

2020 ECOLOGICAL SURVEY REPORT

PREMIUM ECOTOURISM PRODUCTS, COOLOOLA GREAT WALK

Prepared for
Department of Environment and Science



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Signed on behalf of

Date: 08/09/2020

Biodiversity Assessment and Management Pty Ltd



Director

2020 ECOLOGICAL SURVEY REPORT

Premium Ecotourism Products, Cooloola Great Walk

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Table of Terms and Abbreviations

BAAM	Biodiversity Assessment and Management Pty Ltd
BAMM	Biodiversity Assessment Mapping Methodology
DES	Queensland Department of Environment and Science
DAWE	Commonwealth Department of Agriculture, Water and the Environment
EPBC Act	Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i>
EVNT	Species listed as endangered, vulnerable or near threatened under the EPBC Act or NC Act
MNES	Matters of National Environmental Significance
MSES	Matters of State Environmental Significance
NC Act	Queensland <i>Nature Conservation Act 1992</i>
QPWS	Queensland Parks and Wildlife Service
RE	Regional Ecosystem
TEC	Threatened Ecological Community
VM Act	Queensland <i>Vegetation management Act 1999</i>

1.0 INTRODUCTION

The Queensland Government seeks to raise the profile of the State's protected area estate by creating iconic, sustainable ecotourism experiences that showcase landscapes and nature-based experiences. This will include partnering with the private sector to deliver new tourism infrastructure in regional Queensland, including the Cooloola Great Walk. This trail is envisioned to feature multiple nodes stemming from the existing trail permitting diverse styles of eco-accommodation to complement existing (and continuing) State-owned campsites on the trail.

Following the completion of an initial desktop review of expected environmental opportunities and constraints to premium ecotourism products within the vicinity of the Cooloola Great Walk (BAAM, 2019), the Queensland Government, through the Department of Environment and Science (DES), commissioned a baseline ecological survey to verify the on-ground values in the vicinity of initially proposed eco-accommodation sites, as selected by two proponents submitting ecotourism proposals. Based on the results of this baseline ecological survey (completed in July 2019), a number of "preferred" sites (from an ecological perspective) for each general location were identified/recommended, including some alternative sites to those identified by the proponents (BAAM, 2020).

Following consideration of the findings of the 2019 baseline ecological survey, and other design constraints and opportunities, DES commissioned subsequent site investigations and baseline surveys to verify ecological values within five revised site locations selected by the preferred proponent:

- near the Noosa River and existing camp sites ("Site N");
- near the existing Litoria walkers' camp ("Site L");
- south of the existing Kauri walkers' camp ("Site K");
- near Poona Lake ("Site P"); and
- Double Island Point ("Site D1").

These locations are included within the "Surveyed Areas" shown on **Figures 1.1a to 1.1e**.

A detailed ecological survey undertaken in March 2020 determined there was the potential for significant impacts upon important ecological values to occur at the revised locations without the implementation of appropriate measures of avoidance and mitigation. In particular, there was the potential for direct impacts upon threatened ecological communities, threatened flora species, known habitat for threatened fauna species and/or "notable habitat trees"¹ within the boundaries of the camp site envelopes investigated. Site N was also reviewed due to its location relative to existing camping areas. Consequently, additional site investigations were undertaken in May and June 2020 in consultation with the preferred proponent to identify the locations of specific values and constraints, and determine indicative campsite areas and access alignments to inform final project design.

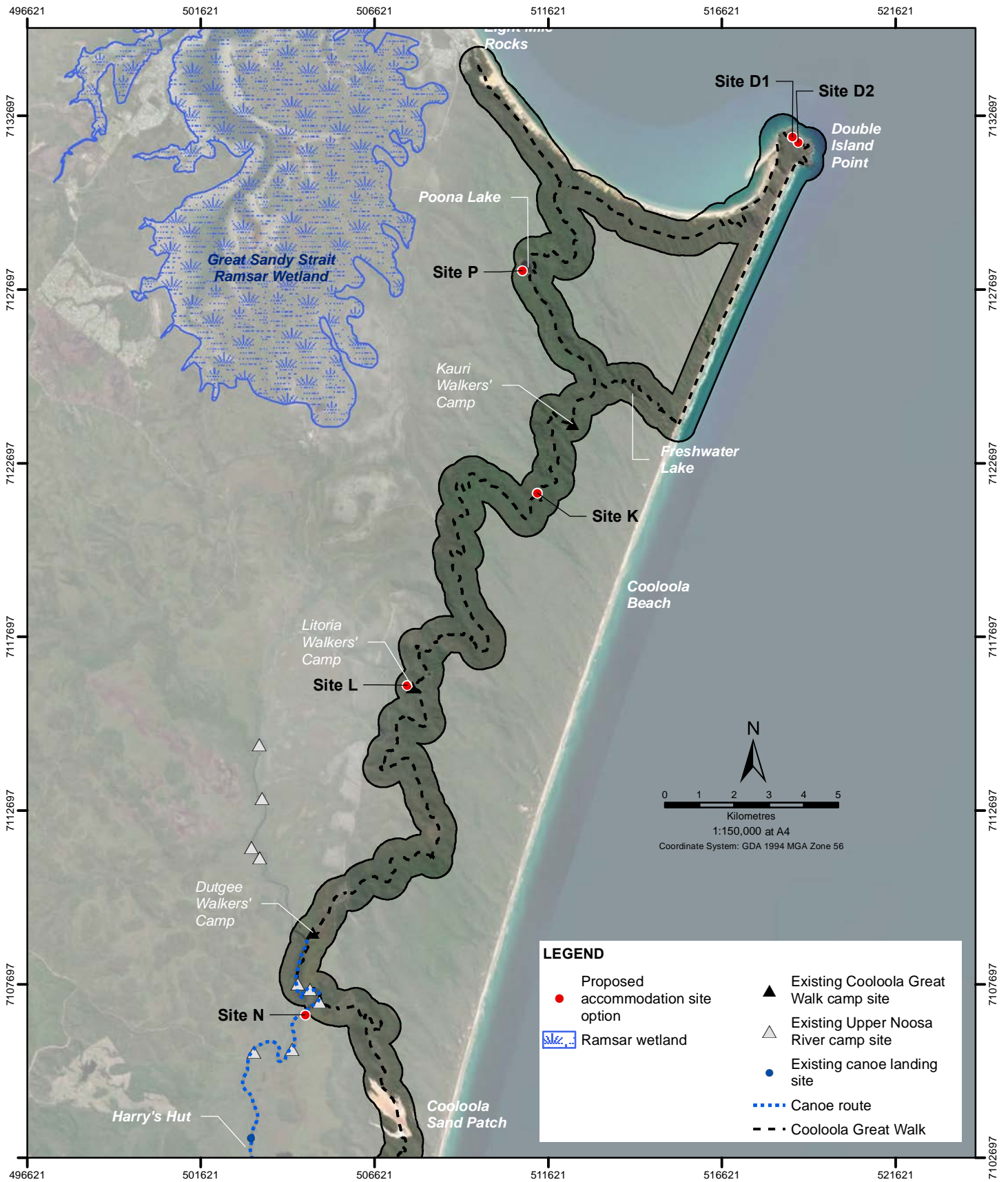
A second site at Double Island Point (Site "D2") was also investigated for use by representatives of the Kabi Kabi people, recognised as the traditional owners of the land over which the Great Sandy National Park has been designated and on which the Cooloola Great Walk and associated accommodation sites are situated.

The "Proposed Lease Areas" within which the accommodation sites are proposed to be located are shown on **Figures 1.1a to 1.1e**.²

This report presents the data collected during the March 2020, May and June 2020 surveys, the findings of an assessment of the significance of potential impacts to matters of national and state environmental significance, and other noteworthy ecological values, resulting from the development of each proposed accommodation site, and recommendations for reducing impacts to acceptable levels in accordance with Commonwealth and State legislation and guidelines.

¹ For the purposes of this assessment, "notable habitat trees" are defined as native trees with a diameter at breast height of 30cm or greater, and/or native trees of any size with hollows or signs of fauna use (e.g. scratches, nests).

² At the time of preparing this report, a final lease area for Site N had yet to be determined. Accordingly, this report assesses two options for Site N, hereafter referred to as Site N (option 1) and Site N (option 2).



Data Sources:
 Ramsar sites - Queensland
 Published 25/11/2002
 State of Queensland (Department of Environment and Science) 2020

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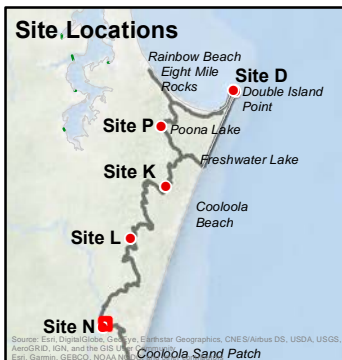
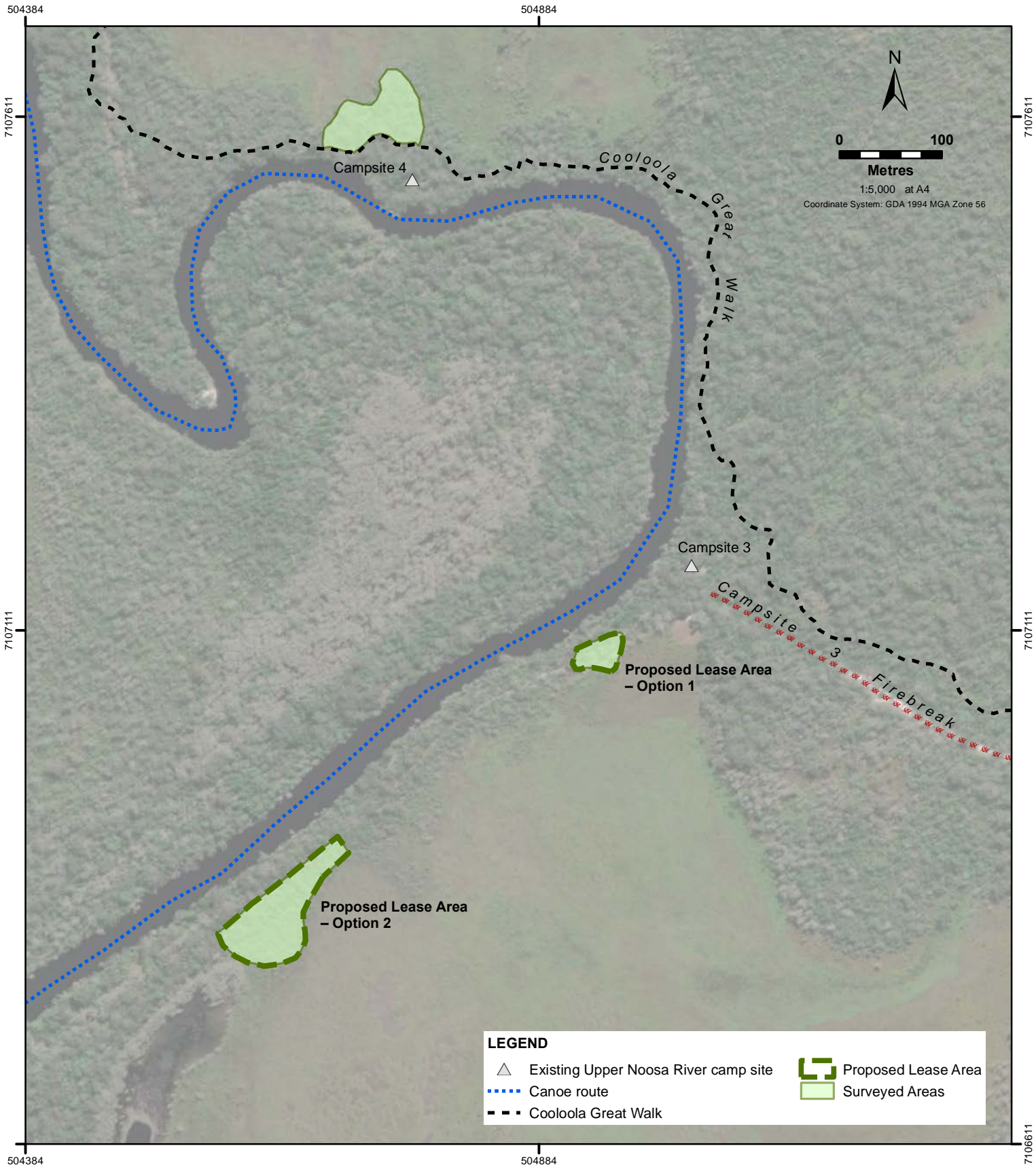
Figure: 1.1

Title: Accommodation Site Locations

Project: Premium Ecotourism Products – Cooloolo Great Walk

Client: Department of Environment and Science





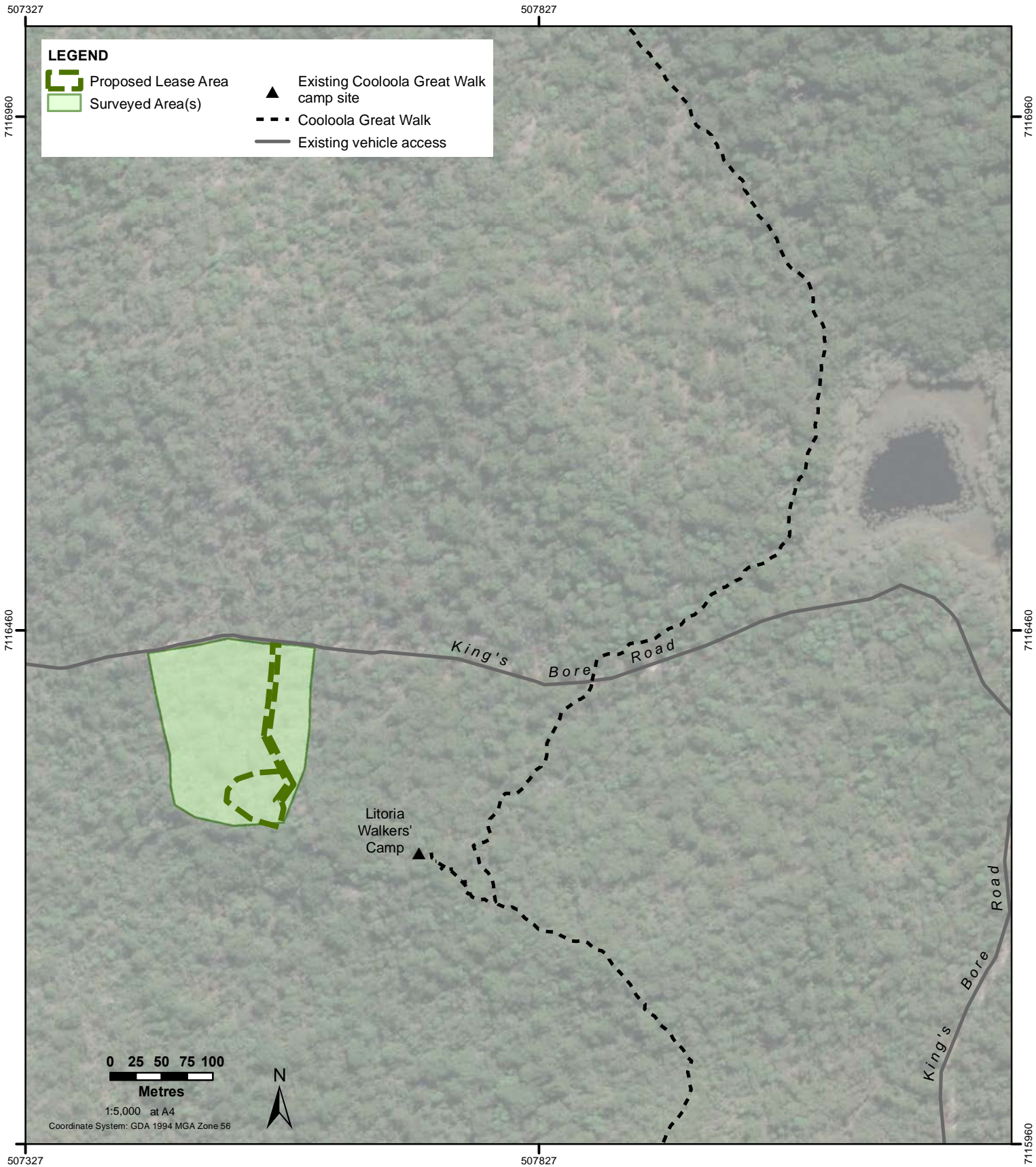
Data Sources:
Surveyed Areas
BAAM - March 2020, May 2020, June 2020

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Drawn By: KM Reviewed by: JA Date: 3/09/2020

Figure: 1.1a
Title: Accommodation Site Locations - Site N
Project: Premium Ecotourism Products - Cooloola Great Walk
Client: Department of Environment and Science





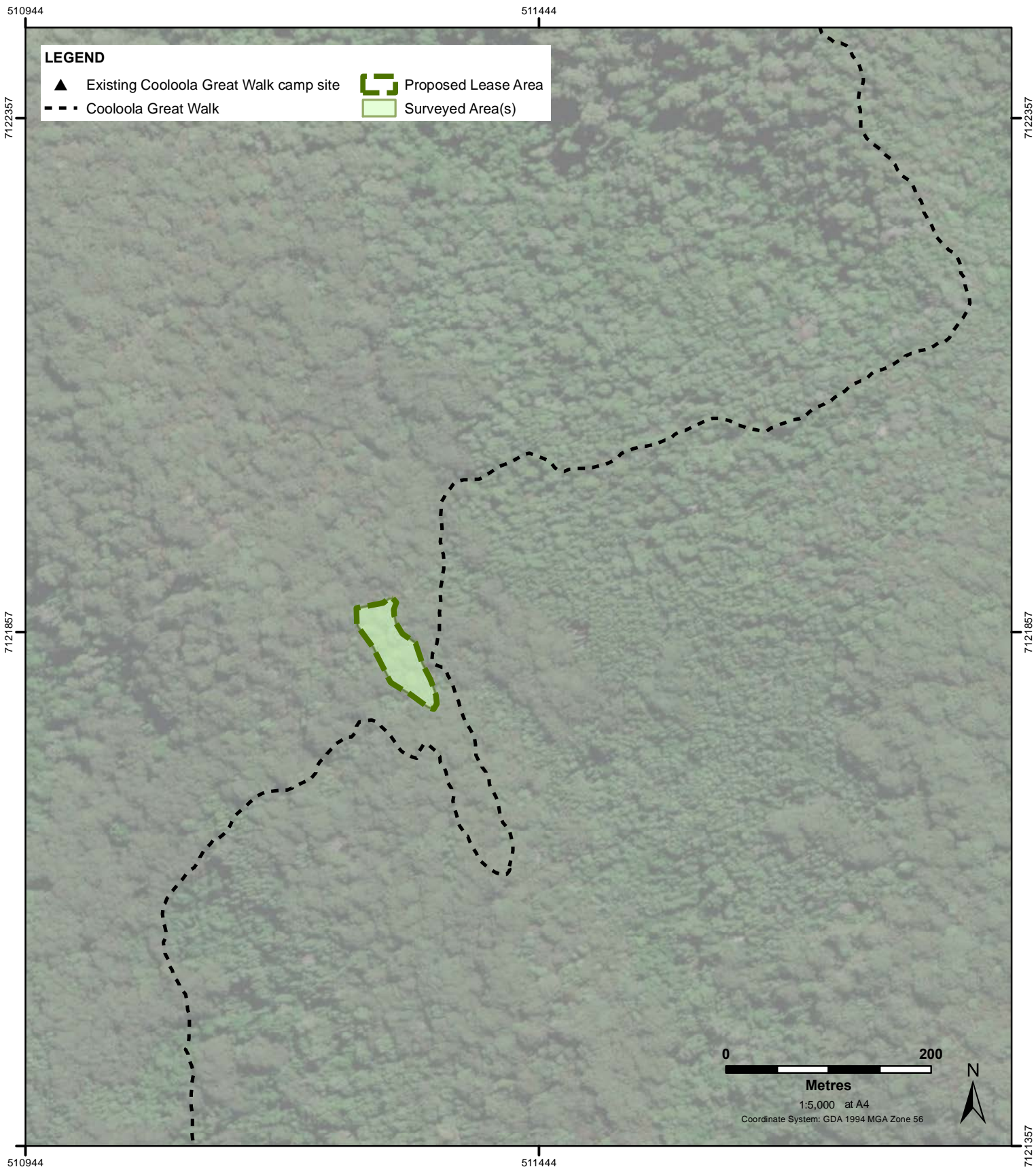
Data Sources:
 Surveyed Areas
 BAAM - March 2020, May 2020, June 2020

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Figure: 1.1b
Title: Accommodation Site Locations - Site L
Project: Premium Ecotourism Products – Cooloolo Great Walk
Client: Department of Environment and Science





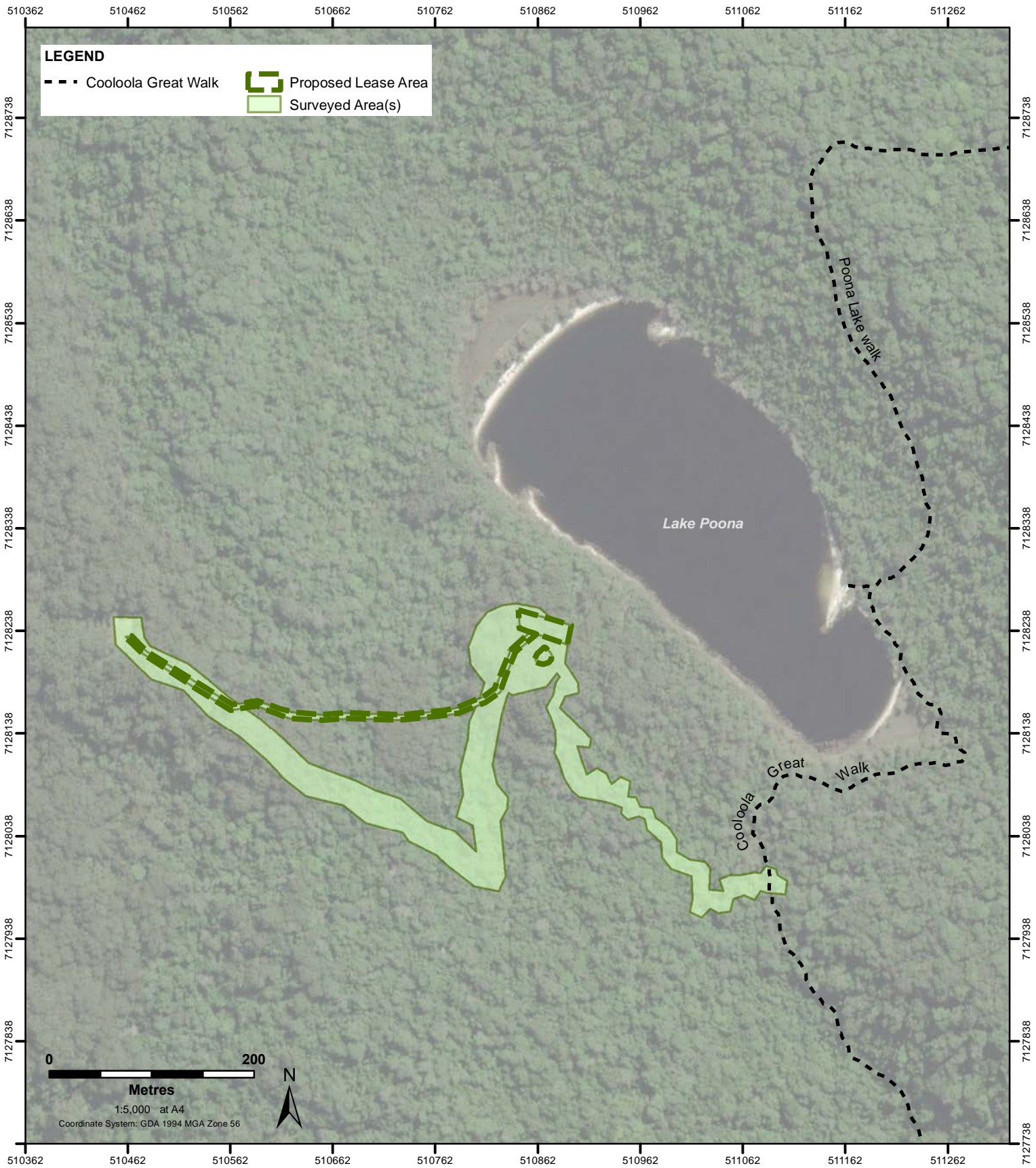
Data Sources:
Surveyed Areas
BAAM - March 2020, May 2020, June 2020

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Figure: 1.1c
Title: Accommodation Site Locations - Site K
Project: Premium Ecotourism Products – Cooloola Great Walk
Client: Department of Environment and Science





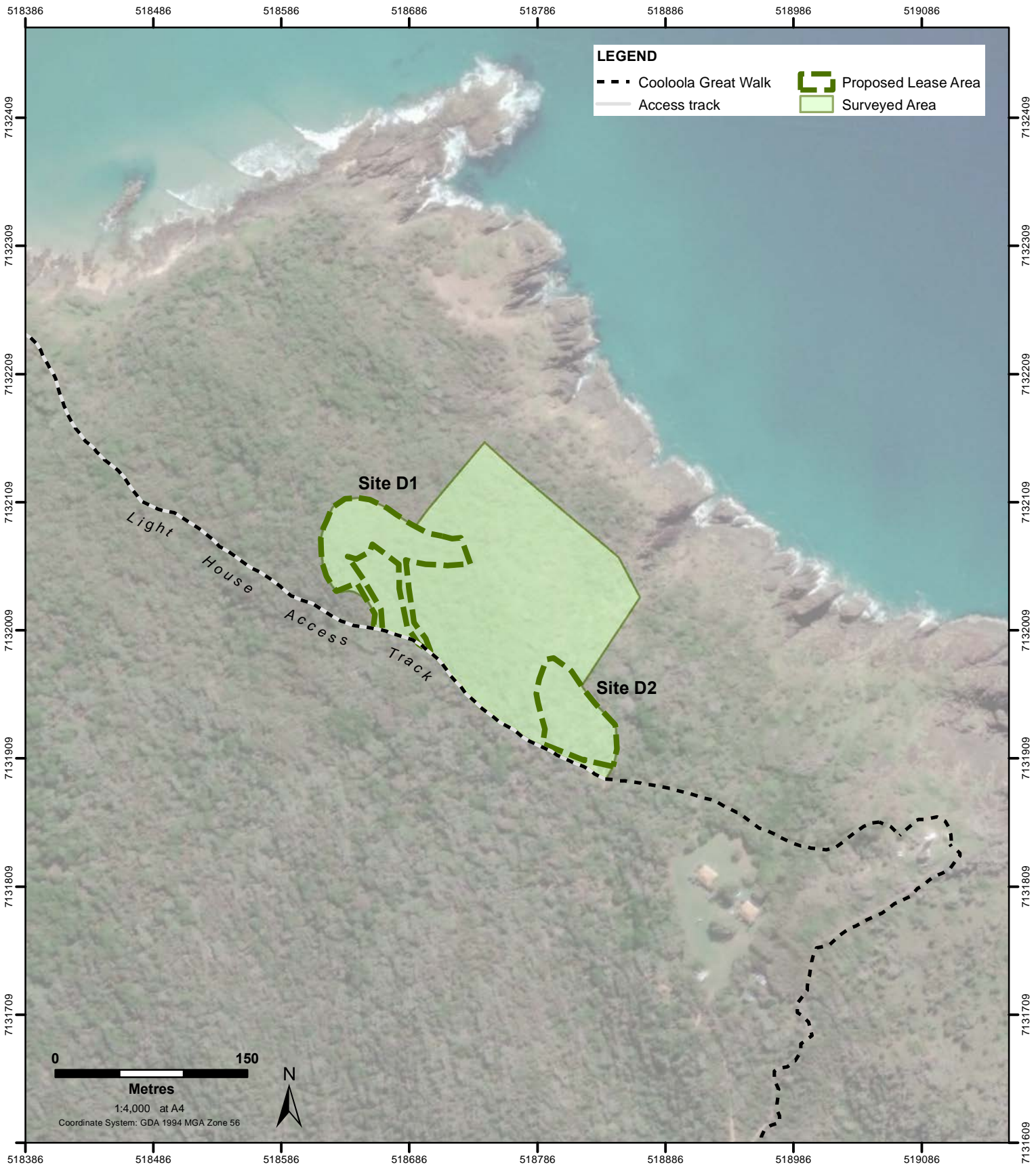
Data Sources:
 Surveyed Areas
 BAAM - March 2020, May 2020, June 2020

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Drawn By: KM Reviewed by: JA Date: 31/08/2020

Figure: 1.1d
Title: Accommodation Site Locations - Site P
Project: Premium Ecotourism Products – Cooloola Great Walk
Client: Department of Environment and Science





Data Sources:
Surveyed Areas
BAAM - March 2020, May 2020, June 2020

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Drawn By: KM Reviewed by: JA Date: 3/09/2020

Figure: 1.1e
Title: Accommodation Site Locations - Site D
Project: Premium Ecotourism Products – Cooloola Great Walk
Client: Department of Environment and Science



2.0 METHODOLOGY

2.1 DESKTOP ASSESSMENT

An initial desktop review of expected environmental opportunities and constraints to premium ecotourism products within the vicinity of the Cooloola Great Walk was completed in 2019, to identify the potential presence of constraints that may influence the location of eco accommodation sites along the trail.

Information reviewed included publicly available datasets and relevant information on conservation significant vegetation communities, habitat and flora and fauna species with reference to the study area locality. This focused on information that indicates the known or potential presence of matters of national environmental significance (MNES) and state environmental significance (MSES), including:

- The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Protected Matters Search Tool (**Appendix A**), for a 30km-wide search area centred on the Cooloola Great Walk alignment (**Appendix A**). This search tool indicates the likely or potential presence of threatened ecological communities (TECs) and species, migratory species, wetlands and marine parks listed under the EPBC Act;
- The Queensland Department of Natural Resources, Mines and Energy's mapping of regulated vegetation and associated Essential Habitat, which indicates the likely or potential presence of TECs and habitat for threatened and migratory species listed under the EPBC Act, as well as Endangered and Of Concern regional ecosystems (REs), wetland REs, REs within the defined distance of watercourses, habitat for Endangered, Vulnerable and Near Threatened (EVNT) species listed under the Queensland *Nature Conservation Act 1992* (NC Act) and marine plants;
- DES Referable Wetlands mapping, which indicates the presence of wetlands protection areas and wetlands of high ecological significance;
- DES Flora Survey Trigger mapping, which indicates the likely or potential presence of EVNT flora species listed under the EPBC Act and/or NC Act;

- DES Wildnet records, Queensland Herbarium HERBRECS collection records and Queensland Museum vertebrate fauna collection records, for a 30km-wide search area centred on the Cooloola Great Walk alignment. These databases indicate the known presence of threatened and migratory species listed under the EPBC Act and EVNT species listed under the NC Act; and
- The State Government's mapping of other MSES (and overlapping MNES) including Strategic Environmental Areas, highly protected zones of State marine parks, declared Fish habitat areas and waterways providing for fish passage.

Potentially important habitat for conservation-significant fauna and flora was also determined through an interrogation of database records and REs within and around the study area, as well as specialist knowledge of each species' habitat preferences.

The State Government's mapping of terrestrial habitat of state, regional or local 'Biodiversity Significance' or 'Corridor Significance' as identified through the Biodiversity Assessment Mapping Methodology (BAMM), habitat of conservation significance identified through AquaBAMM, Special Protection Areas and Directory of Important Wetlands was also reviewed to determine other areas of importance, as necessary.

The findings of the desktop review are presented in detail in BAAM (2019). Findings relevant to the 2020 field investigations are summarised in **Section 3.0** of this report.

2.2 2019 BASELINE SURVEY

Following the completion of the desktop assessment, a baseline ecological survey was undertaken to verify the on-ground values in the vicinity of initially proposed eco-accommodation site options, as selected by two proponents submitting ecotourism proposals. The baseline survey was undertaken by BAAM Principal Wildlife Expert Adrian Caneris and Senior Botanist Jarrah Wills on 29 July to the 2 August 2019, inclusive, and aimed to confirm the actual or likely presence or absence of matters of national and state environmental significance within and around each potential area of impact associated with the development of eco-accommodation sites, utilising various, relatively non-invasive survey techniques.

The survey team inspected each proposed accommodation site option, focusing within a 100m radius of the proposed area of direct impact (assumed to be up to 5000m²). Specific techniques included:

- Verification of the identity, extent and status of vegetation communities, with particular focus on TECs listed under the EPBC Act and Endangered or Of Concern REs listed under the Queensland *Vegetation Management Act 1999* (VM Act). This involved recording floristic information concerning the structure and composition of the vegetation type together with verification of the underlying geology/landzone. Where a suspected TEC had specific diagnostic criteria and/or condition thresholds, these were assessed as per the Commonwealth's guidelines.
- Habitat suitability assessment and targeted searches for EVNT flora species listed under the EPBC Act and/or NC Act, generally in accordance with the Queensland Government's *Flora Survey Guidelines – Protected Plants*. For any EVNT flora species encountered, supplementary information was collected such as the number of individuals and the characteristics of the population and supporting habitat.
- Habitat suitability assessment and targeted searches for EVNT fauna, including:
 - Observed presence of foraging, nesting and/or refuge resources (such as hollow bearing trees).
 - Surveys for birds (focusing on early morning and late afternoon), during which all birds seen and heard calling were recorded.
 - Searches for reptiles and amphibians beneath rocks, logs, woody debris and other microhabitats, supplemented by dusk chorus surveys and call playback for frogs within suitable habitat³, as considered necessary and appropriate.
 - Spotlighting for owls, flying foxes⁴ and arboreal mammals⁵, facilitated by call

play-back where considered necessary and appropriate.

- Systematic searches for nests⁶ and other breeding places, and to identify and record incidental wildlife traces from faecal scats, scratches, diggings, Button-Quail platelets⁵, bones, feathers, burrows and tracks.

The 2019 baseline survey was performed in accordance with BAAM's Permit to Take, Use, Keep or Interfere with Cultural or Natural Resources (WITK17726616-2).

