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MNES Baseline Report

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Beerburrum to Nambour Rail Upgrade Project

MNES Baseline Report



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CONTENTS

EXECUTIVE SUMMARY	1
1. INTRODUCTION	1
1.1 Project Background	1
1.1.1 Project Stages.....	2
1.1.2 EPBC Act Referral	3
1.1.3 Previous Studies	4
1.2 Scope	5
1.3 Objectives.....	5
2. LEGISLATION, POLICY, STANDARDS AND GUIDELINES.....	6
2.1 MNES Significant Impact Guidelines 1.1 (DoE 2013)	6
2.2 EPBC Act Referral Guidelines for the Vulnerable Koala (DoE 2014).....	6
2.3 EPBC Act Referral Guideline for Management Actions in Grey-headed and Spectacled Flying-fox Camps (DoE 2015a)	7
2.4 Draft Guide to Nationally Protected Species Significantly Impacted by Paddock Tree Removal (DAWE, 2021a).....	7
2.5 Referral guideline for 14 birds listed as migratory species under the EPBC Act (DoE, 2015b).....	7
2.6 National Recovery Plans and Survey Guidelines (DAWE, 2021a).....	7
2.6.1 National Recovery Plan for the Grey-headed Flying-fox (DAWE, 2021b)	7
2.6.2 Approved Conservation Advice for Phascolarctos cinereus (combined populations in Queensland, New South Wales and the Australian Capital Territory) (DSEWPC, 2012).....	8
2.6.3 National recovery plan for Stream Frogs of South-east Queensland 2001-2005 (Hines, 2002).....	8
2.6.4 National recovery plan for Acacia attenuata (Brownlie, 2007)	8
2.6.5 National recovery plan for Mt Emu she-oak (QPWS, 2007)	8
2.6.6 Sothern Macadamia Species Recovery Plan (Costello et al., 2007)	8
2.6.7 Survey guidelines for Australia's threatened frogs: Guidelines for detecting frogs listed as threatened under the EPBC Act (DAWE, 2010)	9
2.6.8 Survey Guidelines for Australia's Threatened Mammals (DSEWPC, 2011)	9
2.6.9 Flora Survey Guidelines – Protected Plants NC Act (Flora Survey Guidelines) (DEHP, 2014a).....	9
3. ASSESSMENT METHODOLOGY	10
3.1 Overview.....	10
3.1.1 Desktop Review	10
3.1.2 Field Investigations	11
3.2 Habitat Mapping.....	29
3.3 Likelihood of Occurrence	29
4. ECOLOGICAL VALUES	38
4.1 Habitat Assessments	38
4.2 Modified Habitat Quality Assessment	47
4.3 Koala Habitat Trees	47
4.4 Existing Environment	49
4.5 Threatened Ecological Communities	50
4.6 Threatened Species (EPBC Act Listed).....	51
4.6.1 Koala (Phascolarctos cinereus)	51
4.6.2 Grey-headed flying-fox (Pteropus poliocephalus)	52
4.6.3 Giant barred frog (Mixophyes iteratus).....	54
4.6.4 Migratory species.....	54
4.6.5 Whipstick wattle (Acacia attenuata)	55
4.6.6 Mt Emu she-oak (Allocasuarina emuina)	55

4.6.7	Swamp stringybark (<i>Eucalyptus conglomerata</i>)	55
4.6.8	Macadamia nut (<i>Macadamia integrifolia</i>)	55
4.7	Wetlands of International Importance	56
5.	CONCLUSION	57
6.	REFERENCES	58

APPENDIX A	LIKELIHOOD OF OCCURRENCE
APPENDIX B	BIRD SPECIES OBSERVED DURING FIELD SURVEYS
APPENDIX C	PMST RESULTS
APPENDIX D	HABITAT MAPPING
APPENDIX E	SURVEY LOCATIONS

List of Tables

Table 2-1: Key Legislation and Policy Context	6
Table 3-1: Relevant Desktop Sources	10
Table 3-2: Previous B2N Project Field Investigations	12
Table 3-3: Additional Field Investigations, April-May 2021	14
Table 3-4: Approved Survey Guidelines, Survey Effort and Adequacy	17
Table 3-5: Likelihood of Occurrence Criteria	30
Table 3-6: Likelihood of Occurrence Summary	31
Table 4-1: Habitat Assessment Summary	39
Table 4-2: Site Condition Scores	47
Table 4-3: Approximate Koala Habitat Tree Count in B2N Project Area	48
Table 4-4 : Critical Koala Habitat Analysis	48
Table 4-5: Summary of MNES Relevant to the Project Area	49
Table 4-6: Likelihood of Occurrence of Threatened Ecological Communities within the Project Area	50
Table 4-7: Grey-headed flying-fox camps within 40km radius of Project Area	53

Acronyms and Abbreviations

ALA	Atlas of Living Australia
B2N Upgrade Project	Beerburrum to Nambour Rail Upgrade Project
BACI	Before and After Control Impact
BUS	Bird Utilisation Survey
DAF	Department of Agriculture and Fisheries (Qld)
DAWE	Department of Agriculture, Water and the Environment (Cth)
DBC	Detailed Business Case
DES	Department of Environment and Science (Qld)
DIWA	Directory of Important Wetlands in Australia
DNRME	Department of Resources (Qld)
EIS	Environmental Impact Statement
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cth)
ESD	Ecologically Sustainable Development
Fisheries Act	<i>Fisheries Act 1994</i> (Qld)
Flying-Fox Referral Guidelines	Referral guideline for management actions in grey-headed and spectacled flying-fox camps
GPS	Global Positioning System
KHT	Koala habitat tree
Koala Referral Guidelines	Referral guidelines for the vulnerable koala (combined populations of Queensland, New South Wales and the Australian Capital Territory)
LC	Least Concern
Migratory Bird Referral Guidelines	Referral guideline for 14 birds listed as migratory species under the <i>EPBC Act</i>
MNES	Matters of National Environmental Significance
MSES	Matters of State Environmental Significance
NC Act	<i>Nature Conservation Act 1992</i> (Qld)
OC	Of Concern
OMP	Offset Management Plan
PD	Preliminary Documentation
PMST	Protected Matters Search Tool
QLD	Queensland
QPWS	Queensland Parks and Wildlife Service
RE	Regional Ecosystem
REF	Review of Environmental Factors (SMEC, 2019)
SDAP	State Development Assessment Provisions
SIG 1.1	Significant Impact Guidelines 1.1 - Matters of National Environmental Significance
SPRAT	Species Profile and Threats Database
SRI	Significant Residual Impact
TEC	Threatened Ecological Community
DTMRTMR	Department of Transport and Main Roads (Qld)
WO	Wildlife Online

EXECUTIVE SUMMARY

Environmental Resources Management Australia Pty Ltd (ERM) was commissioned by The Department of Transport and Main Roads (TMR) to conduct an ecological assessment for a rail upgrade project in south-eastern Queensland, the Beerburum to Nambour Rail Upgrade Project, herein referred to as the B2N Project.

The proposed development includes rail duplication between Beerburum and Landsborough and other infrastructure improvements, such as station upgrades and additional passing loops between Landsborough and Nambour. The project will address capacity constraints on this section of the rail corridor by increasing the capacity for freight paths and the reliability of passenger services to ease pressure on the Bruce Highway.

An ecological assessment has been undertaken to assess the Matters of National Environmental Significance (MNES) that may be impacted by the Beerburum to Nambour Rail Upgrade Project (the B2N Project). The MNES Baseline Report includes a description of values to MNES within the Project Area. For the purpose of this MNES Baseline Report, the Project Area refers to the B2N Project disturbance footprint (Early Works, Stage 1, Stage 2) and buffer of 50 m either side of the development footprint. Following submission of an EPBC Act Referral in 2020, an assessment of the B2N Project by Preliminary Documentation will be required under the Environment Protection and Biodiversity Conservation Act 1999.

Previous field based ecological investigations have been undertaken in the Project Area in 2016 and 2020, and information obtained from these investigations is appropriately referenced in this report. In March 2021, a new PMST search was evaluated using information obtained from desktop resources, previous ecological assessments and targeted field surveys in 2021 to define MNES known, likely and with potential to occur within the Project Area and are the subject of this MNES Baseline Report.

The majority of the Project Area consists of urban and agricultural cleared areas and associated infrastructure. The condition of vegetation within the Project Area is highly modified as a result of previous and current land management practices (urban use, agriculture and the existing rail line). Much of the remnant vegetation occurs in small to medium sized linear patches throughout the project alignment, with some vegetation in the southern sections being connected to vegetation adjacent to the Project Area, including Glass House Mountains National Park. Some riparian areas and small farm dams occur throughout the Project Area. However, these are regarded as providing low ecological value due to degradation from heavy weed infestations.

In total, seven EPBC Act listed threatened species and seven listed migratory species were identified as known or likely to occur in the Project Area. No MNES TECs were identified as occurring within the Project Area. Where potential habitat occurs in the Project Area for these species, detailed ground trothed habitat mapping has been prepared and presented in this report.

The B2N Project will occur across a 256.9 ha indicative disturbance footprint, with 64.15 ha of habitat critical to the survival of the koala (habitat score of five) and grey-headed flying-fox within the disturbance footprint. The information presented in this report will be used to inform the development of Preliminary Documentation, in response to DAWE requirements, as part of the process for assessment under the EPBC Act.

1. INTRODUCTION

This MNES Baseline Report documents a baseline assessment of the MNES values associated with the Beerburum to Nambour Rail Upgrade Project (the B2N Project). For the purpose of this MNES Baseline Report, the Project Area refers to the B2N Project disturbance footprint (Early works, Stage 1, Stage 2) and buffer of 50 m either side of the disturbance footprint.

Previous field based ecological investigations have been undertaken in the Project Area in 2016 and 2020, and information obtained from these investigations is appropriately referenced in this report. In March 2021, a new m PMST search was evaluated using information obtained from desktop resources, previous ecological assessments and targeted field surveys in 2021 to define MNES known, likely and with potential to occur within the Project Area and are the subject of this MNES Baseline Report.

The MNES values described in this report have been used to support an assessment of potential impacts, proposed management measures and offsetting for assessment under the *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)*.

1.1 Project Background

The Queensland Department of Transport and Main Roads (TMR) are responsible for the delivery of planning, design and construction of the B2N Project, which focusses on a 39 km of rail track between Beerburum (southern) and Nambour (northern). Construction of the B2N Project generally involves:

- Site establishment including setting up site offices, workforce amenities and car parking, equipment storage, lay down areas and survey set-out to delineate site boundaries;
- Property demolitions;
- Pre-clearing activities such as fauna and flora surveys, site inspections, baseline monitoring, planning implementation of erosion and sediment control devices and, other preliminary assessments;
- Vegetation clearing, within approved boundaries and salvage of fauna hollows and other marketable timber;
- Further installation of site-wide erosion and sediment control devices;
- Bulk earthworks including cut and fill and placement of rail formation and ballast;
- Track laying, signalling, OHLE and other associated rail infrastructure works;
- Railway infrastructure construction (including underground and above ground infrastructure);
- Soil and materials storage;
- Soil remediation, where required;
- Drainage construction;
- Pile driving and bridge construction;
- Relocation of services and public utility plant (PUP), including power transmission, water, sewer and telecommunications;
- Road pavement construction;
- Installation of road furniture and traffic signals;
- Commissioning of signalling devices;
- Decommissioning of redundant railway infrastructure;
- Waste removal;

- Line marking;
- Land rehabilitation and landscaping;
- Offsets and revegetation;
- Removal of temporary erosion and sediment control devices;
- Asset handover to returned works owners (e.g. QR, SCC and others)

Activities and potential benefits and/or impacts associated with the operation of the built asset include:

- Increased freight and passenger train movements;
- Reduced operational costs;
- Potential improvements to road congestion by increased train movements and capacity;
- Improved and dedicated parking in the upgraded park 'n' ride facilities;
- Lesser negative environmental externalities, e.g. a reduction in emissions by freight transported on rail rather than road;
- Impact on heritage township character from the upgrading of stations, if not addressed during design;
- Localised change in local amenity due to increased noise from station operations and to the visual environment as a result of views of the new infrastructure;
- Improved public transport reliability, accessibility and usage;
- Improved level crossing safety;
- Reduced travel times and better connectivity to town centres and community services; and
- Reduced services interruptions and delays due to increased capacity and capability.

1.1.1 Project Stages

The B2N Project is to be delivered in two stages following Early Works, with specific works proposed within each stage, including:

- **Early Works** – Works are located between Nursery Road and Moffatts Road, Glasshouse Mountains, including:
 - Realignment of Steve Irwin Way, and related PUP relocations from Nursery Road to Barrs Road, in the Glasshouse Mountains; and
 - PUP relocations at Beerburum and Glasshouse Mountains.
- **Stage 1** – Works are located between Beerburum and Landsborough, including:
 - Road works to accommodate the new rail corridor and track infrastructure;
 - PUP relocations and other enabling works in road reserve from Beerburum to Landsborough;
 - Duplication of the section of rail between Beerburum and Glass House Mountains on an improved alignment, and between Glass House Mountains and 2 km north of Beerwah within the existing corridor;
 - Beerburum Road and Steve Irwin Way intersection upgrade including a new road overpass on Beerburum Road;
 - Replacement of the Barrs Road level crossing in Glass House Mountains with a new road overpass connecting Barrs Road to Moffatt Road;
 - Replacement of Burgess street road-over-rail bridge with a new road overpass;

- Expansion of the park 'n' ride facility on the northern side of Beerburrrum station (partial);
- Re-signalling of the corridor from Beerburrrum to Beerwah with bi-directional 3 aspect signals including automatic train protection (ATP) and European Train Control System (ETCS) level 1 integration; and
- Power systems upgrades required to facilitate the new track and capacity.

Stage 1 is planned to commence in late 2021 or as soon as an approval under the *EPBC Act* is received.

■ **Stage 2** – Works are located between Beerwah and Landsborough and in discrete sections in Mooloolah Valley, Palmwoods, Woombye, and Nambour, including:

- Duplication of the section of rail between Beerwah and Landsborough within the existing alignment;
- Replacement of the Caloundra Street level crossing with a grade separated crossing;
- Extension of existing passing loops at Landsborough, Eudlo and Woombye;
- Expansion of park 'n' ride facilities at Beerburrrum (remainder), Landsborough (remainder), Palmwoods and Nambour (remainder) stations;
- Replacement of the temporary single platforms at Mooloolah, Eudlo,
- Palmwoods and Woombye stations with permanent dual platforms connected by lifts and overbridges;
- Re-signalling of the corridor from Beerwah to Nambour with bi-directional 3 aspect signals including ATP and ETCS level 1 integration;
- PUP (e.g. Telstra) relocations and enabling works.

Stage 2 is currently unfunded and the timing for construction is unknown at the time of drafting this MNES Baseline Report.

1.1.2 EPBC Act Referral

The *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)* has the objective to provide protection for the environment within Australia. The *EPBC Act* applies to actions that have, or are likely to have, a significant impact on a MNES and require approval from the Australian Government Minister for the Environment before they can proceed. MNES protected under the *EPBC Act* include:

- World heritage properties
- National heritage properties
- Wetlands of international importance (listed under the Ramsar Convention)
- Listed threatened species and ecological communities
- Migratory species protected under international agreements
- Commonwealth marine areas
- The Great Barrier Reef Marine Park
- Nuclear Actions (including uranium mines)
- Water resources, in relation to coal seam gas development and large coal mining development.

Other Matters protected by the *EPBC Act* include:

- The environment, where actions proposed are on, or will affect Commonwealth land and the environment and
- The environment, where Commonwealth agencies are proposing to take an action.

Ecological investigations have identified that MNES values have the potential to occur within, or adjacent to the Project Area and may be impacted by the proposed B2N Project. Accordingly, an *EPBC Act* Referral was made to the Commonwealth Department of Agriculture, Water and the Environment (DAWE) on 30 September 2020 (Reference: EPBC 2020-8803). The original *EPBC Act* Referral only included Stage 1 and Stage 2 of the B2N Project. The *EPBC Act* Referral excluded the Early Works because in pre-referral meetings with DAWE in February and August 2020, TMR identified that due to timing of the proposed early works, they would likely occur prior to the *EPBC Act* Referral decision. Advice from DAWE indicated that the Referral would need to clearly state that the Early Works are not part of the proposed action, and provide an assessment showing that the Early Works would not be likely to have a significant impact on MNES.

Subsequent to the lodgement of the *EPBC Act* Referral and further discussions between TMR and DAWE, TMR has requested a variation of the *EPBC Act* Referral under section 156 A (1) of the *EPBC Act* on 22 December 2020 so that an assessment of potential impacts to MNES associated with the Early Works, in addition to the impacts already referred from Stages 1 and 2, could be undertaken.

Initial assessment of the referred action was undertaken by DAWE, with a determination made on 12 January 2021 that the B2N Project, including the Early Works, Stage 1 and 2, is a 'controlled action' to be assessed by Preliminary Documentation (PD) and requiring approval under the *EPBC Act* before proceeding. A scope for PD was received from DAWE on 27 January 2021. The DAWE PD scope included requests to survey and assess for threatened species listed under the *EPBC Act* and their habitat that may or are likely to occur in the Project Area, and determine the potential for significant impacts to MNES.

ERM was engaged, after the PD request was issued by DAWE, to assess and confirm the impact of the Early Works, Stage 1 and Stage 2 on MNES. This included review of existing *EPBC Act* Referral documentation, further desktop assessments and ground-truthing surveys. ERM will also develop the final PD Report and will be coordinating the response to DAWE and the subsequent phases of the assessment. Other project stakeholders may be involved such as Queensland Rail and Sunshine Coast Council, particularly with respect to offsets.

1.1.3 Previous Studies

Previous detailed ecological assessments have been undertaken for the B2N Project.

The first assessment was contained within the Review of Environmental Factors (REF) prepared by SMEC (2019) to support the Detailed Business Case (DBC) for the B2N Project. This report was first prepared in 2016 and was updated in 2019 to address changes in legislation and the B2N Project reference design. The REF, SMEC 2019 describes the existing environmental and heritage values within the Project Area as of October 2019. It, identifies and assesses potential impacts of the B2N Project proposal, and proposes management and mitigation measures. The REF, SMEC 2019 also describes the methods adopted in the ecological surveys and investigations and it highlights residual matters requiring further investigation, assessment, management or mitigation in future stages of the B2N Project.

The second assessment was documented in the Commonwealth Matters Ecological Report (ARUP 2020) prepared to support the Referral to DAWE under the *EPBC Act* for the B2N Project (EPBC 2020/8803). The Commonwealth Matters Ecological Report (ARUP 2020) detailed the following:

- A description of the action and its components;
- A description of the ecological values relevant to MNES and MSES in the Project Area, with reference to Commonwealth legislation, as derived from desktop and field investigations;
- An assessment of potential impacts of the B2N Project on MNES likely to occur in the Project Area;
- Proposed measures to avoid, minimise and mitigate the potential impacts on MNES; and
- Impact assessment in accordance with relevant guidelines including the MNES Significant Impact Guidelines (SIG 1.1) ((Department of the Environment (DoE) 2013).

1.2 Scope

ERM was engaged by TMR to respond to the DAWE's request for Preliminary Documentation. From a review of the DAWE Request for Additional Information Required for Assessment by Preliminary Documentation dated 27 January 2021, and previous studies prepared for the B2N Project (refer to Section 1.1.3), it was determined that additional ecological assessments were required to fill information gaps. Additional ecological assessments undertaken by ERM include: a new search of the PMST tool to check whether new threatened species may or a likely to occur in the Project Area; field surveys in accordance with the relevant Federal and State government guidelines and detailed mapping of habitat values to inform the quantification of impacts and required offsets. The assessment methodology is outlined in Section 3.

Accordingly, this MNES Baseline Report consolidates information gathered from previous studies by others as well as additional studies conducted by ERM, to inform a description of values of the Project Area for MNES and to support impact assessments as required by the DAWE's PD request.

1.3 Objectives

The purpose of this MNES Baseline Report is to document existing ground-truthed ecological values relevant to MNES within the Project Area. The specific objectives are to:

- Undertake a current search of the PMST and identify whether new listed threatened species, not previously surveyed, are known, likely or have potential to occur within the Project Area;
- Identify the likelihood of presence of listed threatened species and their associated habitat in the Project Area, based on desktop and field collected information;
- Describe and map ecologically significant flora and fauna habitats, including MNES, based on desktop and field collected information;
- Assess the quality and importance of known or potential habitat for MNES within the Project Area;
- Evaluate the ecological significance (values and constraints) of the Project Area;
- Document the abundance, distribution, ecology and habitat preference of the MNES within and surrounding the Project Area; and
- Use the information documented in this MNES Baseline Report to inform the project design to maximise the reduction or avoidance of impact where possible and inform calculation of offset requirements.

2. LEGISLATION, POLICY, STANDARDS AND GUIDELINES

This ecological assessment has been undertaken with consideration of Commonwealth regulatory frameworks and associated legislation. Table 2-1 summarises the relevant legislation and policies to this ecological assessment.

Table 2-1: Key Legislation and Policy Context

Act/Policy	Administering Authority	Purpose
Commonwealth Legislation		
<i>Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)</i>	DAWE	<p>This act administers the protection of the environment within Australia – in particular Matters of National Environmental Significance (MNES), which include:</p> <ul style="list-style-type: none">■ World heritage properties■ National heritage properties■ Wetlands of international importance (listed under the Ramsar Convention)■ Listed threatened species and ecological communities■ Migratory species protected under international agreements■ Commonwealth marine areas■ The Great Barrier Reef Marine Park■ Nuclear Actions (including uranium mines)■ Water resources, in relation to coal seam gas development and large coal mining development. <p>Other Matters protected by the <i>EPBC Act</i> include:</p> <ul style="list-style-type: none">■ The environment, where actions proposed are on, or will affect Commonwealth land and the environment■ The environment, where Commonwealth agencies are proposing to take an action
<i>EPBC Act Environmental Offsets Policy 2012</i>	DAWE	<p>This policy applies where a significant residual impact on a MNES is expected to occur as a result of the B2N Project. The policy provides guidance on the role of offsets and when a proposed offset is considered suitable.</p>

The following impact guidelines are relevant to this MNES Baseline Report as MNES have been identified as having the potential to occur within the Project Area.

2.1 MNES Significant Impact Guidelines 1.1 (DoE 2013)

The SIG 1.1 (DoE 2013) provide the overriding guidance on how to determine whether a proposed action is likely to have a significant impact on MNES listed under the *EPBC Act*. The guidelines outline a self-assessment process that include detailed criteria, to assist in determining whether a Referral will be required to the DAWE, for a decision by the Australian Government Environmental Minister.

2.2 EPBC Act Referral Guidelines for the Vulnerable Koala (DoE 2014)

The *EPBC Act Referral guidelines for the vulnerable koala (combined populations of Queensland, New South Wales and the Australian Capital Territory)* (Koala Referral Guidelines) (DoE 2014) aim to provide guidance on the protection and conservation of the distribution of koalas throughout Australia. The guideline will be used to assess impacts to koalas, as a result of the B2N Project.

2.3 ***EPBC Act Referral Guideline for Management Actions in Grey-headed and Spectacled Flying-fox Camps (DoE 2015a)***

The grey-headed flying-fox (*Pteropus poliocephalus*) and the spectacled flying-fox (*Pteropus conspicillatus*) are both listed as vulnerable species under the EPBC Act. The EPBC Act Referral guideline for management actions in grey-headed and spectacled flying-fox camps (Flying-Fox Referral Guidelines) (DoE 2015a) aims to provide guidance and reduce significant impacts on the EPBC Act listed flying-foxes due to actions aimed at managing their camps. This Guideline is designed to be read from the perspective of a person proposing to take an action that may have a significant impact on the grey-headed or spectacled flying-fox.

This guideline is relevant to this MNES Baseline Report as one grey-headed flying-fox camp is known to occur within 100 m of the Project Area, at Kolora Park, Palmwoods. This guideline will be reviewed wherever actions from the B2N Project may impact on grey-headed flying-fox camps.

2.4 ***Draft Guide to Nationally Protected Species Significantly Impacted by Paddock Tree Removal (DAWE, 2021a)***

The *draft Guide to Nationally Protected Species Significantly Impacted by Paddock Tree Removal* (DAWE, 2021a) has been developed by DAWE to assist landholders to determine if removing their paddock trees will need approval under national environmental law. In some circumstances, scattered trees contribute to the viability of threatened species populations in agricultural landscapes by providing important nesting, roosting and foraging habitat and maintaining connectivity between larger patches of vegetation.

This guideline is relevant to this MNES Baseline Report as individual paddock trees are present in the Project Area. The guideline will be utilised to assess and nesting, roosting and foraging habitat associated with individual paddock trees in the Project Area as well as identifying where they contribute to maintenance of connectivity between larger patches of vegetation.

2.5 ***Referral guideline for 14 birds listed as migratory species under the EPBC Act (DoE, 2015b)***

The *Referral guideline for 14 Birds Listed as Migratory Species Under the EPBC Act* (Migratory Bird Referral Guidelines) applies to 14 birds which are listed as migratory species under the *EPBC Act*. These 14 birds are protected under the *EPBC Act* because they are included in one or more international agreements in which Australia is a party. Given some of these birds have widespread distributions and occupy relatively broad habitats, these species or their habitats are often detected during surveys as part of environmental impact assessments. This guideline provides guidance to assess the potential for significant impacts on one or more of these species.

This guideline is relevant to this MNES Baseline Report as birds listed as migratory species under the EPBC Act have been identified as having the potential to occur within the Project Area from desktop sources and field investigations.

2.6 ***National Recovery Plans and Survey Guidelines (DAWE, 2021a)***

The following national recovery plans and survey guidelines provide relevant strategies and guidance to this MNES Baseline Report as MNES have been identified as having the potential to occur within the Project Area from desktop sources and field investigations analysis.

2.6.1 ***National Recovery Plan for the Grey-headed Flying-fox (DAWE, 2021b)***

This recovery plan was prepared by the Australian Government. The document was jointly made under the *EPBC Act* with the South Australian Government to act as a national recovery plan for the species. The plan sets out the management and research actions required to halt the decline and aid

the recovery of the grey-headed flying-fox over the next 10 years. The actions outlined in this plan aim to improve the national population trend; as well as identifying, protecting and increasing the foraging and roosting habitat for the species.

This national recovery plan is relevant to this MNES Baseline Report as the grey-headed flying-fox is known to occur within the Project Area from desktop sources and field investigations analysis. This national recovery plan will provide information relevant to the assessment of potential impacts, associated with the B2N Project, which can interfere with the recovery of the species.

2.6.2 Approved Conservation Advice for *Phascolarctos cinereus* (combined populations in Queensland, New South Wales and the Australian Capital Territory) (DSEWPC, 2012)

This brief advice distils research and management actions previously given in the *National Koala Conservation and Management Strategy 2009-2014*, many recommendations provided in the Senate Inquiry into the status, health and sustainability of Australia's koala population, and includes some consideration of research and management actions within a series of existing local and regional koala management plans (DSEWPC, 2012).

2.6.3 National recovery plan for Stream Frogs of South-east Queensland 2001-2005 (Hines, 2002)

This recovery plan was developed by Queensland Parks and Wildlife Service, and the Southeast Queensland Threatened Frogs Recovery Team. The aim of the recovery plan is to improve the conservation status and protection of habitat for each species. This recovery plan is relevant to the B2N Project, as the giant barred frog is known to occur 100 m east of the Project Area. This recovery plan will be utilised as a desktop resource to guide field investigations for the species.

2.6.4 National recovery plan for *Acacia attenuata* (Brownlie, 2007)

This recovery plan was developed by Heather Brownlie for the DAWE in 2007. The aim of the recovery plan is to preserve known populations of the species through management of identified threats. This recovery plan is relevant to the B2N Project, as potential whipstick wattle (*Acacia attenuata*) habitat has been identified within the Project Area. This recovery plan will be utilised as a desktop resource to guide field investigations for the species.

2.6.5 National recovery plan for Mt Emu she-oak (QPWS, 2007)

This recovery plan was developed by the Queensland Parks and Wildlife Service (QPWS) in 2007. The aim of the recovery plan is to preserve known populations of the species through management of identified threats. This recovery plan is relevant to the B2N Project, as potential Mt Emu she-oak (*Allocasuarina emuina*) habitat has been identified within the Project Area. This recovery plan will be utilised as a desktop resource to guide field investigations for the species.

2.6.6 Sothorn Macadamia Species Recovery Plan (Costello et al., 2007)

This recovery plan was developed by Horticulture Australia Limited, Sydney in 2007. The aim of the recovery plan is to preserve known populations of the four southern macadamia species through management of identified threats and increased community awareness of threats to the species. This recovery plan is relevant to the B2N Project, as potential macadamia nut (*Macadamia integrifolia*) habitat has been identified within the Project Area. This recovery plan will be utilised as a desktop resource to guide field investigations for the species.

2.6.7 Survey guidelines for Australia's threatened frogs: Guidelines for detecting frogs listed as threatened under the EPBC Act (DAWE, 2010)

These survey guidelines were prepared by the Australian Government. They are intended to act as a guide to surveying Australia's threatened frogs listed under the EPBC Act. These guidelines help determine the likelihood of a species' presence or absence at a site. The guidelines were prepared using a variety of expert sources and should be read in conjunction with the SIG 1.1. The survey guidelines for Australia's threatened frogs will guide the methodologies used to detect EPBC Act listed frog species potentially occurring in the Project Area.

2.6.8 Survey Guidelines for Australia's Threatened Mammals (DSEWPC, 2011)

The survey guidelines were prepared by the Australian Government in consultation with various species experts. The guidelines provide details regarding the effort and methods considered appropriate when completing surveys for mammals listed as threatened under the *EPBC Act*. They provide an overview of survey methods and the expectations from DAWE with regard to threatened mammals. The survey guidelines for Australia's threatened mammals will guide the methodologies used to detect *EPBC Act* listed mammal species potentially occurring in the Project Area.

2.6.9 Flora Survey Guidelines – Protected Plants NC Act (Flora Survey Guidelines) (DEHP, 2014a)

These guidelines were prepared by the Queensland Government and are the most suitable guidelines for use in surveying for MNES flora species in Queensland. The guidelines provide detail for qualifications required, and methods required for flora surveys. The flora survey guidelines will guide the methodologies used to detect *EPBC Act* listed flora species potentially occurring in the Project Area.

3. ASSESSMENT METHODOLOGY

3.1 Overview

This section outlines the methodology implemented to identify ecological values relevant to MNES in the Project Area, inform avoidance measures, and assess likely impacts so that appropriate management and mitigation measures can be proposed.

The general approach consisted of a desktop review to identify values that may be present and to guide development of field survey sampling, followed by a field survey program that collected data to describe on-ground conditions as it relates to MNES.

3.1.1 Desktop Review

Several desktop sources were examined to review and document the ecological values relevant to MNES within the Project Area, and to guide the design of field investigations. The most relevant desktop sources to this MNES Baseline Report are summarised in Table 3-1.

Table 3-1: Relevant Desktop Sources

Information Source	Name	Data Description
DAWE	PMST	<p>The search tool provides predictive results of MNES based on mapping of known and potential species distribution, habitat, ecological communities and wetlands. The outputs are based on modelling results and do not necessarily reflect known records of species or communities. The features highlighted by the search are considered further through a likelihood of occurrence assessment (see Appendix A).</p> <p>Search area: To follow the linear nature of the Project Area the search coordinates utilised for the PMST search are as follows; Nambour -26.62594, 152.95742 to -26.62706 152.95632, Wombye -26.65882 152.96212 to -26.67203, 152.96315, Palmwoods -26.68577, 152.95955 to -26.69059, 152.96133, Eudlo -26.72597, 152.95684 to -26.73302, 152.96255 and Landsborough to Beerburum -26.81016, 152.96665 to -26.95868 152.95875 (with a 2 km buffer around the middle point of the Project Area). The searches were completed on Monday 08 March 2021 and are provided in Appendix C.</p>
DNRME	Regional Ecosystem Version 8.0 mapping	This product maps remnant vegetation communities across Queensland and identifies communities listed as endangered, of concern or least concern status.
DNRME	Property Maps of Assessable Vegetation mapping (published 4 May 2017)	This product provides certified property scale maps indicating where landholders can clear regrowth in 'Category X' areas without further approval.
DNRME	Queensland Globe	A Google Earth based product that allows viewing of spatial data and imagery covering Queensland.
Department of Science, Information Technology and Innovation (DSTIA)	Wildlife Online (WO)	A database that contains records of wildlife sightings including threatened flora and fauna species (protected under the NC Act) that have been provided to the agency by Government departments and external organisations.
ala.org.au	Atlas of Living Australia (ALA)	Australia national biodiversity database (supported by the National Collaborative Research Infrastructure Strategy, CSIRO). Database contains records accessed through an interactive spatial portal. Threatened species are searched to identify known records in proximity to the Project Area.

Information Source	Name	Data Description
SMEC	SMEC (2019) Review of Environmental Factors Report	This Review of Environmental Factors (SMEC 2019) was prepared to support the Business Case for the B2N Project, and has been updated in 2019 to address changes in legislation and the B2N Project design. The Review of Environmental Factors (SMEC 2019) describes the existing environmental and heritage values within the Project Area as of October 2019, identifies and assesses potential impacts of the B2N Project proposal, and recommends management and mitigation measures.
ARUP	ARUP(2020) Commonwealth Matters Ecological Report	The purpose of the Commonwealth Matters Ecological Report (ARUP 2020) was to support a Referral to DAWE under the <i>EPBC Act</i> for the B2N Project and describes MNES values based on desktop and field surveys.
Detection Dogs for Conservation, University of the Sunshine Coast (USC)	USC (2020 and 2021) Koala Survey Using Detection Dogs Beerburum to Nambour Rail Upgrade	USC was contracted by TMR to complete two separate koala presence surveys using detection dogs across potential koala habitat within the Project Area in August 2020 and during the breeding season (August to January) in January 2021. Two separate survey reports were provided to TMR following the surveys. No evidence of Koala presence were detected.
DoEE	Species Profile and Threats Database (SPRAT)	The SPRAT profiles and associated conservation advice documents were consulted for the following reasons: They provide detailed information for the Likelihood of Occurrence assessment on: <ul style="list-style-type: none">■ Species distribution■ Species habitat preferred and general The conservation advice documents are particularly important for assessing threatened ecological communities (TECs) found in field surveys, against the listed TEC guidelines.

3.1.2 Field Investigations

Field investigations were undertaken in the previous studies, with additional field surveys undertaken by ERM to meet DAWE's requirements for the PD. The following section provides details of all field investigations.

3.1.2.1 Previous Field Investigations

In addition to publicly available desktop sources, the field investigations completed for the REF, SMEC 2019 and the Commonwealth Matters Ecological Report, ARUP 2020 were examined to define the targeted MNES values for this MNES Baseline Report.

Review of Environmental Factors SMEC 2019 (REF, SMEC 2019)

Field surveys conducted for the REF occurred over five days in June 2016 and August 2019. *"The survey sites were intended to provide a systematic overview of the vegetation type, vegetation condition, habitat values and waterway values along the alignment. Vegetation mapped as REs was specifically targeted where possible"* (SMEC, 2019). There were thirty-four sites surveyed within the Project Area in 2016 and five sites assessed in 2019. These field investigations assessed threatened and migratory fauna listed under State and Commonwealth legislation for their likelihood of occurrence based on community type (e.g. REs), habitat structure and fauna features (e.g. hollow-bearing trees, foraging resources) suitable to support threatened fauna species. Targeted surveys were undertaken for the koala (14 SAT surveys).

Commonwealth Matters Ecological Report (ARUP 2020)

Surveys conducted for the Commonwealth Matters Ecological Report (ARUP 2020) occurred in February, March, September and December of 2020. Based on recommendations for further ecological investigations in the Review of Environmental Factors (SMEC 2019), the additional targeted surveys included:

- Threatened Flora and Ecological Communities;
- Koala SAT Surveys and Nocturnal Spotlighting;
- Grey-headed Flying-fox Roosting and Foraging Habitat;
- Threatened Frogs Active Searches and Nocturnal Surveys;
- Threatened Fish Passage and Habitat Values Assessment; and
- Fauna Habitat Assessments.

Koala Survey Using Detection Dogs Beerburrum to Nambour Rail Upgrade (USC 2020, 2021)

USC was contracted by TMR to complete two separate koala surveys using detection dogs across potential koala habitat within the Project Area in August 2020 and during the breeding season (August to January) in January 2021. Two separate survey reports USC (2020 and 2021) 'Koala Survey Using Detection Dogs Beerburrum to Nambour Rail Upgrade' were provided to TMR following the surveys. Two detection dogs were fitted with GPS trackers using a casual transect technique surveying identified koala habitat. The total transect length surveyed is approximately 34.2 km (July 2020) and 41.9 km (January - February 2021) within and adjacent to the Project Area.

Table 3-2 summarises the survey effort for the *EPBC Act* and MSES listed threatened species completed in these previous studies.

Table 3-2: Previous B2N Project Field Investigations

Information Source	Target Species / Values	Sampling Effort / Investigation Period	Methods
Review of Environmental Factors (SMEC 2019)	RE, TEC and threatened flora	RE and TEC verification and flora assessment within project alignment. Conducted over five days from 20 to 24 June 2016 (34 sites) and on 13 August 2019 (5 sites).	Quaternary Assessments (Nelder et al., 2012) at 39 sites. The flora survey consisted of 35 quaternary survey sites in 2016 and four quaternary survey sites in 2019.
Review of Environmental Factors (SMEC 2019)	Threatened fauna habitat	Threatened fauna habitat within project alignment. Conducted over five days from 20 to 24 June 2016 (34 sites) and on 13 August 2019 (5 sites).	As above. Habitat assessments were conducted at each quaternary survey site. While in the field all fauna observed or heard calling were recorded.
Review of Environmental Factors (SMEC 2019)	Koala	Koala SAT	9 sites surveyed in 2016 and 5 sites surveyed in 2019. Two person minutes per tree searching for faecal pellets. Brief search of each tree (30 trees per SAT site) for presence/absence.

Information Source	Target Species / Values	Sampling Effort / Investigation Period	Methods
Commonwealth Matters Ecological Report (ARUP 2020)	Threatened fauna habitat	9 fauna habitat assessments were undertaken in February – September 2020.	Fauna habitat data recorded included: <ul style="list-style-type: none"> ■ slope and aspect; ■ level of disturbance; ■ age structure; ■ abundance of fauna features ■ leaf litter depth and cover; ■ proximity to permanent surface water; and ■ importance of the site as a fauna corridor
Commonwealth Matters Ecological Report (ARUP 2020)	Threatened flora	Flora surveys were conducted from 17 February to 28 February 2020, from 16 March to 18 March 2020 and from 17 September to 18 September 2020. Timing of surveys was suitable for threatened species that have the potential to occur in the Project Area.	Surveys consisted of vegetation community assessments, TEC validations and flora meander surveys using quaternary assessments, as per Neldner et. al, (2019). TEC validations evaluated TEC presence using key diagnostic criteria and condition thresholds outlined within the <i>EPBC Act</i> Approved Conservation Advice.
Commonwealth Matters Ecological Report (ARUP 2020)	Koala	SAT Surveys and Nocturnal Spotlighting	14 SAT surveys were conducted. Nocturnal spotlighting was also conducted at one of the SAT survey site locations for 4 nights, during additional 2020 surveys
Commonwealth Matters Ecological Report (ARUP 2020)	Grey-headed flying-fox	Survey of foraging habitat and permanent or temporary roosts.	During fauna habitat assessments across the Project Area, grey-headed flying-fox foraging habitat and/or roosts were recorded.
Commonwealth Matters Ecological Report (ARUP 2020)	Threatened frogs	Nocturnal frog surveys were conducted during 17 th - 20 th February 2020 and 2 nd - 5 th March 2020. Active searches on 4 nights were undertaken at 4 sites that contained potential habitat for giant barred frog	Survey sites were selected based on potential suitable habitat at creeks and creek tributaries crossing the rail corridor. Methods included; eye-shine spotlighting, call playback and visual searches for tadpoles. Surveys were conducted after nightfall, during moderate to warm temperatures and following rain events.
Commonwealth Matters Ecological Report (ARUP 2020)	Threatened fish	Field survey at waterways and drainages in the Project Area from 24 th to 26 th February 2020. 26 sites were surveyed.	A total of 16 waterways, seven drainages, and two wetland (dams) were surveyed. Rapid assessments using the Queensland AusRivAs field sheets were conducted. Sites were searched for a 100 transect at each location. Macrophyte presence and cover, fish habitat and physical attribute information was recorded.
Koala Detection Dog Survey Report (USC, 2020)	Koala	Detection Dogs. 3 days July – August, 2020	Two detection dogs fitted with GPS trackers using a casual transect technique in potential koala habitat. Total transect length surveyed approximately 34.2 km within and adjacent to Project Area.

Information Source	Target Species / Values	Sampling Effort / Investigation Period	Methods
Koala Detection Dog Survey Report (USC, 2021)	Koala	Detection Dogs. 4 days January –February, 2021	Two detection dogs fitted with GPS trackers using a casual transect technique in potential koala habitat. Total transect length surveyed approximately 41.9 km within and adjacent to Project Area.

3.1.2.2 Additional Field Investigations

Based on ERM's review of previous assessments, desktop and field investigations, it was determined that additional field investigations were required to further target *EPBC Act* listed threatened species and migratory species, to determine likelihood of presence and ground-truthed mapping of habitats. This information will then be used to support quantification of direct and indirect impacts from the B2N Project on MNES known and likely to occur in the Project Area documented in the PD.

Specific field methodologies undertaken in 2021 in addition to previous field surveys to meet this objective are described in the following sections.

Survey Effort

The field investigations for this ecological assessment were undertaken by 6 ecologists over 9 days, in April to May 2021. They involved a field assessment of terrestrial and aquatic habitats and a combination of scientifically robust and approved survey techniques such as: threatened flora meander searches, deploying camera traps, spotlighting and targeted bird surveys. A summary of the survey effort is provided in Table 3-3.

Table 3-3: Additional Field Investigations, April-May 2021

Period	Personnel	Assessment Details
09 April 2021	<ul style="list-style-type: none"> Principal Ecologist Senior Ecologist Ecologist 	Hours: 24 hours Focus: Site familiarisation <ul style="list-style-type: none"> driving tour of rail corridor from Beerburum to Woombye led by TMR vegetation and habitat within Project Area relevant to MNES
20 April – 06 May 2021	<ul style="list-style-type: none"> Principal Ecologist 4 x Ecologists 	Hours: 70 hours Focus: Habitat Assessments <ul style="list-style-type: none"> 35 x habitat assessments relevant to MNES values within and directly adjacent to the Project Area koala faecal pellet surveys (SAT) microhabitat surveys
20 April – 06 May 2021	<ul style="list-style-type: none"> 2 x Ecologist 	Hours: 80 hours Focus: Ground-truthed habitat mapping <ul style="list-style-type: none"> ecologists on foot or driving within and directly adjacent to the Project Area to ground-truth habitat relevant to MNES values
20 April – 06 May 2021	<ul style="list-style-type: none"> 2 x Ecologist 	Hours: 20 hours Focus: Threatened and migratory birds <ul style="list-style-type: none"> dawn and dusk bird utilisation surveys 20 minute timed surveys within and directly adjacent to the Project Area over 9 days 30 sampling locations

Period	Personnel	Assessment Details
		<ul style="list-style-type: none"> ■ opportunistic observations were recorded as well as records of important foraging tree species
04 May – 05 May 2021	<ul style="list-style-type: none"> ■ Principal Ecologist ■ 2 x Ecologists 	Hours: 8 hours Focus: Nocturnal MNES species <ul style="list-style-type: none"> ■ spotlighting meander surveys through suitable habitat relevant to MNES values within and directly adjacent to the Project Area ■ focusing on large tracts of vegetation adjacent to the Rail Corridor and within the Project Area that contained large hollow bearing trees ■ 7 sampling locations ■ approximately 2 hours per survey over 2 nights
27 April – 05 May 2021	<ul style="list-style-type: none"> ■ 2 x Ecologists 	Hours: 240 hours Focus: Terrestrial MNES Fauna <ul style="list-style-type: none"> ■ camera traps deployed at 10 sampling locations within the Project Area ■ scent baits utilised ■ 1 x camera trap set for 5 days at each sampling locations
12 November 2021	<ul style="list-style-type: none"> ■ Ecologist 	Hours: 8 hours Focus: Davidsonia spp. <ul style="list-style-type: none"> ■ flora survey using random meander technique across Lot 1 on RP124412 ■ specimens collected and provided to the Queensland Herbarium for identification

Survey Team

Oversight, guidance and technical review has been undertaken by Partner / Principal Ecologist Dr David Dique, a 25 year experienced ecologist, for each field investigation. David led the overall field survey design and was present at three of the four field survey periods. Adam Pavitt led the delivery of the field survey program, and attended all field surveys. Adam is an experienced ecologist with over six years' experience in undertaking field surveys and environmental assessments. Vegetation assessments, including ground truthing and mapping of TEC's was led by Senior Ecologist Dr Toivo Zoete, a 30 year experienced botanist and vegetation specialist.

ERM's survey team includes:

Dr David Dique – Partner in Charge and Lead Fauna Ecologist

David is a Brisbane based Partner that has held state government and private consultancy roles throughout his 25 year career. David has extensive experience in Queensland's resources and infrastructure sectors, having provided approvals leadership and technical support for a range of clients. Specifically, David has a detailed understanding of principles that underpin biodiversity research, survey and assessment, management, rehabilitation and offsetting. David is a recognised specialist regarding Australian threatened fauna, most notably the management and conservation of Koalas having participated in key roles on expert panels for State and Federal Governments in koala management policy development.

Over the last 20 years, David has become recognised as a specialist in koala ecology, research, conservation and management planning. David completed his PhD on koalas in South-east Queensland in 2004, and since then has played key roles on expert panels for State and Federal Governments in koala management policy development. This includes developing the Queensland koala habitat mapping, participation as an invited expert on a panel for the review of the status of

koalas in Australia and contributing as an invited expert for the development the *EPBC Act* koala referral guidelines.

Toivo Zoete – Lead Flora Ecologist

Toivo Zoete is an environmental professional with over 25 years' experience in both "hands on" studies and in management of project teams from a range of offices, agencies, and countries, and mentoring related personnel. He has been based in Brisbane for 30 years and is very familiar with the vegetation in the South-east Queensland region, having conducted multiple vegetation assessments in this region. Most work has been in relation to biodiversity/ecology studies, including vegetation management (landscaping maintenance, revegetation guidelines, species prescriptions, rehabilitation monitoring and corrective actions, weed and pest monitoring and management plans), environmental impact assessment (EIA), and planning for infrastructure and resource (including closure) projects in Australia, the Asia Pacific region, and Algeria.

Toivo is familiar with a wide range of legal and policy settings, including Commonwealth, State, and overseas jurisdictions, as well as the Performance Standards of the International Finance Corporation (IFC). Toivo has conducted projects in environments ranging from alpine meadows to intertidal wetlands, and from tropical rainforests to semi-arid communities.

Adam Pavitt – Ecologist

Adam is an environmental scientist and ecologist with over 6 years of experience contributing to a wide variety of projects related to environmental assessments, due diligence reporting and environmental monitoring.

He is experienced at conducting flora and fauna field surveys, weed surveys and surface water and groundwater sampling. He has also provided fauna spotter / catcher services during vegetation clearing projects. Adam's experience includes the preparation of applications for relevant environmental permits/licences, and ensuring they are managed in accordance with relevant legislation and current industry standards. Adam has contributed to flying-fox plans, programs and monitoring for various councils throughout Queensland and New South Wales. This includes experience monitoring flying-fox roosts and developing flying-fox roost management plans in the Sunshine Coast Region for local council. Tim Callaghan supported Adam for a flora survey in November 2021.

Table 3-4 summarises the survey effort for the *EPBC Act* listed threatened species and migratory species that were targeted during the investigation periods. Table 3-4 also details the survey guideline requirements for each target species and provides commentary associated with survey effort against survey guideline requirement. Detailed descriptions of survey methods is provided in the following sections. Habitat preferences for each species are outlined in Appendix A.

