conserve habitat for these species and thus mitigate the initial impact.
Conclusion	Whilst the Activity has the potential to impact on these species, it is considered unlikely to be significant owing to the extensive areas of habitat that will continue to exist surrounding the Survey Area. To mitigate impacts, a suitably qualified NPWS staff member will be present to supervise the clearing of these trees to ensure that no individuals are impacted from the clearing works.

Appendix C. Biodiversity Conservation Act 2016 Test of Significance (5-part Test) for White-footed Dunnart and Southern Brown Bandicoot

Biodiversity Conservation Act 2016 – Test of Significance (5-part Test) For *Sminthopsis leucopus* (White-footed Dunnart)[1] *Isoodon obesulus obesulus* (Southern Brown Bandicoot – eastern) [2]		
BC Act Status: [1] Vulnerable, [2] Endangered		
(a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,	The proposed activity is not likely to have an adverse effect on the life cycle of the White-footed Dunnart of Southern Brown Bandicoot such that a viable population of either species is likely to be placed at risk of extinction. Coarse woody debris, hollow logs, leaf litter, grass and dense shrubbery located within the Survey Area will require removal to facilitate the proposed activity. While some of these features may provide breeding habitat for the White-footed Dunnart and Southern Brown Bandicoot, any such impacts would likely be minor given the nature of the Activity (clearance of 31.67ha within a 15m wide corridor), and given that extensive areas of similar habitat will remain within the fenced area and elsewhere throughout South East Forest National Park. Moreover, the Proponent will aim to retain habitat features wherever possible, and where it is unavoidable, a suitably qualified Ecologist or NPWS staff member will be present to supervise its removal to ensure that no individuals are directly harmed from the clearing works.	
(b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:	(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or	Not applicable.
	(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,	Not applicable.
(c) in relation to the habitat of a threatened species or ecological community:	(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and	Only a relatively small area (a 15m wide corridor) containing suitable habitat for these species will be cleared for the Activity. Habitat features within this corridor will be retained or relocated wherever possible. Extensive areas of similar habitat will remain within the fenced area and elsewhere throughout South East Forest National Park.
	(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and	Large areas of contiguous habitat will continue to exist on all sides of the proposed works which will continue to provide habitat connectivity to the surrounding area.

Biodiversity Conservation Act 2016 – Test of Significance (5-part Test) For *Sminthopsis leucopus* (White-footed Dunnart)[1] *Isoodon obesulus obesulus* (Southern Brown Bandicoot – eastern) [2]		
BC Act Status: [1] Vulnerable, [2] Endangered		
		While the White-footed Dunnart will be able to move freely through the fence, the fence may be a barrier to movement of the Southern Brown Bandicoot, potentially resulting in fragmentation or isolation of populations of this species. However, this impact is likely to be far outweighed by the benefits of reduced predation that will result from feral eradication inside the fence, which will also benefit the White-footed Dunnart. Detailed monitoring will be undertaken in accordance with the ecological health monitoring framework (DPE 2022a) to determine the impacts of the fence and feral predator eradication on threatened species. If monitoring results indicate it is necessary, occasional manual dispersal of Southern Brown Bandicoot individuals through translocation (capture and release) may be undertaken to maintain connectivity between populations.
	(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,	The habitat to be removed as a result of the Activity is unlikely to be important to the long-term survival of either species in the locality, given its relatively small area in relation to the extensive area of similar habitat that will continue to exist inside the fence and elsewhere throughout South East Forest National Park. Moreover, habitat features within the corridor will be retained or relocated wherever possible.
(d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),	No Areas of Outstanding Biodiversity Value (AOBV) occur within the locality of the Activity and therefore, it will not have an adverse effect, directly or indirectly. Areas of Outstanding Biodiversity Value are: ▪ Gould's Petrel – critical habitat declaration; ▪ Little penguin population in Sydney's North Harbour – critical habitat declaration; ▪ Mitchell's Rainforest Snail in Stotts Island Nature Reserve – critical habitat declaration; and	

Biodiversity Conservation Act 2016 – Test of Significance (5-part Test) For *Sminthopsis leucopus* (White-footed Dunnart)[1] *Isoodon obesulus obesulus* (Southern Brown Bandicoot – eastern) [2]	
BC Act Status: [1] Vulnerable, [2] Endangered	
	▪ Wollemi Pine – critical habitat declaration.
(e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.	The following KTPs listed under Schedule 4 of the BC Act are relevant to the Activity: ▪ Removal of dead wood and dead trees Although the clearing of dead wood is unavoidable to achieve the desired outcomes of the project, the proposed mitigation measures outlined in this report will minimise any impacts to both the White-footed Dunnart and Southern Brown Bandicoot. In addition, the proposed Activity will benefit both species through reduced predation resulting from feral predator eradication, and this will far outweigh any impacts resulting from habitat removal.
Conclusion	Whilst the Activity has the potential to impact on these species, it is considered unlikely that any such impacts would be significant given the extensive areas of habitat that will remain undisturbed within the fenced area and surrounding areas of South East Forest National Park. a. To mitigate impacts, a suitably qualified Ecologist or NPWS staff member will be present to supervise habitat clearing to ensure no individuals are harmed during clearing works. Habitat features will be retained or relocated wherever possible, and if monitoring results indicate it is necessary, occasional manual dispersal of Southern Brown Bandicoot individuals may be undertaken to maintain connectivity between populations inside and outside the fence.

Appendix D. Biodiversity Conservation Act 2016 Test of Significance (5-part Test) for threatened amphibians.

Environmental Planning and Assessment Act 1979 and Biodiversity Conservation Act 2016– Assessment of Significance (5-part Test) for *Heleioporus australiacus* (Giant Burrowing Frog)[1] *Mixophyes balbus* (Stuttering Frog)[2] *Litoria watsoni* (Southern Heath Frog)	
BC Act Status: Vulnerable[1], Endangered[2]	
(a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a	The proposed activity will see the clearing/ modification of vegetation of approximately 2.5ha of vegetation along 27 streams that intersect the Survey Area. This vegetation may provide potential habitat for these species. A vast area of suitable habitat

Environmental Planning and Assessment Act 1979 and Biodiversity Conservation Act 2016– Assessment of Significance (5-part Test) for *Heleioporus australiacus* (Giant Burrowing Frog)[1] *Mixophyes balbus* (Stuttering Frog)[2] *Litoria watsoni* (Southern Heath Frog)		
BC Act Status: Vulnerable[1], Endangered[2]		
viable local population of the species is likely to be placed at risk of extinction,	however, is present directly surrounding the Survey Area and within the greater locality and will continue to exist once works are completed.	
(b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:	(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or	Not Applicable
	(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,	Not Applicable
(c) in relation to the habitat of a threatened species, population or ecological community:	(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and	The proposed activity will see the clearing/ modification of approximately 2.5ha of vegetation along 26 streams and gullies that intersect the survey area. This vegetation may provide potential habitat for these species.

Environmental Planning and Assessment Act 1979 and Biodiversity Conservation Act 2016– Assessment of Significance (5-part Test) for *Heleioporus australiacus* (Giant Burrowing Frog)[1] *Mixophyes balbus* (Stuttering Frog)[2] *Litoria watsoni* (Southern Heath Frog)		
BC Act Status: Vulnerable[1], Endangered[2]		
	(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and	Areas of habitat may become fragmented if the fencing used does not allow movement between non-breeding and breeding habitat. However instream structures are unlikely to impede movement along creeklines. Frog friendly mesh is being used to support movement up and down stream and extensive areas of habitat will continue to exist on all sides of the proposed works area.
	(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,	All potential habitat of these species is important. The proposed activity will see the clearing/ modification of approximately 2.5ha of vegetation along 27 streams that intersect the survey area. A vast area of suitable habitat is present directly surrounding the survey area and within the greater locality.
(d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),	No Areas of Outstanding Biodiversity Value (AOBV) occur within the locality of the Activity and therefore, it will not have an adverse effect, directly or indirectly. Areas of Outstanding Biodiversity Value are: ▪ Gould's Petrel – critical habitat declaration; ▪ Little penguin population in Sydney's North Harbour – critical habitat declaration; ▪ Mitchell's Rainforest Snail in Stotts Island Nature Reserve – critical habitat declaration; and ▪ Wollemi Pine – critical habitat declaration.	

Environmental Planning and Assessment Act 1979 and Biodiversity Conservation Act 2016– Assessment of Significance (5-part Test) for *Heleioporus australiacus* (Giant Burrowing Frog)[1] *Mixophyes balbus* (Stuttering Frog)[2] *Litoria watsoni* (Southern Heath Frog)	
BC Act Status: Vulnerable[1], Endangered[2]	
(e) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the effect of, a key threatening process.	The following threats to these species that are relevant to the proposed Activity include: ▪ Clearing of native vegetation. Although the clearing of vegetation is unavoidable to achieve the desired outcome of the project, the proponent will aim to retain minimise impacts to these areas of habitat as much as possible. Large areas of habitat will also remain within the surrounding area. Appropriately sized mesh is being used to facilitate natural movement up and downstream by these species.

Appendix E. EPBC Act 1999 Assessment of Significant Impact Criteria for *Pultenaea parrisiae* (Parris' Bush-pea).

Commonwealth Environment Protection and Biodiversity Conservation Act 1999 Assessment of Significant Impact Criteria for *Pultenaea parrisiae* (Parris' Bush-pea)	
EPBC Act Status: Vulnerable	
Significant impact criteria An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	
Lead to a long-term decrease in the size of an important population of a species	The population observed occurs at a priority management site for this species. The proposed activity is not likely to lead to a long-term decrease in the size of an important population of this species. Approximately 2,440 individuals have been historically recorded within and surrounding the Survey Area (Miles 2021). It is anticipated that 15 individuals may be directly impacted by the proposed Activity with an addition 415 located in close proximity to the Survey Area (**Figure 7**). Should these 15 individuals be lost it is not anticipated to adversely impact the populations, it is however recommended that a pre-clearance survey be conducted and that any potentially occurring individuals be avoided. Pre-works inspections should be conducted in the vicinity of previously identified individuals and they should be clearly marked to ensure direct impacts are avoided.
Reduce the area of occupancy of an important population	The proposed activity is expected to very slightly reduce the area of occupancy of this population by removing fifteen individuals. However, these impacts are negligible given the vast majority of the population (approx. 2,440 individuals) will not be impacted and those individuals inside the conservation fence will benefit from a reduction in grazing pressure from feral herbivores.
Fragment an existing population into two or more populations	The individuals historically mapped within the conservation fence are unlikely to be fragmented by the proposed Activity. This conservation fence is only 15m wide and will allow gene flow with the individuals outside of the fence.
Adversely affect habitat critical to the survival of a species	The proposed Activity will not adversely affect habitat critical to the survival of this species. Whilst vegetation removal is required within the Survey Area, which may provide suitable habitat, extensive areas of habitat will continue to exist surrounding the Survey Area, which will continue to provide habitat for this species.
Disrupt the breeding cycle of an important population	The Activity is unlikely to disrupt the breeding cycle of this species at this priority management site as the conservation fence is not a

Commonwealth Environment Protection and Biodiversity Conservation Act 1999 Assessment of Significant Impact Criteria for *Pultenaea parrisiae* (Parris' Bush-pea)	
EPBC Act Status: Vulnerable	
	barrier to gene flow. Moreover, the vast majority of the population (approx. 2,440) individuals will not be impacted by the Activity.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The proposed Activity is not likely to modify, destroy, remove, isolate or decrease the availability or quality of habitat for this species. Whilst approx. 0.68ha of suitable habitat will require removal within the Survey Area, extensive areas of habitat will continue to exists surrounding the Survey Area, which will continue to provide habitat for this species.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	The proposed activity is not likely to result in invasive species becoming established in this species' habitat if appropriate hygiene measures are adhered to.
Introduce disease that may cause the species to decline, or	The Activity has the potential to introduce disease (*Phytophthora*) that may cause this species to decline. However, this disease has already been recorded within the Survey Area. Appropriate hygiene measures will be employed to reduce the spread of this disease.
Interfere substantially with the recovery of the species.	The Activity is unlikely to interfere with the recovery of this species (as outlined in the Imlay Road population's management plan). Although the Activity has the potential to threaten several individuals via direct disturbance, the majority of the population will not be impacted- particularly if appropriate hygiene measures are employed during construction and operation of the FPFA.

Appendix F. EPBC Act 1999 Assessment of Significant Impact Criteria for *Callocephalon fimbriatum* (Gang-gang Cockatoo) and *Dasyurus maculatus* (Spotted-tailed Quoll).