Following the baseline ecological survey, data were analysed and interpreted to enable an informed assessment of species presence/absence, relative habitat value, and the accuracy of current State mapping of ecological values. Potential impacts to the identified values as a result of the proposed development of each site were then identified, and recommendations for the avoidance and/or mitigation of potential impacts (including possible alternative sites) were made, where considered necessary.

Based on the results of this baseline ecological survey (presented in BAAM [2020]), a number of "preferred" sites (from an ecological perspective) for each general location were identified/recommended.

2.3 PRELIMINARY 2020 SITE INVESTIGATION

Following consideration of the findings of the 2019 baseline ecological survey, a subsequent, preliminary site investigation was undertaken by BAAM Senior Botanist Dr Jarrah Wills with representatives from DES, Queensland Parks and Wildlife Service (QPWS), Kabi Kabi Traditional Owners, and the preferred Proponent on 24-27 February 2020. This aimed to assess the general suitability of each preferred location in terms of ecological and cultural heritage values, and other constraints, and resulted in the definition of camp site "envelopes" for more detailed survey and design.

³ In accordance with: **Commonwealth of Australia 2010**. Survey guidelines for Australia's threatened frogs. Department of the Environment, Water, Heritage and the Arts, Canberra.

⁴ In accordance with: **Commonwealth of Australia 2010**. Survey guidelines for Australia's threatened bats. Department of the Environment, Water, Heritage and the Arts, Canberra.

⁵ In accordance with: **Commonwealth of Australia 2011**. Survey guidelines for Australia's threatened mammals. Department of the Sustainability, Environment, Water, Populations and Communities, Canberra.

⁶ In accordance with: **Commonwealth of Australia 2010**. Survey guidelines for Australia's threatened birds. Department of the Environment, Water, Heritage and the Arts, Canberra.

The preliminary 2020 site investigation was performed in accordance with BAAM's Permit to Take, Use, Keep or Interfere with Cultural or Natural Resources (WITK17726616-2).

2.4 DETAILED 2020 FIELD SURVEY

The detailed ecological field survey was undertaken by Jarrah Wills and BAAM Principal Wildlife Expert Adrian Caneris on 23-26 March 2020. The survey aimed to confirm the actual or likely presence or absence of matters of national and state environmental significance within and around each camp site envelope, utilising various, relatively non-invasive survey techniques. Specific techniques included:

- Verification of the identity, extent and status of vegetation communities, with particular focus on TECs listed under the EPBC Act and Endangered or Of Concern REs listed under the VM Act. This involved recording floristic information concerning the structure and composition of the vegetation type together with verification of the underlying geology/landzone. Where a suspected TEC had specific diagnostic criteria and/or condition thresholds, these were assessed as per the Commonwealth's guidelines.
- Habitat suitability assessment and targeted searches for EVNT flora species listed under the EPBC Act and/or NC Act, generally in accordance with the Queensland Government's *Flora Survey Guidelines – Protected Plants*. For any EVNT flora species encountered, supplementary information was collected, such as the number of individuals and the characteristics of the population and supporting habitat.
- Habitat suitability assessment and targeted searches for EVNT fauna, including:
 - Observed presence of foraging, nesting and/or refuge resources (such as hollow bearing trees).
 - Surveys for birds (focusing on early morning and late afternoon), during which all birds seen and heard calling were recorded.

- Searches for reptiles and amphibians beneath rocks, logs, woody debris and other microhabitats, supplemented by dusk chorus surveys and call playback for frogs within suitable habitat⁷, as considered necessary and appropriate.
- Spotlighting for owls, flying foxes⁸ and arboreal mammals⁹, facilitated by call play-back where considered necessary and appropriate.
- Systematic searches for nests¹⁰ and other breeding places, and to identify and record incidental wildlife traces from faecal scats, scratches, diggings, Button-Quail platelets⁵, bones, feathers, burrows and tracks.

The detailed 2020 survey was performed in accordance with BAAM's Permit to Take, Use, Keep or Interfere with Cultural or Natural Resources (WITK17726616-2 and PTU20-002516).

2.5 ADDITIONAL 2020 SITE INVESTIGATIONS

The detailed ecological survey determined there was the potential for direct impacts upon threatened ecological communities, threatened flora species, known habitat for threatened fauna species and/or notable habitat trees within the boundaries of the camping areas investigated. Consequently, subsequent site investigations were undertaken by Adrian Caneris and Dr Jarrah Wills with representatives from DES, QPWS, Kabi Kabi Traditional Owners, and the preferred Proponent on 11-14 May 2020, and by Dr Jarrah Wills with representatives from QPWS on 9 June 2020. These subsequent investigations aimed to identify the locations of specific values and constraints, and determine appropriate site locations and development boundaries to inform final project design. This resulted in the "Proposed Lease Areas" shown on **Figures 1.1a to 1.1e**.

⁷ In accordance with: **Commonwealth of Australia 2010**. Survey guidelines for Australia's threatened frogs. Department of the Environment, Water, Heritage and the Arts, Canberra.

⁸ In accordance with: **Commonwealth of Australia 2010**. Survey guidelines for Australia's threatened bats. Department of the Environment, Water, Heritage and the Arts, Canberra.

⁹ In accordance with: **Commonwealth of Australia 2011**. Survey guidelines for Australia's threatened mammals. Department of the Sustainability, Environment, Water, Populations and Communities, Canberra.

¹⁰ In accordance with: **Commonwealth of Australia 2010**. Survey guidelines for Australia's threatened birds. Department of the Environment, Water, Heritage and the Arts, Canberra.

The additional 2020 site investigations were performed in accordance with BAAM's Permit to Take, Use, Keep or Interfere with Cultural or Natural Resources (WITK17726616-2 and PTU20-002516).

2.6 SPECIES LIKELIHOOD ASSESSMENT

Following the 2020 site investigations, data were analysed and interpreted to enable an informed assessment of species presence/absence, habitat value, and the accuracy of current State mapping of ecological values. The likelihood of occurrence of EVNT and migratory species was assessed through integration of the following sources of information:

- database search results that identify whether there are records of the species in the vicinity;
- review of the published literature pertaining to the known distributions and habitat requirements of the species (including seasonal variations); and
- current mapping of REs/habitats, and the results of habitat assessments during the field surveys.

In addition to those species recorded during the surveys, species are considered to have potential to occur if there are records of the species in the vicinity (i.e. within 15km of the site) and the species is not now considered locally extinct, and suitable habitat occur.

2.7 IMPACT ASSESSMENT

Potential impacts to the identified values resulting from the project were identified, and their significance assessed in accordance with the Commonwealth Department of Agriculture, Water and the Environment's (DAWE) Significant Impact Guidelines for MNES, the State Government's Significant Residual Impact Guideline for matters assessed under the NC Act, *Environmental Protection Act 1994* and *Marine Parks Act 2004*, and the Queensland Parks and Wildlife Service's (QPWS) Operational Policy and Procedural Guide for assessing the impact of QPWS actions on natural and cultural values.

3.0 ECOLOGICAL VALUES

The following sections provide an overview of MNES and MSES known or potentially occurring within the vicinity (i.e. within 15km) of the Cooloola Great Walk based on desktop assessment, and their known or potential occurrence within or within the close vicinity (i.e. within 100m) of one or more of the “Proposed Lease Areas” based on the field surveys. **Table 3.2** provides a summary of the ecological values recorded at each of the sites, as well as a brief description of how and why the Proposed Lease Area was determined at each location.

3.1 MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE (MNES)

3.1.1 Wetlands of International Importance (Ramsar)

The Great Sandy Strait Ramsar site lies towards the north-west of the Cooloola Great Walk (**Figure 1.1**). The closest proposed accommodation site (Site P) is located approximately 3.4 km from this Ramsar wetland, and there are no hydrological connections between the site or Poona Lake (a perched lake) and the Ramsar wetland. Consequently, the project is not expected to result in any significant impacts upon the Ramsar wetland.

3.1.2 Threatened Ecological Communities

The EPBC Protected Matters Search Tool (**Appendix A**) indicates three EPBC listed TECs could potentially occur within the vicinity of the accommodation sites:

- Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South East Queensland ecological community (currently listed as Endangered).
- Lowland Rainforest of Subtropical Australia (Critically Endangered).
- Subtropical and Temperate Coastal Saltmarsh (Vulnerable).

The results of the field surveys indicate patches of vegetation mapped as RE 12.2.1 in the vicinity of Site P and as REs 12.2.1 and 12.2.3 in the vicinity of Site K are likely to qualify as the Littoral Rainforests and Coastal Vine Thickets of Eastern Australia TEC (Critically Endangered) (**Figure 3.1**). The characteristics of the vegetation recorded during the surveys were consistent with this TEC rather than the Lowland Rainforest of Subtropical Australia TEC.

No vegetation representing the three TECs listed within EPBC Protected Matters Search Tool results was recorded within or adjacent to any of the proposed lease areas during the surveys.

A summary description of vegetation recorded at each site is provided in **Table 3.2**, with Quaternary site data provided in **Appendix B**.

3.1.3 Threatened Species

Flora

The EPBC Protected Matters Search Tool (**Appendix A**) indicates numerous EPBC listed threatened flora species could potentially occur. Those species known to occur within 15km the Cooloola Great Walk based on previous records include:

- *Acacia attenuata* (Vulnerable).
- *Acronychia littoralis* (Endangered).
- *Allocasuarina emuina* (Endangered).
- *Archidendron lovelliae* (Vulnerable).
- *Arthraxon hispidus* (Vulnerable).
- *Boronia keysii* (Vulnerable).
- *Bosistoia transversa* (Vulnerable).
- *Cryptocarya foetida* (Vulnerable).
- *Eucalyptus conglomerata* (Endangered).
- *Floydia praealta* (Vulnerable).
- *Macadamia integrifolia* (Vulnerable).
- *Macadamia ternifolia* (Vulnerable).
- *Macrozamia pauli-guilielmi* (Endangered).
- *Prostanthera spathulata* (Vulnerable).
- *Romnaldia strobilacea* (Vulnerable).
- *Xanthostemon oppositifolius* (Vulnerable).

The field surveys confirmed the presence of the following species within or within close vicinity to one or more proposed accommodation sites, as shown on **Figure 3.1**:

- *Archidendron lovelliae* (Vulnerable) (**Photo 1**) – a number of seedlings, saplings and small trees recorded along and near the access road alignment for Site P. Large trees occur within the broader area.
- *Cryptocarya foetida* (Vulnerable) (**Photo 2**) - recorded at Site K, represented by a single seedling. Large trees occur within the broader area.

- *Macrozamia pauli-guilielmi* (Endangered) (**Photo 3**) – mature specimens in and around Site L (including the nearby Litoria Walkers' Camp)¹¹, and near Site N (option 2).

The remaining threatened flora species that have been previously recorded within 15km of the proposed lease areas were not detected despite targeted searches within suitable habitat, where this occurred within the surveyed areas. In particular, no other EPBC Act listed threatened flora species were recorded within surveyed rainforest habitat around Site P or within surveyed heath/sedgeland habitat near Site N (option 1) or Site N (option 2), despite the potential for many of these species to occur within these habitat types.



Photo 3. *Macrozamia pauli-guilielmi* at Site L.



Photo 1. Small *Archidendron lovelliae* tree at Site P.



Photo 2. *Cryptocarya foetida* seedling at Site K.

Fauna

The EPBC Protected Matters Search Tool (**Appendix A**) indicates numerous EPBC listed threatened fauna species could potentially occur. Those species known to occur within the vicinity of the Cooloola Great Walk based on previous records (excluding species exclusively or primarily associated with the open ocean, beaches, estuaries or intertidal environments, and/or lacustrine or riverine wetlands) include:

- Three-toed Snake-tooth Skink
Coeranoscincus reticulatus (Vulnerable)
- Spotted-tailed Quoll (southern subspecies)
Dasyurus maculatus maculatus (Endangered)
- Red Goshawk *Erythroriorchis radiatus* (Vulnerable)
- Painted Honeyeater *Grantiella picta* (Vulnerable)
- Wallum Sedgefrog *Litoria olongburensis* (Vulnerable)
- Oxleyan Pygmy Perch *Nannoperca oxleyana* (Endangered)
- Southern Greater Glider *Petauroides volans volans* (Vulnerable)
- Koala *Phascolarctos cinereus* (Vulnerable)
- Grey-headed Flying-fox *Pteropus poliocephalus* (Vulnerable)

¹¹ It is noted that Site L and the surrounding area were burned by fire in late 2019, and that *Macrozamia pauli-guilielmi* can re-grow after having its above-ground structure burnt completely. Although there is a possibility of *Macrozamia pauli-guilielmi* re-emerging after fire, it is expected all specimens present have been identified during the 2019 and 2020 surveys, because:

- The initial baseline survey undertaken in July 2019 pre-dated the fire, and included thorough searches for threatened flora.
- It is considered there has been sufficient time and rainfall since the fire for above-ground biomass to develop and be detected.
- The species has a very low dispersal distance and, subsequently, a clumpy distribution.

- Australian Painted Snipe *Rostratula australis* (Endangered)
- Black-breasted Button-Quail *Turnix melanogaster* (Vulnerable).

Spatial data available from the Queensland Government shows previous records for Black-breasted Button-Quail (Vulnerable) near Sites D1 and D2 (**Figure 3.1**). The field survey confirmed the presence of this species at Site D2 and in the vicinity of Sites D1 and P in the form of platelets (foraging evidence) (**Photo 4, Figure 3.1**), although potential habitat for the species within Sites D1 and P is limited due to the open or disturbed structure of the vegetation.



Photo 4. Black-breasted Button-Quail evidence (diagnostic feeding platelets) at Site D2

The results of the survey indicate potential habitat for the following species occurs at one of more of the proposed accommodation sites, based on habitat type and condition:

- Three-toed Snake-tooth Skink (Vulnerable) – Sites N (option 1), N (option 2), L, K and P.
- Wallum Sedgefrog (Vulnerable) – wallum heaths and sedgeland/swamp adjoining/near Site N (option 1) and Site N (option 2). Spatial data available from the Queensland Government also shows a previous record for Wallum Sedgefrog near Site P (**Figure 3.1**), although not associated with habitats represented within the proposed lease area.
- Oxleyan Pygmy Perch (Endangered) – ponds and streams within wallum heaths and sedgeland/swamp adjoining/near Site N (option 1) and Site N (option 2).
- Grey-headed Flying-fox (Vulnerable) – Sites N (option 1), N (option 2), P, L and K.

Although potential habitat for Koala occurs within and around most of the sites, no Koalas or evidence of their presence (i.e. scratches and scats) was found during the targeted surveys. Consequently, the species is considered unlikely to frequent the proposed lease areas, although it is possible that individuals may occasionally pass through each area.

The remaining threatened fauna species that have been previously recorded within 15km of the Cooloola Great Walk are considered unlikely to occur within or adjacent to the proposed lease areas, as outlined in **Table 3.1**.

3.1.4 Migratory Species

The EPBC Protected Matters Search Tool (**Appendix A**) indicates numerous EPBC listed migratory fauna species could potentially occur. Those species known to occur within the vicinity of the Cooloola Great Walk based on previous records (excluding species exclusively or primarily associated with the open ocean, beaches, estuaries or intertidal environments, and/or lacustrine or riverine wetlands) include:

- Oriental Cuckoo *Cuculus optatus*
- Latham's Snipe *Gallinago hardwickii*
- Black-faced Monarch *Monarcha melanopsis*
- Satin Flycatcher *Myiagra cyanoleuca*
- Eastern Osprey *Pandion cristatus*
- Glossy Ibis *Plegadis falcinellus*
- Rufous Fantail *Rhipidura rufifrons*
- Spectacled Monarch *Symposiachrus trivirgatus*.

Black-faced Monarch and Spectacled Monarch were recorded within the rainforest habitats near Site P. Potential habitat for the following species also occurs at one of more of the proposed accommodation sites, based on habitat type and condition:

- Black-faced Monarch – Sites N (option 1), N (option 2) and L.
- Rufous Fantail – Sites N (option 1), N (option 2), L and K.

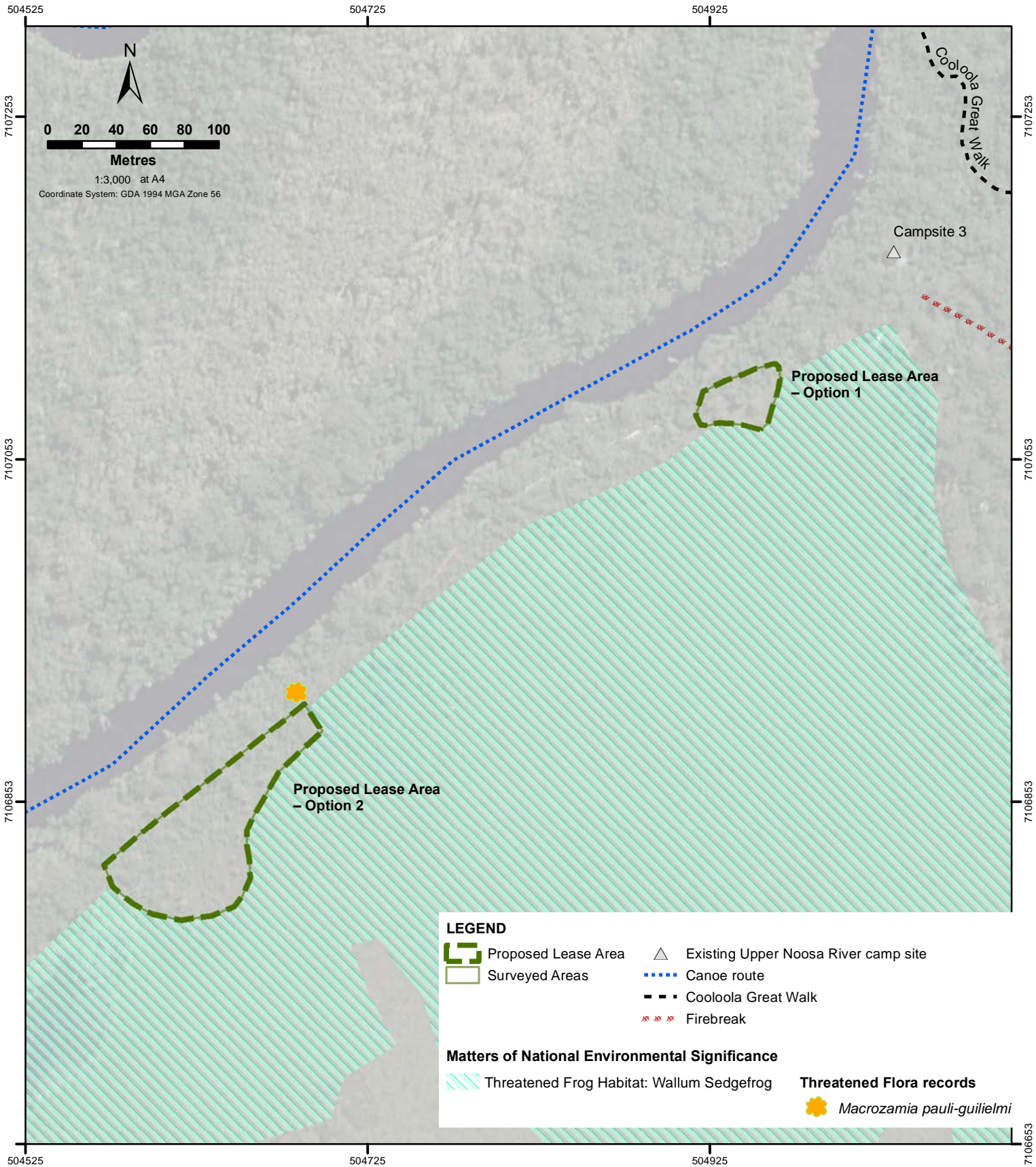
The remaining migratory species that have been previously recorded within 15km of the proposed lease areas are not expected to utilise the habitats present within the proposed lease areas.

Table 3.1. Threatened fauna species previously recorded within 15km of the proposed lease areas but considered unlikely to occur

Species Name	Common Name	EPBC ¹²	NCA	Preferred Habitat Characteristics	Reason the species is considered unlikely to occur within or adjacent to the proposed lease areas
<i>Ornithoptera richmondia</i>	Richmond Birdwing		V	The Richmond Birdwing butterfly mainly lives in subtropical rainforest where its larval host plant <i>Pararistolochia praevenosa</i> grows. Although the species distribution once extended from Maryborough to Grafton in northern New South Wales, its current distribution is fragmented, with the species occurring in two main areas: in the north, from Cootharaba on the Sunshine Coast to near Caboolture, and in the south, from Ormeau and Mount Tamborine in the Gold Coast hinterland to Wardell in north-east New South Wales.	No host plants have been recorded within or adjacent to any of the proposed lease areas. There are no suitable breeding habitats, and the proposed lease areas are beyond the currently recognised distribution of the species.
<i>Adelotus brevis</i>	Tusked Frog		V	The Tusked Frog is a species of ground-dwelling frog associated with dams, ditches, flooded grassland and creeks in rainforest, wet sclerophyll forest and woodland.	There is no suitable habitat within any of the proposed lease areas, and watercourses in the surrounding landscape are generally too ephemeral, acidic or tidally influenced to support the species.
<i>Acanthophis antarcticus</i>	Common Death Adder		V	The Common Death Adder was once abundant in many areas across south-east Queensland, including coastal habitats. Unfortunately, this species has experienced a dramatic reduction in numbers, thought to be primarily associated with the introduction of the Cane Toad, which is common across the Great Sandy region.	Although some of the sites hold potential habitats, the species is considered unlikely to occur due to its dramatic decline across the region.
<i>Rostratula australis</i>	Australian Painted Snipe	E	V	The Australian Painted Snipe frequents shallow freshwater wetlands with a thick cover of low vegetation.	No suitable habitat is present within or adjacent to any of the proposed lease areas.
<i>Podargus ocellatus plumiferus</i>	Plumed Frogmouth		V	This species occurs in subtropical rainforest and vineforest at altitudes from 50–800 m, although it is very rare, and its stronghold is associated with the Conondale Ranges.	Although some potential habitat, the species is considered unlikely to occur due to its rarity outside the Conondale Ranges.
<i>Ninox strenua</i>	Powerful Owl		V	The Powerful Owl occupies a range of vegetation types, from woodland and open sclerophyll forest to tall open wet forest and rainforest. They generally require large tracts of forest or woodland habitat but also occur in fragmented landscapes moving between patches. It roosts by day in dense vegetation, usually riparian or dense rainforest or regrowth habitats. Their main prey items are medium-sized arboreal marsupials, particularly the Greater Glider, Common Ringtail Possum and Sugar Glider.	Whilst their occurrence in the wider landscape is known, the likelihood of Powerful Owl utilising the proposed lease areas is very low as their main prey items are relatively rare in the low nutrient coastal woodlands of the area.
<i>Erythrotriorchis radiatus</i>	Red Goshawk	V	E	The Red Goshawk is considered the rarest Australian bird of prey. It is found mainly in the savanna woodlands of northern Australia, particularly near watercourses. It takes a broad range of live prey, mostly birds. Red Goshawks inhabit open woodland and forest, preferring a mosaic of vegetation types, a large population of birds as a source of food, and permanent water, and are often found associated with riparian habitats.	This species is potentially extinct in the local landscape. If present, the proposed lease areas have little direct relevance to this species and its ongoing use of the National Park.

¹² EPBC = status under the *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth); NCA = status under the *Nature Conservation Act 1992* (Queensland); E = Endangered; V = Vulnerable.

Species Name	Common Name	EPBC ¹²	NCA	Preferred Habitat Characteristics	Reason the species is considered unlikely to occur within or adjacent to the proposed lease areas
<i>Pezoporus wallicus wallicus</i>	Ground Parrot (Eastern)		V	The Ground Parrot is found within marshy coastal heaths and plains generally where trees are absent or very sparse. They mainly occur within heathland, sedgeland or on button-grass plains. The species depends on naturally occurring fires allowing new renewed growth.	There is no suitable habitat within the proposed lease areas, and the species was not detected from any adjacent heath/sedgeland habitats.
<i>Grantiella picta</i>	Painted Honeyeater	V	V	The Painted Honeyeater is a medium-sized honeyeater that is particularly found in association with woodlands in which mistletoe is abundant.	None of the proposed lease areas have suitable feeding resources for any regular visitation or reliance by the species.
<i>Dasyurus maculatus maculatus</i>	Spotted-tail Quoll	E	V	Spot-tailed Quolls can be found in a range of forest environments, from rainforest to open woodland. They require forest with suitable den sites and are primarily associated with areas that provide small caves and rock crevices, though are also known to utilise large hollow logs. They have a large home range of several kilometres.	The species is rare across most of its range, and the habitats within and around the proposed lease areas have little direct relevance to this species. Any presence would be transient whilst moving through the area.
<i>Petauroides volans</i>	Greater Glider	V	V	The Greater Glider chooses habitat based on several factors, the most dominant of which are the presence of specific species of eucalypt and sufficient hollow bearing trees for denning requirements. Another factor determining population density is elevation, with optimal levels 845 m above sea level.	The species is rarely found in coastal environments, and the proposed lease areas are located within areas lacking suitable hollows and sufficient habitat qualities.



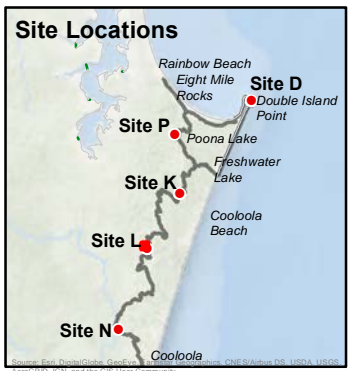
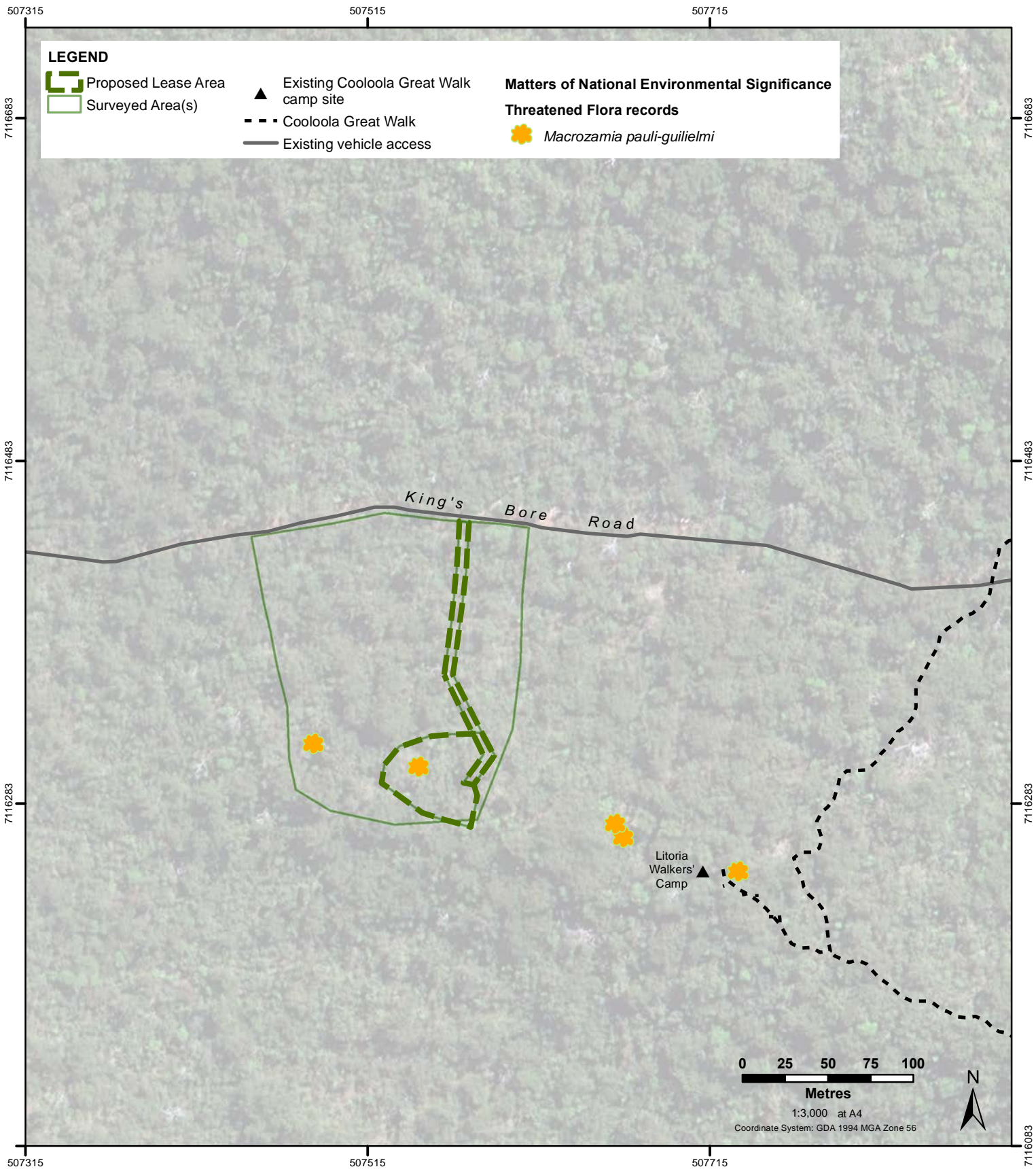
Data Sources:
 Threatened Frog Habitat
 Vegetation management regional ecosystem map - v11.0
 Published 02-04-2020
 Threatened Flora and Fauna Records
 BAAM - March 2020, May 2020, June 2020

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Drawn By: KM Reviewed by: JA Date: 3/09/2020

Figure: 3.1a
Title: Confirmed MNES - Site N
Project: Premium Ecotourism Products – Coolooloa Great Walk
Client: Department of Environment and Science





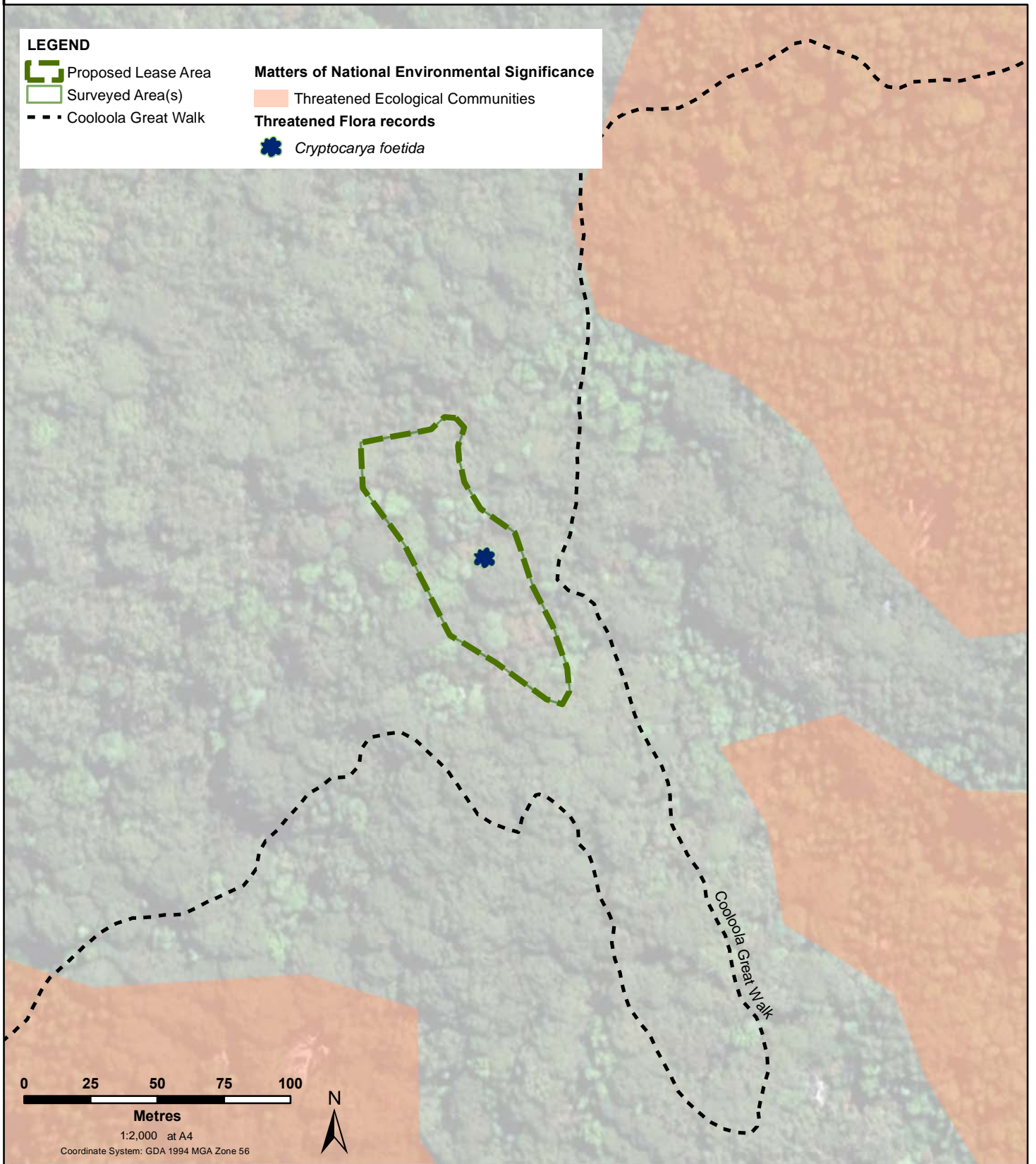
Data Sources:
Threatened Flora Records
BAAM - March 2020, May 2020

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Drawn By: KM Reviewed by: JA Date: 31/08/2020

Figure: 3.1b
Title: Confirmed MNES - Site L
Project: Premium Ecotourism Products – Cooloola Great Walk
Client: Department of Environment and Science





Data Sources:
 Threatened Flora Records
 BAAM - April 2020, May 2020
 TEC's
 Regional Ecosystems - Vegetation management regional ecosystem map - v11.0
 State of Queensland (Department of Environment and Science) 2020