Table 3-4: Approved Survey Guidelines, Survey Effort and Adequacy

Target Species	Survey Guidelines and Requirements	Sampling Technique/ Effort Field Investigation Period April-May 2021	Comment on Survey Adequacy
Birds (including migratory species)			
<i>Falco hypoleucos</i> grey falcon	There are no targeted survey guidelines for this species. This species is rare with a very large distribution so has been hard to find during previous targeted survey efforts. However, they normally are found in treeless areas except along watercourses and often are found over grasslands (Venn, 2003). Nests are located in tall eucalypts close to watercourses	Dawn and dusk timed surveys (20 mins), bird utilisations surveys across 30 sampling locations in the Project Area.	As a result of vegetation management supporting operation of the existing rail line, adjacent urban and agricultural land use and the narrow linear nature of vegetation between existing North Coast Rail Line and Steve Irwin Way the Project Area is largely absent of remnant vegetation and contains only small isolated patches of remnant and regrowth native vegetation. On that basis, suitable habitat for these bird species was largely absent from the Project Area. Nonetheless, searches conducted were done so in accordance with the extent and time periods recommended by the guidelines. <i>Guideline requirements met.</i>
<i>Apus pacificus</i> fork-tailed swift	<i>Draft Referral guidelines for 14 birds listed as migratory species under the EPBC Act (DoE, 2015)</i> No survey guidelines specific to the fork-tailed swift – however, recommended to focus survey efforts from high vantage points. This species is found across a range of habitats (non-breeding habitats only), from inland plains to wooded areas. It is exclusively aerial.	Dawn and dusk timed surveys (20 mins), bird utilisations surveys across 30 sampling locations in the Project Area.	As a result of vegetation management supporting operation of the existing rail line, adjacent urban and agricultural land use and the narrow linear nature of vegetation between existing North Coast Rail Line and Steve Irwin Way the Project Area is largely absent of remnant vegetation and contains only small isolated patches of remnant and regrowth native vegetation. On that basis, suitable habitat for these bird species was largely absent from the Project Area. Nonetheless, searches conducted were done so in accordance with the extent and time periods recommended by the guidelines. <i>Guideline requirements met.</i>

Target Species	Survey Guidelines and Requirements	Sampling Technique/ Effort Field Investigation Period April-May 2021	Comment on Survey Adequacy
<i>Actitis hypoleucos</i> common sandpiper <i>Calidris acuminata</i> sharp-tailed sandpiper <i>Calidris canutus</i> red knot <i>Calidris melanotos</i> pectoral sandpiper <i>Sternula nereis nereis</i> Australian fairy tern <i>Rostratula australis</i> Australian painted snipe	<p>Industry guidelines for avoiding, assessing and mitigating impacts on EPBC Act listed migratory shorebird species (DoEE, 2017)</p> <p>Migratory shorebird surveys are recommended for four survey periods in areas of suitable habitat where replication is necessary. Suitable habitat for these species inland can include wetlands and watercourses but is mainly in coastal areas.</p> <p>This survey guideline is mainly for assessing the species at low and high tides, which is not applicable to the Project Area.</p>	<p>Dawn and dusk timed surveys (20 mins), bird utilisations surveys across 30 sampling locations in the Project Area.</p>	<p>This survey guideline is mainly for assessing the species at low and high tides, which is not applicable to the Project Area.</p> <p>As a result of vegetation management supporting operation of the existing rail line, adjacent urban and agricultural land use and the narrow linear nature of vegetation between existing North Coast Rail Line and Steve Irwin Way the Project Area is largely absent of remnant vegetation and contains only small isolated patches of remnant and regrowth native vegetation. On that basis, suitable habitat for these bird species was largely absent from the Project Area. Nonetheless, searches conducted were done so in accordance with the extent and time periods recommended by the guidelines.</p> <p><i>Guideline requirements met where suitable habitat for these species exists; including watercourses.</i></p>
<i>Hirundapus caudacutus</i> white-throated needletail	<p>No survey guidelines specific to White-throated needletail, but consideration given to:</p> <p>Survey guidelines for Australia's threatened birds: Guidelines for detecting birds listed as threatened under the EPBC Act (DEWHA, 2017)</p> <p>Observations should be made as late as possible in the evening of birds coming into roost in tall trees along ridge tops.</p>	<p>Dawn and dusk timed surveys (20 mins), bird utilisations surveys across 30 sampling locations in the Project Area.</p>	<p>As a result of vegetation management supporting operation of the existing rail line, adjacent urban and agricultural land use and the narrow linear nature of vegetation between existing North Coast Rail Line and Steve Irwin Way the Project Area is largely absent of remnant vegetation and contains only small isolated patches of remnant and regrowth native vegetation. On that basis, suitable habitat for these bird species was largely absent from the Project Area. Nonetheless, searches conducted were done so in accordance with the extent and time periods recommended by the guidelines.</p> <p><i>Guideline requirements met.</i></p>

Target Species	Survey Guidelines and Requirements	Sampling Technique/ Effort Field Investigation Period April-May 2021	Comment on Survey Adequacy
<p><i>Lathamus discolor</i> swift parrot</p> <p><i>Cyclopsitta diophthalma coxeni</i> Coxen's fig-parrot</p>	<p>Survey guidelines for Australia's threatened birds: Guidelines for detecting birds listed as threatened under the EPBC Act (DEWHA, 2017)</p> <p>Area searches or transect surveys of suitable habitat, preferably in the early morning and afternoon when birds are most active and vocal. Detection by sighting or call. Slow-moving vehicle transects also effective in expansive areas, detecting loud, distinctive call that can be heard over noise of engine. Targeted surveys of patches of heavily flowering eucalypts may be useful.</p> <p>Area searches or transect searches – 20 hours for 8 days.</p> <p>Target searches of habitat – 20 hours for 8 days.</p> <p>The timing of these surveys on the mainland should be conducted between March and July.</p>	<p>Dawn and dusk timed surveys (20 mins), bird utilisations surveys across 30 sampling locations in the Project Area.</p> <p>Ad hoc observations will be recorded as well as records of important foraging tree species (e.g. <i>ficus spp</i>)</p>	<p>As a result of vegetation management supporting operation of the existing rail line, adjacent urban and agricultural land use and the narrow linear nature of vegetation between existing North Coast Rail Line and Steve Irwin Way the Project Area is largely absent of remnant vegetation and contains only small isolated patches of remnant and regrowth native vegetation. On that basis, suitable habitat for these bird species was largely absent from the Project Area. Nonetheless, searches conducted were done so in accordance with the extent and time periods recommended by the guidelines.</p> <p><i>Guideline requirements met.</i></p>
<p><i>Xanthomyza phrygia</i> regent honeyeater</p> <p><i>Monarcha melanopsis</i> black-faced monarch</p> <p><i>Monarcha melanopsis</i> spectacled monarch</p>	<p>Survey guidelines for Australia's threatened birds: Guidelines for detecting birds listed as threatened under the EPBC Act (DEWHA, 2017)</p> <p>Area searches in suitable habitat, preferably in the morning but other times may also be appropriate. Detection by call is possible when birds are most vocal (outside the breeding season). Otherwise, detection is by sighting.</p> <p>Targeted searches of woodland patches with heavily flowering trees is useful, especially around water points such as dams and creek lines. Also, check among flocks of other blossom nomads such as lorikeets and other honeyeaters. Broadcast surveys immediately</p>	<p>Dawn and dusk timed surveys (20 mins), bird utilisations surveys across 30 sampling locations in the Project Area.</p>	<p>As a result of vegetation management supporting operation of the existing rail line, adjacent urban and agricultural land use and the narrow linear nature of vegetation between existing North Coast Rail Line and Steve Irwin Way the Project Area is largely absent of remnant vegetation and contains only small isolated patches of remnant and regrowth native vegetation. On that basis, suitable habitat for these bird species was largely absent from the Project Area. Nonetheless, searches conducted were done so in accordance with the extent and time periods recommended by the guidelines.</p> <p><i>Guideline requirements met.</i></p>

Target Species	Survey Guidelines and Requirements	Sampling Technique/ Effort Field Investigation Period April-May 2021	Comment on Survey Adequacy
	before and during the breeding season may also be useful. Area searches for 20 hours over 10 days. Targeted searches for 20 hours over 5 days.		
Mammals			
<i>Pteropus poliocephalus</i> grey-headed flying-fox	<p>Survey guidelines for Australia's threatened bats (DEWHA, 2010)</p> <p>Flying foxes are recognised easily from a distance while they roost or are in flight, and have distinctive audible calls that are heard most frequently in the early morning or under sunny conditions. Other signs include their distinctive odour and droppings. Both the ground and foliage should be examined for flying fox scats.</p> <p>Field surveys conducted by qualified botanist to confirm vegetation communities in the Project Area and presence of food plants.</p> <p>Conduct walking transects (100 m apart) looking for feeding and flying bats as well as detecting their smell. Alternative methods may include night-time audio recordings made at selected sites or fruiting food plants within the Project Area.</p>	<p>Vegetation community assessments to determine presence of suitable habitat and food trees.</p> <p>Spotlight surveys undertaken in spring and summer survey looking for nocturnal species, including feeding flying foxes.</p> <p>2 x Ecologists spotlighting for 2 hours per night for 2 nights.</p>	<p>Known roost sites and potential foraging habitat were surveyed during the 2021 survey period.</p> <p><i>Guideline requirements met.</i></p>
<i>Phascolarctos cinereus</i> koala	<p>Terrestrial Vertebrate Fauna Survey Guidelines for Queensland (DES, 2018)</p> <p>Requires two-person, 30 minute spotlight searches of 100 x 100 m survey site. This can include spotlighting up one side of the 100 x 100 m area and then spotlighting back the other side of the 100 x 100 m area</p> <p>Scat and sign search can coincide with the systematic diurnal active searches, within 50 x 50 m quadrates of the survey site.</p>	<p>Diurnal surveys of incidental fauna sightings and secondary indications of potential presence, including scats, scratches, diggings, tracks or other signs.</p> <p>Specific koala scat surveys undertaken at each habitat assessment location for each survey period using the Spot Assessment technique.</p> <p>2 x Ecologists spotlighting for 2 hours per night for 2 nights.</p>	<p>The habitat assessments identified regrowth koala habitat occurs within the Project Area. While no koalas were observed from spotlight surveys, or diurnal surveys, the species was considered likely to be present on occasion within the Project Area as a result of ARUP (2020) observing indirect signs via a scat and scratch mark on food trees.</p> <p><i>Guideline requirements met.</i></p>

Target Species	Survey Guidelines and Requirements	Sampling Technique/ Effort Field Investigation Period April-May 2021	Comment on Survey Adequacy
	<p>EPBC Act Referral guidelines for the vulnerable koala (DoE, 2014)</p> <p>Strip transects which involve diurnal distance sampling and density searches. Nocturnal spotlighting for smaller sites to determine presence and density.</p> <p>Scats – Spot Assessment Technique which involves looking at food trees for presence of koala scats.</p>		
<p><i>Petauroides volans</i> greater-glider</p>	<p>Terrestrial Vertebrate Fauna Survey Guidelines for Queensland (DES, 2018)</p> <p>Requires two persons for 30 minute spotlight searches of 100 x 100 m survey site across multiple nights. This can include spotlighting up one side of the 100 x 100 m area and then spotlighting back the other side of the 100 x 100m area.</p> <p>Scat and sign search can coincide with the systematic diurnal active searches, within 50 x 50 m quadrates of the survey site.</p> <p>Survey Guidelines for Australia's Threatened Mammals (DSEWPC, 2011)</p> <p>Bright moonlight aids in detecting grey-headed flying-foxes.</p> <p>Spotlighting should be at least two 200 m transects per 5 ha sites. It is also recommended there be 100 m between survey transects.</p>	<p>Survey effort will involve spotlighting in transects throughout any areas identified as containing mature eucalypt forests with hollow-bearing trees.</p> <p>Scat searches were conducted opportunistically during the terrestrial habitat assessments.</p> <p>2 x Ecologists spotlighting for 2 hours per night for 2 nights.</p>	<p>The habitat assessments identified regrowth greater glider foraging habitat within the Project Area. Surveys could not meet guideline requirements within the Project Area, due to a lack of suitable size patches of habitat, and so spotlight surveys were undertaken in large tracts of vegetation adjacent to the Rail Corridor and within the Project Area that contained large hollow bearing trees.</p> <p><i>Guideline requirements met.</i></p>
<p><i>Xeromys myoides</i> water mouse</p>	<p>Referral guideline for the vulnerable water mouse - Xeromys myoides (DOE 2015)</p> <p>Habitat assessment, daytime searches for nesting sites and evidence of foraging and Elliott or camera trapping are the most reliable methods for detecting the presence of the water mouse. Surveyors should examine</p>	<p>Notable habitat features in the Project Area were recorded including vegetation types and species, presence of predator and prey species, supralittoral banks, trees with hollow trunks, as well as any areas of disturbance.</p>	<p>Habitat assessments and the deployment of camera traps occurred across 10 days.</p> <p>Due to the lack of potential habitat in the Project Area, the survey effort did not include trapping.</p> <p><i>Guideline requirements met.</i></p>

Target Species	Survey Guidelines and Requirements	Sampling Technique/ Effort Field Investigation Period April-May 2021	Comment on Survey Adequacy
	<p>satellite imagery or aerial photographs and topographical maps before commencing a habitat assessment or trapping program. This will help to identify elevated, dry supralittoral areas within mangrove communities which may support active nest structures, allowing these areas to be targeted.</p> <p>This survey guideline is mainly for assessing the species in supralittoral areas, which is not applicable to the Project Area.</p>	<p>Daytime searches included looking for nesting structures or water mouse prey remains for every one hectare of intertidal or supralittoral water mouse habitat.</p> <p>2 x Ecologists spotlighting for 2 hours per night for 3 nights.</p>	
Insects			
<p><i>Phyllodes imperialis smithersi</i></p> <p>pink underwing moth</p>	<p>There are no targeted survey guidelines for this species.</p> <p>The Pink Underwing Moth is found below the altitude of 600 m in undisturbed, subtropical rainforest on rich volcanic soils and fertile alluvium. It occurs in association with the vine <i>Carronia multisepalea</i>, a collapsed shrub that provides the food and habitat the moth requires in order to breed (Clarke & Spier-Ashcroft 2003; NSW DECC 2005). <i>Where C. multisepalea</i> attains an upright form, the association with the moth does not occur (TSSC 2002).</p> <p>The common fruit-piercing moth (<i>Eudocima fullonia</i>) is differentiated by having adult moths with hind wings that are orange and black (rather than pink and black). Larvae may occur on the same vine, but are more uniformly brown and have two eye spots on each side (NSW RMS 2013).</p>	<p>Microhabitat searches for signs of the species to be carried out in conjunction with terrestrial fauna searches.</p>	<p>Microhabitat searches for signs of the species were carried out in conjunction with terrestrial fauna searches and habitat assessments.</p> <p><i>Guideline requirements met.</i></p>

Target Species	Survey Guidelines and Requirements	Sampling Technique/ Effort Field Investigation Period April-May 2021	Comment on Survey Adequacy
Frogs			
<i>Mixophyes iterates</i> giant barred frog	<p>Survey guidelines for Australia's threatened frogs: Guidelines for detecting frogs listed as threatened under the EPBC Act (DAWE, 2010)</p> <p>Call playback and spotlighting while walking transect along stream or creek. Most suitably in riparian rainforest and wet sclerophyll forest. Road transects are not effective.</p> <p>Larvae are distinctive and can be collected by dip netting. Multiple sweeps in pools.</p> <p>Seasonal: September–March.</p> <p>Weather conditions: Not during heavy rainfall or stream flow. One week after heavy rainfall.</p> <p>A minimum of two nights under ideal conditions. Should be repeated on at least four separate occasions in activity period.</p> <p>Under optimum weather conditions; that is, substrate and leaf litter wet. At time of peak activity for the species.</p> <p>Stream transect of a minimum of 200 m.</p> <p>Local area study to include reference sites as mandatory.</p>	<p>Nocturnal and call playback surveys near streams during March survey period. Searches conducted after rainfall. Surveys repeated at suitable locations up to 4 nights by suitably qualified ecologist</p> <p>2 x Ecologists spotlighting for 2 hours per night for 2 nights.</p>	<p>Confirmed breeding habitat and foraging habitat was identified outside of the B2N Project boundary at Mellum Creek by ARUP (2020).</p> <p>The nocturnal spotlighting surveys were undertaken during suitable conditions for frog activity, i.e. after nightfall and following rainfall.</p> <p>Surveys were carried out during optimum weather conditions; that is, substrate and leaf litter wet, at time of peak activity for the species (September–March) by ARUP 2020.</p> <p><i>Guideline requirements met.</i></p>
Plants			
<i>Acronychia littoralis</i> scented acronychia <i>Allocasuarina emuina</i> Mt Emu she-oak <i>Baloghia marmorata</i> jointed baloghia	<p>Flora Survey Guidelines – Protected Plants NC Act (Flora Survey Guidelines) (DEHP, 2014a)</p> <p>Meander surveys to be conducted when and where the species is present. This is based on undertaking surveys during flowering (if applicable) and where habitat is available.</p> <p>Meanders must be undertaken at the rate of one meander every two hectares.</p>	<p>Meander surveys to be conducted in suitable habitat areas.</p> <p>Meanders to be undertaken at the rate of one meander every two hectares.</p> <p>Undertaken across minimum 5 day by experienced botanist</p>	<p>Meander surveys were conducted in suitable habitat areas in conjunction with habitat assessments. A total of 35 habitat assessments were completed.</p> <p><i>Guideline requirements met.</i></p>

Target Species	Survey Guidelines and Requirements	Sampling Technique/ Effort Field Investigation Period April-May 2021	Comment on Survey Adequacy
<p>Macadamia integrifolia macadamia nut</p> <p><i>Rhodamnia rubescens</i> scrub turpentine</p> <p><u>Smooth Davidson's plum (<i>Davidsonia johnsonii</i>) later confirmed to be <i>D. jerseyana</i> – see Section 3.3)</u></p> <p><i>Rhodomyrtus psidioides</i> native guava</p> <p><i>Sarcophilus fitzgeraldii</i> ravine orchid</p> <p><i>Zieria bifida</i></p>	<p>The search must be continued (timed) until no new plant species has been recorded for 30 minutes, or when the entire site/habitat has been surveyed.</p>		
Habitat Assessments			
<p>Site condition, site context, species stocking rate and vegetation assessments</p>	<p>Modified Habitat Quality Assessment (MHQA), (Habitat Assessments Guidelines) (DAWE, 2020)</p> <p>The Commonwealth Department's MHQA is an adaptation of the Queensland Government's Guide to determining terrestrial habitat quality (DES 2020). The MHQA better reflects the requirements of the <i>EPBC Act</i> Environmental Offsets Policy (DSEWPC 2012) for determining habitat quality, including consideration of site condition, site context, and species stocking rate, which is detailed in the <i>EPBC Act</i> policy document,</p>	<p>Site specific attributes (site condition, site context, and species stocking rate) will be assessed as per scoring data input contained within the MHQA guidelines. Surveys to be conducted in suitable habitat areas.</p> <p>Undertaken across minimum 5 days by experienced ecologists.</p>	<p>RE assessments were undertaken in accordance with quaternary assessment procedure as outlined in the survey guidelines of Neldner et al. (2019). TEC assessments were also conducted in accordance with relevant guidelines.</p> <p>Habitat assessments involved detailed evaluation of habitat quality and macro/micro features necessary to support general biodiversity as well as specific target species. The habitat assessments were taken often in conjunction with RE</p>

Target Species	Survey Guidelines and Requirements	Sampling Technique/ Effort Field Investigation Period April-May 2021	Comment on Survey Adequacy
	How to use the Offsets Assessment Guide (DAWE).		<p>assessments, and a total of 37 habitat assessments were completed.</p> <p>The vegetation assessments also involved the assessment for presence/absence of any TECs. This assessment for TECs was done through assessing vegetation within the Project Area and checking this against relevant TEC thresholds and diagnostic guidelines.</p> <p><i>Guideline requirements met</i></p>

Vegetation and Habitat Assessments

Vegetation community assessments and habitat assessments were undertaken to describe the type and condition of the communities in the Project Area. The outcomes of the assessment were used to inform the likelihood of occurrence assessment for the relevant listed threatened species and TECs, within the Project Area. The survey locations (Survey Points) were selected on the basis that they provided the greatest representative samples of habitat quality and availability within and directly adjacent to the Project Area. Survey Point locations are mapped in Figure 2 (see Appendix E).

The vegetation assessments undertaken included:

- Assessment of water features (such as riparian areas) and habitat values;
- Recording of topographical features; and
- Defining the barriers of both disturbed and undisturbed areas.

The parameters measured during the **terrestrial** habitat assessments included:

- Context with regards to landscape features (connectivity, proximity to water)
- Terrestrial flora species present including canopy, shrub and ground-layer height
- Condition (weeds, evidence of disturbance, invasive species)
- Breeding and roosting habitat features (hollow bearing trees, nests, caves)
- Foraging sources (flowering tree species, termite mounds)
- Microhabitat presence (woody debris, leaf litter, decorticated bark, bare ground, soil cracks, surface rock and rocky outcrops)
- Representative sampling of vegetation and regional ecosystem types from each sampling point at each zone (mapped and aligned with the DAWE draft Modified Habitat Quality Assessment Methodology).
- Presence, density, species and approximate number of koala food trees
- Wetland and/or waterway presence (presence of aquatic vegetation, water depth and condition); and
- Signs of threatened species (such as scats, scratches and track marks).

The parameters measured during the **aquatic** habitat assessments included:

- Features of the waterway including bank height, estimated flow, width and depth of standing water (if any)
- Condition and complexity of a riparian zone, including vegetation types present and canopy height
- Presence of aquatic habitat necessities including woody debris, leaf litter, shaded areas and free passage of movement
- Adjacent land use types and subsequent impacts to the waterways
- Details of sediment types present (presence of anoxic sediments)
- Presence of litter, erosion caused by land use such as cattle grazing or mechanical impacts
- Presence of aquatic flora species
- Overall habitat condition and value, including an assessment potential to support aquatic species.

Specific detail on vegetation and habitat assessments addressing survey technique, effort and compliance with approved survey guideline requirements, is provided in Table 3-4.

Watercourses within the Project Area were analysed throughout the field investigations.

Targeted Species Surveys

Extensive targeted surveys were previously conducted in and adjacent to the Project Area in 2016 (SMEC, 2019) and 2019 (ARUP, 2020). For a summary of the previous targeted surveys, see Table 3-2. The species targeted for the 2021 investigations considered information from updated database searches as well as the findings from the REF (SMEC 2019) and Commonwealth Matters Ecological Report (ARUP 2020). The previous studies confirmed presence of some MNES species, therefore additional 2021 investigations focused on determining habitats for those species. For species that were deemed to have inadequate survey effort in previous studies (e.g. listed birds and migratory species); a field program was designed to target those species with sufficient effort in accordance with survey guidelines. Additionally, suitable habitats were defined for MNES values known or likely to occur in the Project Area. Table 3-4 summarises the associated survey effort and technique undertaken within the Project Area for the field Investigations in April-May 2021 and presented in this MNES Baseline Report. Table 3-4 also compares all targeted surveys conducted against requirements of survey guidelines.

Targeted surveys for aquatic fauna were not undertaken, due to previous studies (ARUP, 2020), identifying listed aquatic species as unlikely to occur within the Project Area. For an additional summary of survey effort for the additional field investigations refer to Section 3.1.2.2.

The following information summarises the main techniques targeting listed threatened mammals, amphibians and insects within the Project Area.

Faecal pellet surveys were undertaken for koala as per the *Survey Guidelines for Australia's Threatened Mammal* (as listed under the *EPBC Act*) and the Koala Referral Guidelines. Scat searches are not a specific survey guideline recommendation for locating greater gliders however, have been listed in the *Terrestrial Vertebrate Fauna Survey Guidelines for Queensland* as a means to locate cryptic and nocturnal species. Other relevant guidelines and their recommended survey method and extent for the koala and greater glider are as follows:

- Koala Referral Guidelines specific requirements are as follows:
 - Strip transects which involve diurnal distance sampling and density searches
 - Nocturnal spotlighting for smaller sites to determine presence and density; and
 - Scats – Spot Assessment Technique or similar which involves looking at the base of koala food trees for presence of koala scats.

Known roost sites and foraging habitat for the grey-headed flying-fox were surveyed simultaneously with habitat assessments within and directly adjacent to the Project Area.

Spotlighting was undertaken per guideline requirements focusing on arboreal species, particularly targeting koala and greater glider. Two ecologists spotlighted by foot within suitable habitats and vegetation communities across two nights, access permitted. Large and small tracts of vegetation were targeted for spotlight surveys, as well as sampling occurring within linear fragments of vegetation associated with water courses and road side vegetation, to adequately sample the vegetation communities and habitats that occur across the Project Area.

Microhabitat searches were undertaken for frogs as per the Survey guidelines for Australia's threatened frogs (DAWE, 2010). Searches for frogs and insects involved microhabitat identification and searches for signs of the species. This occurred with habitat assessments throughout the Project Area. Other searches involved active searches in suitable habitat areas, including overturning of rocks and disturbance of leaf litter.

Habitat mapping was prepared for those listed species known or likely to occur to inform impact assessments.

Bird Surveys

Bird utilisation surveys (BUSs) involved 20-minute fix point surveys to provide data based on the species present at each sampling location. Each fixed-point survey site was located to provide a search radius of at least 100 m for small birds and up to 200 m for large birds.

The survey guidelines for diurnal bird surveys and their requirements are as follows:

- Terrestrial Vertebrate Fauna Survey Guidelines for Queensland
 - Diurnal bird surveys involve six x 5 -10 min area searches within 100 x 100 m survey site;
 - Two surveys conducted in the morning (<two hours after sunrise), two in mid-morning (two to four hours after sunrise) and two in less optimal times (four hours after sunrise and two hours before sunset).

The bird surveys were conducted in accordance with the time and effort required by the survey guideline requirements.

It is also noted that specific requirements for species listed in the *Survey Guidelines for Australia's Threatened Birds* (as listed under the *EPBC Act*) were considered in designing the field survey program. The *Survey Guidelines for Australia's Threatened Birds* recommends that flushing, listening for foraging scratching, and platelets searches for a total of 15 hours over three days, is recommended for the black-breasted button-quail. However, there was a lack of suitable habitat in the Project Area for this species.

The following sections detail the specific BUSs undertaken throughout the Project Area.

Point Surveys

Point surveys were conducted to target diurnal woodland and riparian bird species. Two ecologists traversed suitable woodland and riparian habitats and conducted 20-minute timed surveys for all birds in the area.

Waterbody Surveys

Waterbody surveys were conducted in order to target aquatic species and woodland species utilising the waterbody. Observations were made from a stationary position, and birds were identified by call detection and visual observations. The Project Area contained several artificial waterbodies, drainage lines and creeks likely to act as important water sources in the landscape, particularly during dry conditions.

Birds of Prey Surveys

Birds of prey surveys were undertaken to target the listed threatened species such as the grey falcon (*Falco hypoleucos*) and generally occurring birds of prey. Birds of prey surveys were undertaken at vantage points (e.g. extensively cleared areas) at mid-morning when birds of prey become increasingly active.

Camera traps

The motion activated camera traps were placed across representative remnant vegetation/habitat types. This included riparian woodlands near water sources and eucalypt open forest or woodlands. The cameras were specifically placed in areas that were near water sources. The survey locations were selected on the basis that they provided the greatest likelihood of detecting an abundance and diversity of terrestrial fauna. Plastic bait stations were used at each sampling location to attract/lure fauna to the camera. The scented baits within each container consisted of honey, oats, peanut butter and anchovies to attract a variety of fauna with varying diets.

The cameras were secured onto trees at approximately 1 metre above the ground. They were collected and the information recorded on the SD cards was then analysed on a desktop computer to determine the species recorded.

3.2 Habitat Mapping

Habitat mapping was undertaken for *EPBC Act* listed threatened species that were identified as likely or known to occur within the Project Area. This was informed by the accumulation of previous studies and additional field investigations undertaken, including ground truthed habitat assessments.

The likelihood of occurrence method used to conclude this is addressed in Section 3.3. The criterion used to determine habitat suitability for *EPBC Act* listed threatened species concluded as likely or known to occur, has also been included in Section 3.3.

Habitat maps have been prepared using ArcGIS desktop. TMR provided the Project Area boundaries and the cadastral lot boundaries were sourced from Queensland Spatial. ESRI World Topographic Map and World imagery (captured in September 2020) has been used in the overview figures. For the habitat assessment figures where greater detail is required, Nearmap imagery captured in May 2021 has been used as the base imagery. Drone footage captured in April-May 2021 was provided by TMR and utilised to distinguish habitat features and refine habitat mapping for the koala and grey-headed flying-fox. Ground-truthed habitat mapping within the Project Area is provided in Appendix D.

3.3 Likelihood of Occurrence

Consistent with the accepted approach for ecological assessment, a likelihood of occurrence assessment was undertaken, informed by desktop sources and relevant field survey results. Desktop sources identified several flora and fauna species listed under the *EPBC Act* (ie. PMST search) that have previously been recorded or predicted to occur within a 2 km buffer of the Project Area.

The likelihood of occurrence approach refines the desktop generated list using site-specific information and specific-species habitat information obtained from field surveys. Desktop sources are indicative only and likelihood rankings, particularly regarding the presence of preferred habitat, are conservative. The assessment ranks the likelihood of the species occurring within the Project Area through analysis of species distribution information and the presence of specific habitat attributes as identified simultaneously through the desktop analysis and field surveys. The criteria applied are outlined in Table 3-5.

Habitat and distribution information for MNES is sourced from SPRAT profiles and/or Conservation Advice where available, supplemented by other primary sources (e.g. published literature). Regarding species records, these were sourced from Wildlife Online (WO) and/or Atlas of Living Australia (ALA). Species records sourced from WO and/or ALA include all records within a 10 km buffer of the Project Area. The buffered area is from here on referred to as the 'locality'. For this ecology assessment, results presented in the Commonwealth Matters Ecological Report (ARUP 2020), USC (2020 and 2021) Koala Survey Using Detection Dogs Beerburum to Nambour Rail Upgrade Reports and the REF (SMEC, 2019), will also be used to inform the likelihood of occurrence assessment of listed threatened species based on the data presented from field surveys from 2016-2020. Where species presence cannot be discounted due to overlapping distributions with the Project Area, they are categorised as potential to occur.

Recent records within the locality are defined as less than 20 years.

This ecological assessment requires species-specific studies to understand more information on flora and fauna that are at risk from the B2N Project. The likelihood of occurrence assessment addresses this requirement through analysing each species that is generated from desktop sources, considering ecological assessments from neighbouring areas and field investigations.

Table 3-5: Likelihood of Occurrence Criteria

	Suitable habitat exists	Suitable habitat is limited or does not exist ¹
Records within Project Area (based on site surveys and recent (last 20 years) records)	Known	Known
Records in the locality ²	Likely	Unlikely
No records in the locality, but Project Area is within known distribution	Potential	Unlikely
No records in the locality, and Project Area is outside of distribution	Unlikely	Unlikely

¹ Some desired habitat features may be present, but not all; habitat may have poor connectivity; or habitat may be known to be disturbed. Based on sources reviewed and/or field survey results.

² 'Locality' refers to a 10 km buffer of the Project Area.

The full likelihood of occurrence assessment is provided in Appendix A. Where ground-truthing of habitat concluded that, for some species predicted to occur, where preferred or general habitat features was absent or lacking desired habitat features, had poor connectivity; and/or the habitat was disturbed by existing road, rail, introduced species, agricultural use or urban development, those species were classified as Unlikely to occur. For some species, where they are known to be infrequent or uncommon visitors and their presence cannot be ruled out (e.g. some migratory species) but habitat was absent within the Project Area, they were classified as potential to occur.

For the purpose of the assessment, this MNES Baseline Report focuses on species that are known or likely to occur in the Project Area. These species are summarised in Table 3-6. Five species are considered potential to occur, but habitat is generally absent in the Project Area (Appendix A).

It is noted that one individual native guava (*Rhodomirtus psidioides*) and one individual smooth Davidson's plum (*Davidsonia johnsonii*) were identified on Lot 1 RP124412 during previous surveys (ARUP 2020). During the November 2021 field surveys it was confirmed that the two previous records were confirmed by the Queensland Herbarium as misidentifications. The native guava was confirmed as bloodhorn (*Ochrosia elliptica*) and the smooth Davidson's plum was instead Davidson's plum (*Davidsonia jerseyana*), listed as endangered under the EPBC Act. Seven cultivated specimens were recorded on Lot 1 RP124412.

While *D. jerseyana* is classified as "known to occur", the Project Area does not support preferred coastal and lowland subtropical rainforest and wet sclerophyll habitat for *D. Jerseyana* (Threatened Species Scientific Committee 2015) and the occurrence of seven cultivated specimens does not constitute a wild population. Given the specimens are located outside of the species current known distribution (restricted to NSW), and other individuals or populations were **not** identified, habitat mapping has not been prepared and the species not considered further.

Table 3-6: Likelihood of Occurrence Summary

Species name	EPBC Status	Habitat requirements	Distribution in Project Area	Records in the Project Area/ locality	Comment on likelihood of occurrence in Project Area
White-throated needletail (<i>Hirundapus caudacutus</i>)	V, M	<p>In Australia, the white-throated needletail is almost exclusively aerial. This species occurs feeding and flying over most types of habitat, but are recorded most often above wooded areas, including open forest and rainforest, and may also fly between trees or in clearings, below the canopy, but they are less commonly recorded flying above woodland. The species has been recorded roosting in trees in forests and woodlands, both among dense foliage in the canopy or in hollows</p> <p>Breeding occurs in Asia, from central and south-eastern Siberia and Mongolia, east to the Maritime Territories of Russia, Sakhalin and the Kuril Islands and south to northern Japan and north-eastern China.</p> <p>Species likely to fly aerially over the Project Area. The Project Area does contain potential general habitat in the form of eucalypt forests. It may also roost and forage in such general woodland habitat.</p>	Yes	Yes (Project Area)	<p>Known to occur</p> <ul style="list-style-type: none"> Project Area is within the distribution of the species. Species likely to fly aerially over the Project Area, which also contains potential general habitat in the form of tall eucalypt forests. Recent records exist within the Project Area near to Beerwah, Landsborough, Mooloolah, Palmwoods and Nambour. (ALA, 2021).
Fork-tailed swift (<i>Apus pacificus</i>)	M	<p>In Australia, they occur over cliffs and beaches and also over islands and sometimes well out to sea. They also occur over settled areas, including towns, urban areas and cities. They mostly occur over dry or open habitats, including riparian woodland and tea-tree swamps, low scrub, heathland or saltmarsh.</p> <p>Potential general foraging habitat exists in the Project Area. There is a lack of preferred coastal and riparian heathland or swamp habitat.</p>	Yes	Yes (Project Area)	<p>Known to occur</p> <ul style="list-style-type: none"> Project Area is within the species distribution. Potential general foraging habitat exists in the Project Area. Eight recent records (2018-2019) for the species occur within the Project Area/locality. The closest records occur near to Nambour, Landsborough and Beerwah (ALA, 2021).

Species name	EPBC Status	Habitat requirements	Distribution in Project Area	Records in the Project Area/ locality	Comment on likelihood of occurrence in Project Area
Oriental cuckoo (<i>Cuculus optatus</i>)	M	The species uses a range of vegetated habitats such as monsoon rainforest, wet sclerophyll forest, open woodlands and appears quite often along edges of forests, or ecotones between forest types. This cuckoo feeds arboreally, foraging for invertebrates on loose bark on the trunks and branches of trees, and among the foliage, including in mistletoes. It will forage from the ground, but requires shrubs or trees from which it sallies and returns to consume prey items. Potential preferred habitat associated with moist forests occur along major drainage lines in the Project Area.	Yes	Yes (locality)	Likely to occur <ul style="list-style-type: none"> Project Area is within the species distribution. Preferred habitat associated with moist forests occur along major drainage lines exist in the Project Area. Two recent records (2017, 2002) for the species exist within the locality near Landsborough and Beerwah (ALA, 2021).
Rufous fantail (<i>Rhipidura rufifrons</i>)	M	In east and south-east Australia, the rufous fantail mainly inhabits wet sclerophyll forests, often in gullies dominated by eucalypts such as tallow-wood (<i>Eucalyptus microcorys</i>) and mountain grey gum (<i>E. cypellocarpa</i>). When on passage, they are sometimes recorded in drier sclerophyll forests and woodlands, including spotted gum (<i>E. maculata</i>), yellow box (<i>E. melliodora</i>), ironbarks or stringybarks, often with a shrubby or heath understorey. Preferred habitat of moist forest environments do occur along major drainage lines in the Project Area.	Yes	Yes (Project Area)	Known to occur <ul style="list-style-type: none"> Project Area is within the species distribution. Preferred habitat of moist forest environments do occur along major drainage lines in the Project Area. One record of species observed during ERM surveys at Survey Point 4 and one record at Survey Point 5 (2021).
Spectacled monarch (<i>Monarcha trivirgatus</i>)	M	The spectacled monarch prefers thick understorey in rainforests, wet gullies and waterside vegetation, as well as mangroves. Preferred habitat of thick understorey in wet gullies with associated vegetation, is present within the Project Area.	Yes	Yes (Project Area)	Known to occur <ul style="list-style-type: none"> Project Area is within the species distribution. General habitat is present within the Project Area. Species observed at Survey Point 29 during ERM surveys (2021).

Species name	EPBC Status	Habitat requirements	Distribution in Project Area	Records in the Project Area/ locality	Comment on likelihood of occurrence in Project Area
Black-faced monarch (<i>Monarcha melanopsis</i>)	M	The black-faced monarch mainly occurs in rainforest ecosystems, including semi-deciduous vine-thickets, complex notophyll vine-forest, tropical (mesophyll) rainforest, subtropical (notophyll) rainforest, mesophyll (broadleaf) thicket/shrubland, warm temperate rainforest, dry (monsoon) rainforest and (occasionally) cool temperate rainforest. Preferred habitat of moist forest environments do occur along major drainage lines in the Project Area.	Yes	Yes (Project Area)	Known to occur <ul style="list-style-type: none"> Project Area is within the species distribution. Preferred habitat of moist forest environments do occur along major drainage lines in the Project Area. Observed in Project Area during ecological assessment surveys by WBM in 2006.
Satin flycatcher (<i>Myiagra cyanoleuca</i>)	M	Satin flycatchers inhabit heavily vegetated gullies in eucalypt-dominated forests and taller woodlands, and on migration, occur in drier woodlands and open forests. Preferred habitat of moist forest environments do occur along major drainage lines in the Project Area.	Yes	Yes (locality)	Likely to occur <ul style="list-style-type: none"> Project Area is within the species distribution. Preferred habitat of moist forest environments do occur along major drainage lines in the Project Area. Six recent records (2002-2017) for the species occur within the locality. The closest records occur near to Beerburum, Landsborough and Beerwah (ALA, 2021).
Koala (<i>Phascolarctos cinereus</i>)	V	Koalas naturally inhabit a range of temperate, sub-tropical and tropical forest, woodland and semi-arid communities dominated by Eucalyptus species as explained by Martin & Handasyde 1999 (as cited in, DoE, 2019h). Koala habitat can be broadly defined as any forest or woodland containing species that are known koala food trees, or shrubland with emergent food trees. Preferred habitat of eucalypt forests, and preferred food trees, present within the Project Area. Habitat within the Project Area is highly disturbed by weeds, domestic animals, and fragmentation by roads, agricultural land and rail.	Yes	Yes (locality)	Known to occur <ul style="list-style-type: none"> The Project Area occurs within the distribution for the species. Preferred and general habitat of eucalypt forests, and preferred food trees, present within the Project Area. No sightings were observed during field surveys or targeted dog detection surveys (USC, 2020, 2021), but signs (faecal pellet and scratches) were observed (ARUP, 2020). Recent records exist in the locality (2014-2020) near to Landsborough, Beerburum and Palmwoods (ALA, 2021). This data

Species name	EPBC Status	Habitat requirements	Distribution in Project Area	Records in the Project Area/ locality	Comment on likelihood of occurrence in Project Area
					suggests very low koala abundance within and adjacent to the Project Area.
Grey-headed flying fox (<i>Pteropus poliocephalus</i>)	V	<p>It is a canopy-feeding frugivore and nectarivore, which utilises vegetation communities including rainforests, open forests, closed and open woodlands, Melaleuca swamps and Banksia woodlands. It also feeds on commercial fruit crops and on introduced tree species in urban areas. Ebv (1998) explained that the primary food source is blossom from Eucalyptus and related genera but in some areas it also utilises a wide range of rainforest fruits (as cited in, DoE, 2019i).</p> <p>The listing advice for this species says that individuals can travel up to 50 km from their known roosting camps, in order to forage. They generally roost within 20 km of food sources which include the nectar and pollen of Eucalyptus, Melaleuca and Banksia native trees.</p> <p>General foraging habitat present in eucalypt woodlands and riparian areas and roost sites are known to occur in the locality, and the species was observed during fauna surveys.</p>	Yes	Yes (Project Area)	<p>Known to occur</p> <ul style="list-style-type: none"> ■ The Project Area occurs within the distribution for this species. ■ Preferred foraging habitat present in eucalypt woodlands and riparian areas. ■ Roost sites are known to occur in the locality, the nearest known roost for the species is at Kolora Park in Palmwoods. Species was observed in locality during ERM surveys 2021. Observed foraging in the Project Area and roosts in use during the daytime were recorded by ARUP (2020).
Giant barred frog (<i>Mixophyes iteratus</i>)	E	<p>The Giant Barred Frog occurs in rainforests and wet sclerophyll forests in upper to lower catchment areas. During surveys in the Cooroy to Curra area of south-east Queensland, Giant Barred Frogs were observed to prefer a closed forest canopy with a relatively light cover of vegetation at ground level.</p> <p>Low levels of suitable habitat exist along the major drainage lines within the Project Area.</p>	Yes	Yes (locality)	<p>Likely to occur</p> <ul style="list-style-type: none"> ■ The Project Area occurs within the distribution for this species. ■ Low levels of suitable habitat exist along the major drainage lines within the Project Area. ■ Species was detected 100 m east of the Project Area during surveys (ARUP 2020) at Mellum Creek.
Whipstick wattle (<i>Acacia attenuata</i>)	V	The species occupies areas lower than 30 m altitude. It occurs in waterlogged areas containing wet healthland, open forests and woodlands	Yes	Yes	Likely to occur

Species name	EPBC Status	Habitat requirements	Distribution in Project Area	Records in the Project Area/ locality	Comment on likelihood of occurrence in Project Area
		<p>areas, on poorly drained sandy soils or peat swamps that are infertile. Often grows in areas with the following species: <i>Leptospermum whitei</i> and <i>Baeckea frutescens</i>; in wallum with <i>Banksia aemula</i> and <i>Eucalyptus robusta</i>; in woodlands with <i>Corymbia trachyphloia</i>, <i>E. umbra</i> and <i>Banksia oblongifolia</i>; and in open forests of <i>E. umbra</i>, <i>E. racemosa</i> and <i>Melaleuca quinquenervia</i> (Queensland CRA/RFA Steering Committee, 1998).</p> <p>Potential preferred habitat of <i>E. racemosa</i> (RE 12.5.3) open forests on sandy soils, often water-logged, is present within the Project Area.</p>		(Project Area)	<ul style="list-style-type: none"> ■ The Project Area occurs within the distribution for this species. ■ Potential preferred habitat of RE 12.5.3 present within the Project Area. ■ There is a record within the Project Area from 2004. It has not been recorded within the past 10 years or from field surveys.
Mt Emu she-oak (<i>Allocasuarina emuina</i>)	E	<p>This species occurs within open and closed heath habitats that are characterised by fine-grained rocky slopes, as well as in Wallum heath in undulating coastal plains. It is found in relatively flat, low-lying coastal areas on areas of slopes of 20 degrees to flat areas (Halford, 1993b). Species associated with habitat for Mt Ema she-oak include <i>Ptilanthium deustum</i>, <i>Hakea actites</i> and <i>Banksia oblongifolia</i>.</p> <p>There is potential preferred habitat of wet heathland (RE 12.3.13), present within the Project Area.</p>	Yes	Yes (Locality, 2020)	<p>Likely to occur</p> <ul style="list-style-type: none"> ■ The Project Area occurs within the distribution for this species. ■ There is potential preferred habitat of wet heathland (RE 12.3.13), present within the locality. ■ Populations for this species occur in the Beerwah conservation areas (RE 12.3.13), within the locality of the Project Area.
Swamp stringybark (<i>Eucalyptus conglomerata</i>)	E	<p>This species occurs on coastal flat areas at approximately 30 m above sea level, often in ecotones between Wallum heath and tall open forests. Soils are general infertile and there is poor drainage so that the area is often water-logged (Bean, 1980).</p> <p>There is potential preferred habitat of open forest to woodland of <i>Melaleuca quinquenervia</i> and</p>	Yes	Yes (Locality, 2020)	<p>Likely to occur</p> <ul style="list-style-type: none"> ■ The Project Area is within the distribution for the species. ■ There is potential habitat of RE 12.3.4 is present within the Project Area. ■ This species was found during field surveys in 2020, however only within the boundary of the National Park outside of the Project boundary (within the locality) (ARUP, 2020).

Species name	EPBC Status	Habitat requirements	Distribution in Project Area	Records in the Project Area/ locality	Comment on likelihood of occurrence in Project Area
		<i>Eucalyptus robusta</i> (RE 12.3.4), present within the Project Area.			
Macadamia nut (<i>Macadamia integrifolia</i>)	V	<p>This species often grows in remnant rainforest areas, most commonly in open areas on the edges of such rainforests. It can be found across hill crests, slopes, in gullies and benches. It grows in high nutrient value alluvial and volcanic soils and in areas that are well drained (Barry & Thomas, 1994). In Queensland it can be found in a range of environments, from tall closed forest, simple notophyll mixed very tall closed forests, to simple microphyll-notophyll mid-high closed forests with Araucaria and Argrodendron emergents (Barry & Thomas, 1994).</p> <p>There is potential preferred habitat of <i>Eucalyptus grandis</i>, <i>Lophostemon confertus</i> tall open forest with vine forest understorey ('wet sclerophyll') (RE 12.3.2), present within the Project Area.</p>	Yes	Yes (locality) Preferred	<p>Likely to occur</p> <ul style="list-style-type: none"> ■ The Project Area is within the distribution for the species. ■ Potential preferred habitat occurs within RE 12.3.2 ■ There was an individual plant recorded for this species within the locality by ARUP in 2020.
Davidson's plum (<i>Davidsonia jerseyana</i>) previously identified by ARUP (2020) as <i>D. johnsonii</i>	E	<p>This species preferred habitat is coastal and lowland subtropical rainforest and wet sclerophyll forest. There are a number of records within subtropical rainforest from a small area in northern NSW (Threatened Species Scientific Committee, 2015).</p> <p>The Project Area is not within the known distribution for the species.</p>	No	Yes (planted individuals)	<p>Known to occur</p> <ul style="list-style-type: none"> ■ The B2N Project is not within the distribution for the species. ■ Seven Davidson's plums have been identified in the Project Area during the 2021 field surveys, on Lot 1 RP124412, between Beerburrum and Beerwah. The specimens were concluded to be cultivated individuals. <p>No further assessment has been undertaken for this species as it does not naturally occur within the Project Area.</p>

Species name	EPBC Status	Habitat requirements	Distribution in Project Area	Records in the Project Area/ locality	Comment on likelihood of occurrence in Project Area
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Status listing per EPBC Act: CE = Critically Endangered; E = Endangered; V = Vulnerable; M = Migratory.

Sources of habitat information for all species, unless otherwise stated, were gathered from DAWE Conservation Advice and SPRAT database:

(<http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl>). Each of these is listed in the references species, specific to the subcategory (eg. Flora, fauna and migratory).

4. ECOLOGICAL VALUES

The following section presents the ecological values, relevant to MNES, of the Project Area based on the findings from the desktop review and field surveys. A summary of MNES relevant to the Project Area is also provided.

4.1 Habitat Assessments

The habitat assessment approach at each of the survey points throughout the Early Works, Stage 1 and Stage 2 aligned with the Biocondition Assessment methodology and the Commonwealth Department's MHQA, including data collected on species, abundance, size class, stratum height and cover. This enabled a condition comparison to be determined for each habitat area compared to the condition score for neighbouring RE's.

The Project Area is dominated by linear stretches of highly disturbed roadside vegetation. Slopes are gentle to steep and vegetation communities and habitat structures are dependent on the level of disturbance (i.e. weed incursion and clearing for plantations, agriculture and urban development). For the purpose of rapid evaluation of the condition state of vegetation at each survey point, the habitat condition class of vegetation at each habitat assessment is divided into 3 categories; minimally disturbed, moderately disturbed and highly disturbed (refer to Table 4-1).

Table 4-1: Habitat Assessment Summary

Location (Survey Point)	Mapped RE	Adjacent RE	Native Tree canopy cover (%)	Tree canopy height (m)	Tree sub- canopy cover (%)	Ground cover vegetation (%)	Non- native plant species cover (%)	Habitat condition	Description
Woombye Station (2)	Non- remnant		0	35	50	60	90	Highly disturbed	Highly disturbed, weeds, built environment. Canopy dominated by camphor laurel (<i>Cinnamomum camphora</i>) and slash pine (<i>Pinus elliotii</i>).
Palmwoods Station (4)	Non- remnant	12.9-10.14	50	25	20	30	5	Moderately disturbed	Vegetation between residential housing backyards and rail line. Remnant native canopy trees of <i>Eucalyptus pilularis</i> , <i>E. grandis</i> and <i>E. microcorys</i> . Minimal clearing to take place.
Eudlo Station (5C)	Non- remnant		80	17	30	10	0	Minimally disturbed	The Eudlo Train Station Revegetation Environmental Walk is approximately 1 ha in size and contains native, planted vegetation.
Eudlo South (5)	12.9-10.14	12.9-10.14	70	35	20	40	20	Minimally disturbed	Minimally disturbed, some weeds and rail corridor. Minimal clearing to take place in bushland adjacent to existing rail corridor.
Mooloolah Station (5A)	Non- remnant		60	40	30	10	20	Moderately disturbed	Vegetation between residential housing backyards and rail line. Remnant native canopy trees of <i>Eucalyptus pilularis</i> , <i>E. grandis</i> and <i>E. microcorys</i> . Minimal clearing to take place.

