



ECOLOGICAL DESKTOP ASSESSMENT

PREMIUM ECOTOURISM PRODUCTS, COOLOOLA GREAT WALK

**Prepared for
Department of Environment and Science**

**Biodiversity Assessment and Management Pty Ltd
PO Box 1376
CLEVELAND 4163**

Specialised ecological knowledge that reduces your risk

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Project Manager/s: Jedd Appleton

Client: Department of Environment and Science

Project Title: Ecological Desktop Assessment, Premium Ecotourism Products, Cooloola Great Walk

Project Author/s: Jedd Appleton

Project Summary: Undertake a desktop review of ecological values on land within the vicinity of the Cooloola Great Walk to identify the potential presence of constraints that may influence the site location of eco accommodation along the trail.

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Date: 24/04/2019

Biodiversity Assessment and Management Pty Ltd



Director

EXECUTIVE SUMMARY

This report documents the results of a desktop review of ecological values on land within the vicinity of the Coolooloa Great Walk (the 'study area') to identify the potential presence of constraints that may influence the site location of eco accommodation along the trail. The primary deliverable from the review is a 'heat map' indicating areas alongside the trail where the development of eco-accommodation may require Commonwealth and/or State approval and/or may otherwise cause significant impacts to important ecological values, as well as areas where no significant impacts are likely to occur and any approvals would be relatively straightforward.

METHODOLOGY

The desktop review included publicly available datasets and an analysis of relevant information for conservation significant vegetation communities, habitat and flora and fauna species with reference to the study area locality. Analysis focused on information that indicates the known or potential presence of matters of national environmental significance (MNES) and state environmental significance (MSES).

For the purposes of this assessment it is understood the proposed eco-accommodation would be located no further than 500 m from the existing trails; consequently, the desktop review focused on a 1km corridor centred on the existing trail alignment.

ECOLOGICAL VALUES

The study area supports known and potential habitat for numerous flora and fauna species listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and/or Queensland *Nature Conservation Act 1992* (NC Act).

Most of the study area is mapped by the State as containing remnant vegetation, some of which comprises regional ecosystems (REs) that have a status under the Queensland *Vegetation Management Act 1999* of Of Concern, as well as a number of REs recognised as wetlands.

State mapping indicates wetlands of high ecological significance occur within the central and southern portions of the study area, while the southern-most extent of the study area is a recognised fish habitat area that contains marine plants. A number of waterways mapped by the State as providing for fish passage also occur within the central portion of the study area.

The Noosa River Wetland system (portions of which occur within the study area) is recognised as a Nationally Important Wetland.

State mapping identifies all land within the study area as having State biodiversity significance.

HEAT MAPPING

Heat map categories were assigned on the basis of the likely presence of MNES, MSES or other significant ecological values and the likelihood that the development of eco-accommodation may lead to a significant impact on the identified ecological values. This was determined through consideration of the nature of the proposed action, the sensitivity of the value being impacted and relevant impact assessment guidelines.

It is understood preference will be given to locating the proposed eco-accommodation nodes in close proximity to the four existing walkers' camps along the Coolooloa Great Walk. The heat mapping presented in this report indicates there are likely to be suitable locations for eco-accommodation nodes within the vicinity of these existing camps subject to on-ground verification, with the exception of Dutgee Walkers' Camp which is located within and surrounded by a wetland of State and National importance and should be avoided. It is likely there are suitable alternatives for this location (subject to on-ground verification) as close as 2 km to the north of the existing camp.

ECOLOGICAL DESKTOP ASSESSMENT

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
DNRME	Queensland Department of Natural Resources, Mines and Energy
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

It is understood the Queensland Government seeks to raise the profile of the State's protected area estate (including national parks) 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, beginning with three trails - Thorsborne Trail, Cooloola Great Walk and Whitsunday Island Trail. These trails are envisioned to feature multiple nodes stemming from each trail permitting diverse styles of eco-accommodation to complement existing (and continuing) State-owned campsites on the trails.

Following the completion of an internal review of expected environmental opportunities and constraints to premium ecotourism products within the vicinity of the Whitsunday Island Trail, the Queensland Government, through the Department of Environment and Science (DES), has commissioned desktop environmental reviews for the Cooloola Great Walk (Great Sandy National Park) and Thorsborne Trail (Hinchinbrook Island National Park).

This report documents the results of a desktop review of ecological values on land within the vicinity of the Cooloola Great Walk (the 'study area') (**Figure 1.1**) to identify the potential presence of constraints that may influence the site location of eco accommodation along the trail.

The results of the assessment have been collated to form a 'Heat Map' of relative constraints.

2.0 METHODOLOGY

2.1 DESKTOP REVIEW

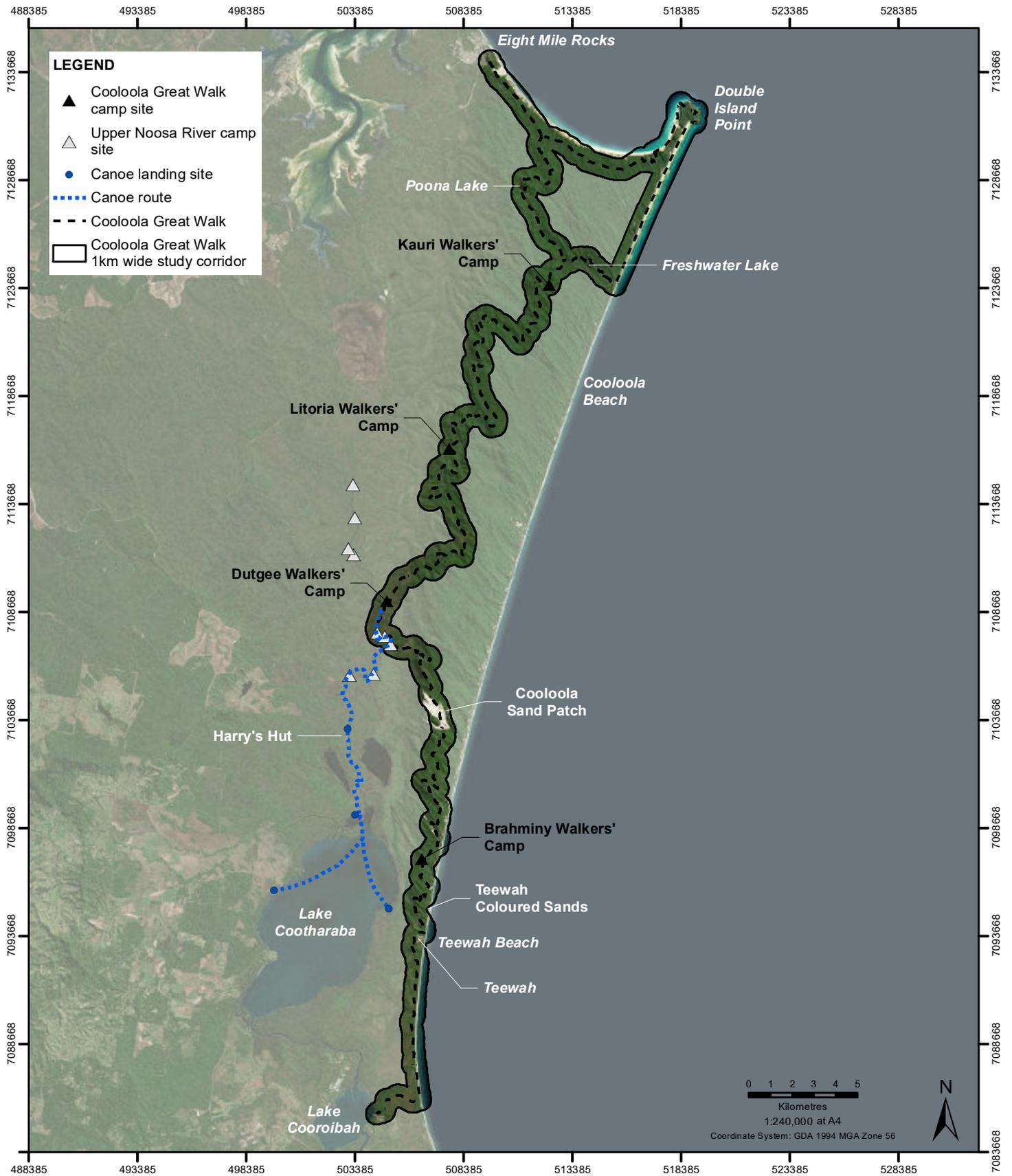
The desktop review included publicly available datasets and an analysis of relevant information on conservation significant vegetation communities, habitat and flora and fauna species with reference to the study area locality. This focused on information that indicates the known or potential presence 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 Report, which indicates the likely or potential presence of threatened ecological communities and species, migratory species, wetlands and marine parks listed under the EPBC Act;

- The Queensland Department of Natural Resources, Mines and Energy's (DNRME) 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, which 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.
- Other relevant documentation regarding the Cooloola Great Walk and Great Sandy National Park, as provided by DES.