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Drawn By: KM Reviewed by: JA Date: 1/09/2020

Figure: 3.1c
Title: Confirmed MNES - Site K
Project: Premium Ecotourism Products – Coolooloa Great Walk
Client: Department of Environment and Science




LEGEND

-  Proposed Lease Area
-  Surveyed Area(s)
-  Coolooloa Great Walk


Matters of National Environmental Significance

-  Threatened Ecological Communities


Threatened Fauna Records: 2020 Surveys

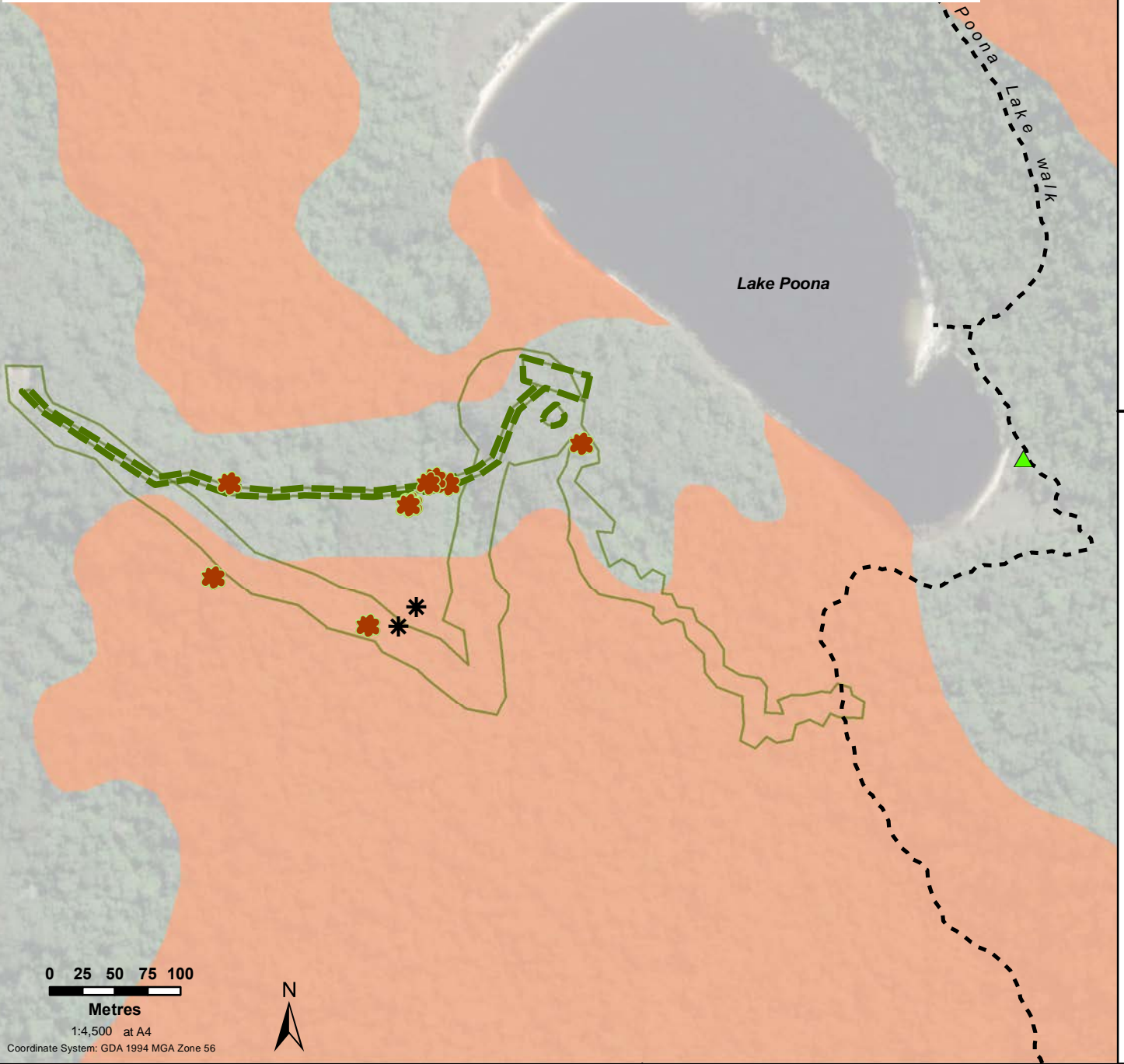
-  Black-breasted Button-Quail

Threatened Flora Records: 2020 Surveys

-  *Archidendron lovelliae*

Threatened Fauna Records: WildNet

-  Wallum Sedgefrog



Site Locations



Data Sources:

- Threatened Flora and Fauna Records: 2020 Surveys
- BAAM - March 2020, May 2020
- TEC's
- Regional Ecosystems - Vegetation management regional ecosystem map - v11.0
- State of Queensland (Department of Environment and Science) 2020
- Threatened Fauna Records: WildNet - WildNet wildlife records - published - Queensland
- State of Queensland (Department of Environment and Science) 2020

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Drawn By: KM Reviewed by: JA Date: 3/09/2020

Figure: 3.1d






Title: Confirmed MNES - Site P

Project: Premium Ecotourism Products – Coolooloa Great Walk

Client: Department of Environment and Science




LEGEND


-  Proposed Lease Area
-  Surveyed Area
-  Cooloola Great Walk
-  Access track
-  Tracks and walks

Matters of National Environmental Significance


Threatened Fauna Records: 2020 Surveys

-  Black-breasted Button-Quail

Threatened Fauna Records: WildNet

-  Black-breasted Button-quail

N

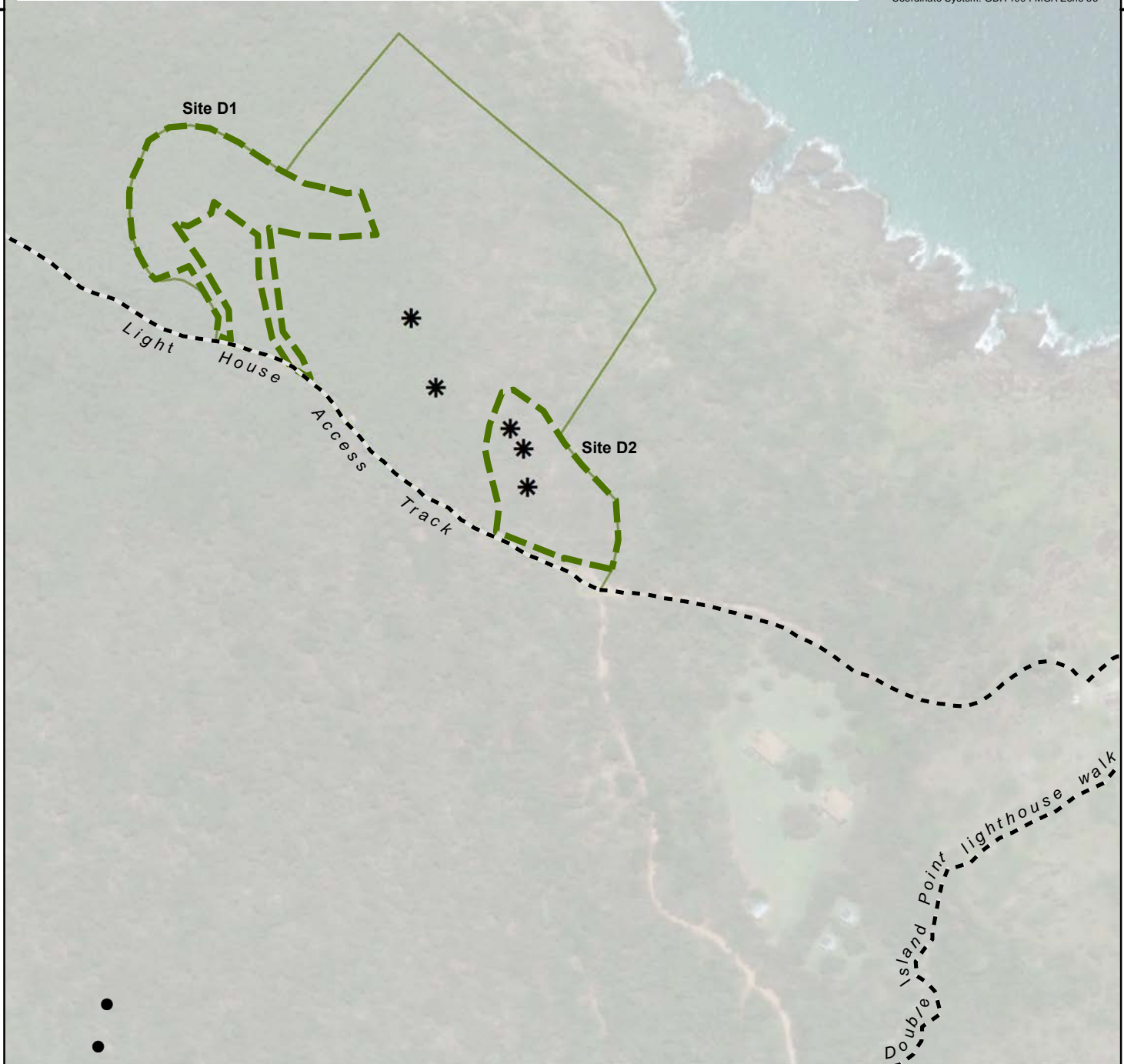


0 20 40 60 80

Metres

1:2,750 at A4

Coordinate System: GDA 1994 MGA Zone 56



Data Sources:
 Threatened Fauna Records: 2020 Surveys
 BAAM - March 2020, May 2020
 Threatened Fauna Records: WildNet - WildNet wildlife records - published - Queensland
 State of Queensland (Department of Environment and Science) 2020

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Drawn By: KM Reviewed by: JA Date: 3/09/2020

Figure: 3.1e
Title: Confirmed MNES - Site D
Project: Premium Ecotourism Products – Cooloola Great Walk
Client: Department of Environment and Science



3.2 MATTERS OF STATE ENVIRONMENTAL SIGNIFICANCE (MSES)

3.2.1 Regulated Vegetation

Categories of regulated vegetation that are recognised as prescribed MSES include:

- Remnant REs with an Endangered or Of Concern status under the Queensland *Vegetation Management Act 1999*;
- Remnant REs that intersect with an area shown as a wetland on the vegetation management wetlands map (to the extent of the intersection);
- Remnant REs located within a defined distance from the defining banks of a mapped watercourse; and
- An area of essential habitat on the essential habitat map for threatened plant or animal.

State mapping of regulated vegetation indicates numerous Of Concern REs and vegetated wetlands occur within the vicinity of the Cooloola Great Walk. A large proportion of these and other remnant REs are also mapped as essential habitat for State-listed threatened species, while numerous watercourses associated with remnant vegetation are also mapped.

The field survey confirmed the State mapping of regulated vegetation is generally accurate, as shown on **Figure 3.2**. The exceptions were the mapping of RE 12.2.12 (Of Concern) within Site N (option 1) (ground-truthed as Of Concern RE 12.3.14a), the mapping of RE 12.2.12 (Of Concern) within Site N (option 2) (ground-truthed as Least Concern RE 12.2.9 and Of Concern RE 12.3.14a), and the mapping of Least Concern RE 12.2.8 within a portion of the access alignment for Site P (ground-truthed as Of Concern RE 12.2.3).

The following Of Concern REs were confirmed within or within the close vicinity of one or more proposed accommodation sites (**Figure 3.2**):

- 12.2.1 Notophyll vine forest on parabolic high dunes – near Sites P and K.
- 12.2.3 Araucarian microphyll/notophyll vine forest on parabolic dunes. – within a portion of the access alignment for Site P and near Site K.
- 12.2.4 *Syncarpia hillii*, *Lophostemon confertus* tall open to closed forest on parabolic high dunes – near Site P.

- 12.2.12 Closed heath on seasonally waterlogged sand plains – adjacent to Site N (option 1) and Site N (option 2).
- 12.3.14a *Eucalyptus racemosa* subsp. *racemosa* woodland to open forest on alluvial plains usually near coast – within and adjacent to Site N (option 1) and Site N (option 2).
- 12.12.19 Vegetation complex of rocky headlands on Mesozoic to Proterozoic igneous rocks – near Sites D1 and D2.

Vegetation management wetlands were confirmed adjacent to Site N (option 1) and Site N (option 2) (**Figure 3.3**), although the mapping of management wetlands within these proposed lease areas was ground-truthed as incorrect due to the presence of non-wetland REs (i.e. REs 12.3.14a and 12.2.9).

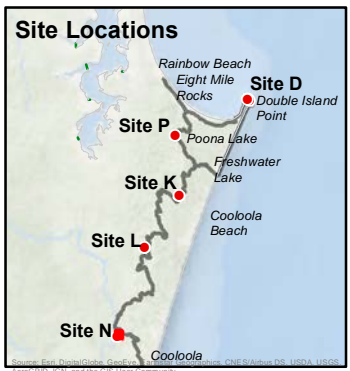
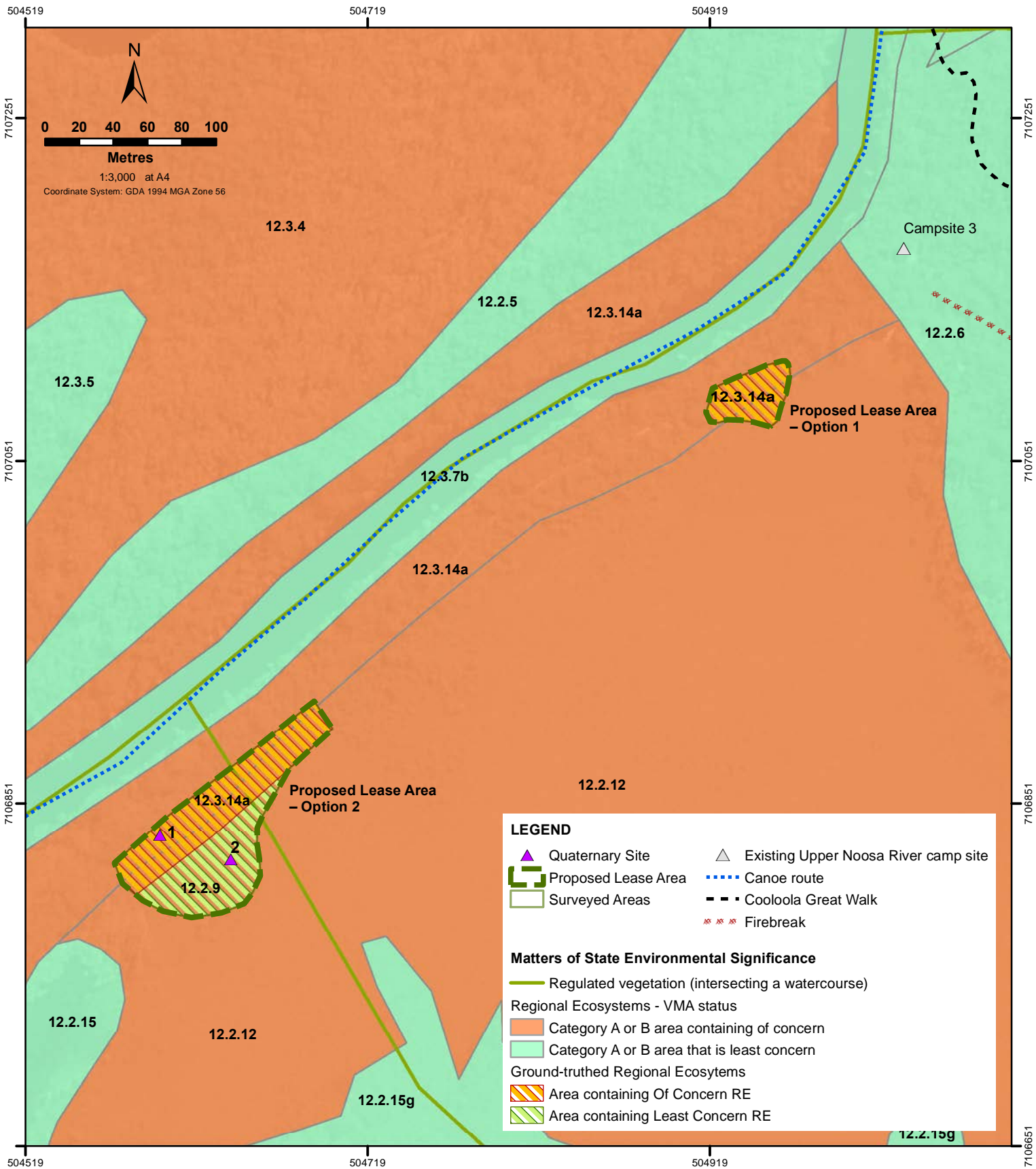
All mapped Essential Habitat was confirmed (i.e. within and surrounding all proposed sites) (**Figure 3.4**).

3.2.2 Wetlands and Watercourses

Categories of wetlands and watercourses that are recognised as prescribed MSES include:

- A wetland in a wetland protection area;
- A wetland of high ecological significance shown on the map of Queensland wetland environmental values; and
- A wetland or watercourse in high ecological value waters.

State mapping indicates wetlands of high ecological significance occur within and adjacent to Site N (option 1) and Site N (option 2), and in the vicinity of sites L and P, and high ecological value watercourses occur within Site N (option 2) and in the vicinity of sites L and P (**Figure 3.3**). The field survey confirmed the presence of these features adjacent to sites N (option 1) and N (option 2), and near sites L and P. However, the proposed lease area for Site N (option 1) was found to comprise *Banksia* woodland, while the proposed lease area for Site N (option 2) was found to comprise eucalypt and *Banksia* woodland, with wetland habitats adjacent to, but outside of, the proposed lease areas.



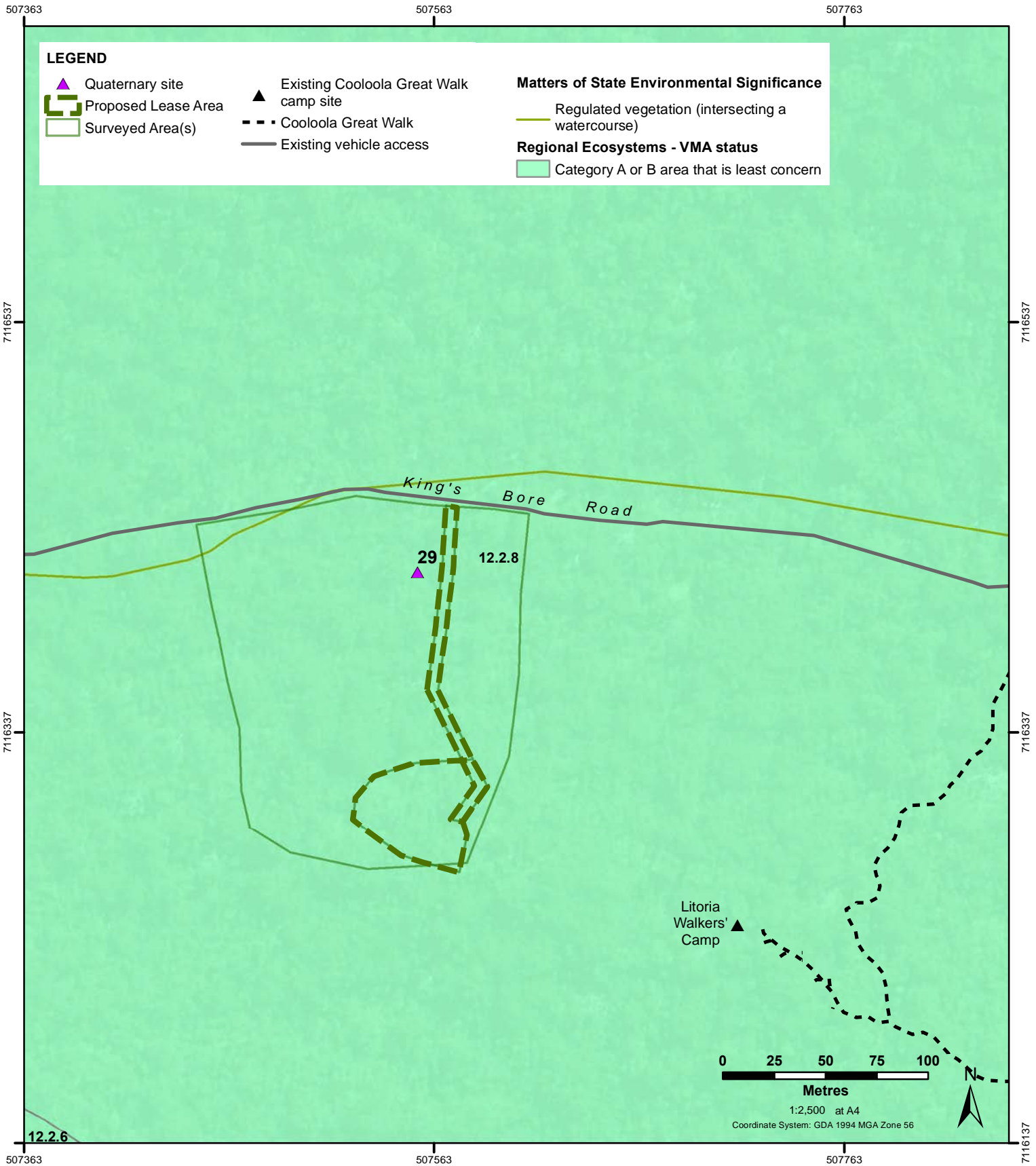
Data Sources:
 Vegetation management regional ecosystem map - v11.0
 Published 02-04-2020
 Department of Natural Resources Mines and Energy 2020
 Ground-truth regional ecosystems
 BAAM - March 2020, June 2020

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Drawn By: KM **Reviewed by:** JA **Date:** 3/09/2020

Figure: 3.2a
Title: Regional Ecosystems - Site N
Project: Premium Ecotourism Products – Coolooloa Great Walk
Client: Department of Environment and Science





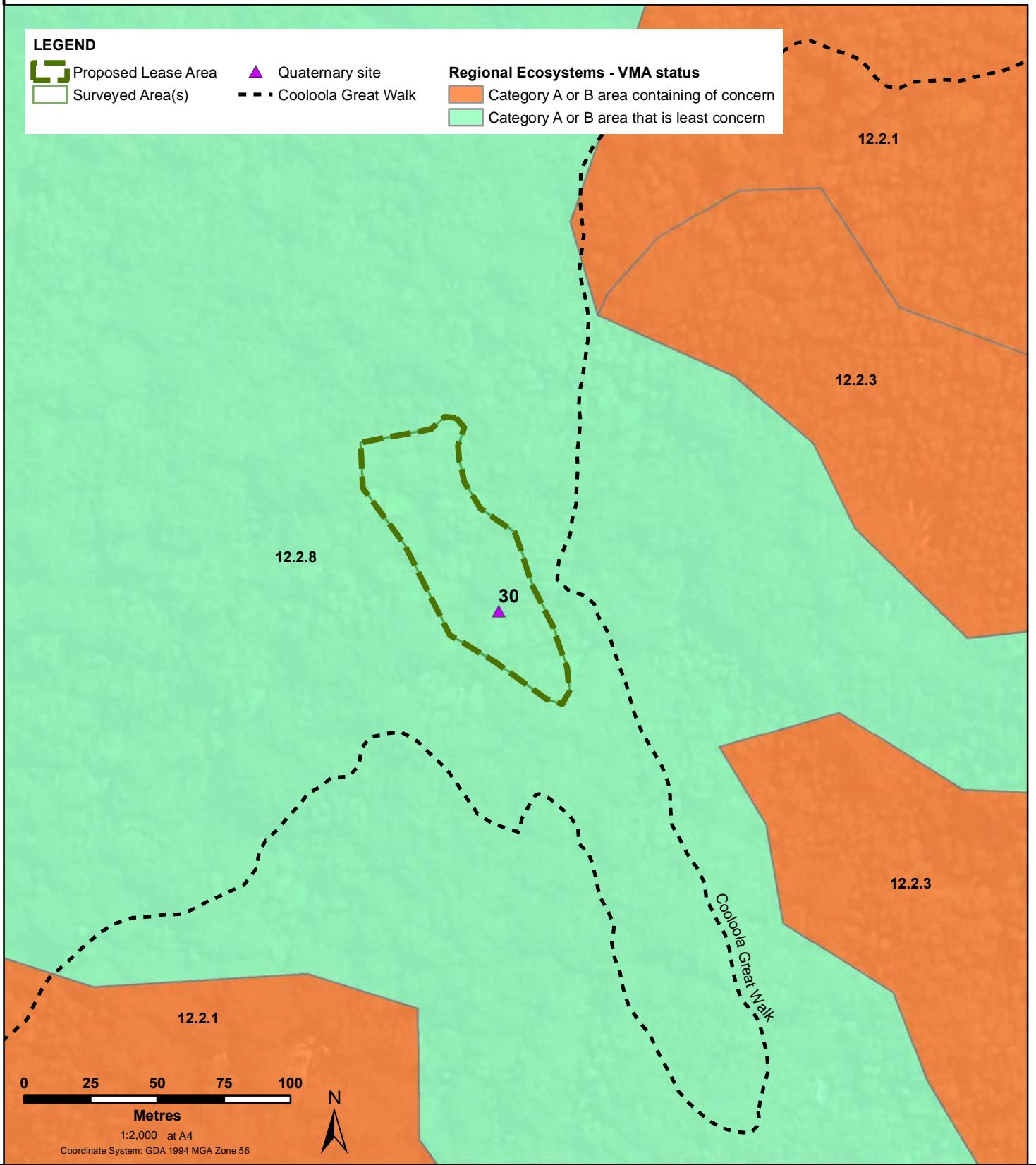
Data Sources:
 Vegetation management regional ecosystem map - v11.0
 Published 02-04-2020
 Department of Natural Resources Mines and Energy 2020
 Ground-truth regional ecosystems
 BAAM - March 2020, May 2020

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Drawn By: KM Reviewed by: JA Date: 31/08/2020

Figure: 3.2b
Title: Regional Ecosystems - Site L
Project: Premium Ecotourism Products – Coolooloa Great Walk
Client: Department of Environment and Science





Data Sources:
 Vegetation management regional ecosystem map - v11.0
 Published 02-04-2020
 Department of Natural Resources Mines and Energy 2020
 Ground-truth regional ecosystems
 BAAM - April 2020, May 2020





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Drawn By: KM Reviewed by: JA Date: 3/09/2020


Figure: 3.2c
Title: Regional Ecosystems - Site K
Project: Premium Ecotourism Products – Cooloola Great Walk
Client: Department of Environment and Science





LEGEND

-  Proposed Lease Area
-  Surveyed Area(s)
-  Quaternary site
-  Coolooloa Great Walk



Matters of State Environmental Significance

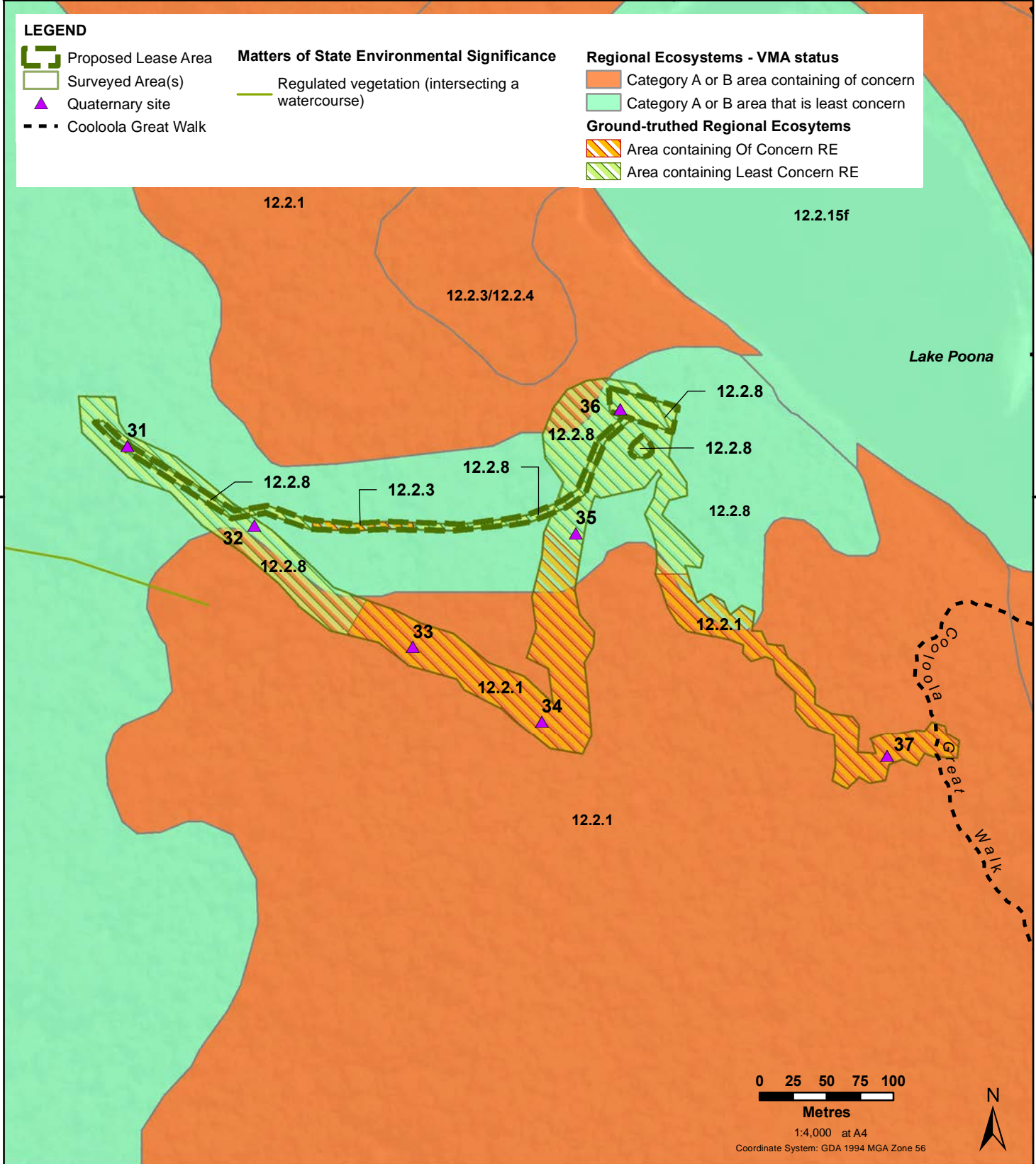
-  Regulated vegetation (intersecting a watercourse)

Regional Ecosystems - VMA status

-  Category A or B area containing of concern
-  Category A or B area that is least concern

Ground-truthed Regional Ecosystems

-  Area containing Of Concern RE
-  Area containing Least Concern RE



1:4,000 at A4

Coordinate System: GDA 1994 MGA Zone 56



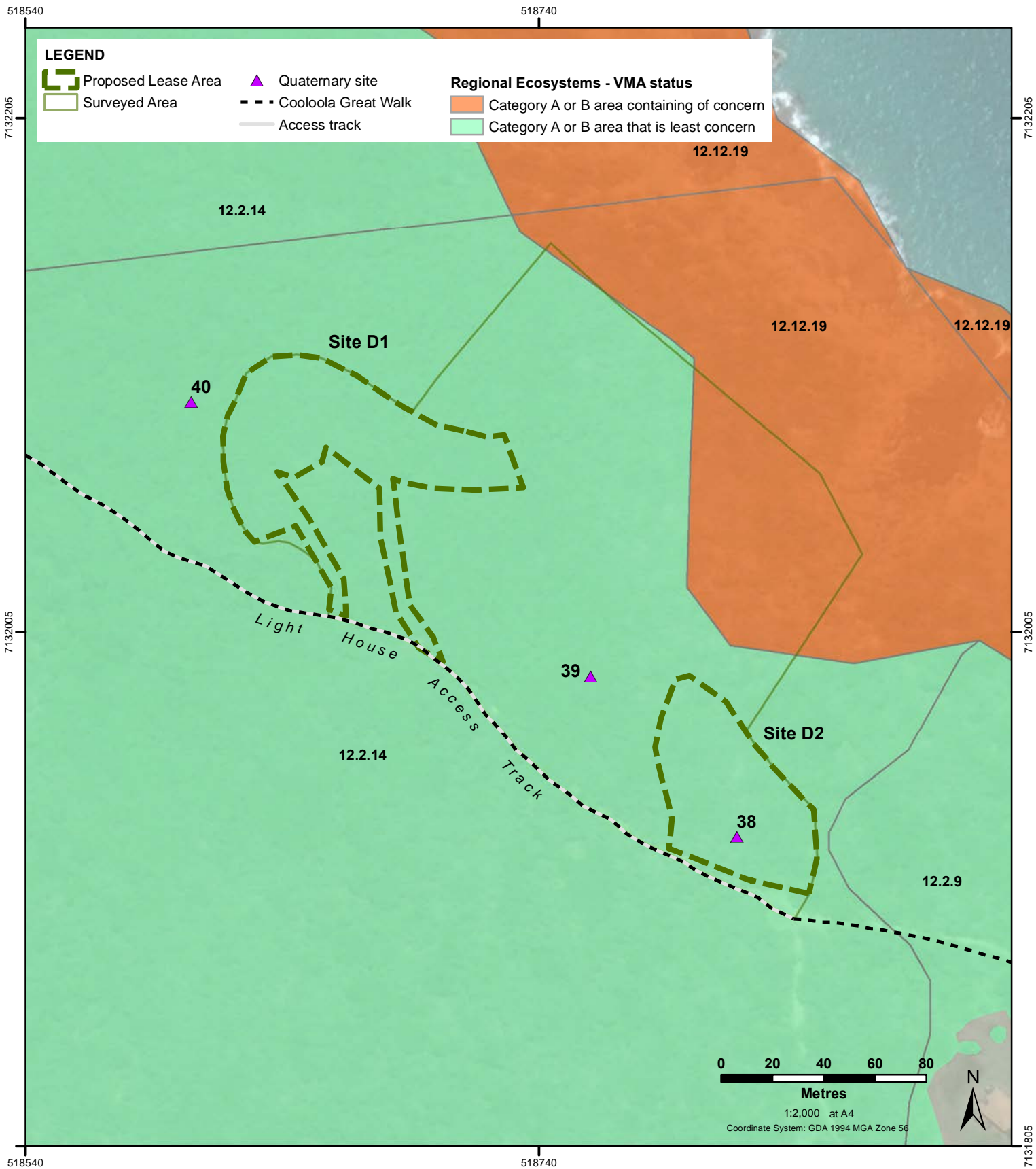
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 Published 02-04-2020
 Department of Natural Resources Mines and Energy 2020
 Ground-truth regional ecosystems
 BAAM - March 2020, May 2020