Location (Survey Point)	Mapped RE	Adjacent RE	Native Tree canopy cover (%)	Tree canopy height (m)	Tree sub-canopy cover (%)	Ground cover vegetation (%)	Non-native plant species cover (%)	Habitat condition	Description
Landsborough (6)	Non-remnant	12.3.2	80	17	20	85	50	Moderately disturbed	Mixed native and exotic vegetation along watercourse, canopy dominated by exotic vegetation such as camphor laurel and slash pine. Scattered natives present such as <i>Eucalyptus tereticornis</i> , <i>E. microcorys</i> , <i>E. pilularis</i> .
Landsborough (8)	12.3.11	12.3.11	50	30	30	40	25	Moderately disturbed	Roadside bushland. Sparse canopy of <i>E.grandis</i> , <i>C.intermedia</i> , <i>E.tereticornis</i> , <i>E.siderophloia</i> . Heavily weed infested along roadside.
Landsborough (9)	Non-remnant	12.3.1a	40	16	50	80	60	Moderately disturbed	Moderately disturbed vegetation corridor surrounded by maintained cattle properties. Scattered koala food trees present slightly uphill being <i>E. Tereticornis</i> and <i>C. intermedia</i> . Ground cover largely invasive species. Mellum Creek highly disturbed in this section. School of 20 tilapia observed in creek.
Steve Irwin Way (10)	Non-remnant		50	30	50	70	60	Highly disturbed.	Heavily disturbed linear vegetation between road and rail corridor. Heavily infested by weeds. Scattered koala trees present.
Old Landsborough Road (11)	12.3.5		70	30	30	60	70	Moderately disturbed.	Mellum creek tributary runs through site, neighbouring recreational area, road, and residential area. Weed species present on ground and in creek.

Location (Survey Point)	Mapped RE	Adjacent RE	Native Tree canopy cover (%)	Tree canopy height (m)	Tree sub- canopy cover (%)	Ground cover vegetation (%)	Non- native plant species cover (%)	Habitat condition	Description
Old Landsborough Road (12)	12.3.4		40	35	50	60	50	Highly disturbed.	Roadside bushland surrounded by agricultural land. Heavily infested with exotic grasses, pines and shrubs.
Steve Irwin Way (13)	Non- remnant	12.3.4	40	30	40	50	40	Moderately disturbed.	Mixed native and exotic vegetation in road reserve. Bordered by road and rail line with weed incursions.
Old Landsborough Road (14)	Non- remnant	12.3.4	40	35	40	40	30	Highly disturbed.	Mixed native and exotic vegetation in road reserve. Bordered by road and rail line with heavy weed incursions.
Steve Irwin Way (15)	Non- remnant		50	35	40	50	60	Highly disturbed.	Mixed native and exotic vegetation in road reserve. Bordered by road and rail line with heavy weed incursions.
Beerwah (17)	Non- remnant		25	40	30	60	50	Highly disturbed.	Mixed native and exotic vegetation in road reserve. Bordered by road and rail line with heavy weed incursions.
Beerwah (18)	Non- remnant		25	15	25	100	40	Moderately disturbed.	Cleared paddock and roadside areas with exotic grasses. Bordered by road and rail line.
Kellos Road (19)	12.3.2		50	40	40	50	30	Minimally disturbed.	Mature eucalypts present, pedestrian path through site and vegetation fringes Coochin Creek. Noise disturbance from rail.

Location (Survey Point)	Mapped RE	Adjacent RE	Native Tree canopy cover (%)	Tree canopy height (m)	Tree sub- canopy cover (%)	Ground cover vegetation (%)	Non- native plant species cover (%)	Habitat condition	Description
Kellos Road (20)	12.3.2		60	40	40	40	35	Moderately disturbed.	Creekline. <i>E.pilularis</i> dominant canopy with scattered <i>E.tereticornis</i> , <i>E.microcorys</i> and <i>C.intermedia</i> . Moderate density canopy layer. Transitions to rainforest species along waterway. Understory of palms, Macaranga, Waterhousia, and various vine species. Some camphor and slash pine present. <i>Lomandra longifolia</i> dominates waterway banks.
Glass House Mountains (21)	12.3.2		60	45	50	50	20	Minimally disturbed.	Native understory, abundant mature natives. <i>E.pilularis</i> dominant canopy with <i>E. microcorys</i> , <i>E. tidaliae</i> . High recruitment of mature species forms a shrub layer with some <i>Alphitonia excelsa</i> , some <i>Acacia</i> spp. Weeds low with some umbrella trees, lantana and scattered slash pine.
Youngs Road (23)	12.3.2		50	35	20	90	50	Highly disturbed.	Mixed native and exotic vegetation in along Coochin Creek tributary. Bordered by road, farms and rail line with heavy weed incursions.
Roberts Road (23A)	Non- remnant		30	30	40	60	30	Moderately disturbed.	Farmland, dam and creekline. Bordered by road, farms and rail line with medium weed incursions.

Location (Survey Point)	Mapped RE	Adjacent RE	Native Tree canopy cover (%)	Tree canopy height (m)	Tree sub- canopy cover (%)	Ground cover vegetation (%)	Non- native plant species cover (%)	Habitat condition	Description
Glass House Mountains Station (24)	Non- remnant	12.3.4	40	25	15	80	60	Highly disturbed.	Fringing native and exotic vegetation on modified watercourse adjacent to rail line and maintained park land. Vegetation around watercourse is dominated by invasive species such as camphor and slash pine with scattered natives of <i>Melaleuca quinquenervia</i> , <i>Eucalyptus tereticornis</i> , <i>E. robusta</i> , <i>Lophostemon suaveolens</i> and <i>E. racemosa</i> . Ground cover dominated by invasive species such as Singapore daisy, <i>Ochna serrulata</i> , <i>Lantana camara</i> , Guinea grass and a variety of fern species.
Burgess Street (25)	Non- remnant	12.3.4	40	35	50	50	35	Moderately disturbed.	Recreational area with mature eucalypts in canopy, bordered by road and rail with medium weed incursions. Tributary of Coonowrin Creek runs through site.
Glass House Mountains (26)	Non- remnant	12.5.3	70	40	30	60	70	Highly disturbed.	Bushland adjacent to rail line, bordered by residential land. Tributary of Coonowrin Creek runs through site with heavy weed incursions.
Steve Irwin Way (28)	Non- remnant		50	30	20	40	35	Moderately disturbed.	Mixed native and exotic vegetation in road reserve. Bordered by road and rail line with moderate weed incursions.

Location (Survey Point)	Mapped RE	Adjacent RE	Native Tree canopy cover (%)	Tree canopy height (m)	Tree sub-canopy cover (%)	Ground cover vegetation (%)	Non-native plant species cover (%)	Habitat condition	Description
Moffatt Road (29)	12.3.4	12.5.3	40	30	30	70	25	Moderately disturbed.	<i>Melaleuca quinquenervia</i> dominant wetland with <i>C.intermedia</i> , <i>L.suaveolens</i> <i>E.grandis</i> <i>E.acmeoides</i> and <i>E.latisinensis</i> present toward dryer areas. Understory of <i>M.quinquenervia</i> , <i>L.suaveolens</i> , and <i>A.littoralis</i> . Sedge, fern, <i>Lomandra longifolia</i> and monkey rope (<i>Parsonsia straminea</i>) ground cover with moderate weed incursions.
Glass House Mountains National Park (30)	12.5.3	12.8.20	60	30	50	30	10	Minimally disturbed.	National Park bordered by rail line and agricultural land. Canopy dominated by <i>Casuarina</i> sp. and <i>Eucalypt</i> spp. Low level weed incursions along edges and tracks.
Steve Irwin Way Realignment (31)	Non-remnant	12.5.3	50	20	30	30	30	Moderately disturbed.	Road reserve dominated by regrowth <i>Corymbia trachyphloia</i> , <i>Eucalyptus racemosa</i> , <i>Angophora leiocarpa</i> and <i>Eucalyptus pilularis</i> .
	Intersects remnant RE 12.3.4 and 12.5.3	12.5.3	50	18	40	80	30		Cleared paddock and roadside areas predominantly regrowth <i>Melaleuca quinquenervia</i> and <i>Eucalyptus</i> species and two small areas mapped as RE.
Evans Road (32)	12.3.4		40	25	25	65	30	Moderately disturbed.	Bushland within farm including dam and creek. Bordered by road, farms and rail line with medium weed incursions.

Location (Survey Point)	Mapped RE	Adjacent RE	Native Tree canopy cover (%)	Tree canopy height (m)	Tree sub-canopy cover (%)	Ground cover vegetation (%)	Non-native plant species cover (%)	Habitat condition	Description
Evans Road (34)	Non-remnant		60	25	40	75	35	Moderately disturbed.	Bushland canopy dominated by eucalypts, bordered by road, farms and rail line with medium weed incursions. Tibrogargan Creek runs through site and banks are heavily infested with weeds.
Glass House Mountains National Park (35)	12.5.3	12.8.2	40	30	20	80	10	Minimally disturbed.	National Park bordered by rail line and agricultural land. Canopy dominated by eucalypt spp. Low level weed incursions along edges and tracks.
Steve Irwin Way (36)	12.5.3		65	25	35	60	20	Minimally disturbed.	<i>E.racemosa</i> and <i>C.intermedia</i> dominate the sparse canopy layer as mature remnant specimens. Scattered slash pine also in canopy. Understory is moderately dense with a mix of natives and slash pine. Natives include canopy species plus <i>Alphitonia excelsa</i> , <i>Lophostemon suaveolens</i> , <i>Melaleuca quinquenervia</i> , <i>Allocasuarina littoralis</i> . Light shrub layer of sparse <i>Acacia sp.</i> Ground cover of mixed native grasses, ferns, and forbes. Bordered by road and rail line.
Old North Coast Road (37)	12.3.4	12.5.3	35	17	60	50	20	Minimally disturbed.	Remnant native vegetation with moderately dense understory. Scattered slash pine throughout, with some patches of higher density slash pine. Canopy of scattered mature <i>E. racemosa</i> dominant with <i>C.intermedia</i> and

Location (Survey Point)	Mapped RE	Adjacent RE	Native Tree canopy cover (%)	Tree canopy height (m)	Tree sub- canopy cover (%)	Ground cover vegetation (%)	Non- native plant species cover (%)	Habitat condition	Description
									<i>E.resinifera</i> co-dominant. Moderate to dense understory of <i>Allocasuarina littoralis</i> and <i>Pinus elliottii</i> . Bordered by road and rail line.

4.2 Modified Habitat Quality Assessment

DAWE's MHQA is an adaptation of the Queensland Government's Guide to determining terrestrial habitat *quality* (DES, 2020). The MHQA better reflects the requirements of the *EPBC Act* Environmental Offsets Policy (DSEWPC, 2012) for determining habitat quality, including consideration of site condition, site context, and species stocking rate, which is detailed in the *EPBC Act* policy document, How to use the Offsets Assessment Guide (DAWE).

The MHQA can be used to value the quality of habitat. For the purpose of this MNES Baseline Report the impacted species assessed were the koala and grey-headed flying-fox. Survey Points were selected to provide representative samples of habitat quality throughout the Project Area. This includes Survey Points in remnant vegetation and non-remnant vegetation.

To achieve a representative quality score for habitat quality throughout the Project Area, the following REs were used as assessment units:

- RE 12.5.3 - *Eucalyptus racemosa subsp. racemosa* woodland on remnant tertiary surfaces,
- RE 12.3.2 - *Eucalyptus grandis* tall open forest on alluvial plains, and
- RE 12.3.1a regrowth - Complex notophyll vine forest.

Within each of the abovementioned REs, two sites were assessed against the quantitative values specific to the RE present in the assessment unit to achieve a site condition score. Most MHQA site condition scores were less than half of the maximum benchmark score for that RE. The final site condition score weighted against the project area was 1.4 out of 3. A summary of the site condition scores is provided in Table 4-2.

Table 4-2: Site Condition Scores

	Regional Ecosystem					
	RE 12.5.3		RE 12.3.2		RE 12.3.1a	
Survey Point	36	31	23	20	10	9
Survey Point Condition Score	0.7/1	0.4/1	0.4/1	0.3/1	0.5/1	0.4/1
Final Site Condition Score	1.4/3					

In addition to the site condition score, other values are assessed to determine a final habitat quality score out of 10. The other values include:

- species presence detected on or adjacent to site,
- species usage of the site (habitat type & evidenced usage),
- species density (per ha),
- role/importance of species population on site.

The final habitat quality score, weighted across the indicative disturbance footprint is 4.2 out of 10.

4.3 Koala Habitat Trees

The koala referral guidelines defines koala habitat as any forest or woodland containing species that are known koala food trees (of the following genus: Angophora, Corymbia, Eucalyptus, Lophostemon and Melaleuca), or shrubland with emergent food trees. This can include remnant and non- remnant vegetation in natural, agricultural, urban and peri-urban environments. Koala habitat is defined by the vegetation community present and the vegetation structure; koalas do not necessarily have to be present.

A calculation of trees in the *Corymbia*, *Lophostemon*, *Melaleuca*, *Angophora* and *Eucalyptus* genera was undertaken based on their abundance in representative habitat assessment sites. A summary of approximate koala habitat trees is provided in Table 4-3.

Table 4-3: Approximate Koala Habitat Tree Count in B2N Project Area

Within Non-remnant Vegetation (KHT)	Within Remnant Vegetation (KHT)	Total (KHT)
5,000	8,000 – 15,000	13,000 – 20,000

The assessment process for koala habitat involved extensive desktop reviews as well as the field investigations in 2021. There were no sightings of the species during the field investigations. Koala habitat has been identified within the Project Area. This habitat is characterised by vegetation communities containing remnant or regrowth *Eucalypt*, *Angophora*, *Lophostemon*, *Melaleuca* and *Corymbia species*. The Project Area (including buffer area) encompassed 39.93 ha of remnant vegetation that is koala habitat and 24.22 ha of regrowth vegetation that is koala habitat.

The Koala Referral Guidelines define habitat as ‘critical to the survival of the koala’ if it receives a score of five or more using the koala habitat assessment tool. For the B2N Project, habitat within the Project Area received a score of five and is therefore considered to be habitat critical to the survival of the koala. For the full assessment of koala habitat, refer to Table 4-4.

Table 4-4 : Critical Koala Habitat Analysis

Attribute	Description	Score
Koala Occurrence	The field investigations did not record any koalas. Records from the Atlas of Living Australia database are only known for the koala within 5 km of the Project Area in 2014 (more than 5 years), obtained from relevant databases.	0
Vegetation Composition	The Project Area is largely cleared or dominated by native and invasive grasslands. The structural form of vegetation is primarily considered regrowth. There is a total of 64.15 ha of potential koala habitat ground-truthed within the Project Area. This habitat contains predominately regrowth <i>Eucalyptus</i> spp. and <i>Melaleuca</i> sp. This potential koala habitat therefore contains more than two known koala food trees.	+2
Habitat Connectivity	The habitat assessment identified 64.15 ha of potential koala habitat in the Project Area. Linear fragments of vegetation adjacent to the Project Area are largely small, surrounded by cleared agricultural areas, and adjacent to existing roadways or rail. Overall, the habitat within the Project Area is largely disconnected to other larger remnant patches by roads (e.g. Steve Irwin Way) and the existing rail line; however, the habitat is considered part of a contiguous landscape greater than 500 ha.	+2
Key Existing Threats	Evidence of wild dogs was recorded in the Beerburum State forest during Koala Survey Using detection dogs Beerburum to Nambour Rail Upgrade (USC 2020). SEQ is known for the threat of vehicle collisions and particularly wild dogs across the hinterland region of the Sunshine Coast, causing a significant threat to koalas.	+1
Recovery Value	The interim recovery objectives for the koala are: Protect and conserve the quality and extent of habitat refuges for the persistence of the species during droughts and periods of extreme heat, especially in riparian environments and other areas with reliable soil moisture and fertility; and Maintain the quality, extent and connectivity of large areas of koala habitat surrounding habitat refuges. The Project Area occurs predominately in existing, highly cleared residential, road reserve and agricultural areas. 64.15 ha of koala habitat	0

Attribute	Description	Score
	occurs within the Project Area, and there is no evidence of koala use or important populations in the vicinity of the Project Area. It is unlikely to impact habitat that is important for achieving the interim recovery objectives.	
Total Habitat Score		5

In accordance with Attachment 1 of the Koala Referral Guidelines the Project Area habitat assessments on average define structural forms of vegetation as open-forest with a canopy of 10-30 metres and mid-dense (30-70%) percentage foliage cover of tallest plant layer. Based on this assessment tool score of five, vegetation within the Project Area is classified as habitat critical to the survival of the koala.

4.4 Existing Environment

Table 4-5 provides an overview of the MNES that have been identified as occurring within the Project Area. The following sections give more detail on MNES relevant to the B2N Project Area.

Table 4-5: Summary of MNES Relevant to the Project Area

MNES Matter	Relevance
World Heritage Properties	There are no World Heritage properties associated with the Project Area.
National Heritage Properties	<p>The Glass House Mountains National Landscape is a Natural Heritage Place adjacent to the existing rail corridor and proposed Project Area. A significant impact assessment was conducted and outlined in the original MNES Baseline Report (ARUP, 2020). The broader B2N Project was not expected to have a significant impact on the values of the National Heritage Place. This will be further considered as part of the additional B2N Project investigations and development of the PD response.</p> <p>Significant indirect impacts to the National Heritage Place are not anticipated during Early Works. The temporary nature of the works in conjunction with implementation of construction environmental management measures are expected to limit the impacts of noise and dust to the National Heritage place.</p>
Wetlands of International Importance	The southern section of the Project Area is located approximately 10 km east of the Moreton Bay Ramsar site. The Moreton Bay Ramsar site is not directly impacted by activities within the Project Area.
Listed threatened species and ecological communities	<p>Eight listed threatened species have been identified as known or likely to occur within the Project Area and include:</p> <ul style="list-style-type: none"> ■ koala (<i>Phascolarctos cinereus</i>) ■ grey-headed flying-fox (<i>Pteropus poliocephalus</i>) ■ giant barred frog (<i>Mixophyes iteratus</i>) ■ white-throated needletail (<i>Hirundapus caudacutus</i>) ■ whipstick wattle (<i>Acacia attenuata</i>) ■ Mt Emu she-oak (<i>Allocasuarina emuina</i>) ■ swamp stringybark (<i>Eucalyptus conglomerata</i>) ■ macadamia nut (<i>Macadamia integrifolia</i>) <p>No TECs are observed to occur within the Project Area.</p>
Migratory species	<p>Seven migratory species were identified as known or likely to occur within the Project Area. Migratory species considered as likely or known to occur in the Project Area include:</p> <ul style="list-style-type: none"> ■ white-throated needletail (<i>Hirundapus caudacutus</i>) ■ fork-tailed swift (<i>Apus pacificus</i>) ■ oriental cuckoo (<i>Cuculus optatus</i>) ■ rufous fantail (<i>Rhipidura rufifrons</i>) ■ spectacled monarch (<i>Monarcha trivirgatus</i>)

MNES Matter	Relevance
	<ul style="list-style-type: none"> ■ black-faced monarch (<i>Monarcha melanopsis</i>) ■ satin flycatcher (<i>Myiagra cyanoleuca</i>)
Commonwealth marine areas	There are no Commonwealth Marine areas associated with the Project Area.
The Great Barrier Reef Marine Park	The Great Barrier Reef Marine Park is not associated with the Project Area.
Nuclear actions	The Project does not involve any nuclear actions.
Actions proposed are on, or will affect Commonwealth land and the environment	The B2N Project does not involve any actions on or affecting Commonwealth land.

4.5 Threatened Ecological Communities

The PMST search identified the potential occurrence of two TECs in the MNES Project Area, as listed in Table 4-6.

Upon review of additional desktop information as well as field investigations, it was concluded that both TECs do not occur within the Project Area. Outcomes are summarised in Table 4-6.

Table 4-6: Likelihood of Occurrence of Threatened Ecological Communities within the Project Area

TEC Name	EPBC Act Status	Habitat Preferences and Known Distribution	Present in Project Area
Coastal Swamp Oak (<i>Casuarina glauca</i>) Forest of New South Wales and South East Queensland ecological community	Endangered	<p>This community is associated with coastal catchments, typically 30 km of the coast in Queensland and 30–100 km inland from the coast in New South Wales. This community is also known to occur on floodplains or coastland flats associated with former or current coastal river systems. It is dominated by swamp oak (<i>Casuarina glauca</i>), with a number of eucalypt species or melaleuca species as emergent depending on the local environmental conditions.</p> <p>This TEC can be associated with the following REs: 12.1.1 and areas within 12.3.20, where the canopy is dominated by <i>Casuarina glauca</i>.</p>	TEC not present
Lowland Rainforest of Subtropical Australia	Critically Endangered	<p>This community is associated with areas of highly fertile basaltic and alluvial soils. The vegetation structure of this ecological community is a closed forest reaching heights of greater than 20 m. The canopy/ sub canopy layer is known to contain a diverse range of species including hoop pine, figs and white booyong. Buttress roots and a diverse range of vine species is also associated with this TEC. This community is unlikely to contain species of Eucalyptus, Melaleuca and Casuarina.</p> <p>This TEC can be associated with the following REs: 12.3.1, 12.5.13, 12.8.3, 12.8.4, 12.8.13, 12.11.1, 12.11.10, 12.12.1 and 12.12.16.</p>	TEC not present

4.6 Threatened Species (EPBC Act Listed)

The desk-based review identified a total of 60 *EPBC Act* listed threatened flora and fauna species with the potential to occur within 2 km of the Project Area. Desktop sources are indicative only and likelihood rankings, particularly in regard to the presence of suitable habitat, are conservative. The likelihood of occurrence approach ranks the likelihood of a species occurring within the Project Area through analysis of species distribution information and the presence of specific habitat attributes as identified simultaneously through the desktop analysis and field surveys. Following review of desktop information, and results from targeted surveys from previous field investigations and the current field survey, fourteen listed threatened species were considered likely or known to occur within the Project Area. These fourteen species were the koala, grey-headed flying-fox, giant barred frog, white-throated needletail, fork-tailed swift, oriental cuckoo, rufous fantail, spectacled monarch, black-faced monarch, satin flycatcher, whipstick wattle, Mt Emu she-oak, swamp stringybark and macadamia nut. The likelihood of occurrence assessment summary is provided in Section 3.3 and the full likelihood of occurrence assessment is provided in Appendix A. A detailed discussion relating to the values for threatened species in the MNES Project Area is provided in the following sections.

The updated PMST search reports are provided in Appendix C.

4.6.1 Koala (*Phascolarctos cinereus*)

The koala is generally found in temperate to tropical forests as well as woodlands and semi-arid communities dominated by eucalyptus species (Martin and Handasyde, 1999). The species can be found in habitat broadly defined as woodlands and open forests, as long as food trees are present (DOE, 2020a).

Koalas are known to occur within urban and rural landscapes, utilising regrowth and remnant eucalypt dominated vegetation in southeast Queensland. The 2021 field investigations did not record any evidence of koalas. The Project Area does occur within the distribution for the species. The closest recent records (within 5 years) exist near to Pumicestone National Park, Beerburum in 2019 (ALA, 2021) and Montville in 2020 (ALA, 2021). No evidence of koala presence were observed during detection dog surveys in 2020 and 2021 (USC 2020, 2021). The habitat assessments undertaken during the desktop survey and field investigations identified that regrowth dominated by eucalypt and melaleuca species was present within the Project Area including residential areas, road reserves and cleared paddocks. Food trees of forest red gum (*E. tereticornis*), grey gum (*E. propinqua*), tallowwood (*E. microcorys*), swamp box (*Lophostemon suaveolens*), broad-leaved paperbark (*Melaleuca quinquenervia*), pink bloodwood (*Corymbia intermedia*), red mahogany (*E. resinifera*), blackbutt (*E. pilularis*), brown bloodwood (*C. trachyphloia*), rusty gum (*Angophora leiocarpa*) and grey ironbark (*E. siderophloia*) were recorded within the Project Area. Habitat maps are provided in Appendix D. One potential record of a koala faecal pellet was observed near Landsborough Station Car Park (ARUP, 2020) and no other records of koalas were observed during the ERM surveys (2021) or by other previous targeted surveys (USC, 2020; USC 2021).

The Koala Referral Guidelines state that decisions as to whether an action is likely to have a significant impact on the koala typically come down to two key considerations:

- Adversely affecting habitat critical to the survival of the koala; and/or
- Interfering substantially with the recovery of the koala through the introduction or exacerbation of key threats in areas of habitat critical to the survival of the koala.

The Project Area is located within the coastal range in South-East Queensland (SEQ). Potential koala habitat has been identified within the Project Area and is characterised by remnant and regrowth mixed eucalypt and melaleuca species within the road reserves and adjacent vegetation. Ground-truthed surveys have identified 64.15 ha of koala habitat within the indicative disturbance footprint and 241.72 ha within the Project Area. Largely, this vegetation is dominated by regrowth mixed juvenile eucalypt and melaleuca species. In accordance with Attachment 1 of the Koala Referral Guidelines, the Project

Area's habitat assessments on average define structural forms of vegetation as open-forest with a canopy of 10-30 metres and mid-dense (30-70%) percentage foliage cover of the tallest plant layer. Based on the assessment tool score of five, vegetation within the Project Area is classified as habitat critical to the survival of the koala. The mapped koala habitat is depicted on figures within Attachment E. It is highlighted that the identified potential koala habitat differs from conclusions made by ARUP (2020) as the primary methodology to determine value was based on desktop information, and ground-truthed surveys were not undertaken throughout the Project Area by ARUP (2020).

4.6.2 Grey-headed flying-fox (*Pteropus poliocephalus*)

It is considered that habitat for the grey-headed flying-fox and the koala are normally analogous, given the extent of eucalypts and melaleuca that occur within the mapped koala regrowth habitat. Therefore, the 64.15 ha mapped koala habitat is also considered as a foraging resource for the grey-headed flying-fox.

Many myrtaceous tree species that make up the diet of the grey-headed flying-fox flower at different times of the year. Important winter and spring vegetation communities are those that contain *Eucalyptus tereticornis*, *E. albens*, *E. crebra*, *E. fibrosa*, *E. melliodora*, *E. paniculata*, *E. pilularis*, *E. robusta*, *E. seeana*, *E. sideroxylon*, *E. siderophloia*, *Banksia integrifolia*, *Castanospermum australe*, *Corymbia citriodora citriodora*, *C. eximia*, *C. maculata*, *Grevillea robusta*, *Melaleuca quinquenervia* or *Syncarpia glomulifera* (Eby and Law 2008; Eby 2016; Eby et al., 2019). The Project Area contains many of these myrtaceous species and rainforest species with fleshy fruits. Where the existence of these important winter and spring flowering vegetation communities is verified in the field, they are considered habitat critical to the survival of the Grey-headed Flying-fox (DAWE, 2021). It is difficult to predict which vegetation communities will produce foraging resources at certain times of the year. However, grey-headed flying-foxes forage over extensive areas and have been known to fly as far as 40 km to feed, before returning to their roost the same night (Eby, 1991). As outlined in the National Recovery Plan for the Grey-headed Flying-fox (DAWE, 2021); habitat critical to the survival of the grey-headed flying-fox may also be vegetation communities not containing the above tree species but which:

- Contain native species that are known to be productive as foraging habitat during the final weeks of gestation, and during the weeks of birth, lactation and conception (August to May)
- Contain native species used for foraging and occur within 20 km of a nationally important camp, or
- Contain native and or exotic species used for roosting at the site of a nationally important grey-headed flying-fox.

Nationally important camps are those that have contained $\geq 10,000$ Grey-headed Flying-foxes in more than one year in the last 10 years, or have been occupied by more than 2,500 Grey-headed Flying-foxes permanently or seasonally every year for the last 10 years (DoE 2015a). Table 4-7 outlines five nationally important camps within a 40km radius of the Project Area.

When assessed at a local scale, the species is generally present intermittently and irregularly (Eby and Lunney 2002). Like general roosting trends for the species a small number of local areas do support a continuous presence while others are associated with consistent, annual patterns of use. "Flying-foxes on the coast tend to migrate to different winter sites near the flowering paperbarks" (de Kauwe, 2021). Irregular patterns of camp occupancy are apparent for the species in the B2N Project locality based on the DAWE Interactive Flying-fox Web Viewer (DAWE interactive map) monitoring data and Sunshine Coast Council's interactive BatMap (SCC BatMap) monitoring data.

The DAWE interactive map displays nineteen flying-fox camps that contain grey-headed flying-fox and SCC BatMap displays thirteen within 40 km of the Project Area (see Table 4-7). ARUP also identified one roost south of Coochin Creek, Glass House Mountains and incidental records of foraging activity at night during their 2020 survey period. The mapped grey-headed flying-fox habitat (vegetation communities) in the Project Area (Appendix D) are considered a foraging resource for the colonies roosting at these camps.

Table 4-7: Grey-headed flying-fox camps within 40km radius of Project Area

Camp Location	Camp Reference	Most recent camp occupancy data
Railway street, Dayboro [^]	DAWE interactive map	2,500 – 9,999 in February 2020 (DAWE)
Rowley Road, Burpengary	DAWE interactive map	1 – 499 in August 2020 (DAWE)
Wararba Creek, Caboolture	DAWE interactive map	2,500 – 9,999 in August 2020 (DAWE)
Bestman Road, Sandstone Point	DAWE interactive map	500 – 2,499 in May 2018 (DAWE)
Webb Lane, Woodford	DAWE interactive map	2,500 – 9,999 in February 2020 (DAWE)
Kilcoy Creek, Kilcoy	DAWE interactive map	2,500 – 9,999 in August 2020 (DAWE)
Vidler Court, Landsborough	DAWE interactive map & SCC BatMap	500 – 2,499 in August 2019 (DAWE)
Stella Maris, Maroochydore [^]	DAWE interactive map & SCC BatMap	0 in May 2021 (DAWE)
Hyne Estate Road, Kandanga [^]	DAWE interactive map	16,000 – 49,999 in August 2020 (DAWE)
Yellow Belly Reserve, Cooran	DAWE interactive map	500 – 2,499 in August 2020 (DAWE)
McDonald's Road, Peachester [^]	DAWE interactive map	
Cootharaba Road, Kinmond Creek	DAWE interactive map	500 – 2,499 in November 2012 (DAWE)
Weyba Creek, Noosaville	DAWE interactive map	500 – 2,499 in August 2013 (DAWE)
Sandy Creek, Esk	DAWE interactive map	100 – 499 in August 2020 (DAWE)
Jubilee Drive, Palmwoods [^]	DAWE interactive map	100 – 499 in August 2018 (DAWE)
Kolora Park, Palmwoods*	DAWE interactive map & SCC BatMap	0 in May 2021, 4,779 in April 2021 (SCC) 2,500 – 9,999 in November 2019 (DAWE)
Greenless Court, Palmwoods	DAWE interactive map	500 – 2,499 in November 2016 (DAWE)
Mary Cairncross Reserve, Maleny	DAWE interactive map & SCC BatMap	100 – 499 in August 2019 (DAWE)
Tesch Park, Maleny	DAWE interactive map	16,000 – 49,999 in February 2020 (DAWE)
Elizabeth Street, Cooloom	SCC BatMap	0 in May 2021 (SCC)
Emerald Woods, Mooloolaba	SCC BatMap	0 in May 2021 (SCC)
Buderim Pines Reserve, Buderim	SCC BatMap	0 in May 2021 (SCC)
McArthur Park, Kuluin	SCC BatMap	0 in May 2021 (SCC)
Alex Forest Conservation Area, Alexandra Headlands	SCC BatMap	105 in May 2021 (SCC)
Porter Park, Golden Beach	SCC BatMap	27,247 in May 2021 (SCC)
Andrea Ahern Bushland Reserve, Battery Hill	SCC BatMap	27,247 in May 2021 (SCC)
Pecan Park, Maleny	SCC BatMap	23,050 in April 2021 (SCC)
Parkside Drive Bushland Park, Beerwah*	SCC BatMap	582 in April 2021 (SCC)
Coonowrin Creek, Glass House Mountains	ARUP 2020 Survey	No monitoring data is available. Camp was first observed on 2/3/2020, 3/3/2020 and 17/3/2020 (ARUP, 2020). Site was not occupied during ERM 2021 surveys.

*Grey-headed flying-foxes observed at camp during ERM 2021 surveys

[^]Nationally important camp

Taking a precautionary approach to MNES habitat assessments determines that the mapped 64.15 ha of foraging resources present within the Project Area are deemed habitat critical to the survival of grey-headed flying-fox. The B2N Project will not directly impact any known grey-headed flying-fox camps. Ground-truthed surveys have identified 64.15 ha of grey-headed flying-fox habitat within the indicative disturbance footprint and 241.72 ha within the Project Area.

4.6.3 Giant barred frog (*Mixophyes iteratus*)

The species occurs along shallow rocky streams in rainforest, wet sclerophyll forest and farmland between 100 m and 1000 m elevation (Covacevich & McDonald 1993) or deep, slow moving streams with steep banks in lowland areas. A short-term study of the patterns of daily movement of this species during the breeding season showed that individuals moved up to 100 m in a night, but not more than 20 m from the stream (Lemckert & Brassil 2000).

In south-eastern Queensland, the giant barred frog is known from Doongul Creek in the Burrum River catchment (Hines 2003), at scattered locations in the Mary River catchment downstream to Kenilworth, the Upper Stanley River, Caboolture River and Coomera River (Hines et al. 1999). A survey between Cooroy and Curra (Cooroy Creek, Six Mile Creek and Skyring Creek) detected the species at 11 of 19 surveyed sites targeted multiple times in 2011-12 (Aland & Wood 2013).

The Review of Environmental Factors (SMEC 2019) established that potential habitat for the giant barred frog was present along many of the major drainage lines within the Project Area including Tibrogargan Creek, Back Creek, Coonowrin Creek, Coochin Creek, Mellum Creek and Addlington Creek and its tributaries. Further frog studies were completed by ARUP in 2020 and concluded that sites at Coochin Creek and Addlington Creek tributaries provide the most suitable quality habitat.

The giant barred frog was observed at Mellum Creek during nocturnal frog surveys in 2019 (ARUP, 2020), approximately 100 m east of the Project Area, this area is downstream of the existing railway and is considered a breeding place for the species. Immature and mature individuals of Giant Barred Frog were observed to be active at Mellum Creek (ARUP, 2020). No giant barred frogs were detected during ERM surveys (2021); determination of suitable habitat within the Project Area was consistent with the previous ecological studies for the species. Ground-truthed surveys have identified 0.1 ha of giant barred frog habitat within the indicative disturbance footprint and 0.98 ha within the Project Area.

4.6.4 Migratory species

The Commonwealth Matters Ecological Report (ARUP 2020), outlines a likelihood of occurrence assessment for listed migratory species that are known or likely to occur in the Project Area. With similar results; the ERM desktop searches and field investigations completed in 2021 identified seven species of migratory birds known or likely to occur in the Project Area. They are the fork-tailed swift (*Apus pacificus*), white-throated needletail (*Hirundapus caudacutus*), oriental cuckoo (*Cuculus optatus*), rufous fantail (*Rhipidura rufifrons*), spectacled monarch (*Monarcha trivirgatus*), black-faced monarch (*Monarcha melanopsis*) and satin flycatcher (*Myiagra cyanoleuca*). The white-throated needletail and fork-tailed swift are both almost exclusively aerial. Tall mature forests were mapped as habitat for the white-throated needletail (also listed as Vulnerable) as the species is known to occasionally roost in this type of habitat.

The oriental cuckoo, rufous fantail, spectacled monarch, black-faced monarch and satin flycatcher all mostly utilise moist forests. Major drainage lines within the B2N Project were identified as potential habitat in the Review of Environmental Factors (SMEC, 2019). Field surveys confirmed that habitat exists along some major drainage lines within the Project Area. The high level of disturbance (e.g. weeds, noise and introduced predators) to these existing habitats means they are in all probability only utilised for movement by these species and not to breed. The rufous fantail was observed during the 2021 field surveys at Sites 4 and 5 in dense vegetation close to drainage lines. The spectacled monarch was observed at Site 29 in dense vegetation bordering swamp habitat. Ground-truthed surveys have identified 14.47 ha of migratory bird habitat within the indicative disturbance footprint and 41.61 ha within the Project Area.

4.6.5 Whipstick wattle (*Acacia attenuata*)

The species occupies areas lower than 30 m altitude. It occurs in waterlogged areas containing wet healthland, open forests and woodlands areas, on poorly drained sandy soils or peat swamps that are infertile. Often grows in areas with the following species: *Leptospermum whitei* and *Baeckea frutescens*; in wallum with *Banksia aemula* and *Eucalyptus robusta*; in woodlands with *Corymbia trachyphloia*, *E. umbra* and *Banksia oblongifolia*; and in open forests of *E. umbra*, *E. racemosa* and *Melaleuca quinquenervia* (Queensland CRA/RFA Steering Committee, 1998).

Potential preferred habitat of *E. racemosa* (RE 12.5.3) open forests on sandy soils, often water-logged, is present within the Project Area. There is a record within the Project Area from 2004. It has not been recorded within the past 10 years or from field surveys. None of the MNES flora species identified as known or likely to occur within the Project Area/locality were observed in the disturbance footprint during field surveys. A conservative approach of mapping potential habitat for these species was undertaken for this MNES Baseline Report. Suitable habitat in RE 12.5.3 has been mapped for this species. Ground-truthed surveys have identified 17.13 ha of potential whipstick wattle habitat within the indicative disturbance footprint and 46.97 ha within the Project Area.

4.6.6 Mt Emu she-oak (*Allocasuarina emuina*)

This species occurs within open and closed heath habitats that are characterised by fine-grained rocky slopes, as well as in Wallum heath in undulating coastal plains. It is found in relatively flat, low-lying coastal areas on areas of slopes of 20 degrees to flat areas (Halford, 1993b). Species associated with habitat for Mt Ema she-oak include *Ptilanthium deustum*, *Hakea actites* and *Banksia oblongifolia*.

There is potential preferred habitat of wet healthland (RE 12.3.13), present within the Project Area. Populations for this species do occur in the Beerwah conservation areas, within the locality of the Project Area. Ground-truthed surveys have identified no potential Mt Emu she-oak habitat within the indicative disturbance footprint and 0.58 ha of potential habitat within the Project Area.

4.6.7 Swamp stringybark (*Eucalyptus conglomerata*)

This species occurs on coastal flat areas at approximately 30 m above sea level, often in ecotones between Wallum heath and tall open forests. Soils are general infertile and there is poor drainage so that the area is often water-logged (Bean, 1980).

There is potential preferred habitat of open forest to woodland of *Melaleuca quinquenervia* and *Eucalyptus robusta* (RE 12.3.4), present within the Project Area. This species was found during field surveys in 2020, however only within the boundary of the Glasshouse Mountains national park, outside of the Project Area (within the locality) (ARUP, 2020).

One planted specimen of swamp stringybark was observed in the Eudlo Train Station Revegetation Environmental Walk (Survey point 5C). The Eudlo Train Station Revegetation Environmental Walk is located adjacent to the Eudlo Train Station, is approximately 1 ha in size and contains native, planted vegetation. The revegetation site was established in 1995 by the Eudlo and Ilkley Landcare Group and is maintained by volunteers. Ground-truthed surveys have identified 11.85 ha of potential swamp stringybark habitat within the indicative disturbance footprint and 32.63 ha within the Project Area.

4.6.8 Macadamia nut (*Macadamia integrifolia*)

This species often grows in remnant rainforest areas, most commonly in open areas on the edges of such rainforests. It can be found across hill crests, slopes, in gullies and benches. It grows in high nutrient value alluvial and volcanic soils and in areas that are well drained (Barry & Thomas, 1994). In Queensland it can be found in a range of environments, from tall closed forest, simple notophyll mixed very tall closed forests, to simple microphyll-notophyll mid-high closed forests with *Araucaria* and *Argyrodendron* emergents (Barry & Thomas, 1994).

There is potential preferred habitat of *Eucalyptus grandis*, *Lophostemon confertus* tall open forest with vine forest understorey ('wet sclerophyll') (RE 12.3.2), present within the Project Area. One individual plant was recorded for this species within the locality in 2020 (ARUP, 2020). The individual was described as a planted individual on a private property (Lot 4 on SP195902) where there is mapped RE 12.3.2, adjacent to the disturbance footprint. Ground-truthed surveys have identified 0.12 ha of potential macadamia nut habitat within the indicative disturbance footprint and 6.45 ha within the Project Area.

4.7 Wetlands of International Importance

The Moreton Bay Ramsar site is a semi-enclosed basin spanning over 110,000 hectares and bounded on its eastern side by two large sand islands. It supports large numbers of marine fauna (including turtles and dugong) as well as shorebirds, mangroves and invertebrates. At its closest point, the wetland is approximately 10 km downstream of the proposed Project Area. Creeks and tributaries within the Project Area do form part of the Pumice Stone Passage catchment area, which flow into the Moreton Bay expanse. Both the Review of Environmental Factors (SMEC 2019) and Commonwealth Protected Matters Report (ARUP, 2020) conclude that the B2N Project will not generate significant impacts to the Ramsar wetland. The B2N Project activities will not have an impact on this Ramsar site, due to the large distance between the Project Area from the Moreton Bay Ramsar site and the proposed construction mitigation measures that will limit the potential for increased impacts to waterways.

5. CONCLUSION

To assess the potential impacts to MNES values associated with the B2N Project, an ecological assessment was undertaken to determine the ecological values within the Project Area. In review of the DAWE Request for Additional Information Required for Assessment by Preliminary Documentation dated 27 January 2021, and previous ecological studies prepared for the B2N Project, it was determined that additional ecological assessments were required to adequately describe MNES values in the Project Area and inform impact assessments.

Documented in this MNES Baseline Report is a description of MNES values in the Project Area based on desktop research, previous field investigations (SMEC 2019; ARUP 2020) and field investigations undertaken in April to May 2021. The field investigations involved an assessment of terrestrial and aquatic habitats using survey techniques aligned with survey guidelines including: threatened flora meander searches, deploying camera traps, spotlighting and targeted bird surveys.

The majority of the Project Area consists of urban and agricultural cleared areas and associated road and rail infrastructure. The condition of vegetation within the Project Area is highly modified as a result of previous and current land management practices (urban use, agriculture and the existing rail line). Much of the remnant vegetation occurs in small to medium sized linear patches throughout the project alignment, with some vegetation in the southern sections being connected to vegetation adjacent to the Project Area, including Glass House Mountains National Park. Some riparian areas and small farm dams occur throughout the Project Area. However, these are regarded as providing low ecological value due to degradation from heavy weed infestations.

In total, seven *EPBC Act* listed threatened species and seven listed migratory species were identified as known or likely to occur in the Project Area. No MNES TECs were identified as occurring within the Project Area.

The B2N Project will occur across a 256.9 ha indicative disturbance footprint, with 64.15 ha of habitat critical to the survival of the koala (habitat score of five) and grey-headed flying-fox within the disturbance footprint. The information presented in this report will be used to inform the development of the PD, in response to recent DAWE requests, as part of the process for assessment under the *EPBC Act*.

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APPENDIX A LIKELIHOOD OF OCCURRENCE

Species name	EPBC Status	Habitat requirements	Distribution in Project Area	Records in the Project Area/ locality	Comment on likelihood of occurrence in Project Area
Birds (including listed migratory species)					
Regent honeyeater (<i>Anthochaera phrygia</i>)	CE	<p>It primarily occurs in box-ironbark woodland, but also occurs in other forest types. The species primarily feeds on nectar and, to a lesser extent, insects and their exudates (lerps and honeydew). It mainly feeds on nectar from eucalypts and mistletoes and it prefers taller and larger diameter trees for foraging.</p> <p>Box ironbark woodland is largely absent in the Project Area. Desired habitat features associated with eucalypt dominated remnant vegetation may be present in limited amounts, but have poor connectivity and are known to be disturbed. This species does have the potential to visit the Project Area seasonally, especially during inland droughts. There are no known breeding areas for this species in Queensland (DoE, 2015).</p>	Yes	No	<p>Potential to occur</p> <ul style="list-style-type: none"> ■ Project Area is within the distribution for the species ■ Species may visit the Project Area seasonally, especially during inland droughts. ■ No records within the Project Area/locality (closest record is the Bribie Island State Forest, 14 km east of the Project Area).
Coxen's fig parrot (<i>Cyclopsitta diophthalma coxeni</i>)	E	<p>Coxen's Fig-Parrot occurs in rainforest habitats including subtropical rainforest, dry rainforest, littoral and developing littoral rainforest, and vine forest. The fig-parrot is likely to favour alluvial areas that support figs and other trees with fleshy fruits, in particular, habitats that have a high diversity of fig species, and that have a fruiting season that is staggered across moisture and altitudinal gradients.</p> <p>No preferred habitat with a high diversity of fig species are present. Potential general habitat associated with rainforest tree species is limited, has poor connectivity, is known to be disturbed and there is a lack of fruiting season that is staggered across moisture and altitudinal gradients.</p>	Yes	No	<p>Unlikely to occur</p> <ul style="list-style-type: none"> ■ Project Area is within the distribution for the species ■ Lack of suitable habitat in the Project Area. ■ No recent records for the species occur within the Project Area/locality.

Species name	EPBC Status	Habitat requirements	Distribution in Project Area	Records in the Project Area/ locality	Comment on likelihood of occurrence in Project Area
Australian Fairy Tern (<i>Sternula nereis nereis</i>)	V	<p>This species nests on sheltered sandy beaches, spits and banks above the high tide line and below vegetation. The subspecies has been found in embayments of a variety of habitats including offshore, estuarine or lacustrine (lake) islands, wetlands and mainland coastline. The bird roosts on beaches at night.</p> <p>No preferred or general habitat associated with coastal areas is present within the Project Area.</p>	Yes	No	<p>Unlikely to occur</p> <ul style="list-style-type: none"> ■ Project Area is within the distribution for the species ■ No preferred or general habitat associated with coastal areas is present within the Project Area. ■ No records for the species occur within the Project Area/locality.
Australasian Bittern (<i>Botaurus poiciloptilus</i>)	E	<p>Australasian bitterns feed and breed in generally large, fresh to moderately brackish wetlands. Extensive areas of water plants, especially rushes, reeds and sedges, provide habitat for the bitterns. Shallow water with a low to medium density of water plants mixed with, or near short fine sedges are favoured for foraging while higher density emergent vegetation is preferred for nesting.</p> <p>No preferred permanent freshwater wetlands with tall, dense vegetation are present. The potential general habitat associated with farm dams in the Project Area has poor connectivity, is known to be disturbed and lacks the preferred higher density emergent vegetation for nesting.</p>	Yes	No	<p>Unlikely to occur</p> <ul style="list-style-type: none"> ■ Project Area is within the distribution for the species (may occur) ■ Lack of suitable habitat to sustain this species in the Project Area.. ■ No records within the Project Area/locality (closest record is the Maroochy Wetlands Sanctuary, 10.5 km east of the Project Area).
Curlew sandpiper (<i>Calidris ferruginea</i>)	M	<p>This species can occur inland, including around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand. They occur in both fresh and brackish waters. Occasionally they are recorded around floodwaters.</p> <p>No preferred watercourses with mud or sand flats are present.</p>	Yes	No	<p>Unlikely to occur</p> <ul style="list-style-type: none"> ■ Project Area is within the distribution for the species (may occur) ■ No preferred watercourses with mud or sand flats are present. ■ No records within the Project Area/locality (closest record is the

Species name	EPBC Status	Habitat requirements	Distribution in Project Area	Records in the Project Area/ locality	Comment on likelihood of occurrence in Project Area
					Coolum Creek Environment Reserve 10.5 km north-east of the Project Area).
Red goshawk (<i>Erythrorhynchus radiatus</i>)	V	<p>This species prefers wooded and forested lands of tropical and warm-temperate Australia. Forests of intermediate density are favoured, or ecotones between habitats of differing densities, e.g. between rainforest and eucalypt forest, between gallery forest and woodland, or on edges of woodland and forest where they meet grassland, cleared land, roads or watercourses. This species has a large home range.</p> <p>No preferred ecotones are present within the Project Area. The limited amounts of general habitat in the form of wooded eucalypt forests present in the Project Area has poor connectivity and is known to be disturbed.</p>	Yes	No	<p>Unlikely to occur</p> <ul style="list-style-type: none"> ■ Project Area is within the distribution for the species. ■ Lack of suitable quality habitat in the Project Area. ■ No records within the Project Area/locality. Closest record is over 30 km to the west of the Project Area, in Conondale National Park (2007).
Grey Falcon (<i>Falco hypoleucos</i>)	V	<p>The species occurs in arid and semi-arid Australia, including the Murray-Darling Basin, Eyre Basin, central Australia and Western Australia. The species is mainly found where annual rainfall is less than 500 mm, except when wet years are followed by drought, when the species might become marginally more widespread, although it is essentially confined to the arid and semi-arid zones at all times.</p> <p>The species frequents timbered lowland plains, particularly acacia shrublands that are crossed by tree-lined water courses. The species has been observed hunting in treeless areas and frequents tussock grassland and open woodland, especially in winter.</p>	Yes	No	<p>Unlikely to occur</p> <ul style="list-style-type: none"> ■ Project Area is within the species distribution. ■ The species occurs in arid and semi-arid Australia. Lack of arid and semi-arid zones in the Project Area. ■ No records for the species occur within the Project Area/locality.
White-throated needletail (<i>Hirundapus caudacutus</i>)	M	This species occurs over most types of habitat, but are recorded most often above wooded areas, including open forest and rainforest, and may also	Yes	Yes (Project Area)	Known to occur

Species name	EPBC Status	Habitat requirements	Distribution in Project Area	Records in the Project Area/ locality	Comment on likelihood of occurrence in Project Area
		<p>fly between trees or in clearings, below the canopy, but they are less commonly recorded flying above woodland. Whilst rare, they have been recorded on wooded ends of ridges, roosting after dark high in the eucalypt tree canopies.</p> <p>Species likely to fly aerially over the Project Area. The Project Area does contain potential general habitat in the form of eucalypt forests. It may also roost and forage in such general woodland habitat.</p>			<ul style="list-style-type: none"> ■ Project Area is within the distribution of the species. ■ Species likely to fly aerially over the Project Area, which also contains potential general habitat in the form of tall eucalypt forests. ■ Recent records exist within the Project Area (ALA, 2021).
Swift parrot (<i>Lathamus discolor</i>)	CE	<p>This bird mainly occurs in the eucalypt forests where it forages on flowers and psyllid lerps. This species mainly occurs on inland slopes and occasionally is found on the coast. The majority of the species, outside its breeding habitat in Tasmania, is found in flowering eucalypt woodlands of Victoria and New South Wales.</p> <p>Although disturbed, some habitat elements may occur (e.g. <i>E. tereticornis</i>, <i>E. robusta</i>, <i>E. siderophloia</i>) but mostly occur in disturbed linear fragments.</p>	Yes	No	<p>Unlikely to occur</p> <ul style="list-style-type: none"> ■ Project Area is on the northern edge of the distribution for this species. ■ Lack of suitable habitat in the Project Area. ■ No records within the Project Area/locality. The nearest recent record for this species in Queensland, occurs in Sheep Station Creek Conservation Park, Upper Caboolture.
Black-breasted button-quail (<i>Turnix melanogaster</i>)	V	<p>The black-breasted button-quail is restricted to rainforests and forests, mostly in areas with 770-1200 mm rainfall per annum. In south-eastern Queensland, they are recorded on rare occasions in open eucalypt forest. It also occurs within semi-evergreen vine thicket habitats.</p> <p>There are no preferred rainforest habitats within the Project Area. The potential habitat present in the Project Area in the form of open eucalypt forest is disturbed, contains introduced predators and lacks connectivity.</p>	Yes	No	<p>Unlikely to occur</p> <ul style="list-style-type: none"> ■ Project Area is within the species distribution as it sits just to the west of the species westernmost range. ■ Lack of suitable quality habitat in the Project Area. ■ No records within the Project Area/locality. Nearest recent record (2012) is in the Beerburrum East State Forest, 11.5 km east of the Project Area (ALA, 2021).