Commonwealth Environment Protection and Biodiversity Conservation Act 1999 Assessment of Significant Impact Criteria For *Callocephalon fimbriatum* (Gang-gang Cockatoo); and *Dasyurus maculatus* (Spotted-tailed Quoll)	
EPBC Act Status: Endangered	
Significant impact criteria An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:	
Lead to a long-term decrease in the size of a population	The proposed activity is not likely to lead to a long-term decrease in the size of a population of these species. Up to 203 medium and large hollows were located within the disturbance footprint which are likely to require removal to facilitate the proposed activity. These hollows may provide breeding habitat for these species. The footprint of the conservation fence corridor will aim to retain as many hollows as possible. A suitably qualified Ecologist or NPWS staff member will be present to supervise the clearing of these trees to ensure that no individuals are impacted from the clearing works. Additionally, a substantially large area of foraging and breeding habitat will remain within the surrounding area.
Reduce the area of occupancy of the species	The potential removal of up to 203 medium and large hollows may result in an impact to these species however it is unlikely to be significant considering the extensive number of hollow-bearing trees occurring within the surrounding area. For example, there were 116 additional hollows (small, medium and large) recorded within the 5m buffer either side of the conservation fence.
Fragment an existing population into two or more populations	The proposed Activity is not likely to fragment an existing population into two or more populations as the cockatoos are highly mobile and there is a very low likelihood that any Spotted-tailed Quolls exist in the area. Spotted-tailed Quolls may also be able to climb the fence, as other quoll species are known to be able to escape from conservation fencing. Areas of contiguous habitat will continue to exist on all sides of the works area, connecting with the vast habitat in the surrounding area.
Adversely affect habitat critical to the survival of a species	The proposed activity will adversely affect habitat critical to the survival of these species, albeit on a very small scale. A total of 203 medium and large hollows may be impacted by the proposed works, however the Proponent will aim to retain these hollow-bearing trees as much as possible. A substantially large area of foraging and breeding habitat will also remain within the surrounding area.
Disrupt the breeding cycle of a population	If the mitigation measures outlined in this report are adhered to, the Activity is unlikely to disrupt the breeding cycle of a population of these species. The proponent will aim to retain these hollows to maintain breeding habitat for them. Otherwise, clearing supervision will ensure any individuals are protected and relocated, and

Commonwealth Environment Protection and Biodiversity Conservation Act 1999 Assessment of Significant Impact Criteria For *Callocephalon fimbriatum* (Gang-gang Cockatoo); and *Dasyurus maculatus* (Spotted-tailed Quoll)	
EPBC Act Status: Endangered	
	extensive breeding habitat will be retained within the surrounding area.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The proposed activity is not likely to modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that these species are likely to decline. The potential removal of hollow-bearing trees is not considered likely to be significant in comparison to the extensive number of hollows that are likely to occur within the surrounding area. For example, there were 116 additional hollows (small, medium and large) recorded within the 5m buffer either side of the conservation fence. Furthermore, the proponent will prioritise the retention of these hollows as much as possible.
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 proposed activity is not likely to result in invasive species becoming established in these species' habitat. In fact, the Activity will likely reduce the density of invasive species within the fenced area and outside.
introduce disease that may cause the species to decline, or	The Activity is not likely to introduce disease that may cause these species to decline.
Interfere with the recovery of the species	The Activity will not interfere with the recovery of these species which focusses on managing loss of habitat (cockatoos and quolls), competition with introduced predators (quolls) and deliberate shooting/poisoning (quolls). Recommended mitigation measures will ensure no individuals are likely to be directly impacted.

Appendix G. EPBC Act 1999 Assessment of Significant Impact Criteria for *Petauroides volans* (Greater Glider).

Commonwealth Environment Protection and Biodiversity Conservation Act 1999 Assessment of Significant Impact Criteria for *Petauroides volans* (Greater Glider)	
EPBC Act Status: Vulnerable	
Significant impact criteria An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	
Lead to a long-term decrease in the size of an important population of a species	The proposed activity is not likely to lead to a long-term decrease in the size of an important population of this species. Up to 54 large hollows which may provide potential breeding habitat for this species may require removal to facilitate the proposed activity. The design of the conservation fence will aim to retain as many hollows as possible. A suitably qualified ecologist or NPWS staff member will be present to supervise the clearing of these trees to ensure that no individuals are directly impacted from the clearing works. Additionally, a substantially large area of breeding habitat will also remain within the surrounding area.
Reduce the area of occupancy of an important population	The proposed activity is not expected to reduce the area of occupancy of an important population of this species. The potential removal of up to 54 large hollows is considered unlikely to be significant in comparison to the extensive large-hollow bearing trees occurring within the surrounding area.
Fragment an existing population into two or more populations	The proposed activity is not likely to fragment an existing population into two or more populations. Areas of contiguous habitat will continue to exist on all sides of the proposed works area, connecting with the vast habitat in the surrounding area.
Adversely affect habitat critical to the survival of a species	The proposed activity will adversely affect habitat critical to the survival of this species, albeit at very minor scale. Up to 54 large hollows may be impacted by the proposed activity although many large hollows (i.e. critical habitat) exist outside of the disturbance footprint.
Disrupt the breeding cycle of an important population	There is only one important population of Greater Glider in NSW and that is in the Eurobodalla LGA. Therefore, the Activity will not disrupt the breeding of an important population of Greater Gliders. Clearing supervision will ensure any breeding individuals are protected and relocated, and extensive breeding habitat will be retained within the surrounding area. For example, there were 19 additional large hollows recorded within the 5m buffer either side of the conservation fence.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The proposed activity is not likely to modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that this species is likely to decline. The potential removal of up to 54 large hollows is considered unlikely to be significant in comparison to the extensive hollow-bearing trees occurring within

Commonwealth Environment Protection and Biodiversity Conservation Act 1999 Assessment of Significant Impact Criteria for *Petauroides volans* (Greater Glider)	
EPBC Act Status: Vulnerable	
	the surrounding area. For example, there were 19 additional large hollows recorded within the 5m buffer either side of the conservation fence corridor.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	The proposed activity is not likely to result in invasive species becoming established in these species' habitat. In fact, the Activity will likely reduce the density of invasive species within the conservation area and outside.
Introduce disease that may cause the species to decline, or	The Activity is not likely to introduce disease that may cause these species to decline.
Interfere substantially with the recovery of the species.	The Activity will not interfere with the recovery of this species. Recommended mitigation measures will ensure no individuals are likely to be directly impacted.

Appendix H. EPBC Act 1999 Assessment of Significant Impact Criteria for threatened amphibians.

Commonwealth Environment Protection and Biodiversity Conservation Act 1999 Assessment of Significant Impact Criteria for *Heleioporus australiacus* (Giant Burrowing Frog)[1] *Mixophyes balbus* (Stuttering Frog)[1] *Litoria watsoni* (Watson's Tree Frog)[2]	
EPBC Act Status: Vulnerable[1], Endangered[2]	
Significant impact criteria An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	
Lead to a long-term decrease in the size of an important population of a species	Wherever these species occur is considered to be an important population. The proposed Activity is not likely to lead to a long-term decrease in the size of an important population of these species. The proposed works will require the removal/modification of approximately 2.5ha of vegetation along 27 streams that intersect the survey area. This vegetation may provide potential habitat for these species. A suitably qualified Ecologist or NPWS staff member will be present to supervise any riparian vegetation to ensure no individuals are directly harmed from the clearing works or culvert and bridge construction/modification.
Reduce the area of occupancy of an important population	Wherever these species occur is considered to be an important population. The proposed Activity is not expected to reduce the area of occupancy of an important population of these species since the conservation fencing at the stream crossings is frog friendly and allows passage up and downstream for breeding. A suitably qualified Ecologist or NPWS staff member will be present to supervise any riparian vegetation to ensure no individuals are directly harmed from the clearing works or culvert and bridge construction/modification.
Fragment an existing population into two or more populations	Areas of habitat are unlikely to become fragmented as a result of the proposed Activity as the conservation fencing at the stream crossings is frog friendly and allows passage up and downstream for breeding. Moreover, extensive areas of habitat will continue to exist on all sides of the FPFA.
Adversely affect habitat critical to the survival of a species	The proposed Activity will not adversely affect habitat critical to the survival of this species. Whilst approximately 2.5 ha of vegetation removal is required within the Survey Area, which may provide suitable habitat for these species, extensive areas of suitable habitat will continue to exist surrounding the Survey Area.
Disrupt the breeding cycle of an important population	Wherever these species occur is considered to be an important population. The Activity is unlikely to disrupt the breeding cycle of

Commonwealth Environment Protection and Biodiversity Conservation Act 1999 Assessment of Significant Impact Criteria for *Heleioporus australiacus* (Giant Burrowing Frog)[1] *Mixophyes balbus* (Stuttering Frog)[1] *Litoria watsoni* (Watson's Tree Frog)[2]	
EPBC Act Status: Vulnerable[1], Endangered[2]	
	an important population of these species as the areas of potential habitat being impacted have been kept to a minimum.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The proposed activity is likely to modify, destroy, remove, isolate or decrease the availability or quality of habitat for these species, albeit on a minor scale. Whilst vegetation removal is required within the Survey Area, which may provide suitable habitat for these species, extensive areas of suitable habitat will continue to exists surrounding the Survey Area.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	The proposed activity is not likely to result in invasive species becoming established in these species' habitat. In fact, the Activity will likely reduce the density of invasive species within and outside the conservation fence.
Introduce disease that may cause the species to decline, or	The Activity has the potential to introduce disease that may cause these species to decline. It is important that appropriate hygiene measures are adhered to.
Interfere substantially with the recovery of the species.	The Activity will not interfere with the recovery of these species. The FPFA may act as a safe haven for these species given the removal of invasive predators and feral herbivores.

Appendix I. EPBC Act 1999 Assessment of Significant Impact Criteria for *Isoodon obsesulus obesulus* (Southern Brown Bandicoot - eastern).

Commonwealth Environment Protection and Biodiversity Conservation Act 1999 Assessment of Significant Impact Criteria for *Isoodon obsesulus obesulus* (Southern Brown Bandicoot – eastern)	
EPBC Act Status: Endangered	
Significant impact criteria An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	
Lead to a long-term decrease in the size of an important population of a species	The proposed Activity is not likely to lead to a long-term decrease in the size of an important population of the Southern Brown Bandicoot. Only a small amount of potential habitat (55.78ha within a 15m wide corridor) will be cleared for the proposed Activity, relative to the much larger areas of habitat that will remain undisturbed inside the fence and elsewhere within South East Forest National Park. Habitat removal of this scale would be unlikely to have any appreciable impact on any populations of the species. Conversely, the reduced predation that will result from eradication of feral predators will likely lead to an increased population of this species, if present, within the fenced area.
Reduce the area of occupancy of an important population	The proposed Activity is not expected to reduce the area of occupancy of any Southern Brown Bandicoot population. Only a small amount of potential habitat (55.78ha within a 15m wide corridor) will be cleared for the proposed Activity, relative to that which will remain undisturbed inside the fence and elsewhere within South East Forest National Park. Habitat removal of this scale would be unlikely to have any appreciable impact on the occupancy of the species.
Fragment an existing population into two or more populations	Habitat removal associated with the activity would be unlikely to result in fragmentation of Southern Brown Bandicoot populations. However, population fragmentation could occur as a result of the predator-proof fence, which may create a barrier to movement of the species. It is anticipated that this impact will be far outweighed by the benefits of reduced predation that will result from feral eradication inside the fence. Moreover, detailed monitoring will be undertaken in accordance with the draft Nungatta ecological health monitoring framework (DPE 2022a) to determine the impacts of the fence on threatened species. If monitoring results indicate it is necessary, occasional manual dispersal of Southern Brown Bandicoot individuals through translocation (capture and release) may be undertaken to maintain connectivity between populations.
Adversely affect habitat critical to the survival of a species	The proposed Activity will not adversely affect habitat critical to the survival of this species, which has a wide but patchy distribution in

Commonwealth Environment Protection and Biodiversity Conservation Act 1999 Assessment of Significant Impact Criteria for *Isoodon obsesulus obesulus* (Southern Brown Bandicoot – eastern)	
EPBC Act Status: Endangered	
	NSW, from the Hawkesbury River to the Victorian border (i.e. it is not solely dependent on any habitat within the Survey Area). Only a small amount of potential habitat (55.78ha within a 15m wide corridor) will be cleared for the proposed Activity, relative to the much larger areas of habitat that will remain undisturbed inside the fence and elsewhere within South East Forest National Park. Moreover, habitat features will be retained or relocated wherever possible.
Disrupt the breeding cycle of an important population	The proposed activity is not likely to have an adverse effect on the breeding cycle of the Southern Brown Bandicoot. While some of habitat features proposed for removal may provide breeding habitat for the Southern Brown Bandicoot, any impacts associated with its removal will likely be minor given the scale of the Activity (clearance of 55.78ha within a 15m wide corridor), and given that extensive areas of similar habitat will remain within the fenced area and elsewhere throughout South East Forest National Park. Moreover, habitat features will be retained or relocated wherever possible. Where clearance is unavoidable, a suitably qualified Ecologist or NPWS staff member will be present to supervise its removal to ensure no individuals are directly harmed from the clearing works.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The proposed activity is unlikely to modify, destroy, remove, isolate or decrease the availability or quality of habitat for the Southern Brown Bandicoot such that it is likely to decline. Only a relatively small area of potential habitat will be cleared relative to that which will remain inside the fenced area, elsewhere throughout South East Forest National Park, and elsewhere throughout the range of the species. Reduced predation resulting from eradication of feral predators is more likely to result in an increased Southern Brown Bandicoot population inside the fence, rather than a decline.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	The Activity will result in eradication of invasive feral predators, rather than leading to their establishment. While it does have some potential to result in increased incursion of invasive weeds within the Survey Area, appropriate hygiene protocols will be implemented to minimise the potential for this. Monitoring will also be undertaken in accordance with the draft Nungatta ecological health monitoring framework to assist in identifying any weed incursions and ensuring they are managed in accordance with the NPWS Pest and Weed System.