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Drawn By: KM Reviewed by: JA Date: 1/09/2020

Figure: 3.2d
Title: Regional Ecosystems - Site P
Project: Premium Ecotourism Products – Coolooloa Great Walk
Client: Department of Environment and Science





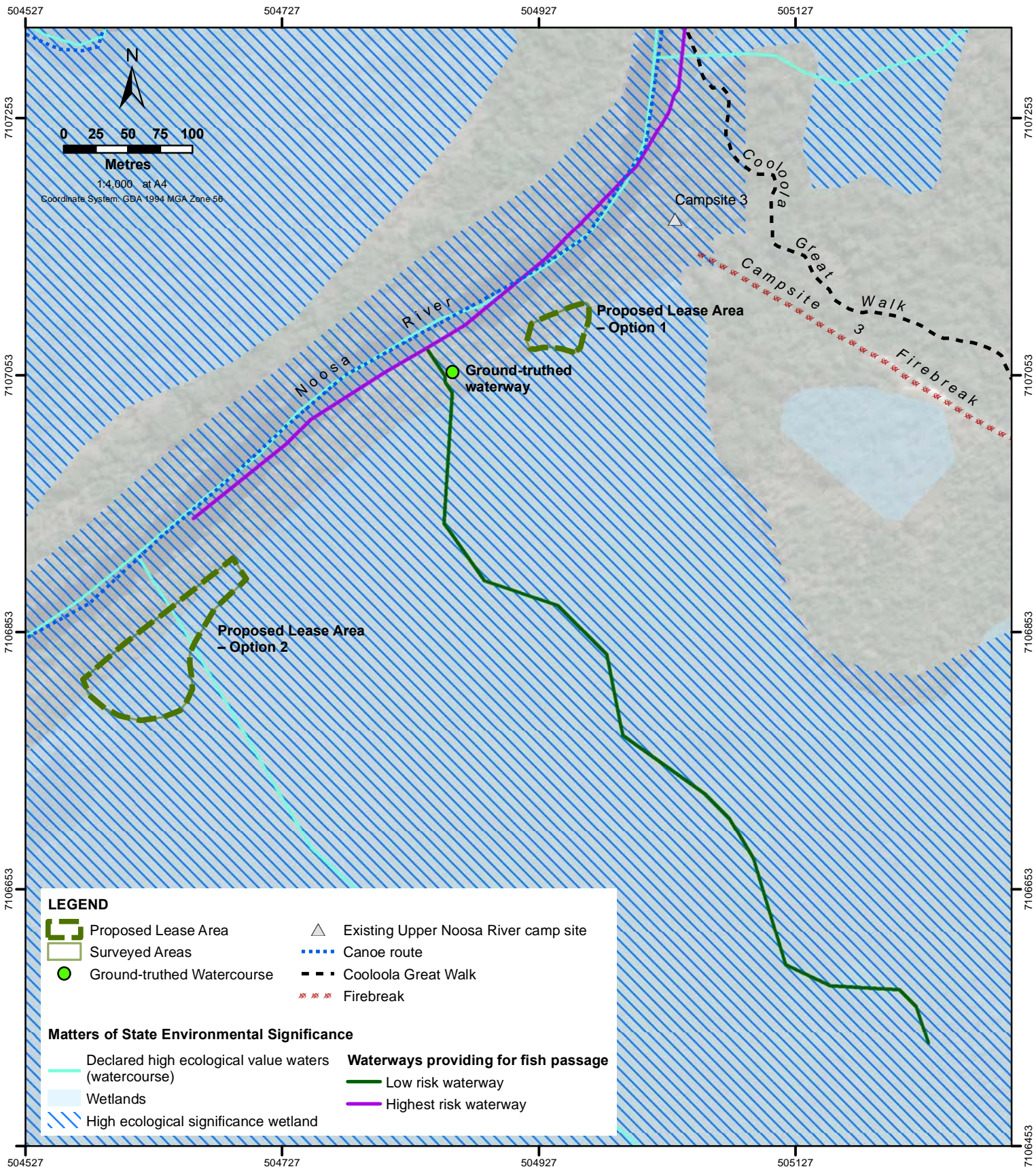
Data Sources:
 Vegetation management regional ecosystem map - v11.0
 Published 02-04-2020
 Department of Natural Resources Mines and Energy 2020
 Ground-truth regional ecosystems
 BAAM - March 2020, May 2020

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Drawn By: KM Reviewed by: JA Date: 3/09/2020

Figure: 3.2e
Title: Regional Ecosystems - Site D
Project: Premium Ecotourism Products – Coolooloa Great Walk
Client: Department of Environment and Science





Data Sources:
 Matters of State Environmental Significance
 Downloaded 18/03/2020
 Waterways for fish passage - Queensland waterways for waterway barrier works
 State of Queensland (Department of Environment and Science) 2020

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Drawn By: KM Reviewed by: JA Date: 3/09/2020

Figure: 3.3a
Title: MSES – Wetlands and Watercourses - Site N
Project: Premium Ecotourism Products – Cooloola Great Walk
Client: Department of Environment and Science



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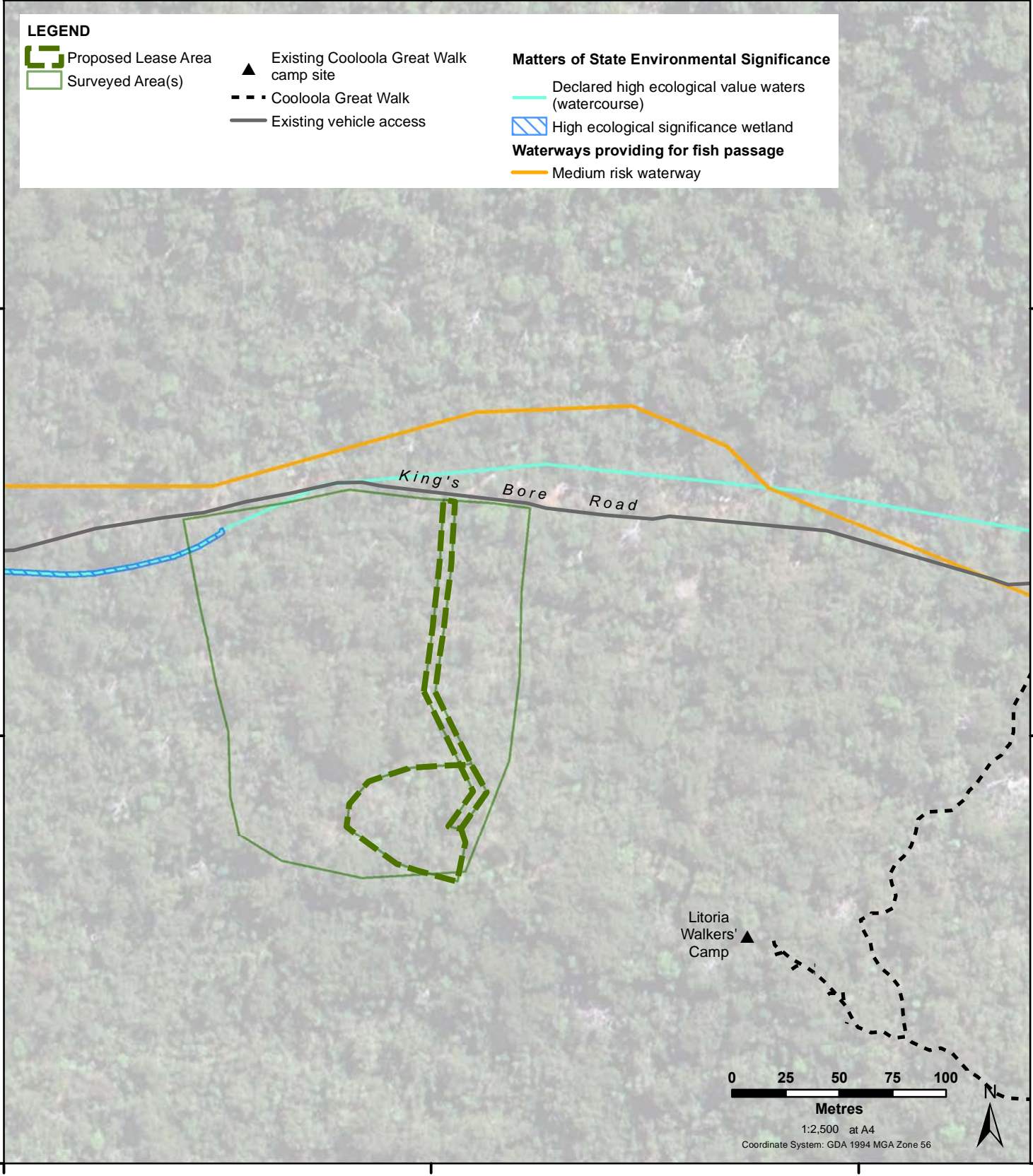
LEGEND

-  Proposed Lease Area
-  Surveyed Area(s)

-  Existing Cooloola Great Walk camp site
-  Cooloola Great Walk
-  Existing vehicle access

Matters of State Environmental Significance

-  Declared high ecological value waters (watercourse)
 -  High ecological significance wetland
- Waterways providing for fish passage**
-  Medium risk waterway



Data Sources:
 Matters of State Environmental Significance
 Downloaded 18/03/2020
 Waterways for fish passage - Queensland waterways for waterway barrier works
 State of Queensland (Department of Environment and Science) 2020




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Drawn By: KM Reviewed by: JA Date: 31/08/2020




Figure: 3.3b
Title: MSES – Wetlands and Watercourses - Site L
Project: Premium Ecotourism Products – Cooloola Great Walk
Client: Department of Environment and Science

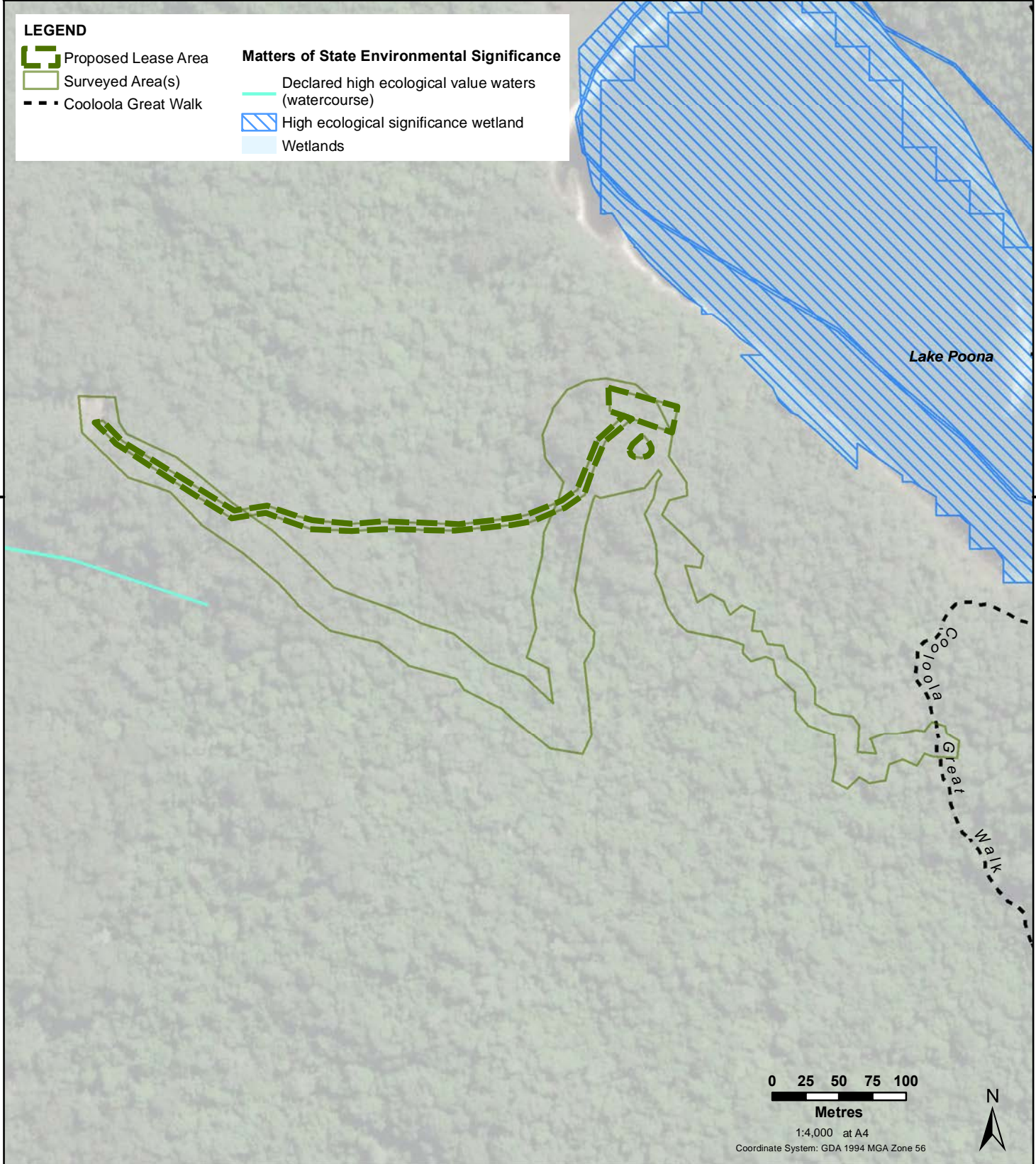


LEGEND

-  Proposed Lease Area
-  Surveyed Area(s)
-  Cooloola Great Walk

Matters of State Environmental Significance

-  Declared high ecological value waters (watercourse)
-  High ecological significance wetland
-  Wetlands



Data Sources:
 Matters of State Environmental Significance
 Downloaded 18/03/2020
 Waterways for fish passage - Queensland waterways for waterway barrier works
 State of Queensland (Department of Environment and Science) 2020

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Drawn By: KM Reviewed by: JA Date: 1/09/2020

Figure: 3.3c
Title: MSES – Wetlands and Watercourses - Site P
Project: Premium Ecotourism Products – Cooloola Great Walk
Client: Department of Environment and Science



Furthermore, there was no evidence of the high ecological value watercourse mapped as traversing the eastern portion of Site N (option 2). However, a watercourse mapped by the State as providing for fish passage between Site N (option 1) and Site N (option 2) (**Figure 3.3**) was confirmed during the survey (**Photo 5**), and it is considered this is also likely to be the correct location of the high ecological value watercourse.



Photo 5. watercourse recorded between Site N (option 1) and Site N (option 2) (refer **Figure 3.3**).

3.2.1 Protected Wildlife Habitat

Protected wildlife habitat includes:

- an area that is shown as a high-risk area on the flora survey trigger map and that contains threatened plants;
- an area that is not shown as a high-risk area on the flora survey trigger map, to the extent the area contains threatened plants;
- a Koala habitat area;
- an area of land used by an animal that is listed as endangered wildlife or vulnerable wildlife or a special least concern animal (i.e. Short-beaked Echidna *Tachyglossus aculeatus* and Platypus *Ornithorhynchus anatinus*) under the NC Act for foraging, roosting, nesting or breeding.

The State maps Wildlife Habitat over sites N (option 1), N (option 2), L, P, D1 and D2, based on known records and/or modelling of suitable habitat (**Figure 3.4**). The actual presence of threatened or special

least concern species, and their use of the mapped areas, is subject to field verification.

The State also maps Koala habitat “Core” and “Locally Refined” within and around Sites N (option 1) and N (option 2) (**Figure 3.4**).

Flora species listed as Endangered or Vulnerable under the NC Act that are known to occur within the vicinity of the Cooloola Great Walk based on previous records include:

- *Acacia attenuata* (Vulnerable)
- *Acacia baueri subsp. Baueri* (Vulnerable)
- *Acronychia littoralis* (Endangered)
- *Allocasuarina emuina* (Endangered)
- *Archidendron lovelliae* (Vulnerable)
- *Arthraxon hispidus* (Vulnerable)
- *Blandfordia grandiflora* (Endangered)
- *Boronia keysii* (Vulnerable)
- *Bosistoia transversa* (Vulnerable)
- *Carex breviscapa* (Vulnerable)
- *Cryptocarya foetida* (Vulnerable)
- *Eucalyptus conglomerata* (Endangered)
- *Floydia praealta* (Vulnerable)
- *Macadamia integrifolia* (Vulnerable)
- *Macadamia ternifolia* (Vulnerable)
- *Macrozamia pauli-guilielmi* (Endangered).
- *Mallotus megadontus* (Vulnerable)
- *Marsdenia coronata* (Vulnerable)
- *Parsonsia sankowskyana* (Endangered)
- *Pomaderris crassifolia* (Vulnerable)
- *Prostanthera spathulata* (Vulnerable)
- *Ricinocarpos speciosus* (Vulnerable)
- *Romnaldia strobilacea* (Vulnerable)
- *Xanthostemon oppositifolius* (Vulnerable).

The field survey confirmed the presence of the following Endangered or Vulnerable flora species within or within close vicinity to one or more proposed accommodation sites:

- *Archidendron lovelliae* (Vulnerable) – a number of seedlings, saplings and small trees recorded along and near the access road alignment for Site P (**Figure 3.4**). Large trees occur within the broader area.

- *Cryptocarya foetida* (Vulnerable) - recorded at Site K, represented by a single seedling (**Figure 3.4**). Large trees occur within the broader area.
- *Macrozamia pauli-guilielmi* (Endangered) – mature individuals recorded in and around Site L (including the nearby Litoria Walkers' Camp), and in near Site N (option 2) (**Figure 3.4**).
- *Blandfordia grandiflora* (Endangered) – mature individual recorded on the edge of Site N (option 2).

The field surveys also confirmed the presence of *Boronia rivularis* (listed as Near Threatened under the NC Act) within heath/sedgeland habitat near to Site N (option 1) and Site N (option 2). Although habitat for Near Threatened species is not technically recognised as a “prescribed environmental matter” requiring assessment under relevant Queensland legislation, these species are protected under the State’s protected plant framework in accordance with the NC Act, and are also recognised as important values under the QPWS Operational Policy and Procedural Guide for assessing the impact of QPWS actions on natural and cultural values.

The remaining threatened flora species that have been previously recorded within 15km of the proposed lease areas were not detected despite targeted searches within suitable habitat, where this occurred within the surveyed areas. In particular, no other NC Act listed threatened flora species were recorded within surveyed rainforest habitat around Site P or within surveyed heath/sedgeland habitat around Site N (option 1) and Site N (option 2), despite the potential for many of these species to occur within these habitat types.

Fauna species listed as Endangered or Vulnerable under the NC Act that are known to occur within the vicinity of the Cooloola Great Walk based on previous records (excluding species exclusively or primarily associated with the open ocean, beaches, estuaries or intertidal environments, and/or lacustrine or riverine wetlands) include:

- Common Death Adder *Acanthophis antarcticus* (Vulnerable)
- Tusked Frog *Adelotus brevis* (Vulnerable)
- Glossy Black-Cockatoo *Calyptorhynchus lathami* (Vulnerable)
- Wallum Froglet *Crinia tinnula* (Vulnerable)

- Spotted-tailed Quoll (southern subspecies) (Vulnerable)
- Red Goshawk (Endangered)
- Painted Honeyeater (Vulnerable)
- Wallum Rocketfrog *Litoria freycineti* (Vulnerable)
- Wallum Sedgefrog (Vulnerable)
- Oxleyan Pygmy Perch (Vulnerable)
- Powerful Owl *Ninox strenua* (Vulnerable)
- Richmond Birdwing *Ornithoptera richmondia* (Vulnerable)
- Southern Greater Glider (Vulnerable)
- Ground Parrot (Eastern) *Pezoporus wallicus wallicus* (Vulnerable)
- Koala (Vulnerable)
- Plumed Frogmouth *Podargus ocellatus plumiferus* (Vulnerable)
- Australian Painted Snipe (Vulnerable)
- Southern Emu-wren *Stipiturus malachurus* (Vulnerable)
- Black-breasted Button-Quail (Vulnerable).

Platypus *Ornithorhynchus anatinus* and Short-beaked Echidna *Tachyglossus aculeatus* (both listed as Special Least Concern under the NC Act) are also known from the vicinity of the study area.

Spatial data available from the Queensland Government shows previous records for Black-breasted Button-Quail (Vulnerable) in close proximity to Sites D1 and D2 (**Figure 3.4**). The field survey confirmed the presence of this species at Site D2 and in the vicinity of Sites D1 and P in the form of platelets (foraging evidence) (**Photo 4, Figure 3.4**), although potential habitat for the species within Sites D1 and P is limited due to the open or disturbed structure of the vegetation.

The results of the survey indicate potential habitat for the following species occurs at one or more of the proposed accommodation sites, based on habitat type and condition:

- Glossy Black-Cockatoo (Vulnerable) – Sites K, L and P.
- Wallum Froglet (Vulnerable) – wallum heaths and sedgeland/swamp adjoining/near Site N (option 1) and Site N (option 2).

- Wallum Sedgefrog (Vulnerable) – wallum heaths and sedgeland/swamp adjoining/near Site N (option 1) and Site N (option 2). Spatial data available from the Queensland Government also shows previous records for Wallum Sedgefrog in close proximity to Site P (**Figure 3.4**). However, this species is not associated with habitats represented within the proposed lease area.
- Wallum Rocketfrog (Vulnerable) – wallum heaths and sedgeland/swamp adjoining/near Site N (option 1) and Site N (option 2). Spatial data available from the Queensland Government also shows previous records for Wallum Rocketfrog in close proximity to Site P (**Figure 3.4**). However, this species is not associated with habitats represented within the proposed lease area.
- Oxleyan Pygmy Perch (Vulnerable) – ponds and streams within wallum heaths and sedgeland/swamp adjoining/near Site N (option 1) and Site N (option 2).
- Southern Emu-wren (Vulnerable) – Sites N (option 1), N (option 2) and L.

The field survey also indicates potential habitat for Cooloola Blind Snake *Ramphotyphlops silvia* (Near Threatened) at Site P. Although habitat for Near Threatened species is not technically recognised as a “prescribed environmental matter” requiring assessment under relevant Queensland legislation, these species are recognised as important values under the QPWS Operational Policy and Procedural Guide for assessing the impact of QPWS actions on natural and cultural values.

Although the State maps Koala habitat at Site N (option 1) and Site N (option 2) (**Figure 3.4**), no evidence of Koala (i.e. no scratches or scats) was found during the targeted surveys, and the species is considered unlikely to frequent these proposed lease areas. However, there are suitable Koala food trees within these proposed lease areas and along the Noosa River, and it is possible that individuals may occasionally pass through the area.

3.2.2 Protected Areas

The entire Cooloola Great Walk and the proposed accommodation sites occur with the Gat Sandy National Park.

3.2.3 Marine Parks

There are no marine parks recognised within the vicinity of the Cooloola Great Walk.

3.2.4 Fish Habitat Areas

Lake Cooroibah is a recognised fish habitat area, a portion of which occurs near the southern-most portion of the Cooloola Great Walk. None of the proposed accommodation sites are located within, or in close proximity to this fish habitat area.

3.2.5 Waterways Providing for Fish Passage

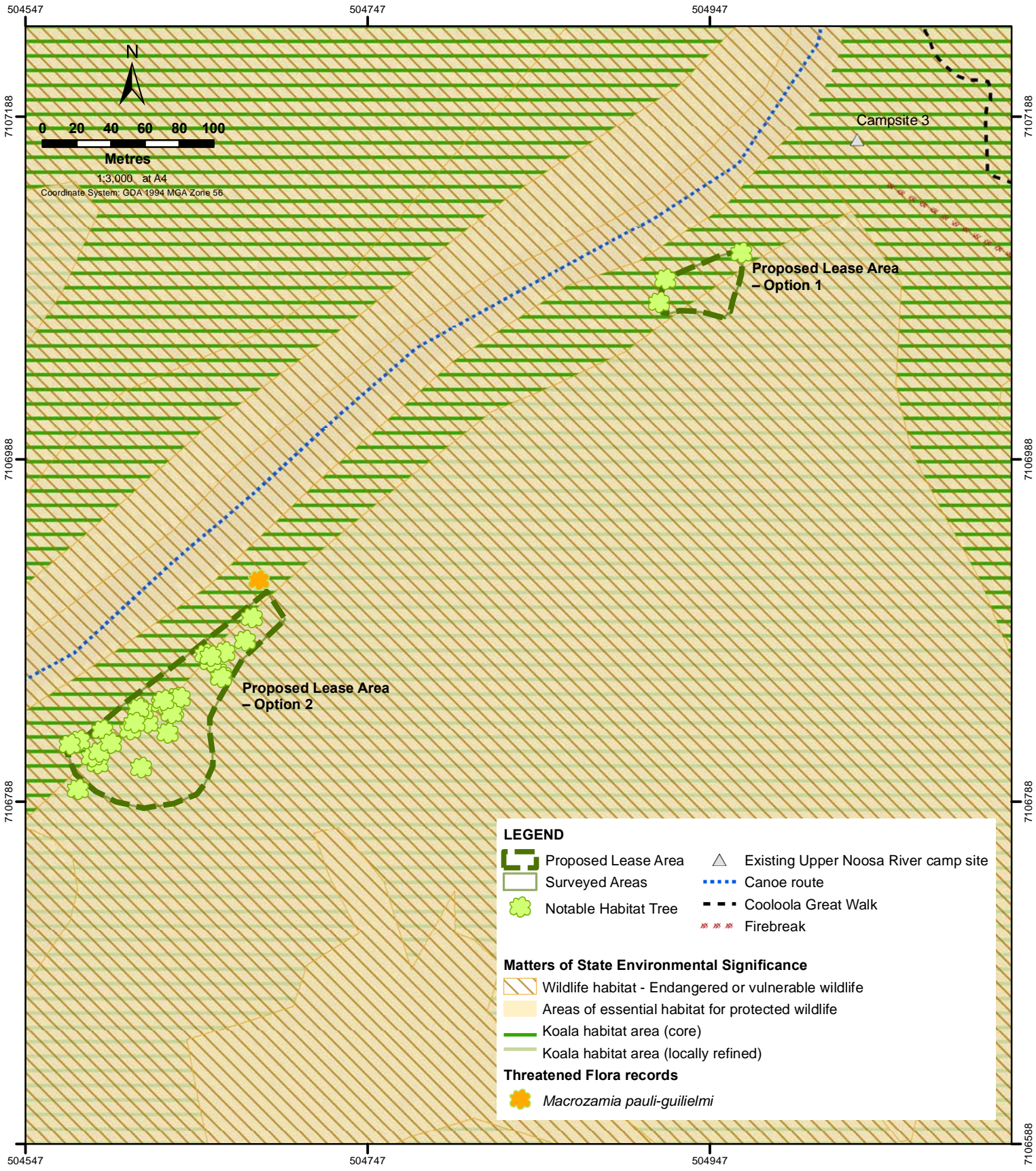
A number of waterways mapped by the State as providing for fish passage occur within the vicinity of the Cooloola Great Walk, from the vicinity of Freshwater Lake to the vicinity of Dutgee Walker’s Camp. Lake Cooroibah is also recognised as an estuary providing for fish passage.

The field survey confirmed the presence of fish passage waterways near Sites N (option 1), N (option 2) and L (**Figure 3.3**).

3.2.6 Marine Plants

State mapping of remnant vegetation and estuarine habitat indicates marine plants in the vicinity of the Cooloola Great Walk are likely to be restricted to Lake Cooroibah and its immediate surrounds.

The field survey confirmed no marine plants occur within close proximity to any of the proposed accommodation sites.



LEGEND

Proposed Lease Area	Existing Upper Noosa River camp site
Surveyed Areas	Canoe route
Notable Habitat Tree	Coolooloa Great Walk
	Firebreak

Matters of State Environmental Significance

Wildlife habitat - Endangered or vulnerable wildlife
Areas of essential habitat for protected wildlife
Koala habitat area (core)
Koala habitat area (locally refined)

Threatened Flora records

<i>Macrozamia pauli-guilielmi</i>



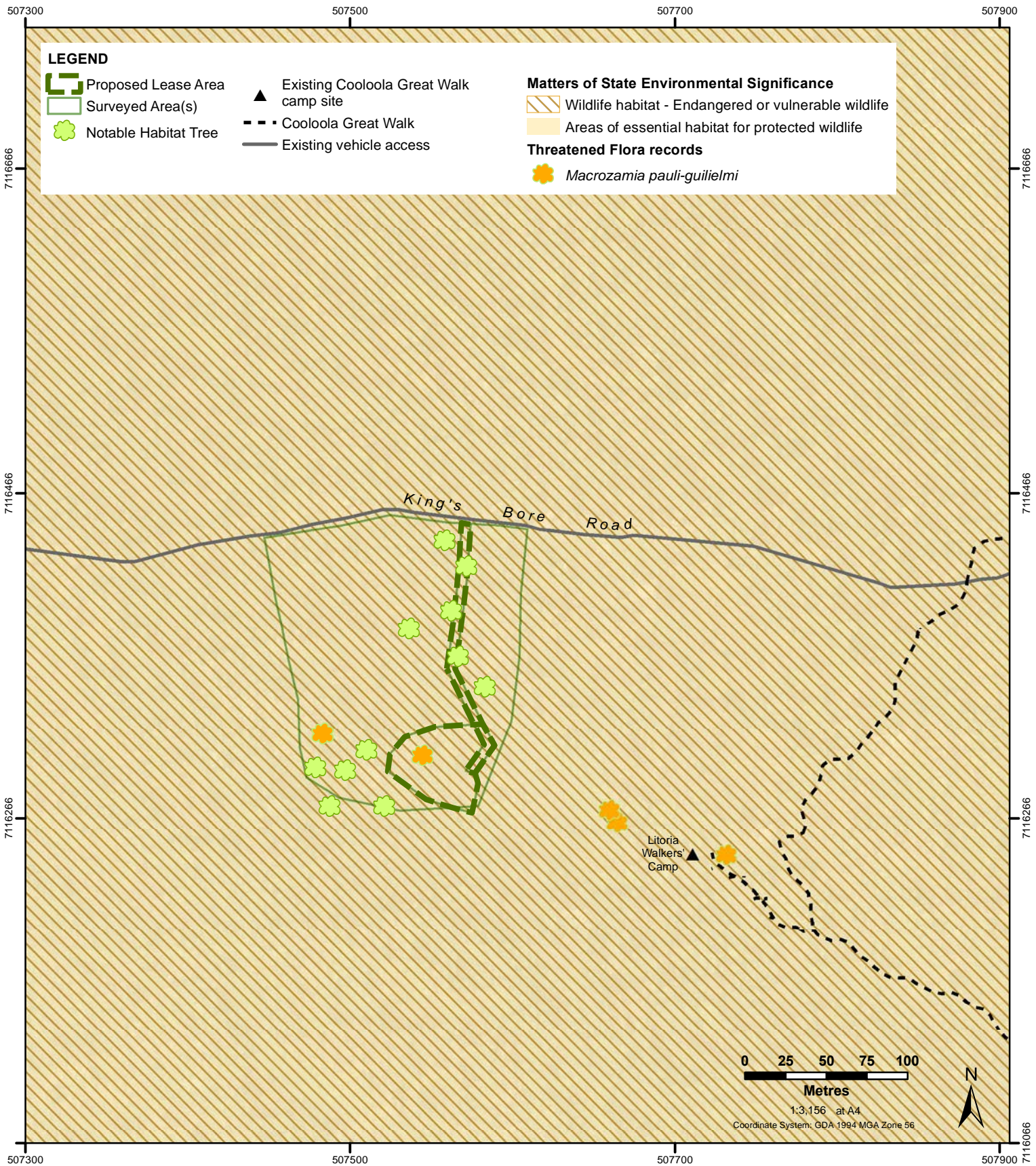
Data Sources:
 Threatened Flora Records
 BAAM - March 2020, May 2020, June 2020
 DEH - 21 June 2020
 MSES Regulated Vegetation Essential Habitat - Qld
 Publication Date 09-04-020
 MSES Wildlife Habitat - Endangered or Vulnerable Wildlife
 Publication Date 03-02-020
 MSES Wildlife Habitat - Special Least Concern Animal
 Publication Date 07-02-020
 State of Queensland (Department of Environment and Science) 2020

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Drawn By: KM Reviewed by: JA Date: 3/09/2020

Figure: 3.4a
Title: MSES – Threatened Species and Habitat - Site N
Project: Premium Ecotourism Products – Coolooloa Great Walk
Client: Department of Environment and Science





LEGEND

- Proposed Lease Area
- Surveyed Area(s)
- Notable Habitat Tree
- Existing Cooloola Great Walk camp site
- Cooloola Great Walk
- Existing vehicle access

Matters of State Environmental Significance

- Wildlife habitat - Endangered or vulnerable wildlife
- Areas of essential habitat for protected wildlife