Species name	EPBC Status	Habitat requirements	Distribution in Project Area	Records in the Project Area/ locality	Comment on likelihood of occurrence in Project Area
Common Greenshank (<i>Tringa nebularia</i>)	M	<p>The Common Greenshank is found in a wide variety of inland wetlands and sheltered coastal habitats of varying salinity. It occurs in sheltered coastal habitats, typically with large mudflats and saltmarsh, mangroves or seagrass. Habitats include embayments, harbours, river estuaries, deltas and lagoons and are recorded less often in round tidal pools, rock-flats and rock platforms. The species uses both permanent and ephemeral terrestrial wetlands, including swamps, lakes, dams, rivers, creeks, billabongs, waterholes and inundated floodplains, claypans and saltflats. The species is known to forage at edges of wetlands, in soft mud on mudflats, in channels, or in shallows around the edges of water often among pneumatophores of mangroves or other sparse, emergent or fringing vegetation, such as sedges or saltmarsh. It will occasionally feed on exposed seagrass beds.</p> <p>No preferred wetland habitats with large mudflats and saltmarsh, mangroves or seagrass occur in the Project Area. Habitats including embayments, harbours, river estuaries, deltas and lagoons are absent from the Project Area.</p>	Yes	Yes (locality)	<p>Potential to occur</p> <ul style="list-style-type: none"> ■ Project Area is within the distribution of the species, where it may occur. ■ Suitable habitat does not occur in the Project Area. ■ Nearest recent record (2017) is the Maroochy Wetlands Sanctuary, 9 km east of the Project Area (ALA, 2021).
Common sandpiper (<i>Actitis hypoleucos</i>)	M	<p>The species utilises a wide range of coastal wetlands and some inland wetlands, with varying levels of salinity, and is mostly found around muddy margins or rocky shores and rarely on mudflats. The common sandpiper has been recorded in estuaries and deltas of streams, as well as on banks farther upstream; around lakes, pools, billabongs, reservoirs, dams and claypans, and occasionally piers and jetties.</p>	Yes	No	<p>Unlikely to occur</p> <ul style="list-style-type: none"> ■ Project Area is within the species distribution, where it may occur. ■ Suitable habitat does not occur in the Project Area. ■ No records for the species exist within the Project Area/locality.

Species name	EPBC Status	Habitat requirements	Distribution in Project Area	Records in the Project Area/ locality	Comment on likelihood of occurrence in Project Area
		No preferred coastal or wetland habitats, with suitable muddy or rocky margins, present within the Project Area.			
Oriental cuckoo (<i>Cuculus optatus</i>)	M	<p>The species uses a range of vegetated habitats such as monsoon rainforest, wet sclerophyll forest, open woodlands and appears quite often along edges of forests, or ecotones between forest types. This cuckoo feeds arboreally, foraging for invertebrates on loose bark on the trunks and branches of trees, and among the foliage, including in mistletoes. It will forage from the ground, but requires shrubs or trees from which it sallies and returns to consume prey items.</p> <p>Potential preferred habitat associated with moist forests occur along major drainage lines in the Project Area.</p>	Yes	Yes (locality)	<p>Likely to occur</p> <ul style="list-style-type: none"> Project Area is within the species distribution. Preferred habitat associated with moist forests occur along major drainage lines exist in the Project Area. Two recent records (2017, 2002) for the species exist within the locality near Landsborough and Beerwah (ALA, 2021).
Spectacled monarch (<i>Monarcha trivirgatus</i>)	M	<p>The spectacled monarch prefers thick understorey in rainforests, wet gullies and waterside vegetation, as well as mangroves.</p> <p>Preferred habitat of thick understorey in wet gullies with associated vegetation, is present within the Project Area.</p>	Yes	Yes (Project Area)	<p>Known to occur</p> <ul style="list-style-type: none"> Project Area is within the species distribution. General habitat is present within the Project Area. Species observed during ERM surveys (2021).
Pectoral sandpiper (<i>Calidris melanotos</i>)	M	In Australasia, the pectoral sandpiper prefers shallow fresh to saline wetlands. The species is found at coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands.	Yes	No	<p>Unlikely to occur</p> <ul style="list-style-type: none"> Project Area is within the distribution for this species. No preferred or general habitat of shallow fresh or saline wetlands or coastal habitats present within the Project Area.

Species name	EPBC Status	Habitat requirements	Distribution in Project Area	Records in the Project Area/ locality	Comment on likelihood of occurrence in Project Area
		No preferred or general habitat of shallow fresh or saline wetlands or coastal habitats present within the Project Area.			<ul style="list-style-type: none"> No records for the species exist within the Project Area/locality.
Osprey (<i>Pandion haliaetus</i>)	M	<p>This species occurs in littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands. They are found in lakes, large waterholes, beaches, coastal cliffs as well as inshore waters, bays and reefs.</p> <p>No preferred habitat associated with coastal or wetland areas are present. Extensive areas of open fresh, brackish or saline water are required for foraging (Marchant & Higgins 1993), these habitats do not occur in the Project Area.</p>	Yes	Yes (locality)	<p>Potential to occur</p> <ul style="list-style-type: none"> Project Area is within the distribution for this species. Lack of suitable quality habitat in the Project Area. Two recent records (2019) for the species exist within the locality near Landsborough and Beerwah (ALA, 2021).
Fork-tailed swift (<i>Apus pacificus</i>)	M	<p>In Australia, they occur over cliffs and beaches and also over islands and sometimes well out to sea. They also occur over settled areas, including towns, urban areas and cities. They mostly occur over dry or open habitats, including riparian woodland and tea-tree swamps, low scrub, heathland or saltmarsh.</p> <p>Potential general foraging habitat exists in the Project Area. There is a lack of preferred coastal and riparian heathland or swamp habitat.</p>	Yes	Yes (Project Area)	<p>Known to occur</p> <ul style="list-style-type: none"> Project Area is within the species distribution. Potential general foraging habitat exists in the Project Area. Eight recent records (2018-2019) for the species occur within the Project Area/locality. The closest records occur near to Nambour, Landsborough and Beerwah (ALA, 2021).
Black-faced monarch (<i>Monarcha melanopsis</i>)	M	The black-faced monarch mainly occurs in rainforest ecosystems, including semi-deciduous vine-thickets, complex notophyll vine-forest, tropical (mesophyll) rainforest, subtropical (notophyll) rainforest, mesophyll (broadleaf) thicket/shrubland, warm temperate rainforest, dry (monsoon) rainforest and (occasionally) cool temperate rainforest.	Yes	Yes (Project Area)	<p>Known</p> <ul style="list-style-type: none"> Project Area is within the species distribution. Preferred habitat of moist forest environments do occur along major drainage lines in the Project Area.

Species name	EPBC Status	Habitat requirements	Distribution in Project Area	Records in the Project Area/ locality	Comment on likelihood of occurrence in Project Area
		Preferred habitat of moist forest environments do occur along major drainage lines in the Project Area.			<ul style="list-style-type: none"> Observed in Project Area during ecological assessment surveys by WBM in 2006.
Satin flycatcher (<i>Myiagra cyanoleuca</i>)	M	<p>Satin flycatchers inhabit heavily vegetated gullies in eucalypt-dominated forests and taller woodlands, and on migration, occur in drier woodlands and open forests.</p> <p>Preferred habitat of moist forest environments do occur along major drainage lines in the Project Area.</p>	Yes	Yes (locality)	<p>Likely to occur</p> <ul style="list-style-type: none"> Project Area is within the species distribution. Preferred habitat of moist forest environments do occur along major drainage lines in the Project Area. Six recent records (2002-2017) for the species occur within the locality. The closest records occur near to Beerburrum, Landsborough and Beerwah (ALA, 2021).
Rufous fantail (<i>Rhipidura rufifrons</i>)	M	<p>In east and south-east Australia, the rufous fantail mainly inhabits wet sclerophyll forests, often in gullies dominated by eucalypts such as tallow-wood (<i>Eucalyptus microcorys</i>) and mountain grey gum (<i>E. cypellocarpa</i>). When on passage, they are sometimes recorded in drier sclerophyll forests and woodlands, including spotted gum (<i>E. maculata</i>), yellow box (<i>E. melliodora</i>), ironbarks or stringybarks, often with a shrubby or heath understorey.</p> <p>Preferred habitat of moist forest environments do occur along major drainage lines in the Project Area.</p>	Yes	Yes (Project Area)	<p>Known to occur</p> <ul style="list-style-type: none"> Project Area is within the species distribution. Preferred habitat of moist forest environments do occur along major drainage lines in the Project Area. Species observed during ERM surveys (2021).
Sharp-tailed sandpiper (<i>Calidris acuminata</i>)	M	Prefers habitat on muddy edges of freshwater wetlands or brackish wetlands. Can be found at dam inland. Will often occupy coastal mudflats when ephemeral terrestrial wetlands have dried out.	Yes	Yes (locality)	<p>Unlikely to occur</p> <ul style="list-style-type: none"> Project Area is within the species distribution, where the species may occur. Lack of suitable habitat in the Project Area

Species name	EPBC Status	Habitat requirements	Distribution in Project Area	Records in the Project Area/ locality	Comment on likelihood of occurrence in Project Area
		Preferred and general habitat of muddy edges on freshwater or brackish wetlands are not present within the Project Area.			<ul style="list-style-type: none"> Four recent records (2012-2013) for the species occur within the locality near to Landsborough (ALA, 2021).
Red knot (<i>Calidris canutus</i>)	M	<p>In Australasia the Red Knot mainly inhabit intertidal mudflats, sandflats and sandy beaches of sheltered coasts, in estuaries, bays, inlets, lagoons and harbours; sometimes on sandy ocean beaches or shallow pools on exposed wave-cut rock platforms or coral reefs. They are occasionally seen on terrestrial saline wetlands near the coast, such as lakes, lagoons, pools and pans, and recorded on sewage ponds and saltworks, but rarely use freshwater swamps. They rarely use inland lakes or swamps.</p> <p>No preferred or general coastal habitats present within the Project Area.</p>	Yes	No	<p>Unlikely to occur</p> <ul style="list-style-type: none"> Project Area is within the distribution for this species. No preferred or general coastal habitats present within the Project Area. No records for the species exist within the Project Area/locality.
Latham's snipe (<i>Gallinago hardwickii</i>)	M	<p>They usually occur in open, freshwater wetlands that have some form of shelter (usually low and dense vegetation) nearby. They generally occupy flooded meadows, seasonal or semi-permanent swamps, or open waters, but various other freshwater habitats can be used including bogs, waterholes, billabongs, lagoons, lakes, creek or river margins, river pools and floodplains. This species has been said to occur very rarely in small patches of habitat such as roadside ditches and alpine bogs (Higgins & Davies, 1996).</p> <p>There is a lack of preferred/general wetland and watercourse features throughout the Project Area, with the necessary forms of shelter.</p>	Yes	Yes (locality)	<p>Unlikely to occur</p> <ul style="list-style-type: none"> Project Area is within the species distribution. No preferred or general habitat of wetlands with appropriate shelter vegetation present. No records for the species occur within the Project Area. Six records exist within the locality, near to Beerburum, Beerwah and Landsborough, from 2011-2019 (ALA, 2021).

Mammals

Species name	EPBC Status	Habitat requirements	Distribution in Project Area	Records in the Project Area/ locality	Comment on likelihood of occurrence in Project Area
Large-eared pied bat (<i>Chalinolobus dwyeri</i>)	V	<p>Sandstone cliffs and fertile wooded valley habitat within close proximity of each other are considered as habitat critical to the survival of the large-eared pied bat. Rainforest and moist eucalypt forest habitats on other geological substrates (viz. rhyolite, trachyte and basalt) at high elevation are also considered to be important for this species.</p> <p>The large-eared pied bat requires the presence of diurnal roosts in order to shelter. Potential general roosting habitat occurs in the locality on nearby rocky outcrops of Glass House Mountains. The species may forage in the Project Area though habitat is disturbed and fragmented by existing rail and roads.</p>	Yes	No	<p>Unlikely to occur</p> <ul style="list-style-type: none"> ■ The Project Area occurs within the distribution for this species. ■ Lack of roosting habitat in Project Area. The limited existing habitat of eucalypt forests are disturbed and fragmented. ■ No records occur within the Project Area/locality.
Northern quoll (<i>Dasyurus hallucatus</i>)	E	<p>The northern quoll occurs in a range of habitats, including open dry sclerophyll forest and woodland, riparian woodland, low dry vine thicket, the margins of notophyll vineforest, sugarcane farms and in urban areas. They are most abundant in hilly or rocky areas close to permanent water.</p> <p>The preferred habitat of rocky areas close to permanent water are not present within the Project Area. No general habitat of rocky areas within dry sclerophyll forests associated with remnant eucalypt woodlands are present.</p>	Yes	No	<p>Unlikely to occur</p> <ul style="list-style-type: none"> ■ Project Area is within the southern distribution of the species. ■ No preferred or general habitat of rocky areas close to permanent water are present within the Project Area. ■ There are no recent records within the Project Area/locality. The closest record is from Montville in 1989, 6 km north-east of Eudlo (ALA, 2021).
Long-nosed potoroo (<i>Potorous tridactylus tridactylus</i>)	V	<p>There is no consistent pattern to the habitat of the Long-nosed Potoroo (SE Mainland); it can be found in wet eucalypt forests to coastal heaths and scrubs. The main factors would appear to be access to some form of dense vegetation for shelter and the presence of an abundant supply of fungi for food.</p>	Yes	No	<p>Unlikely to occur</p> <ul style="list-style-type: none"> ■ The Project Area occurs within the distribution for this species. ■ Lack of suitable habitat in the Project Area. The limited amount of potential

Species name	EPBC Status	Habitat requirements	Distribution in Project Area	Records in the Project Area/ locality	Comment on likelihood of occurrence in Project Area
		Potential general habitat of eucalypt forests exists within Project Area, however, the limited amount of potential habitat contains introduced predators, is disturbed and fragmented.			<p>habitat contains introduced predators, is disturbed and fragmented.</p> <ul style="list-style-type: none"> There are no recent records within the Project Area/locality.
Greater glider (<i>Petauroides volans</i>)	V	<p>The grey-headed flying-fox is an arboreal nocturnal marsupial, largely restricted to eucalypt forests and woodlands. It is primarily folivorous, with a diet mostly comprising eucalypt leaves, and occasionally flowers. It is more common in taller, montane older forests which have an abundance of hollows.</p> <p>Preferred habitat of older forests which have an abundance of hollows and good connectivity are not present in the Project Area. Potential habitat features of tall, mature eucalypts with some hollows are infrequently encountered in the project area, and only occur in narrow, linear fragments in disturbed parts of the Project Area.</p>	Yes	Yes (locality)	<p>Unlikely to occur</p> <ul style="list-style-type: none"> The Project Area occurs within the distribution for the species. Potential habitat features of tall, mature eucalypts with some hollows are infrequently encountered in the project area, and only occur in narrow, linear fragments in disturbed parts of the Project Area. There are no recent records within the Project Area. There is one record in the locality, 2 km south of the Project Area, in Eudlo from 2008 (ALA, 2021).
Koala (<i>Phascolarctos cinereus</i>)	V	<p>Koalas naturally inhabit a range of temperate, sub-tropical and tropical forest, woodland and semi-arid communities dominated by Eucalyptus species as explained by Martin & Handasyde 1999 (as cited in, DoE, 2019h). Koala habitat can be broadly defined as any forest or woodland containing species that are known koala food trees, or shrubland with emergent food trees.</p> <p>Preferred habitat of eucalypt forests, and preferred food trees, present within the Project Area. Habitat within the Project Area is highly disturbed by weeds, domestic animals, and fragmentation by roads, agricultural land and rail.</p>	Yes	Yes (locality)	<p>Known to occur</p> <ul style="list-style-type: none"> The Project Area occurs within the distribution for the species. Preferred and general habitat of eucalypt forests, and preferred food trees, present within the Project Area. No sightings were observed during field surveys or targeted dog detection surveys (USC, 2020, 2021), but signs (faecal pellet and scratches) were observed (ARUP, 2020). Recent records exist in the locality (2014-2020) near to Landsborough, Beerburum and Palmwoods (ALA, 2021). This data

Species name	EPBC Status	Habitat requirements	Distribution in Project Area	Records in the Project Area/ locality	Comment on likelihood of occurrence in Project Area
					suggests very low koala abundance within and adjacent to the Project Area.
Grey-headed flying fox (<i>Pteropus poliocephalus</i>)	V	<p>It is a canopy-feeding frugivore and nectarivore, which utilises vegetation communities including rainforests, open forests, closed and open woodlands, Melaleuca swamps and Banksia woodlands. It also feeds on commercial fruit crops and on introduced tree species in urban areas. Ebv (1998) explained that the primary food source is blossom from Eucalyptus and related genera but in some areas it also utilises a wide range of rainforest fruits (as cited in, DoE, 2019i).</p> <p>The listing advice for this species says that individuals can travel up to 50 km from their known roosting camps, in order to forage. They generally roost within 20 km of food sources which include the nectar and pollen of Eucalyptus, Melaleuca and Banksia native trees.</p> <p>General foraging habitat present in eucalypt woodlands and riparian areas and roost sites are known to occur in the locality, and the species was observed during fauna surveys.</p>	Yes	Yes (Project Area)	<p>Known to occur</p> <ul style="list-style-type: none"> ■ The Project Area occurs within the distribution for this species. ■ Preferred foraging habitat present in eucalypt woodlands and riparian areas. ■ Roost sites are known to occur in the locality, the nearest known roost for the species is at Kolora Park in Palmwoods. Species was observed in locality during ERM surveys 2021. Observed foraging in the Project Area and roosts in use during the daytime were recorded by ARUP (2020).
Spotted-tailed quoll (<i>Dasyurus maculatus maculatus</i>)	E	<p>This species generally requires more mature wet forests. However it has been found in a range of habitats which include open and closed eucalypt woodlands, sub-alpine woodlands and coastal heathlands. Like the northern quoll, it requires denning habitats, normally in the form of rocky escarpments.</p> <p>There are no preferred mature wet sclerophyll forests present within the Project Area. General habitat of open eucalypt woodlands associated with</p>	Yes	No	<p>Unlikely to occur</p> <ul style="list-style-type: none"> ■ The Project Area sits in the species distribution, where the species may occur. ■ Lack of suitable habitat within the Project Area. ■ There are no recent records within the Project Area/locality.

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		remnant vegetation are fragmented, disturbed and limited in the Project Area.			
Water mouse (<i>Xeromys myoides</i>)	V	<p>This species requires habitat including mangroves and the associated saltmarsh, sedgeland, clay pans, heathlands and freshwater wetlands. In south-east Queensland, water mouse habitat includes mangrove communities and adjacent sedgeland, grasslands and freshwater wetlands. The water mouse has also been captured from a variety of freshwater wetland and wet heath habitats in south-east Queensland.</p> <p>No preferred or general wetland habitats exist in the Project Area.</p>	Yes	No	<p>Unlikely to occur</p> <ul style="list-style-type: none"> ■ The Project Area sits in the species distribution, where the species may occur. ■ There is no preferred or general wetland habitat within the Project Area. ■ There are no recent records within the Project Area/locality.
Insects					
Australian fritillary (<i>Argynnis hyperbius inconstans</i>)	CE	<p>The Australian fritillary is restricted to areas where its larval food plant, <i>Viola betonicifolia</i> (the arrowhead violet), occurs. The arrowhead violet is widespread throughout Queensland and NSW, at both high and low altitudes. However, the Australian fritillary appears to only occupy lower altitude sites.</p> <p>Preferred or general microhabitat does not exist in Project Area.</p>	Yes	No	<p>Unlikely to occur</p> <ul style="list-style-type: none"> ■ The Project Area sits in the species distribution, where the species may occur. ■ Preferred or general microhabitat does not exist in Project Area. ■ There are no recent records within the Project Area/locality.
Pink underwing moth (<i>Phyllodes imperialis smithersi</i>)	E	<p>The Pink underwing moth is found below the altitude of 600 m in undisturbed, subtropical rainforest on rich volcanic soils and fertile alluvium. It occurs in association with the vine <i>Carronia multiseptata</i>, a collapsed shrub that provides the food and habitat the moth requires in order to breed.</p> <p>Preferred or general microhabitat does not exist in Project Area.</p>	Yes	No	<p>Unlikely to occur</p> <ul style="list-style-type: none"> ■ The Project Area sits in the species distribution, where the species may occur. ■ Preferred or general microhabitat does not exist in Project Area.

Species name	EPBC Status	Habitat requirements	Distribution in Project Area	Records in the Project Area/ locality	Comment on likelihood of occurrence in Project Area
					<ul style="list-style-type: none"> There are no recent records within the Project Area/locality.
Frogs					
Wallum sedge frog (<i>Litoria alongburensis</i>)	V	<p>The Wallum Sedge Frog is found in ephemeral, seasonal and permanent wetlands with emergent reeds, ferns and/or sedges, in undisturbed coastal wallum swamps.</p> <p>No preferred habitat of undisturbed coastal wallum swamps occur in the Project Area. There is a lack of preferred sedge species for the wallum sedge frog present in the Project Area.</p>	Yes	Yes (locality)	<p>Unlikely to occur</p> <ul style="list-style-type: none"> The Project Area sits in the species distribution, where the species may occur. Lack of suitable habitat in the Project Area. There are no recent records within the Project Area. One recent record exists within the locality, 9 km east of Landsborough, from 2010 (ALA, 2021).
Giant barred frog (<i>Mixophyes iteratus</i>)	E	<p>The Giant Barred Frog occurs in rainforests and wet sclerophyll forests in upper to lower catchment areas. During surveys in the Cooroy to Curra area of south-east Queensland, Giant Barred Frogs were observed to prefer a closed forest canopy with a relatively light cover of vegetation at ground level.</p> <p>Small amounts of preferred habitat exists along some major drainage lines within the Project Area.</p>	Yes	Yes (locality)	<p>Likely to occur</p> <ul style="list-style-type: none"> The Project Area occurs within the distribution for this species. Small amounts of preferred habitat exists along some major drainage lines within the Project Area. Species was detected 100 m east of the Project Area during surveys (ARUP, 2020) at Mellum Creek.
Fleay's frog (<i>Mixophyes fleayi</i>)	E	<p>Fleay's frog is associated with montane rainforest and open forest communities adjoining rainforest. The species occurs along stream habitats from first to third order streams and is not found in ponds or ephemeral pools. Adults may be found in leaf litter and along watercourses in rainforest and adjoining wet sclerophyll forests. At some locations where the species has been recorded, riparian vegetation has</p>	Yes	No	<p>Unlikely to occur</p> <ul style="list-style-type: none"> The Project Area sits in the species distribution, where the species may occur. Preferred or general microhabitat does not exist in Project Area.

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		<p>been disturbed and replaced by weeds, however this is considered marginal habitat.</p> <p>No preferred or general rainforest habitat occurs in the Project Area.</p>			<ul style="list-style-type: none"> There are no recent records within the Project Area/locality.
Reptiles					
Collared delma (<i>Delma torquata</i>)	V	<p>This species normally inhabits eucalypt-dominated woodlands and open-forests in Queensland Regional Ecosystem Land Zones. The regional ecosystems it prefers are ones dominated by poplar box (<i>Eucalyptus populnea</i>) on alluvial plains, lemon-scented gum (<i>Corymbia citriodora</i>) open forest on coarse-grained sedimentary rocks and poplar box/brigalow (<i>Acacia harpophylla</i>) open forests on fine-grained sedimentary rocks.</p> <p>Preferred microhabitats and associated open forests are not present within the Project Area and preferred rocky areas are lacking within the Project Area.</p>	Yes	No	<p>Unlikely to occur</p> <ul style="list-style-type: none"> The Project Area occurs within the distribution for this species. Preferred and general microhabitats and associated open forests are not present within the Project Area. No records for this species occur within the Project Area/locality.
Dunmall's snake (<i>Furina dunmali</i>)	V	<p>This species is found in forests and woodlands on black alluvial cracking clay and clay loams dominated by Brigalow (<i>Acacia harpophylla</i>), other Wattles (<i>A. burowii</i>, <i>A. deanii</i>, <i>A. leioclyx</i>), native Cypress (<i>Callitris</i> spp.) or Bull-oak (<i>Allocasuarina luehmannii</i>).</p> <p>There is no preferred or general habitat of Brigalow and <i>Callitris</i> forests present within the Project Area.</p>	Yes	No	<p>Unlikely to occur</p> <ul style="list-style-type: none"> The Project Area occurs within the distribution for this species. There is no preferred or general habitat of Brigalow and <i>Callitris</i> forests present within the Project Area. No records for this species occur within the Project Area/locality.
Three-toed snake-tooth skink	V	In Queensland, the Three-toed Snake-tooth Skink has been recorded in rainforest, closed forest, wet sclerophyll forest, tall open Blackbutt (<i>Eucalyptus</i>	Yes	No	Unlikely to occur

Species name	EPBC Status	Habitat requirements	Distribution in Project Area	Records in the Project Area/ locality	Comment on likelihood of occurrence in Project Area
(<i>Coeranoscincus reticulatus</i>)		<p>pilularis) forest, tall layered open eucalypt forest and closed Brush Box (<i>Lophostemon confertus</i>) forest.</p> <p>There are limited preferred forested habitats with the correct microhabitat occurring within the Project Area. Habitat in the Project Area is disturbed and fragmented by existing road and rail.</p>			<ul style="list-style-type: none"> ■ The Project Area sits in the species distribution, where the species may occur. ■ Project AreaLack of preffered microhabitat in Project Area. ■ There are no recent records within the Project Area.
Plants					
Whipstick wattle (<i>Acacia attenuata</i>)	E	<p>The species occupies areas lower than 30 m altitude. It occurs in waterlogged areas containing wet healthland, open forests and woodlands areas, on poorly drained sandy soils or peat swamps that are infertile. Often grows in areas with the following species: <i>Leptospermum whitei</i> and <i>Baeckea frutescens</i>; in wallum with <i>Banksia aemula</i> and <i>Eucalyptus robusta</i>; in woodlands with <i>Corymbia trachyphloia</i>, <i>E. umbra</i> and <i>Banksia oblongifolia</i>; and in open forests of <i>E. umbra</i>, <i>E. racemosa</i> and <i>Melaleuca quinquenervia</i> (Queensland CRA/RFA Steering Committee, 1998).</p> <p>Potential preferred habitat of <i>E. racemosa</i> (RE 11.5.3) open forests on sandy soils, often water-logged, is present within the Project Area.</p>	Yes	Yes (Project Area)	<p>Likely to occur</p> <ul style="list-style-type: none"> ■ The Project Area occurs within the distribution for this species. ■ Potential preferred habitat of RE 12.5.3 present within the Project Area. ■ There is a record within the Project Area from 2004. It has not been recorded within the past 10 years or from field surveys.
Scented acronychia (<i>Acronychia littoralis</i>)	E	<p>This species occurs in sub-littoral rainforest most commonly in transitional zones between swamp sclerophyll and littoral rainforest, coastal pine communities and littoral rainforest and also littoral forest and cleared land. Species it is commonly associated with include Brush Box (<i>Lophostemon confertus</i>), Coast Banksia (<i>Banksia integrifolia</i>), Coast Cypress Pine (<i>Callitris columellaris</i>), Hoop Pine (<i>Araucaria cunninghamii</i>), Pink Bloodwood (<i>Eucalyptus intermedia</i>) and Broad-leaved</p>	Yes	No	<p>Unlikely to occur</p> <ul style="list-style-type: none"> ■ The Project Area occurs within the distribution for this species. ■ No preferred or general habitat ■ There are no records for the species in the Project Area/locality.

Species name	EPBC Status	Habitat requirements	Distribution in Project Area	Records in the Project Area/ locality	Comment on likelihood of occurrence in Project Area
		<p>Paperbark (<i>Melaleuca quinquenervia</i>) (Benwell, 1996).</p> <p>There are no appropriate transitional zones and associated species for habitat requirements for this species in the Project Area.</p>			
Mt Emu she-oak (<i>Allocasuarina emuina</i>)	E	<p>This species occurs within open and closed heath habitats that are characterised by fine-grained rocky slopes, as well as in Wallum heath in undulating coastal plains. It is found in relatively flat, low-lying coastal areas on areas of slopes of 20 degrees to flat areas (Halford, 1993b). Species associated with habitat for Mt Ema she-oak include <i>Ptilanthium deustum</i>, <i>Hakea actites</i> and <i>Banksia oblongifolia</i>.</p> <p>There is potential preferred habitat of wet healthland (RE 12.3.13), present within the Project Area.</p>	Yes	Yes (Locality, 2020)	<p>Likely to occur</p> <ul style="list-style-type: none"> ■ The Project Area occurs within the distribution for this species. ■ There is potential preferred habitat of wet healthland (RE 12.3.13), present within the locality. ■ Populations for this species occur in the Beerwah conservation areas (RE 12.3.13), within the locality of the Project Area.
<i>Allocasuarina thalassoscopica</i>	E	<p>This species is restricted to low closed heathland areas on the upper slopes of Mt Coolum at 150-200 m. Common species recorded at this area include <i>Acacia hubbardiana</i>, <i>Banksia oblongifolia</i>, <i>Hakea actites</i>, <i>Leptospermum microcarpum</i>, <i>Melaleuca nodosa</i> and <i>Xanthorrhoea latifolia</i> ssp. <i>latifolia</i>.</p> <p>This species is restricted to Mt Coolum only and thus no potential habitat (preferred/general is present).</p>	No	No	<p>Unlikely to occur</p> <ul style="list-style-type: none"> ■ This species is restricted to Mt Coolum only and thus no habitat and no records exist within the Project Area/locality.
Hairy-joint grass (<i>Arthraxon hispidus</i>)	V	In Queensland this species is found on the edges of rainforests and wet sclerophyll forests, near swamps and creeks, and also in woodland habitats. In SEQ, the species has been recorded in freshwater springs on coastal foreshore dunes, as well as on creek banks, sandy alluvium creek beds in open forests	Yes	No	<p>Unlikely to occur</p> <ul style="list-style-type: none"> ■ The Project Area is within the distribution for the species. ■ Potential habitat is heavily disturbed and edge affected within the Project Area.

Species name	EPBC Status	Habitat requirements	Distribution in Project Area	Records in the Project Area/ locality	Comment on likelihood of occurrence in Project Area
		<p>and in small shaded gullies (Queensland CRA/RFA Steering Committee, 1997; 1998b).</p> <p>Potential small patches of habitat of REs 12.3.5 and 12.3.4 are present within the Project Area, but are heavily disturbed and edge affected.</p>			<ul style="list-style-type: none"> There are no records for the species in the locality.
Jointed Baloghia (<i>Baloghia marmorata</i>)	V	<p>This species is found within subtropical rainforest/notophyll vine forests as well as wet sclerophyll forests with a rainforest dominated understorey (brush box woodland). They are present at 150-550 m above sea level (Queensland Herbarium, 2008). Associated species include <i>Eucalyptus microcorys</i>, <i>Archontophoenix cunninghamiana</i>, <i>Aphananthe philippinensis</i>, <i>Capparis arborea</i>, <i>Planchonella australis</i>, <i>Ficus</i> spp., <i>Olea paniculata</i>, <i>Planchonella myrsinoides</i>, <i>Brachychiton discolor</i>, <i>Mallotus claoxyloides</i>, <i>Drypetes deplancheri</i>, and <i>Calamus muelleri</i> (Queensland Herbarium, 2008).</p> <p>The Project Area occurs just south of the distribution for this species.</p> <p>There is potential preferred habitat of notophyll vine forests (RE 12.3.1) present within the Project Area.</p>	No	No	<p>Unlikely to occur</p> <ul style="list-style-type: none"> The Project Area is not within the known distribution for the species. There is potential preferred habitat of notophyll vine forests (RE 12.3.1) present within the Project Area. There are no records for the species within the Project Area/locality.
Three-leaved bosistoa (<i>Bosistoa transversa</i>)	V	<p>This species grows in lowland subtropical rainforest habitats up to 300 m above sea level (Floyd, 1989). In Buderim Qld, this species has been found in growing in remnant vine forest pockets, with highly infested weed species, from flat areas to areas with high slopes (Department of the Environment, Water, Heritage and the Arts, 2008)</p>	Yes	No	<p>Unlikely to occur</p> <ul style="list-style-type: none"> The Project Area is within the distribution for the species. No suitable habitat is present for this species within the Project Area.

Species name	EPBC Status	Habitat requirements	Distribution in Project Area	Records in the Project Area/ locality	Comment on likelihood of occurrence in Project Area
		There is no suitable lowland subtropical rainforests for potential habitat, present within the Project Area.			<ul style="list-style-type: none"> There are no records for the species in the Project Area/locality
Stinking cryptocarya (<i>Cryptocarya foetida</i>)	V	<p>This species is restricted to coastal areas, in littoral rainforest on sand dunes and in subtropical rainforests. It is often found with species including <i>Syzygium hemilamprum</i> (Broad-leaved Lilly Pilly), <i>Acronychia imperforata</i> (Beach Acronychia), <i>Cryptocarya triplinervis</i> (Three-veined Laurel), <i>Cupaniopsis anacardioides</i> (Tuckeroo), <i>Flindersia bennettiana</i> (Bennet's Ash), <i>Lophostemon confertus</i> (Brush Box) and <i>Syzygium luehmannii</i> (Small-leaved Lilly Pilly) (Quinn et al. 1995; Sheringham & Westaway 1995).</p> <p>There is potential general habitat of wet sclerophyll forests (RE 12.3.2) within the Project Area.</p>	Yes	No	<p>Unlikely to occur</p> <ul style="list-style-type: none"> The Project Area is within the distribution for the species. There is potential general habitat of wet sclerophyll forests (RE 12.3.2) within the Project Area. There are no records for the species within the Project Area/locality.
Leafless tongue-orchid (<i>Cryptostylis hunteriana</i>)	V	<p>This species has been recorded in a variety of areas including heathlands, sedge lands, dry sclerophyll forests, freshwater wetlands, grassy woodlands, rainforests heathly woodlands and wet sclerophyll forests (Backhouse & Jeanes, 1995). In SEQ it is often found in plant communities including Banksia (Banksia spp.) / Mahogany (Eucalyptus spp.) and Wallum Heath.</p> <p>There is potential preferred habitat of heathlands and wet sclerophyll forests (REs 12.3.2, 12.3.13, 12.3.4, 12.3.5) present within the Project Area.</p>	Yes	No	<p>Unlikely to occur</p> <ul style="list-style-type: none"> The Project Area is within the distribution for the species. Potential habitat of RE 12.3.2, 12.3.13, 12.3.4, 12.3.5 are present within the Project Area. There are no records for the species within the Project Area/locality.
Wedge-leaf tuckeroo (<i>Cupaniopsis shirleyana</i>)	V	This species occurs in a variety of dry rainforest vegetation areas, including vine thicket communities on slopes, along riverbanks and stream beds at altitudes up to 550 m. This species can also be found on the edge of scrubby urban vegetation areas (Thomas & McDonald, 1989). They are most	Yes	No	<p>Unlikely to occur</p> <ul style="list-style-type: none"> The Project Area is within the distribution for the species.

Species name	EPBC Status	Habitat requirements	Distribution in Project Area	Records in the Project Area/ locality	Comment on likelihood of occurrence in Project Area
		<p>commonly found in simple microphyll closed forests that are close to tall closed forest near Hoop Pines. It is commonly found with the following species: <i>Ailanthus triphysa</i>, <i>Alchornea ilicifolia</i>, <i>Aphananthe philippinensis</i>, <i>Araucaria cunninghamii</i>, <i>Archidendropsis thozetiana</i>, <i>Argyrodendron trifoliatum</i>, <i>Atalaya multiflora</i>, <i>Austromyrtus bidwillii</i>, <i>Baloghia inophylla</i>, <i>Barklya syringifolia</i>, <i>Bosistoa transversa</i>, <i>Bouchardatia neurococca</i>, <i>Croton acronychioides</i>, <i>Cryptocarya triplinervis</i>, <i>Dendrocnide photinophylla</i>, <i>Diospyros australis</i>, <i>Disiliaria muelleri</i>, <i>Drypetes deplanchei</i>, <i>Elaeocarpus obovatus</i>, <i>Fitzalania heteropetala</i>, <i>Planchonella laurifolia</i>, <i>P. myrsinoides</i>, <i>Pleiogynium timorense</i>, <i>Sterculia quadrifida</i> and <i>Strychnos axillaris</i> (Barry & Thomas, 1994).</p> <p>There is no potential habitat of simple microphyll forests close to tall forests with Hoop pine, present within the Project Area.</p>			<ul style="list-style-type: none"> ■ No suitable habitat is present for this species within the Project Area. ■ There are no records for the species in the Project
Small-leaved tamarind (<i>Diploglottis campbellii</i>)	E	<p>In Qld, the species is found lowland tropical forests to drier subtropical rainforests that contain a dominant <i>Lophostemon confertus</i> (Brush Box) open overstorey. Bonogin Creek has the most intact habitat in Qld where the species occurs in rainforest and dry sclerophyll forest, on a steep slope with outcropping rock. It is commonly found with the following species: <i>Syzygium francisii</i> (Giant Water Gum), <i>Elaeocarpus grandis</i> (Blue Quandong), <i>Sloanea woollsii</i> (Yellow Carabeen), <i>Flindersia bennettiana</i> (Bennett's ash), <i>Cinnamomum oliveri</i> (Oliver's Sassafras) and emergent Brush Box and <i>Ficus</i> sp.</p> <p>There is no suitable habitat of lowland tropical forests and subtropical rainforests with dominant</p>	Yes	No	<p>Unlikely to occur</p> <ul style="list-style-type: none"> ■ The Project Area is on the edge of the distribution for the species, with a small overlap down the bottom near Beerwah. ■ No suitable habitat is present for this species within the Project Area. ■ There are no records for the species in the Project

Species name	EPBC Status	Habitat requirements	Distribution in Project Area	Records in the Project Area/ locality	Comment on likelihood of occurrence in Project Area
		<i>Lophostemon confertus</i> (Brush Box) open overstorey present within the Project Area.			
Velvet hopbush (<i>Dodonaea rupicola</i>)	V	<p>This species is found exclusively found in the Glass House Mountains in SEQ, growing amongst rocks on the mountains (West, 1984).</p> <p>Project Area is outside of the distribution which is in Glasshouse Mountains in SEQ.</p> <p>This population is restricted to the slopes of the Glass House Mountains and so no suitable habitat is present within the Project Area.</p>	No	No	<p>Unlikely to occur</p> <ul style="list-style-type: none"> ■ This species is restricted to Glass House Mountain slopes only and thus no habitat and no records exist within the Project Area/locality.
Swamp stringybark (<i>Eucalyptus conglomerata</i>)	E	<p>This species occurs on coastal flat areas at approximately 30 m above sea level, often in ecotones between Wallum heath and tall open forests. Soils are general infertile and there is poor drainage so that the area is often water-logged (Bean, 1980).</p> <p>There is potential preferred habitat of open forest to woodland of <i>Melaleuca quinquenervia</i> and <i>Eucalyptus robusta</i> (RE 12.3.4), present within the Project Area.</p>	Yes	Yes (Locality, 2020)	<p>Likely to occur</p> <ul style="list-style-type: none"> ■ The Project Area is within the distribution for the species. ■ Suitable habitat of RE 12.3.4 is present within the Project Area. ■ This species was found during field surveys in 2020, however only within the boundary of the national park outside of the B2N Project boundary (within the locality) (ARUP, 2020).
Mount Beerwah mallee (<i>Eucalyptus kabiana</i>)	V	<p>This species is found from a single population in the upper slopes of Mt Beerwah, found in open heath that is dominated by tea-tee (<i>Leptospermum luehmannii</i>) and brush box (<i>Lophostemon confertus</i>) on steep slopes where plans are within natural pavement with little soil (DEWHA, 2008a).</p> <p>There is no suitable habitat present within the Project Area as this species is restricted to the slopes of Mt Beerwah only.</p>	No	No	<p>Unlikely to occur</p> <ul style="list-style-type: none"> ■ This species is restricted to the slopes of Mt Beerwah only and thus no habitat and no records exist within the Project Area/locality.

Species name	EPBC Status	Habitat requirements	Distribution in Project Area	Records in the Project Area/ locality	Comment on likelihood of occurrence in Project Area
Ball nut (<i>Floydia praealta</i>)	V	<p>This species occurs in tall, closed riverine to subtropical rainforests and coastal scrub ecosystems (Foreman, 1995a; Barry & Thomas, 1994). It is often found on moderate slopes and hillslopes, at altitudes from 30-350 m, on red loam soil on basalt (Barry & Thomas, 1994).</p> <p>There is no suitable tall, closed riverine to subtropical rainforests, on moderate slopes present within the Project Area.</p>	Yes	No	<p>Unlikely to occur</p> <ul style="list-style-type: none"> ■ The Project Area is within the distribution for the species. ■ No suitable habitat is present for this species within the Project Area. ■ There are no records for the species in the Project
Sweet myrtle (<i>Gossia fragrantissima</i>)	E	<p>This species is located in dry subtropical and riverine rainforest ecosystems and it can often be found as isolated plants in paddocks or regrowth due its ability to coppice from roots left after land clearing (NSW National Parks and Wildlife Service, 2002).</p> <p>In Queensland the distribution for this species occurs in rainforests of Mooloolah Valley (Leiper, 2008).</p> <p>There is limited suitable habitat present within the Project Area.</p>	No	Yes (locality)	<p>Unlikely to occur</p> <ul style="list-style-type: none"> ■ The Project Area is not within the distribution for the species. ■ Lack of suitable habitat within the Project Area. ■ There is one record for this species 4 km east of Mooloolah from 2002 (ALA, 2021)
Macadamia nut (<i>Macadamia integrifolia</i>)	V	<p>This species often grows in remnant rainforest areas, most commonly in open areas on the edges of such rainforests. It can be found across hill crests, slopes, in gullies and benches. It grows in high nutrient value alluvial and volcanic soils and in areas that are well drained (Barry & Thomas, 1994). In Queensland it can be found in a range of environments, from tall closed forest, simple notophull mixed very tall closed forests, to simple</p>	Yes	Yes (locality)	<p>Likely to occur</p> <ul style="list-style-type: none"> ■ The Project Area is within the distribution for the species. ■ Potential preferred habitat occurs within RE 12.3.2

Species name	EPBC Status	Habitat requirements	Distribution in Project Area	Records in the Project Area/ locality	Comment on likelihood of occurrence in Project Area
		<p>microphyll-notophyll mid-high closed forests with Araucaria and Argirodendron emergents (Barry & Thomas, 1994).</p> <p>There is potential preferred habitat of <i>Eucalyptus grandis</i>, <i>Lophostemon confertus</i> tall open forest with vine forest understorey ('wet sclerophyll') (RE 12.3.2), present within the Project Area.</p>			<ul style="list-style-type: none"> There was an individual plant recorded for this species within the locality by ARUP in 2020.
Gympie nut (<i>Macadamia ternifolia</i>)	V	<p>This species is located within lowland warm complex notophyll vine forest and notophyll vine forest dominated by Araucaria. This species is found on basic and intermediate volcanic soils in areas characterised by higher rainfall (Costello et al. 2009). Soils tend to be dark, sandy loams to light clays, slightly acidic and well drained (Barry & Thomas, 1994). It is found in steeply inclined hills and foot slopes, at 100-350 m above sea level. A tall rainforest tree layer may be present and associated species include White Booyong (<i>Argyrodendron trifoliatum</i>) - Red Heart (<i>Dissilaria baloghioides</i>) alliance (Barry & Thomas, 1994).</p> <p>There is no potential habitat of notophyll forest dominated by Araucaria, present within the Project Area.</p>	Yes	No	<p>Unlikely to occur</p> <ul style="list-style-type: none"> The Project Area is within the distribution for the species. No suitable habitat is present for this species within the Project Area. There are no records for the species in the Project Area/locality
Rough-shelled bush nut (<i>Macadamia tetraphylla</i>)	V	<p>This species is often associated with subtropical rainforests and complex notophyll vineforests as well as in mixed sclerophyll forests (Barry & Thomas, 1994). It occurs in restricted habitat areas, on moderate to steep hillslopes on alluvial soils with well-drained soils (Queensland CRA/RFA Steering Committee, 1997). It is found within very tall mixed sclerophyll-simple notophyll vineforest with Tallow-wood (<i>Eucalyptus microcorys</i>), Queensland Brush Box (<i>Lophostemon confertus</i>) and Turpentine</p>	Yes	No	<p>Unlikely to occur</p> <ul style="list-style-type: none"> The Project Area is within the distribution for the species. Lack of suitable habitat within the Project Area. There are no records for the species in the locality.

Species name	EPBC Status	Habitat requirements	Distribution in Project Area	Records in the Project Area/ locality	Comment on likelihood of occurrence in Project Area
		<p>(<i>Syncarpia glomulifera</i>), complex notophyll vineforest and simple-complex notophyll rainforest with Lilly Pilly (<i>Acmena smithii</i>), Hairy Acronychia (<i>Acronychia pubescens</i>), Jackwood (<i>Cryptocarya glaucescens</i>), Sandpaper Fig (<i>Ficus coronata</i>) and Rose Apple (<i>Syzygium moorei</i>) (Barry & Thomas 1994).</p> <p>There is potential preferred habitat of RE 12.3.2 present within the Project Area. However, very tall mixed sclerophyll-simple notophyll vineforest, complex notophyll vineforest and simple-complex notophyll rainforest on moderate to steep hillslopes on alluvial soils with well-drained soils are largely absent from the Project Area. The habitat present within the Project Area is disturbed, fragmented and weed incursions are common.</p>			
Tall knotweed (<i>Persicaria elatior</i>)	V	<p>General habitat is in damp places including coastal and swampy areas, along watercourses, lakes and streams, swamp forests and disturbed areas (NSW DECCW, 2005). It's preferred habitat is associated with REs 12.9.1, 12.3.8 and 12.3.5 and in waterholes with <i>Livistona australis</i>.</p> <p>Distribution is south and west of the Project Area.</p> <p>There is potential general habitat of swampy areas and watercourses within the Project Area, but no preferred REs are present.</p>	No	No	<p>Unlikely to occur</p> <ul style="list-style-type: none"> ■ The Project Area is just outside of the distribution for the species, which sits south of the Project Area boundary. ■ Potential general habitat of swampy areas and watercourses within the Project Area, but no preferred REs are present. ■ There are no records for the species in the Project Area/locality
Lesser swamp-orchid (<i>Phaius australis</i>)	E	<p>It is often found with coastal wet heath/sedgeland wetlands, swampy forest and swampy grassland and often where Broad-leaved Paperbark and Swamp Mahogany are found (Barry, 2005; Sparshott & Bostock, 1993). It is restricted to</p>	Yes	No	<p>Unlikely to occur</p> <ul style="list-style-type: none"> ■ The Project Area is within the distribution for the species.