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.



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Figure: 1.1

Title: Ecological Desktop Assessment - Locality Map

Project: Premium Ecotourism Products – Cooloolo Great Walk

Client: Department of Environment and Science



For the purposes of this assessment, it is understood the proposed eco-accommodation would be located no further than 500 m from the existing trails; consequently, the desktop review and associated heat mapping focused on a 1km corridor centred on the existing trail alignment (**Figure 1.1**). Conservation significant species records were obtained from an area at least 10 km from the existing alignment to allow for variable past survey effort within the 1km corridor and surrounds.

2.2 HEAT MAPPING

The primary deliverable from the review is a 'heat map' indicating areas alongside the trail where the development of eco-accommodation may require Commonwealth and/or State approval (and associated management/compensatory measures) and/or may otherwise cause significant impacts to important ecological values. The heat map also indicates areas where no significant impacts are likely to occur, and therefore where any approvals required would be relatively straightforward.

Heat map categories were assigned on the basis of:

- The likely presence of MNES, MSES or other significant ecological values; and
- The likelihood that the development of eco-accommodation may lead to a significant impact on the identified ecological values, as determined through consideration of the nature of the proposed action (where available), the sensitivity of the value being impacted, and relevant impact assessment guidelines.

Further details regarding the assignment of heat mapping categories to each of the identified values is provided in **Section 4.0**.

3.0 ECOLOGICAL VALUES

3.1 MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE (MNES)

3.1.1 Wetlands of International Importance (Ramsar)

The northern portion of the study area is located adjacent to the Great Sandy Strait Ramsar site (**Figure 3.1**).

3.1.2 Threatened Ecological Communities

The EPBC Protected Matters Search indicates three EPBC listed TECs could potentially occur within the study area:

- 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).

A review of State-mapped regional ecosystems within the study area indicates these TECs are unlikely to occur; consequently, they are not considered further as part of this assessment.

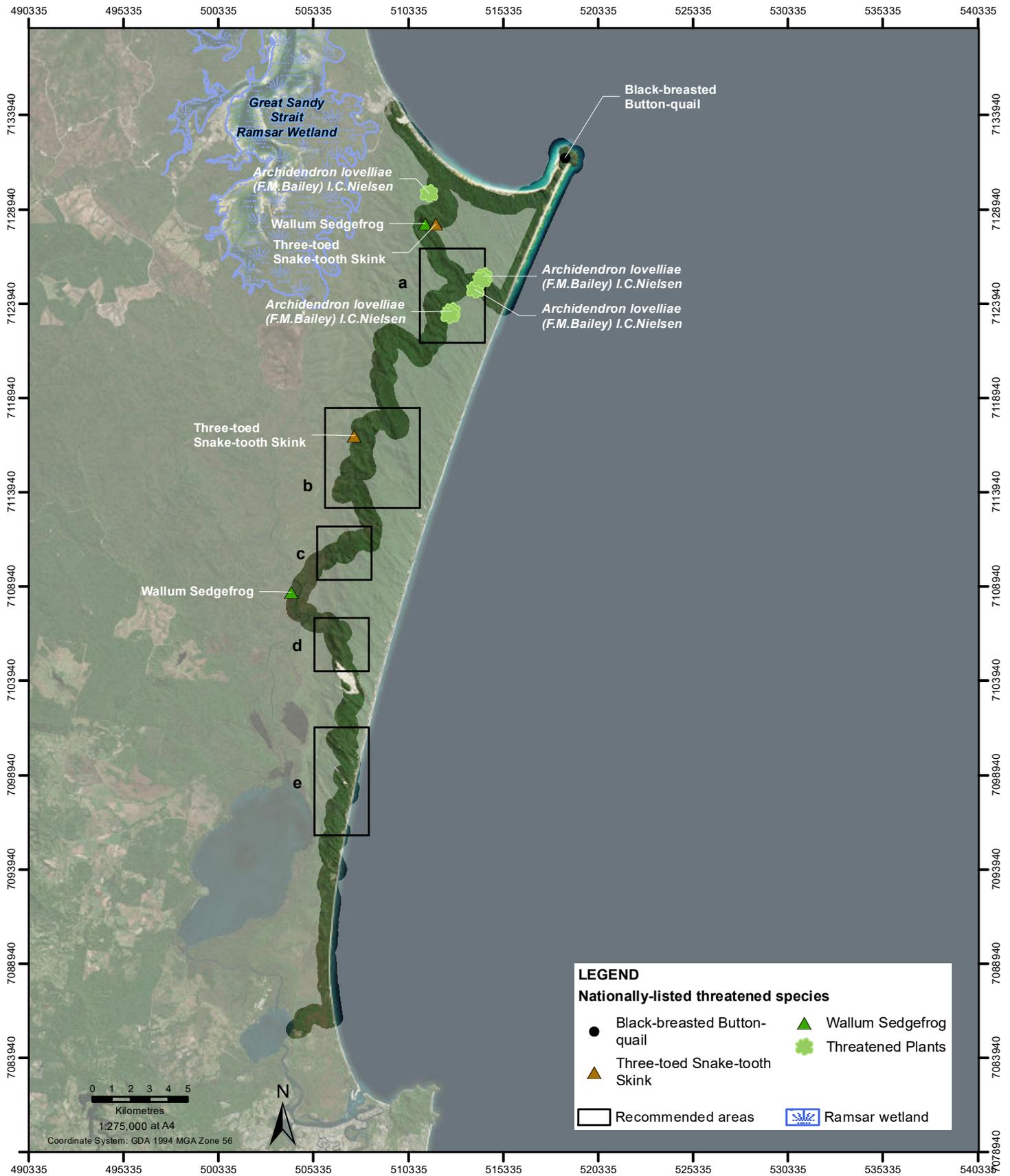
3.1.3 Threatened Species

Flora

The EPBC Protected Matters Search indicates numerous EPBC listed threatened flora species could potentially occur within the study area. EPBC listed threatened flora species known to occur within the vicinity of the study area 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).
- *Prostanthera spathulata* (Vulnerable).
- *Romnaldia strobilacea* (Vulnerable).
- *Xanthostemon oppositifolius* (Vulnerable).

Records located within the study area are shown on **Figure 3.1**.



Data Sources:
 Ramsar sites - Queensland
 Nationally-listed threatened species - WildNet wildlife records - published - Queensland;
 Queensland Museum Records; HERBRECS Records

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Figure: 3.1
Title: Ecological Desktop Assessment - MNES within the Study Area
Project: Premium Ecotourism Products – Cooloola Great Walk
Client: Department of Environment and Science



Fauna

The EPBC Protected Matters Search indicates numerous EPBC listed threatened fauna species could potentially occur within the study area. Many of these are species exclusively or primarily associated with the open ocean, beaches, estuaries or intertidal environments, and/or lacustrine or riverine wetlands. Based on the assumption that the eco accommodation would be located inland from, or on higher ground away from, these habitats, these species are not considered further as part of this assessment.

Of the remaining species, those known to occur within the vicinity of the study area based on previous records include:

- Three-toed Snake-tooth Skink *Coeranoscincus reticulatus* (Vulnerable)
- Spotted-tailed Quoll (southern subspecies) *Dasyurus maculatus maculatus* (Endangered)
- Red Goshawk *Erythrorchis 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)
- Australian Painted Snipe *Rostratula australis* (Endangered)
- Black-breasted Button-Quail *Turnix melanogaster* (Vulnerable).