Threatened Flora records

- Macrozamia pauli-guilielmi*



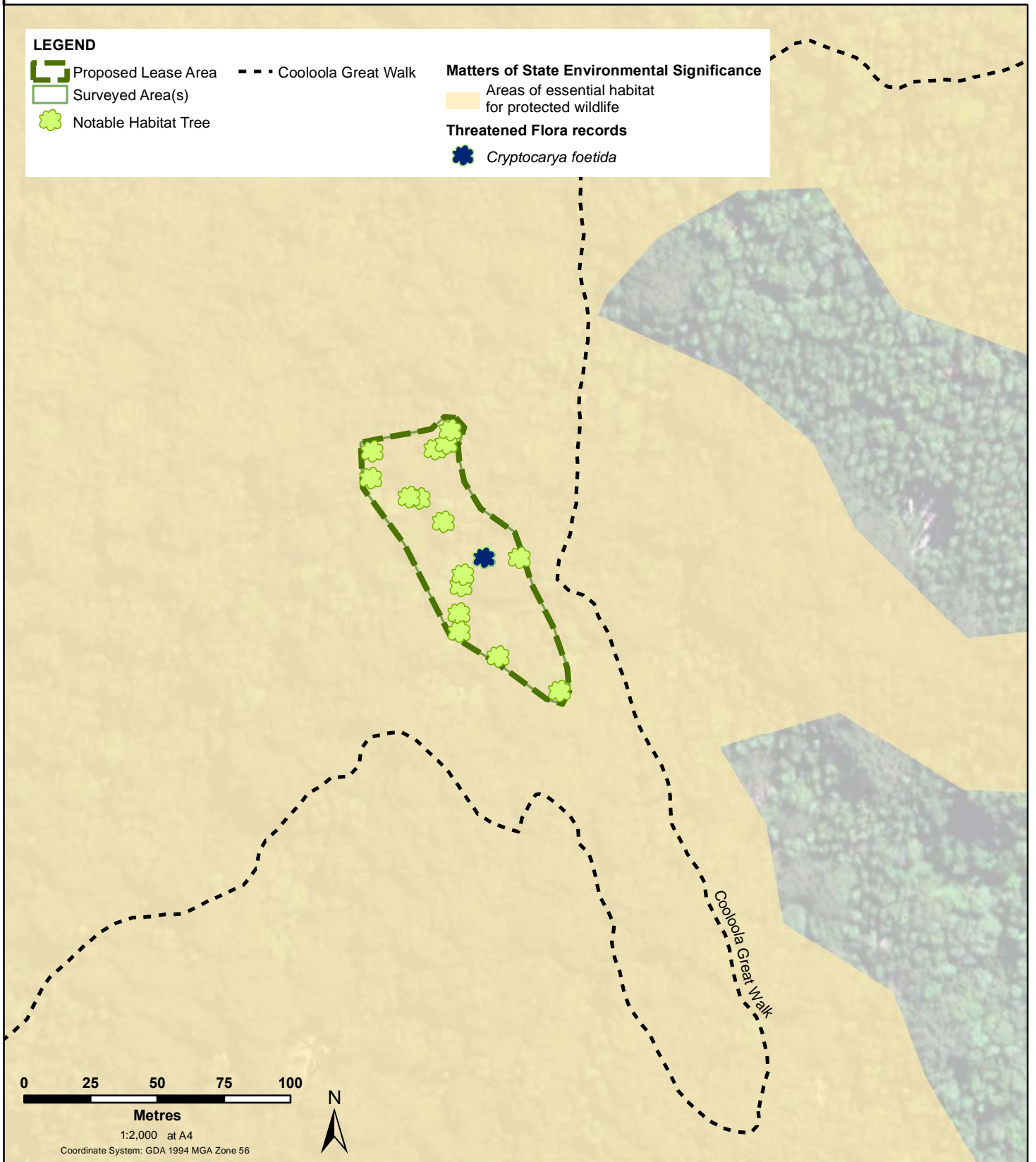
Data Sources:
 Threatened Flora Records
 BAAM - March 2020, May 2020
 MSES Regulated Vegetation Essential Habitat - Qld
 Publication Date 09-04-020
 MSES Wildlife Habitat - Endangered or Vulnerable Wildlife
 Publication Date 03-02-020
 MSES Wildlife Habitat - Special Least Concern Animal
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Drawn By: KM Reviewed by: JA Date: 2/09/2020

Figure: 3.4b
Title: MSES – Threatened Species and Habitat - Site L
Project: Premium Ecotourism Products – Cooloola Great Walk
Client: Department of Environment and Science





Data Sources:
 Threatened Flora Records
 BAAM - April 2020, May 2020
 MSES Regulated Vegetation Essential Habitat - Qld
 Publication Date 09-04-020
 MSES Wildlife Habitat - Endangered or Vulnerable Wildlife
 Publication Date 03-02-020
 MSES Wildlife Habitat - Special Least Concern Animal
 Publication Date 07-02-020
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Drawn By: KM Reviewed by: JA Date: 2/09/2020

Figure: 3.4c
Title: MSES – Threatened Species and Habitat - Site L
Project: Premium Ecotourism Products – Cooloola Great Walk
Client: Department of Environment and Science



LEGEND

- Proposed Lease Area
- Surveyed Area(s)
- Notable Habitat Tree
- Coolooloa Great Walk

Matters of State Environmental Significance

- Wildlife habitat - Endangered or vulnerable wildlife
- Wildlife habitat - Special least concern animal
- Areas of essential habitat for protected wildlife

Threatened Fauna Records: 2020 Surveys

- Black-breasted Button-Quail

Threatened Flora Records: 2020 Surveys

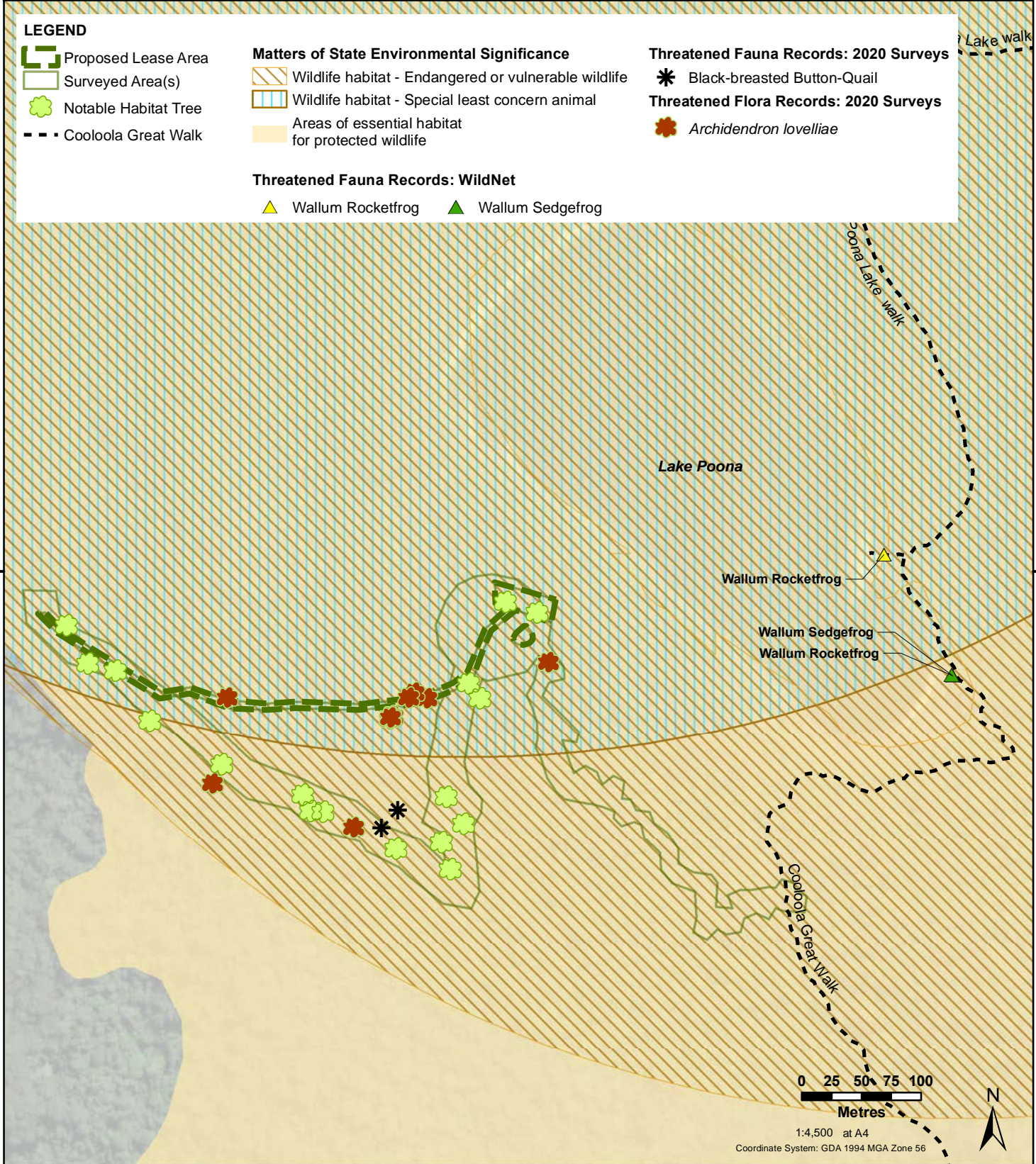
- Archidendron lovelliae*

Threatened Fauna Records: WildNet

- Wallum Rocketfrog
- Wallum Sedgefrog

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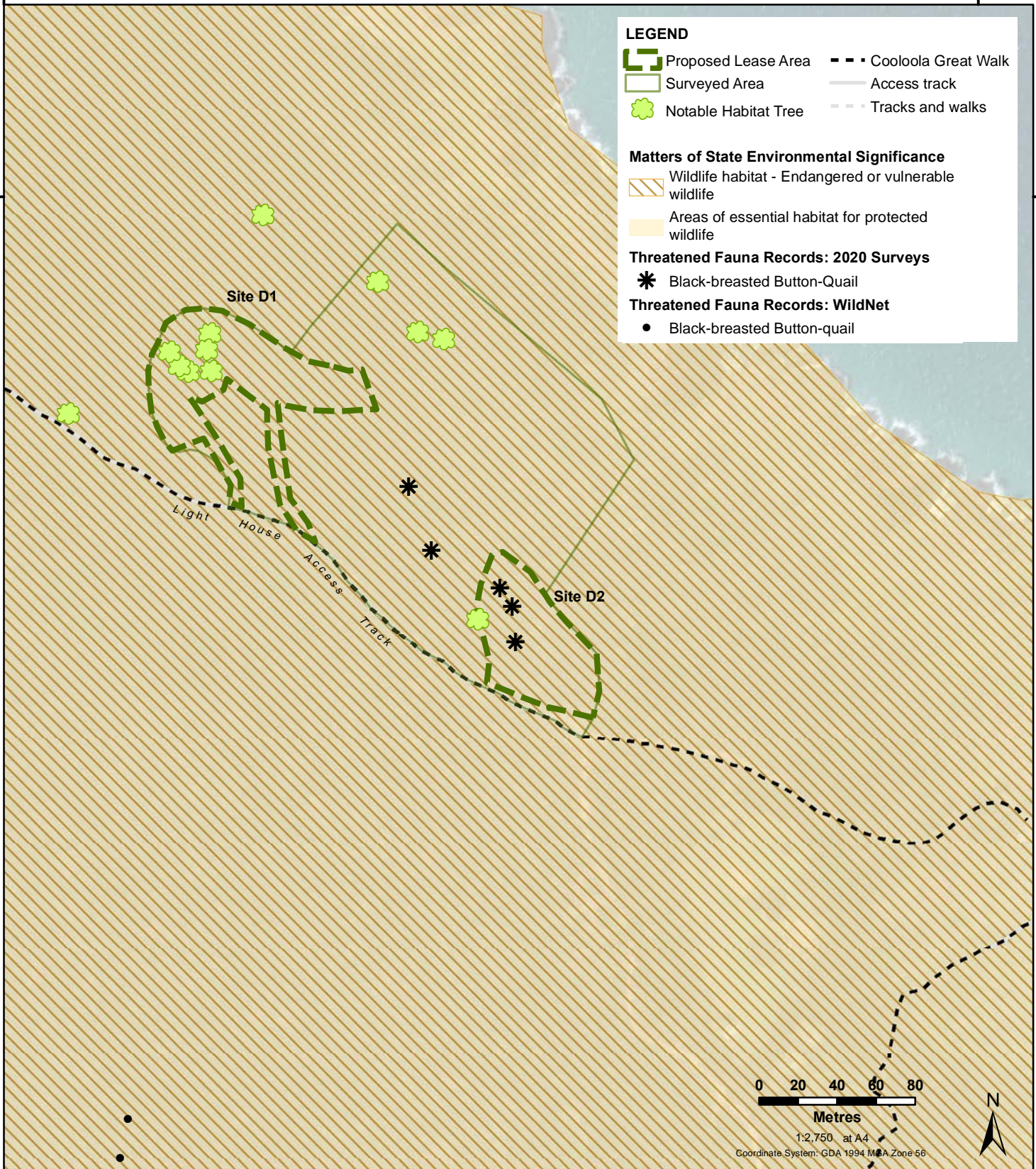
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Data Sources:
 Threatened Flora and Fauna Records: 2020 Surveys
 BAAM - March 2020, May 2020
 MSES Regulated Vegetation Essential Habitat - Qld
 Publication Date 09-04-020
 MSES Wildlife Habitat - Endangered or Vulnerable Wildlife
 Publication Date 03-02-020
 MSES Wildlife Habitat - Special Least Concern Animal
 Publication Date 07-02-020
 Threatened Fauna Records: WildNet - WildNet wildlife records - published - Queensland
 State of Queensland (Department of Environment and Science) 2020
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 Drawn By: KM Reviewed by: JA Date: 3/09/2020

Figure: 3.4d
Title: MSES – Threatened Species and Habitat - Site P
Project: Premium Ecotourism Products – Coolooloa Great Walk
Client: Department of Environment and Science





Data Sources:
 Threatened Fauna Records: 2020 Surveys
 BAAM - March 2020, May 2020
 MSES Regulated Vegetation Essential Habitat - Qld
 Publication Date 09-04-020
 MSES Wildlife Habitat - Endangered or Vulnerable Wildlife
 Publication Date 03-02-020
 MSES Wildlife Habitat - Special Least Concern Animal
 Publication Date 07-02-020
 Threatened Fauna Records: WildNet - WildNet wildlife records - published - Queensland
 State of Queensland (Department of Environment and Science) 2020





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Drawn By: KM Reviewed by: JA Date: 3/09/2020

Figure: 3.4e
Title: MSES – Threatened Species and Habitat - Site D
Project: Premium Ecotourism Products – Coolooloa Great Walk
Client: Department of Environment and Science



Table 3.2. Summary of ecological values and generally suitability of each proposed accommodation site

Site	GPS coordinates	Photos	Description of Ecological Values and General Suitability
Site N (option 1)	-26.1555, 153.0495		<p>This proposed lease area is not located adjacent to the Great Walk but is located along the walking track between the existing Noosa River campsites 2 and 3. The vegetation was ground-truthed as containing Of Concern RE 12.3.14a. Adjacent vegetation includes Least Concern RE 12.3.14a and Of Concern RE 12.2.12. The vegetation on the edges of the proposed lease area contains some hollow bearing trees.</p> <p>This site is mapped within a wetland of high ecological significance, although the survey determined that wetland habitat does not occur within the proposed lease area. Adjacent wetland habitat provides high quality resources for threatened fauna species such as Wallum Sedgefrog, Wallum Froglet and Wallum Rocketfrog, and threatened plant species such as <i>Blandfordia grandiflora</i>. The site and surrounds also provide potential habitat for Grey-headed Flying Fox, Three-toed Snake-tooth Skink, Southern Emu-wren, Black-faced Monarch and Rufous Fantail. <i>Boronia rivularis</i> is also common in the surrounding landscape, while Oxleyan Pygmy Perch may occur in ponds and streams within adjacent wetland habitat. The large trees present have high value for breeding and denning for hollow dependant species. The potential for Koalas at this location is low, despite suitable food trees.</p> <p>This site was selected as an alternative to the originally proposed campsite envelope near existing Noosa River campsite 4, which was considered too close to the existing campsite and the Great Walk track. Site N (option 1) maintains proximity to the Great Walk and the Noosa River, although may be less suitable than Site N (option 2) due to its closer proximity to existing Noosa River campsite 3.</p>
Site N (option 2) (Q1 and Q2)	-26.1579, 153.046		<p>This proposed lease area is not located adjacent to the Great Walk but is located along the walking track between the existing Noosa River campsites 2 and 3, further south-west than Site N (option 1). The vegetation was ground-truthed as containing Of Concern RE 12.3.14a and Least Concern RE 12.2.9. Adjacent vegetation includes RE 12.3.14a, Of Concern RE 12.2.12 and Least Concern RE 12.2.15. The vegetation within the site contains some hollow bearing trees, primarily within RE 12.3.14a.</p> <p>An isolated individual of <i>Macrozamia pauli-guilielmi</i> was detected adjacent to the north-eastern corner of the proposed lease area, while <i>Blandfordia grandiflora</i> has been detected on the edge of the proposed lease area. This site is mapped within a wetland of high ecological significance, although the survey determined that wetland habitat does not occur within the proposed lease area. Adjacent wetland habitat provides high quality resources for threatened fauna species such as Wallum Sedgefrog, Wallum Froglet and Wallum Rocketfrog, as and threatened plant species such as <i>Blandfordia grandiflora</i>. The site and surrounds also provide potential habitat for Grey-headed Flying Fox, Three-toed Snake-tooth Skink, Southern Emu-wren, Black-faced Monarch and Rufous Fantail. <i>Boronia rivularis</i> is also common in the surrounding landscape, while Oxleyan Pygmy Perch may occur in ponds and streams within adjacent wetland habitat. The potential for Koalas at this location is low, despite suitable food trees.</p> <p>This site was selected as an alternative to Site N (option 1) and another site close to existing Noosa River campsite 4, as it was a sufficient distance from existing campsites, but could still be readily accessed from the Great Walk and the Noosa River.</p>
Site L (Q29)	-26.0724, 153.0755		<p>This area is adjacent to the existing Litoria Walkers' camp, with a proposed access road to extend north from the site to an existing access road ("King's Bore Road"). RE confirmed as least concern 12.2.8 (<i>Eucalyptus pilularis</i> open forest), with some large, hollow-bearing trees recorded in the area.</p> <p><i>Macrozamia pauli-guilielmi</i> is common throughout the existing Litoria Walkers' Campgrounds, and one specimen was recorded within the proposed accommodation site. The area also provides potential habitat for Three-toed Snake-tooth Skink, Grey-headed Flying Fox, Glossy Black-Cockatoo and Southern Emu-wren, as well as Black-faced Monarch and Rufous Fantail. The large trees present have high value for breeding and denning for hollow dependant species, including Glossy Black-Cockatoo.</p> <p>The locations of proposed camp site infrastructure and the proposed access road were refined during the subsequent site inspections undertaken during May 2020, in order to avoid notable habitat trees.</p>
Site K (Q30)	-26.0223, 153.1130		<p>RE confirmed as the least concern RE 12.2.8 (<i>Eucalyptus pilularis</i> open forest), with some large, hollow-bearing trees recorded.</p> <p>A <i>Cryptocarya foetida</i> seedling was found within the site. The vegetation also provides potential habitat for Three-toed Snake-tooth Skink, Grey-headed Flying-fox and Glossy Black-Cockatoo, as well as Black-faced Monarch, Rufous Fantail and Spectacled Monarch. The large trees present have high value for breeding and denning for hollow dependant species, including Glossy Black-Cockatoo.</p> <p>The proposed lease area was extended slightly during the subsequent site inspections undertaken during May 2020, to allow sufficient room for camp site infrastructure to avoid the <i>Cryptocarya foetida</i> specimen and notable habitat trees, including some large <i>Allocasuarina torulosa</i> representing potential feeding trees for Glossy Black-Cockatoo.</p>

Site	GPS coordinates	Photos	Description of Ecological Values and General Suitability
Site P (Q31-36)	-25.9646, 153.1086		<p>The site envelope assessed during the detailed survey in March 2020 contained very large, old growth trees that would need to be removed or lopped due to potential safety concerns. The proposed access road alignment also contained numerous large, notable habitat trees, and traversed some well-developed and highly diverse rainforest vegetation recognised as Of Concern RE 12.2.1 and a Critically Endangered Ecological Community containing threatened plant species. Black-breasted Button-Quail evidence was also recorded adjoining the access alignment.</p> <p>Due to the significance of potential impacts associated with the site and access road surveyed during March 2020, the subsequent site inspections undertaken during May 2020 resulted in the identification of a new proposed lease area that avoids the patch of RE 12.2.1 and the majority of notable habitat trees. The proposed access road is also now much shorter in length and follows an old snig track, predominantly within Least Concern RE 12.2.8 (<i>Eucalyptus pilularis</i> open forest).</p> <p>A small area of Of Concern RE 12.2.3 (Araucarian vine forest – not a Threatened Ecological Community) is now crossed within the lower road sections, and a number of specimens of the threatened flora species <i>Archidendron lovelliae</i> were recorded along the alignment, although these could be avoided during road construction. The new road alignment also utilises a tree fall gap that will reduce the need to clear notable habitat trees. The campsite area has also been positioned to avoid the clearing of notable habitat trees and threatened flora.</p>
Site D1 (Q38-40)	-25.9297, 153.1861		<p>The site envelope and access road alignment assessed during the detailed survey in March 2020 was located adjacent to Of Concern RE 12.12.19 (vegetation complex of rocky headlands) and contained some large, hollow-bearing trees, particularly along the proposed access road. Black-breasted Button-Quail evidence was also recorded along the proposed access road.</p> <p>Due to the potential impacts associated with the site and access road surveyed during March 2020, the subsequent site inspections undertaken during May 2020 resulted in the repositioning of the access road within lower value, early successional vegetation, to avoid notable habitat trees and higher quality Black-breasted Button-Quail habitat. The proposed lease area was also moved away from Of Concern RE 12.12.19, although some significant trees remain, and should be avoided where practical.</p>
Site D2 (Q38-40)	-25.9310, 153.1879 (southern site)		<p>This site contains some Black-breasted Button-Quail evidence, but is mainly comprised early successional vegetation with low value for the species. It is understood the use of this site will involve low impact activities, with no significant clearing of vegetation or extensive fixed structures expected.</p>

4.0 IMPACT ASSESSMENT

4.1 IMPACT MECHANISMS

4.1.1 Vegetation Removal

Some removal of vegetation will need to occur for the siting and construction of accommodation infrastructure and access tracks.

Removal of vegetation reduces the total amount of habitat and populations of flora and fauna, and has the potential to result in fragmentation of habitats and populations, changes to remaining vegetation that cause the loss of food, breeding and shelter resources for fauna, and exposure to introduced species that are either competitors or predators. The removal of vegetation can also result in direct loss of individual plants, including EVNT species, and large trees that may provide breeding and sheltering resources for fauna, and can result in the mortality of fauna present at the time of vegetation removal.

The extent of direct impact from clearing is restricted to the specific locations of vegetation being removed. However, secondary impacts can affect peripheral vegetation through:

- soil disturbance/exposure and altered water flow patterns, and subsequent erosion and sedimentation, which may expose tree roots, smother vegetation, and potentially alter the physical form, chemical processes and ecological health of downstream aquatic and riparian habitats; and
- increased desiccation, light penetration, wind-throw, herbivory, weed invasion, nest predation, and parasitism for adjacent flora and fauna. In particular, introduced weeds can change vegetation community composition and, in some cases, increase the intensity of fire, leading to further community degradation.

The extent of these impacts (referred to as “edge effects”) vary according to vegetation/habitat type and other biophysical characteristics, as well as the nature and severity of the impact. McAlpine (2007) states that a comprehensive review by Murcia (1995) “noted that most edge effects were reported to have disappeared within 50m of the remnant edge, whilst a review by Laurance (2001) concluded that most empirical studies of edge effects reported distances of penetration less than 150m”. For the purposes of this assessment, it is assumed vegetation/habitat up to 100m from the clearing footprint could be affected by edge effects, although significant impacts are unlikely beyond 50m from the clearing footprint.

The removal of vegetation can also create barriers to fauna movement through habitat fragmentation, affecting reproductive cycles and facilitating the incursion of pest species and aggressive, native “edge” species deeper into woodlands and forests.

4.1.2 Construction and Operation

In addition to vegetation removal and the associated secondary (or indirect) impacts, the construction and operation of the accommodation sites (and the expected associated increase in use of the existing Cooloola Great Walk track) have the potential to result in on-going disturbance to surrounding habitats.

Artificial lighting may affect behaviour of both nocturnal and diurnal fauna, both vertebrate and invertebrate, including interfering with birds that migrate at night; altering reproductive behaviour of frogs; disrupting communication between individual mammals and birds; focusing the foraging activities of insectivores; and increasing the likelihood of predation for some species.

Similarly, noise, including background noise, generated by human activities can potentially affect behaviour and persistence of species and communities by, for example, masking of alarm and mating calls, location and motion of resources, obstructions or potential harms; in short, noise pollution affects the sending and reception of behavioural and social signals in faunal communities.

Construction/maintenance vehicles and accommodation guests have the potential to introduce and/or spread weed species and plant pathogens, and damage vegetation (including EVNT flora species and important habitat features) through unauthorised or inadvertent access to adjacent habitats.

Degradation of adjacent and downstream habitats can result from increased local nutrient loads (e.g. from insufficiently treated/contained wastewater), contamination (from insufficiently contained hazardous substances) and altered drainage.

The extent of these impacts would vary according to vegetation/habitat type and other biophysical characteristics, as well as the nature and severity of the impact.

General waste and land disturbance also have the potential to attract highly competitive and/or predatory exotic fauna species.

Without appropriate design, structures to facilitate vehicular access across waterways can represent barriers to the movement of fish and other aquatic fauna between upstream and downstream habitats.

4.1.3 Fire

Fire is a natural part of the Australian landscape, and is critical to the life cycles of many native species. However, some ecosystems (such as rainforests) have a low tolerance to fire, while others have adapted to specific fire “regimes” characterised by a combination of fire frequency, extent, intensity and season.

An increase in human presence, particularly that associated with camping activities, has the potential to increase the risk of accidental fires within vegetated areas, disrupting the natural fire regime and adversely affecting vegetation and habitat structure and habitat value for a range of significant species. These impacts can occur over large areas, well beyond the source of the fire, and can be long-lasting or irreversible.

4.2 RISK OF SIGNIFICANT IMPACTS UPON MNES

The following sections assess the risk of potentially significant impacts (i.e. beyond the risks of those impacts occurring as a result of the ongoing use of the Cooloola Great Walk and existing camps in the absence of any additional accommodation sites) on MNES, to determine the management measures required to eliminate the risks, or reduce or maintain risks at low levels.

The significance of potential impacts is based on recognised criteria for the matter being assessed, while risk levels have been assessed on the basis of the risk assessment matrix shown in **Figure 4.1**.

Likelihood	Consequence	
	Minor	Significant
Improbable	Low Risk	Low Risk
Possible	Low Risk	Moderate Risk
Probable	Low Risk	High Risk

Figure 4.1. Risk assessment matrix

4.2.1 Fire

Under certain conditions, accidental fires resulting from the operation of the proposed accommodation sites would have the potential to result in significant impacts on all MNES occurring within the surrounding National Park. However, it is acknowledged that there is, and will continue to

be, an existing risk of accidental fire from the ongoing use of the Cooloola Great Walk and existing camping areas in the absence of any additional accommodation sites. Consequently, without appropriate management, the risk of an increase in these impacts as a result of the operation of the proposed accommodation sites is assessed as low-moderate. This risk is able to be reduced or maintained at low levels through restrictions on campfires and the numbers of guests, preventing use of the accommodation sites during periods of extreme or catastrophic bushfire danger, ensuring site and equipment maintenance is undertaken at appropriate intervals, using dedicated storage structures for flammable liquids at each site, ensuring guests are accompanied and supervised by highly trained guides, and educating guests on the causes and impacts of fire.

4.2.2 Other Potential Impacts

The field surveys have determined the project may result in impacts upon the following MNES:

- **Critically Endangered TECs**, including the Littoral Rainforests and Coastal Vine Thickets of Eastern Australia.
- **Endangered Flora Species**, including *Macrozamia pauli-guilielmi*.
- **Vulnerable Flora Species**, including *Archidendron lovelliae* and *Cryptocarya foetida*.
- **Endangered Fauna Species**, including Oxleyan Pygmy Perch.
- **Vulnerable Fauna Species**, including Wallum Sedgefrog, Three-toed Snake-tooth Skink, Black-breasted Button-Quail and Grey-headed Flying-fox.
- **Migratory Fauna Species**, including , Rufous Fantail, Black-faced Monarch and Spectacled Monarch.

Tables 4.1 to 4.6 summarise an assessment of the significance and risk of potential impacts (other than fire – refer **Section 4.2.1**) upon these MNES, based on the criteria specified in the *Matters of National Environmental Significance: Significant Impact Guidelines 1.1* (DotE 2013). This includes an assessment of the risk of significant impact in the absence of impact management, and a description of impact management measures to eliminate the risk or achieve/maintain a low “residual” (post-management) risk.

Table 4.1: Assessment against significant impact criteria for Critically Endangered TECs

Significant Impact Criteria	Potential Impact	Risk of Significant Impact without Impact Management	Impact Management Measures to Eliminate Risk, or Achieve/Maintain Low Residual Risk
<p><i>An action is likely to have a significant impact on an Endangered TEC if there is a real chance or possibility that it will:</i></p> <p><i>Reduce the extent of an ecological community</i></p>	<p>The establishment of accommodation infrastructure and associated access for Site P could result in the accidental removal of, or damage to, some adjacent TEC vegetation.</p>	<p>Low Risk: This impact could occur in the absence of appropriate site design and management, but the extent of the impact would be very low (i.e. a small number of trees/shrubs).</p>	<ul style="list-style-type: none"> • Incorporate suitable buffers between the clearing footprint and the adjacent TEC as part of detailed site design. • Clearly delineate and communicate clearing footprint boundaries and “no-go” areas during construction.
<p><i>Fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines</i></p>	<p>The establishment and operation of the proposed accommodation infrastructure and associated access at Sites P and K would not fragment or increase fragmentation of the TEC.</p>	<p>n/a</p>	<p>n/a</p>
<p><i>Adversely affect habitat critical to the survival of an ecological community</i></p>	<p>The clearing of vegetation for Sites P and K could lead to edge effects that extend into the adjacent/nearby TEC.</p> <p>Construction/maintenance vehicles and accommodation guests could introduce and/or spread weed species and plant pathogens through unauthorised or inadvertent access into the TEC adjacent to Site P.</p>	<p>Low-Medium Risk.</p> <p>Removal of some of the previously undisturbed canopy is likely to lead to edge effects that extend into surrounding vegetation. This may lead to significant impacts upon the TEC vegetation adjacent to Site P, whereas the impact to TEC vegetation near Site K is unlikely to be significant.</p> <p>The spread of existing weed species is likely to occur without appropriate management measures, although the introduction of new species and pathogens beyond that which would occur from ongoing use of the Great Walk and existing camp sites is unlikely.</p>	<ul style="list-style-type: none"> • Position infrastructure within existing cleared areas and/or avoid the removal of canopy vegetation wherever possible. • Restrict the numbers of guests and ensure they are accompanied and supervised by highly trained guides and educated on access restrictions and the avoidance of environmental impact, particularly in relation to the introduction and spread of weeds and plant pathogens. • Cancel or postpone tours in response to high biosecurity risks. • Prepare and implement Environmental Management Plans that commit to the ongoing maintenance of the sites and appropriate environmental standards over the life of the project, and the ongoing monitoring and management of impacts. For example: <ul style="list-style-type: none"> - Ensure construction equipment and vehicles are cleaned and certified “weed free” before entering the National Park. - Provide chemical footbaths at the commencement of the Great Walk trail and at each accommodation site. - Train tour guides in the identification of weeds and other indicators of ecological impact, such

Significant Impact Criteria	Potential Impact	Risk of Significant Impact without Impact Management	Impact Management Measures to Eliminate Risk, or Achieve/Maintain Low Residual Risk
			that they can provide regular feedback as part of a broader monitoring regime.
<p><i>Modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns</i></p>	<p>The establishment and operation of accommodation infrastructure and associated access at Sites P and K would not destroy abiotic necessary for the ecological community's survival. In particular, there are no drainage lines impacted by either site, and they are positioned on highly permeable, sandy substrates with limited earthworks required. Hence, a substantial alteration of surface water drainage patterns and/or a reduction of groundwater levels would not be expected.</p>	n/a	n/a
<p><i>Cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting</i></p>	<p>The establishment and operation of accommodation infrastructure and associated access at Sites P and K would not cause a substantial change in the species composition of the ecological communities occurring in the vicinity.</p>	n/a	n/a
<p><i>Cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to:</i></p> <ul style="list-style-type: none"> - <i>assisting invasive species, that are harmful to the listed ecological community, to become established, or</i> - <i>causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of</i> 	<p>The clearing of vegetation for Sites P and K could lead to edge effects that extend into the adjacent/nearby TEC.</p> <p>Construction/maintenance vehicles and accommodation guests could introduce and/or spread weed species and plant pathogens through unauthorised or inadvertent access into the TEC adjacent to Site P.</p>	<p>Low-Medium Risk.</p> <p>Removal of some of the previously undisturbed canopy is likely to lead to edge effects that extend into surrounding vegetation. This may lead to significant impacts upon the TEC vegetation adjacent to Site P, whereas the impact to TEC vegetation near Site K is unlikely to be significant.</p> <p>The spread of existing weed species is likely to occur without appropriate management measures, although the introduction of new species and pathogens beyond that which would occur from ongoing use of the Great Walk and existing camp sites is unlikely.</p>	<ul style="list-style-type: none"> • Position infrastructure within existing cleared areas and/or avoid the removal of canopy vegetation wherever possible. • Restrict the numbers of guests and ensure they are accompanied and supervised by highly trained guides and educated on access restrictions and the avoidance of environmental impact, particularly in relation to the introduction and spread of weeds and plant pathogens. • Cancel or postpone tours in response to high biosecurity risks. • Prepare and implement Environmental Management Plans that commit to the ongoing maintenance of the sites and appropriate environmental standards over the life of the project, and the ongoing monitoring and management of impacts. For example:

Significant Impact Criteria	Potential Impact	Risk of Significant Impact without Impact Management	Impact Management Measures to Eliminate Risk, or Achieve/Maintain Low Residual Risk
<i>species in the ecological community</i>			<ul style="list-style-type: none"> - Ensure construction equipment and vehicles are cleaned and certified “weed free” before entering the National Park. - Provide chemical footbaths at the commencement of the Great Walk trail and at each accommodation site. - Train tour guides in the identification of weeds and other indicators of ecological impact, such that they can provide regular feedback as part of a broader monitoring regime.
<i>Interfere with the recovery of an ecological community.</i>	The establishment and operation of the proposed accommodation infrastructure and associated access would not interfere with the recovery of the TEC.	n/a	n/a

Table 4.2: Assessment against significance impact criteria for Endangered flora species

Significant Impact Criteria	Potential Impact	Risk of Significant Impact without Impact Management	Impact Management Measures to Eliminate Risk, or Achieve/Maintain Low Residual Risk
<p><i>An action is likely to have a significant impact on an Endangered species if there is a real chance or possibility that it will:</i></p> <p><i>Lead to a long-term decrease in the size of a population</i></p>	<p>The establishment of accommodation infrastructure at Site L could result in a direct impact to a single <i>Macrozamia pauli-guilielmi</i> specimen, while the construction of access for Site N (option 2) could result in the accidental removal of, or damage to, a single <i>Macrozamia pauli-guilielmi</i> specimen.</p> <p>The operation of these sites could also lead to direct impacts on these <i>Macrozamia pauli-guilielmi</i> specimens through accidental trampling by accommodation guests.</p> <p>Unauthorised or inadvertent guest access into habitat surrounding Site L could also lead to direct impacts on other <i>Macrozamia pauli-guilielmi</i> specimens.</p>	<p>Low Risk. Direct impacts are likely to occur in the absence of appropriate site design and management. However, the loss of a single or small number of specimens is not expected to lead to a long-term decrease in the size of the population occurring throughout the National Park.</p>	<ul style="list-style-type: none"> • Position site infrastructure and access alignments to avoid <i>Macrozamia pauli-guilielmi</i> specimens. • Incorporate suitable buffers between clearing footprints and known/potential habitat for endangered flora species as part of detailed site design. • Provide supervision and physical protection for <i>Macrozamia pauli-guilielmi</i> specimens and clearly delineate and communicate clearing footprint boundaries and “no-go” areas during construction. • Restrict the numbers of guests and ensure they are accompanied and supervised by highly trained guides and educated on access restrictions and the avoidance of environmental impact, particularly in relation to known or potentially occurring threatened flora.
<p><i>Reduce the area of occupancy of the species</i></p>	<p>The establishment and operation of the proposed accommodation infrastructure and associated access will not reduce the area of occupancy of these endangered species.</p>	<p>n/a</p>	<p>n/a</p>
<p><i>Fragment an existing population into two or more populations</i></p>	<p>Direct impacts to <i>Macrozamia pauli-guilielmi</i> specimens during the establishment and operation of accommodation infrastructure and associated access at Sites L and N (option 2) has the potential to fragment existing populations into two or more populations if the distance between retained individuals has a significant impact on reproduction (i.e. pollination).</p>	<p>Low Risk. Direct impacts are likely to occur at Site L and could occur at Site N (option 2) in the absence of appropriate site design and management. However, the loss of a single or small number of specimens is not expected to fragment existing populations into two or more populations.</p>	<ul style="list-style-type: none"> • Position site infrastructure and access alignments to avoid <i>Macrozamia pauli-guilielmi</i> specimens. • Incorporate suitable buffers between clearing footprints and known/potential habitat for endangered flora species as part of detailed site design. • Provide supervision and physical protection for <i>Macrozamia pauli-guilielmi</i> specimens and clearly delineate and communicate clearing footprint boundaries and “no-go” areas during construction. • Restrict the numbers of guests and ensure they are accompanied and supervised by highly trained guides and educated on access restrictions and the avoidance of environmental impact, particularly in relation to known or potentially occurring threatened flora.