Commonwealth Environment Protection and Biodiversity Conservation Act 1999 Assessment of Significant Impact Criteria for *Isoodon obsesulus obesulus* (Southern Brown Bandicoot – eastern)	
EPBC Act Status: Endangered	
Introduce disease that may cause the species to decline, or	It is unlikely the Activity would introduce any disease that would impact on this species. However, the Activity does have the potential to cause the spread of *Phytopthora cinnamomi* across the site, which could in turn be detrimental to foraging and/or shelter habitat of the Southern Brown Bandicoot, Appropriate hygiene measures will be implemented to minimise the potential for this.
Interfere substantially with the recovery of the species.	The Activity will not interfere with the recovery of the Southern Brown Bandicoot. As one of the main drivers of its decline is considered to be predation by cats, dogs and foxes, the species will conversely be likely to benefit from the reduced predation by feral predators that will result from feral eradication inside the fence.

Appendix J. Flora species identified during Narla's Site Assessment (May/June 2022) within the Survey Area.

Scientific Name	Canopy	Mid-Story	Ground
Acacia dealbata		x	
Acacia falciformis		x	
Acacia gunnii		x	
Acacia mearnsii		x	
Acacia melanoxylon		x	
Acacia myrtifolia		x	
Acacia terminalis		x	
Acacia ulicifolia		x	
Allocasuarina littoralis		x	
Allocasuarina nana		x	
Allocasuarina paludosa		x	
Amperea xiphoclada			x
Arthropodium spp.			x
Austral Indigo			x
Banksia marginata		x	
Baumea rubiginosa			x
Blechnum cartilagineum			x
Blechnum nudum			x
Bossiaea buxifolia		x	
Bossiaea prostrata		x	
Brachyloma daphnoides		x	
Brachyscome spathulata			x
Burchardia umbellata			x
Bursaria spinosa		x	
Callistemon citrinus		x	
Calochilus campestris			x
Calochlaena dubia			x
Carex appressa			x
Carex breviculmis			x
Cassinia aculeata		x	
Cassinia longifolia		x	
Cassinia trinerva		x	
Cassytha glabella			x
Cassytha melantha			x
*Centaurium erythraea**			x
Centella asiatica			x
Cheilanthes sieberi			x
Clematis aristata			x
Clematis glycinoides			x
*Conyza spp.**			x
Coprosma quadrifida			x
Coronidium scorpioides			x
Correa reflexa		x	
Crassula sieberiana			x

Scientific Name	Canopy	Mid-Story	Ground
Cyathea australis		x	
Cymbonotus lawsonianus			x
Cynoglossum australe			x
Cyperus lucidus			x
Daviesia latifolia		x	
Daviesia mimosoides		x	
Deyeuxia decipiens			x
Dianella caerulea			x
Dianella tasmanica			x
Dichelachne micrantha			x
Dichelachne rara			x
Dichondra repens			x
Dicksonia antarctica			x
Dillwynia glaberrima			x
Drosera spatulata			x
Echinopogon caespitosus			x
Echinopogon ovatus			x
Einadia nutans			x
Entolasia marginata			x
Entolasia stricta			x
Epacris impressa		x	
Eucalyptus agglomerata	x		
Eucalyptus angophoroides	x		
Eucalyptus consideniana	x		
Eucalyptus croajingolensis	x		
Eucalyptus cypellocarpa	x		
Eucalyptus dives	x		
Eucalyptus elata	x		
Eucalyptus globoidea	x		
Eucalyptus globulus	x		
Eucalyptus muelleriana	x		
Eucalyptus obliqua	x		
Eucalyptus ovata	x		
Eucalyptus radiata	x		
Eucalyptus sieberi	x		
Eucalyptus viminalis	x		
Euchiton japonicus			x
Euchiton sphaericus			x
Eustrephus latifolius			x
Exocarpos strictus		x	
Gahnia radula			x
Gahnia sieberiana			x
Galium leiocarpum			x
*Gamochaeta americana**			x
Geranium potentilloides			x
Geranium solanderi			x

Scientific Name	Canopy	Mid-Story	Ground
Glycine spp.			x
Gompholobium huegelii			x
Gonocarpus micranthus			x
Gonocarpus tetragynus			x
Gonocarpus teucrioides			x
Goodenia bellidifolia			x
Goodenia ovata			x
Goodia lotifolia		x	
Grona varians			x
Hakea eriantha		x	
Hardenbergia violacea			x
Hibbertia aspera		x	
Hibbertia empetrifolia		x	
Hibbertia obtusifolia		x	
Hydrocotyle laxiflora			x
Hydrocotyle hirta			x
Hypericum gramineum			x
Hypericum japonicum			x
*Hypochaeris radicata**			x
Indigofera australis		x	
Juncus planifolius			x
Juncus spp.			x
Kennedia prostrata			x
Kunzea ericoides		x	
Lagenophora gracilis			x
Lagenophora stipitata			
Lepidosperma filiforme			x
Lepidosperma gunnii			x
Lepidosperma laterale			x
Leptospermum continentale		x	
Leptospermum scoparium		x	
Leucopogon lanceolatus			x
Lindsaea linearis			x
Lissanthe strigosa		x	
Lomandra filiformis			x
Lomandra glauca			x
Lomandra longifolia			x
Lomandra multiflora			x
Lomatia ilicifolia		x	
Luzula flaccida			x
Lycopodium deuterodensum			x
Microlaena stipoides			x
Monotoca scoparia		x	
Olearia erubescens		x	
Olearia lirata		x	
Opercularia aspera			x

Scientific Name	Canopy	Mid-Story	Ground
Oxalis spp.			x
Oxylobium arborescens			x
Ozothamnus argophyllus		x	
Patersonia fragilis			x
Patersonia sericea var. sericea			x
Pelargonium inodorum			x
Persoonia linearis		x	
Phragmites australis		x	
Plantago debilis			x
Plantago varia			x
Platysace lanceolata		x	
Poa meionectes			x
Poa spp.			x
Podolobium alpestre		x	
Podolobium ilicifolium		x	
Polyscias sambucifolia		x	
Pomaderris ferruginea		x	
Pomax umbellata			x
Poranthera microphylla			x
Pteridium esculentum			x
Pultenaea retusa			x
Ranunculus plebeius			x
Rytidosperma spp.			x
Rhytidosporum procumbens			x
*Rubus fruticosus***			x
Rubus parvifolius			x
Rumex brownii			x
Rytidosperma pallidum			x
Scaevola aemula			x
Senecio hispidulus			x
Senecio linearifolius			x
*Senecio madagascariensis***			x
Senecio minimus			x
Senecio prenanthoides			x
Solanum prinophyllum			x
Sonchus asper			x
*Sonchus asper**			x
Stellaria angustifolia			x
Stellaria flaccida			x
Stellaria multiflora			x
Stellaria pungens			x
Stylidium armeria			x
Tetratheca bauerifolia			x
Thelionema caespitosum			x
Themeda triandra			x
Tylophora barbata			x

Scientific Name	Canopy	Mid-Story	Ground
Veronica plebeia			x
Viola betonicifolia			x
Viola hederacea			x
Wahlenbergia gracilis			x
Wahlenbergia spp.			x
Wahlenbergia stricta			x
Xanthosia dissecta			x
Xyris gracilis			x