Species name	EPBC Status	Habitat requirements	Distribution in Project Area	Records in the Project Area/ locality	Comment on likelihood of occurrence in Project Area
		<p>swamp-forest margins, where it is found in swamp sclerophyll forest (<i>Lophostemon suaveolens</i>), swampy rainforest and fringing open forest. It is often associated with Bangalow Palm (<i>Archontophoenix cunninghamiana</i>) or Cabbage Tree Palm (<i>Livistona australis</i>) (Benwell, 1994). Species is rarely seen on mainland Australia (Leiper, 2008).</p> <p>Lack of suitable microhabitats are present in the Project Area.</p>			<ul style="list-style-type: none"> ■ Lack of suitable microhabitats are present in the Project Area. ■ There are no records for the species in the Project Area/locality
Silver plectranthus (<i>Plectranthus nitidus</i>)	E	<p>This species occurs on rocky cliff areas as well as amongst rocky outcrops, often in shaded and damp areas at altitudes of 180 m (Forster, 1992). It is found in subtropical rainforests and ecotones between open forest and rainforests. It is often associated with Flea Bush (<i>Plectranthus graveolens</i>) and Crofton Weed (<i>Ageratina adenophora</i>) (NSW NPWS, 1999).</p> <p>There are no rocky cliff areas or rocky outcrops present for there to be potential habitat for this species within the Project Area.</p>	Yes – just within the search buffer at Mooloolah (otherwise outside of distribution)	No	<p>Unlikely to occur</p> <ul style="list-style-type: none"> ■ The Project Area is just within of the distribution for the species, which overlaps with the boundary at Mooloolah. ■ No suitable habitat is present for this species within the Project Area. ■ There are no records for the species in the B2N Project
Scrub turpentine (<i>Rhodamnia rubescens</i>)	CE	<p>This species occurs in rainforest habitats except for cool temperature rainforests. It is a common pioneer species in eucalypt forests (Floyd, 2008). It is often found in wet sclerophyll forests associated with rainforest transition zones, including creekside riparian vegetation (TSSC, 2020).</p> <p>There is potential general habitat features in the form of wet sclerophyll forests on creek beds, present within the Project Area. However the general habitat is disturbed, fragmented and weed incursions are common.</p>	Yes	Yes (locality)	<p>Potential to occur</p> <ul style="list-style-type: none"> ■ The B2N Project is within the distribution for the species. ■ Lack of suitable habitat within the Project Area. ■ There are records for this species within the locality from 2001 - 2015 (ALA, 2021).

Species name	EPBC Status	Habitat requirements	Distribution in Project Area	Records in the Project Area/ locality	Comment on likelihood of occurrence in Project Area
Native guava (<i>Rhodomyrtus psidioides</i>)	CE	<p>This species is described as a pioneer in disturbed environments (Williams & Adam, 2010). Vegetation types it is found in include subtropical rainforest, warm temperate rainforests, littoral rainforests and wet sclerophyll forests (Keith, 2004).</p> <p>While wet sclerophyll forests are present within the Project Area, it is disturbed, fragmented and weed incursions are common, such that suitable habitat does not occur within the Project Area</p>	Yes	No	<p>Potential to occur</p> <ul style="list-style-type: none"> ■ The B2N Project is within the distribution for the species. ■ There is no suitable habitat present within the Project Area. ■ There is a single record within the locality, from Mount Mellum from 2014 (approximately 4 km from the Project Area).
Davidson's plum (<i>Davidsonia jerseyana</i>) (previously identified as <i>D. johnsonii</i> by ARUP 2020)	E	<p>This species preferred habitat is coastal and lowland subtropical rainforest and wet sclerophyll forest. There are a number of records within subtropical rainforest from a small area in northern NSW (Threatened Species Scientific Committee, 2015).</p> <p>The Project Area is not within the known distribution for the species.</p>	No	Yes (planted)	<p>Known to occur</p> <ul style="list-style-type: none"> ■ The B2N Project is not within the distribution for the species. ■ Seven Davidson's plums have been identified in the Project Area during the ERM 2021 field surveys, on Lot 1 RP124412, between Beerburrum and Beerwah. The specimens were concluded by the Queensland Herbarium to be cultivated individuals. <p>No further assessment has been undertaken for this species as it does not naturally occur within the Project Area.</p>
<i>Romnalda strobilacea</i>	V	<p>This species occurs from Kin Kin to Mt Mee in SEQ. It occurs in complex notophyll rainforest among the ground flora as a puffed perennial. It has a preference for moist gully or stream bank situations and level to steep slopes where soil is nutrient dense (Barry & Thomas, 1994).</p>	Yes	No	<p>Unlikely to occur</p> <ul style="list-style-type: none"> ■ The Project Area is just within of the distribution for the species, which overlaps with the boundary at Mooloolah.

Species name	EPBC Status	Habitat requirements	Distribution in Project Area	Records in the Project Area/ locality	Comment on likelihood of occurrence in Project Area
		<p>Species distribution is only at the bottom of the Project Area near Mooloolah.</p> <p>There is minimal complex notophyll forest with nutrient dense soil, present within the Project Area.</p>			<ul style="list-style-type: none"> ■ No suitable habitat is present for this species within the Project Area. ■ There are no records for the species in the Project Area/locality
Quassia (<i>Samadera bidwillii</i>)	V	<p>This species is often found in lowland rainforests and on the margins of rainforests (Hewson, 1985), but has been found in open forests and woodlands (QDNR, 2001). This species is found adjacent to temporary and permanent watercourses up to 510 m above sea level. Commonly associated species include Spotted Gum (<i>Corymbia citriodora</i>), Grey Gum (<i>Eucalyptus propinqua</i>), White Mahogany (<i>E. acmenoides</i>), Forest Red Gum (<i>E. tereticornis</i>), Pink Bloodwood (<i>E. intermedia</i>), an ironbark (<i>E. siderophloia</i>), Gum Topped Box (<i>E. moluccana</i>), Gympie Messmate (<i>E. cloeziana</i>) and Broad Leaved Ironbark (<i>E. fibrosa</i>) (DEWHA, 2008).</p> <p>There is marginal habitat of <i>Eucalyptus tereticornis</i> open forest present within the Project Area.</p>	Yes	No	<p>Unlikely to occur</p> <ul style="list-style-type: none"> ■ The Project Area is within of the distribution for the species. ■ There is only marginal habitat of <i>Eucalyptus tereticornis</i> open forest present within the Project Area. ■ There are no records for the species in the Project Area/locality
Ravine orchid (<i>Sarcochilus fitzgeraldii</i>)	V	<p>This species is found in rocky areas and sometimes on trees in rocky areas, often in shaded places and near streams (DECC, 2005). It is also found in subtropical rainforests and open forests in Maleny in SEQ.</p> <p>There are no rocky areas that are potential habitat for this species, within the Project Area.</p>	Yes	No	<p>Unlikely to occur</p> <ul style="list-style-type: none"> ■ The Project Area is within of the distribution for the species. ■ No suitable habitat is present for this species within the Project Area. ■ There are no records for the species in the Project Area/locality.
<i>Sophora fraseri</i>	V	<p><i>Sophora fraseri</i> is a subtropical shrub that normally grows in wet sclerophyll forest and a range of rainforest types. It has been reported growing in hilly</p>	Yes	No	Unlikely to occur

Species name	EPBC Status	Habitat requirements	Distribution in Project Area	Records in the Project Area/ locality	Comment on likelihood of occurrence in Project Area
		<p>terrain on hillslopes at altitudes from 60 to 660m, mostly shallow stony to shaly soils, of loam to clay texture derived from sandstone or basalt rocks. Associated species include: <i>Corymbia citriodora</i>, <i>Eucalyptus carnea</i>, <i>E. microcorys</i>, <i>E. acmenoides</i>, <i>E. propinqua</i> and <i>Lophostemon confertus</i>.</p> <p>There are limited preferred habitats in the form of <i>E. microcorys</i> wet sclerophyll forests with <i>Lophostemon confertus</i>, present within the Project Area. However the general habitat is disturbed, fragmented and weed incursions are common.</p>			<ul style="list-style-type: none"> ■ The Project Area is within of the distribution for the species. ■ Lack of suitable habitat within the Project Area. ■ There are no records for the species in the Project Area/locality.
Smooth-bark rose apple (<i>Syzygium hodgkinsoniae</i>)	V	<p>This species is found in riverine sub-tropical and gallery rainforests on deep rich alluvial and basalt soils. It is adapted to growing along and occasionally within fast-flowing streams (Barry & Thomas, 1994). Associated species have included Yellow Carrabeen (<i>Sloanea woollsii</i>), Coachwood (<i>Ceratopetalum apetalum</i>), Red Carrabeen (<i>Geissois benthamii</i>), Rose-leaf Marara (<i>Caldcluvia paniculosa</i>) and Piccabeen Palm (<i>Archontophoenix cunninghamiana</i>) (DoE, 2021a).</p> <p>The distribution for this species is within the southern extent of the Project Area near Beerwah.</p> <p>There is potential general habitat (though disturbed) in the form of riverine rainforests present within the Project Area, but a lack of associated species and nutrient rich soils.</p>	Yes	No	<p>Unlikely to occur</p> <ul style="list-style-type: none"> ■ The Project Area is just within of the distribution for the species, which overlaps only on the southern boundary near Beerwah. ■ There is potential general habitat in the form of general riverine rainforests present within the Project Area, but a lack of associated species. ■ There are no records for the species in the Project Area/locality
Toadflax (<i>Thesium australe</i>)	V	<p>This species grows in grassland or woodland, often in damp sites. Examples of associated vegetation includes: open woodland with <i>Eucalyptus tereticornis</i> and <i>E. tindaliae</i> on skeletal soils; on heavy alluvium soil in grassy <i>E. populnea</i> woodland;</p>	Yes	No	<p>Unlikely to occur</p> <ul style="list-style-type: none"> ■ This Project Area is within the distribution of the species.

Species name	EPBC Status	Habitat requirements	Distribution in Project Area	Records in the Project Area/ locality	Comment on likelihood of occurrence in Project Area
		<p>on black cracking clay in grassland of <i>Dichanthium sericeum</i>; and grassland dominated by <i>Themeda triandra</i> and <i>Heteropogon contortus</i> on basaltic, rocky soils.</p> <p>There is potential habitat of grassy areas and Eucalyptus open forests (REs 12.3.5 and 12.5.3) are present in the Project Area. However, the habitat is often disturbed, fragmented and weed incursions are common.</p>			<ul style="list-style-type: none"> There is potential habitat in the form of RE 12.5.3 and 12.3.5 that are present within the Project Area. There are no records for the species in the Project Area/locality.
Glossy spice brush (<i>Triunia robusta</i>)	E	<p>The habitat for this species is notophyll vine forest and mixed tall open forest which in the absence of fire, will have a rainforest understorey (Shapcott, 2002). This species is commonly found within 25 m of streams and rivers, on south/south-east facing slopes. This species occurs on well-drained soil, in clayey sand, loamy sand (Shapcott, 2005).</p> <p>There is limited potential habitat of tall open forest with streams, present within the Project Area. However, the habitat is disturbed, fragmented and weed incursions are common.</p>	Yes	No	<p>Unlikely to occur</p> <ul style="list-style-type: none"> The Project Area is within of the distribution for the species. Lack of suitable habitat within the Project Area. There are no records for the species in the Project Area/locality.
<i>Zieria bifida</i>	E	<p>This species occurs within wet sclerophyll forests and is associated with an ecotone that is for open forest and rainforest. It is associated with the following species: <i>Eucalyptus propinqua</i>, <i>Lophostemon confertus</i>, <i>Eucalyptus microcorys</i>, <i>Corymbia intermedia</i>, <i>Trochocarpa laurina</i> and <i>Macrozamia lucida</i> with introduced Lantana (<i>Lantana camara</i>) (DoE, 2021b).</p> <p>Species distribution is only just within the northern area of the Project Area near Nambour where the disturbance footprint is small.</p>	Yes	Yes (locality)	<p>Unlikely to occur</p> <ul style="list-style-type: none"> The Project Area occurs within the distribution for this species however it is only within the northern area of the B2N Project search buffer (near Nambour). Lack of suitable habitat within the Project Area. There is a record within the locality, in Palmwoods (3km from the B2N Project boundary).

Species name	EPBC Status	Habitat requirements	Distribution in Project Area	Records in the Project Area/ locality	Comment on likelihood of occurrence in Project Area
		There is potential habitat in the form of wet sclerophyll forests with <i>Lophostemon confertus</i> and <i>Eucalyptus microcorys</i> , present within the Project Area. However, the habitat is disturbed, fragmented and weed incursions are common.			

Status listing per EPBC and NC Acts: CE = Critically Endangered; E = Endangered; V = Vulnerable; M = Migratory; LC = Least Concern; SLC = Special Least Concern; NT = Near Threatened.

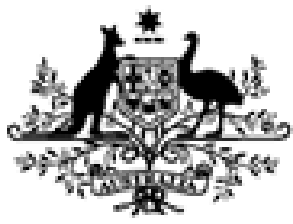
Sources of habitat information for all species, unless otherwise stated, were gathered from DoEE Conservation Advice and SPRAT database: (<http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl>). Each of these is listed in the references species, specific to the subcategory (eg. Flora, fauna and migratory).

APPENDIX B BIRD SPECIES OBSERVED DURING FIELD SURVEYS

- Australasian figbird (*Specothes vieillotii*)
 - Australian brush-turkey (*Alectura lathamii*)
 - Australian golden whistler (*Pachycephala pectoralis*)
 - Australian king parrot (*Alisterus scapularis*)
 - Australian magpie (*Cracticus tibicen*)
 - Australian white ibis (*Threskiornis molucca*)
 - Australian wood duck (*Chenonetta jubata*)
 - Bar-shouldered dove (*Geopelia humeralis*)
 - Black-faced cuckoo-shrike (*Coracina novaehollandiae*)
 - Blue-faced honeyeater (*Entomyzon cyanotis*)
 - Brown cuckoo-dove (*Macropygia amboinensis*)
 - Brown gerygone (*Gerygone mouki*)
 - Brown honeyeater (*Lichmera indistincta*)
 - Brown treecreeper (*Climacteris picumnus*)
 - Cattle egret (*Bubulcus ibis*)
 - Common bronzewing (*Phaps chalcoptera*)
 - Crested pigeon (*Ocyphaps lophotes*)
 - Double-barred finch (*Taeniopygia bichenovii*)
 - Eastern whipbird (*Psophodes olivaceus*)
 - Eastern yellow robin (*Eopsaltria australis*)
 - Galah (*Eolophus roseicapilla*)
 - Golden-headed cisticola (*Cisticola exilis*)
 - Grey butcherbird (*Cracticus torquatus*)
 - Grey fantail (*Rhipidura fuliginosa*)
 - Jacky winter (*Microeca fascinans*)
 - Laughing kookaburra (*Dacelo novaeguineae*)
 - Lewin's honeyeater (*Meliphaga lewinii*)
 - Little black cormorant (*Phalacrocorax sulcirostris*)
 - Magpie-lark (*Grallina cyanoleuca*)
 - Masked lapwing (*Vanellus miles*)
 - Noisy friarybird (*Philemon corniculatus*)
 - Noisy miner (*Manorina melanocephala*)
 - Pale-headed rosella (*Platycercus adscitus*)
 - Peaceful dove (*Geopelia placida*)
 - Plumed whistling duck (*Dendrocygna eytoni*)
 - Pied currawong (*Strepera graculina*)
 - Purple swamphen (*Porphyrio porphyrio*)
-

- Rainbow bee-eater (*Merops ornatus*)
 - Rainbow lorikeet (*Trichoglossus moluccanus*)
 - Red-backed fairy-wren (*Malurus melanocephalus*)
 - Red-browed finch (*Neochmia temporalis*)
 - Red-browed treecreeper (*Climacteris erythrops*)
 - Rufous fantail (*Rhipidura rufifrons*)
 - Scarlet honeyeater (*Myzomela sanguinolenta*)
 - Spangled drongo (*Dicrurus bracteatus*)
 - Spectacled monarch (*Symposiachrus trivirgatus*)
 - Spotted dove (*Spilopelia chinensis*)
 - Straw-necked ibis (*Threskiornis spinicollis*)
 - Striated pardalote (*Pardalotus striatus*)
 - Striped honeyeater (*Plectorhyncha lanceolata*)
 - Sulphur-crested cockatoo (*Cacatua galerita*)
 - Torresian crow (*Corvus orru*)
 - Varied triller (*Lalage leucomela*)
 - Welcome swallow (*Hirundo neoxena*)
 - White-browed scrubwren (*Sericornis frontalis*)
 - White-throated honeyeater (*Melithreptus albogularis*)
 - Willie wagtail (*Rhipidura leucophrys*)
 - Australian wood duck (*Chenonetta jubata*)
 - Yellow-faced honeyeater (*Lichenostomus chrysops*)
 - Yellow-tailed black-cockatoo (*Calyptorhynchus funereus*)
-

APPENDIX C PMST RESULTS



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.

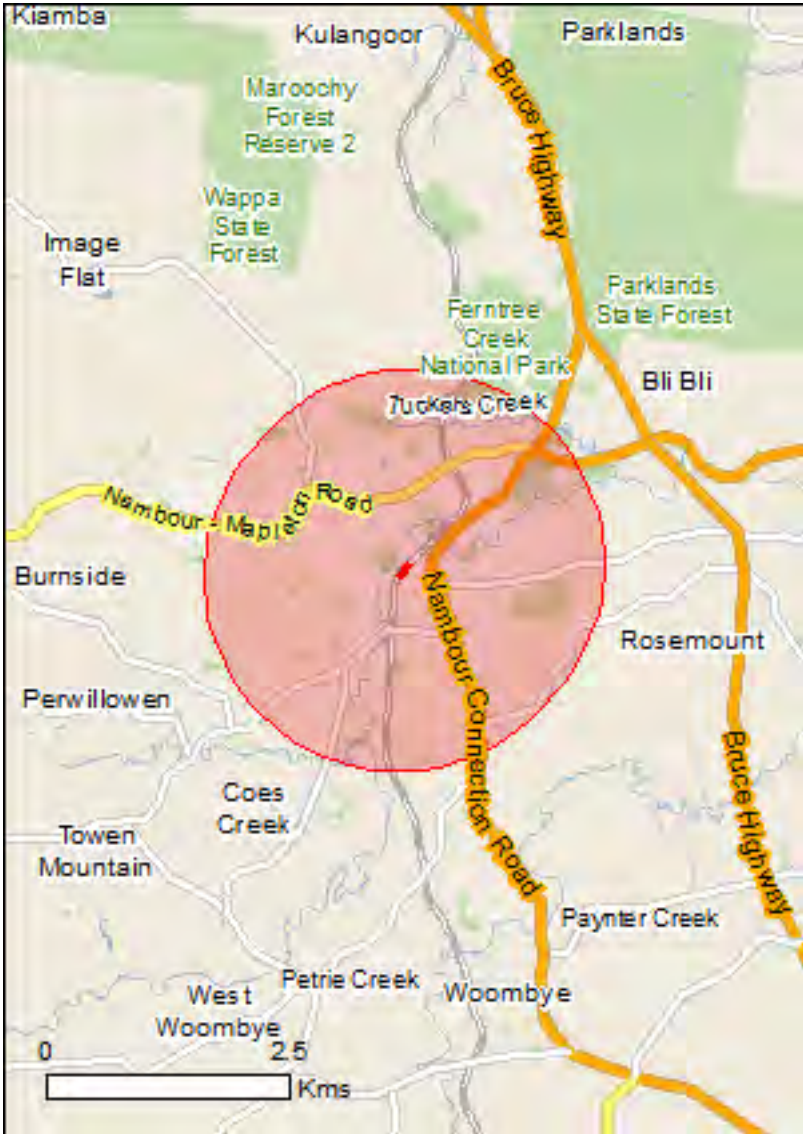
Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about [Environment Assessments](#) and the EPBC Act including significance guidelines, forms and application process details.

Report created: 08/03/21 16:26:04

- [Summary](#)
- [Details](#)

[Matters of NES](#)[Other Matters Protected by the EPBC Act](#)[Extra Information](#)
- [Caveat](#)
- [Acknowledgements](#)



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[Coordinates](#)

Buffer: 2.0Km



Summary

Matters of National Environmental 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:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	2
Listed Threatened Species:	47
Listed Migratory Species:	15

Other Matters Protected by the EPBC Act

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

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <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 Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	22
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

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

State and Territory Reserves:	1
Regional Forest Agreements:	None
Invasive Species:	32
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	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.

Name	Status	Type of Presence
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community	Endangered	Community may occur within area
Lowland Rainforest of Subtropical Australia	Critically Endangered	Community likely to occur within area

Listed Threatened Species

[Resource Information]

Name	Status	Type of Presence
Birds		
Anthochaera phrygia		
Regent Honeyeater [82338]	Critically Endangered	Foraging, feeding or related behaviour may occur within area
Botaurus poiciloptilus		
Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Cyclopsitta diophthalma coxeni		
Coxen's Fig-Parrot [59714]	Endangered	Species or species habitat may occur within area
Erythrotriorchis radiatus		
Red Goshawk [942]	Vulnerable	Species or species habitat likely to occur within area
Falco hypoleucos		
Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area
Hirundapus caudacutus		
White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Lathamus discolor		
Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
Numenius madagascariensis		
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Rostratula australis		
Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area

Name	Status	Type of Presence
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat may occur within area
Thinornis cucullatus cucullatus Hooded Plover (eastern), Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat may occur within area
Turnix melanogaster Black-breasted Button-quail [923]	Vulnerable	Species or species habitat likely to occur within area
Frogs		
Litoria olongburensis Wallum Sedge Frog [1821]	Vulnerable	Species or species habitat may occur within area
Mixophyes fleayi Fleay's Frog [25960]	Endangered	Species or species habitat likely to occur within area
Mixophyes iteratus Giant Barred Frog, Southern Barred Frog [1944]	Endangered	Species or species habitat may occur within area
Insects		
Argynnis hyperbius inconstans Australian Fritillary [88056]	Critically Endangered	Species or species habitat may occur within area
Phyllodes imperialis smithersi Pink Underwing Moth [86084]	Endangered	Species or species habitat may occur within area
Mammals		
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat likely to occur within area
Dasyurus hallucatus Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat likely to occur within area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat likely to occur within area
Petauroides volans Greater Glider [254]	Vulnerable	Species or species habitat likely to occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat known to occur within area
Potorous tridactylus tridactylus Long-nosed Potoroo (SE Mainland) [66645]	Vulnerable	Species or species habitat likely to occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Plants		
Acacia attenuata [10690]	Vulnerable	Species or species habitat may occur within area
Acronychia littoralis Scented Acronychia [8582]	Endangered	Species or species habitat may occur within area

Name	Status	Type of Presence
Arthraxon hispidus Hairy-joint Grass [9338]	Vulnerable	Species or species habitat likely to occur within area
Baloghia marmorata Marbled Balogia, Jointed Baloghia [8463]	Vulnerable	Species or species habitat may occur within area
Bosistoa transversa Three-leaved Bosistoa, Yellow Satinheart [16091]	Vulnerable	Species or species habitat likely to occur within area
Cryptocarya foetida Stinking Cryptocarya, Stinking Laurel [11976]	Vulnerable	Species or species habitat may occur within area
Cryptostylis hunteriana Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat may occur within area
Eucalyptus conglomerata Swamp Stringybark [3160]	Endangered	Species or species habitat may occur within area
Floydia praealta Ball Nut, Possum Nut, Big Nut, Beefwood [15762]	Vulnerable	Species or species habitat known to occur within area
Macadamia integrifolia Macadamia Nut, Queensland Nut Tree, Smooth-shelled Macadamia, Bush Nut, Nut Oak [7326]	Vulnerable	Species or species habitat likely to occur within area
Macadamia ternifolia Small-fruited Queensland Nut, Gympie Nut [7214]	Vulnerable	Species or species habitat likely to occur within area
Macadamia tetraphylla Rough-shelled Bush Nut, Macadamia Nut, Rough-shelled Macadamia, Rough-leaved Queensland Nut [6581]	Vulnerable	Species or species habitat likely to occur within area
Phaius australis Lesser Swamp-orchid [5872]	Endangered	Species or species habitat likely to occur within area
Rhodamnia rubescens Scrub Turpentine, Brown Malletwood [15763]	Critically Endangered	Species or species habitat known to occur within area
Rhodomyrtus psidioides Native Guava [19162]	Critically Endangered	Species or species habitat likely to occur within area
Samadera bidwillii Quassia [29708]	Vulnerable	Species or species habitat may occur within area
Sarcochilus fitzgeraldii Ravine Orchid [19131]	Vulnerable	Species or species habitat may occur within area
Sophora fraseri [8836]	Vulnerable	Species or species habitat may occur within area
Triunia robusta Glossy Spice Bush [14747]	Endangered	Species or species habitat likely to occur within area
Reptiles		
Coeranoscincus reticulatus Three-toed Snake-tooth Skink [59628]	Vulnerable	Species or species habitat likely to occur within area

Name	Status	Type of Presence
<u>Delma torquata</u> Adorned Delma, Collared Delma [1656]	Vulnerable	Species or species habitat may occur within area
<u>Furina dunmalli</u> Dunmall's Snake [59254]	Vulnerable	Species or species habitat may occur within area
Listed Migratory Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Migratory Marine Birds		
<u>Apus pacificus</u> Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
<u>Cuculus optatus</u> Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area
<u>Hirundapus caudacutus</u> White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
<u>Monarcha melanopsis</u> Black-faced Monarch [609]		Species or species habitat known to occur within area
<u>Monarcha trivirgatus</u> Spectacled Monarch [610]		Species or species habitat known to occur within area
<u>Myiagra cyanoleuca</u> Satin Flycatcher [612]		Species or species habitat known to occur within area
<u>Rhipidura rufifrons</u> Rufous Fantail [592]		Species or species habitat known to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
<u>Calidris ferruginea</u> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
<u>Gallinago hardwickii</u> Latham's Snipe, Japanese Snipe [863]		Species or species habitat likely to occur within area
<u>Numenius madagascariensis</u> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
<u>Pandion haliaetus</u> Osprey [952]		Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Tringa nebularia		
Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species	[Resource Information]	
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos		
Common Sandpiper [59309]		Species or species habitat may occur within area
Anseranas semipalmata		
Magpie Goose [978]		Species or species habitat may occur within area
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba		
Great Egret, White Egret [59541]		Species or species habitat known to occur within area
Ardea ibis		
Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata		
Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos		
Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii		
Latham's Snipe, Japanese Snipe [863]		Species or species habitat likely to occur within area
Haliaeetus leucogaster		
White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat known to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area
Thinornis rubricollis rubricollis Hooded Plover (eastern) [66726]	Vulnerable*	Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Extra Information

State and Territory Reserves	[Resource Information]
Name	State
Ferntree Creek	QLD

Invasive Species	[Resource Information]
Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.	

Name	Status	Type of Presence
Birds		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Lonchura punctulata Nutmeg Mannikin [399]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Frogs		
Rhinella marina Cane Toad [83218]		Species or species habitat known to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species

Name	Status	Type of Presence
habitat likely to occur within area		
Plants		
Anredera cordifolia		
Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine, Anredera, Gulf Madeiravine, Heartleaf Madeiravine, Potato Vine [2643]		Species or species habitat likely to occur within area
Asparagus aethiopicus		
Asparagus Fern, Ground Asparagus, Basket Fern, Sprengi's Fern, Bushy Asparagus, Emerald Asparagus [62425]		Species or species habitat likely to occur within area
Cabomba caroliniana		
Cabomba, Fanwort, Carolina Watershield, Fish Grass, Washington Grass, Watershield, Carolina Fanwort, Common Cabomba [5171]		Species or species habitat likely to occur within area
Chrysanthemoides monilifera		
Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Dolichandra unguis-cati		
Cat's Claw Vine, Yellow Trumpet Vine, Cat's Claw Creeper, Funnel Creeper [85119]		Species or species habitat likely to occur within area
Eichhornia crassipes		
Water Hyacinth, Water Orchid, Nile Lily [13466]		Species or species habitat likely to occur within area
Hymenachne amplexicaulis		
Hymenachne, Olive Hymenachne, Water Stargrass, West Indian Grass, West Indian Marsh Grass [31754]		Species or species habitat likely to occur within area
Lantana camara		
Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Parthenium hysterophorus		
Parthenium Weed, Bitter Weed, Carrot Grass, False Ragweed [19566]		Species or species habitat likely to occur within area
Prosopis spp.		
Mesquite, Algaroba [68407]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii		
Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Salvinia molesta		
Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Senecio madagascariensis		
Fireweed, Madagascar Ragwort, Madagascar Groundsel [2624]		Species or species habitat likely to occur within area
Reptiles		
Ramphotyphlops braminus		
Flowerpot Blind Snake, Brahminy Blind Snake, Cacing Besi [1258]		Species or species habitat may occur within area

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

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.

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

Where very little information is available for 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 reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

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

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

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

Coordinates

-26.62594 152.95742,-26.62706 152.95632

Acknowledgements

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

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

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

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

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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.

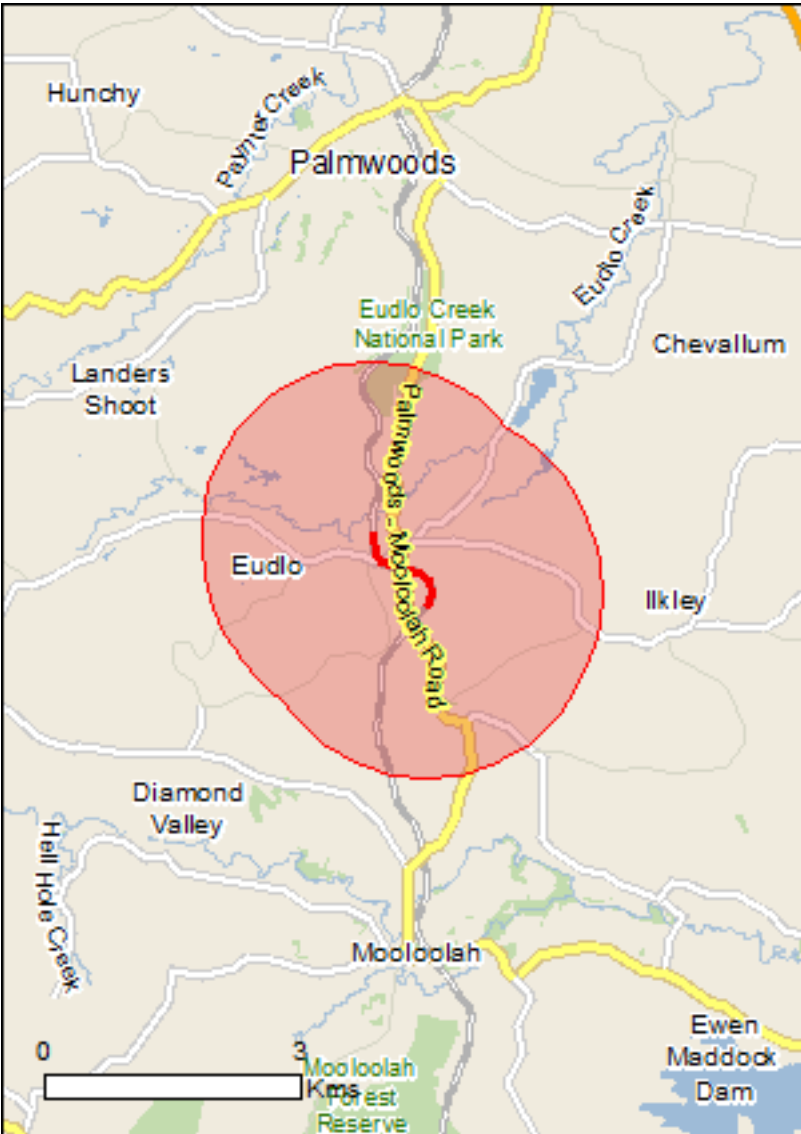
Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about [Environment Assessments](#) and the EPBC Act including significance guidelines, forms and application process details.

Report created: 08/03/21 16:35:04

- [Summary](#)
- [Details](#)

[Matters of NES](#)[Other Matters Protected by the EPBC Act](#)[Extra Information](#)
- [Caveat](#)
- [Acknowledgements](#)



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[Coordinates](#)

Buffer: 2.0Km



Summary

Matters of National Environmental 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:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	2
Listed Threatened Species:	49
Listed Migratory Species:	15

Other Matters Protected by the EPBC Act

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

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <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 Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	22
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

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

State and Territory Reserves:	2
Regional Forest Agreements:	None
Invasive Species:	31
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	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.

Name	Status	Type of Presence
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community	Endangered	Community may occur within area
Lowland Rainforest of Subtropical Australia	Critically Endangered	Community may occur within area

Listed Threatened Species

[Resource Information]

Name	Status	Type of Presence
Birds		
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Foraging, feeding or related behaviour may occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Cyclopsitta diophthalma coxeni Coxen's Fig-Parrot [59714]	Endangered	Species or species habitat may occur within area
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat likely to occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area

Name	Status	Type of Presence
<u>Thinornis cucullatus cucullatus</u>		
Hooded Plover (eastern), Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat may occur within area
<u>Turnix melanogaster</u>		
Black-breasted Button-quail [923]	Vulnerable	Species or species habitat likely to occur within area
Fish		
<u>Pseudomugil mellis</u>		
Honey Blue Eye, Honey Blue-eye [26180]	Vulnerable	Species or species habitat may occur within area
Frogs		
<u>Litoria olongburensis</u>		
Wallum Sedge Frog [1821]	Vulnerable	Species or species habitat may occur within area
<u>Mixophyes fleayi</u>		
Fleay's Frog [25960]	Endangered	Species or species habitat likely to occur within area
<u>Mixophyes iteratus</u>		
Giant Barred Frog, Southern Barred Frog [1944]	Endangered	Species or species habitat likely to occur within area
Insects		
<u>Argynnis hyperbius inconstans</u>		
Australian Fritillary [88056]	Critically Endangered	Species or species habitat may occur within area
<u>Phyllodes imperialis smithersi</u>		
Pink Underwing Moth [86084]	Endangered	Breeding may occur within area
Mammals		
<u>Chalinolobus dwyeri</u>		
Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat likely to occur within area
<u>Dasyurus hallucatus</u>		
Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat likely to occur within area
<u>Dasyurus maculatus maculatus (SE mainland population)</u>		
Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat likely to occur within area
<u>Petauroides volans</u>		
Greater Glider [254]	Vulnerable	Species or species habitat known to occur within area
<u>Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)</u>		
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat known to occur within area
<u>Potorous tridactylus tridactylus</u>		
Long-nosed Potoroo (SE Mainland) [66645]	Vulnerable	Species or species habitat likely to occur within area
<u>Pteropus poliocephalus</u>		
Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Plants		
<u>Acacia attenuata</u>		
[10690]	Vulnerable	Species or species habitat may occur within area
<u>Arthraxon hispidus</u>		
Hairy-joint Grass [9338]	Vulnerable	Species or species habitat likely to occur within area

Name	Status	Type of Presence
<u>Bosistoa transversa</u> Three-leaved Bosistoa, Yellow Satinheart [16091]	Vulnerable	Species or species habitat likely to occur within area
<u>Cryptocarya foetida</u> Stinking Cryptocarya, Stinking Laurel [11976]	Vulnerable	Species or species habitat may occur within area
<u>Cryptostylis hunteriana</u> Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat may occur within area
<u>Eucalyptus conglomerata</u> Swamp Stringybark [3160]	Endangered	Species or species habitat may occur within area
<u>Floydia praealta</u> Ball Nut, Possum Nut, Big Nut, Beefwood [15762]	Vulnerable	Species or species habitat likely to occur within area
<u>Gossia fragrantissima</u> Sweet Myrtle, Small-leaved Myrtle [78867]	Endangered	Species or species habitat may occur within area
<u>Macadamia integrifolia</u> Macadamia Nut, Queensland Nut Tree, Smooth-shelled Macadamia, Bush Nut, Nut Oak [7326]	Vulnerable	Species or species habitat likely to occur within area
<u>Macadamia ternifolia</u> Small-fruited Queensland Nut, Gympie Nut [7214]	Vulnerable	Species or species habitat likely to occur within area
<u>Macadamia tetraphylla</u> Rough-shelled Bush Nut, Macadamia Nut, Rough-shelled Macadamia, Rough-leaved Queensland Nut [6581]	Vulnerable	Species or species habitat may occur within area
<u>Phaius australis</u> Lesser Swamp-orchid [5872]	Endangered	Species or species habitat known to occur within area
<u>Plectranthus nitidus</u> Nightcap Plectranthus, Silver Plectranthus [55742]	Endangered	Species or species habitat may occur within area
Rhodamnia rubescens Scrub Turpentine, Brown Malletwood [15763]	Critically Endangered	Species or species habitat known to occur within area
Rhodomyrtus psidioides Native Guava [19162]	Critically Endangered	Species or species habitat likely to occur within area
<u>Samadera bidwillii</u> Quassia [29708]	Vulnerable	Species or species habitat likely to occur within area
<u>Sarcochilus fitzgeraldii</u> Ravine Orchid [19131]	Vulnerable	Species or species habitat may occur within area
Sophora fraseri [8836]	Vulnerable	Species or species habitat may occur within area
<u>Syzygium hodgkinsoniae</u> Smooth-bark Rose Apple, Red Lilly Pilly [3539]	Vulnerable	Species or species habitat likely to occur within area
<u>Thesium australe</u> Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat may occur within area

Name	Status	Type of Presence
<u>Triunia robusta</u> Glossy Spice Bush [14747]	Endangered	Species or species habitat likely to occur within area
Reptiles		
<u>Coeranoscincus reticulatus</u> Three-toed Snake-tooth Skink [59628]	Vulnerable	Species or species habitat may occur within area
<u>Delma torquata</u> Adorned Delma, Collared Delma [1656]	Vulnerable	Species or species habitat may occur within area
<u>Furina dunmalli</u> Dunmall's Snake [59254]	Vulnerable	Species or species habitat may occur within area
Listed Migratory Species		
[<u>Resource Information</u>]		
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Migratory Marine Birds		
<u>Apus pacificus</u> Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
<u>Cuculus optatus</u> Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat known to occur within area
<u>Hirundapus caudacutus</u> White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
<u>Monarcha melanopsis</u> Black-faced Monarch [609]		Species or species habitat known to occur within area
<u>Monarcha trivirgatus</u> Spectacled Monarch [610]		Species or species habitat known to occur within area
<u>Myiagra cyanoleuca</u> Satin Flycatcher [612]		Species or species habitat known to occur within area
<u>Rhipidura rufifrons</u> Rufous Fantail [592]		Species or species habitat known to occur within area
Migratory Wetlands Species		
<u>Actitis hypoleucos</u> Common Sandpiper [59309]		Species or species habitat may occur within area
<u>Calidris acuminata</u> Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
<u>Calidris ferruginea</u> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
<u>Calidris melanotos</u> Pectoral Sandpiper [858]		Species or species habitat may occur within area
<u>Gallinago hardwickii</u> Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area

Name	Threatened	Type of Presence
<u>Numenius madagascariensis</u> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
<u>Pandion haliaetus</u> Osprey [952]		Species or species habitat may occur within area
<u>Tringa nebularia</u> Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species	[<u>Resource Information</u>]	
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat known to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area
Thinornis rubricollis rubricollis Hooded Plover (eastern) [66726]	Vulnerable*	Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Extra Information

State and Territory Reserves	[Resource Information]
Name	State
Eudlo Creek	QLD
Ga'ri djaa ga'wun	QLD

Invasive Species

[Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Lonchura punctulata Nutmeg Mannikin [399]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Frogs		
Rhinella marina Cane Toad [83218]		Species or species habitat known to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur

Name	Status	Type of Presence
		within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Anredera cordifolia Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine, Anredera, Gulf Madeiravine, Heartleaf Madeiravine, Potato Vine [2643]		Species or species habitat likely to occur within area
Cabomba caroliniana Cabomba, Fanwort, Carolina Watershield, Fish Grass, Washington Grass, Watershield, Carolina Fanwort, Common Cabomba [5171]		Species or species habitat likely to occur within area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Eichhornia crassipes Water Hyacinth, Water Orchid, Nile Lily [13466]		Species or species habitat likely to occur within area
Hymenachne amplexicaulis Hymenachne, Olive Hymenachne, Water Stargrass, West Indian Grass, West Indian Marsh Grass [31754]		Species or species habitat likely to occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Parthenium hysterophorus Parthenium Weed, Bitter Weed, Carrot Grass, False Ragweed [19566]		Species or species habitat likely to occur within area
Prosopis spp. Mesquite, Algaroba [68407]		Species or species habitat likely to occur within area
Sagittaria platyphylla Delta Arrowhead, Arrowhead, Slender Arrowhead [68483]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Senecio madagascariensis Fireweed, Madagascar Ragwort, Madagascar Groundsel [2624]		Species or species habitat likely to occur within area
Reptiles		
Ramphotyphlops braminus Flowerpot Blind Snake, Brahminy Blind Snake, Cacing Besi [1258]		Species or species habitat may occur within area

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

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.

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

Where very little information is available for 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 reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

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

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

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

Coordinates

-26.72597 152.95684,-26.72788 152.95705,-26.72881 152.95786,-26.72931 152.9596,-26.72965 152.96162,-26.73058 152.96277,-26.73175 152.96312,-26.73302 152.96255

Acknowledgements

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

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

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

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

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[Department of Agriculture Water and the Environment](#)

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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.

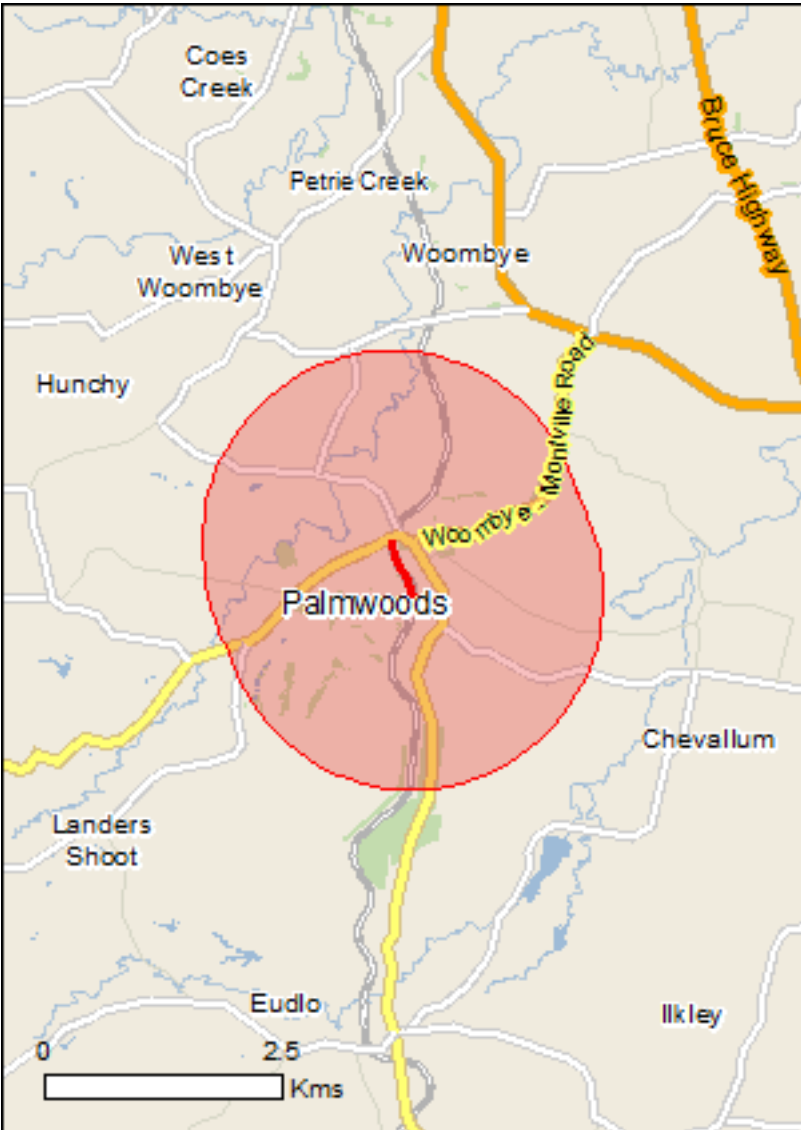
Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about [Environment Assessments](#) and the EPBC Act including significance guidelines, forms and application process details.

Report created: 08/03/21 16:32:19

- [Summary](#)
- [Details](#)

[Matters of NES](#)[Other Matters Protected by the EPBC Act](#)[Extra Information](#)
- [Caveat](#)
- [Acknowledgements](#)



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2015

[Coordinates](#)

Buffer: 2.0Km



Summary

Matters of National Environmental 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:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	2
Listed Threatened Species:	46
Listed Migratory Species:	15

Other Matters Protected by the EPBC Act

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

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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 Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	22
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

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

State and Territory Reserves:	1
Regional Forest Agreements:	None
Invasive Species:	33
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	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.

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Listed Threatened Species

[Resource Information]

Name	Status	Type of Presence
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Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area

Name	Status	Type of Presence
<u>Thinornis cucullatus cucullatus</u> Hooded Plover (eastern), Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat may occur within area
<u>Turnix melanogaster</u> Black-breasted Button-quail [923]	Vulnerable	Species or species habitat likely to occur within area
Frogs		
<u>Litoria olongburensis</u> Wallum Sedge Frog [1821]	Vulnerable	Species or species habitat may occur within area
<u>Mixophyes fleayi</u> Fleay's Frog [25960]	Endangered	Species or species habitat likely to occur within area
<u>Mixophyes iteratus</u> Giant Barred Frog, Southern Barred Frog [1944]	Endangered	Species or species habitat may occur within area
Insects		
<u>Argynnis hyperbius inconstans</u> Australian Fritillary [88056]	Critically Endangered	Species or species habitat may occur within area
<u>Phyllodes imperialis smithersi</u> Pink Underwing Moth [86084]	Endangered	Species or species habitat may occur within area
Mammals		
<u>Chalinolobus dwyeri</u> Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat likely to occur within area
<u>Dasyurus hallucatus</u> Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat likely to occur within area
<u>Dasyurus maculatus maculatus (SE mainland population)</u> Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat likely to occur within area
<u>Petauroides volans</u> Greater Glider [254]	Vulnerable	Species or species habitat likely to occur within area
<u>Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)</u> Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat known to occur within area
<u>Potorous tridactylus tridactylus</u> Long-nosed Potoroo (SE Mainland) [66645]	Vulnerable	Species or species habitat may occur within area
<u>Pteropus poliocephalus</u> Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area
<u>Xeromys myoides</u> Water Mouse, False Water Rat, Yirrkoo [66]	Vulnerable	Species or species habitat known to occur within area
Plants		
<u>Acacia attenuata</u> [10690]	Vulnerable	Species or species habitat may occur within area
<u>Arthraxon hispidus</u> Hairy-joint Grass [9338]	Vulnerable	Species or species habitat likely to occur within area

Name	Status	Type of Presence
Bosistoa transversa Three-leaved Bosistoa, Yellow Satinheart [16091]	Vulnerable	Species or species habitat likely to occur within area
Cryptocarya foetida Stinking Cryptocarya, Stinking Laurel [11976]	Vulnerable	Species or species habitat may occur within area
Cryptostylis hunteriana Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat may occur within area
Eucalyptus conglomerata Swamp Stringybark [3160]	Endangered	Species or species habitat may occur within area
Macadamia integrifolia Macadamia Nut, Queensland Nut Tree, Smooth-shelled Macadamia, Bush Nut, Nut Oak [7326]	Vulnerable	Species or species habitat likely to occur within area
Macadamia ternifolia Small-fruited Queensland Nut, Gympie Nut [7214]	Vulnerable	Species or species habitat likely to occur within area
Macadamia tetraphylla Rough-shelled Bush Nut, Macadamia Nut, Rough-shelled Macadamia, Rough-leaved Queensland Nut [6581]	Vulnerable	Species or species habitat may occur within area
Phaius australis Lesser Swamp-orchid [5872]	Endangered	Species or species habitat likely to occur within area
Rhodamnia rubescens Scrub Turpentine, Brown Malletwood [15763]	Critically Endangered	Species or species habitat known to occur within area
Rhodomyrtus psidioides Native Guava [19162]	Critically Endangered	Species or species habitat likely to occur within area
Samadera bidwillii Quassia [29708]	Vulnerable	Species or species habitat likely to occur within area
Sarcochilus fitzgeraldii Ravine Orchid [19131]	Vulnerable	Species or species habitat may occur within area
Sophora fraseri [8836]	Vulnerable	Species or species habitat may occur within area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat may occur within area
Triunia robusta Glossy Spice Bush [14747]	Endangered	Species or species habitat likely to occur within area
Zieria bifida [83095]	Endangered	Species or species habitat may occur within area
Reptiles		
Coeranoscincus reticulatus Three-toed Snake-tooth Skink [59628]	Vulnerable	Species or species habitat likely to occur within area
Delma torquata Adorned Delma, Collared Delma [1656]	Vulnerable	Species or species habitat may occur within area

Name	Status	Type of Presence
<u>Furina dunmalli</u> Dunmall's Snake [59254]	Vulnerable	Species or species habitat may occur within area
Listed Migratory Species		
[<u>Resource Information</u>]		
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Migratory Marine Birds		
<u>Apus pacificus</u> Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
<u>Cuculus optatus</u> Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area
<u>Hirundapus caudacutus</u> White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
<u>Monarcha melanopsis</u> Black-faced Monarch [609]		Species or species habitat known to occur within area
<u>Monarcha trivirgatus</u> Spectacled Monarch [610]		Species or species habitat known to occur within area
<u>Myiagra cyanoleuca</u> Satin Flycatcher [612]		Species or species habitat known to occur within area
<u>Rhipidura rufifrons</u> Rufous Fantail [592]		Species or species habitat known to occur within area
Migratory Wetlands Species		
<u>Actitis hypoleucos</u> Common Sandpiper [59309]		Species or species habitat may occur within area
<u>Calidris acuminata</u> Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
<u>Calidris ferruginea</u> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
<u>Calidris melanotos</u> Pectoral Sandpiper [858]		Species or species habitat may occur within area
<u>Gallinago hardwickii</u> Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area
<u>Numenius madagascariensis</u> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
<u>Pandion haliaetus</u> Osprey [952]		Species or species habitat may occur within area
<u>Tringa nebularia</u> Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat known to occur within area
Ardea ibis Cattle Egret [59542]		Breeding likely to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat known to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area
Thinornis rubricollis rubricollis Hooded Plover (eastern) [66726]	Vulnerable*	Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Extra Information

State and Territory Reserves	[Resource Information]
Name	State
Eudlo Creek	QLD

Invasive Species

[Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Lonchura punctulata Nutmeg Mannikin [399]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species

Name	Status	Type of Presence
Streptopelia chinensis Spotted Turtle-Dove [780]		habitat likely to occur within area Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Frogs		
Rhinella marina Cane Toad [83218]		Species or species habitat known to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Anredera cordifolia Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine, Anredera, Gulf Madeiravine, Heartleaf Madeiravine, Potato Vine [2643]		Species or species habitat likely to occur within area
Asparagus aethiopicus Asparagus Fern, Ground Asparagus, Basket Fern, Sprengi's Fern, Bushy Asparagus, Emerald Asparagus [62425]		Species or species habitat likely to occur within area
Cabomba caroliniana Cabomba, Fanwort, Carolina Watershield, Fish Grass, Washington Grass, Watershield, Carolina Fanwort, Common Cabomba [5171]		Species or species habitat likely to occur within area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Dolichandra unguis-cati Cat's Claw Vine, Yellow Trumpet Vine, Cat's Claw Creeper, Funnel Creeper [85119]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Eichhornia crassipes Water Hyacinth, Water Orchid, Nile Lily [13466]		Species or species habitat likely to occur within area
Hymenachne amplexicaulis Hymenachne, Olive Hymenachne, Water Stargrass, West Indian Grass, West Indian Marsh Grass [31754]		Species or species habitat likely to occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Parthenium hysterophorus Parthenium Weed, Bitter Weed, Carrot Grass, False Ragweed [19566]		Species or species habitat likely to occur within area
Prosopis spp. Mesquite, Algaroba [68407]		Species or species habitat likely to occur within area
Sagittaria platyphylla Delta Arrowhead, Arrowhead, Slender Arrowhead [68483]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Senecio madagascariensis Fireweed, Madagascar Ragwort, Madagascar Groundsel [2624]		Species or species habitat likely to occur within area
Reptiles		
Ramphotyphlops braminus Flowerpot Blind Snake, Brahminy Blind Snake, Cacing Besi [1258]		Species or species habitat may occur within area

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

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.