Records within the study area for those species with specialised habitat preferences and/or restricted home ranges are shown on **Figure 3.1**.

3.1.4 Migratory Species

The EPBC Protected Matters Search indicates numerous EPBC listed migratory fauna species could potentially occur within the study area. Many of these are species exclusively or primarily associated with the open ocean, beaches, estuaries or intertidal environments, and/or lacustrine or riverine wetlands. Based on

the assumption that the eco accommodation would be located inland from, or on higher ground away from, these habitats, these species are not considered further as part of this assessment.

Of the remaining species, those known to occur within the vicinity of the study area based on previous records 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*.

3.2 MATTERS OF STATE ENVIRONMENTAL SIGNIFICANCE (MSES)

3.2.1 Regulated Vegetation

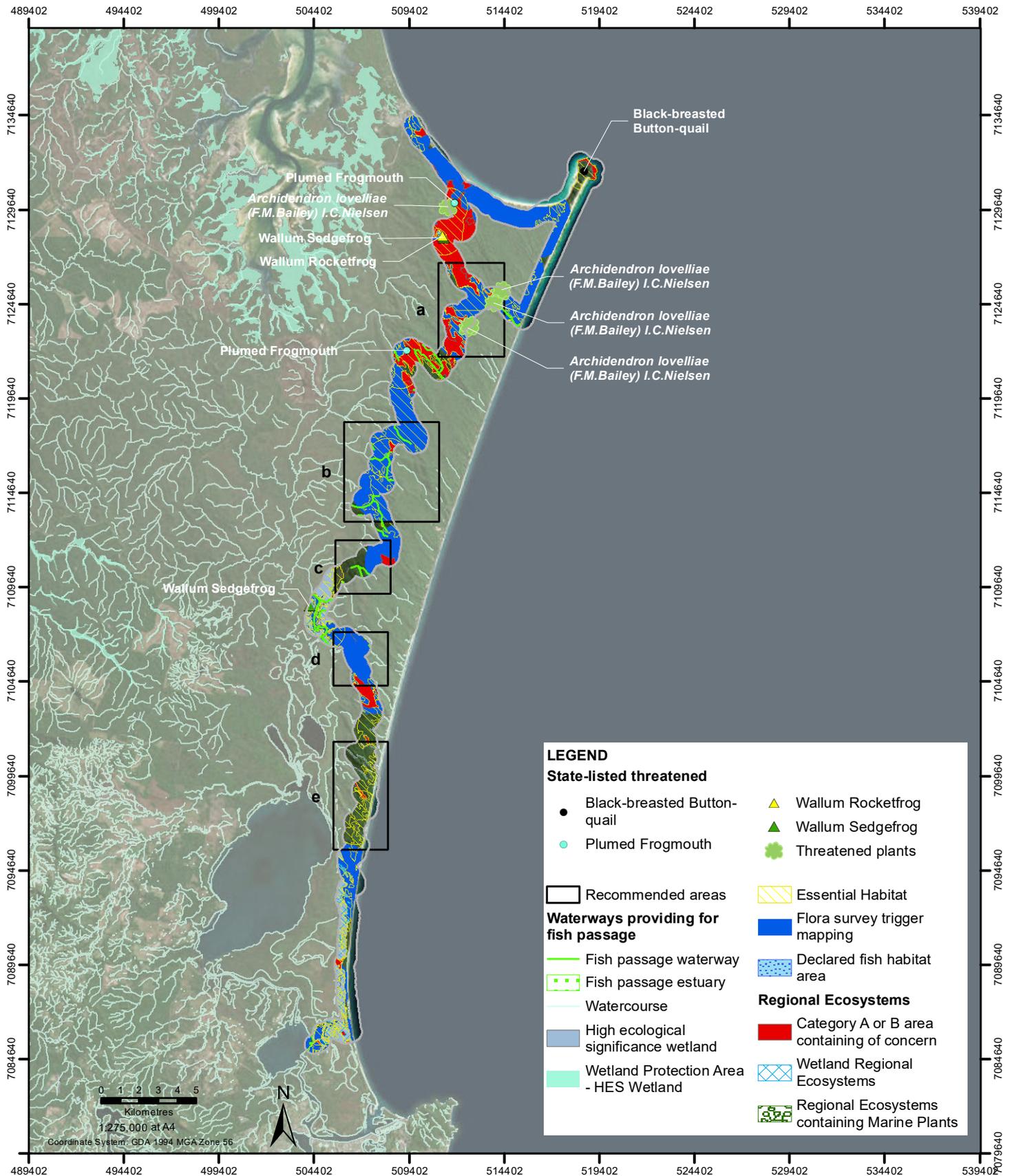
The study area covers approximately 8,030 ha of land, of which 99% is mapped by the State as supporting remnant vegetation, as defined under the Queensland *Vegetation Management Act 1999* (VM Act).

The mapped remnant vegetation is comprised of 23 REs and RE sub-types, nine of which have a VM Act status of Of Concern covering approximately 24% of land within the study area, and ten of which are recognised as wetland RE types covering approximately 4% of land within the study area (**Figure 3.2, Appendix A**). A large proportion of the mapped remnant is also mapped as essential habitat for State-listed threatened species (**Figure 3.2**).

The study area also contains numerous mapped watercourses, the majority of which are associated with mapped remnant vegetation.

3.2.2 Wetlands and Watercourses

State mapping indicates wetlands of high ecological significance occur within the central portion of the study area (in the vicinity of Dutgee Walker's Camp) and in the southern portion of the study area (from between Teewah and Lake Cootharaba to Lake Cooroibah) (**Figure 3.2**).



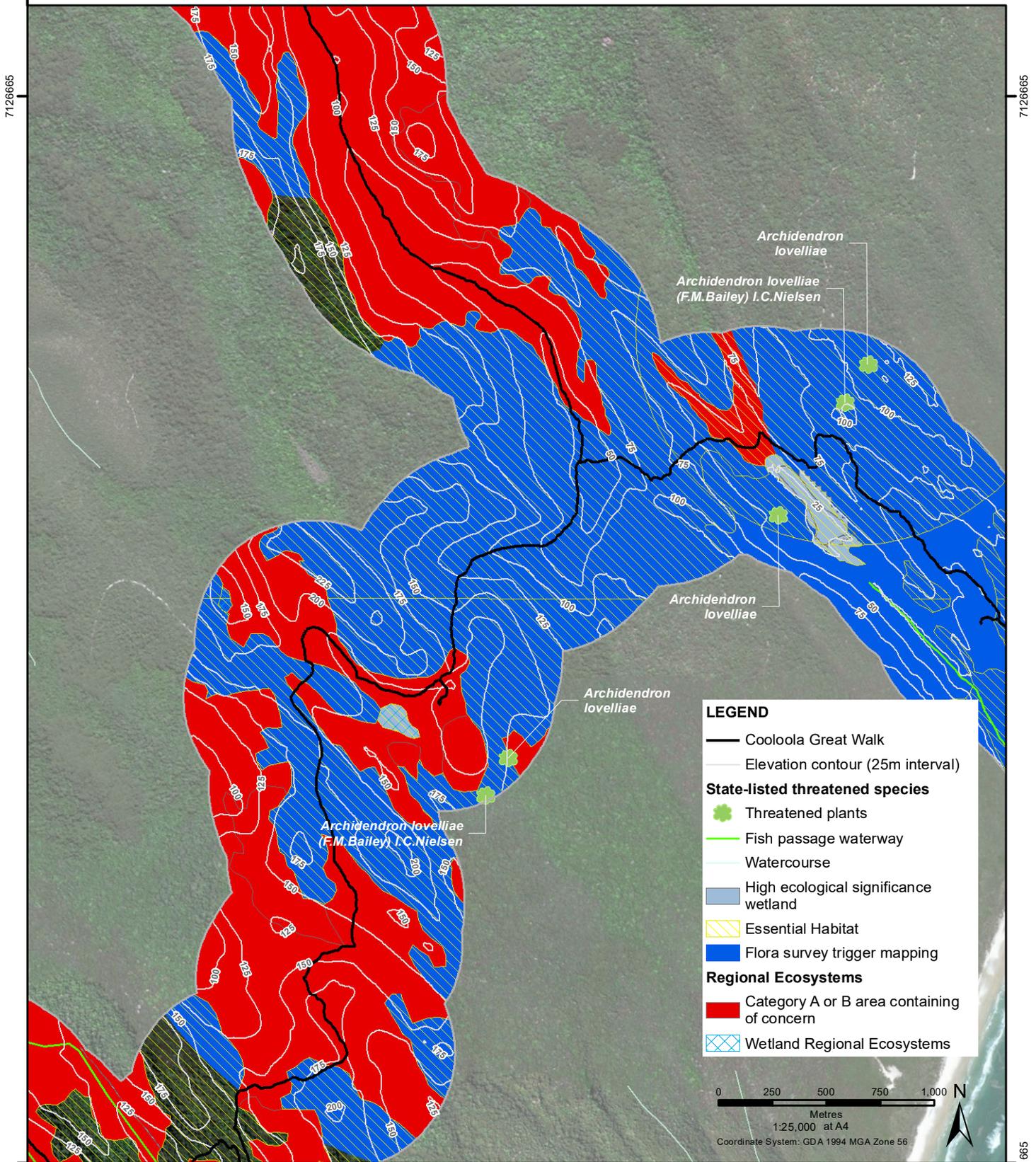
Data Sources:
 State-listed threatened species - WildNet wildlife records - published - Queensland; Queensland Museum Records; HERBRECS Records
 Waterways for fish passage - Queensland waterways for waterway barrier works
 MSES High ecological value waters - waterways and wetlands - Queensland
 Watercourses - Vegetation management watercourse and drainage feature map (1:25000) and (1:100000 and 1:250000) - v 2.0
 Wetland protection area - HES Wetland
 MSES - Regulated vegetation - essential habitat - Queensland
 Nature Conservation Act Protected Plants EVNT Flora Survey Trigger Map V 6, May 2018
 MSES fish habitat area - A and B areas - Queensland
 Regional Ecosystems - Vegetation management regional ecosystem map - v10.