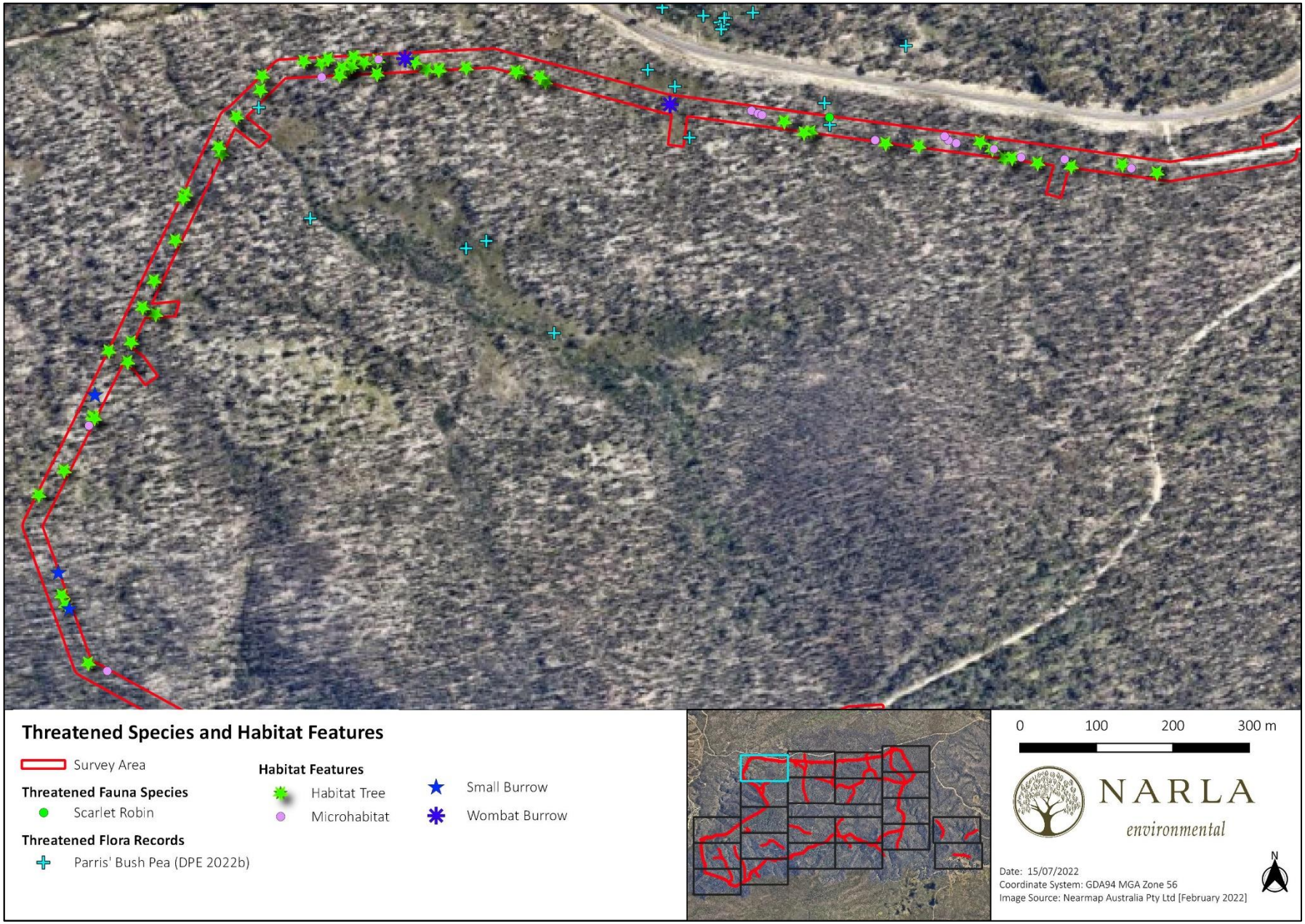
** Denotes exotic species*

*** Denotes Priority Weed*

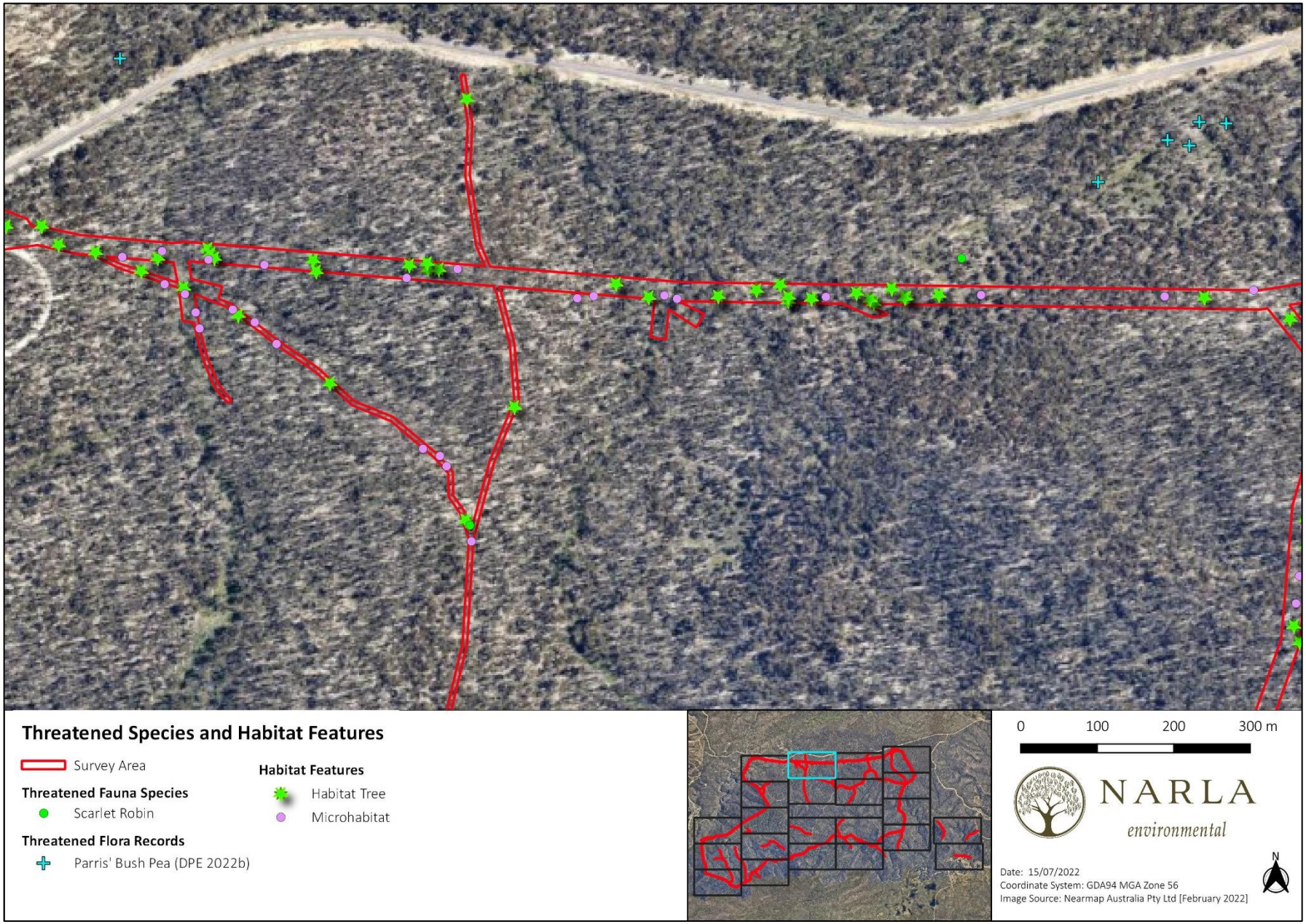
Appendix K. Fauna species identified during Narla's Site Assessment (May/June 2022) within the Survey Area.

Class	Scientific	Common	Status
Amphibia	*Crinia signifera*	Common eastern froglet	Protected
Aves	*Corvus coronoides*	Australian Raven	Protected
	Acanthiza chrysorrhoa	Yellow-rumped Thornbill	Protected
	Anthochaera chrysoptera	Little Wattlebird	Protected
	Aquila audax	Wedge-tailed Eagle	Protected
	Callocephalon fimbriatum	Gang Gang Cockatoo	BC Act - Vulnerable; EPBC Act - Endangered
	Colluricincla harmonica	Grey Shrike-thrush	Protected
	Coracina novaehollandiae	Black-faced Cuckoo-shrike	Protected
	Corcorax melanorhamphos	White-winged Chough	Protected
	Cormobates leucophaea	White-throated Treecreeper	Protected
	Coturnix ypsilophora	Brown Quail	Protected
	Cracticus torquatus	Grey Butcher Bird	Protected
	Dacelo novaeguineae	Laughing Kookaburra	Protected
	Eopsaltria australis	Eastern Yellow Robin	Protected
	Falco berigora	Brown Falcon	Protected
	Hirundo neoxena	Welcome Swallow	Protected
	Malurus cyaneus	Superb Fairy Wren	Protected
	Manorina melanophrys	Bell Miner	Protected
	Melithreptus lunatus	White-naped Honeyeater	Protected
	Menura novaehollandiae	Superb Lyrebird	Protected
	Myiagra inquieta	Restless Flycatcher	Protected
	Neochmia temporalis	Red-browed finch	Protected
	Notamacropus rufogriseus	Red-necked Wallaby	Protected
	Petroica boodang	Scarlet Robin	BC Act - Vulnerable
	Platycercus elegans	Crimson Rosella	Protected
	Purnella albifrons	White-faced Honeyeater	Protected
	Rhipidura albiscapa	Grey Fantail	Protected
	Sericornis frontalis	White-browed Scrubwren	Protected
	Strepera graculina	Pied Currawong	Protected
	Wallabia bicolor	Swamp Wallaby	Protected
	Zosterops lateralis	Silvereye	Protected
Mammalia	*Cervus spp.*	Deer	Exotic
	Macropus giganteus	Eastern Grey Kangaroo	Protected
	Oryctolagus cuniculus	European Rabbit	Exotic
	Sus scrofa	Feral Pig	Exotic
	Vombatus ursinus	Common Wombat	Protected
	Vulpes vulpes	Red Fox	Exotic

Appendix L. Threatened species and habitat features identified within the Survey Area (Map 1 of 22).

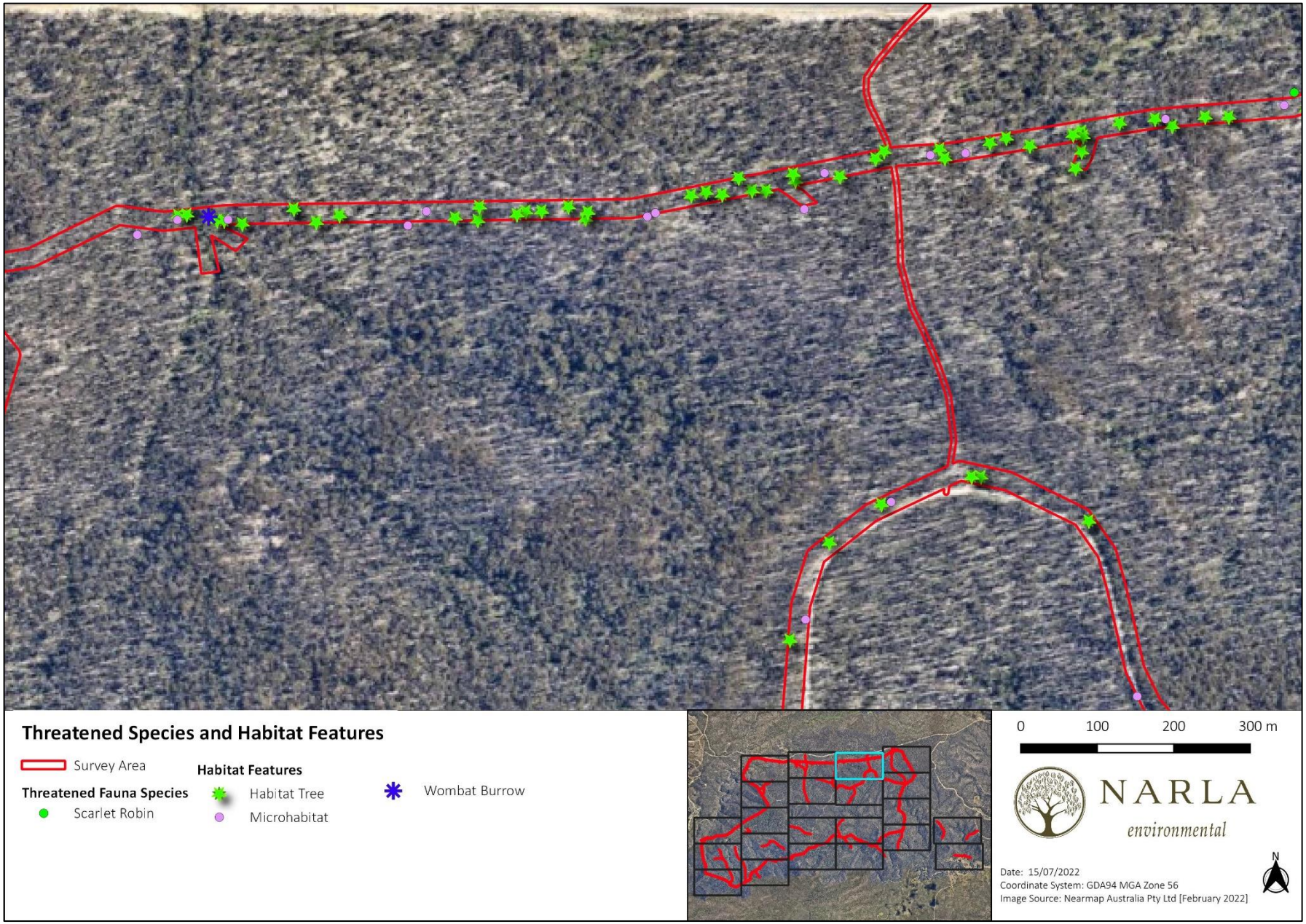


Threatened species and habitat features identified within the Survey Area (Map 2 of 22).



Threatened species and habitat features identified within the Survey Area (Map 3 of 22).

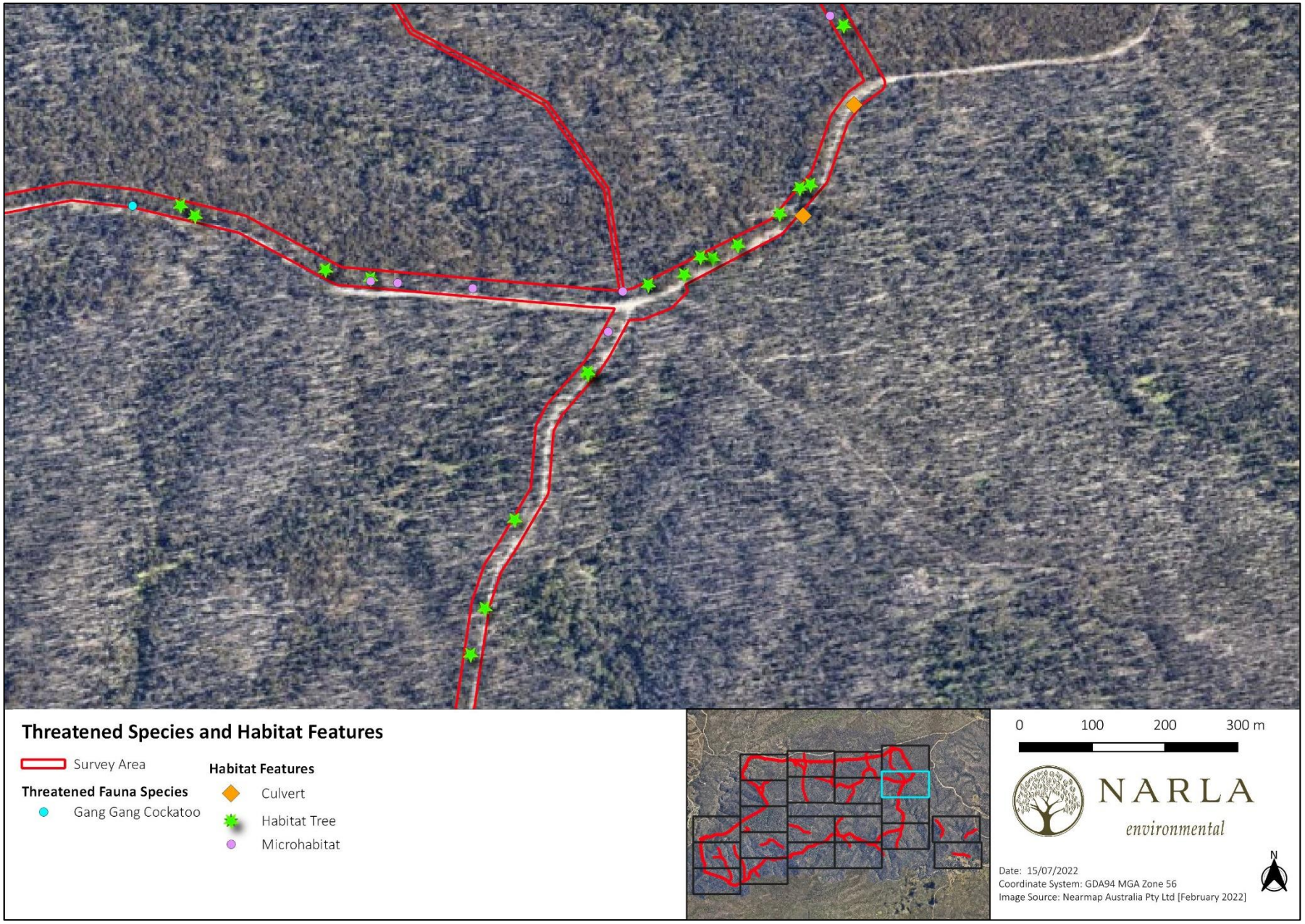
Threatened species and habitat features identified within the Survey Area (Map 4 of 22).