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

Where very little information is available for 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 reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

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

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

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

Coordinates

-26.68577 152.95955,-26.68714 152.95975,-26.689 152.96094,-26.68972 152.9613,-26.69059 152.96133

Acknowledgements

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

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

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

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

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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.

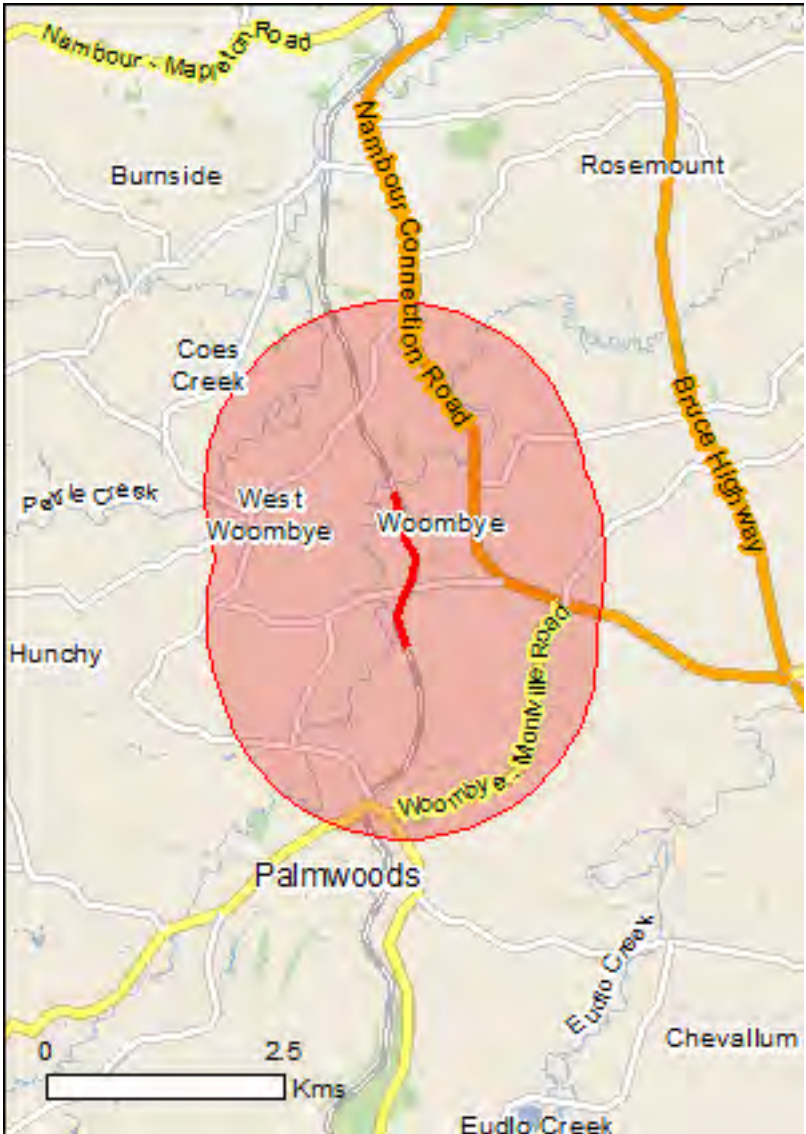
Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about [Environment Assessments](#) and the EPBC Act including significance guidelines, forms and application process details.

Report created: 08/03/21 16:29:19

- [Summary](#)
- [Details](#)

[Matters of NES](#)[Other Matters Protected by the EPBC Act](#)[Extra Information](#)
- [Caveat](#)
- [Acknowledgements](#)



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2015

[Coordinates](#)

Buffer: 2.0Km



Summary

Matters of National Environmental 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:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	2
Listed Threatened Species:	47
Listed Migratory Species:	15

Other Matters Protected by the EPBC Act

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

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <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 Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	22
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

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

State and Territory Reserves:	None
Regional Forest Agreements:	None
Invasive Species:	33
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	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.

Name	Status	Type of Presence
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community	Endangered	Community may occur within area
Lowland Rainforest of Subtropical Australia	Critically Endangered	Community may occur within area

Listed Threatened Species

[Resource Information]

Name	Status	Type of Presence
Birds		
Anthochaera phrygia		
Regent Honeyeater [82338]	Critically Endangered	Foraging, feeding or related behaviour may occur within area
Botaurus poiciloptilus		
Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Cyclopsitta diophthalma coxeni		
Coxen's Fig-Parrot [59714]	Endangered	Species or species habitat may occur within area
Erythrotriorchis radiatus		
Red Goshawk [942]	Vulnerable	Species or species habitat likely to occur within area
Falco hypoleucos		
Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area
Hirundapus caudacutus		
White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Lathamus discolor		
Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
Numenius madagascariensis		
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Rostratula australis		
Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area

Name	Status	Type of Presence
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat may occur within area
Thinornis cucullatus cucullatus Hooded Plover (eastern), Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat may occur within area
Turnix melanogaster Black-breasted Button-quail [923]	Vulnerable	Species or species habitat likely to occur within area
Frogs		
Litoria olongburensis Wallum Sedge Frog [1821]	Vulnerable	Species or species habitat may occur within area
Mixophyes fleayi Fleay's Frog [25960]	Endangered	Species or species habitat likely to occur within area
Mixophyes iteratus Giant Barred Frog, Southern Barred Frog [1944]	Endangered	Species or species habitat may occur within area
Insects		
Argynnis hyperbius inconstans Australian Fritillary [88056]	Critically Endangered	Species or species habitat may occur within area
Phyllodes imperialis smithersi Pink Underwing Moth [86084]	Endangered	Species or species habitat may occur within area
Mammals		
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat likely to occur within area
Dasyurus hallucatus Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat likely to occur within area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat likely to occur within area
Petauroides volans Greater Glider [254]	Vulnerable	Species or species habitat likely to occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat known to occur within area
Potorous tridactylus tridactylus Long-nosed Potoroo (SE Mainland) [66645]	Vulnerable	Species or species habitat likely to occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area
Plants		
Acacia attenuata [10690]	Vulnerable	Species or species habitat may occur within area
Acronychia littoralis Scented Acronychia [8582]	Endangered	Species or species habitat may occur within area

Name	Status	Type of Presence
<u>Arthraxon hispidus</u> Hairy-joint Grass [9338]	Vulnerable	Species or species habitat likely to occur within area
<u>Bosistoa transversa</u> Three-leaved Bosistoa, Yellow Satinheart [16091]	Vulnerable	Species or species habitat likely to occur within area
<u>Cryptocarya foetida</u> Stinking Cryptocarya, Stinking Laurel [11976]	Vulnerable	Species or species habitat may occur within area
<u>Cryptostylis hunteriana</u> Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat may occur within area
<u>Eucalyptus conglomerata</u> Swamp Stringybark [3160]	Endangered	Species or species habitat may occur within area
<u>Floydia praealta</u> Ball Nut, Possum Nut, Big Nut, Beefwood [15762]	Vulnerable	Species or species habitat may occur within area
<u>Macadamia integrifolia</u> Macadamia Nut, Queensland Nut Tree, Smooth-shelled Macadamia, Bush Nut, Nut Oak [7326]	Vulnerable	Species or species habitat likely to occur within area
<u>Macadamia ternifolia</u> Small-fruited Queensland Nut, Gympie Nut [7214]	Vulnerable	Species or species habitat likely to occur within area
<u>Macadamia tetraphylla</u> Rough-shelled Bush Nut, Macadamia Nut, Rough-shelled Macadamia, Rough-leaved Queensland Nut [6581]	Vulnerable	Species or species habitat may occur within area
<u>Phaius australis</u> Lesser Swamp-orchid [5872]	Endangered	Species or species habitat likely to occur within area
Rhodamnia rubescens Scrub Turpentine, Brown Malletwood [15763]	Critically Endangered	Species or species habitat likely to occur within area
Rhodomyrtus psidioides Native Guava [19162]	Critically Endangered	Species or species habitat likely to occur within area
<u>Samadera bidwillii</u> Quassia [29708]	Vulnerable	Species or species habitat may occur within area
<u>Sophora fraseri</u> [8836]	Vulnerable	Species or species habitat may occur within area
<u>Thesium australe</u> Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat may occur within area
<u>Triunia robusta</u> Glossy Spice Bush [14747]	Endangered	Species or species habitat known to occur within area
<u>Zieria bifida</u> [83095]	Endangered	Species or species habitat may occur within area
Reptiles		
<u>Coeranoscincus reticulatus</u> Three-toed Snake-tooth Skink [59628]	Vulnerable	Species or species habitat likely to occur within area

Name	Status	Type of Presence
<u>Delma torquata</u> Adorned Delma, Collared Delma [1656]	Vulnerable	Species or species habitat may occur within area
<u>Furina dunmalli</u> Dunmall's Snake [59254]	Vulnerable	Species or species habitat may occur within area
Listed Migratory Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Migratory Marine Birds		
<u>Apus pacificus</u> Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
<u>Cuculus optatus</u> Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area
<u>Hirundapus caudacutus</u> White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
<u>Monarcha melanopsis</u> Black-faced Monarch [609]		Species or species habitat known to occur within area
<u>Monarcha trivirgatus</u> Spectacled Monarch [610]		Species or species habitat known to occur within area
<u>Myiagra cyanoleuca</u> Satin Flycatcher [612]		Species or species habitat known to occur within area
<u>Rhipidura rufifrons</u> Rufous Fantail [592]		Species or species habitat known to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
<u>Calidris ferruginea</u> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
<u>Gallinago hardwickii</u> Latham's Snipe, Japanese Snipe [863]		Species or species habitat likely to occur within area
<u>Numenius madagascariensis</u> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
<u>Pandion haliaetus</u> Osprey [952]		Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Tringa nebularia		
Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species	[Resource Information]	
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat known to occur within area
Ardea ibis Cattle Egret [59542]		Breeding likely to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat likely to occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species

Name	Threatened	Type of Presence
Lathamus discolor Swift Parrot [744]	Critically Endangered	habitat known to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat likely to occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat may occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat known to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]	Critically Endangered	Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area
Thinornis rubricollis rubricollis Hooded Plover (eastern) [66726]	Vulnerable*	Species or species habitat likely to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat may occur within area

Extra Information

Invasive Species

[[Resource Information](#)]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur

Name	Status	Type of Presence
within area		
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Lonchura punctulata Nutmeg Mannikin [399]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Frogs		
Rhinella marina Cane Toad [83218]		Species or species habitat known to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		

Name	Status	Type of Presence
Anredera cordifolia		
Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine, Anredera, Gulf Madeiravine, Heartleaf Madeiravine, Potato Vine [2643]		Species or species habitat likely to occur within area
Asparagus aethiopicus		
Asparagus Fern, Ground Asparagus, Basket Fern, Sprengi's Fern, Bushy Asparagus, Emerald Asparagus [62425]		Species or species habitat likely to occur within area
Cabomba caroliniana		
Cabomba, Fanwort, Carolina Watershield, Fish Grass, Washington Grass, Watershield, Carolina Fanwort, Common Cabomba [5171]		Species or species habitat likely to occur within area
Chrysanthemoides monilifera		
Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Dolichandra unguis-cati		
Cat's Claw Vine, Yellow Trumpet Vine, Cat's Claw Creeper, Funnel Creeper [85119]		Species or species habitat likely to occur within area
Eichhornia crassipes		
Water Hyacinth, Water Orchid, Nile Lily [13466]		Species or species habitat likely to occur within area
Hymenachne amplexicaulis		
Hymenachne, Olive Hymenachne, Water Stargrass, West Indian Grass, West Indian Marsh Grass [31754]		Species or species habitat likely to occur within area
Lantana camara		
Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Parthenium hysterophorus		
Parthenium Weed, Bitter Weed, Carrot Grass, False Ragweed [19566]		Species or species habitat likely to occur within area
Prosopis spp.		
Mesquite, Algaroba [68407]		Species or species habitat likely to occur within area
Sagittaria platyphylla		
Delta Arrowhead, Arrowhead, Slender Arrowhead [68483]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii		
Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Salvinia molesta		
Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Senecio madagascariensis		
Fireweed, Madagascar Ragwort, Madagascar Groundsel [2624]		Species or species habitat likely to occur within area
Reptiles		
Ramphotyphlops braminus		
Flowerpot Blind Snake, Brahminy Blind Snake, Cacing Besi [1258]		Species or species habitat may occur within area

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

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.

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

Where very little information is available for 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 reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

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

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

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

Coordinates

-26.65882 152.96212,-26.6627 152.96313,-26.66426 152.96392,-26.6662 152.96374,-26.66796 152.96284,-26.66936 152.96228,-26.67203 152.96315

Acknowledgements

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

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

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

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

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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.

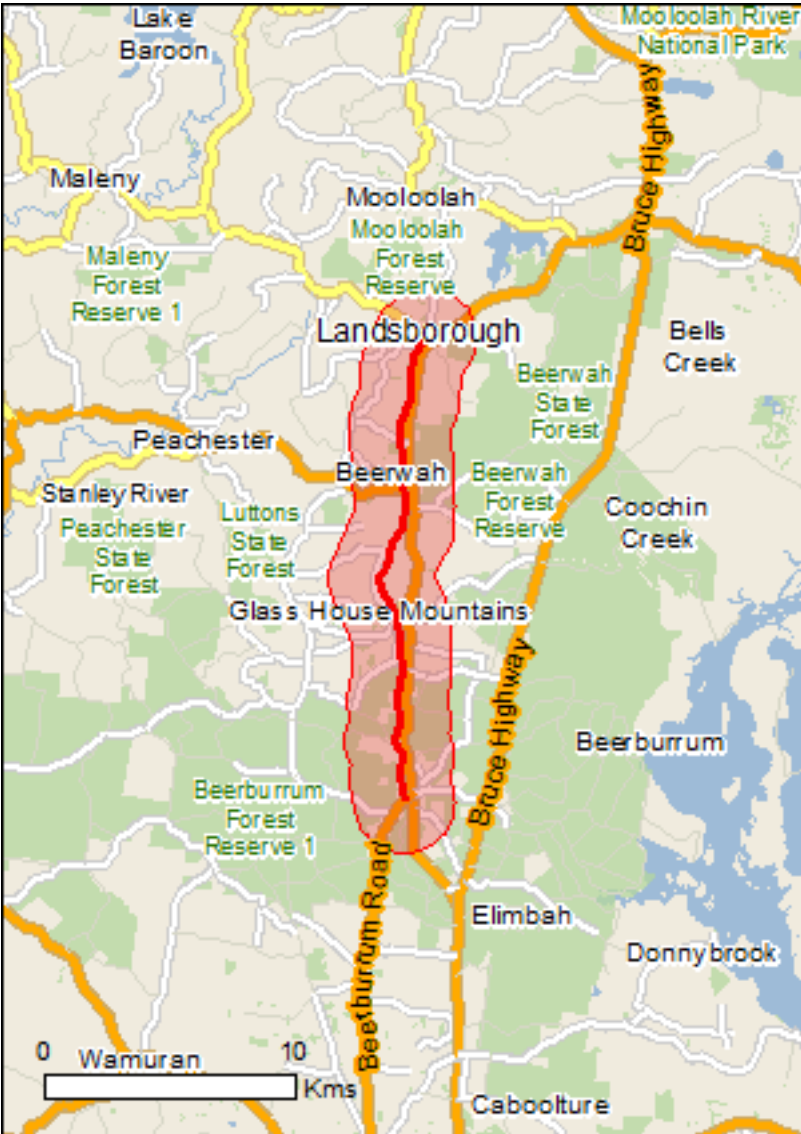
Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about [Environment Assessments](#) and the EPBC Act including significance guidelines, forms and application process details.

Report created: 08/03/21 16:01:34

- [Summary](#)
- [Details](#)

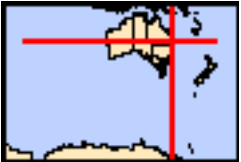
[Matters of NES](#)[Other Matters Protected by the EPBC Act](#)[Extra Information](#)
- [Caveat](#)
- [Acknowledgements](#)



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2015

[Coordinates](#)

Buffer: 2.0Km



Summary

Matters of National Environmental 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:	1
Wetlands of International Importance:	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	2
Listed Threatened Species:	60
Listed Migratory Species:	16

Other Matters Protected by the EPBC Act

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

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <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 Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	24
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

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

State and Territory Reserves:	4
Regional Forest Agreements:	None
Invasive Species:	32
Nationally Important Wetlands:	1
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

National Heritage Properties		[Resource Information]
Name	State	Status
Natural		
Glass House Mountains National Landscape	QLD	Listed place

Wetlands of International Importance (Ramsar)		[Resource Information]
Name	Proximity	
Moreton bay	Within 10km of Ramsar	

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.		
Name	Status	Type of Presence
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community	Endangered	Community may occur within area
Lowland Rainforest of Subtropical Australia	Critically Endangered	Community likely to occur within area

Listed Threatened Species		[Resource Information]
Name	Status	Type of Presence
Birds		
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Foraging, feeding or related behaviour likely to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Cyclopsitta diophthalma coxeni Coxen's Fig-Parrot [59714]	Endangered	Species or species habitat may occur within area
Erythroriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat known to occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species

Name	Status	Type of Presence
habitat likely to occur within area		
<u>Numenius madagascariensis</u> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
<u>Rostratula australis</u> Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
<u>Sternula nereis nereis</u> Australian Fairy Tern [82950]	Vulnerable	Species or species habitat may occur within area
<u>Thinornis cucullatus cucullatus</u> Hooded Plover (eastern), Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat may occur within area
<u>Turnix melanogaster</u> Black-breasted Button-quail [923]	Vulnerable	Species or species habitat likely to occur within area
Fish		
<u>Nannoperca oxleyana</u> Oxleyan Pygmy Perch [64468]	Endangered	Species or species habitat likely to occur within area
<u>Pseudomugil mellis</u> Honey Blue Eye, Honey Blue-eye [26180]	Vulnerable	Species or species habitat likely to occur within area
Frogs		
<u>Litoria olongburensis</u> Wallum Sedge Frog [1821]	Vulnerable	Species or species habitat may occur within area
<u>Mixophyes fleayi</u> Fleay's Frog [25960]	Endangered	Species or species habitat likely to occur within area
<u>Mixophyes iteratus</u> Giant Barred Frog, Southern Barred Frog [1944]	Endangered	Species or species habitat known to occur within area
Insects		
<u>Argynnis hyperbius inconstans</u> Australian Fritillary [88056]	Critically Endangered	Species or species habitat may occur within area
<u>Phyllodes imperialis smithersi</u> Pink Underwing Moth [86084]	Endangered	Species or species habitat may occur within area
Mammals		
<u>Chalinolobus dwyeri</u> Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat likely to occur within area
<u>Dasyurus hallucatus</u> Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat likely to occur within area
<u>Dasyurus maculatus maculatus (SE mainland population)</u> Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat likely to occur within area
<u>Petauroides volans</u> Greater Glider [254]	Vulnerable	Species or species habitat likely to occur within area
<u>Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)</u> Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory)	Vulnerable	Species or species habitat known to occur

Name	Status	Type of Presence
[85104] <u>Potorous tridactylus tridactylus</u>		within area
Long-nosed Potoroo (SE Mainland) [66645]	Vulnerable	Species or species habitat may occur within area
<u>Pteropus poliocephalus</u>		
Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area
Plants		
<u>Acacia attenuata</u>		
[10690]	Vulnerable	Species or species habitat known to occur within area
<u>Allocasuarina emuina</u>		
Emu Mountain Sheoak, Mt Emu She-oak [21926]	Endangered	Species or species habitat known to occur within area
<u>Allocasuarina thalassoscopica</u>		
[21927]	Endangered	Species or species habitat known to occur within area
<u>Arthraxon hispidus</u>		
Hairy-joint Grass [9338]	Vulnerable	Species or species habitat likely to occur within area
<u>Bosistoa transversa</u>		
Three-leaved Bosistoa, Yellow Satinheart [16091]	Vulnerable	Species or species habitat likely to occur within area
<u>Cryptocarya foetida</u>		
Stinking Cryptocarya, Stinking Laurel [11976]	Vulnerable	Species or species habitat likely to occur within area
<u>Cryptostylis hunteriana</u>		
Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat may occur within area
<u>Cupaniopsis shirleyana</u>		
Wedge-leaf Tuckeroo [3205]	Vulnerable	Species or species habitat may occur within area
<u>Diploglottis campbellii</u>		
Small-leaved Tamarind [21484]	Endangered	Species or species habitat may occur within area
<u>Dodonaea rupicola</u>		
Velvet Hopbush [15140]	Vulnerable	Species or species habitat known to occur within area
<u>Eucalyptus conglomerata</u>		
Swamp Stringybark [3160]	Endangered	Species or species habitat known to occur within area
<u>Eucalyptus kabiana</u>		
Mount Beerwah Mallee [56319]	Vulnerable	Species or species habitat likely to occur within area
<u>Floydia praealta</u>		
Ball Nut, Possum Nut, Big Nut, Beefwood [15762]	Vulnerable	Species or species habitat likely to occur within area
<u>Gossia fragrantissima</u>		
Sweet Myrtle, Small-leaved Myrtle [78867]	Endangered	Species or species habitat may occur within area
<u>Macadamia integrifolia</u>		
Macadamia Nut, Queensland Nut Tree, Smooth-shelled Macadamia, Bush Nut, Nut Oak [7326]	Vulnerable	Species or species habitat likely to occur within area
<u>Macadamia ternifolia</u>		
Small-fruited Queensland Nut, Gympie Nut [7214]	Vulnerable	Species or species habitat likely to occur within area

Name	Status	Type of Presence
Macadamia tetraphylla Rough-shelled Bush Nut, Macadamia Nut, Rough-shelled Macadamia, Rough-leaved Queensland Nut [6581]	Vulnerable	Species or species habitat likely to occur within area
Persicaria elatior Knotweed, Tall Knotweed [5831]	Vulnerable	Species or species habitat may occur within area
Phaius australis Lesser Swamp-orchid [5872]	Endangered	Species or species habitat likely to occur within area
Plectranthus nitidus Nightcap Plectranthus, Silver Plectranthus [55742]	Endangered	Species or species habitat may occur within area
Rhodamnia rubescens Scrub Turpentine, Brown Malletwood [15763]	Critically Endangered	Species or species habitat likely to occur within area
Rhodomyrtus psidioides Native Guava [19162]	Critically Endangered	Species or species habitat likely to occur within area
Romnalda strobilacea [5948]	Vulnerable	Species or species habitat likely to occur within area
Samadera bidwillii Quassia [29708]	Vulnerable	Species or species habitat likely to occur within area
Sarcochilus fitzgeraldii Ravine Orchid [19131]	Vulnerable	Species or species habitat may occur within area
Sophora fraseri [8836]	Vulnerable	Species or species habitat may occur within area
Syzygium hodgkinsoniae Smooth-bark Rose Apple, Red Lilly Pilly [3539]	Vulnerable	Species or species habitat likely to occur within area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat may occur within area
Triunia robusta Glossy Spice Bush [14747]	Endangered	Species or species habitat likely to occur within area
Reptiles		
Coeranoscincus reticulatus Three-toed Snake-tooth Skink [59628]	Vulnerable	Species or species habitat likely to occur within area
Delma torquata Adorned Delma, Collared Delma [1656]	Vulnerable	Species or species habitat may occur within area
Furina dunmalli Dunmall's Snake [59254]	Vulnerable	Species or species habitat may occur within area
Listed Migratory Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur

Name	Threatened	Type of Presence within area
Migratory Terrestrial Species		
<u>Cuculus optatus</u> Oriental Cuckoo, Horsfield's Cuckoo [86651]	Vulnerable	Species or species habitat known to occur within area
<u>Hirundapus caudacutus</u> White-throated Needletail [682]		Species or species habitat known to occur within area
<u>Monarcha melanopsis</u> Black-faced Monarch [609]		Species or species habitat known to occur within area
<u>Monarcha trivirgatus</u> Spectacled Monarch [610]		Species or species habitat known to occur within area
<u>Myiagra cyanoleuca</u> Satin Flycatcher [612]		Species or species habitat known to occur within area
<u>Rhipidura rufifrons</u> Rufous Fantail [592]		Species or species habitat known to occur within area
Migratory Wetlands Species		
<u>Actitis hypoleucos</u> Common Sandpiper [59309]	Endangered	Species or species habitat may occur within area
<u>Calidris acuminata</u> Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
<u>Calidris canutus</u> Red Knot, Knot [855]		Species or species habitat may occur within area
<u>Calidris ferruginea</u> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
<u>Calidris melanotos</u> Pectoral Sandpiper [858]		Species or species habitat may occur within area
<u>Gallinago hardwickii</u> Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area
<u>Numenius madagascariensis</u> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
<u>Pandion haliaetus</u> Osprey [952]		Breeding known to occur within area
<u>Tringa nebularia</u> Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat known to occur

Name	Threatened	Type of Presence
Myiagra cyanoleuca Satin Flycatcher [612]		within area Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Breeding known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area
Thinornis rubricollis rubricollis Hooded Plover (eastern) [66726]	Vulnerable*	Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Reptiles	
Emydocephalus annulatus	
Turtle-headed Seasnake [1125]	Species or species habitat may occur within area

Extra Information

State and Territory Reserves	[Resource Information]
Name	State
Beerwah	QLD
Dularcha	QLD
East Mount Mellum	QLD
Glass House Mountains	QLD

Invasive Species	[Resource Information]
Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.	

Name	Status	Type of Presence
Birds		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species

Name	Status	Type of Presence
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		habitat likely to occur within area
Lonchura punctulata Nutmeg Mannikin [399]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Frogs		
Rhinella marina Cane Toad [83218]		Species or species habitat known to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Feral deer Feral deer species in Australia [85733]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Anredera cordifolia Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine, Anredera, Gulf Madeiravine, Heartleaf Madeiravine, Potato Vine [2643]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Cabomba caroliniana		
Cabomba, Fanwort, Carolina Watershield, Fish Grass, Washington Grass, Watershield, Carolina Fanwort, Common Cabomba [5171]		Species or species habitat likely to occur within area
Chrysanthemoides monilifera		
Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Eichhornia crassipes		
Water Hyacinth, Water Orchid, Nile Lily [13466]		Species or species habitat likely to occur within area
Hymenachne amplexicaulis		
Hymenachne, Olive Hymenachne, Water Stargrass, West Indian Grass, West Indian Marsh Grass [31754]		Species or species habitat likely to occur within area
Lantana camara		
Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Parthenium hysterophorus		
Parthenium Weed, Bitter Weed, Carrot Grass, False Ragweed [19566]		Species or species habitat likely to occur within area
Prosopis spp.		
Mesquite, Algaroba [68407]		Species or species habitat likely to occur within area
Sagittaria platyphylla		
Delta Arrowhead, Arrowhead, Slender Arrowhead [68483]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii		
Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Salvinia molesta		
Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Senecio madagascariensis		
Fireweed, Madagascar Ragwort, Madagascar Groundsel [2624]		Species or species habitat likely to occur within area

Reptiles
Ramphotyphlops braminus
Flowerpot Blind Snake, Brahminy Blind Snake, Cacing Besi [1258]

Nationally Important Wetlands	[Resource Information]
Name	State
Upper Pumicestone Coastal Plain	QLD

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

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.

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

Where very little information is available for 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 reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

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

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

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

Coordinates

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Acknowledgements

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

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

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

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

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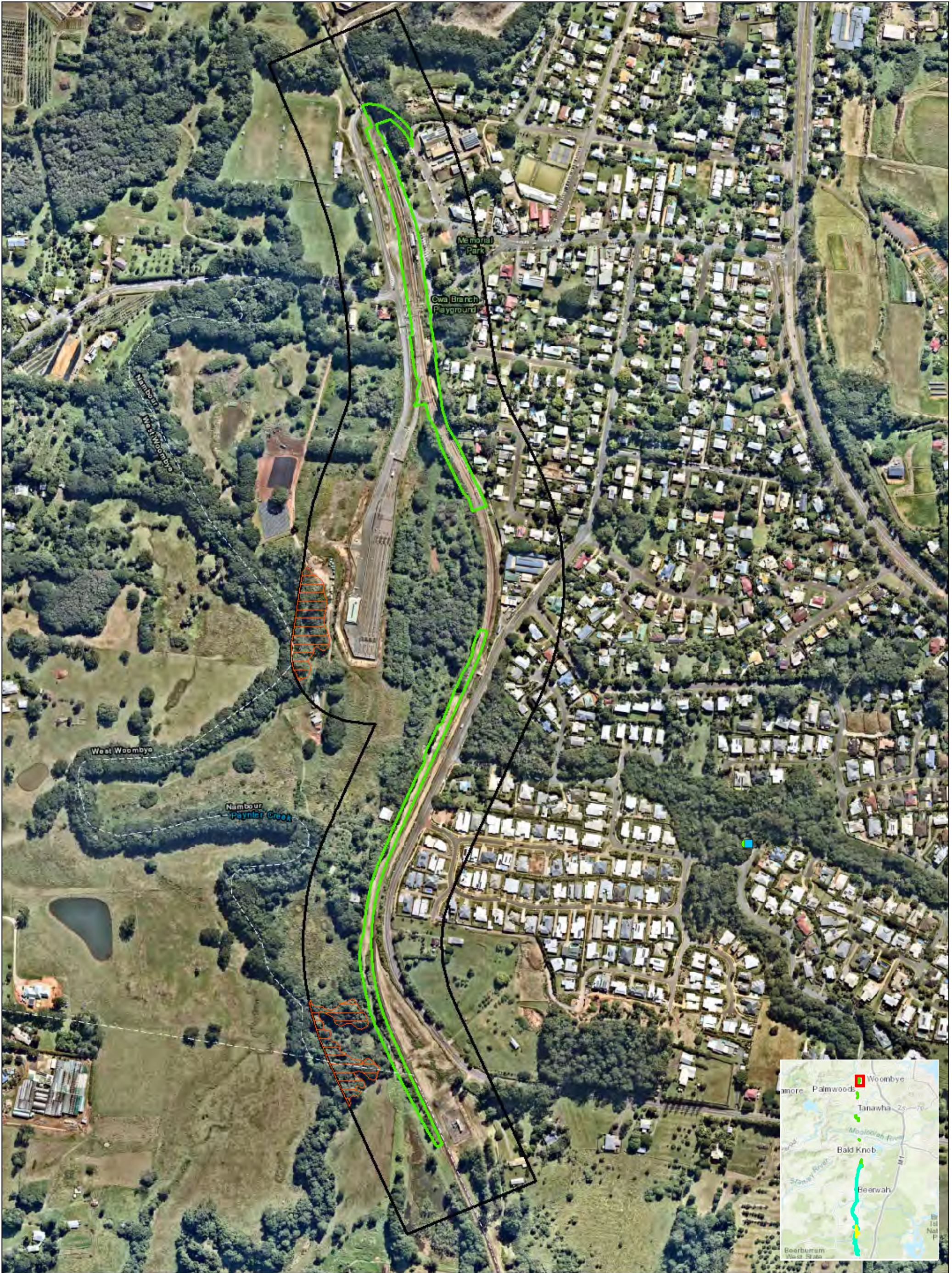
[Department of Agriculture Water and the Environment](#)

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APPENDIX D HABITAT MAPPING



- Legend
- EPBC Stage 2 Boundary
 - Assessment Boundary
 - Macadamia Nut
 - White-throated needletail
 - Rufous fantail

Data Source:
ESRI World Topographic Map, Nearmap 19th May 2021

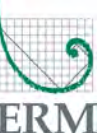
MNES Habitat within the Disturbance Footprint

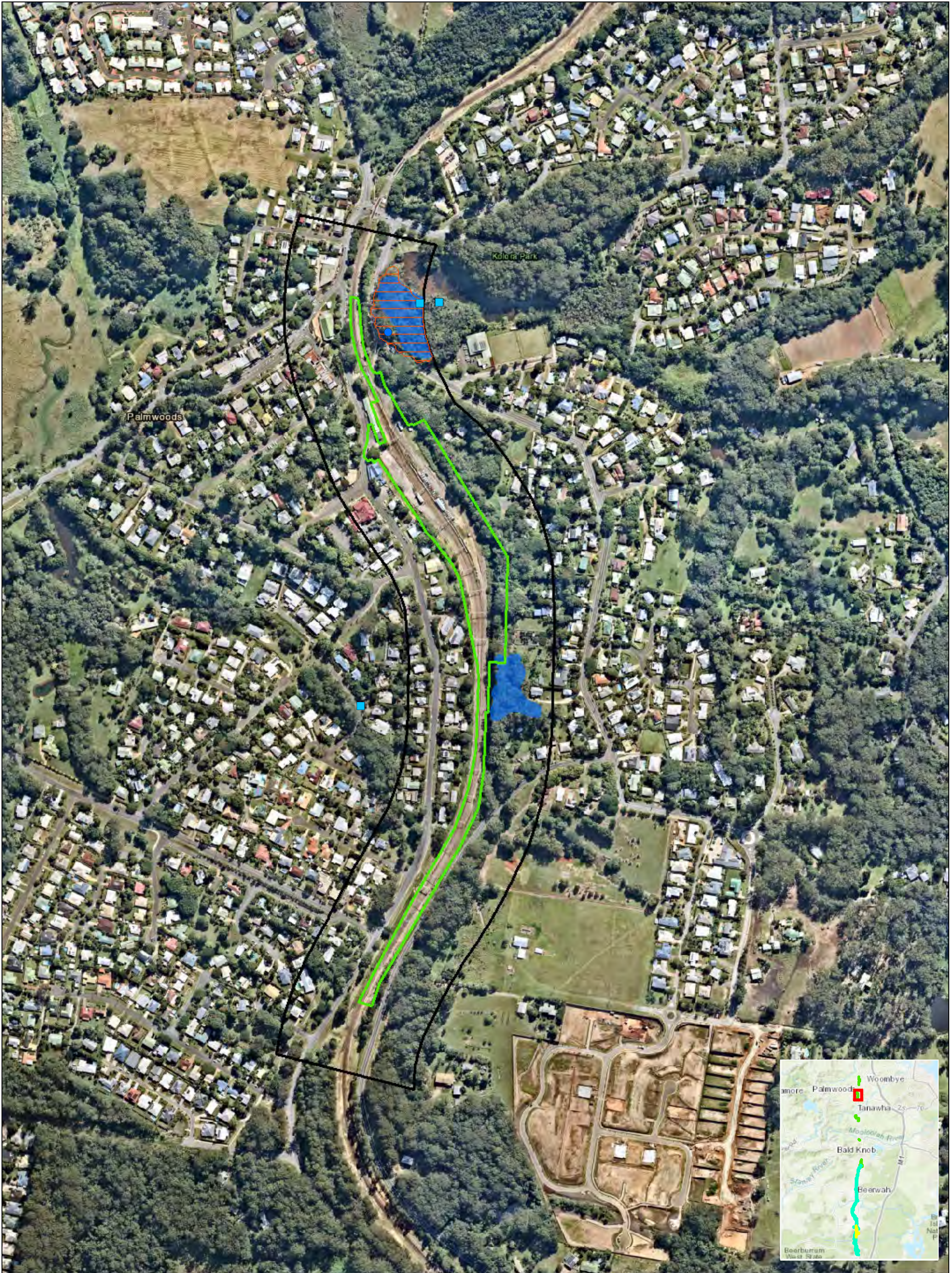
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Drawn By: VN	Reviewed By: EW
Coordinate System: GDA2020 MGA Zone 56	Client: Qld Department of Transport and Main Roads
This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.	

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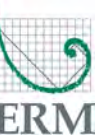
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Coordinate System: GDA2020 MGA Zone 56		
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- Legend
- EPBC Stage 2 Boundary
 - Assessment Boundary
 - Macadamia Nut
 - Migratory Birds Habitat
 - Black-faced monarch
 - Rufous fantail

Data Source:
ESRI World Topographic Map, Nearmap 19th May 2021





F4-3

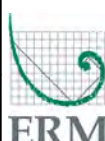
Beerburrum to Nambour Rail Upgrade

Drawing Size: A4

Reviewed By: EW

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Legend

- White-throated needletail

■ Rufous fantail

Data Source:
ESRI World Topographic Map, Nearmap 19th May 2021



F4-4

Beerburrum to Nambour Rail Upgrade

Drawing Size: A4

Reviewed By: EW

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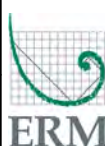
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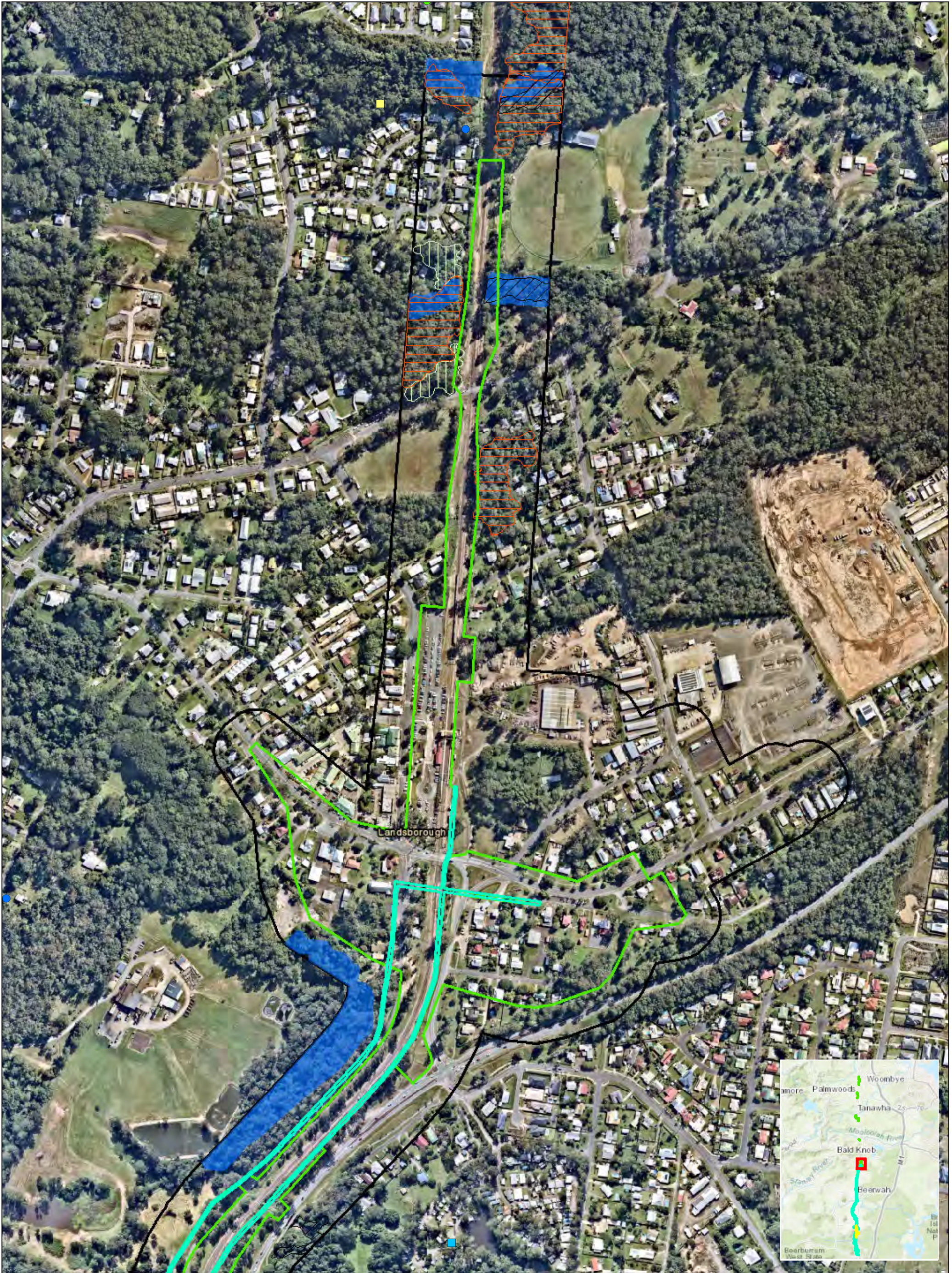


not warrant its accuracy.

 EPBC Stage 2 Boundary  Oriental cuckoo
 Assessment Boundary  White-throated needletail
 Rufous fantail

Data Source:
ESRI World Topographic Map, Nearmap 19th May 2021







Legend

- EPBC Stage 1 Main Works Boundary
- EPBC Stage 2 Boundary
- Assessment Boundary
- Macadamia Nut
- Whipstick Wattle
- Giant Barred Frog Habitat
- Migratory Birds Habitat
- White-throated needletail
- Black-faced monarch
- Grey-headed flying fox
- Rufous fantail

Data Source:
ESRI World Topographic Map, Nearmap 19th May 2021

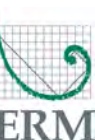
MNES Habitat within the Disturbance Footprint

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Coordinate System: GDA2020 MGA Zone 56		Client: Qld Department of Transport and Main Roads	
			
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F4-5





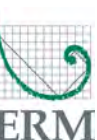
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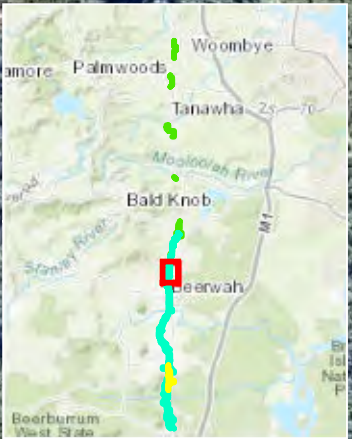
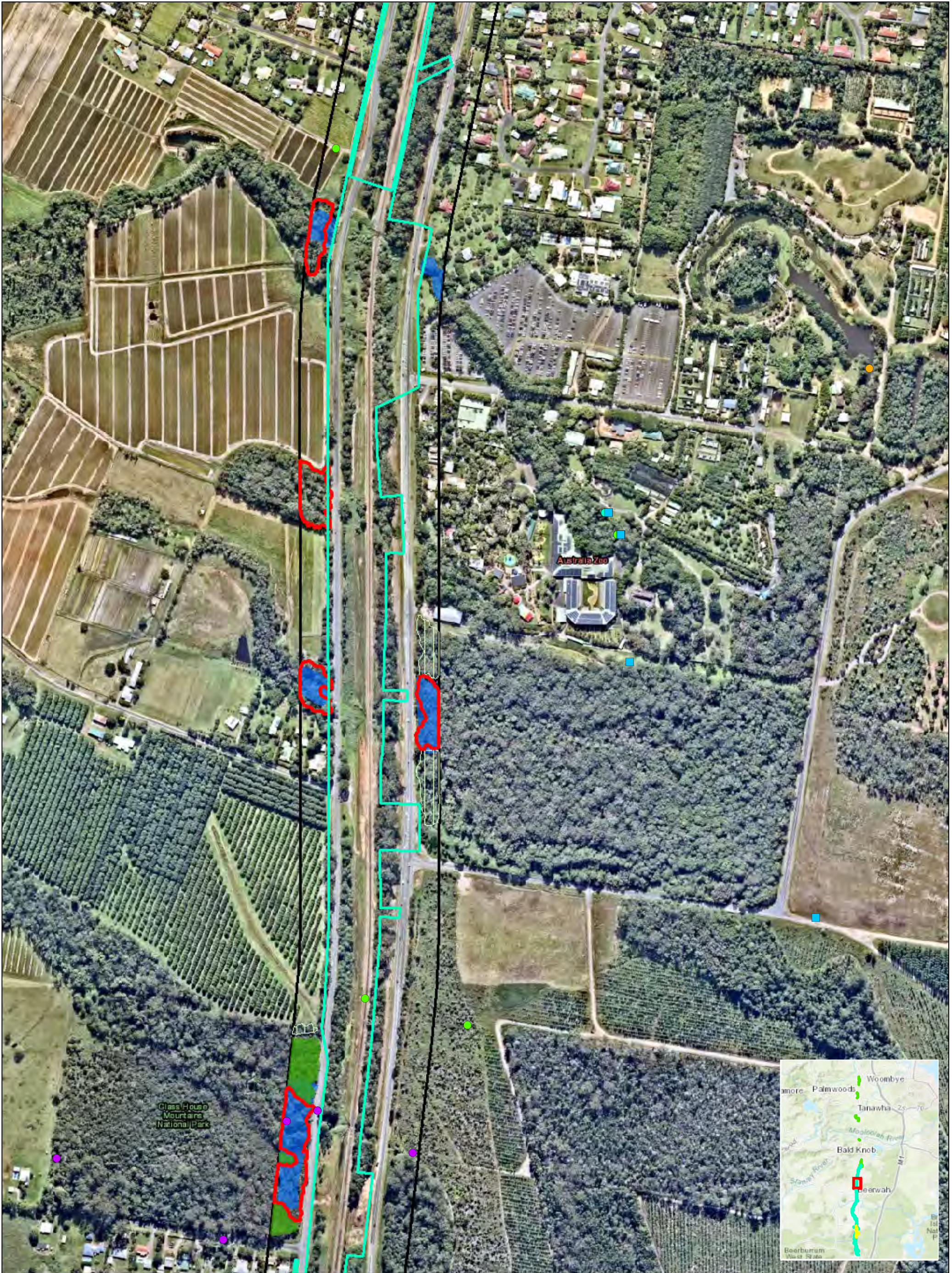
- EPBC Stage 1 Main Works Boundary
- EPBC Stage 2 Boundary
- Assessment Boundary
- Swamp Stringybark
- Migratory Birds Habitat
- White-throated needletail
- Rufous fantail

Data Source:
ESRI World Topographic Map, Nearmap 19th May 2021













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Drawn By: VN	Reviewed By: EW	Client: Qld Department of Transport and Main Roads
Coordinate System: GDA2020 MGA Zone 56		
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Legend

- | | | |
|--|---|---|
|  EPBC Stage 1 Main Works Boundary |  Migratory Birds Habitat |  Whipstick wattle |
|  EPBC Stage 2 Boundary |  Swamp stringybark |  White-throated needletail |
|  Assessment Boundary |  Satin flycatcher |  Rufous fantail |
|  Swamp Stringybark | | |
|  Whipstick Wattle | | |
|  Mt Emu She-Oak | | |

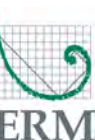
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ESRI World Topographic Map, Nearmap 19th May 2021

MNES Habitat within the Disturbance Footprint

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Coordinate System: GDA2020 MGA Zone 56	
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F4-7





Legend

- EPBC Stage 1 Main Works Boundary
- Assessment Boundary
- Swamp stringybark
- White-throated needletail
- Satin flycatcher

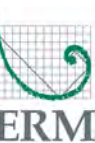
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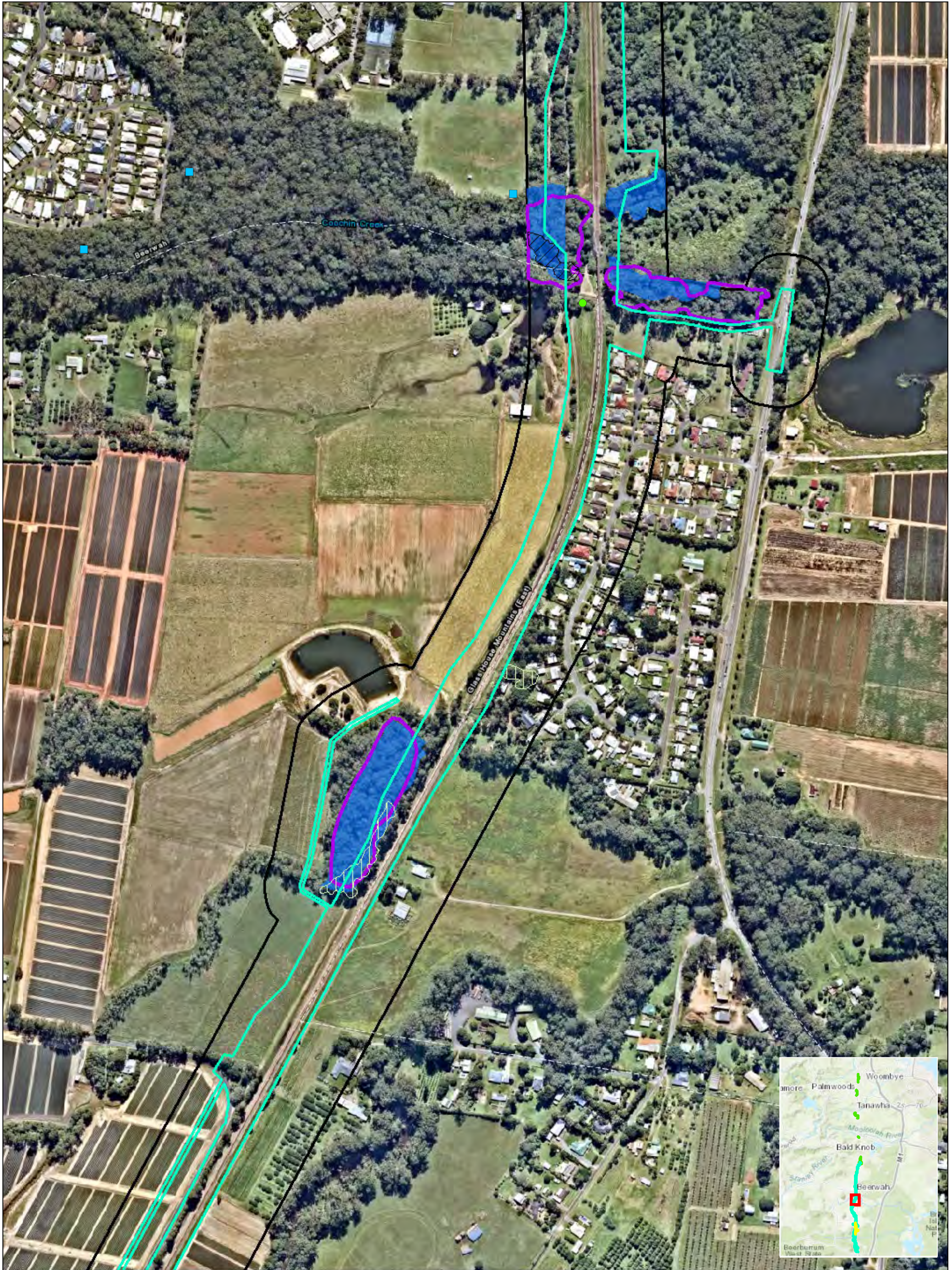
MNES Habitat within the Disturbance Footprint

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Drawn By: VN	Reviewed By: EW
Coordinate System: GDA2020 MGA Zone 56	Client: Qld Department of Transport and Main Roads
0 50 100 150m	This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.