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Figure: 3.2
Title: Ecological Desktop Assessment - MSES within the Study Area
Project: Premium Ecotourism Products – Cooloola Great Walk
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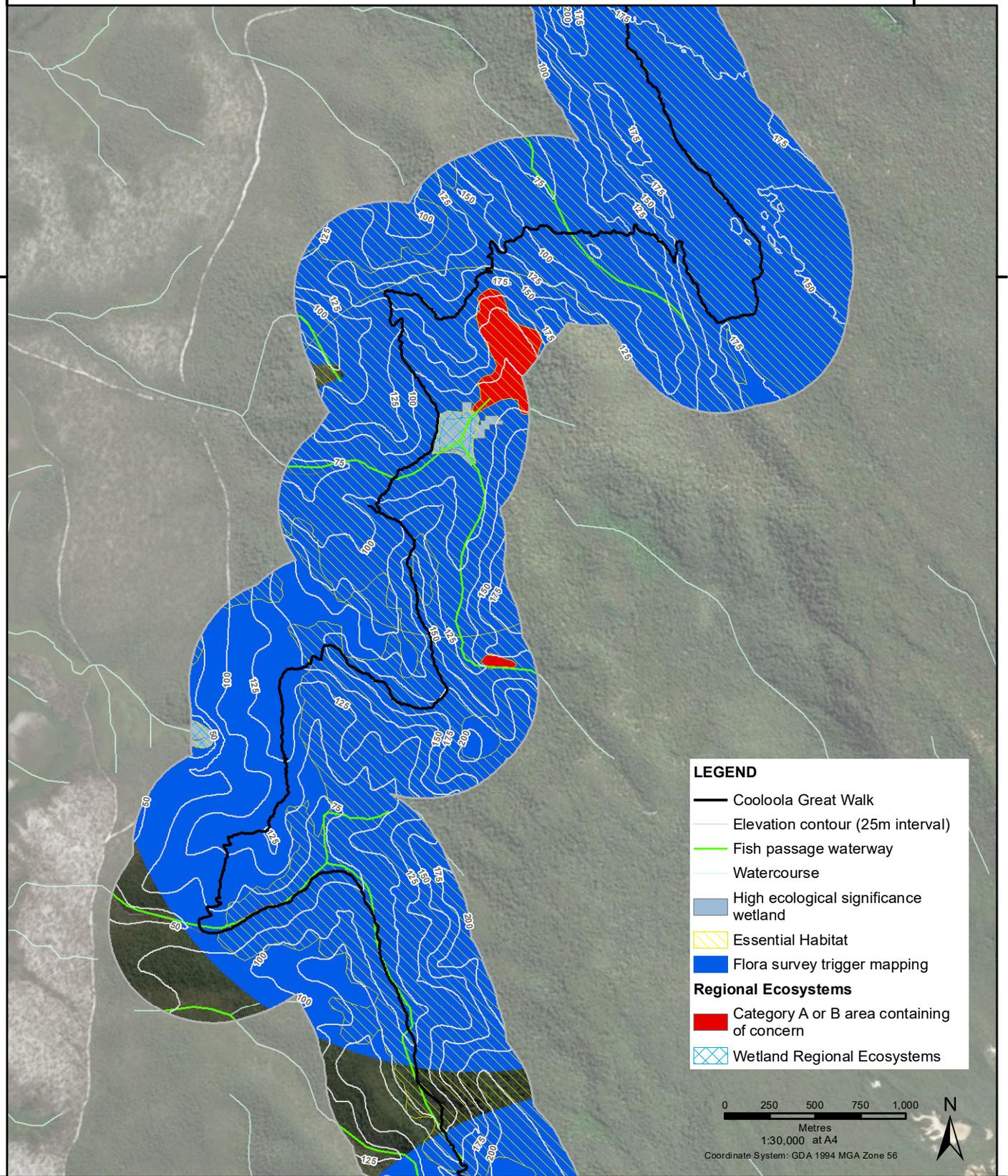


Data Sources:
 State-listed threatened species - WildNet wildlife records - published - Queensland; Queensland Museum Records; HERBRECS Records
 Waterways for fish passage - Queensland waterways for waterway barrier works
 MSES High ecological value waters - waterways and wetlands - Queensland
 Watercourses - Vegetation management watercourse and drainage feature map (1:25000) and (1:100000 and 1:250000) - v 2.0
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Figure: 3.2a
Title: Ecological Desktop Assessment - MSES within the Study Area
Project: Premium Ecotourism Products – Cooloola Great Walk
Client: Department of Environment and Science