Threatened species and habitat features identified within the Survey Area (Map 5 of 22).

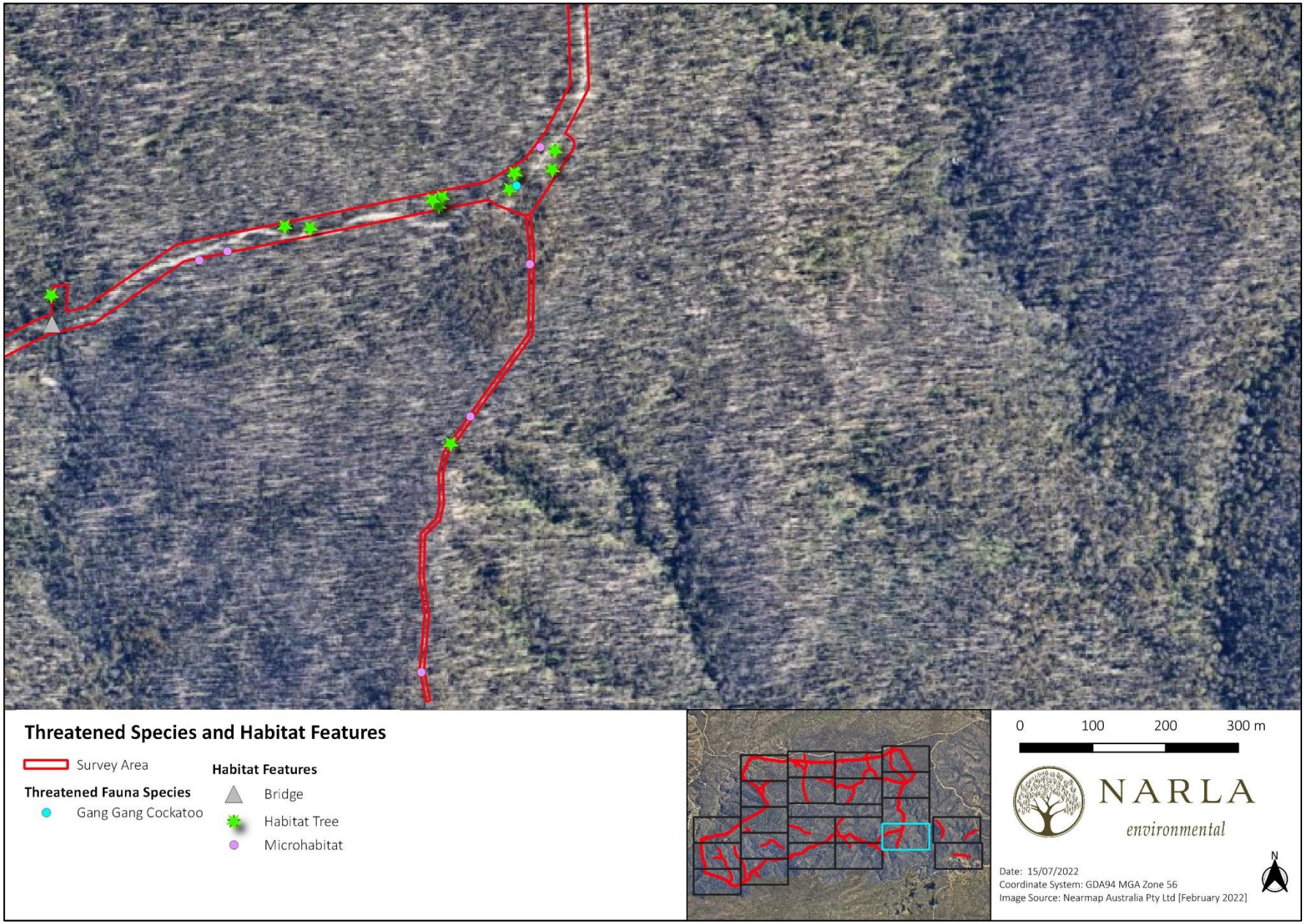
Threatened species and habitat features identified within the Survey Area (Map 6 of 22).

Threatened species and habitat features identified within the Survey Area (Map 7 of 22).



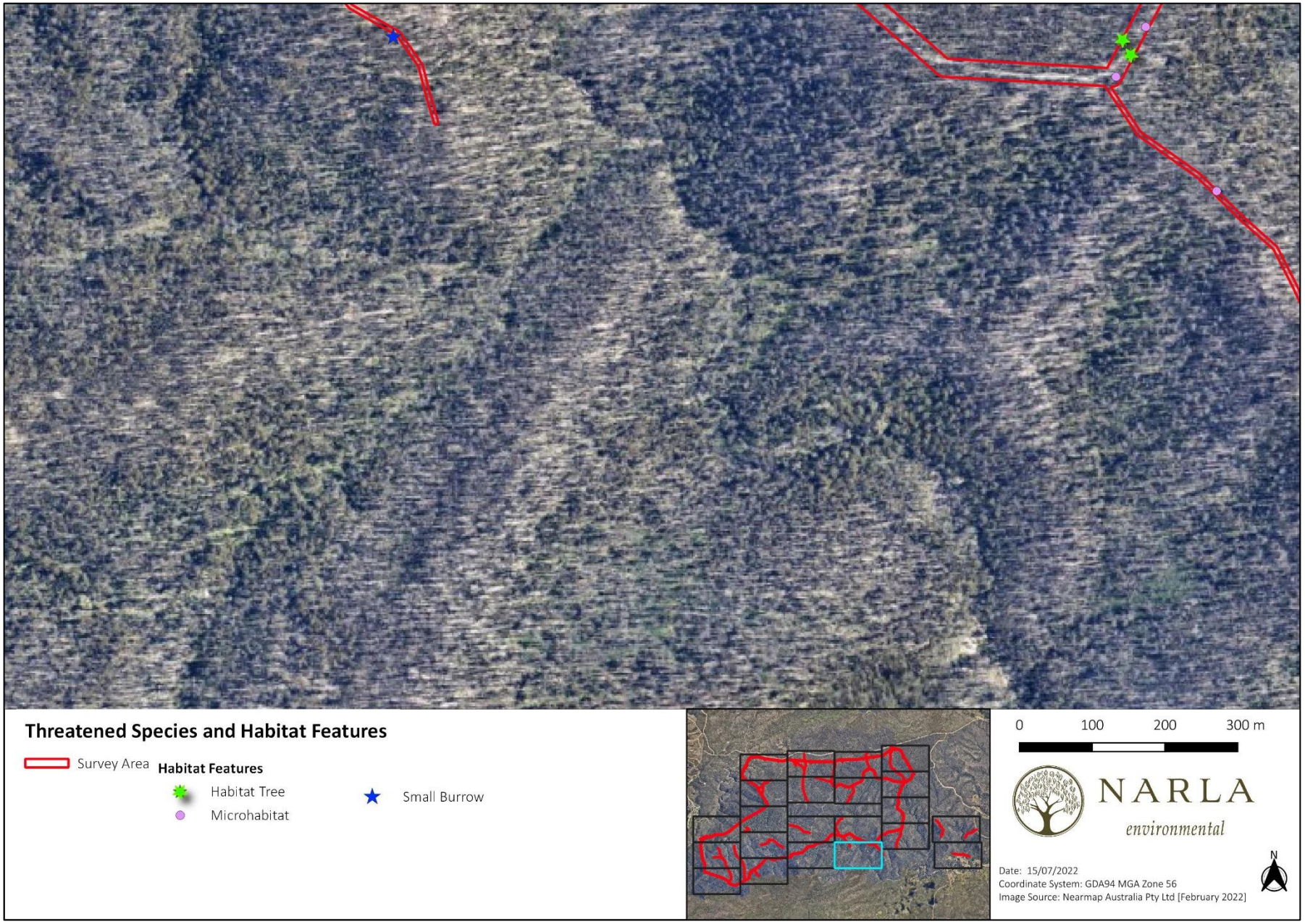
Threatened species and habitat features identified within the Survey Area (Map 8 of 22).

Threatened species and habitat features identified within the Survey Area (Map 9 of 22).



Threatened species and habitat features identified within the Survey Area (Map 10 of 22).

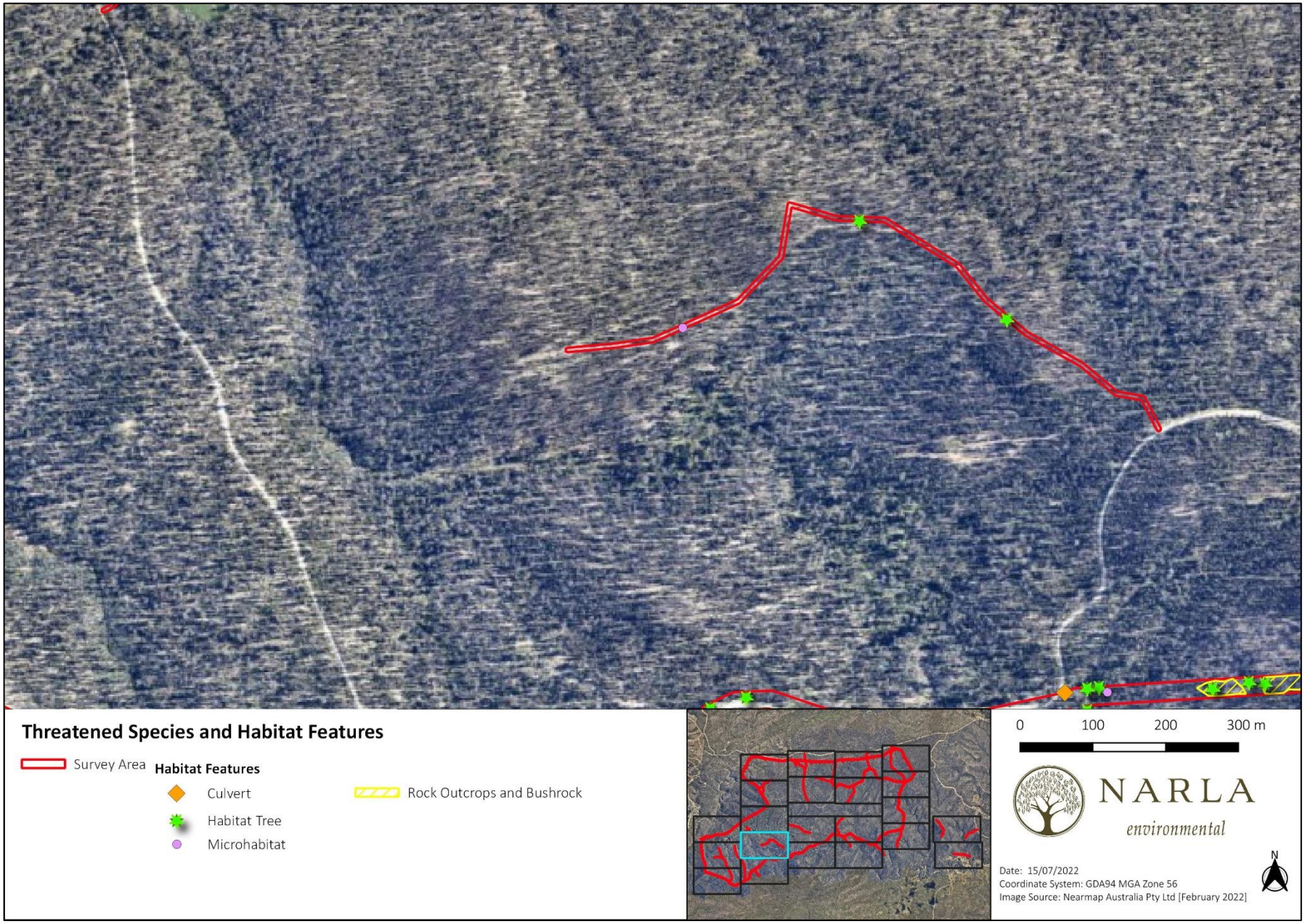
Threatened species and habitat features identified within the Survey Area (Map 11 of 22).