Significant Impact Criteria	Potential Impact	Risk of Significant Impact without Impact Management	Impact Management Measures to Eliminate Risk, or Achieve/Maintain Low Residual Risk
<p><i>Adversely affect habitat critical to the survival of a species</i></p>	<p>The clearing of vegetation for Sites L and N (option 2) could lead to edge effects that extend into adjacent habitat for <i>Macrozamia pauli-guilielmi</i>.</p> <p>Construction/maintenance vehicles and accommodation guests could introduce and/or spread weed species and plant pathogens through unauthorised or inadvertent access into habitat for <i>Macrozamia pauli-guilielmi</i> adjacent to Sites L and N (option 2).</p>	<p>Low-Moderate Risk.</p> <p>Removal of the previously undisturbed canopy is likely to lead to edge effects that extend into surrounding vegetation. This may adversely affect important habitat for <i>Macrozamia pauli-guilielmi</i>.</p> <p>The spread of existing weed species is likely to occur without appropriate measures, although the introduction of new species and pathogens beyond that which would occur from ongoing use of the Great Walk and existing camp sites is unlikely.</p>	<ul style="list-style-type: none"> • Position infrastructure within existing cleared areas and/or avoid the removal of canopy vegetation wherever possible. • Restrict the numbers of guests and ensure they are accompanied and supervised by highly trained guides and educated on access restrictions and the avoidance of environmental impact, particularly in relation to the introduction and spread of weeds and plant pathogens. • Cancel or postpone tours in response to high biosecurity risks. • Prepare and implement Environmental Management Plans that commit to the ongoing maintenance of the sites and appropriate environmental standards over the life of the project, and the ongoing monitoring and management of impacts. For example: <ul style="list-style-type: none"> - Ensure construction equipment and vehicles are cleaned and certified “weed free” before entering the National Park. - Provide chemical footbaths at the commencement of the Great Walk trail and at each accommodation site. - Train tour guides in the identification of weeds and other indicators of ecological impact, such that they can provide regular feedback as part of a broader monitoring regime.
<p><i>Disrupt the breeding cycle of a population</i></p>	<p>Direct impacts to <i>Macrozamia pauli-guilielmi</i> specimens during the establishment and operation of accommodation infrastructure and associated access at Sites L and N (option 2) has the potential to disrupt the breeding cycle of this species if the distance between retained individuals has an impact on pollination.</p>	<p>Low Risk. Direct impacts are likely to occur at Site L and could occur at Site N (option 2) in the absence of appropriate site design and management. However, the loss of a single or small number of specimens is not expected to disrupt the breeding cycle of the population occurring throughout the National Park.</p>	<ul style="list-style-type: none"> • Position site infrastructure and access alignments to avoid <i>Macrozamia pauli-guilielmi</i> specimens. • Incorporate suitable buffers between clearing footprints and known/potential habitat for endangered flora species as part of detailed site design. • Provide supervision and physical protection for <i>Macrozamia pauli-guilielmi</i> specimens and clearly delineate and communicate clearing footprint boundaries and “no-go” areas during construction. • Restrict the numbers of guests and ensure they are accompanied and supervised by highly trained guides and educated on access restrictions and the

Significant Impact Criteria	Potential Impact	Risk of Significant Impact without Impact Management	Impact Management Measures to Eliminate Risk, or Achieve/Maintain Low Residual Risk
			avoidance of environmental impact, particularly in relation to known or potentially occurring threatened flora.
<i>Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline</i>	The establishment and operation of accommodation infrastructure and associated access would not modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the known or potentially occurring endangered species are likely to decline.	n/a	n/a
<i>Result in invasive species that are harmful to the species becoming established in the species' habitat</i>	The clearing of vegetation for Sites L and N (option 2) could lead to edge effects that extend into adjacent habitat for <i>Macrozamia pauli-guilielmi</i> . Construction/maintenance vehicles and accommodation guests could introduce and/or spread weed species and plant pathogens through unauthorised or inadvertent access into habitat for <i>Macrozamia pauli-guilielmi</i> adjacent to Sites L and N (option 2).	Low-Moderate Risk. The spread of existing weed species is likely to occur without appropriate measures, although the introduction of new species beyond that which would occur from ongoing use of the Great Walk and existing camp sites is unlikely.	<ul style="list-style-type: none"> • Position infrastructure within existing cleared areas and/or avoid the removal of canopy vegetation wherever possible. • Restrict the numbers of guests and ensure they are accompanied and supervised by highly trained guides and educated on access restrictions and the avoidance of environmental impact, particularly in relation to the introduction and spread of weeds. • Cancel or postpone tours in response to high biosecurity risks. • Prepare and implement Environmental Management Plans that commit to the ongoing maintenance of the sites and appropriate environmental standards over the life of the project, and the ongoing monitoring and management of impacts. For example: <ul style="list-style-type: none"> - Ensure construction equipment and vehicles are cleaned and certified "weed free" before entering the National Park. - Provide chemical footbaths at the commencement of the Great Walk trail and at each accommodation site. - Train tour guides in the identification of weeds, such that they can provide regular feedback as part of a broader monitoring regime.
<i>Introduce disease that may cause the species to decline</i>	Construction/maintenance vehicles and accommodation guests could introduce and/or spread weed species and plant pathogens through unauthorised or inadvertent access	Low Risk. The introduction of new pathogens beyond that which would occur from	<ul style="list-style-type: none"> • Restrict the numbers of guests and ensure they are accompanied and supervised by highly trained guides and educated on access restrictions and the avoidance of environmental impact, particularly in

Significant Impact Criteria	Potential Impact	Risk of Significant Impact without Impact Management	Impact Management Measures to Eliminate Risk, or Achieve/Maintain Low Residual Risk
	into habitat for <i>Macrozamia pauli-guilielmi</i> adjacent to Sites L and N (option 2).	ongoing use of the Great Walk and existing camp sites is unlikely.	relation to the introduction and spread of plant pathogens. <ul style="list-style-type: none"> • Cancel or postpone tours in response to high biosecurity risks. • Prepare and implement Environmental Management Plans that commit to the ongoing maintenance of the sites and appropriate environmental standards over the life of the project, and the ongoing monitoring and management of impacts. For example: <ul style="list-style-type: none"> - Provide chemical footbaths at the commencement of the Great Walk trail and at each accommodation site. - Train tour guides in the identification of plant pathogen impacts, such that they can provide regular feedback as part of a broader monitoring regime.
<i>Interfere with the recovery of the species.</i>	The establishment and operation of the proposed accommodation infrastructure and associated access would not interfere with the recovery of these endangered species.	n/a	n/a

Table 4.3: Assessment against significance impact criteria for Vulnerable flora species

Significant Impact Criteria	Potential Impact	Risk of Significant Impact without Impact Management	Impact Management Measures to Eliminate Risk, or Achieve/Maintain Low Residual Risk
<p>An action is likely to have a significant impact on a Vulnerable species if there is a real chance or possibility that it will:</p> <p>Lead to a long-term decrease in the size of an important population¹³</p>	<p>The establishment of accommodation infrastructure at Site K could result in a direct impact to a single <i>Cryptocarya foetida</i> specimen, while the construction of access for Site P could result in the accidental removal of, or damage to, one or more <i>Archidendron lovelliae</i> specimens.</p> <p>The operation of these sites could also lead to direct impacts on these specimens through accidental trampling by accommodation guests.</p>	<p>Low Risk. Direct impacts are likely to occur in the absence of appropriate site design and management. However, the loss of a single or small number of specimens is not expected to lead to a long-term decrease in the size of the population occurring throughout the National Park.</p>	<ul style="list-style-type: none"> Position site infrastructure and access alignments to avoid <i>Cryptocarya foetida</i> and <i>Archidendron lovelliae</i> specimens. Provide supervision and physical protection for <i>Cryptocarya foetida</i> and <i>Archidendron lovelliae</i> specimens and clearly delineate and communicate clearing footprint boundaries and “no-go” areas during construction. Restrict the numbers of guests and ensure they are accompanied and supervised by highly trained guides and educated on access restrictions and the avoidance of environmental impact, particularly in relation to known or potentially occurring threatened flora.
<p>Reduce the area of occupancy of an important population</p>	<p>The establishment and operation of the proposed accommodation infrastructure and associated access will not reduce the area of occupancy of these vulnerable species.</p>	<p>n/a</p>	<p>n/a</p>
<p>Fragment an important population into two or more populations</p>	<p>Direct impacts to <i>Cryptocarya foetida</i> and <i>Archidendron lovelliae</i> specimens during the establishment and operation of accommodation infrastructure and associated access at Sites K and P has the potential to fragment existing populations into two or more populations if the distance between retained individuals has a significant impact on reproduction (i.e. pollination).</p>	<p>Low Risk. Direct impacts are likely to occur in the absence of appropriate site design and management. However, the loss of a single or small number of specimens is not expected to fragment existing populations into two or more populations.</p>	<ul style="list-style-type: none"> Position site infrastructure and access alignments to avoid <i>Cryptocarya foetida</i> and <i>Archidendron lovelliae</i> specimens. Provide supervision and physical protection for <i>Cryptocarya foetida</i> and <i>Archidendron lovelliae</i> specimens and clearly delineate and communicate clearing footprint boundaries and “no-go” areas during construction. Restrict the numbers of guests and ensure they are accompanied and supervised by highly trained guides and educated on access restrictions and the avoidance of environmental impact, particularly in relation to known or potentially occurring threatened flora.

¹³ The occurrence of *Cryptocarya foetida* at Site K, and *Archidendron lovelliae* at Site P, within relatively intact habitat within a protected area, suggests they may be part of important populations from a conservation perspective.

Significant Impact Criteria	Potential Impact	Risk of Significant Impact without Impact Management	Impact Management Measures to Eliminate Risk, or Achieve/Maintain Low Residual Risk
<p><i>Adversely affect habitat critical to the survival of a species</i></p>	<p>The clearing of vegetation for Site K could lead to edge effects that extend into adjacent habitat for <i>Cryptocarya foetida</i>, while the clearing of vegetation for Site P could lead to edge effects that extend into adjacent habitat for <i>Archidendron lovelliae</i>.</p> <p>Construction/maintenance vehicles and accommodation guests could introduce and/or spread weed species and plant pathogens through unauthorised or inadvertent access into habitat for these vulnerable species adjacent to Sites K and P.</p>	<p>Low-Moderate Risk.</p> <p>Removal of the previously undisturbed canopy is likely to lead to edge effects that extend into surrounding vegetation. This may adversely affect important habitat for <i>Cryptocarya foetida</i> and <i>Archidendron lovelliae</i>.</p> <p>The spread of existing weed species is likely to occur without appropriate measures, although the introduction of new species and pathogens beyond that which would occur from ongoing use of the Great Walk and existing camp sites is unlikely.</p>	<ul style="list-style-type: none"> • Position infrastructure within existing cleared areas and/or avoid the removal of canopy vegetation wherever possible. • Restrict the numbers of guests and ensure they are accompanied and supervised by highly trained guides and educated on access restrictions and the avoidance of environmental impact, particularly in relation to the introduction and spread of weeds and plant pathogens. • Cancel or postpone tours in response to high biosecurity risks. • Prepare and implement Environmental Management Plans that commit to the ongoing maintenance of the sites and appropriate environmental standards over the life of the project, and the ongoing monitoring and management of impacts. For example: <ul style="list-style-type: none"> - Ensure construction equipment and vehicles are cleaned and certified “weed free” before entering the National Park. - Provide chemical footbaths at the commencement of the Great Walk trail and at each accommodation site. - Train tour guides in the identification of weeds and other indicators of ecological impact, such that they can provide regular feedback as part of a broader monitoring regime.
<p><i>Disrupt the breeding cycle of an important population</i></p>	<p>Direct impacts to <i>Cryptocarya foetida</i> and <i>Archidendron lovelliae</i> specimens during the establishment and operation of accommodation infrastructure and associated access at Sites K and P has the potential to disrupt the breeding cycle of these species if the distance between retained individuals has a significant impact on pollination.</p>	<p>Low Risk. Direct impacts are likely to occur in the absence of appropriate site design and management. However, the loss of a single or small number of specimens is not expected to disrupt the breeding cycle of the population occurring throughout the National Park.</p>	<ul style="list-style-type: none"> • Position site infrastructure and access alignments to avoid <i>Cryptocarya foetida</i> and <i>Archidendron lovelliae</i> specimens. • Provide supervision and physical protection for <i>Cryptocarya foetida</i> and <i>Archidendron lovelliae</i> specimens and clearly delineate and communicate clearing footprint boundaries and “no-go” areas during construction. • Restrict the numbers of guests and ensure they are accompanied and supervised by highly trained guides and educated on access restrictions and the avoidance of environmental impact, particularly in

Significant Impact Criteria	Potential Impact	Risk of Significant Impact without Impact Management	Impact Management Measures to Eliminate Risk, or Achieve/Maintain Low Residual Risk
			relation to known or potentially occurring threatened flora.
<i>Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline</i>	The establishment and operation of accommodation infrastructure and associated access would not modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that these vulnerable species are likely to decline.	n/a	n/a
<i>Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat</i>	<p>The clearing of vegetation for Site K could lead to edge effects that extend into adjacent habitat for <i>Cryptocarya foetida</i>, while the clearing of vegetation for Site P could lead to edge effects that extend into adjacent habitat for <i>Archidendron lovelliae</i>.</p> <p>Construction/maintenance vehicles and accommodation guests could introduce and/or spread weed species through unauthorised or inadvertent access into habitat for these vulnerable species adjacent to Sites K and P.</p>	<p>Low-Moderate Risk.</p> <p>Removal of the previously undisturbed canopy is likely to lead to edge effects that extend into surrounding vegetation. This may adversely affect important habitat for <i>Cryptocarya foetida</i> and <i>Archidendron lovelliae</i>.</p> <p>The spread of existing weed species is likely to occur without appropriate measures, although the introduction of new species beyond that which would occur from ongoing use of the Great Walk and existing camp sites is unlikely.</p>	<ul style="list-style-type: none"> • Position infrastructure within existing cleared areas and/or avoid the removal of canopy vegetation wherever possible. • Restrict the numbers of guests and ensure they are accompanied and supervised by highly trained guides and educated on access restrictions and the avoidance of environmental impact, particularly in relation to the introduction and spread of weeds. • Cancel or postpone tours in response to high biosecurity risks. • Prepare and implement Environmental Management Plans that commit to the ongoing maintenance of the sites and appropriate environmental standards over the life of the project, and the ongoing monitoring and management of impacts. For example: <ul style="list-style-type: none"> - Ensure construction equipment and vehicles are cleaned and certified “weed free” before entering the National Park. - Provide chemical footbaths at the commencement of the Great Walk trail and at each accommodation site. - Train tour guides in the identification of weeds, such that they can provide regular feedback as part of a broader monitoring regime.
<i>Introduce disease that may cause the species to decline</i>	Construction/maintenance vehicles and accommodation guests could introduce and/or spread plant pathogens through unauthorised or inadvertent access into habitat for these vulnerable species adjacent to Sites K and P.	<p>Low Risk.</p> <p>The introduction of new pathogens beyond that which would occur from ongoing use of the Great Walk and existing camp sites is unlikely.</p>	<ul style="list-style-type: none"> • Restrict the numbers of guests and ensure they are accompanied and supervised by highly trained guides and educated on access restrictions and the avoidance of environmental impact, particularly in relation to the introduction and spread of plant pathogens.

Significant Impact Criteria	Potential Impact	Risk of Significant Impact without Impact Management	Impact Management Measures to Eliminate Risk, or Achieve/Maintain Low Residual Risk
			<ul style="list-style-type: none"> • Cancel or postpone tours in response to high biosecurity risks. • Prepare and implement Environmental Management Plans that commit to the ongoing maintenance of the sites and appropriate environmental standards over the life of the project, and the ongoing monitoring and management of impacts. For example: <ul style="list-style-type: none"> - Provide chemical footbaths at the commencement of the Great Walk trail and at each accommodation site. - Train tour guides in the identification of plant pathogen impacts, such that they can provide regular feedback as part of a broader monitoring regime.
<i>Interfere with the recovery of the species.</i>	The establishment and operation of the proposed accommodation infrastructure and associated access would not interfere with the recovery of these vulnerable species.	n/a	n/a

Table 4.4: Assessment against significance impact criteria for Endangered fauna species

Significant Impact Criteria	Potential Impact	Risk of Significant Impact without Impact Management	Impact Management Measures to Eliminate Risk, or Achieve/Maintain Low Residual Risk
<p><i>An action is likely to have a significant impact on an Endangered species if there is a real chance or possibility that it will:</i></p> <p><i>Lead to a long-term decrease in the size of a population</i></p>	<p>The establishment of accommodation infrastructure at either Site N (option 1) or Site N (option 2) could lead to indirect impacts upon adjacent potential habitat for Oxleyan Pygmy Perch.</p>	<p>Moderate Risk.</p> <p>Contamination and/or eutrophication of adjacent wetland habitat could lead to a long-term decrease in the size of a population without appropriate measures.</p>	<ul style="list-style-type: none"> • Use fully contained septic/wastewater systems, with all waste products removed from site at appropriate intervals. • Use dedicated storage structures for hazardous substances, with chemicals for weed treatment managed by specialist contractors and not stored on site. • Prepare and implement Environmental Management Plans that commit to the ongoing maintenance of the sites and appropriate environmental standards over the life of the project, and the ongoing monitoring and management of impacts. • Train tour guides in the identification of ecological impact, such that they can provide regular feedback as part of a broader monitoring regime.
<p><i>Reduce the area of occupancy of an important population</i></p>	<p>The establishment and operation of the proposed accommodation infrastructure and associated access will not reduce the area of occupancy of this endangered species.</p>	n/a	n/a
<p><i>Fragment an existing important population into two or more populations</i></p>	<p>The establishment and operation of the proposed accommodation infrastructure and associated access will not fragment existing populations into two or more populations.</p>	n/a	n/a
<p><i>Adversely affect habitat critical to the survival of a species</i></p>	<p>Potential habitat for Oxleyan Pygmy Perch adjacent to Site N (option 1) or Site N (option 2) could be impacted by sedimentation, increased local nutrient loads, contamination and altered drainage.</p> <p>Construction/maintenance vehicles and accommodation guests could introduce and/or spread weed species and plant/animal pathogens through unauthorised or inadvertent access into habitat for this endangered species.</p>	<p>Low-Moderate Risk.</p> <p>Contamination and/or eutrophication of adjacent wetland habitat could adversely affect important habitat for this species.</p> <p>The spread of existing weed species is likely to occur without appropriate measures, although the introduction of new species and pathogens beyond that which would occur from ongoing use of the Great Walk and existing camp sites is unlikely.</p>	<ul style="list-style-type: none"> • Raise accommodation and storage structures to enable natural stormwater flows to continue unaffected. • Use fully contained septic/wastewater systems, with all waste products removed from site at appropriate intervals. • Use dedicated storage structures for hazardous substances, with chemicals for weed treatment managed by specialist contractors and not stored on site. • Prepare and implement Environmental Management Plans that commit to the ongoing maintenance of the sites and appropriate environmental standards over the life of the project,

Significant Impact Criteria	Potential Impact	Risk of Significant Impact without Impact Management	Impact Management Measures to Eliminate Risk, or Achieve/Maintain Low Residual Risk
			and the ongoing monitoring and management of impacts. <ul style="list-style-type: none"> Train tour guides in the identification of ecological impact, such that they can provide regular feedback as part of a broader monitoring regime.
<i>Disrupt the breeding cycle of a population</i>	Potential impacts to habitat for Oxleyan Pygmy Perch adjacent to Site N (option 1) or Site N (option 2) from contamination and eutrophication could disrupt the breeding cycle of this species at these location.	Moderate Risk. Contamination and/or eutrophication of adjacent wetland habitats could significantly impact important breeding habitat for Oxleyan Pygmy Perch without appropriate measures.	<ul style="list-style-type: none"> Use fully contained septic/wastewater systems, with all waste products removed from site at appropriate intervals. Use dedicated storage structures for hazardous substances, with chemicals for weed treatment managed by specialist contractors and not stored on site. Prepare and implement Environmental Management Plans that commit to the ongoing maintenance of the sites and appropriate environmental standards over the life of the project, and the ongoing monitoring and management of impacts. Training tour guides in the identification of animal breeding places, such that they can provide feedback on potential impacts to animal breeding activity as part of a broader monitoring and impact mitigation regime.
<i>Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline</i>	The establishment and operation of accommodation infrastructure and associated access would not modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that this endangered species is likely to decline.	n/a	n/a
<i>Result in invasive species that are harmful to the species becoming established in the species' habitat</i>	General waste and land disturbance have the potential to attract predatory exotic fauna species.	Low Risk. The introduction or spread of predatory exotic fauna species beyond that which has already occurred or that would occur from ongoing use of the Great Walk and existing camp sites is unlikely.	<ul style="list-style-type: none"> Restrict the numbers of guests and ensure they are accompanied and supervised by highly trained guides and educated the avoidance of environmental impact, including the containment of waste. <ul style="list-style-type: none"> Train tour guides in the identification of ecological impact, including evidence of pest animal species, such that they can provide regular feedback as part of a broader monitoring regime.

Significant Impact Criteria	Potential Impact	Risk of Significant Impact without Impact Management	Impact Management Measures to Eliminate Risk, or Achieve/Maintain Low Residual Risk
<i>Introduce disease that may cause the species to decline</i>	Construction/maintenance vehicles and accommodation guests could introduce and/or spread animal pathogens through unauthorised or inadvertent access into habitat for this endangered species.	Low Risk. The introduction of new pathogens beyond that which would occur from ongoing use of the Great Walk and existing camp sites is unlikely.	<ul style="list-style-type: none"> • Restrict the numbers of guests and ensure they are accompanied and supervised by highly trained guides and educated on access restrictions and the avoidance of environmental impact, particularly in relation to unauthorised access and the introduction and spread animal pathogens. <ul style="list-style-type: none"> - Train tour guides in the identification of ecological impact, such that they can provide regular feedback as part of a broader monitoring regime.
<i>Interfere with the recovery of the species.</i>	The establishment and operation of the proposed accommodation infrastructure and associated access would not interfere with the recovery of this endangered species.	n/a	n/a

Table 4.5: Assessment against significance impact criteria for Vulnerable fauna species

- Three-toed Snake-tooth Skink (Vulnerable) – Sites N (option 1), N (option 2), L, K and P.
- Wallum Sedgefrog (Vulnerable) – wallum heaths and sedgeland/swamp adjoining/near Site N (option 1) and Site N (option 2). Spatial data available from the Queensland Government also shows a previous record for Wallum Sedgefrog near Site P (**Figure 3.1**), although not associated with habitats represented within the proposed lease area.
- Grey-headed Flying-fox (Vulnerable) – Sites N (option 1), N (option 2), P, L and K.

Significant Impact Criteria	Potential Impact	Risk of Significant Impact without Impact Management	Impact Management Measures to Eliminate Risk, or Achieve/Maintain Low Residual Risk
<p><i>An action is likely to have a significant impact on a Vulnerable species if there is a real chance or possibility that it will:</i></p> <p><i>Lead to a long-term decrease in the size of an important population¹⁴ of a species</i></p>	<p>The establishment of accommodation infrastructure and associated access could result in the removal of up to 1 ha of habitat for Black-breasted Button-Quail and up to 2 ha of habitat for Three-toed Snake-tooth Skink and Grey-headed Flying-fox, in total¹⁵. The removal of vegetation can also facilitate the incursion of pest species deeper into woodlands and forests, while general waste and land disturbance have the potential to attract predatory exotic fauna species.</p>	<p>Low Risk.</p> <p>Removal of habitat will occur, although the extent of habitat loss compared to that which will be retained within the surrounding landscape will be negligible. For example, compared to the extent of potential habitat occurring within 5km of each relevant site, the removal of up to 1 ha of habitat for Black-breasted Button-Quail and up to 2 ha of habitat for Three-toed Snake-tooth Skink and Grey-headed Flying-fox, would represent:</p> <ul style="list-style-type: none"> • Approximately 0.3% of potential habitat for Black-breasted Button-Quail; • Approximately 0.01% of potential habitat for Three-toed Snake-tooth Skink; and 	<ul style="list-style-type: none"> • Position infrastructure within existing cleared areas wherever possible, and limit the removal of vegetation to that absolutely necessary for the establishment and operation of each camping area and associated access. • Avoid the removal of important habitat features for Black-breasted Button-Quail, Three-toed Snake-tooth Skink, Wallum Sedgefrog and Grey-headed Flying-fox wherever possible. • Use appropriately qualified fauna spotters during vegetation clearing to ensure threatened fauna and important habitat features are appropriately managed. • Clearly delineate and communicate clearing footprint boundaries and “no-go” areas during construction. • Restrict the numbers of guests and ensure they are accompanied and supervised by highly trained guides and educated the avoidance of

¹⁴ The *National recovery plan for the wallum sedgefrog and other wallum-dependent frog species* (Meyer et al, 2006) indicates the Great Sandy National Park comprises an important population for Wallum Sedgefrog.

The *Draft Recovery Plan for the Grey-headed Flying-fox Pteropus poliocephalus* (Commonwealth of Australia, 2017), suggests that Grey-headed Flying-foxes utilising the National Park would be considered part of a single, mobile population with individuals distributed across Queensland, New South Wales, Victoria, South Australia, Tasmania and the ACT. Accordingly, this would be considered an “important population”.

The occurrence of Black-breasted Button-Quail at Site D2 and in the vicinity of Sites D1 and P, and the potential occurrence of Three-toed Snake-tooth Skink at Sites N (option 1 or 2), L, K and P, within relatively intact habitat within a protected area, suggests they may also be part of important populations from a conservation perspective.

¹⁵ Assuming clearing footprints will not exceed 0.5ha for each site.

Significant Impact Criteria	Potential Impact	Risk of Significant Impact without Impact Management	Impact Management Measures to Eliminate Risk, or Achieve/Maintain Low Residual Risk
		<ul style="list-style-type: none"> Approximately 0.01% of potential habitat for Grey-headed Flying-fox. The introduction or spread of predatory exotic fauna species beyond that which has already occurred or that would occur from ongoing use of the Great Walk and existing camp sites is unlikely.	environmental impact, including the containment of waste. <ul style="list-style-type: none"> Train tour guides in the identification of ecological impact, including evidence of pest animal species, such that they can provide regular feedback as part of a broader monitoring regime.
<i>Reduce the area of occupancy of an important population</i>	The establishment and operation of the proposed accommodation infrastructure and associated access will not reduce the area of occupancy of these vulnerable species.	n/a	n/a
<i>Fragment an existing important population into two or more populations</i>	The establishment and operation of the proposed accommodation infrastructure and associated access will not fragment existing populations into two or more populations.	n/a	n/a
<i>Adversely affect habitat critical to the survival of a species</i>	The clearing of vegetation could lead to edge effects that extend into adjacent habitat. Construction/maintenance vehicles and accommodation guests could introduce and/or spread weed species and plant/animal pathogens through unauthorised or inadvertent access into habitat for these vulnerable species. The establishment and operation of the proposed accommodation infrastructure could impact adjacent, retained habitat through excess noise and artificial light. Wetland habitat for Wallum Sedgefrog adjacent to Site N (option 1) or Site N (option 2) could be impacted by sedimentation, increased local nutrient loads, contamination and altered drainage.	Low-Moderate Risk. Black-breasted Button-Quail is known to utilise retained habitats in proximity to camping areas, and Grey-headed Flying-fox regularly forages and breeds in close proximity to human settlements. Removal of the previously undisturbed canopy is likely to lead to edge effects that extend into surrounding habitat, although the impact is unlikely to be significant. The spread of existing weed species is likely to occur without appropriate measures, although the introduction of new species and pathogens beyond that which would occur from ongoing use of the Great Walk and existing camp sites is unlikely. Excess noise and artificial light are likely to impact surrounding habitat without appropriate measures, although the frequency and extent of the impact is unlikely to be significant. Site N (option 1 or 2) is positioned on highly permeable, sandy substrate with	<ul style="list-style-type: none"> Position infrastructure within existing cleared areas and/or avoid the removal of canopy vegetation wherever possible. Restrict the numbers of guests and ensure they are accompanied and supervised by highly trained guides and educated on access restrictions and the avoidance of environmental impact, particularly in relation to unauthorised access and the introduction and spread of weeds and plant/animal pathogens, and excess noise. Cancel or postpone tours in response to high biosecurity risks. Incorporate site designs that minimise impacts from artificial lighting. Raise accommodation and storage structures to enable natural stormwater flows to continue unaffected. Use fully contained septic/wastewater systems, with all waste products removed from site at appropriate intervals. Use dedicated storage structures for hazardous substances, with chemicals for weed treatment managed by specialist contractors and not stored on site.