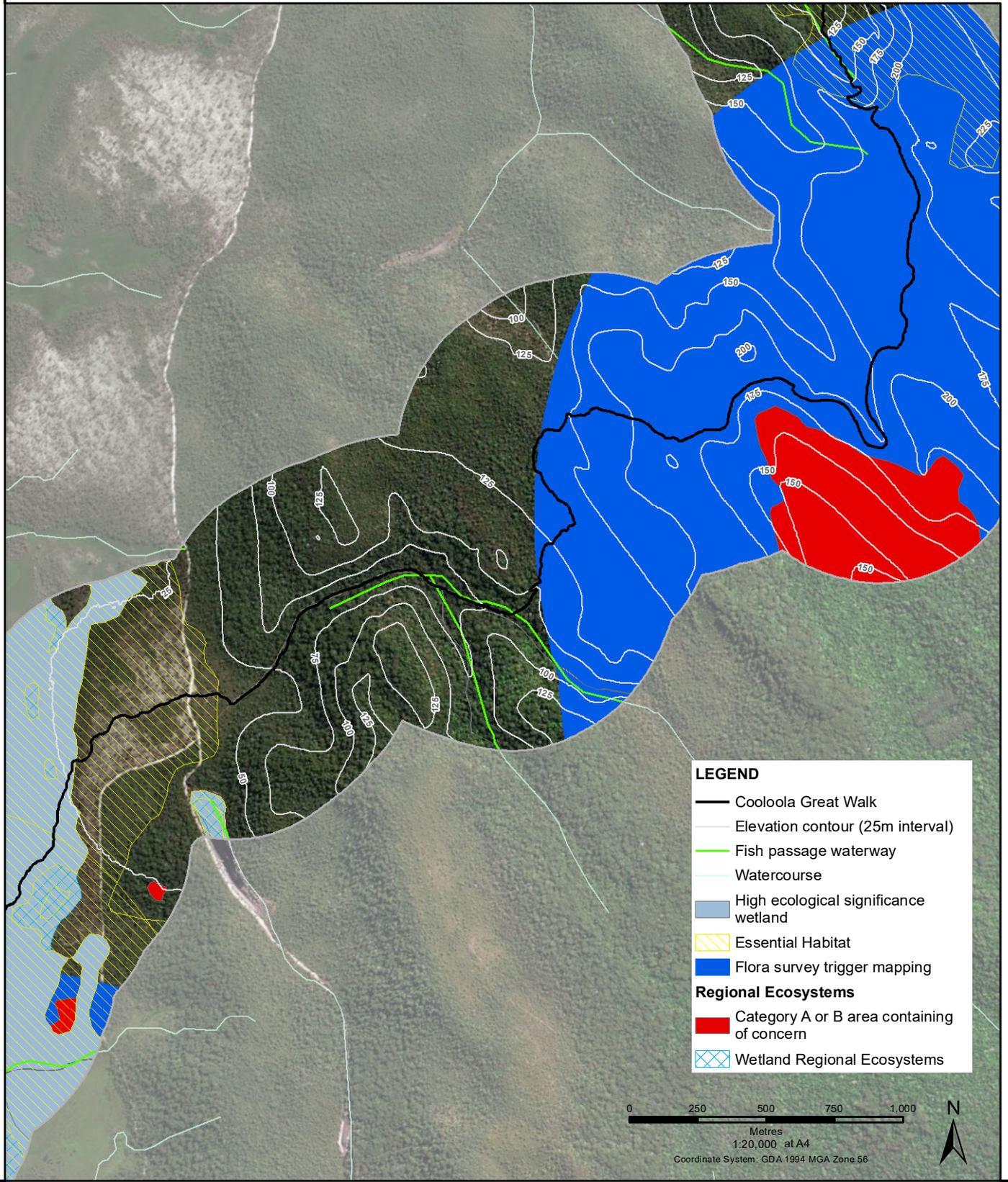
Data Sources:
 State-listed threatened species - WildNet wildlife records - published - Queensland;
 Queensland Museum Records; HERBRECS Records
 Waterways for fish passage - Queensland waterways for waterway barrier works
 MSES High ecological value waters - waterways and wetlands - Queensland
 Watercourses - Vegetation management watercourse and drainage feature map (1:250000)
 and (1:100000 and 1:250000) - v 2.0
 Wetland protection area - HES Wetland
 MSES - Regulated vegetation - essential habitat - Queensland
 Nature Conservation Act Protected Plants EVNT Flora Survey Trigger Map V 6, May 2018
 MSES fish habitat area - A and B areas - Queensland
 Regional Ecosystems - Vegetation management regional ecosystem map - v10.

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Figure: 3.2b
Title: Ecological Desktop Assessment - MSES within the Study Area
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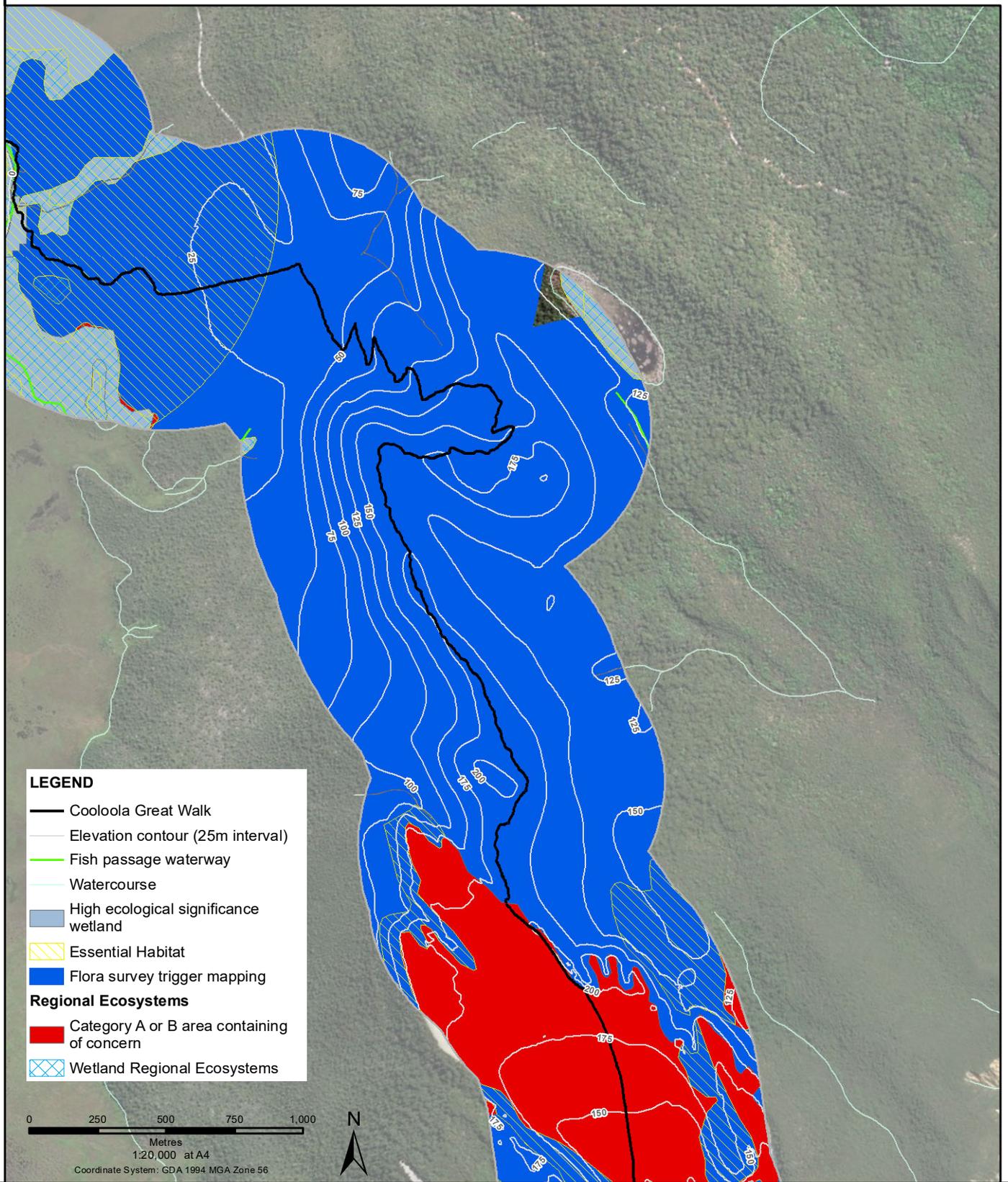
Data Sources:
 State-listed threatened species - WildNet wildlife records - published - Queensland; Queensland Museum Records; HERBRECS Records
 Waterways for fish passage - Queensland waterways for waterway barrier works
 MSES High ecological value waters - waterways and wetlands - Queensland
 Watercourses - Vegetation management watercourse and drainage feature map (1:25000) and (1:100000 and 1:250000) - v 2.0
 Wetland protection area - HES Wetland
 MSES - Regulated vegetation - essential habitat - Queensland
 Nature Conservation Act Protected Plants EVNT Flora Survey Trigger Map V 6, May 2018
 MSES fish habitat area - A and B areas - Queensland
 Regional Ecosystems - Vegetation management regional ecosystem map - v10.