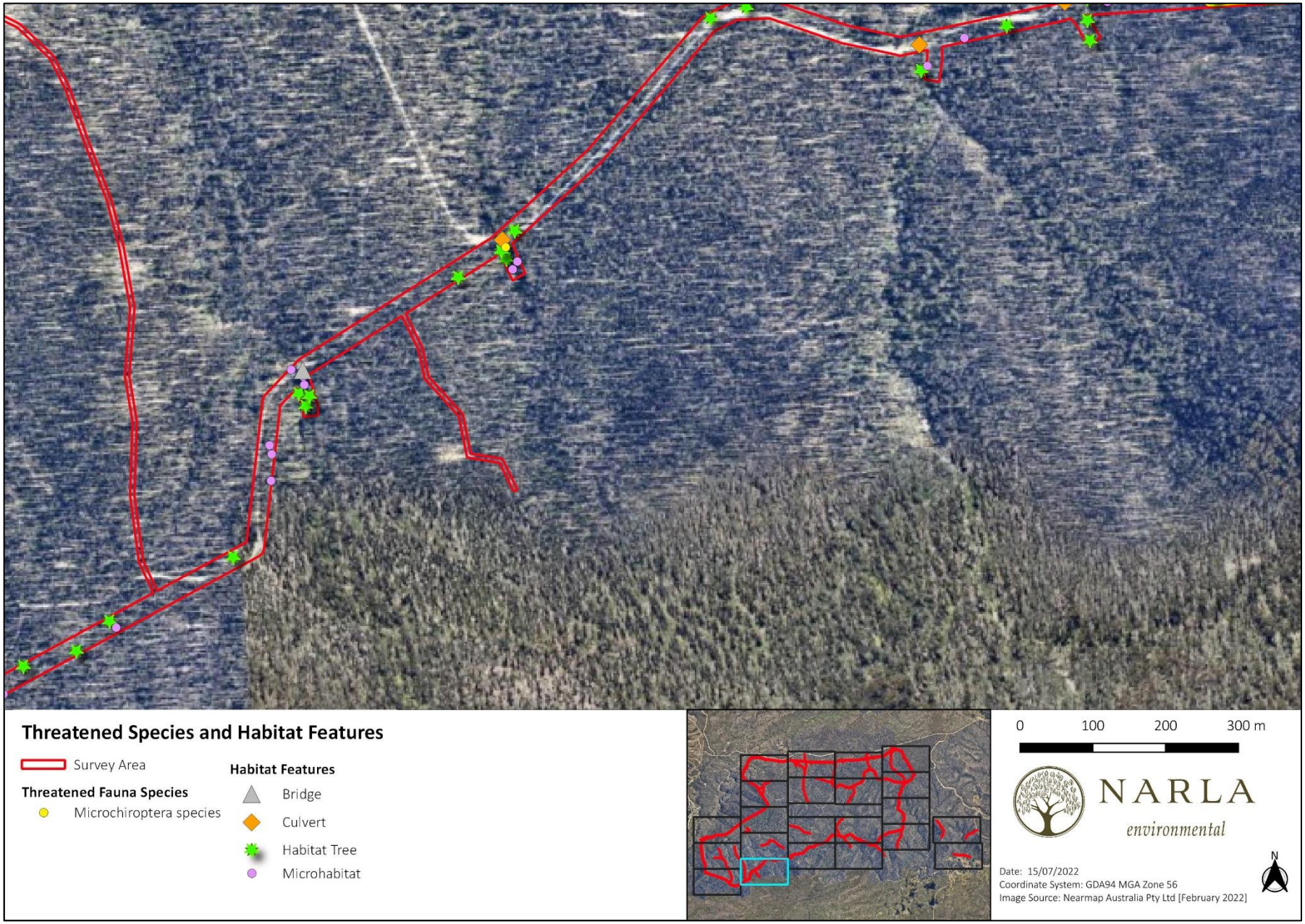
Threatened species and habitat features identified within the Survey Area (Map 12 of 22).

Threatened species and habitat features identified within the Survey Area (Map 13 of 22).

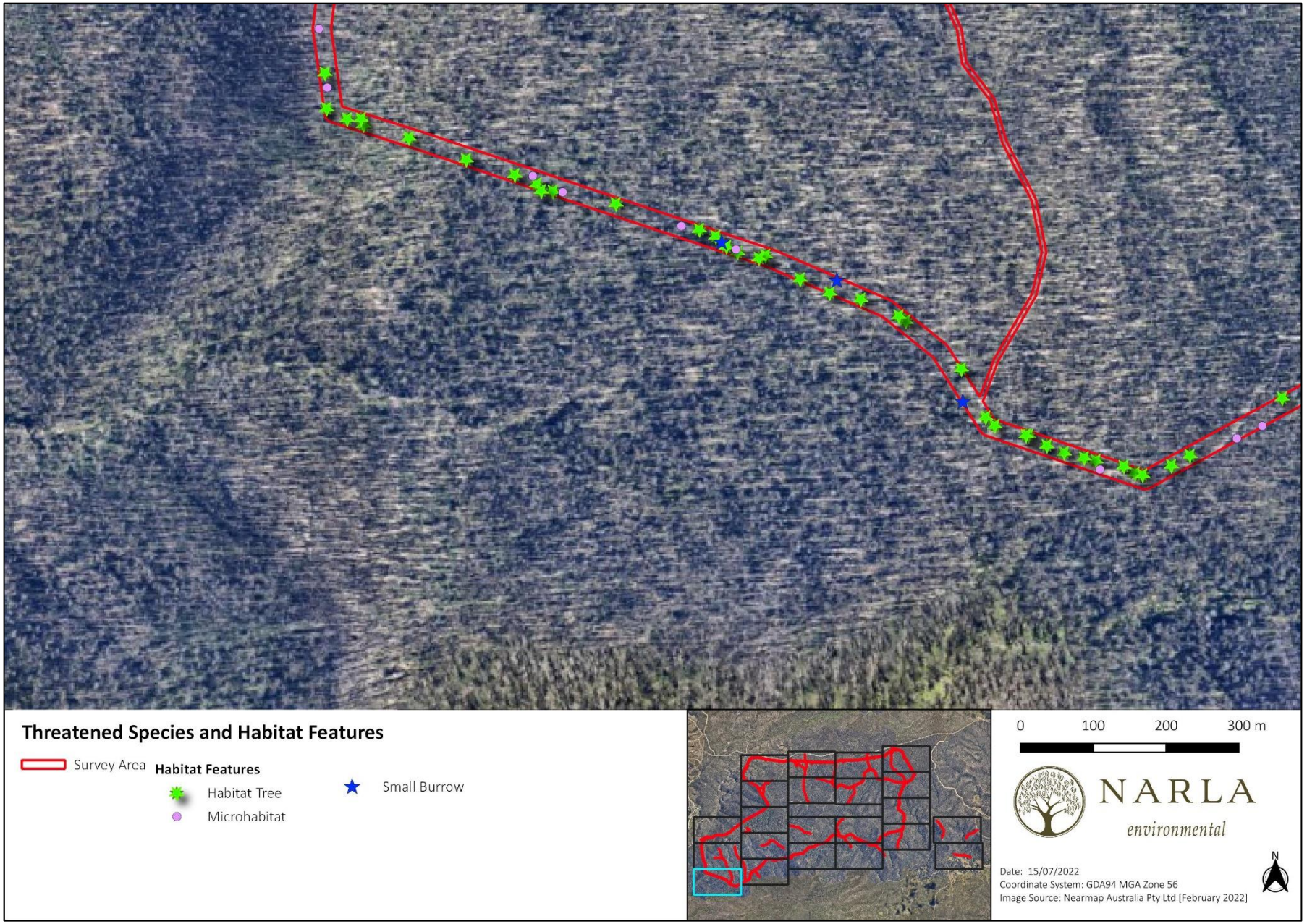
Threatened species and habitat features identified within the Survey Area (Map 14 of 22).



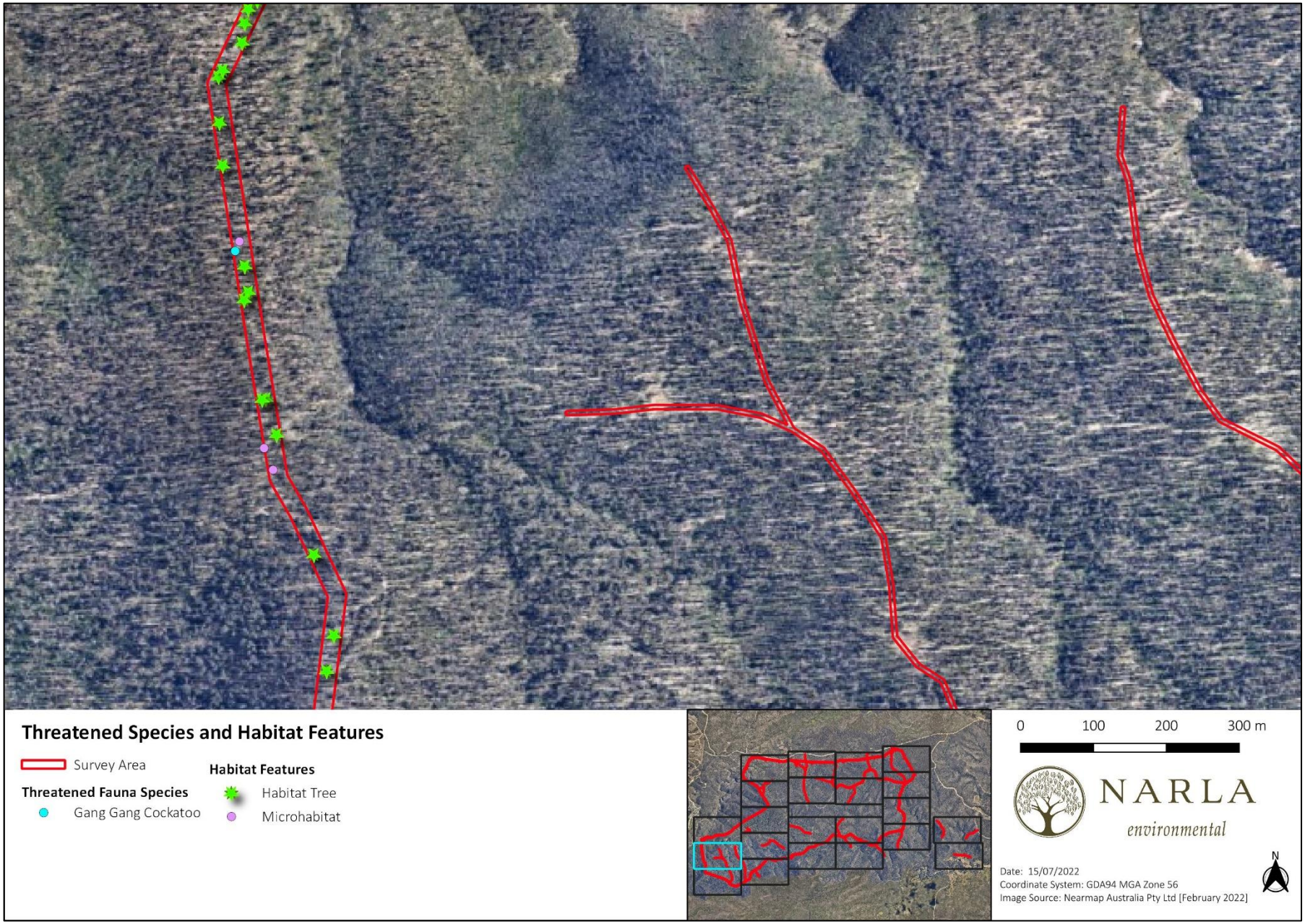
Threatened species and habitat features identified within the Survey Area (Map 15 of 22).