Significant Impact Criteria	Potential Impact	Risk of Significant Impact without Impact Management	Impact Management Measures to Eliminate Risk, or Achieve/Maintain Low Residual Risk
		<p>limited earthworks required, such that impacts from sedimentation and altered drainage are unlikely to be severe. Contamination and/or eutrophication of adjacent wetland habitat could significantly impact important breeding habitat for Wallum Sedgefrog at this location without appropriate measures, although would not disrupt the breeding cycle of the broader population occurring throughout the National Park.</p>	<ul style="list-style-type: none"> • Prepare and implement Environmental Management Plans that commit to the ongoing maintenance of the sites and appropriate environmental standards over the life of the project, and the ongoing monitoring and management of impacts. For example: <ul style="list-style-type: none"> - Ensure construction equipment and vehicles are cleaned and certified “weed free” before entering the National Park. - Provide chemical footbaths at the commencement of the Great Walk trail and at each accommodation site. - Train tour guides in the identification of ecological impact, such that they can provide regular feedback as part of a broader monitoring regime.
<p><i>Disrupt the breeding cycle of an important population</i></p>	<p>Potential impacts to retained habitat adjacent to Site N (option 1) or Site N (option 2) from excess noise and light, contamination and eutrophication, could disrupt the breeding cycle of Wallum Sedgefrog at these locations. Black-breasted Button-Quail is known to utilise retained habitats in proximity to camping areas, and Grey-headed Flying-fox regularly forages and breeds in close proximity to human settlements. Their breeding cycles are unlikely to be disrupted by the establishment and operation of the proposed accommodation infrastructure.</p>	<p>Low-Moderate Risk.</p> <p>Excess noise and artificial light are likely to impact adjacent habitat without appropriate measures, although the frequency and extent of the impact is unlikely to be significant.</p> <p>Contamination and/or eutrophication of adjacent wetland habitats could significantly impact important breeding habitat for Wallum Sedgefrog adjacent to Site N (option 1 or 2) without appropriate measures, although would not disrupt the breeding cycle of the broader population occurring throughout the National Park.</p>	<ul style="list-style-type: none"> • Restrict the numbers of guests and ensure they are accompanied and supervised by highly trained guides and educated on access restrictions and the avoidance of environmental impact, particularly in relation to unauthorised access and the introduction and spread of weeds and plant/animal pathogens, and excess noise. • Cancel or postpone tours in response to high biosecurity risks. • Incorporate site designs that minimise impacts from artificial lighting. • Raise accommodation and storage structures to enable natural stormwater flows to continue unaffected. • Use fully contained septic/wastewater systems, with all waste products removed from site at appropriate intervals. • Use dedicated storage structures for hazardous substances, with chemicals for weed treatment managed by specialist contractors and not stored on site. • Prepare and implement Environmental Management Plans that commit to the ongoing maintenance of the sites and appropriate

Significant Impact Criteria	Potential Impact	Risk of Significant Impact without Impact Management	Impact Management Measures to Eliminate Risk, or Achieve/Maintain Low Residual Risk
			environmental standards over the life of the project, and the ongoing monitoring and management of impacts. For example: <ul style="list-style-type: none"> - Ensure construction equipment and vehicles are cleaned and certified “weed free” before entering the National Park. - Provide chemical footbaths at the commencement of the Great Walk trail and at each accommodation site. - Train tour guides in the identification of ecological impact, such that they can provide regular feedback as part of a broader monitoring regime. - Training tour guides in the identification of animal breeding places, such that they can provide feedback on potential impacts to animal breeding activity as part of a broader monitoring and impact mitigation regime.
<i>Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline</i>	The establishment and operation of accommodation infrastructure and associated access would not modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that these vulnerable species are likely to decline.	n/a	n/a
<i>Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species’ habitat</i>	The removal of vegetation can facilitate the incursion of pest species deeper into woodlands and forests, while general waste and land disturbance have the potential to attract predatory exotic fauna species.	Low Risk. The introduction or spread of predatory exotic fauna species beyond that which has already occurred or that would occur from ongoing use of the Great Walk and existing camp sites is unlikely.	<ul style="list-style-type: none"> • Restrict the numbers of guests and ensure they are accompanied and supervised by highly trained guides and educated the avoidance of environmental impact, including the containment of waste. • Train tour guides in the identification of ecological impact, including evidence of pest animal species, such that they can provide regular feedback as part of a broader monitoring regime.
<i>Introduce disease that may cause the species to decline</i>	Construction/maintenance vehicles and accommodation guests could introduce and/or spread animal pathogens through unauthorised or inadvertent access into habitat for these vulnerable species.	Low Risk. The introduction of new pathogens beyond that which would occur from ongoing use of the Great Walk and existing camp sites is unlikely.	<ul style="list-style-type: none"> • Restrict the numbers of guests and ensure they are accompanied and supervised by highly trained guides and educated on access restrictions and the avoidance of environmental impact, particularly in relation to unauthorised access and the introduction and spread animal pathogens.

Significant Impact Criteria	Potential Impact	Risk of Significant Impact without Impact Management	Impact Management Measures to Eliminate Risk, or Achieve/Maintain Low Residual Risk
			<ul style="list-style-type: none"> Train tour guides in the identification of ecological impact, such that they can provide regular feedback as part of a broader monitoring regime.
<i>Interfere with the recovery of the species</i>	The establishment and operation of the proposed accommodation infrastructure and associated access would not interfere with the recovery of these vulnerable species.	n/a	n/a

Table 4.6: Assessment against significance impact criteria for Migratory fauna species

Significant Impact Criteria	Potential Impact	Risk of Significant Impact without Impact Management	Impact Management Measures to Eliminate Risk, or Achieve/Maintain Low Residual Risk
<p><i>An action is likely to have a significant impact on a Migratory species if there is a real chance or possibility that it will:</i></p> <p><i>Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat¹⁶ for a migratory species</i></p>	<p>The establishment of proposed accommodation infrastructure and associated access at Sites N, L, K and P could result in the removal of up to 1.5ha of habitat, in total¹⁷, for Black-faced Monarch and Rufous Fantail, and < 0.1ha of habitat for Spectacled Monarch.</p>	<p>Low Risk.</p> <p>These species are all common, widely-distributed species that are neither known to be declining nor at the limit of their range within the local area.</p> <p>Potential impacts from clearing, edge effects, excessive noise and artificial light, are negligible compared to the extent of habitat available within the surrounding landscape. For example, compared to the extent of potential habitat occurring within 5km of each relevant site, the removal of up to 1.5 ha of habitat for Black-faced Monarch and Rufous Fantail, and up to 0.1 ha of habitat for Spectacled Monarch, would represent:</p> <ul style="list-style-type: none"> • Approximately 0.02% of potential habitat for Black-faced Monarch; • Approximately 0.02% of potential habitat for Rufous Fantail; and • Approximately 0.01% of potential habitat for Spectacled Monarch. 	<ul style="list-style-type: none"> • Position infrastructure within existing cleared areas wherever possible, and limit the removal of vegetation to that absolutely necessary for the establishment and operation of each camping area and associated access.

¹⁶ The *Matters of National Environmental Significance: Significant Impact Guidelines* (DotE 2013) define an area of “important habitat” for a migratory species as:

- habitat utilised by a migratory species occasionally or periodically within a region that supports an ecologically significant proportion of the population of the species, and/or
- habitat that is of critical importance to the species at particular life-cycle stages, and/or
- habitat utilised by a migratory species which is at the limit of the species range, and/or
- habitat within an area where the species is declining.

The guidelines also suggest that, what is an “ecologically significant proportion” of the population varies with the species, and requires consideration of the species’ population status, genetic distinctiveness and species specific behavioural patterns (for example, site fidelity and dispersal rates).

It is unknown whether the National Park represents “important habitat” for any of the known or potentially occurring migratory species, and/or if an “ecologically significant proportion” of the population occurs within the National Park. This assessment assumes the National Park may represent important habitat and/or support an ecologically significant proportion of the population for one or more of the relevant species.

¹⁷ Assuming clearing footprints will not exceed 0.5ha for each site.

Significant Impact Criteria	Potential Impact	Risk of Significant Impact without Impact Management	Impact Management Measures to Eliminate Risk, or Achieve/Maintain Low Residual Risk
		These impacts will not substantially modify, destroy or isolate an area of important habitat for these migratory species.	
<i>Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species</i>	The clearing of vegetation and resultant edge effects on adjacent habitat could facilitate the introduction or spread of aggressive, native “edge” species that may be harmful to the relevant migratory species.	Low risk. The introduction or spread of aggressive, native “edge” species beyond that which has already occurred or that would occur from ongoing use of the Great Walk and existing camp sites is unlikely.	<ul style="list-style-type: none"> Position infrastructure within existing cleared areas wherever possible, and limit the removal of vegetation to that absolutely necessary for the establishment and operation of each camping area and associated access.
<i>Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species</i>	The establishment of proposed accommodation infrastructure and associated access at Sites N, L, K and P could result in the removal of up to 1.5ha of habitat, in total, for Black-faced Monarch and Rufous Fantail, and < 0.1ha of habitat for Spectacled Monarch.	Low Risk. These species are all common, widely-distributed species that are neither known to be declining nor at the limit of their range within the local area. Potential impacts from clearing, edge effects, excessive noise and artificial light, are negligible compared to the extent of habitat available within the surrounding landscape. For example, compared to the extent of potential habitat occurring within 5km of each relevant site, the removal of up to 1.5 ha of habitat for Black-faced Monarch and Rufous Fantail, and up to 0.1 ha of habitat for Spectacled Monarch, would represent: <ul style="list-style-type: none"> Approximately 0.02% of potential habitat for Black-faced Monarch; Approximately 0.02% of potential habitat for Rufous Fantail; and Approximately 0.01% of potential habitat for Spectacled Monarch. These impacts will not seriously disrupt the lifecycle of an ecologically significant proportion of the population of these migratory species.	Position infrastructure within existing cleared areas wherever possible, and limit the removal of vegetation to that absolutely necessary for the establishment and operation of each camping area and associated access.

4.3 RISK OF SIGNIFICANT IMPACTS UPON MSES

4.3.1 Fire

Under certain conditions, accidental fires resulting from the operation of the proposed accommodation sites would have the potential to result in significant impacts on all MSES occurring within the surrounding National Park. However, it is acknowledged that there is, and will continue to be, an existing risk of accidental fire from the ongoing use of the Cooloola Great Walk and existing camping areas in the absence of any additional accommodation sites. Consequently, without appropriate management, the risk of an increase in these impacts as a result of the operation of the proposed accommodation sites is assessed as low-moderate. This risk is able to be reduced or maintained at low levels through restrictions on campfires and the numbers of guests, preventing use of the accommodation sites during periods of extreme or catastrophic bushfire danger, ensuring site and equipment maintenance is undertaken at appropriate intervals, using dedicated storage structures for flammable liquids at each site, ensuring guests are accompanied and supervised by highly trained guides, and educating guests on the causes and impacts of fire.

4.3.2 Other Potential Impacts

It is understood the proposed activities will constitute “prescribed activities” conducted under an authority granted, made, issued or given under the NC Act in a protected area, which require assessment of impacts to relevant “prescribed environmental matters” prior to the issuing of the authority. For prescribed activities conducted under an authority granted, made, issued or given under the NC Act in a protected area, all MSES listed in Schedule 2 of the *Environmental Offsets Regulation* are relevant “prescribed environmental matters” requiring assessment.

The field surveys have confirmed the project may result in impacts upon the following prescribed MSES:

- **Regulated Vegetation**, including:
 - Of Concern REs, including REs 12.2.1, 12.2.3, 12.2.4, 12.2.12, 12.3.14a and 12.12.19;
 - remnant vegetation intersecting with a wetland;
 - remnant vegetation within the defined distance of a watercourse; and

- essential habitat.
- **Wetlands of High Ecological Significance and High Ecological Value Watercourses.**
- **Protected Wildlife Habitat for Endangered or Vulnerable Flora Species**, including *Archidendron lovelliae*, *Cryptocarya foetida*, *Macrozamia pauli-guilielmi* and *Blandfordia grandiflora*.
- **Protected Wildlife Habitat for Endangered or Vulnerable Fauna Species**, including Oxleyan Pygmy Perch, Black-breasted Button-Quail, Glossy Black-Cockatoo, Wallum Froglet, Wallum Sedgefrog, Wallum Rocketfrog, Southern Emu-wren and Koala.
- **Waterways Providing for Fish Passage.**
- **Protected Areas** (Great Sandy National Park).

Table 4.7 summarises an assessment of the significance of potential impacts (other than fire – refer **Section 4.3.1**) upon these prescribed MSES, based on the criteria specified in the State Government’s Significant Residual Impact Guideline for matters assessed under the NC Act, *Environmental Protection Act 1994* and *Marine Parks Act 2004*. This includes an assessment of the risk of significant impact in the absence of impact management, and a description of impact management measures to eliminate the risk or achieve/maintain a low “residual” (post-management) risk.

The field survey also confirmed the project may result in impacts upon *Boronia rivularis* and Cooloola Blind Snake, both of which are listed as Near Threatened under the NC Act. Although not currently recognised as prescribed environmental matters, Near Threatened flora species are recognised under the State’s protected plant framework in accordance with the NC Act, and measures should be taken to ensure no net loss of these plants in the wild. Near Threatened flora species and fauna species are also still recognised as MSES, and due regard should be given to avoiding and minimising impacts upon these species wherever possible.

The risk of significant impacts on threatened flora and fauna and associated mitigation measures outlined in **Table 4.7** also apply to these Near Threatened species.

Table 4.6: Assessment against significance impact criteria for prescribed MSES

Prescribed MSES	Significant Impact Criteria	Potential Impact	Risk of Significant Impact without Impact Management	Impact Management Measures to Eliminate Risk, or Achieve/Maintain Low Residual Risk
Regulated Vegetation - Of Concern REs, including REs 12.2.1, 12.2.3, 12.2.4, 12.2.12, 12.3.14a and 12.12.19	<p>For clearing for linear infrastructure:- greater than 25m wide in a grassland (structural category) regional ecosystem; or- greater than 20m wide in a sparse (structural category) regional ecosystem; or- greater than 10m wide in a dense to mid-dense (structural category) regional ecosystem.</p> <p>For clearing other than clearing for linear infrastructure: - area greater than 5 ha where in a grassland (structural category) regional ecosystem; or- area greater than 2 ha where in a sparse (structural category) regional ecosystem; or- area greater than 0.5 ha where in a dense to mid-dense(structural category) regional ecosystem.</p>	<p>Linear clearing of RE 12.2.3 (dense structural category) is proposed for accessing Site P.</p> <p>Linear and/or non-linear clearing of RE 12.3.14a (sparse structural category) is proposed for establishing and/or accessing either Site N (option 1) or Site N (option 2).</p> <p>The establishment of accommodation infrastructure and associated access at these sites could also result in the accidental removal of, or damage to, adjacent RE 12.2.1 or RE 12.2.12 (dense structural categories).</p>	<p>Low Risk.</p> <p>Clearing of RE 12.2.3 for accessing Site P should not exceed 10m in width.</p> <p>Clearing of RE 12.3.14a for establishing/accessing either Site N (option 1) or Site N (option 2) should not exceed 2 ha or 20m in width.</p> <p>Accidental clearing of RE 12.2.1 adjacent to Site P or RE 12.2.12 adjacent to either Site N (option 1) or Site N (option 2) should not exceed 0.5ha or 10m in width.</p>	<ul style="list-style-type: none"> Position infrastructure within existing cleared areas wherever possible, and limit the removal of vegetation to that absolutely necessary for the establishment and operation of each camping area and associated access. Incorporate suitable buffers between the clearing footprint and adjacent of Concern REs as part of detailed site design. Clearly delineate and communicate clearing footprint boundaries and “no-go” areas during construction.
Regulated Vegetation - Remnant vegetation intersecting with a wetland	As for Of Concern REs (above), AND: Clearing within 50m of the defining bank.	Clearing for the establishment of either Site N (option 1) or Site N (option 2) and associated access will occur within and adjacent to remnant vegetation mapped as intersecting with a wetland.	<p>Low Risk.</p> <p>Clearing for establishing/accessing either Site N (option 1) or Site N (option 2) should not exceed 2 ha or 20m in width.</p>	<ul style="list-style-type: none"> Position infrastructure within existing cleared areas wherever possible, and limit the removal of vegetation to that absolutely necessary for the establishment and operation of each camping area and associated access. Incorporate suitable buffers between the clearing footprint and adjacent Wetland REs as part of detailed site design. Clearly delineate and communicate clearing footprint boundaries and “no-go” areas during construction.
Regulated Vegetation - Remnant vegetation within the defined distance of a watercourse	As for Of Concern REs (above), AND: Clearing within 5m of the defining bank.	Clearing for the establishment of Site N (option 2) and associated access will occur within the defined distance of a mapped watercourse.	<p>Low Risk.</p> <p>Clearing for establishing/accessing Site N (option 2) should not exceed 2 ha or 20m in width.</p> <p>The field survey has also determined that the correct location of the watercourse is</p>	<ul style="list-style-type: none"> Position infrastructure within existing cleared areas wherever possible, and limit the removal of vegetation to that absolutely necessary for the establishment and operation of each camping area and associated access.

Prescribed MSES	Significant Impact Criteria	Potential Impact	Risk of Significant Impact without Impact Management	Impact Management Measures to Eliminate Risk, or Achieve/Maintain Low Residual Risk
			more than 5m from the proposed lease area.	<ul style="list-style-type: none"> Clearly delineate and communicate clearing footprint boundaries and “no-go” areas during construction.
Regulated Vegetation - Essential habitat.	As for Protected Wildlife Habitat (see below).	As for Protected Wildlife Habitat (see below).	As for Protected Wildlife Habitat (see below).	As for Protected Wildlife Habitat (see below).
Wetlands of High Ecological Significance and High Ecological Value Watercourses.	<p>An action is likely to have a significant residual impact on prescribed wetlands or watercourses if it is likely that the action will result in environmental values being affected in any of the following ways:</p> <ul style="list-style-type: none"> • areas of the wetland or watercourse being destroyed or artificially modified; • a measurable change in water quality of the wetland or watercourse—for example a change in the level of the physical and/or chemical characteristics of the water, including salinity, pollutants, or nutrients in the wetland or watercourse, to a level that exceeds the water quality guidelines for the waters; or • the habitat or lifecycle of native species, including invertebrate fauna and fish species, dependent upon the wetland being seriously affected; or • a substantial and measurable change in the hydrological regime or recharge zones of the wetland, e.g. a substantial change to the volume, timing, duration and frequency of ground and surface water flows to and within the wetland; or • an invasive species that is harmful to the environmental values of the wetland being established (or an existing invasive species being spread) in the wetland. 	<p>The establishment of accommodation infrastructure and associated access at either Site N (option 1) or Site N (option 2) will occur within a mapped wetland of high ecological significance and across a mapped high ecological value watercourse, which may result in these areas of the wetland and watercourse being destroyed or artificially modified.</p> <p>The establishment of accommodation infrastructure and associated access at Site N (option 2) will also occur across a mapped high ecological value watercourse, although the field survey has determined that the correct location of the watercourse is well outside of the proposed lease area.</p> <p>Mapped wetlands of high ecological significance adjacent to Sites N (Option 1) and N (option 2), and within the vicinity of Sites N (option 1), N (option 2), L and P, could be impacted by sedimentation, increased local nutrient loads, contamination and altered drainage.</p>	<p>Low – Moderate Risk.</p> <p>The construction of accommodation infrastructure at Sites P and L will occur at least 100m from mapped wetlands and watercourses, such that significant impacts upon these features are unlikely.</p> <p>All sites are positioned on highly permeable, sandy substrate with limited earthworks required, such that impacts from sedimentation and altered drainage are unlikely to be significant.</p> <p>Vegetation to be removed for the establishment of either Site N (option 1) or Site N (option 2) was ground-truthed as <i>Banksia</i> and eucalypt woodland, the removal of which is unlikely to significantly alter the character of the mapped wetland. However, contamination and/or eutrophication of wetlands adjacent to either Site N (option 1) or Site N (option 2) could significantly impact these features without appropriate measures.</p> <p>The introduction or spread of predatory exotic fauna species beyond that which has already occurred or that would occur</p>	<ul style="list-style-type: none"> • Position infrastructure within existing cleared areas and/or avoid the removal of canopy vegetation wherever possible. • Restrict the numbers of guests and ensure they are accompanied and supervised by highly trained guides and educated on access restrictions and the avoidance of environmental impact, particularly in relation to unauthorised access, the introduction and spread of weeds and plant/animal pathogens, and the containment of waste. • Cancel or postpone tours in response to high biosecurity risks. • Raise accommodation and storage structures to enable natural stormwater flows to continue unaffected. • Use fully contained septic/wastewater systems, with all waste products removed from site at appropriate intervals. • Use dedicated storage structures for hazardous substances, with chemicals for weed treatment managed by specialist contractors and not stored on site. • Prepare and implement Environmental Management Plans that commit to the ongoing maintenance of the sites and appropriate environmental standards over the life of the project, and the ongoing monitoring and management of impacts. For example:

Prescribed MSES	Significant Impact Criteria	Potential Impact	Risk of Significant Impact without Impact Management	Impact Management Measures to Eliminate Risk, or Achieve/Maintain Low Residual Risk
		<p>Construction/maintenance vehicles and accommodation guests could introduce and/or spread weed species and plant/animal pathogens through unauthorised or inadvertent access into wetlands and waterways.</p> <p>The removal of vegetation can also facilitate the incursion of pest species deeper into native habitats, while general waste and land disturbance have the potential to attract predatory exotic fauna species.</p>	<p>from ongoing use of the Great Walk and existing camp sites is unlikely.</p>	<ul style="list-style-type: none"> - Ensure construction equipment and vehicles are cleaned and certified "weed free" before entering the National Park. - Provide chemical footbaths at the commencement of the Great Walk trail and at each accommodation site. - Train tour guides in the identification of ecological impact, such that they can provide regular feedback as part of a broader monitoring regime.
<p>Protected Wildlife Habitat for Endangered or Vulnerable Flora Species, including <i>Archidendron lovelliae</i>, <i>Cryptocarya foetida</i>, <i>Macrozamia pauli-guilielmi</i> and <i>Blandfordia grandiflora</i>.</p>	<p>An action is likely to have a significant impact on endangered and vulnerable wildlife if the impact on the habitat is likely to:</p> <ul style="list-style-type: none"> • lead to a long-term decrease in the size of a local population; or • reduce the extent of occurrence of the species; or • fragment an existing population; or • result in genetically distinct populations forming as a result of habitat isolation; or • result in invasive species that are harmful to an endangered or vulnerable species becoming established in the endangered or vulnerable species' habitat; or • introduce disease that may cause the population to decline, or • interfere with the recovery of the species; or • cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a species. 	<p>Refer to Tables 4.2 and 4.3 for an assessment of the risk of significant impacts on <i>Archidendron lovelliae</i>, <i>Cryptocarya foetida</i> and <i>Macrozamia pauli-guilielmi</i> in relation to these criteria. This suggests there is a low-moderate risk of significant impacts to habitat for these species from the spread of existing weed species and other edge effects, without appropriate measures. All other risks are assessed as low or not applicable.</p> <p>The same levels of risk apply to <i>Blandfordia grandiflora</i>, although the degradation of habitat for this species adjacent to either Site N (option 1) or Site N (option 2) due to contamination and eutrophication would also be assessed as moderate.</p>		<ul style="list-style-type: none"> • Position site infrastructure and access alignments to avoid threatened flora specimens. • Position infrastructure within existing cleared areas and/or avoid the removal of canopy vegetation wherever possible. • Incorporate suitable buffers between clearing footprints and known/potential habitat for threatened flora species as part of detailed site design. • Provide supervision and physical protection for threatened flora specimens and clearly delineate and communicate clearing footprint boundaries and "no-go" areas during construction. • Restrict the numbers of guests and ensure they are accompanied and supervised by highly trained guides and educated on access restrictions and the avoidance of environmental impact, particularly in relation to known or potentially occurring threatened flora, and the introduction and spread of weeds and plant pathogens.

Prescribed MSES	Significant Impact Criteria	Potential Impact	Risk of Significant Impact without Impact Management	Impact Management Measures to Eliminate Risk, or Achieve/Maintain Low Residual Risk
				<ul style="list-style-type: none"> • Cancel or postpone tours in response to high biosecurity risks. • Raise accommodation and storage structures to enable natural stormwater flows to continue unaffected. • Use fully contained septic/wastewater systems, with all waste products removed from site at appropriate intervals. • Use dedicated storage structures for hazardous substances, with chemicals for weed treatment managed by specialist contractors and not stored on site. • Prepare and implement Environmental Management Plans that commit to the ongoing maintenance of the sites and appropriate environmental standards over the life of the project, and the ongoing monitoring and management of impacts. For example: <ul style="list-style-type: none"> - Ensure construction equipment and vehicles are cleaned and certified “weed free” before entering the National Park. - Provide chemical footbaths at the commencement of the Great Walk trail and at each accommodation site. - Train tour guides in the identification of weeds and other indicators of ecological impact, such that they can provide regular feedback as part of a broader monitoring regime.
Protected Wildlife Habitat for Endangered or Vulnerable Fauna Species, including Oxleyan Pygmy Perch, Black-breasted Button-	An action is likely to have a significant impact on endangered and vulnerable wildlife if the impact on the habitat is likely to: <ul style="list-style-type: none"> • lead to a long-term decrease in the size of a local population; or 	Refer to Tables 4.4 and 4.5 for an assessment of the risk of significant impacts on Oxleyan Pygmy Perch, Black-breasted Button-Quail and Wallum Sedgefrog in relation to these criteria. This suggests there is a low-moderate risk of significant impacts to habitat for these species from the spread of existing weed species, and from contamination and eutrophication of wetland habitat for Oxleyan Pygmy Perch and Wallum Sedgefrog adjacent to either		<ul style="list-style-type: none"> • Position infrastructure within existing cleared areas wherever possible, and limit the removal of vegetation to that absolutely necessary for the establishment and operation of each camping area and associated access.

Prescribed MSES	Significant Impact Criteria	Potential Impact	Risk of Significant Impact without Impact Management	Impact Management Measures to Eliminate Risk, or Achieve/Maintain Low Residual Risk
<p>Quail, Glossy Black-Cockatoo, Wallum Froglet, Wallum Sedgefrog, Wallum Rocketfrog and Southern Emu-wren.</p>	<ul style="list-style-type: none"> • reduce the extent of occurrence of the species; or • fragment an existing population; or • result in genetically distinct populations forming as a result of habitat isolation; or • result in invasive species that are harmful to an endangered or vulnerable species becoming established in the endangered or vulnerable species' habitat; or • introduce disease that may cause the population to decline, or • interfere with the recovery of the species; or • cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a species. 	<p>Site N (option 1) or Site N (option 2), without appropriate measures. All other risks are assessed as low or not applicable. The same levels of risk apply to Glossy Black-Cockatoo, Wallum Froglet, Wallum Rocketfrog and Southern Emu-wren.</p>		<ul style="list-style-type: none"> • Avoid the removal of important habitat features for threatened fauna species wherever possible. • Use appropriately qualified fauna spotters during vegetation clearing to ensure threatened fauna and important habitat features are appropriately managed. • Clearly delineate and communicate clearing footprint boundaries and “no-go” areas during construction. • Restrict the numbers of guests and ensure they are accompanied and supervised by highly trained guides and educated the avoidance of environmental impact, particularly in relation to the introduction and spread of weeds and plant/animal pathogens, excessive noise, and the containment of waste. • Cancel or postpone tours in response to high biosecurity risks. • Incorporate site designs that minimise impacts from artificial lighting. • Raise accommodation and storage structures to enable natural stormwater flows to continue unaffected. • Use fully contained septic/wastewater systems, with all waste products removed from site at appropriate intervals. • Use dedicated storage structures for hazardous substances, with chemicals for weed treatment managed by specialist contractors and not stored on site. • Prepare and implement Environmental Management Plans that commit to the ongoing maintenance of the sites and appropriate environmental standards over the life of the project, and the ongoing monitoring and management of impacts. For example:

Prescribed MSES	Significant Impact Criteria	Potential Impact	Risk of Significant Impact without Impact Management	Impact Management Measures to Eliminate Risk, or Achieve/Maintain Low Residual Risk
				<ul style="list-style-type: none"> - Ensure construction equipment and vehicles are cleaned and certified "weed free" before entering the National Park. - Provide chemical footbaths at the commencement of the Great Walk trail and at each accommodation site. - Train tour guides in the identification of ecological impact, including evidence of pest animal species, such that they can provide regular feedback as part of a broader monitoring regime. - Training tour guides in the identification of animal breeding places, such that they can provide feedback on potential impacts to animal breeding activity as part of a broader monitoring and impact mitigation regime.
Protected Wildlife Habitat for Koala	A significant residual impact on Koala habitat in SEQ is any prescribed activity that will remove a non-juvenile koala habitat tree (i.e. a koala habitat tree that is more than 4m high, or has a trunk with a circumference of more than 31.5cm at 1.3m above the ground).	The establishment of accommodation infrastructure and associated access at either Site N (option 1) or Site N (option 2) will occur within mapped Koala habitat.	High risk. Vegetation to be removed for the establishment of either Site N (option 1) or Site N (option 2) was ground-truthed as Banksia and eucalypt woodland, the removal of which is likely to involve the removal of non-juvenile koala habitat trees, without appropriate measures.	<ul style="list-style-type: none"> • Position infrastructure within existing cleared areas wherever possible, and avoid the removal of non-juvenile koala habitat trees wherever possible.
Waterways Providing for Fish Passage	An action is likely to have a significant impact on a waterway providing for fish passage if there is a real possibility that it will: <ul style="list-style-type: none"> • result in the mortality or injury of fish; or • result in conditions that substantially increase risks to the health, wellbeing and productivity of fish seeking passage such as through the depletion of fishes' 	The establishment of vehicular access to Site N (option 2) may impact upon fish passage within the waterway ground-truthed as occurring between sites N (option 1) and N (option 2).	High risk. The establishment of vehicular access across the waterway ground-truthed as occurring between sites N (option 1) and N (option 2) is likely to reduce the extent, frequency or duration of fish passage previously found at a site, without appropriate design.	<ul style="list-style-type: none"> • Design any structure that enables vehicular access across the waterway to maintain the current level of fish passage to continue.

Prescribed MSES	Significant Impact Criteria	Potential Impact	Risk of Significant Impact without Impact Management	Impact Management Measures to Eliminate Risk, or Achieve/Maintain Low Residual Risk
	<p>energy reserves, stranding, increased predation risks, entrapment or confined schooling behaviour in fish; or</p> <ul style="list-style-type: none"> • reduce the extent, frequency or duration of fish passage previously found at a site; or • substantially modify, destroy or fragment areas of fish habitat (including, but not limited to in-stream vegetation, snags and woody debris, substrate, bank or riffle formations) necessary for the breeding and/or survival of fish; or • result in a substantial and measurable change in the hydrological regime of the waterway, for example, a substantial change to the volume, depth, timing, duration and frequency of flows; or • lead to significant changes in water quality parameters such as temperature, dissolved oxygen, pH and conductivity that provide cues for movement in local fish species. 			
<p>Protected Areas (Great Sandy National Park).</p>	<p>Under section 8(2) of the <i>Environmental Offsets Act 2014</i>, an impact on a protected area is significant if a prescribed activity results, or will or is likely to result, in one or more of the following:</p> <ul style="list-style-type: none"> • the authorised clearing or inundation of all or part of the protected area for the construction of private or publicly owned infrastructure on the area; • the exclusion of, or reduction in, the public use or enjoyment of all or part of the protected area; • a reduction in the natural or cultural values of all or part of the protected area. 	<p>High Risk. The proposed infrastructure will result in the authorised clearing of parts of the protected area for the construction of private or publicly owned infrastructure on the area. Hence, there will be a significant impact on the Great Sandy National Park, based on these criteria.</p>		<ul style="list-style-type: none"> • Position infrastructure within existing cleared areas wherever possible, and limit the removal of vegetation to that absolutely necessary for the establishment and operation of each camping area and associated access.

5.0 IMPACT MANAGEMENT

The assessments outlined in **Sections 4.2 and 4.3** have determined there is a low to moderate risk that the proposed activities will result in a significant impact on MNES and a low to high risk that the proposed activities will result in a significant impact on MSES. Accordingly, measures are required to eliminate or achieve/maintain a low risk of significant impact, as also outlined in **Sections 4.2 and 4.3**. In this respect, the overarching principle of relevant State and Commonwealth environmental protection policies is to avoid impacts as much as possible in the first instance, following which mitigation measures are used in an attempt to reduce unavoidable impacts to acceptable/insignificant levels. Where impacts remain at unacceptable/significant levels post-mitigation, only then should compensatory measures (e.g. offsets) be employed as a last resort.

5.1 IMPACT AVOIDANCE

The most effective means of avoiding direct impacts associated with the removal of vegetation and associated loss of habitat and flora species is through appropriate development footprint location and design. In particular, the following ecological values are to be avoided, where feasible in terms of functionality and safety:

- TECs and/or Of Concern REs within and adjacent to Site P and Sites N (option 1) or N (option 2);
- Wetlands of State significance adjacent to Sites N (option 1) or N (option 2);
- Specimens of *Macrozamia pauli-guilielmi* within and adjacent to Sites L and N (option 2);
- Specimens of *Cryptocarya foetida* within Site K;
- Specimens of *Archidendron lovelliae* within and adjacent to Site P;
- Non-juvenile Koala habitat trees within and adjacent to Sites N (option 1) or N (option 2).

Other key measures recommended for the purposes of impact avoidance include:

- Positioning of sites and associated infrastructure to include existing cleared areas wherever possible.
- Avoiding notable habitat trees and other canopy trees wherever possible;

- Designing any structures that enable vehicular access across waterways to maintain the current level of fish passage to continue.
- Use of an appropriately qualified ecologist during vegetation clearing to ensure direct impacts to EVNT species and other significant ecological features are avoided in accordance with site design.
- Raising accommodation and storage structures to enable natural stormwater flows to continue unaffected.
- Using fully contained septic/wastewater systems, with all waste products removed from site at appropriate intervals.
- Using dedicated storage structures for flammable liquids and other hazardous substances, with chemicals for weed treatment managed by specialist contractors and not stored on site.
- Limiting guests per night/tour to small numbers (<30), with all guests accompanied and supervised by highly trained guides and educated on the avoidance of environmental impact, particularly in relation to fire and access restrictions to prevent unnecessary impacts to vegetation and important habitat, and containment of waste.
- Cancelling or postponing tours during periods of extreme or catastrophic bushfire danger and/or in response to high biosecurity risks.
- Preparation and implementation of Environmental Management Plans that commit to the ongoing maintenance of the sites and appropriate environmental standards over the life of the project, and the ongoing monitoring and management of avoidable impacts.

5.2 IMPACT MITIGATION

Key measures outlined for the purposes of impact mitigation include:

- Limiting the total removal of vegetation and associated habitat to the smallest area possible to accommodate structures and associated access.
- Use of appropriately qualified fauna spotters during vegetation clearing to ensure any resident fauna and important habitat features are appropriately managed.
- Incorporating site designs that minimise impacts from artificial lighting.

- Limiting guests per night/tour to small numbers (<30), with all guests accompanied and supervised by highly trained guides and educated on the minimisation of environmental impact, particularly in relation to the introduction and spread of weeds and plant pathogens, bushfire risk and excessive noise.
- Preparation and implementation of Environmental Management Plans that commit to the ongoing maintenance of the sites and appropriate environmental standards over the life of the project, and the ongoing monitoring and mitigation of impacts. For example:
 - Ensuring construction equipment and vehicles are cleaned and certified “weed free” before entering the National Park.
 - providing chemical footbaths at the commencement of the Great Walk trail and at each accommodation site.
 - training tour guides in the identification of weeds and other indicators of ecological impact (such as evidence of plant pathogens and pest animal species), such that they can provide regular feedback as part of a broader monitoring regime.
 - training tour guides in the identification of animal breeding places, such that they can provide feedback on potential impacts to animal breeding activity (e.g. if a nest or flying-fox roost is established within or within close proximity to one of the sites) as part of a broader monitoring and impact mitigation regime.