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Figure: 3.2c
Title: Ecological Desktop Assessment - MSES within the Study Area
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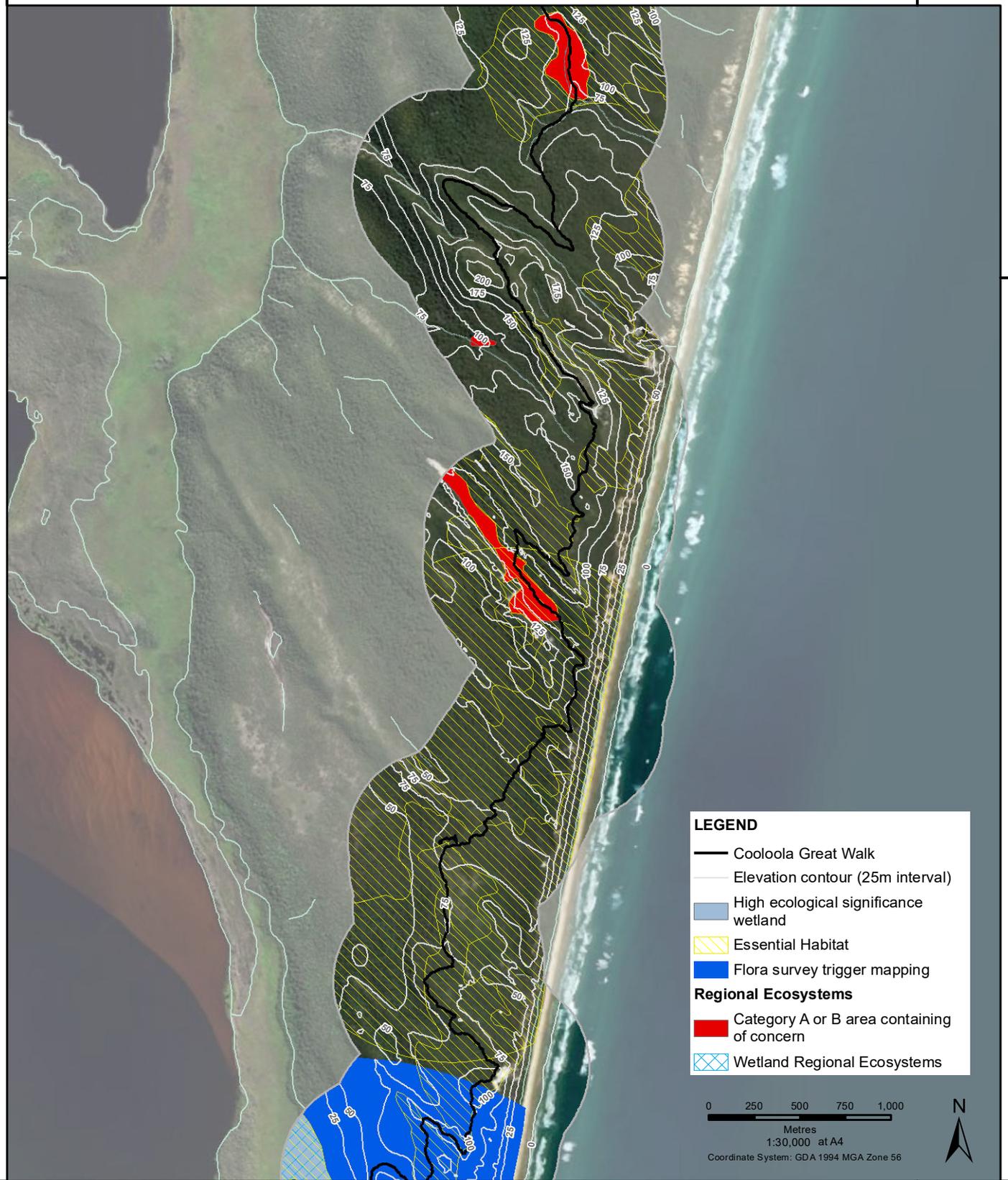


Data Sources:
 State-listed threatened species - WildNet wildlife records - published - Queensland;
 Queensland Museum Records; HERBRECS Records
 Waterways for fish passage - Queensland waterways for waterway barrier works
 MSES High ecological value waters - waterways and wetlands - Queensland
 Watercourses - Vegetation management watercourse and drainage feature map (1:250000) and (1:100000 and 1:250000) - v 2.0
 Wetland protection area - HES Wetland
 MSES - Regulated vegetation - essential habitat - Queensland
 Nature Conservation Act Protected Plants EVNT Flora Survey Trigger Map V 6, May 2018
 MSES fish habitat area - A and B areas - Queensland
 Regional Ecosystems - Vegetation management regional ecosystem map - v10.

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Figure: 3.2d
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Data Sources:
 State-listed threatened species - WildNet wildlife records - published - Queensland; Queensland Museum Records; HERBRECS Records
 Waterways for fish passage - Queensland waterways for waterway barrier works
 MSES High ecological value waters - waterways and wetlands - Queensland
 Watercourses - Vegetation management watercourse and drainage feature map (1:25000) and (1:100000 and 1:250000) - v 2.0
 Wetland protection area - HES Wetland
 MSES - Regulated vegetation - essential habitat - Queensland
 Nature Conservation Act Protected Plants EVNT Flora Survey Trigger Map V 6, May 2018
 MSES fish habitat area - A and B areas - Queensland
 Regional Ecosystems - Vegetation management regional ecosystem map - v10.

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Drawn By: KM **Reviewed by:** JA **Date:** 5/03/2019

Figure: 3.2e
Title: Ecological Desktop Assessment - MSES within the Study Area
Project: Premium Ecotourism Products – Cooloola Great Walk
Client: Department of Environment and Science



3.2.1 Strategic Environmental Areas

There are no strategic environmental areas recognised within the study area.

3.2.2 Protected Wildlife Habitat

Areas mapped by the State as essential habitat, as well as areas shown as high risk areas on the State's flora survey trigger map, represent potential protected wildlife habitat. Together, these two mapping layers cover most of the study area (**Figure 3.2**).

Flora species listed as Endangered or Vulnerable under the NC Act that are known to occur within the vicinity of the study area 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)
- *Bosistoa transversa* (Vulnerable)
- *Carex breviscapa* (Vulnerable)
- *Cryptocarya foetida* (Vulnerable)
- *Eucalyptus conglomerata* (Endangered)
- *Floydia praealta* (Vulnerable)
- *Macadamia integrifolia* (Vulnerable)
- *Macadamia ternifolia* (Vulnerable)
- *Mallotus megadontus* (Vulnerable)
- *Marsdenia coronata* (Vulnerable)
- *Parsonsia sankowskyana* (Endangered)
- *Pomaderris crassifolia* (Vulnerable)
- *Prostanthera spathulata* (Vulnerable)
- *Ricinocarpos speciosus* (Vulnerable)
- *Romnalda strobilacea* (Vulnerable)
- *Xanthostemon oppositifolius* (Vulnerable).

Records for these species within the study area are shown on **Figure 3.2**.

Fauna species listed as Endangered or Vulnerable under the NC Act that are known to occur within the vicinity of the study area 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).

Records within the study area for those species with specialised habitat preferences and/or restricted home ranges are shown on **Figure 3.2**.

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.

3.2.3 Marine Parks

There are no marine parks recognised within the study area.

3.2.4 Fish Habitat Areas

Lake Cooroibah is a recognised fish habitat area, a portion of which occurs within the southern-most extent of the study area (**Figure 3.2**).

3.2.5 Waterways Providing for Fish Passage

A number of waterways mapped by the State as providing for fish passage occur within the study area, from the vicinity of Freshwater Lake to the vicinity of Dutgee Walker's Camp (**Figure 3.2**).

Lake Cooroibah is also recognised as an estuary providing for fish passage (**Figure 3.2**).

3.2.6 Marine Plants

State mapping of remnant vegetation and estuarine habitat indicates marine plants are likely to be restricted to Lake Cooroibah and its immediate surrounds, a portion of which occurs within the southern-most extent of the study area.

3.3 OTHER NOTABLE ECOLOGICAL VALUES

The Noosa River Wetland system is recognised as a Nationally Important Wetland, portions of which occur within the study area in the vicinity of Dutgee Walker's Camp and Lake Cooroibah (**Figure 3.3**).

The State's mapping of terrestrial habitat of state, regional or local 'Biodiversity Significance' or 'Corridor Significance' as identified through the Biodiversity Assessment Mapping Methodology (BAMM) identifies all land within the study area as having State biodiversity significance, the vast majority of which is also a component of a State significant biodiversity corridor (**Figure 3.3**). Most of the study area also scores very high under the AquaBAMM aquatic conservation assessment (**Figure 3.3**).