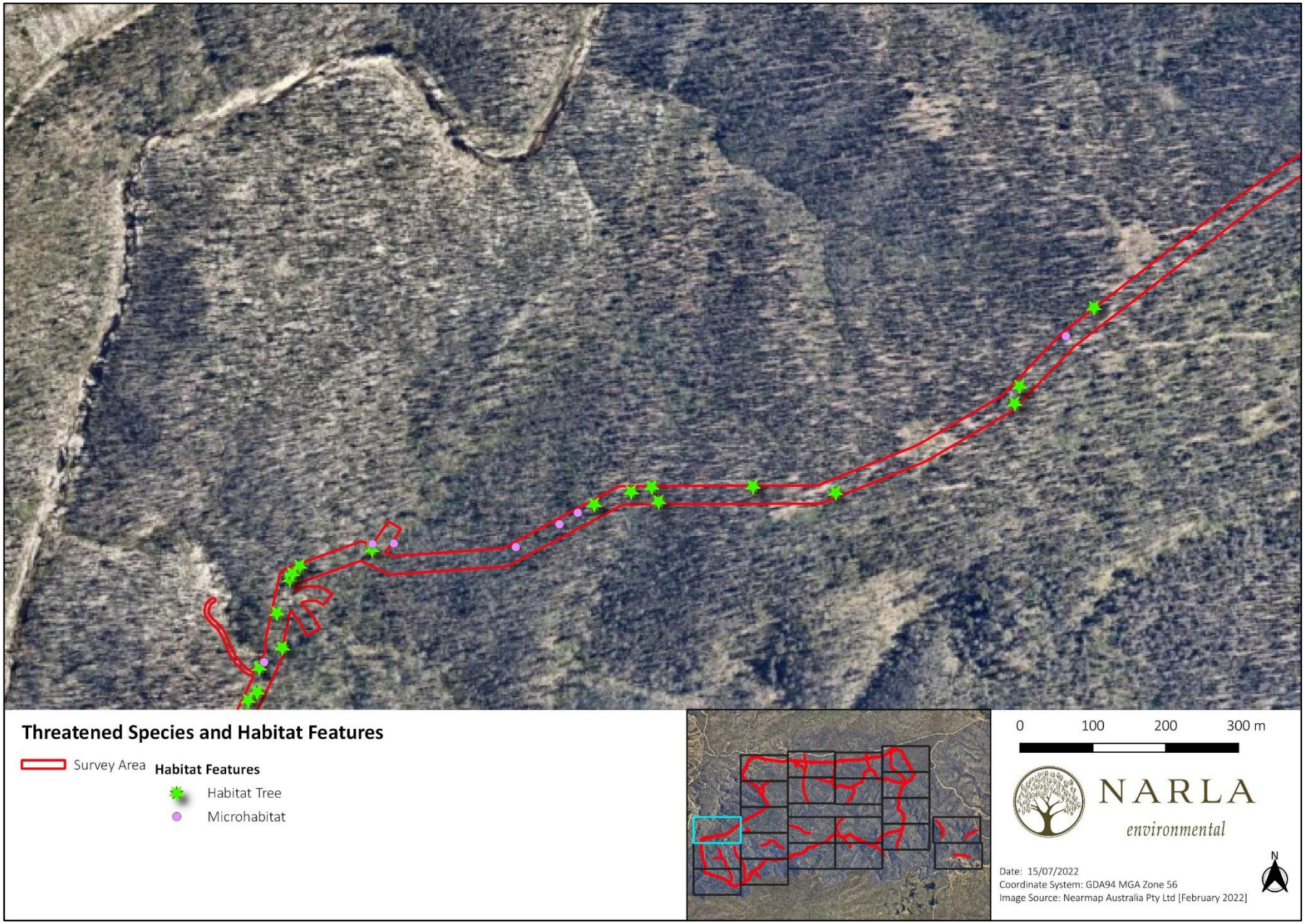
Threatened species and habitat features identified within the Survey Area (Map 16 of 22).



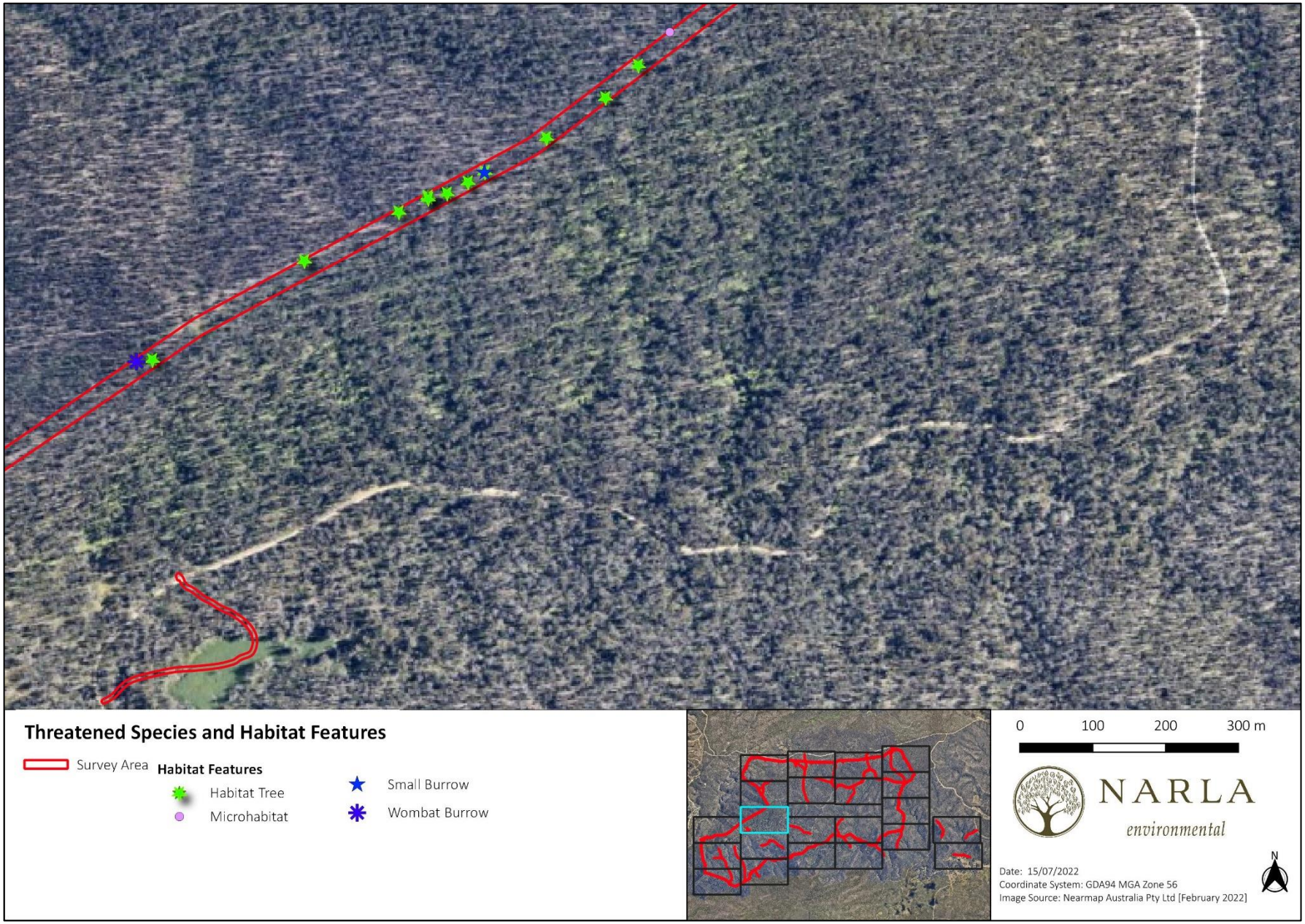
Threatened species and habitat features identified within the Survey Area (Map 17 of 22).



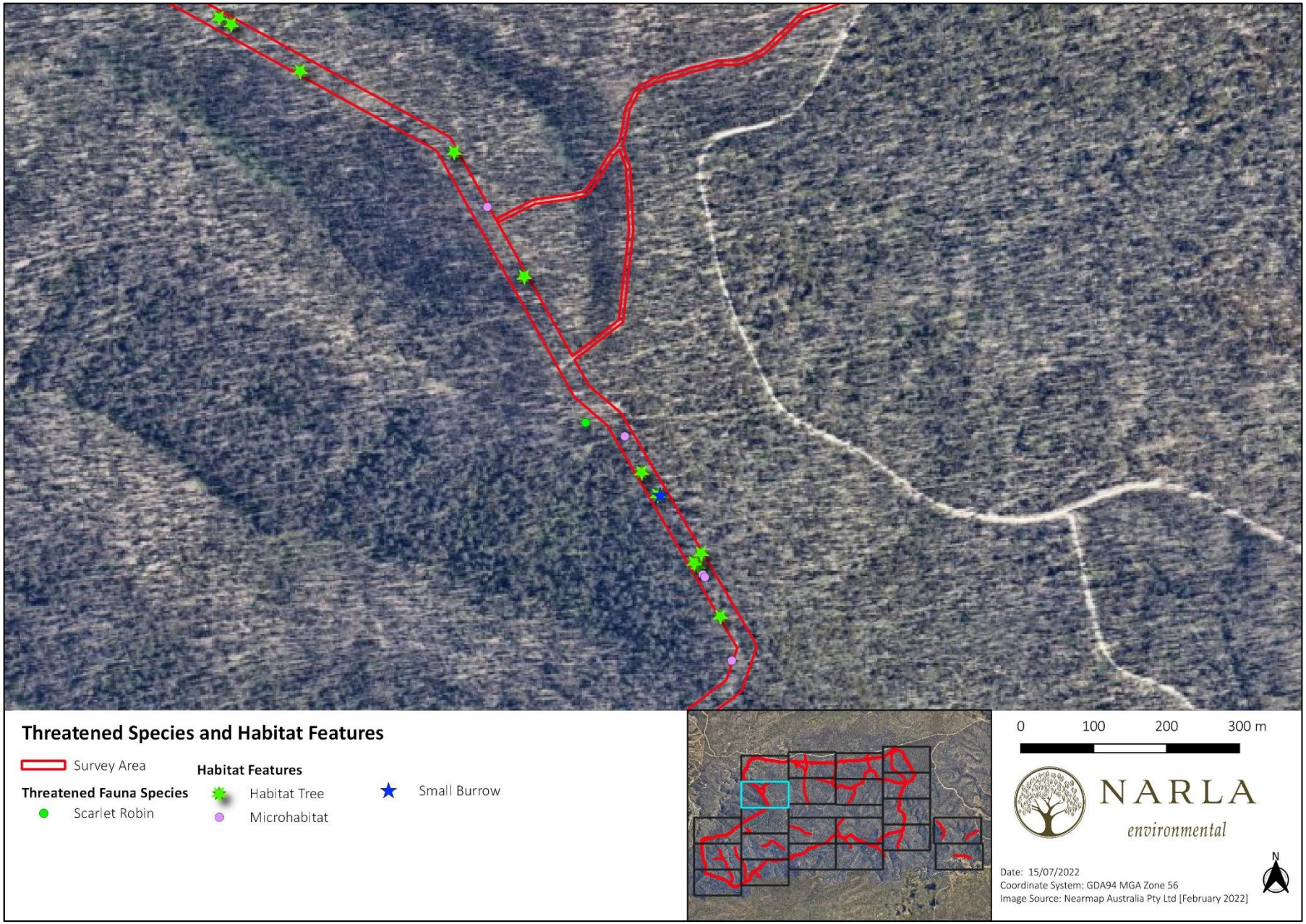
Threatened species and habitat features identified within the Survey Area (Map 18 of 22).



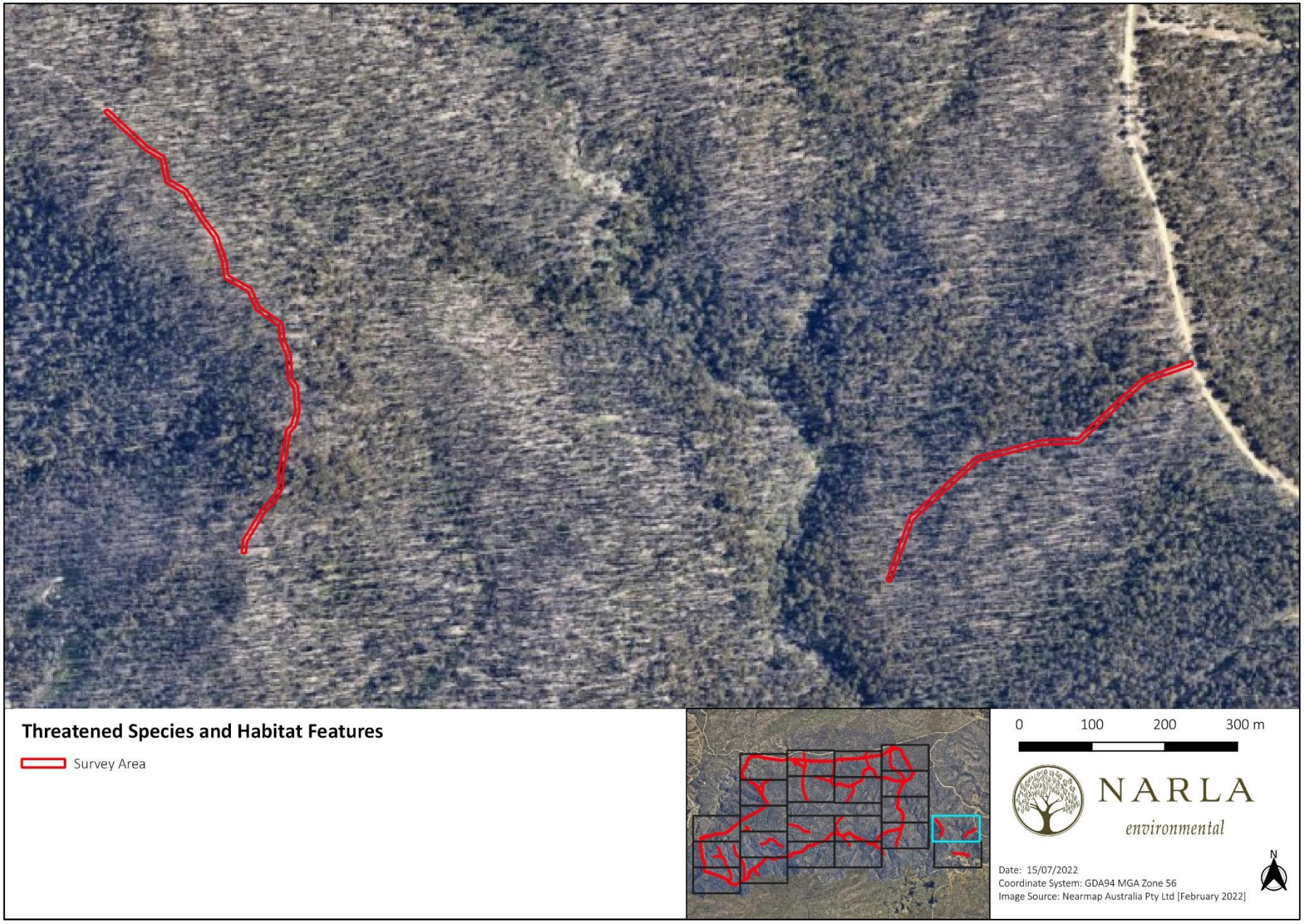
Threatened species and habitat features identified within the Survey Area (Map 19 of 22).