5.3 OFFSETS FOR SIGNIFICANT RESIDUAL IMPACTS

The implementation of the measures outlined in **Sections 5.1 and 5.2** is expected to eliminate or achieve/maintain a low risk of significant impact in relation to the relevant criteria outlined in **Tables 4.1-4.7**. The main exception is the authorised clearing of part of the Great Sandy National Park protected area, which is unavoidable and unable to be mitigated to level that would be considered insignificant. Consequently, it is understood an offset or other appropriate conservation outcome would be required to compensate for this impact.

Compensation for unavoidable residual impacts in the form of offsets may also be required if non-juvenile Koala habitat trees require removal for the purposes of accommodation site construction or operation at Site N (option 1) or N (option 2).

6.0 REFERENCES

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APPENDIX A

EPBC Protected Matters Search Tool 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: 12/02/19 17:01:37

[Summary](#)

[Details](#)

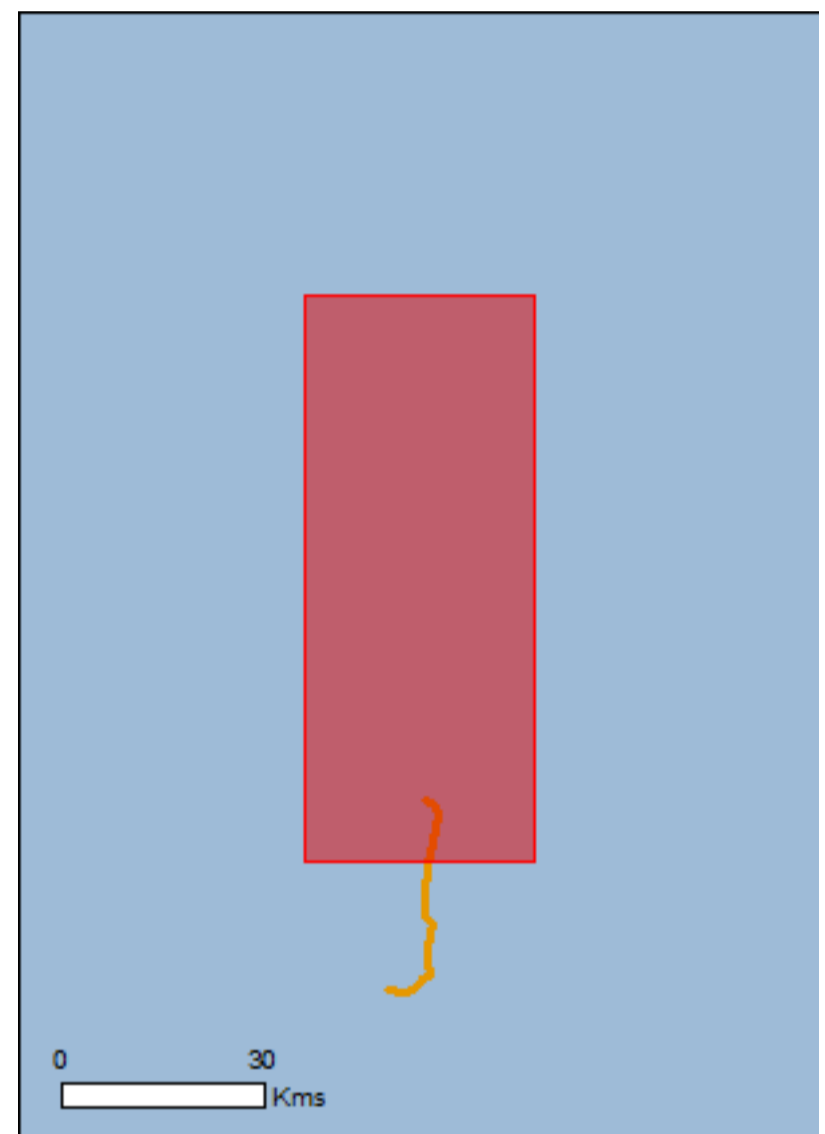
[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2010

[Coordinates](#)

[Buffer: 1.0Km](#)



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:	1
National Heritage Places:	1
Wetlands of International Importance:	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	1
Listed Threatened Ecological Communities:	3
Listed Threatened Species:	96
Listed Migratory Species:	77

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:	1
Commonwealth Heritage Places:	1
Listed Marine Species:	115
Whales and Other Cetaceans:	15
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:	39
Regional Forest Agreements:	None
Invasive Species:	43
Nationally Important Wetlands:	5
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

World Heritage Properties [\[Resource Information \]](#)

Name	State	Status
Fraser Island	QLD	Declared property

National Heritage Properties [\[Resource Information \]](#)

Name	State	Status
Natural		
Fraser Island	QLD	Listed place

Wetlands of International Importance (Ramsar) [\[Resource Information \]](#)

Name	Proximity
Great sandy strait (including great sandy strait, tin can bay and tin can	Within Ramsar site

Commonwealth Marine Area [\[Resource Information \]](#)

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside the Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area. Generally the Commonwealth Marine Area stretches from three nautical miles to two hundred nautical miles from the coast.

Name

EEZ and Territorial Sea

Marine Regions [\[Resource Information \]](#)

If you are planning to undertake action in an area in or close to the Commonwealth Marine Area, and a marine bioregional plan has been prepared for the Commonwealth Marine Area in that area, the marine bioregional plan may inform your decision as to whether to refer your proposed action under the EPBC Act.

Name

[Temperate East](#)

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 likely to occur within area
Lowland Rainforest of Subtropical Australia	Critically Endangered	Community likely to occur within area
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	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 known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur

Name	Status	Type of Presence within area
Calidris tenuirostris Great Knot [862]	Critically Endangered	Roosting known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Roosting known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Cyclopsitta diophthalma coxeni Coxen's Fig-Parrot [59714]	Endangered	Species or species habitat likely to occur within area
Dasyornis brachypterus Eastern Bristlebird [533]	Endangered	Species or species habitat may occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Species or species habitat may occur within area
Diomedea antipodensis gibsoni Gibson's Albatross [82270]	Vulnerable	Species or species habitat may occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Species or species habitat may occur within area
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat known to occur within area
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area
Geophaps scripta scripta Squatter Pigeon (southern) [64440]	Vulnerable	Species or species habitat may occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
Limosa lapponica baueri Bar-tailed Godwit (baueri), Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat known to occur within area
Limosa lapponica menzbieri Northern Siberian Bar-tailed Godwit, Bar-tailed Godwit (menzbieri) [86432]	Critically Endangered	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within

Name	Status	Type of Presence area
Poephila cincta cincta Southern Black-throated Finch [64447]	Endangered	Species or species habitat may occur within area
Pterodroma neglecta neglecta Kermadec Petrel (western) [64450]	Vulnerable	Foraging, feeding or related behaviour may occur within area
Rostratula australis Australian Painted-snipe, Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
Thalassarche cauta cauta Shy Albatross, Tasmanian Shy Albatross [82345]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta steadi White-capped Albatross [82344]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Species or species habitat may occur within area
Turnix melanogaster Black-breasted Button-quail [923]	Vulnerable	Species or species habitat known to occur within area
Fish		
Epinephelus daemeli Black Rockcod, Black Cod, Saddled Rockcod [68449]	Vulnerable	Species or species habitat may occur within area
Maccullochella mariensis Mary River Cod [83806]	Endangered	Species or species habitat known to occur within area
Nannoperca oxleyana Oxleyan Pygmy Perch [64468]	Endangered	Species or species habitat likely to occur within area
Neoceratodus forsteri Australian Lungfish, Queensland Lungfish [67620]	Vulnerable	Species or species habitat known to occur within area
Pseudomugil mellis Honey Blue-eye [26180]	Vulnerable	Species or species habitat likely to occur within area
Frogs		
Litoria olongburensis Wallum Sedge Frog [1821]	Vulnerable	Species or species habitat known to 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

Name	Status	Type of Presence
habitat known to 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	Breeding may occur within area
Mammals		
Balaenoptera borealis Sei Whale [34]	Vulnerable	Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Species or species habitat may occur within area
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 known 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 known to occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Petauroides volans Greater Glider [254]	Vulnerable	Species or species habitat known 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
Xeromys myoides Water Mouse, False Water Rat, Yirrkoo [66]	Vulnerable	Species or species habitat known to occur within area
Plants		
Acacia attenuata [10690]	Vulnerable	Species or species habitat known to occur within area
Acronychia littoralis Scented Acronychia [8582]	Endangered	Species or species habitat likely to occur within area
Allocasuarina emuina Emu Mountain Sheoak, Mt Emu She-oak [21926]	Endangered	Species or species

Name	Status	Type of Presence
Allocasuarina thalassoscopica [21927]	Endangered	habitat known to occur within area Species or species habitat known to occur within area
Archidendron lovelliae Bacon Wood, Tulip Siris [13451]	Vulnerable	Species or species habitat known to occur within area
Arthraxon hispidus Hairy-joint Grass [9338]	Vulnerable	Species or species habitat known to occur within area
Baloghia marmorata Marbled Baloghia, Jointed Baloghia [8463]	Vulnerable	Species or species habitat likely to occur within area
Boronia keysii Key's Boronia [21632]	Vulnerable	Species or species habitat known to 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 known to occur within area
Cryptostylis hunteriana Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat known to occur within area
Eucalyptus conglomerata Swamp Stringybark [3160]	Endangered	Species or species habitat likely to occur within area
Floydia praealta Ball Nut, Possum Nut, Big Nut, Beefwood [15762]	Vulnerable	Species or species habitat likely to occur within area
Lepidium peregrinum Wandering Pepper-cress [14035]	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 known to occur within area
Macadamia ternifolia Small-fruited Queensland Nut, Gympie Nut [7214]	Vulnerable	Species or species habitat known to occur within area
Macrozamia pauli-guilielmi Pineapple Zamia [5712]	Endangered	Species or species habitat likely to occur within area
Phaius australis Lesser Swamp-orchid [5872]	Endangered	Species or species habitat known to occur within area
Planchonella eerwah Shiny-leaved Condo, Black Plum, Wild Apple [17340]	Endangered	Species or species habitat likely to occur within area
Prasophyllum wallum Wallum Leek-orchid [55148]	Vulnerable	Species or species habitat likely to occur within area
Prostanthera spathulata [88266]	Vulnerable	Species or species habitat known to occur

Name	Status	Type of Presence within area
Romnalda strobilacea [5948]	Vulnerable	Species or species habitat likely to occur within area
Samadera bidwillii Quassia [29708]	Vulnerable	Species or species habitat known to 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 known to occur within area
Xanthostemon oppositifolius Penda, Southern Penda, Luya's Hardwood [8738]	Vulnerable	Species or species habitat likely to occur within area
Reptiles		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding known to occur within area
Delma torquata Adorned Delma, Collared Delma [1656]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Furina dunmalli Dunmall's Snake [59254]	Vulnerable	Species or species habitat may occur within area
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Foraging, feeding or related behaviour known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area
Saiphos reticulatus Three-toed Snake-tooth Skink [88328]	Vulnerable	Species or species habitat likely to occur within area
Sharks		
Carcharias taurus (east coast population) Grey Nurse Shark (east coast population) [68751]	Critically Endangered	Species or species habitat known to occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
Pristis zijsron Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Breeding likely to occur within area

Name	Status	Type of Presence
Rhincodon typus Whale Shark [66680]	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		
Anous stolidus Common Noddy [825]		Species or species habitat known to occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat known to occur within area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat may occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Species or species habitat may occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Species or species habitat may occur within area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat known to occur within area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Sternula albifrons Little Tern [82849]		Species or species habitat may occur within area
Thalassarche cauta Tasmanian Shy Albatross [89224]	Vulnerable*	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area

Name	Threatened	Type of Presence
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Species or species habitat may occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Migratory Marine Species		
Balaena glacialis australis Southern Right Whale [75529]	Endangered*	Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Species or species habitat may occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Species or species habitat may occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding known to occur within area
Crocodylus porosus Salt-water Crocodile, Estuarine Crocodile [1774]		Species or species habitat likely to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Dugong dugon Dugong [28]		Species or species habitat known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Foraging, feeding or related behaviour known to occur within area
Manta alfredi Reef Manta Ray, Coastal Manta Ray, Inshore Manta Ray, Prince Alfred's Ray, Resident Manta Ray [84994]		Species or species habitat known to occur within area
Manta birostris Giant Manta Ray, Chevron Manta Ray, Pacific Manta Ray, Pelagic Manta Ray, Oceanic Manta Ray [84995]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Foraging, feeding or

Name	Threatened	Type of Presence
Natator depressus Flatback Turtle [59257]	Vulnerable	related behaviour known to occur within area Breeding known to occur within area
Orcaella heinsohni Australian Snubfin Dolphin [81322]		Species or species habitat likely to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Pristis zijsron Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Breeding likely to occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Sousa chinensis Indo-Pacific Humpback Dolphin [50]		Breeding known to occur within area
Migratory Terrestrial Species		
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat known to 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
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Arenaria interpres Ruddy Turnstone [872]		Roosting known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Roosting known to occur within area
Calidris alba Sanderling [875]		Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat likely to occur

Name	Threatened	Type of Presence
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area
Calidris subminuta Long-toed Stint [861]		Roosting known to occur within area
Calidris tenuirostris Great Knot [862]	Critically Endangered	Roosting known to occur within area
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Roosting known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Roosting known to occur within area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area
Limnodromus semipalmatus Asian Dowitcher [843]		Roosting known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]		Roosting known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting known to occur within area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area
Pandion haliaetus Osprey [952]		Breeding known to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area
Pluvialis squatarola Grey Plover [865]		Roosting known to occur within area
Tringa brevipes Grey-tailed Tattler [851]		Roosting known to occur within area
Tringa glareola Wood Sandpiper [829]		Roosting known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area
Xenus cinereus Terek Sandpiper [59300]		Roosting known to occur

Name	Threatened	Type of Presence within area
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Other Matters Protected by the EPBC Act

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

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

Name
Defence - TIN CAN BAY TRAINING AREA

Commonwealth Heritage Places [\[Resource Information \]](#)

Name	State	Status
Natural		
Wide Bay Military Reserve	QLD	Listed place

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 known to occur within area

[Anous stolidus](#)
Common Noddy [825] Species or species habitat known to 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

[Arenaria interpres](#)
Ruddy Turnstone [872] Roosting known to occur within area

[Calidris acuminata](#)
Sharp-tailed Sandpiper [874] Roosting known to occur within area

Name	Threatened	Type of Presence
Calidris alba Sanderling [875]		Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat likely to occur within area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area
Calidris subminuta Long-toed Stint [861]		Roosting known to occur within area
Calidris tenuirostris Great Knot [862]	Critically Endangered	Roosting known to occur within area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat may occur within area
Catharacta skua Great Skua [59472]		Species or species habitat may occur within area
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Roosting known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Charadrius ruficapillus Red-capped Plover [881]		Roosting known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Species or species habitat may occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Species or species habitat may occur within area
Diomedea gibsoni Gibson's Albatross [64466]	Vulnerable*	Species or species habitat may occur within area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat known to occur within area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Roosting known to occur within area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area

Name	Threatened	Type of Presence
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Heteroscelus brevipes Grey-tailed Tattler [59311]		Roosting known to occur within area
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Roosting known to occur within area
Hirundapus caudacutus White-throated Needletail [682]		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
Limnodromus semipalmatus Asian Dowitcher [843]		Roosting known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]		Roosting known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may 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 known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting known to occur within area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Breeding known to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area

Name	Threatened	Type of Presence
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area
Pluvialis squatarola Grey Plover [865]		Roosting known to occur within area
Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [1043]		Species or species habitat known to occur within area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Roosting 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
Sterna albifrons Little Tern [813]		Species or species habitat may occur within area
Thalassarche cauta Tasmanian Shy Albatross [89224]	Vulnerable*	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Species or species habitat may occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Tringa glareola Wood Sandpiper [829]		Roosting known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area
Xenus cinereus Terek Sandpiper [59300]		Roosting known to occur within area
Fish		
Acentronura tentaculata Shortpouch Pygmy Pipehorse [66187]		Species or species habitat may occur within area
Campichthys tryoni Tryon's Pipefish [66193]		Species or species habitat may occur within area
Corythoichthys amplexus Fijian Banded Pipefish, Brown-banded Pipefish		Species or species

Name	Threatened	Type of Presence
[66199]		habitat may occur within area
Corythoichthys ocellatus Orange-spotted Pipefish, Ocellated Pipefish [66203]		Species or species habitat may occur within area
Festucalex cinctus Girdled Pipefish [66214]		Species or species habitat may occur within area
Filicampus tigris Tiger Pipefish [66217]		Species or species habitat may occur within area
Halicampus grayi Mud Pipefish, Gray's Pipefish [66221]		Species or species habitat may occur within area
Hippichthys cyanospilos Blue-speckled Pipefish, Blue-spotted Pipefish [66228]		Species or species habitat may occur within area
Hippichthys heptagonus Madura Pipefish, Reticulated Freshwater Pipefish [66229]		Species or species habitat may occur within area
Hippichthys penicillus Beady Pipefish, Steep-nosed Pipefish [66231]		Species or species habitat may occur within area
Hippocampus kelloggi Kellogg's Seahorse, Great Seahorse [66723]		Species or species habitat may occur within area
Hippocampus kuda Spotted Seahorse, Yellow Seahorse [66237]		Species or species habitat may occur within area
Hippocampus planifrons Flat-face Seahorse [66238]		Species or species habitat may occur within area
Hippocampus trimaculatus Three-spot Seahorse, Low-crowned Seahorse, Flat-faced Seahorse [66720]		Species or species habitat may occur within area
Hippocampus whitei White's Seahorse, Crowned Seahorse, Sydney Seahorse [66240]		Species or species habitat likely to occur within area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Micrognathus andersonii Anderson's Pipefish, Shortnose Pipefish [66253]		Species or species habitat may occur within area
Micrognathus brevirostris thorntail Pipefish, Thorn-tailed Pipefish [66254]		Species or species habitat may occur within area
Microphis manadensis Manado Pipefish, Manado River Pipefish [66258]		Species or species habitat may occur within area
Solegnathus dunckeri Duncker's Pipehorse [66271]		Species or species habitat may occur within

Name	Threatened	Type of Presence area
Solegnathus hardwickii Pallid Pipehorse, Hardwick's Pipehorse [66272]		Species or species habitat may occur within area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area
Solenostomus cyanopterus Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area
Solenostomus paradoxus Ornate Ghostpipefish, Harlequin Ghost Pipefish, Ornate Ghost Pipefish [66184]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area
Trachyrhamphus bicoarctatus Bentstick Pipefish, Bend Stick Pipefish, Short-tailed Pipefish [66280]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Mammals		
Dugong dugon Dugong [28]		Species or species habitat known to occur within area
Reptiles		
Acalyptophis peronii Horned Seasnake [1114]		Species or species habitat may occur within area
Aipysurus duboisii Dubois' Seasnake [1116]		Species or species habitat may occur within area
Aipysurus laevis Olive Seasnake [1120]		Species or species habitat may occur within area
Astrotia stokesii Stokes' Seasnake [1122]		Species or species habitat may occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding known to occur within area
Crocodylus porosus Salt-water Crocodile, Estuarine Crocodile [1774]		Species or species habitat likely to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Disteira kingii Spectacled Seasnake [1123]		Species or species habitat may occur within area
Disteira major Olive-headed Seasnake [1124]		Species or species habitat may occur within area
Emydocephalus annulatus Turtle-headed Seasnake [1125]		Species or species habitat may occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Hydrophis elegans Elegant Seasnake [1104]		Species or species habitat may occur within area
Laticauda colubrina a sea krait [1092]		Species or species habitat may occur within area
Laticauda laticaudata a sea krait [1093]		Species or species habitat may occur within area
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Foraging, feeding or related behaviour known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area
Pelamis platurus Yellow-bellied Seasnake [1091]		Species or species habitat may occur within area

Whales and other Cetaceans [Resource Information]

Name	Status	Type of Presence
Mammals		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Species or species habitat may occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Species or species habitat may occur within area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species

Name	Status	Type of Presence
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	habitat may occur within area Foraging, feeding or related behaviour known to occur within area
Orcaella brevirostris Irrawaddy Dolphin [45]		Species or species habitat likely to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Sousa chinensis Indo-Pacific Humpback Dolphin [50]		Breeding known to occur within area
Stenella attenuata Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area

Extra Information

State and Territory Reserves	[Resource Information]
Name	State
Alyxia	QLD
Arthur Harrold	QLD
Bill Huxley	QLD
Bryn Glas	QLD
Cooloola (Noosa River)	QLD
Cooloothin	QLD
Cooroibah Environmental Reserve	QLD
Dangerbridge	QLD
Dangerbridge A	QLD
Doonan Wetlands	QLD
Doonella Wetlands	QLD
Double Island Point	QLD
Eumundi	QLD
Girraween	QLD
Goat Island (Noosa River)	QLD
Great Sandy	QLD
Great Sandy 1	QLD
Great Sandy 2	QLD
Great Sandy National Park	QLD
Harry Spring	QLD
Johns Property addition to Great Sandy National Park	QLD
Keyser Island	QLD
Kildey's Dangerbridge	QLD
Kingsgate Drive	QLD
Mount Cooroy	QLD
NOF-DANGERBRIDGE	QLD
Noosa	QLD
Noosa North Shore	QLD
Penda Scrub	QLD

Name	State
Pipeclay	QLD
Sheep Island	QLD
Tainsh's	QLD
Tarangau Station	QLD
Tewantin	QLD
Una Corbould	QLD
Verrierdale Rise	QLD
Weyba	QLD
Weyba Creek	QLD
Womalah	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 Resources 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
Turdus merula Common Blackbird, Eurasian Blackbird [596]		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

Name	Status	Type of Presence
Equus caballus Horse [5]		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 norvegicus Brown Rat, Norway Rat [83]		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		
Annona glabra Pond Apple, Pond-apple Tree, Alligator Apple, Bullock's Heart, Cherimoya, Monkey Apple, Bobwood, Corkwood [6311]		Species or species habitat likely to occur within area
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
Asparagus africanus Climbing Asparagus, Climbing Asparagus Fern [66907]		Species or species habitat likely to occur within area
Asparagus plumosus Climbing Asparagus-fern [48993]		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
Chrysanthemoides monilifera subsp. rotundata Bitou Bush [16332]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Cryptostegia grandiflora Rubber Vine, Rubbervine, India Rubber Vine, India Rubbervine, Palay Rubbervine, Purple Allamanda [18913]		Species or species habitat likely to 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
Opuntia spp. Prickly Pears [82753]		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
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		
Hemidactylus frenatus Asian House Gecko [1708]		Species or species habitat likely to occur within area
Ramphotyphlops braminus Flowerpot Blind Snake, Brahminy Blind Snake, Cacing Besi [1258]		Species or species habitat may occur within area
Nationally Important Wetlands		[Resource Information]
Name	State	
Fraser Island	QLD	
Great Sandy Strait	QLD	
Lake Weyba	QLD	
Noosa River Wetlands	QLD	
Wide Bay Military Training Area C	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

-25.7941 152.9313,-25.7941 153.2367,-26.4698 153.2367,-26.4698 152.9313,-25.7941 152.9313

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.

APPENDIX B

Quaternary Site Data

Table B.1. Site Reference Table

Quaternary Site Number Noted on Vegetation Assessment Forms in Appendix A	Corresponding Site Number in Table 3.1 of Main Report
1	Site N (Option 2)
2	Site N (Option 2)
29	Site L
30	Site K
31	Site P
32	Site P
33	Site P
34	Site P
35	Site P
36	Site P
37	Site P
38	Sites D1 and D2
39	Sites D1 and D2
40	Sites D1 and D2

Site	Habitat description	Representative photo
Q1	<p>Remnant RE 12.3.14a.</p> <p>Canopy (T1): Mid Dense Dominant Species: <i>Eucalyptus racemosa</i> Sub-Dominant Species: <i>Banksia aemula</i> Associated Species: <i>Corymbia intermedia</i>, <i>Endiandra sieberi</i>, 5-10m</p> <p>Sub-Canopy (T2): Mid-dense Dominant Species: <i>Banksia aemula</i> 2-5m</p> <p>Shrub (S1): Sparse Co-Dominant Species: <i>Banksia aemula</i>, <i>Styphelia viridis</i>, <i>Persoonia virgata</i> 1-2m</p>	
Q2	<p>Remnant RE 12.2.9.</p> <p>Canopy (Emergent): Sparse Dominant species: Mallee <i>Eucalyptus tereticornis</i> 5-6m</p> <p>Canopy (T1): Sparse Dominant Species: <i>Banksia aemula</i>, Associated Species: <i>Banksia oblongifolia</i>, 2-5</p> <p>Shrub (S1): Sparse Co-Dominant Species: <i>Leptospermum polygalifolium</i>, <i>Banksia oblongifolia</i>, <i>Melaleuca pachyphylla</i> 1-2m</p>	

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Created	2020-03-24 01:37:53 UTC by Lizzy Buckby
Updated	2020-03-24 01:40:14 UTC by Lizzy Buckby
Location	-26.0713241333333, 153.075533166667

Site Photos



Recorders Jarrah

Date 2020-03-24

Site number 29

T1 Stratum

Median height 21

Height interval 17-23

Estimated cover density Mid-Dense

T2 Stratum

Median height 15

Height interval 12-17

Estimated cover density Mid-Dense

Additional information RE 12.2.8

Species dominance

T1

Stratum T1

Relative dominance Dominant

Species Eucalyptus pilularisblackbutt

T1

Stratum T1

Relative dominance Subdominant

Species Endiandra sieberihard corkwood

T2

Stratum	T2
Relative dominance	Dominant
Species	Endiandra sieberihard corkwood

T2

Stratum	T2
Relative dominance	Subdominant
Species	Corymbia intermediapink bloodwood

30

Created	2020-03-24 04:32:17 UTC by Lizzy Buckby
Updated	2020-03-24 04:36:20 UTC by Lizzy Buckby
Location	-26.0225183166667, 153.113114483333
Recorders	Jarrah
Date	2020-03-24
Site number	30

T1 Stratum

Median height	23
Height interval	19-23
Estimated cover density	Sparse

T2 Stratum

Median height	16
Height interval	12-19
Estimated cover density	Mid-Dense

Species dominance

T1

Stratum	T1
Relative dominance	Codominant
Species	Syncarpia hillii Fraser Island satinay, Lophostemon confertus brush box

T2

Stratum	T2
Relative dominance	Dominant
Species	Allocasuarina torulosa

T2

Stratum	T2
Relative dominance	Associated
Species	Psydrax lamprophylla, Acronychia imperforata beach acronychia

25

Created	2020-02-25 04:24:01 UTC by Lizzy Buckby
Updated	2020-02-25 04:26:21 UTC by Lizzy Buckby
Location	-26.0225799833333, 153.1130467

Site Photos



Recorders	Jarrah
Date	2020-02-25
Site number	25
Additional information	Preferred 3

31

Created	2020-03-24 23:22:13 UTC by Lizzy Buckby
Updated	2020-03-24 23:24:52 UTC by Lizzy Buckby
Location	-25.96475935, 153.104729533333

Site Photos



Recorders	Jarrah
Date	2020-03-25
Site number	31

T1 Stratum

Median height	24
Height interval	19-26
Estimated cover density	Mid-Dense
Additional information	12.2.8

Species dominance

T1

Stratum	T1
Relative dominance	Dominant
Species	Eucalyptus pilularisblackbutt

32

Created 2020-03-24 23:44:45 UTC by Lizzy Buckby

Updated 2020-03-24 23:45:30 UTC by Lizzy Buckby

Location -25.9652972166667, 153.105676066667

Site Photos



Recorders Jarrah

Date 2020-03-25

Site number 32

Species dominance

T1

Stratum T1

Relative dominance Dominant

Species Eucalyptus pilularisblackbutt

33

Created	2020-03-25 00:33:13 UTC by Lizzy Buckby
Updated	2020-03-25 00:39:00 UTC by Lizzy Buckby
Location	-25.9661124508551, 153.106856457889

Site Photos



Recorders	Jarrah
Date	2020-03-25
Site number	33
Additional information	12.2.1

Species dominance

T1

Stratum	T1
Relative dominance	Dominant
Species	Agathis robusta

T1

Stratum	T1
Relative dominance	Associated
Species	Cryptocarya glaucescens, Rhodamnia acuminata, cooloola ironwood, Beilschmiedia elliptica, grey walnut, Euroschinus falcatus, Schizomeria ovata

34

Created	2020-03-25 01:18:39 UTC by Lizzy Buckby
Updated	2020-03-25 01:21:26 UTC by Lizzy Buckby
Location	-25.9666147333333, 153.107819016667

Site Photos



Recorders	Jarrah
Date	2020-03-25
Site number	34
Additional information	Rainforest

Species dominance

T1

Stratum	T1
Relative dominance	Dominant
Species	Agathis robusta

T1

Stratum	T1
Relative dominance	Subdominant
Species	Lophostemon confertusbrush box

T1

Stratum	T1
Relative dominance	Associated
Species	Polyalthia nitidissima, Cryptocarya glaucescens, Syzygium luehmannii, Sarcopteryx stipatasteelwood

35

Created	2020-03-25 02:09:32 UTC by Lizzy Buckby
Updated	2020-03-25 02:10:39 UTC by Lizzy Buckby
Location	-25.9653465833333, 153.108073616667

Site Photos



Recorders	Jarrah
Date	2020-03-25
Site number	35
Additional information	12.2.8

Species dominance

T1

Stratum	T1
Relative dominance	Dominant
Species	Eucalyptus pilularisblackbutt

36

Created	2020-03-25 02:15:19 UTC by Lizzy Buckby
Updated	2020-03-25 02:17:00 UTC by Lizzy Buckby
Location	-25.9645069, 153.108404566667

Site Photos



Recorders	Jarrah
Date	2020-03-25
Site number	36
Additional information	12.2.8. Significant trees everywhere

Species dominance

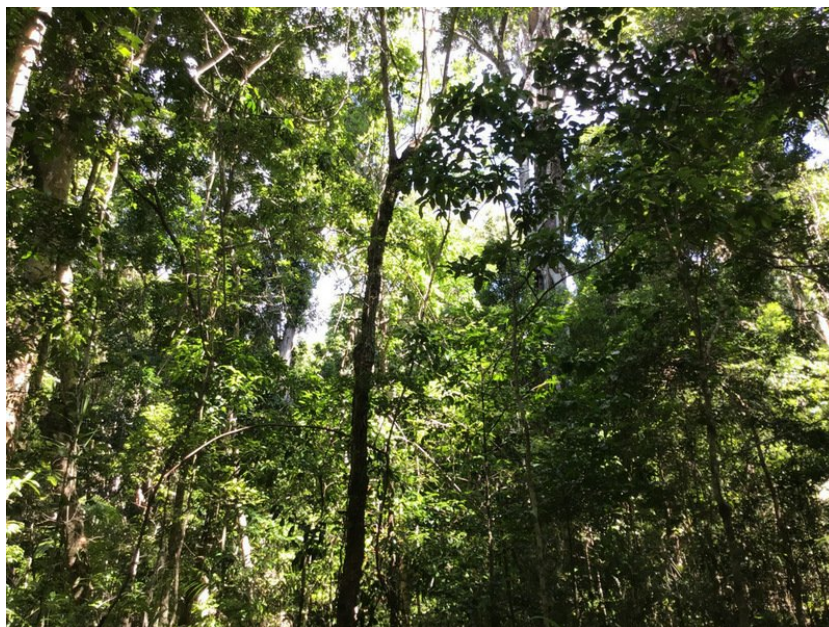
T1

Stratum	T1
Relative dominance	Dominant
Species	Eucalyptus pilularisblackbutt

37

Created	2020-03-25 03:15:59 UTC by Lizzy Buckby
Updated	2020-03-25 03:17:42 UTC by Lizzy Buckby
Location	-25.9668427, 153.110394133333

Site Photos



Recorders	Jarrah
Date	2020-03-25
Site number	37

Species dominance

T1

Stratum	T1
Relative dominance	Codominant
Species	Lophostemon confertusbrush box, Agathis robusta

38

Created	2020-03-25 23:47:29 UTC by Lizzy Buckby
Updated	2020-03-25 23:50:37 UTC by Lizzy Buckby
Location	-25.9311682833333, 153.187909916667

Site Photos



Recorders	Jarrah
Date	2020-03-26
Site number	38

T1 Stratum

Median height	4.5
Height interval	3-6
Estimated cover density	Mid-Dense

Species dominance

T1

Stratum	T1
Relative dominance	Codominant
Species	Acacia leiocalyx, Allocasuarina littoralis, Psydrax lamprophylla, Petalostigma pubescensquinine tree

39

Created	2020-03-25 23:59:58 UTC by Lizzy Buckby
Updated	2020-03-26 00:04:04 UTC by Lizzy Buckby
Location	-25.9306060166667, 153.1873416
Recorders	Jarrah
Date	2020-03-26
Site number	39

T1 Stratum

Median height	8
Height interval	6-11
Estimated cover density	Mid-Dense

Species dominance

T1

Stratum	T1
Relative dominance	Dominant
Species	Corymbia intermediapink bloodwood

T1

Stratum	T1
Relative dominance	Associated
Species	Alectryon coriaceusbeach alectryon, Triploceras gracile, Callitris columellaris

G

Stratum	G
Relative dominance	Associated
Species	Zieria smithii

40

Created	2020-03-26 01:03:02 UTC by Lizzy Buckby
Updated	2020-03-26 01:04:39 UTC by Lizzy Buckby
Location	-25.9296443833333, 153.185784616667

Site Photos



Recorders	Jarrah
Date	2020-03-26
Site number	40

T1 Stratum

Median height	8
Height interval	6-12
Estimated cover density	Dense

Species dominance

T1

Stratum	T1
Relative dominance	Dominant
Species	Corymbia intermediapink bloodwood

T1

Stratum	T1
Relative dominance	Subdominant
Species	Callitris columellaris