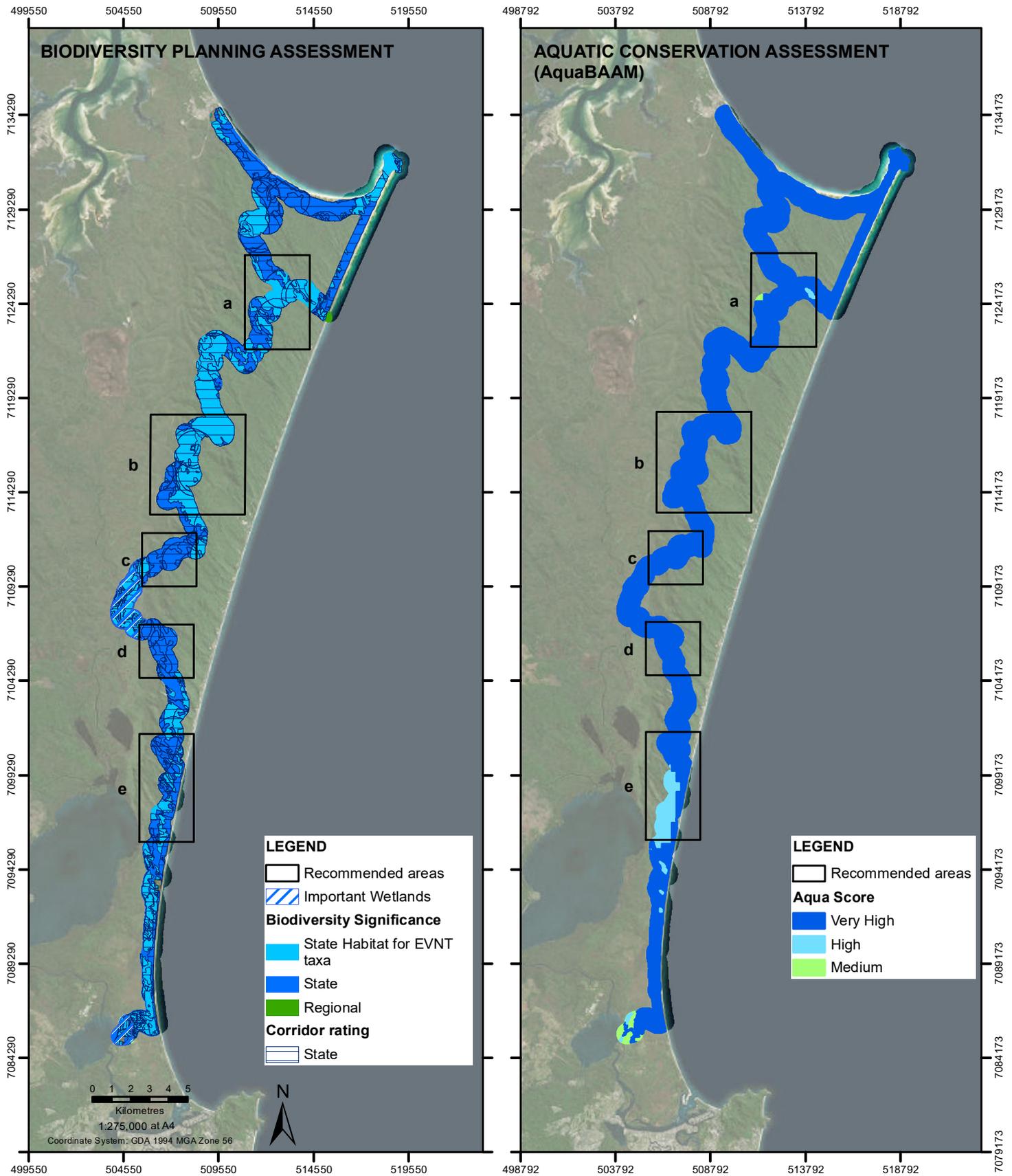
4.0 HEAT MAPPING

4.1 CATEGORIES

As noted in **Section 2.2**, heat mapping has been developed to indicate areas alongside the trail where the development of eco-accommodation may require Commonwealth and/or State approval (and associated management/compensatory

measures) and/or may otherwise cause significant impacts to important ecological values. The mapping also shows areas where no significant impacts are likely to occur, and therefore any approvals would be relatively straightforward. This has been informed by 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, which defines the following five impact classes:

- Class 1 – Routine works and upgrades or replacement entirely within an existing footprint and with no or very low potential for impact on natural and cultural values.
- Class 2 – Minor to major works (capital or non-capital) creating a new, or enlarging an existing, footprint, and/or altering the fabric of a cultural heritage place where:
 - a) None of the Value Groups listed on the Impact Assessment Checklist are present or they are highly unlikely to be present.
 - b) A value is known, or is likely, to be present but it has been determined that the action: will not have a significant impact on the value; or will not have a significant impact on the value if specified prevention/mitigation strategies are applied.
 - c) The values in the area are poorly known but the nature of the action is such that the likelihood of a significant impact is very low (the precautionary principle must be rigorously applied).
- Class 3 – Minor to major works (capital or non-capital) creating a new, or enlarging an existing, footprint, and/or altering the fabric of a cultural heritage place where:
 - The action will have, or is likely to have, significant impacts on values other than matters of national or state environmental significance and/or Aboriginal and Torres Strait Islander cultural heritage and/or historic/shared cultural heritage.
- Class 4 – Medium to major works (capital or non-capital) creating a new, or enlarging an existing, footprint, and/or altering the fabric of a cultural heritage place where:
 - Values in the area are poorly known and the works to be undertaken are of a kind likely to cause significant irreversible, or potentially irreversible, impacts.



Data Sources:
 South East Queensland Biodiversity Planning Assessment - Version 4.1
 Directory of important wetlands - Queensland
 Aquatic Conservation Assessment – South East Queensland v 1.1 – Riverine results,
 Riverine results by buffered streams, and Non-riverine results

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Figure: 3.3
Title: Ecological Desktop Assessment - Other Notable Ecological Values within the Study Area
Project: Premium Ecotourism Products – Cooloola Great Walk
Client: Department of Environment and Science