F4-8





Legend

- EPBC Stage 1 Main Works Boundary

Assessment Boundary

Whipstick Wattle

Giant Barred Frog Habitat
- Migratory Birds Habitat

White Throated Needletail Habitat
- White-throated needletail

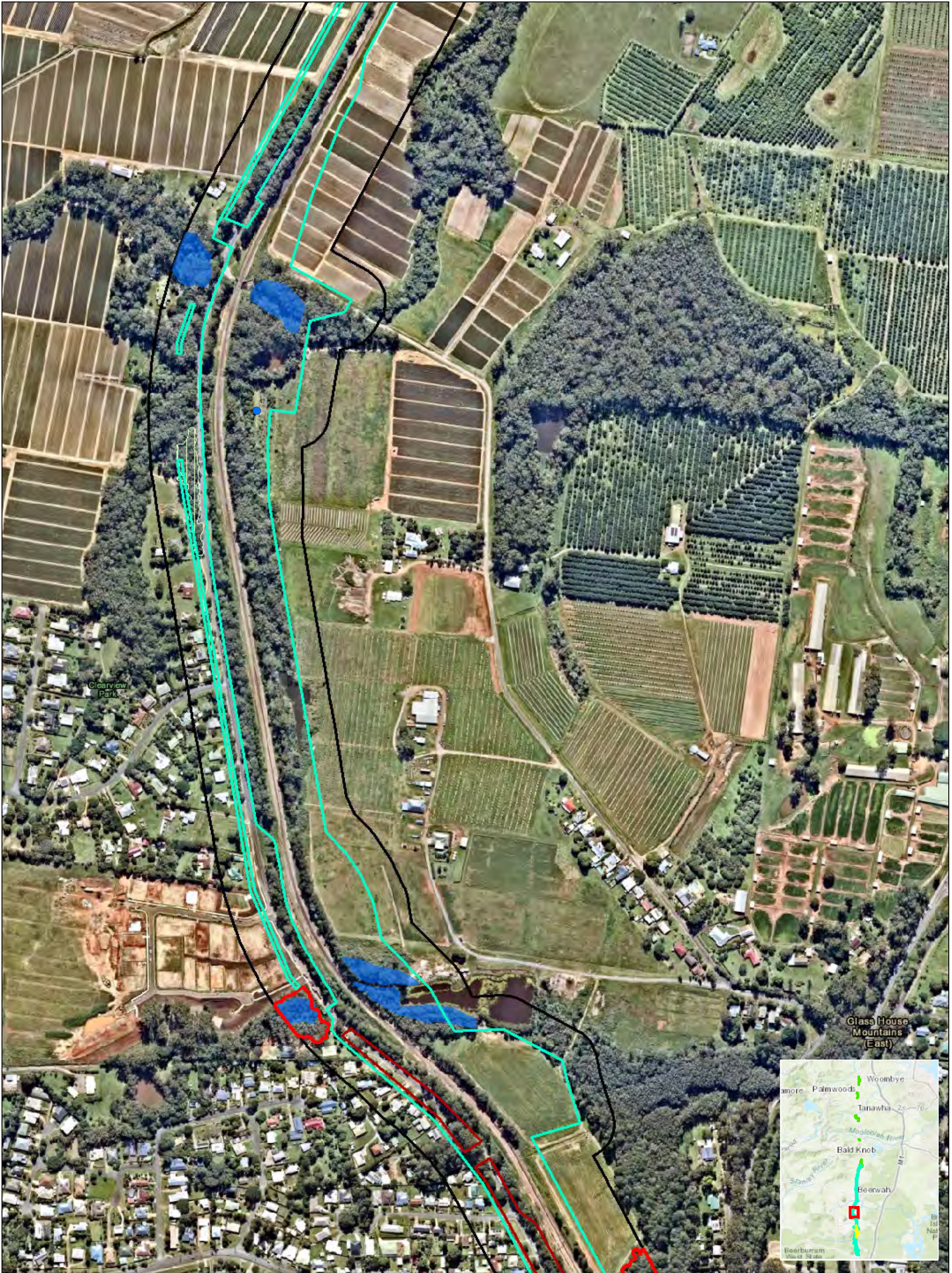
Rufous fantail

Data Source:
ESRI World Topographic Map, Nearmap 19th May 2021

MNES Habitat within the Disturbance Footprint

Drawing No: 0589458s_B2NBio_G004_R6.mxd	Beerwarrum to Nambour Rail Upgrade	
Date: 21/10/2021	Drawing Size: A4	
Drawn By: VN	Reviewed By: EW	Client: Qld Department of Transport and Main Roads
Coordinate System: GDA2020 MGA Zone 56		
0 50 100 150m		This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy





- Legend
- EPBC Stage 1 Main Works Boundary
 - No GO Area
 - Assessment Boundary
 - Swamp Stringybark
 - Whipstick Wattle
 - Migratory Birds Habitat
 - Black-faced monarch

Data Source:
ESRI World Topographic Map, Nearmap 19th May 2021

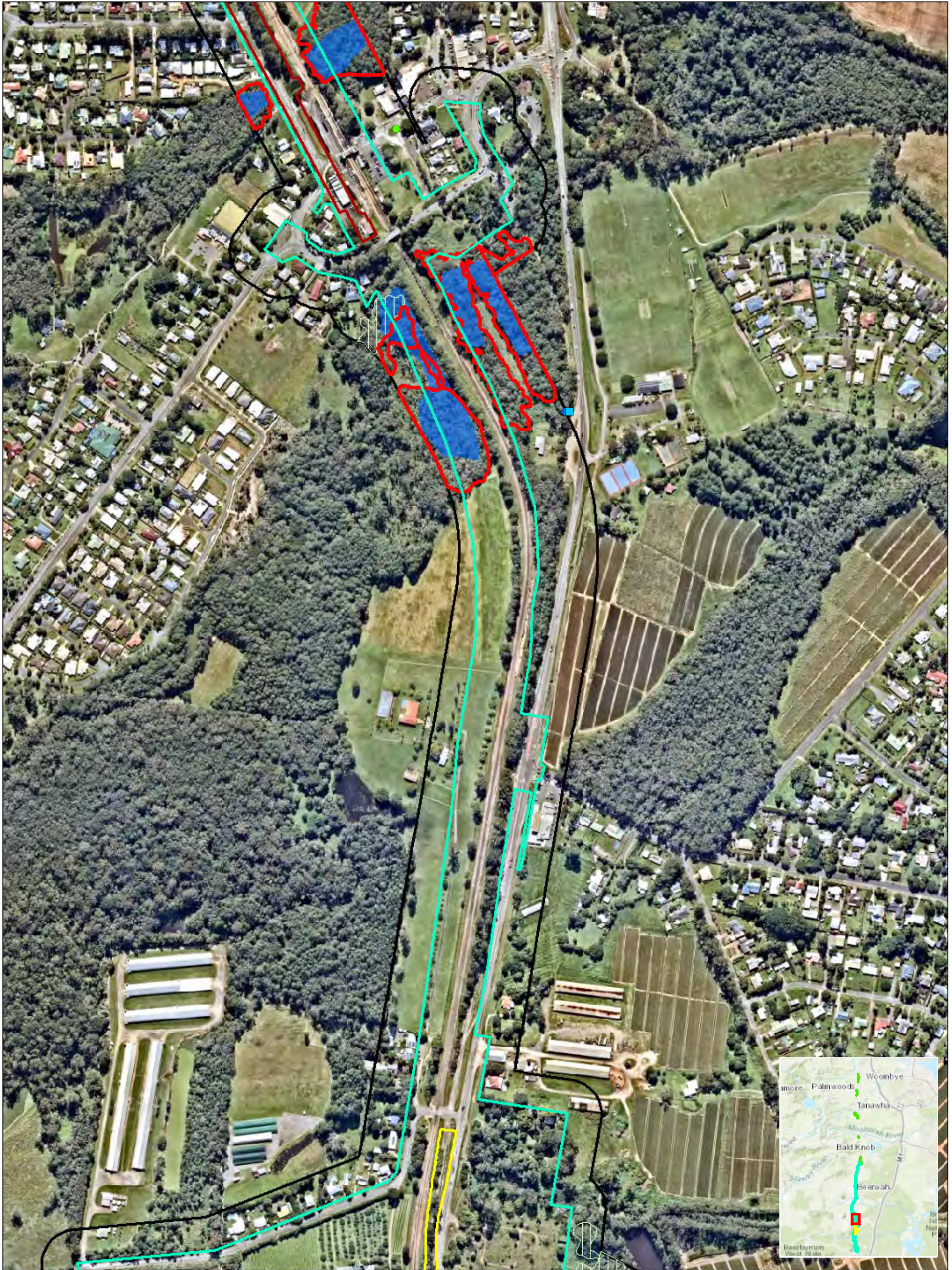
MNES Habitat within the Disturbance Footprint

Drawing No: 0589458s_B2NBio_G004_R6.mxd	Beerburum to Nambour Rail Upgrade	
Date: 21/10/2021	Drawing Size: A4	
Drawn By: VN	Reviewed By: EW	Client: Qld Department of Transport and Main Roads
Coordinate System: GDA2020 MGA Zone 56		
0 50 100 150m		This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.



F4-10



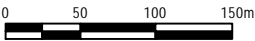


- Legend**
- EPBC Early Works Boundary
 - EPBC Stage 1 Main Works Boundary
 - No GO Area
 - Assessment Boundary
 - Swamp Stringybark
 - Whipstick Wattle
 - Migratory Birds Habitat
 - White-throated needletail
 - Black-faced monarch
 - Rufous fantail

Data Source:
ESRI World Topographic Map, Nearmap 19th May 2021

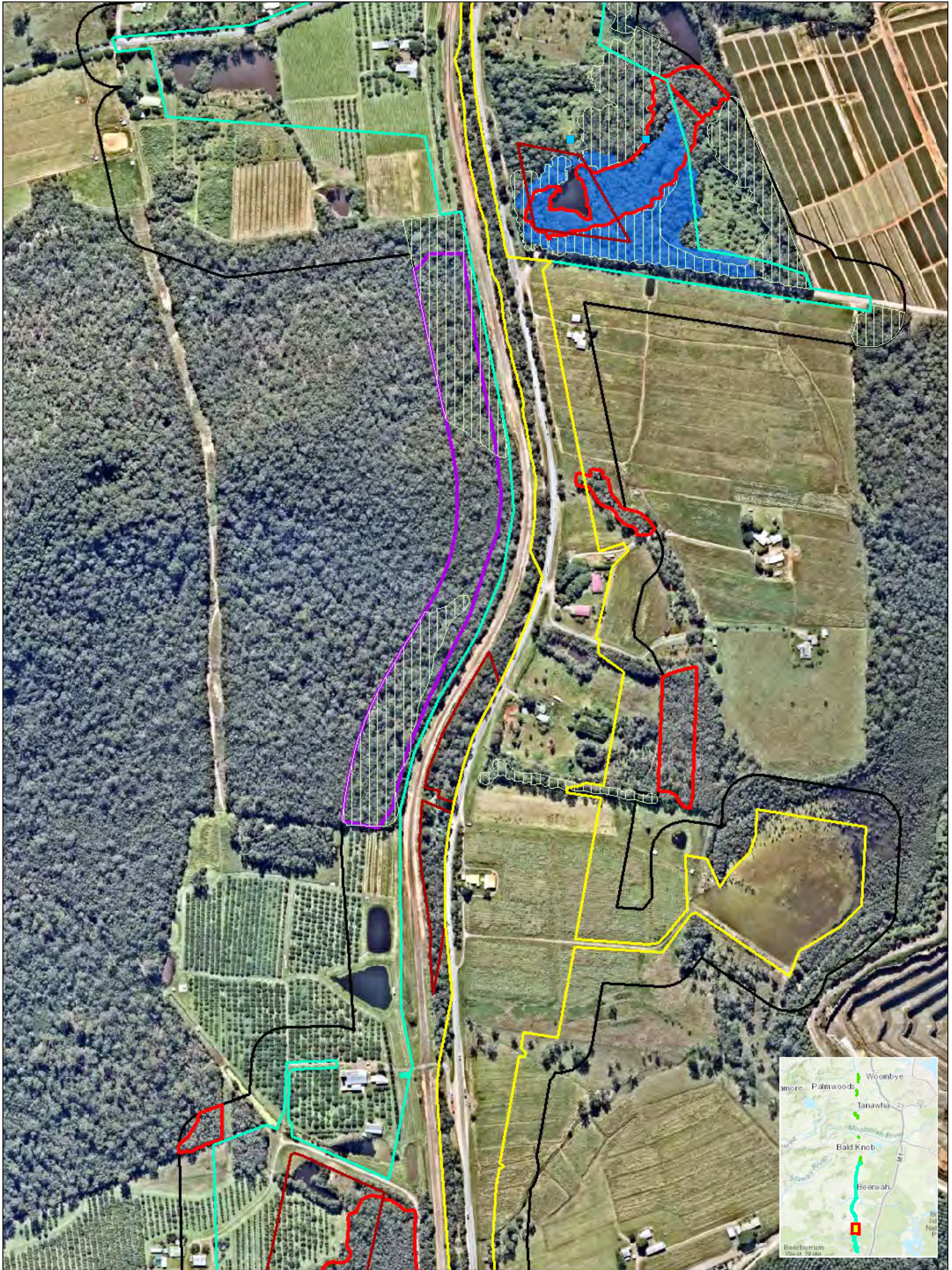
MNES Habitat within the Disturbance Footprint

Drawing No: 0589458s_B2NBio_G004_R6.mxd	Beerburum to Nambour Rail Upgrade
Date: 21/10/2021	Drawing Size: A4
Drawn By: VN	Reviewed By: EW
Coordinate System: GDA2020 MGA Zone 56	Client: Qld Department of Transport and Main Roads
This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.	



F4-11







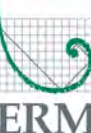
- Legend**
- EPBC Early Works Boundary
 - EPBC Stage 1 Main Works Boundary
 - No GO Area
 - Assessment Boundary
 - Swamp Stringybark
 - Whipstick Wattle
 - Migratory Birds Habitat
 - White Throated Needletail Habitat
 - Rufous fantail

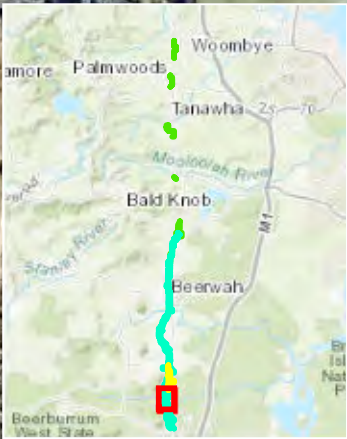
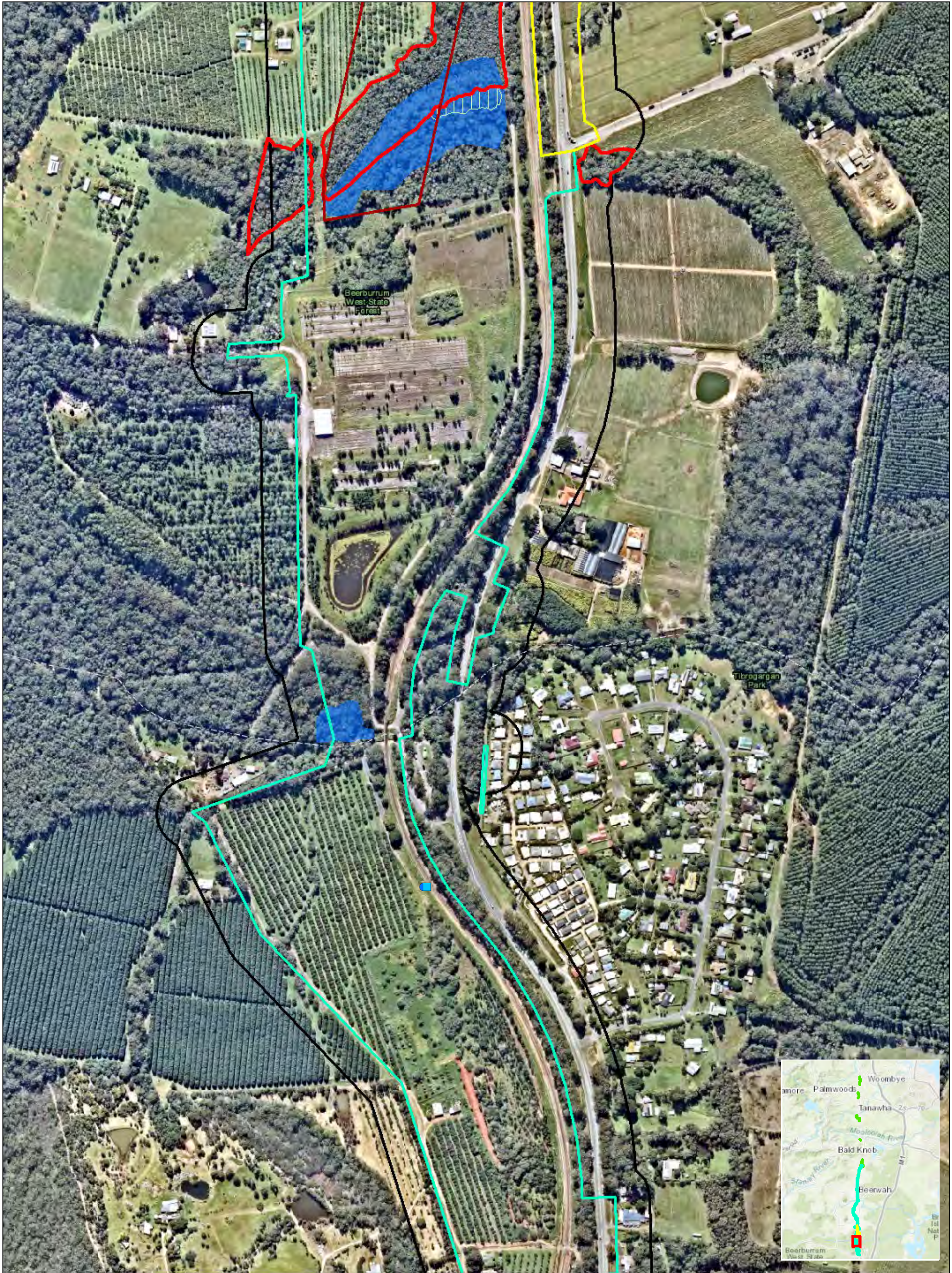
Data Source:
ESRI World Topographic Map, Nearmap 19th May 2021

MNES Habitat within the Disturbance Footprint

Drawing No: 0589458s_B2NBio_G004_R6.mxd		Beerburrrum to Nambour Rail Upgrade	
Date: 21/10/2021		Drawing Size: A4	
Drawn By: VN		Reviewed By: EW	
Client: Old Department of Transport and Main Roads			
Coordinate System: GDA2020 MGA Zone 56			
		<div>N </div> <p>This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.</p>	

F4-12





- Legend
- EPBC Early Works Boundary
 - EPBC Stage 1 Main Works Boundary
 - No GO Area
 - Assessment Boundary
 - Swamp Stringybark
 - Whipstick Wattle
 - Migratory Birds Habitat
 - Black-faced monarch
 - Rufous fantail

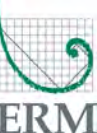
Data Source:
ESRI World Topographic Map, Nearmap 19th May 2021

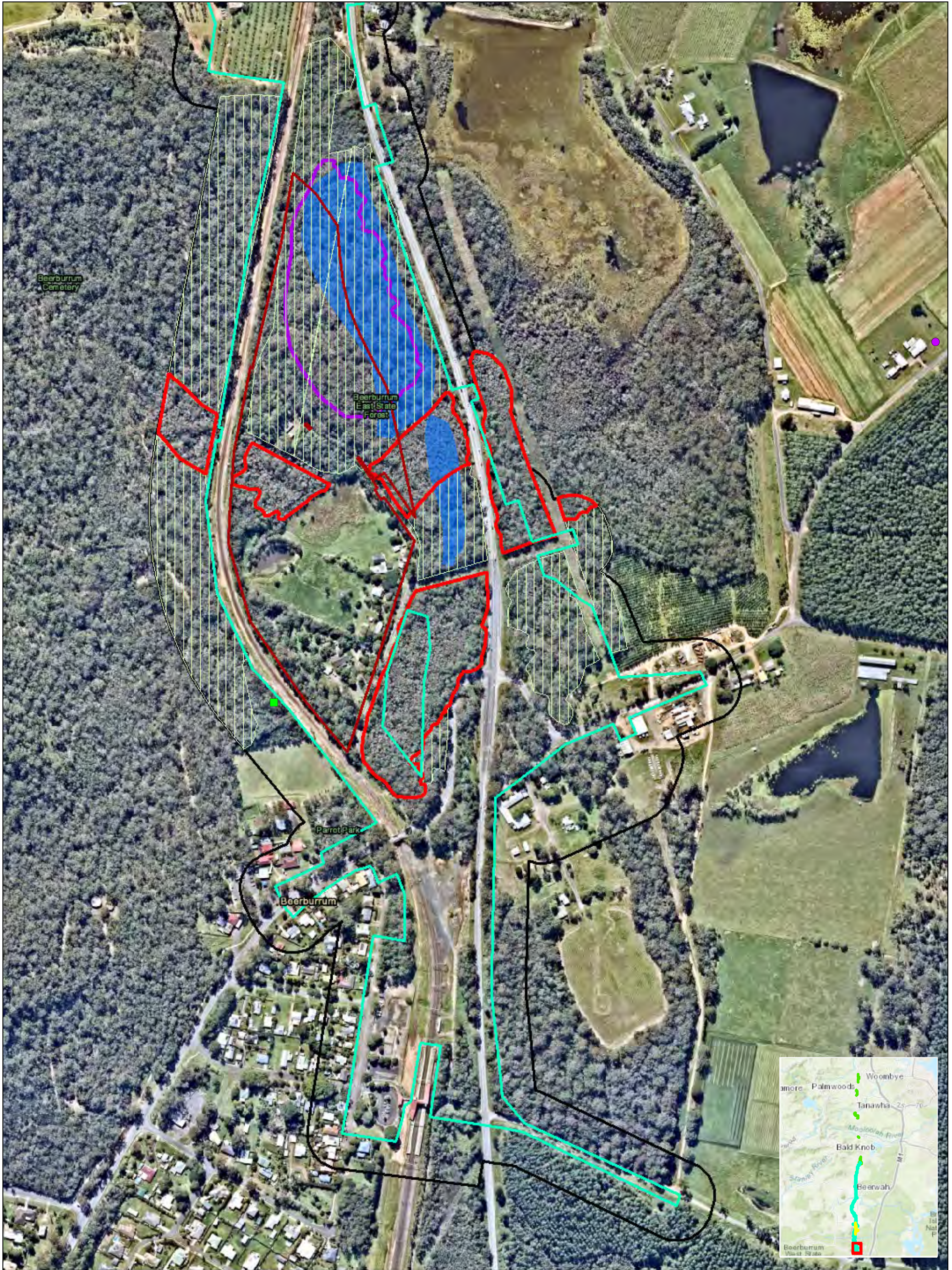
MNES Habitat within the Disturbance Footprint

Drawing No: 0589458s_B2NBio_G004_R6.mxd	Beerburum to Nambour Rail Upgrade
Date: 21/10/2021	Drawing Size: A4
Drawn By: VN	Reviewed By: EW
Coordinate System: GDA2020 MGA Zone 56	Client: Qld Department of Transport and Main Roads
0 50 100 150m	This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.



F4-13





Legend

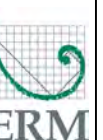
- | | | |
|----------------------------------|-----------------------------------|-------------------|
| EPBC Stage 1 Main Works Boundary | Migratory Birds Habitat | Swamp stringybark |
| No GO Area | White Throated Needletail Habitat | Koala |
| Assessment Boundary | | |
| Swamp Stringybark | | |
| Whipstick Wattle | | |

Data Source:
ESRI World Topographic Map, Nearmap 19th May 2021

MNES Habitat within the Disturbance Footprint

Drawing No: 0589458s_B2NBio_G004_R6.mxd		Beerburum to Nambour Rail Upgrade	
Date: 21/10/2021	Drawing Size: A4		
Drawn By: VN	Reviewed By: EW		Client: Qld Department of Transport and Main Roads
Coordinate System: GDA2020MGA Zone 56			
		<p>This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.</p>	


F4-14



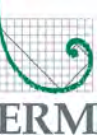


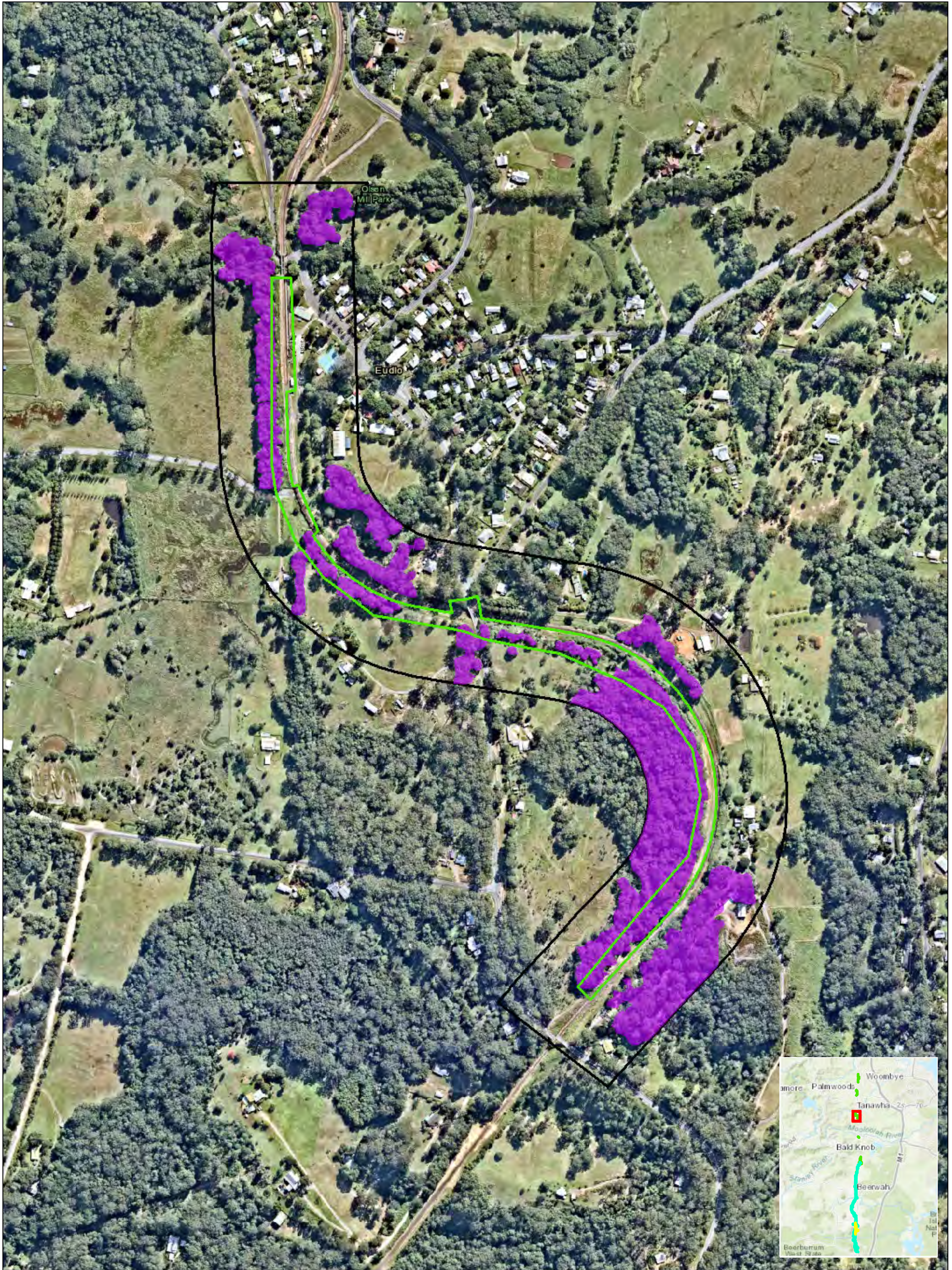
Legend
EPBC Stage 2 Boundary
Koala and Grey-headed Flying Fox Habitat
Assessment Boundary
Data Source:
ESRI World Topographic Map, Nearmap 19th May 2021

Koala and Grey-headed Flying-fox Habitat within the Disturbance Footprint

Drawing No: 0589458s_B2NBio_G003_R6.mxd		Beerburum to Nambour Rail Upgrade	
Date: 22/07/2021		Drawing Size: A4	
Drawn By: VN		Reviewed By: EW	
Client: Qld Department of Transport and Main Roads			
Coordinate System: GDA2020 MGA Zone 56			
0 50 100 150m			This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.

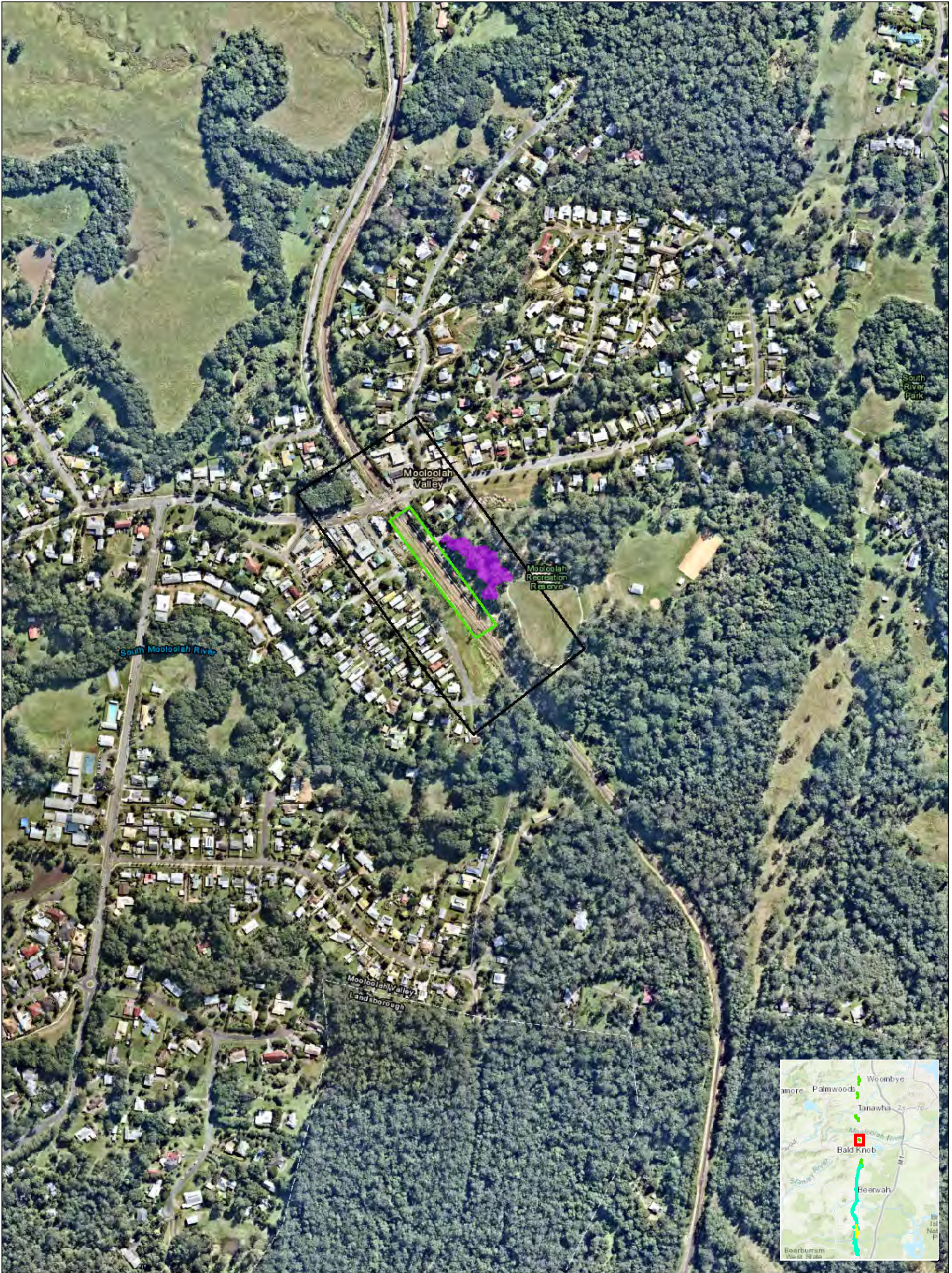
F3-1





Legend
EPBC Stage 2 Boundary
Koala and Grey-headed Flying Fox Habitat
Assessment Boundary
Data Source:
ESRI World Topographic Map, Nearmap 19th May 2021

Koala and Grey-headed Flying-fox Habitat within the Disturbance Footprint		F3-2
Drawing No: 0589458s_B2NBio_G003_R6.mxd	Beerburum to Nambour Rail Upgrade	
Date: 22/07/2021	Drawing Size: A4	Client: Qld Department of Transport and Main Roads
Drawn By: VN	Reviewed By: EW	
Coordinate System: GDA2020 MGA Zone 56		This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.
0 50 100 150m		



Legend

- EPBC Stage 2 Boundary
- Koala and Grey-headed Flying Fox Habitat
- Assessment Boundary

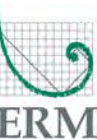
Data Source:
ESRI World Topographic Map, Nearmap 19th May 2021

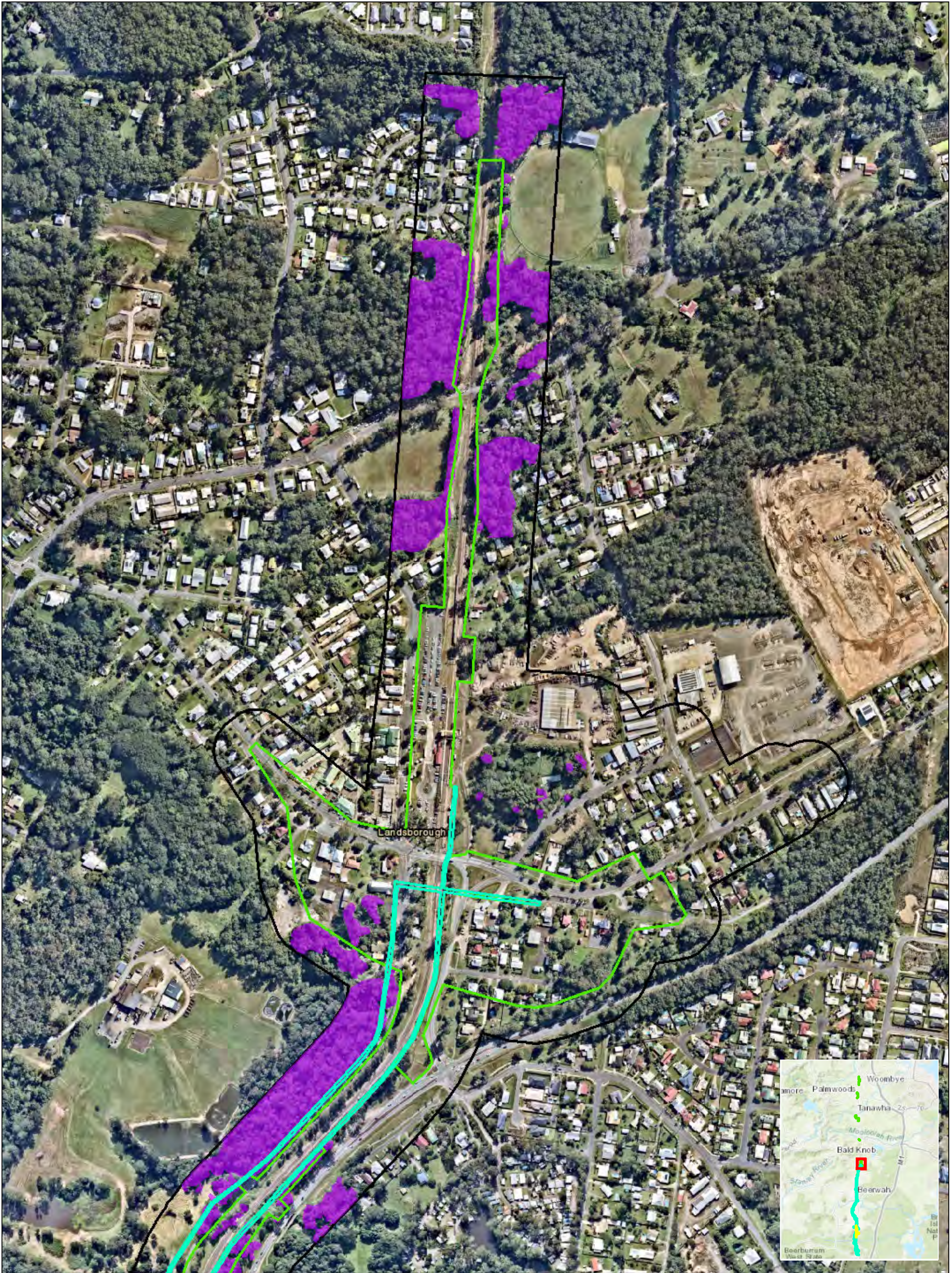
Koala and Grey-headed Flying-fox Habitat within the Disturbance Footprint

Drawing No: 0589458s_B2NBio_G003_R6.mxd	Beerburrum to Nambour Rail Upgrade
Date: 22/07/2021	Drawing Size: A4
Drawn By: VN	Reviewed By: EW
Client: Qld Department of Transport and Main Roads	
Coordinate System: GDA2020 MGA Zone 56	
0 50 100 150m	

This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.

F3-3





Legend

- EPBC Stage 1 Main Works Boundary
- EPBC Stage 2 Boundary
- Koala and Grey Headed Flying Fox Habitat
- Assessment Boundary

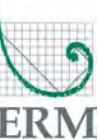
Data Source:
ESRI World Topographic Map, Nearmap 19th May 2021

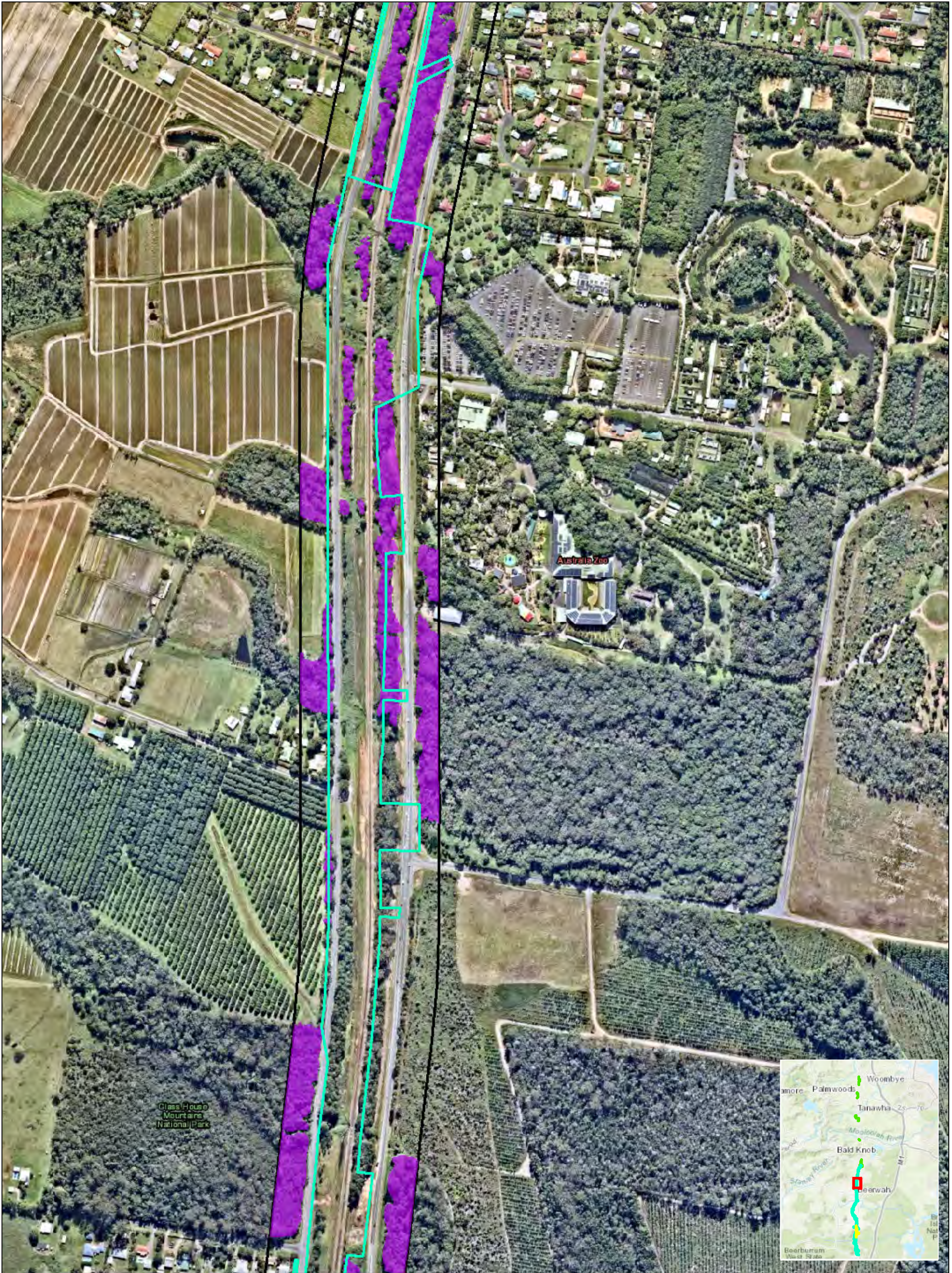
Koala and Grey-headed Flying-fox Habitat within the Disturbance Footprint

Drawing No: 0589458s_B2NBio_G003_R6.mxd	Beerburum to Nambour Rail Upgrade
Date: 22/07/2021	Drawing Size: A4
Drawn By: VN	Reviewed By: EW
Client: Qld Department of Transport and Main Roads	
Coordinate System: GDA2020 MGA Zone 56	
0 50 100 150m	

This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy

F3-4







Legend

- EPBC Stage 1 Main Works Boundary
- EPBC Stage 2 Boundary
- Koala and Grey Headed Flying Fox Habitat
- Assessment Boundary

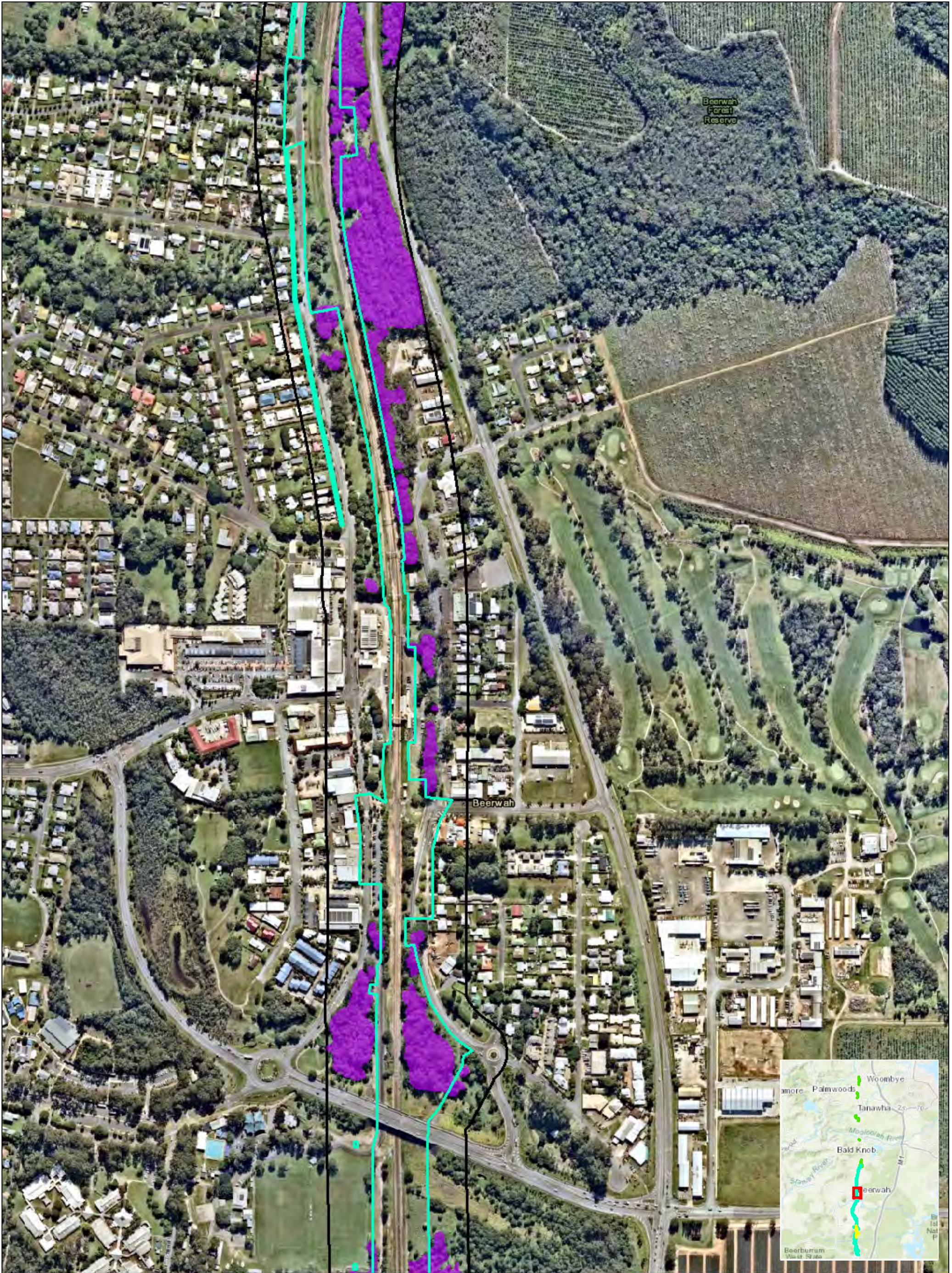
Data Source:
ESRI World Topographic Map, Nearmap 19th May 2021

Koala and Grey-headed Flying-fox Habitat within the Disturbance Footprint

Drawing No: 0589458s_B2NBio_G003_R6.mxd		Beerburum to Nambour Rail Upgrade	
Date: 22/07/2021		Drawing Size: A4	
Drawn By: VN		Reviewed By: EW	
Coordinate System: GDA2020 MGA Zone 56		Client: Qld Department of Transport and Main Roads	
		 This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.	