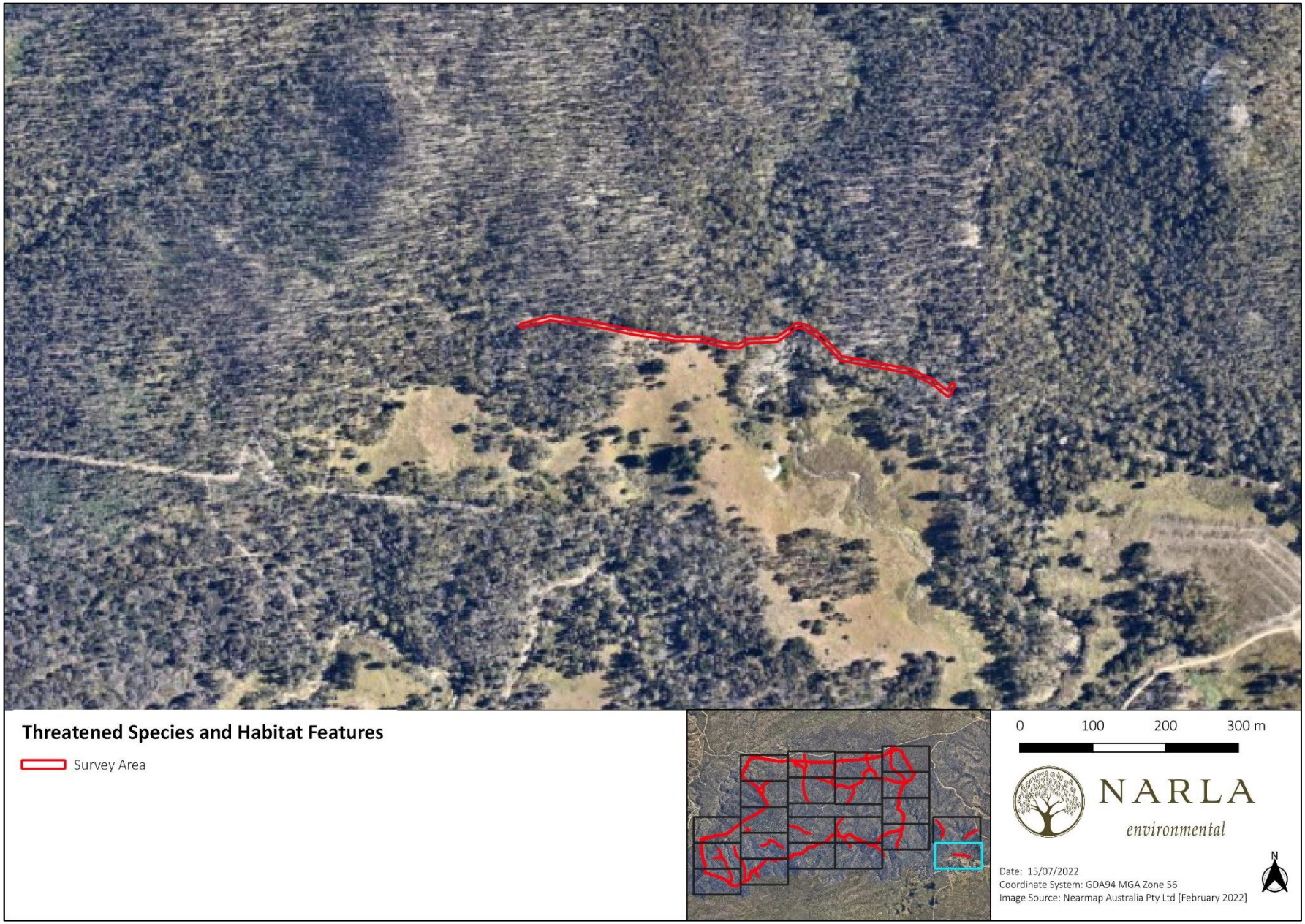
Threatened species and habitat features identified within the Survey Area (Map 20 of 22).



Threatened species and habitat features identified within the Survey Area (Map 21 of 22).



Threatened species and habitat features identified within the Survey Area (Map 22 of 22).



Appendix M. Protected Matters Search Tool.

Australian Government
Department of Agriculture, Water and the Environment

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: 08-Jun-2022

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	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	3
Listed Threatened Species:	52
Listed Migratory Species:	11

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

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 http://www.environment.gov.au/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:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	17
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:	10
Regional Forest Agreements:	2
Nationally Important Wetlands:	1
EPBC Act Referrals:	5
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

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
Brogo Vine Forest of the South East Corner Bioregion	Endangered	Community may occur within area	In buffer area only
Lowland Grassy Woodland in the South East Corner Bioregion	Critically Endangered	Community may occur within area	In feature area
Natural Temperate Grassland of the South Eastern Highlands	Critically 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			
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Foraging, feeding or related behaviour may occur within area	In feature area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Callocephalon fimbriatum Gang-gang Cockatoo [768]	Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Falco hypoleucos](#) Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area	In feature area
[Grantiella picta](#) Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Hirundapus caudacutus](#) White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Lathamus discolor](#) Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area	In feature area
[Numenius madagascariensis](#) Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
[Pycnoptilus floccosus](#) Pilotbird [525]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Rostratula australis](#) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area	In feature area
FISH			
[Prototroctes maraena](#) Australian Grayling [26179]	Vulnerable	Species or species habitat known to occur within area	In feature area
FROG			
[Heleioporus australiacus](#) Giant Burrowing Frog [1973]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Litoria castanea](#) Yellow-spotted Tree Frog, Yellow-spotted Bell Frog [1848]	Critically Endangered	Species or species habitat may occur within area	In buffer area only
[Litoria raniformis](#) Growling Grass Frog, Southern Bell Frog, Green and Golden Frog, Warty Swamp Frog, Golden Bell Frog [1828]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Litoria watsoni			
Watson's Tree Frog [91509]	Endangered	Species or species habitat likely to occur within area	In feature area
Mixophyes balbus			
Stuttering Frog, Southern Barred Frog (in Victoria) [1942]	Vulnerable	Species or species habitat may occur within area	In buffer area only
MAMMAL			
Dasyurus maculatus maculatus (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
Isoodon obesulus obesulus			
Southern Brown Bandicoot (eastern), Southern Brown Bandicoot (south-eastern) [68050]	Endangered	Species or species habitat known to occur within area	In feature area
Mastacomys fuscus mordicus			
Broad-toothed Rat (mainland), Tooarrana [87617]	Vulnerable	Species or species habitat may occur within area	In feature area
Petauroides volans			
Greater Glider [254]	Vulnerable	Species or species habitat known to occur within area	In feature area
Petaurus australis australis			
Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat known to occur within area	In feature area
Petrogale penicillata			
Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)			
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat likely to occur within area	In feature area
Potorous longipes			
Long-footed Potoroo [217]	Endangered	Species or species habitat known to occur within area	In feature area
Potorous tridactylus trisulcatus			
Long-nosed Potoroo (southern mainland) [86367]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Pseudomys fumeus](#) Smoky Mouse, Konoom [88]	Endangered	Species or species habitat known to occur within area	In feature area
[Pteropus poliocephalus](#) Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
PLANT			
[Acacia georgensis](#) Bega Wattle [9848]	Vulnerable	Species or species habitat may occur within area	In buffer area only
[Amphibromus fluitans](#) River Swamp Wallaby-grass, Floating Swamp Wallaby-grass [19215]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
[Boronia deanei](#) Deane's Boronia [8397]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Caladenia tessellata](#) Thick-lipped Spider-orchid, Daddy Long-legs [2119]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Callistemon forresterae](#) Forrester's Bottlebrush [56501]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
[Calotis glandulosa](#) Mauve Burr-daisy [7842]	Vulnerable	Species or species habitat may occur within area	In buffer area only
[Correa lawrenceana var. genoensis](#) Genoa River Correa [66626]	Endangered	Species or species habitat known to occur within area	In feature area
[Cryptostylis hunteriana](#) Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat may occur within area	In buffer area only
[Dodonaea procumbens](#) Trailing Hop-bush [12149]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Glycine latrobeana Clover Glycine, Purple Clover [13910]	Vulnerable	Species or species habitat may occur within area	In feature area
Grevillea acanthifolia subsp. paludosa Bog Grevillea [21872]	Endangered	Species or species habitat known to occur within area	In buffer area only
Leionema ralstonii [64926]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Lepidium hyssopifolium Basalt Pepper-cress, Peppercress, Rubble Pepper-cress, Pepperweed [16542]	Endangered	Species or species habitat likely to occur within area	In feature area
Leucochrysum albicans subsp. tricolor Hoary Sunray, Grassland Paper-daisy [89104]	Endangered	Species or species habitat may occur within area	In buffer area only
Nematolepis rhytidophylla [64936]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Pomaderris cotoneaster Cotoneaster Pomaderris [2043]	Endangered	Species or species habitat known to occur within area	In feature area
Pomaderris parrisiae Parris' Pomaderris [22119]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Pomaderris sericea Bent Pomaderris [9597]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Prasophyllum petilum Tarengo Leek Orchid [55144]	Endangered	Species or species habitat may occur within area	In buffer area only
Pterostylis chlorogramma Green-striped Greenhood [56510]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Pultenaea parrisiae [56699]	Vulnerable	Species or species habitat known to occur within area	In feature area
Thelymitra matthewsii Spiral Sun-orchid [4168]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat may occur within area	In feature area
Xerochrysum palustre Swamp Everlasting, Swamp Paper Daisy [76215]	Vulnerable	Species or species habitat known to occur within area	In feature area

Listed Migratory Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area	In feature area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
[Gallinago hardwickii](#) Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area	In feature area
[Numenius madagascariensis](#) Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area

Other Matters Protected by the EPBC Act

Listed Marine Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
[Actitis hypoleucos](#) Common Sandpiper [59309]		Species or species habitat may 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]		Species or species habitat may occur within area overfly marine area	In feature area
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area overfly marine area	In feature area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area overfly marine area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Neophema chrysostoma Blue-winged Parrot [726]		Species or species habitat likely to occur within area overfly marine area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area	In feature area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area

Extra Information

State and Territory Reserves [Resource Information]

Protected Area Name	Reserve Type	State	Buffer Status
Bondi Gulf	Nature Reserve	NSW	In buffer area only
Coopracambra	National Park	VIC	In buffer area only
Genoa	Wilderness Zone	VIC	In buffer area only
Genoa River	Heritage River	VIC	In buffer area only
Letts Mountain	Flora Reserve	NSW	In buffer area only
Mount Poole	Flora Reserve	NSW	In buffer area only
South East Forest	National Park	NSW	In feature area
Wallagaraugh	Flora Reserve	NSW	In buffer area only
Winnot Creek	Natural Catchment Area	VIC	In buffer area only
Winnot Creek	Reference Area	VIC	In buffer area only

Regional Forest Agreements [Resource Information]

Note that all areas with completed RFAs have been included.

RFA Name	State	Buffer Status
East Gippsland RFA	Victoria	In buffer area only

RFA Name	State	Buffer Status
Eden RFA	New South Wales	In feature area

Nationally Important Wetlands [Resource Information]

Wetland Name	State	Buffer Status
Genoa River	VIC	In buffer area only

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Biodiversity Impacts Audit	2011/6191	Not Controlled Action	Completed	In buffer area only
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed	In feature area
Not controlled action (particular manner)				
Aerial baiting for wild dog control	2006/2713	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval	In feature area

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 are 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

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

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

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
- 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

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-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
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-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
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-Other groups and individuals

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Please feel free to provide feedback via the Contact Us page.

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