F3-6







Legend

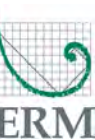
- EPBC Stage 1 Main Works Boundary
- Koala and Grey-headed Flying Fox Habitat
- Assessment Boundary

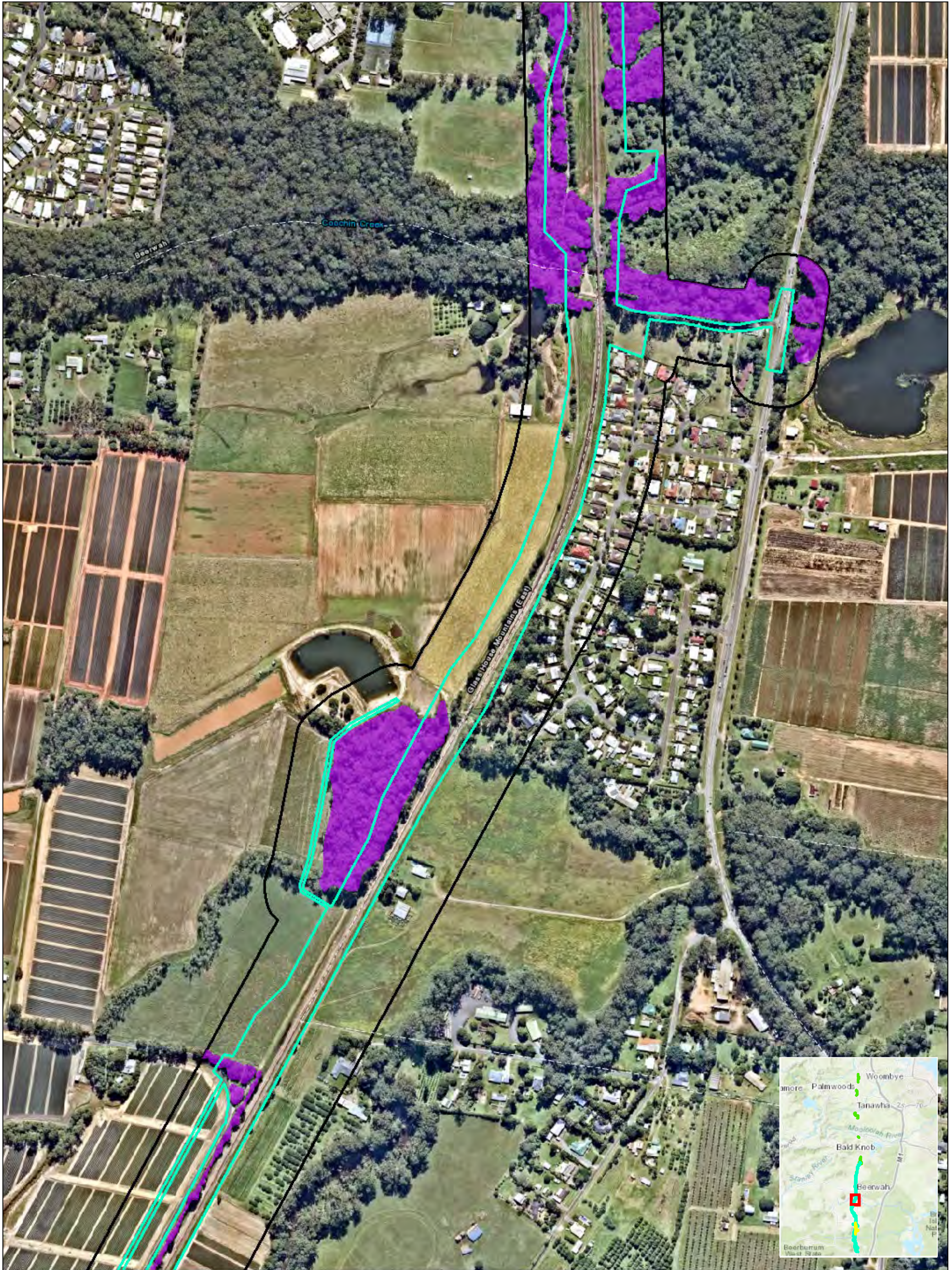
Data Source:
ESRI World Topographic Map, Nearmap 19th May 2021

Koala and Grey-headed Flying-fox Habitat within the Disturbance Footprint

Drawing No: 0589458s_B2NBio_G003_R6.mxd		Beerburum to Nambour Rail Upgrade	
Date: 22/07/2021		Drawing Size: A4	
Drawn By: VN		Reviewed By: EW	
Client: Old Department of Transport and Main Roads			
Coordinate System: GDA2020 MGA Zone 56			
		 <p>This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.</p>	

F3-7







Legend

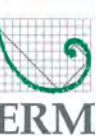
- EPBC Stage 1 Main Works Boundary
- Koala and Grey-headed Flying Fox Habitat
- Assessment Boundary

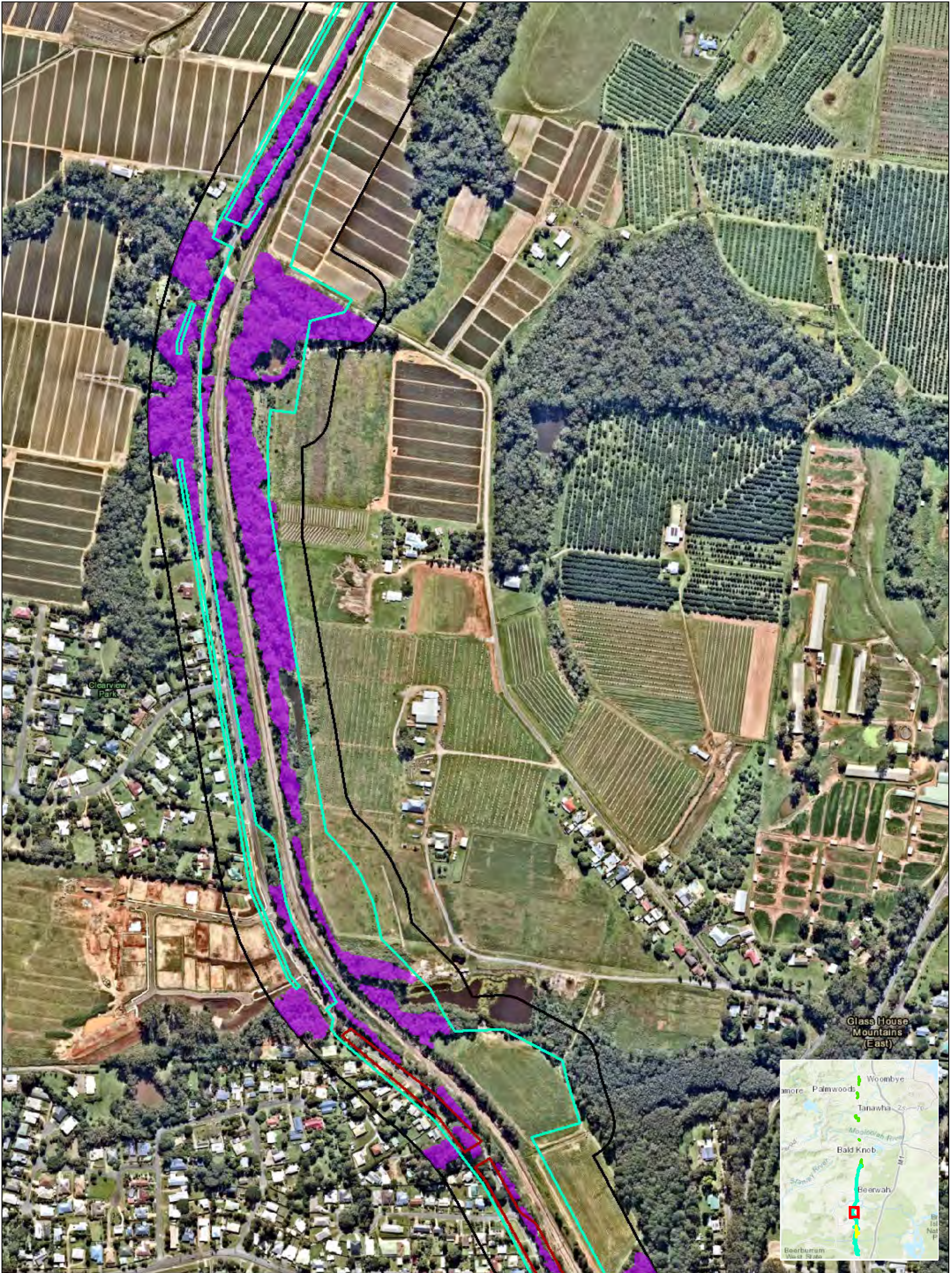
Data Source:
ESRI World Topographic Map, Nearmap 19th May 2021

Koala and Grey-headed Flying-fox Habitat within the Disturbance Footprint

Drawing No: 0589458s_B2NBio_G003_R6.mxd		Beerburum to Nambour Rail Upgrade	
Date: 22/07/2021	Drawing Size: A4		
Drawn By: VN	Reviewed By: EW		Client: Qld Department of Transport and Main Roads
Coordinate System: GDA2020 MGA Zone 56			
0 50 100 150m			This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.
			

F3-8





Legend

- EPBC Stage 1 Main Works Boundary
- No GO Area
- Koala and Grey-headed Flying Fox Habitat
- Assessment Boundary

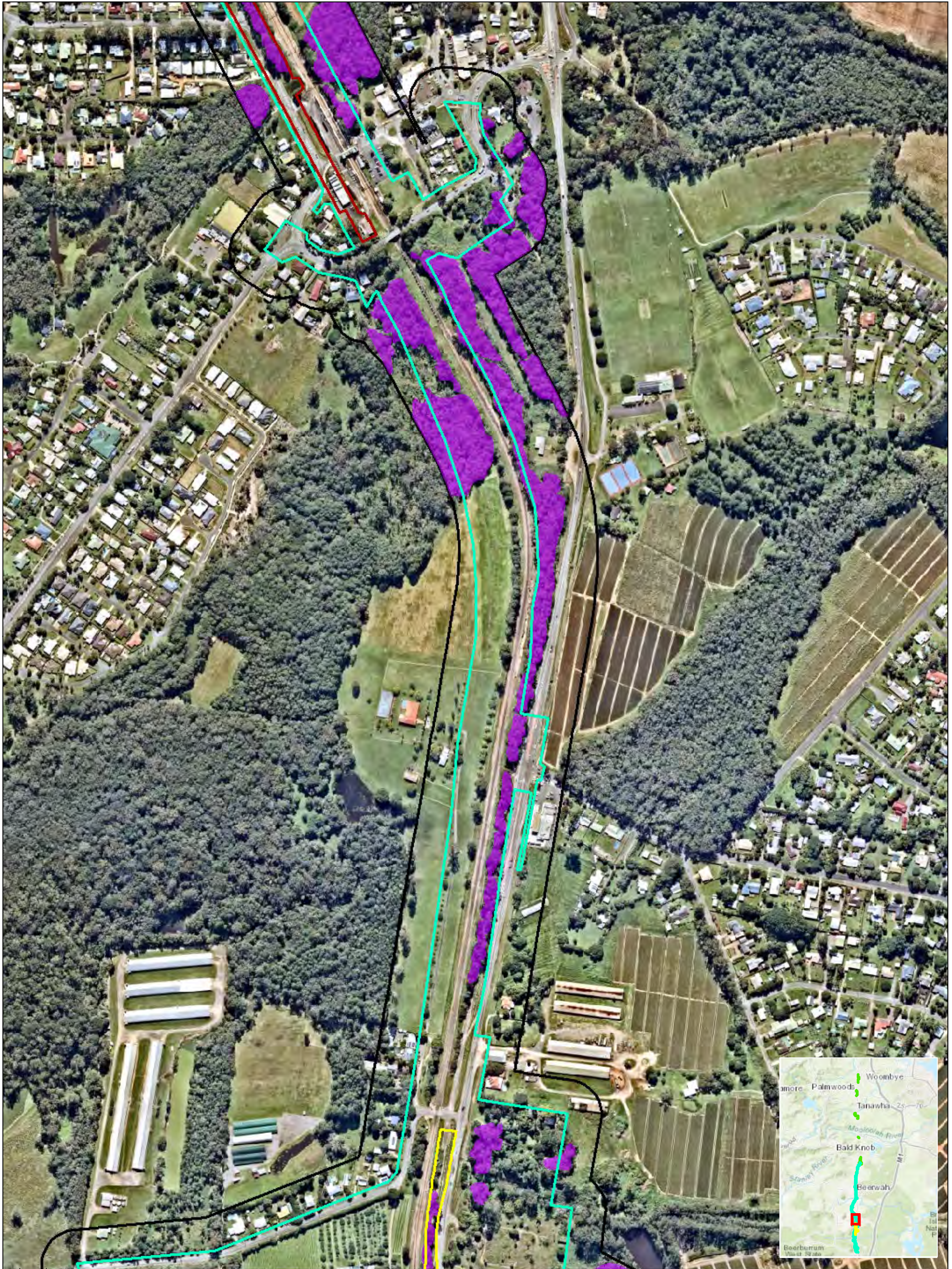
Data Source:
ESRI World Topographic Map, Nearmap 19th May 2021

Koala and Grey-headed Flying-fox Habitat within the Disturbance Footprint

Drawing No: 0589458s_B2NBio_G003_R6.mxd	Beerburum to Nambour Rail Upgrade
Date: 22/07/2021	Drawing Size: A4
Drawn By: VN	Reviewed By: EW
Client: Qld Department of Transport and Main Roads	
Coordinate System: GDA2020 MGA Zone 56	
0 50 100 150m	
N	
This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.	

F3-9



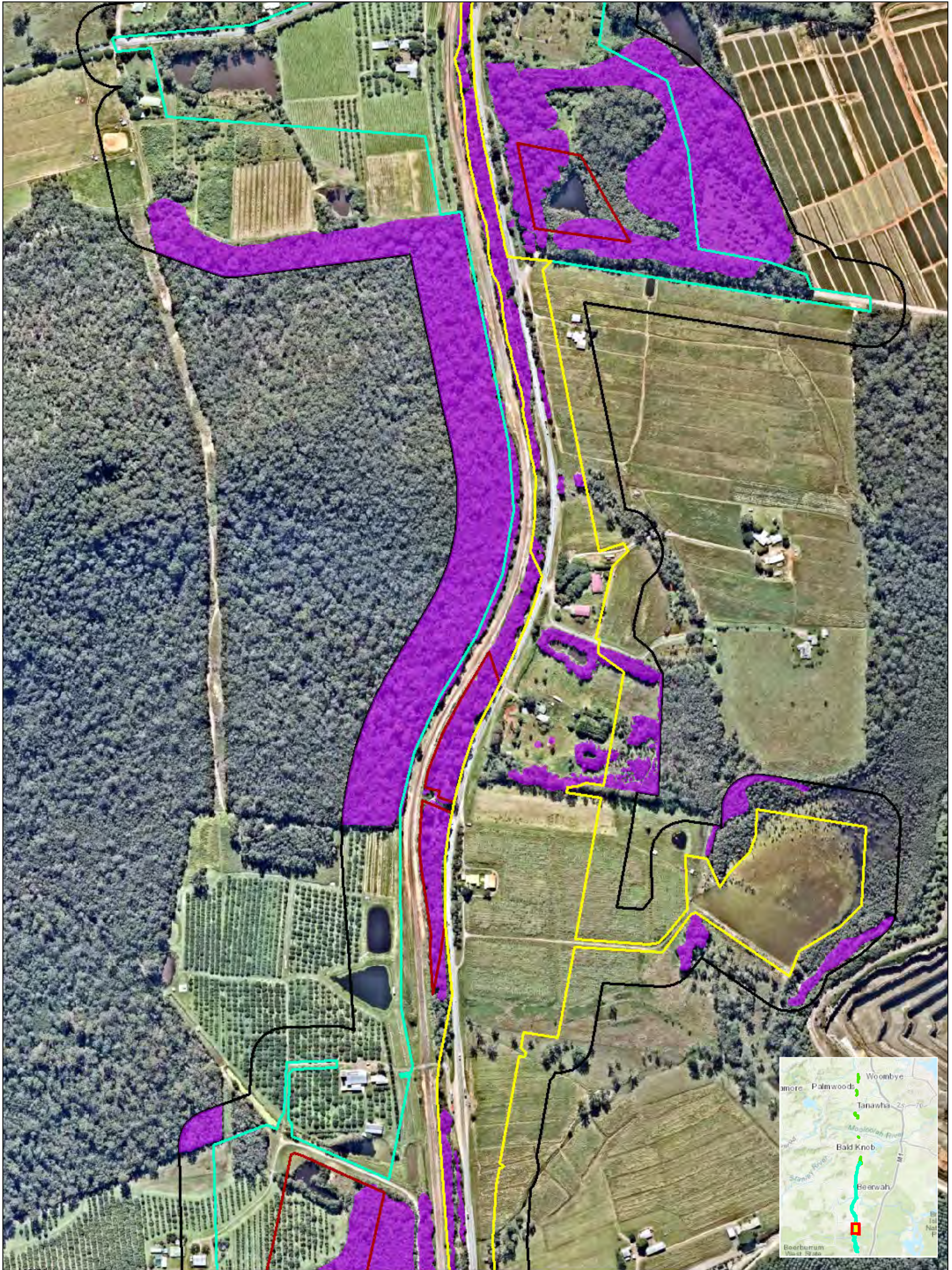


Legend

- EPBC Early Works Boundary
- EPBC Stage 1 Main Works Boundary
- No GO Area
- Koala and Grey Headed Flying Fox Habitat
- Assessment Boundary

Data Source:
ESRI World Topographic Map, Nearmap 19th May 2021

Koala and Grey-headed Flying-fox Habitat within the Disturbance Footprint		F3-10
Drawing No: 0589458s_B2NBio_G003_R6.mxd		Beerburrum to Nambour Rail Upgrade
Date: 22/07/2021	Drawing Size: A4	Client: Qld Department of Transport and Main Roads
Drawn By: VN	Reviewed By: EW	
Coordinate System: GDA2020 MGA Zone 56		<p>This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.</p>
0 50 100 150m		

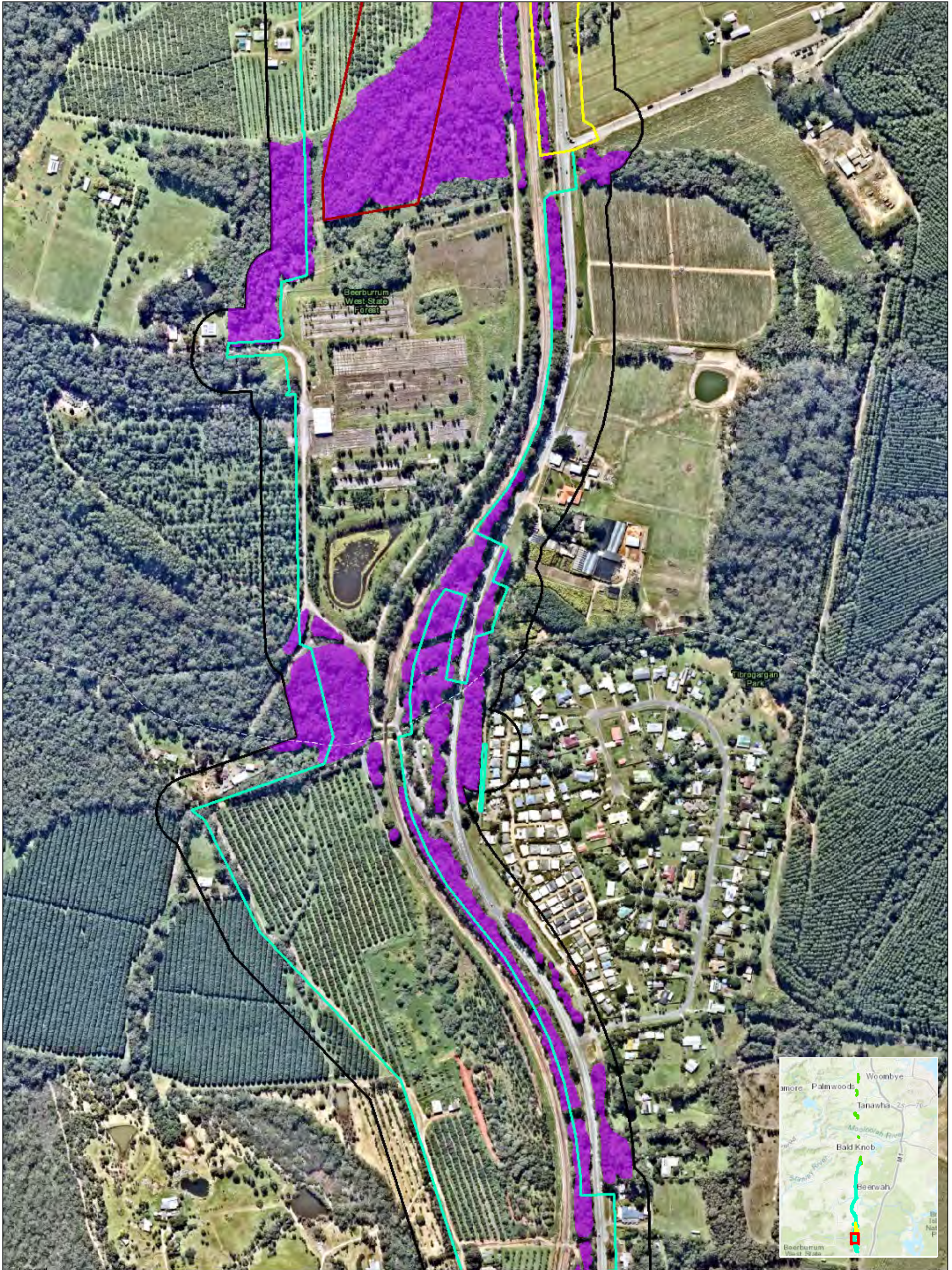


Legend

- EPBC Early Works Boundary
- EPBC Stage 1 Main Works Boundary
- No GO Area
- Koala and Grey Headed Flying Fox Habitat
- Assessment Boundary

Data Source:
ESRI World Topographic Map, Nearmap 19th May 2021

Koala and Grey-headed Flying-fox Habitat within the Disturbance Footprint		F3-11
Drawing No: 0589458s_B2NBio_G003_R6.mxd		Beerburum to Nambour Rail Upgrade
Date: 22/07/2021	Drawing Size: A4	Client: Qld Department of Transport and Main Roads
Drawn By: VN	Reviewed By: EW	
Coordinate System: GDA2020 MGA Zone 56		This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.
0 50 100 150m		



Legend

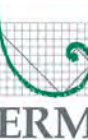
- EPBC Early Works Boundary
- EPBC Stage 1 Main Works Boundary
- No GO Area
- Koala and Grey-headed Flying Fox Habitat
- Assessment Boundary

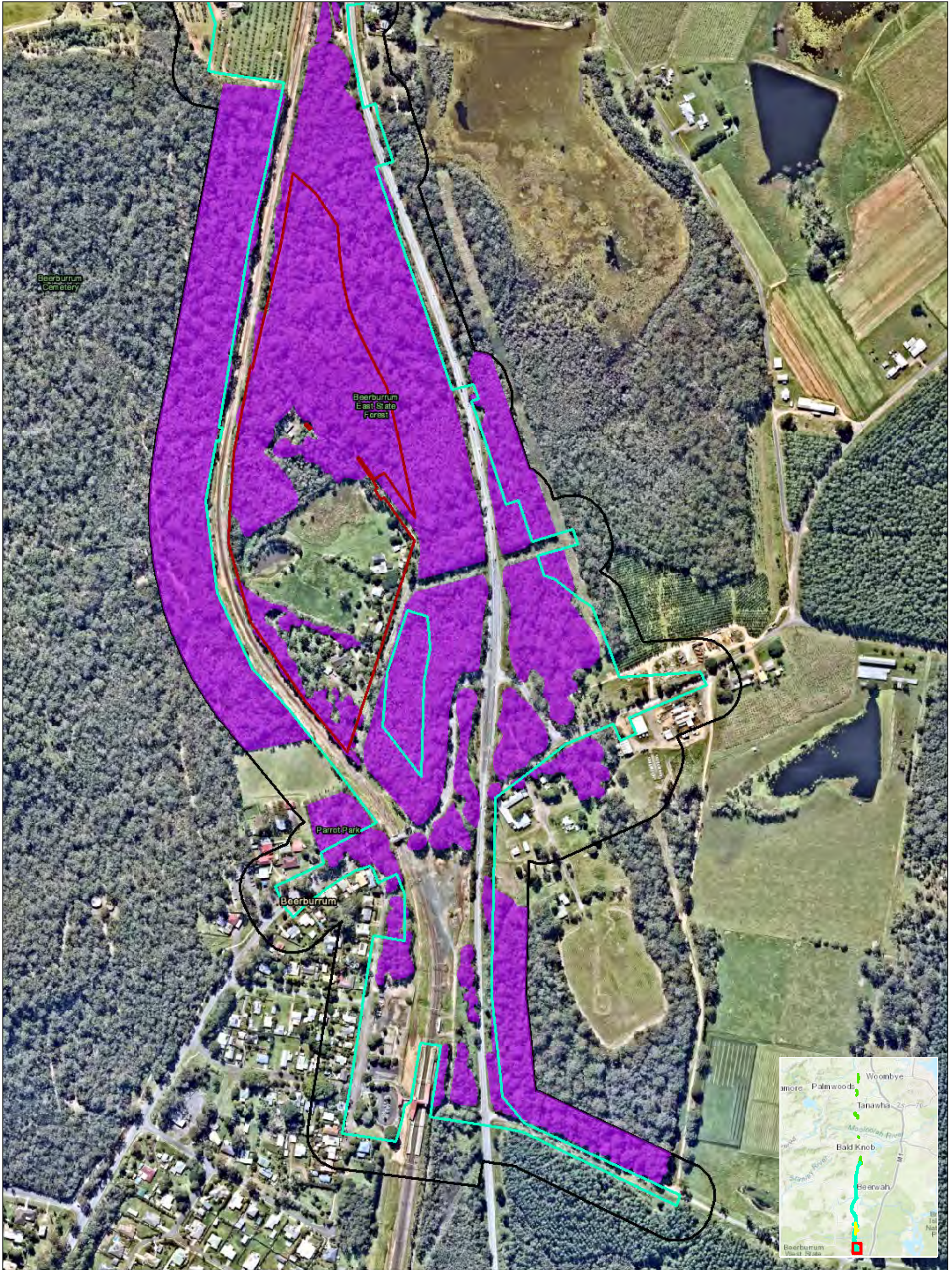
Data Source:
ESRI World Topographic Map, Nearmap 19th May 2021

Koala and Grey-headed Flying-fox Habitat within the Disturbance Footprint

Drawing No: 0589458s_B2NBio_G003_R6.mxd	Beerburrum to Nambour Rail Upgrade
Date: 22/07/2021	Drawing Size: A4
Drawn By: VN	Reviewed By: EW
Client: Qld Department of Transport and Main Roads	
Coordinate System: GDA2020 MGA Zone 56	
0 50 100 150m	
N	
This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.	

F3-12







Legend

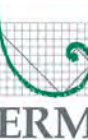
- EPBC Stage 1 Main Works Boundary
- No GO Area
- Koala and Grey Headed Flying Fox Habitat
- Assessment Boundary

Data Source:
ESRI World Topographic Map, Nearmap 19th May 2021

Koala and Grey-headed Flying-fox Habitat within the Disturbance Footprint

Drawing No: 0589458s_B2NBio_G003_R6.mxd		Beerburum to Nambour Rail Upgrade	
Date: 22/07/2021		Drawing Size: A4	
Drawn By: VN		Reviewed By: EW	
Coordinate System: GDA2020 MGA Zone 56		Client: Qld Department of Transport and Main Roads	
		 <div>This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.</div>	

F3-13



APPENDIX E SURVEY LOCATIONS



Legend

EPBC Stage 2 Boundary	Bird Survey (BUS)
Survey Point	Camera trap
	Spotlighting Survey
	Habitat Assessment

Data Source:
ESRI World Topographic Map, ESRI World Imagery Sep 2020

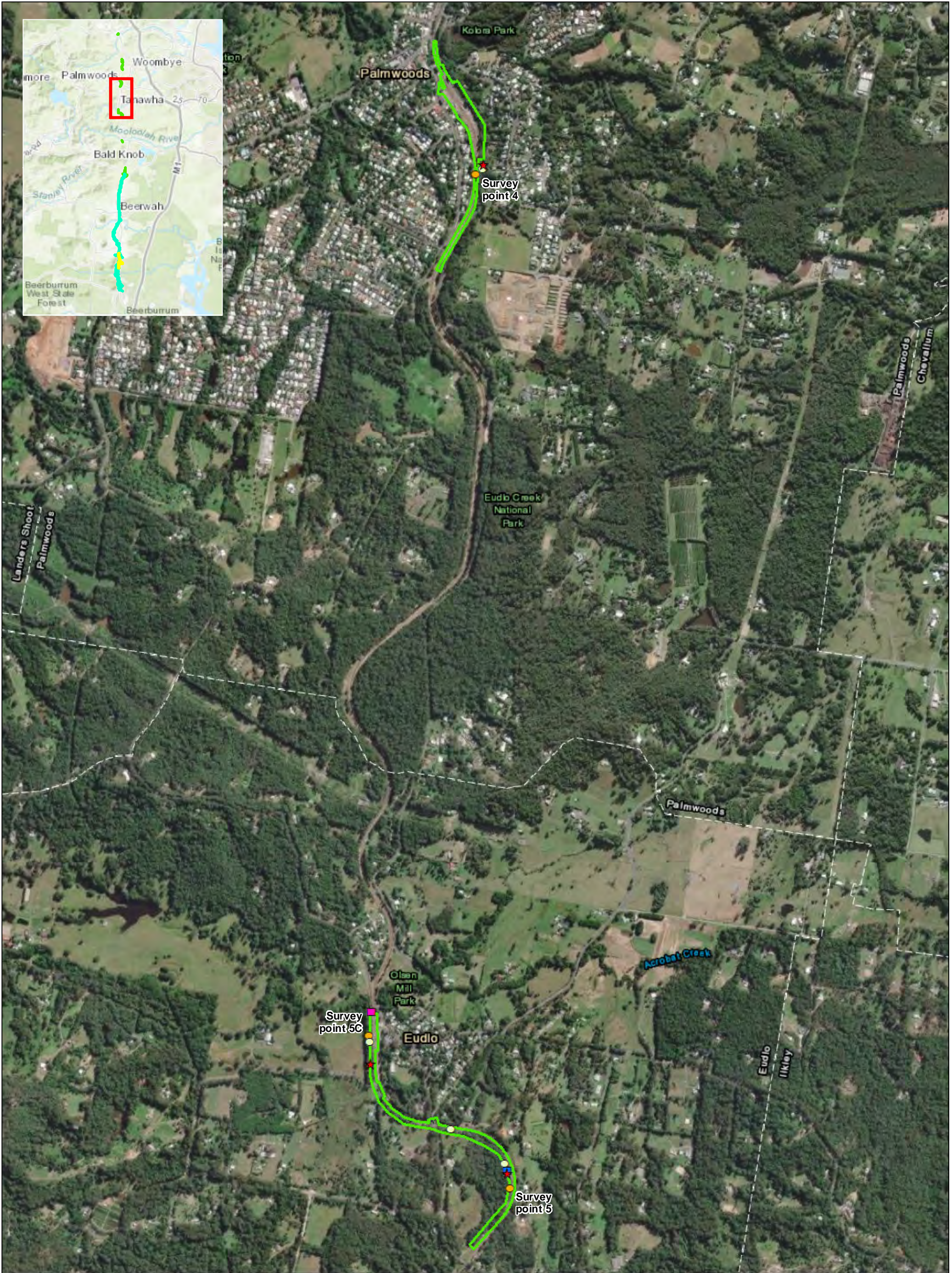
Survey Locations	
Drawing No: 0589458s_B2NBio_G002_R5.mxd	Beerburum to Nambour Rail Upgrade
Date: 17/11/2021	Drawing Size: A4
Drawn By: VN	Reviewed By: EW
Client: Qld Department of Transport and Main Roads	
Coordinate System: GDA2020 MGA Zone 56	
0 100 200 300m	



This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.

F2-1

ERM

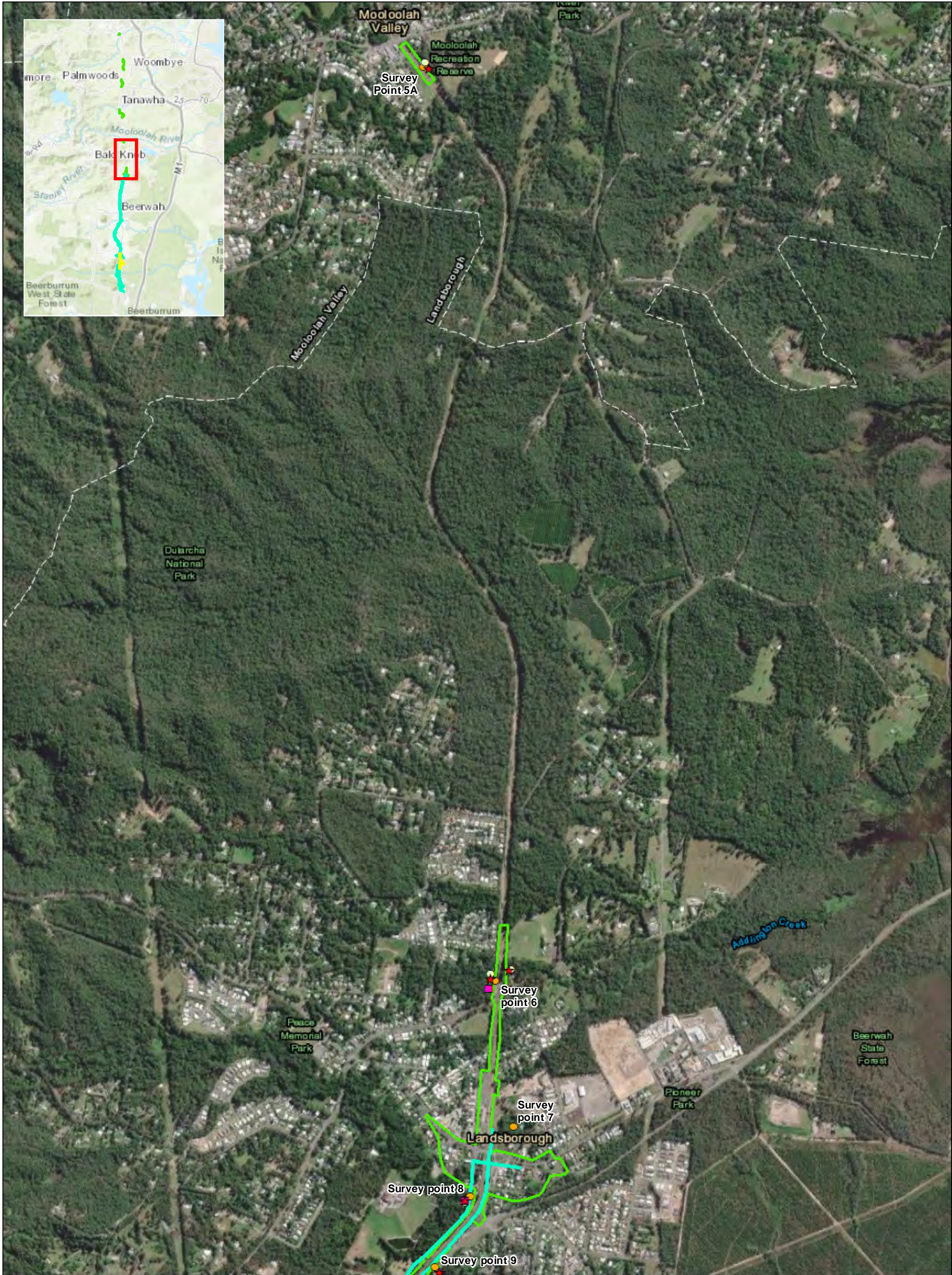


Legend

- EPBC Stage 2 Boundary
- Survey Point
- Bird Survey (BUS)
- Camera trap
- Spotlighting Survey
- Habitat Assessment

Data Source:
ESRI World Topographic Map, ESRI World Imagery Sep 2020

Survey Locations		F2-2
Drawing No: 0589458s_B2NBio_G002_R5.mxd	Beerburum to Nambour Rail Upgrade	
Date: 17/11/2021	Drawing Size: A4	
Drawn By: VN	Reviewed By: EW	
Client: Qld Department of Transport and Main Roads		<p>This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.</p>
Coordinate System: GDA2020 MGA Zone 56		
<div><div>0 100 200 300m</div><div></div></div>		



- Legend
- EPBC Stage 1 Main Works Boundary
 - EPBC Stage 2 Boundary
 - Survey Point
 - Bird Survey (BUS)
 - Camera trap
 - Spotlighting Survey
 - Habitat Assessment

Data Source:
ESRI World Topographic Map, ESRI World Imagery Sep 2020

Survey Locations

Drawing No: 0589458s_B2NBio_G002_R5.mxd	Beerburum to Nambour Rail Upgrade	
Date: 17/11/2021	Drawing Size: A4	
Drawn By: VN	Reviewed By: EW	Client: Qld Department of Transport and Main Roads
Coordinate System: GDA2020 MGA Zone 56		
0 100 200 300m	N	This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.

F2-3





- Legend
- EPBC Stage 1 Main Works Boundary
 - EPBC Stage 2 Boundary
 - Survey Point
 - Bird Survey (BUS)
 - Camera trap
 - Spotlighting Survey
 - Habitat Assessment

Data Source:
ESRI World Topographic Map, ESRI World Imagery Sep 2020

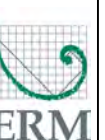
Survey Locations

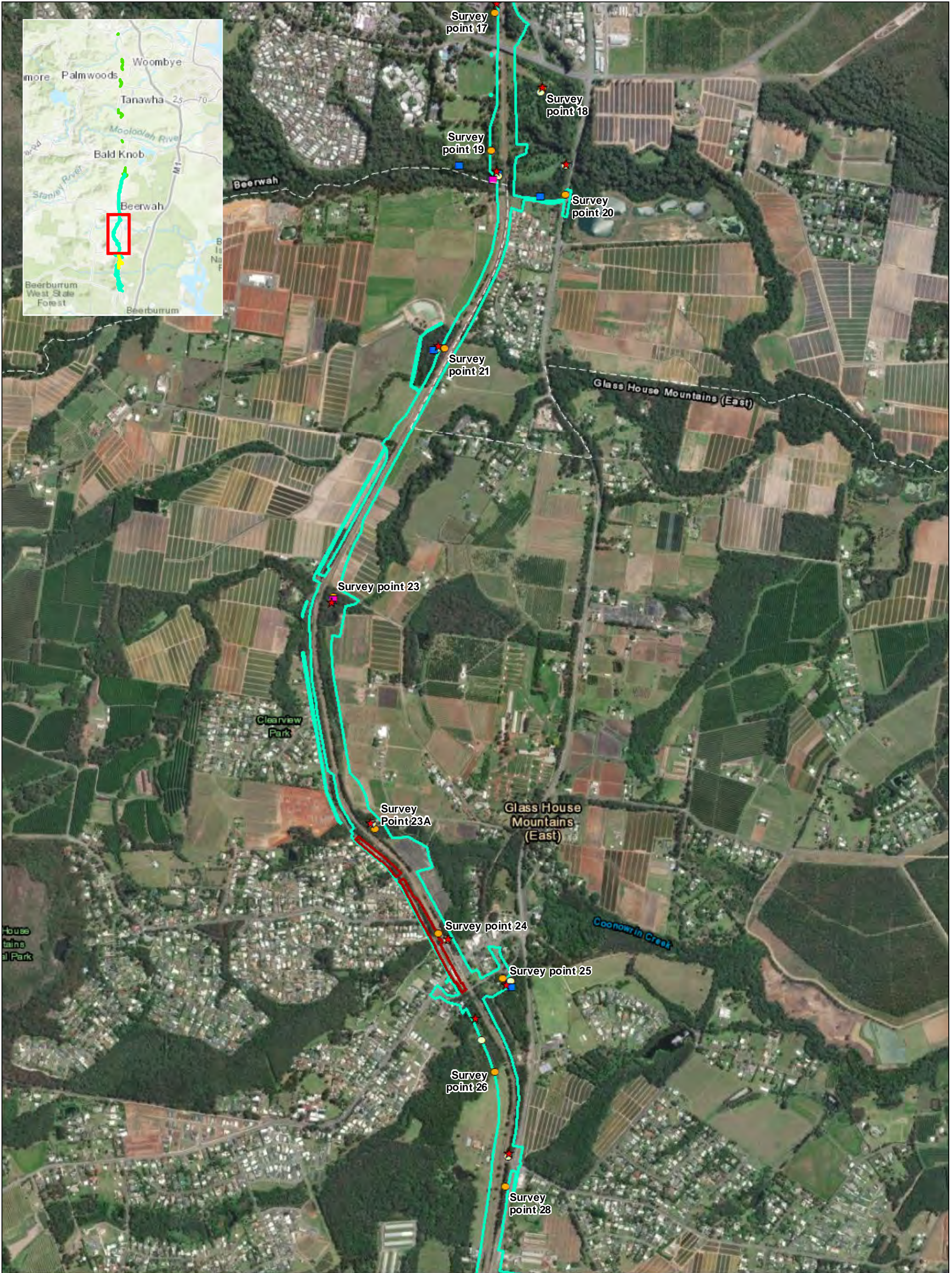
Drawing No: 0589458s_B2NBio_G002_R5.mxd	Beerburum to Nambour Rail Upgrade
Date: 17/11/2021	Drawing Size: A4
Drawn By: VN	Reviewed By: EW
Client: Qld Department of Transport and Main Roads	
Coordinate System: GDA2020 MGA Zone 56	
0 100 200 300m	





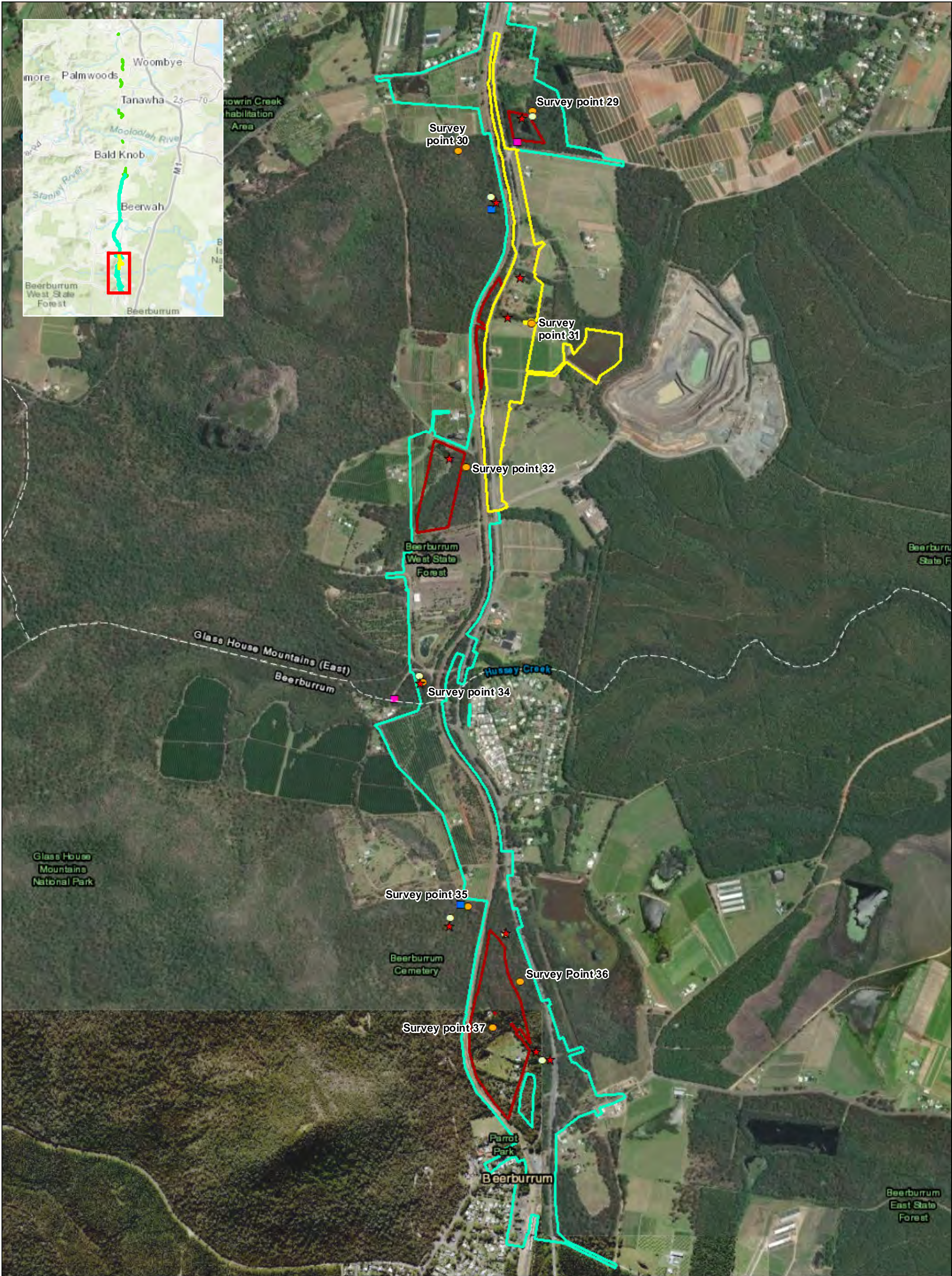
This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.

F2-4





Legend		Survey Locations		F2-5
 EPBC Stage 1 Main Works Boundary	 Bird Survey (BUS)	Drawing No: 0589458s_B2NBio_G002_R5.mxd	Beerburum to Nambour Rail Upgrade	
 No GO Area	 Camera trap	Date: 17/11/2021	Drawing Size: A4	
 Survey Point	 Spotlighting Survey	Drawn By: VN	Reviewed By: EW	
 Habitat Assessment		Client: Qld Department of Transport and Main Roads		
Data Source: ESRI World Topographic Map, ESRI World Imagery Sep 2020		Coordinate System: GDA2020 MGA Zone 56		
		<div><div><div>0100200300m</div><div></div></div><div>This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.</div></div>		



- Legend**
- EPBC Early Works Boundary
 - EPBC Stage 1 Main Works Boundary
 - No GO Area
 - Survey Point
 - Bird Survey (BUS)
 - Camera trap
 - Spotlighting Survey
 - Habitat Assessment

Data Source:
ESRI World Topographic Map, ESRI World Imagery Sep 2020

Survey Locations

Drawing No: 0589458s_B2NBio_G002_R5.mxd	Beerburum to Nambour Rail Upgrade	
Date: 17/11/2021	Drawing Size: A4	
Drawn By: VN	Reviewed By: EW	Client: Qld Department of Transport and Main Roads
Coordinate System: GDA2020 MGA Zone 56		
0 100 200 300m		This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.

F2-6



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