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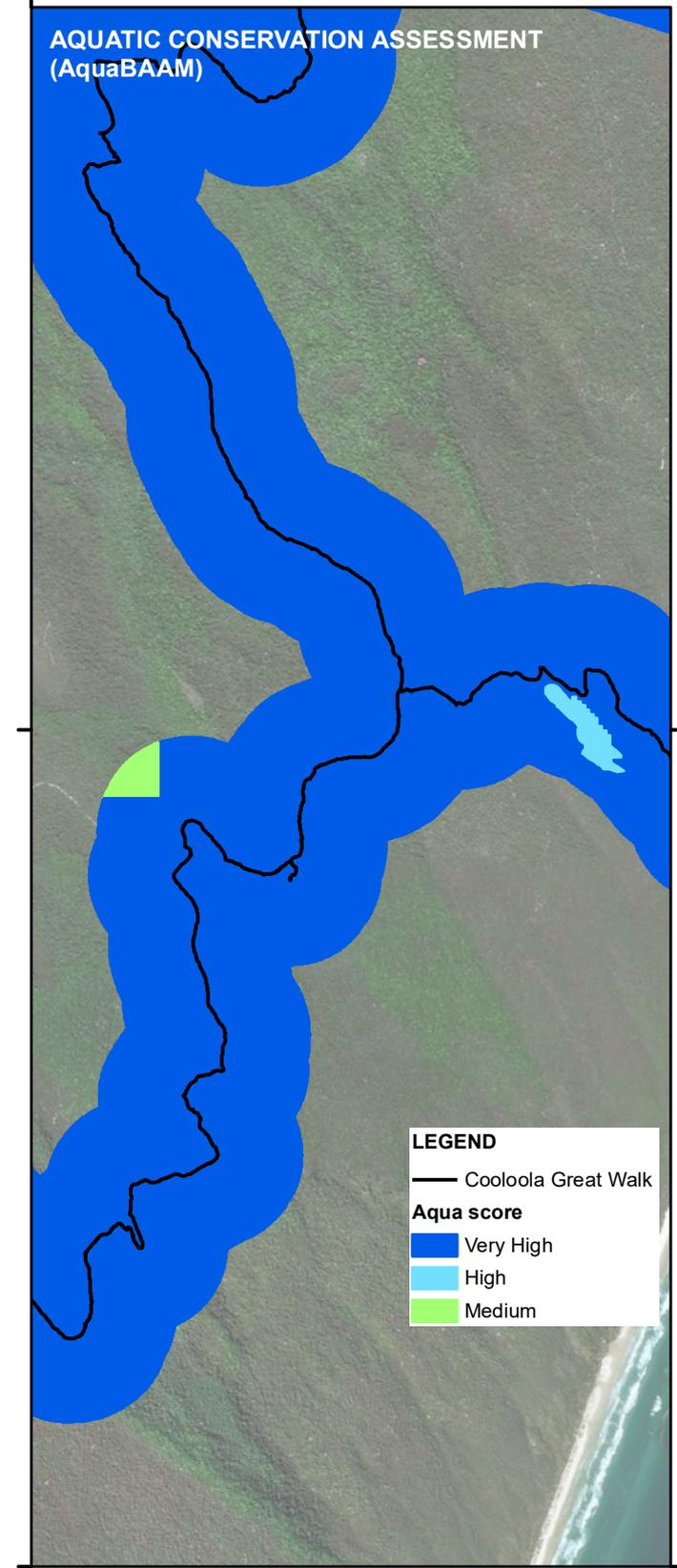
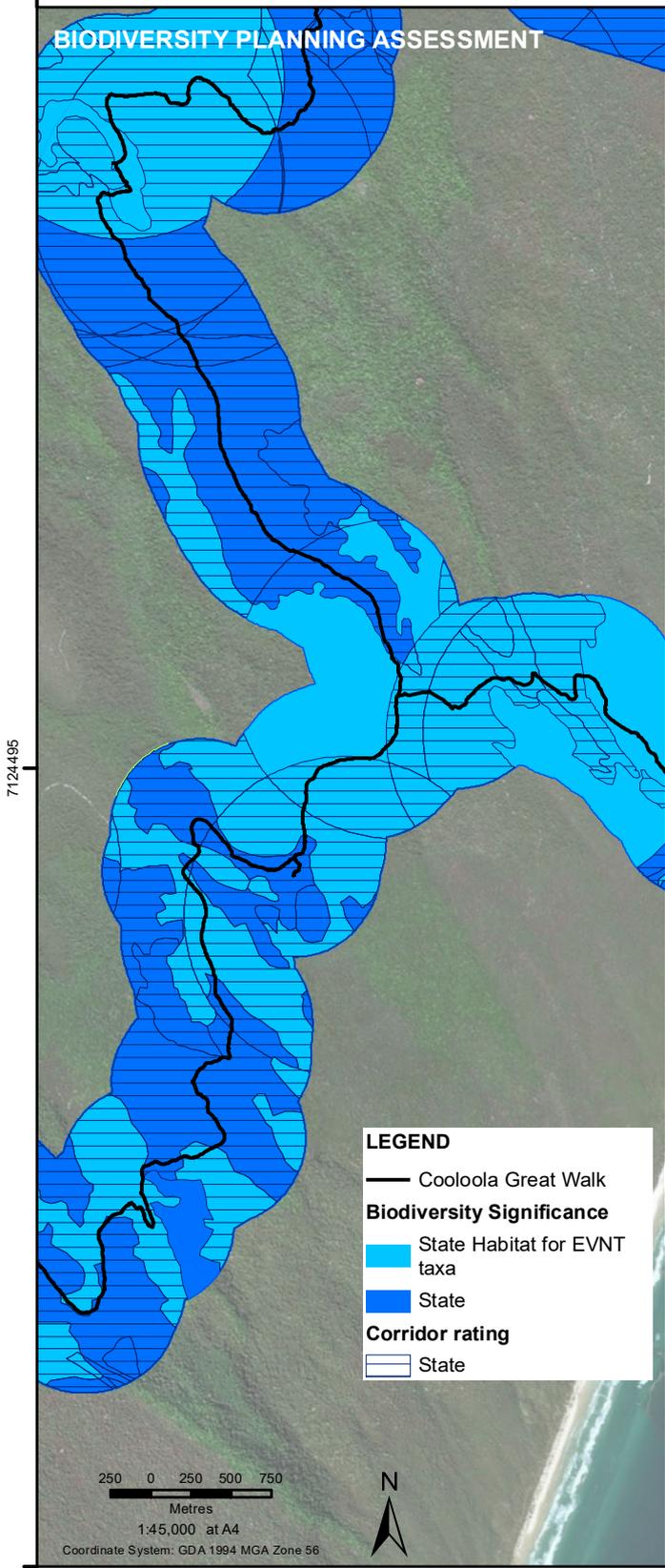


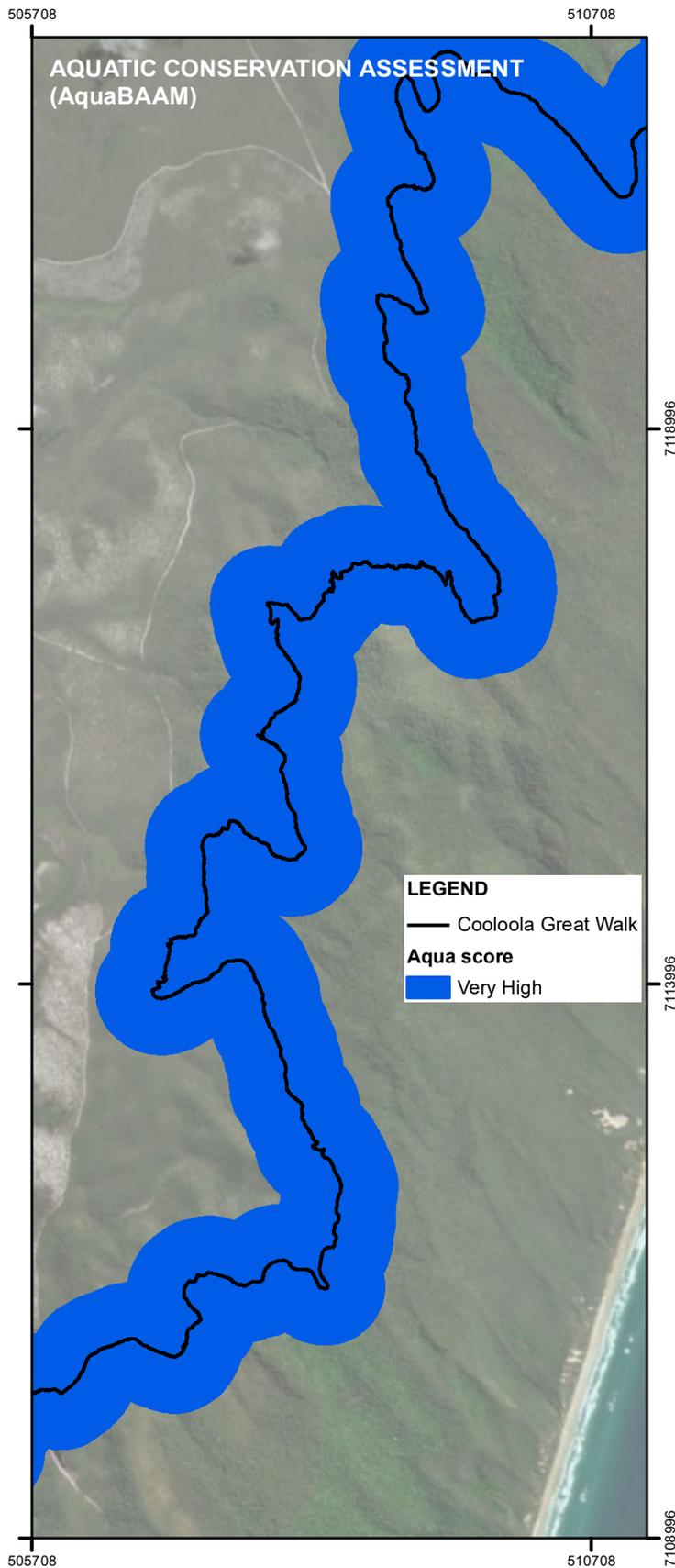
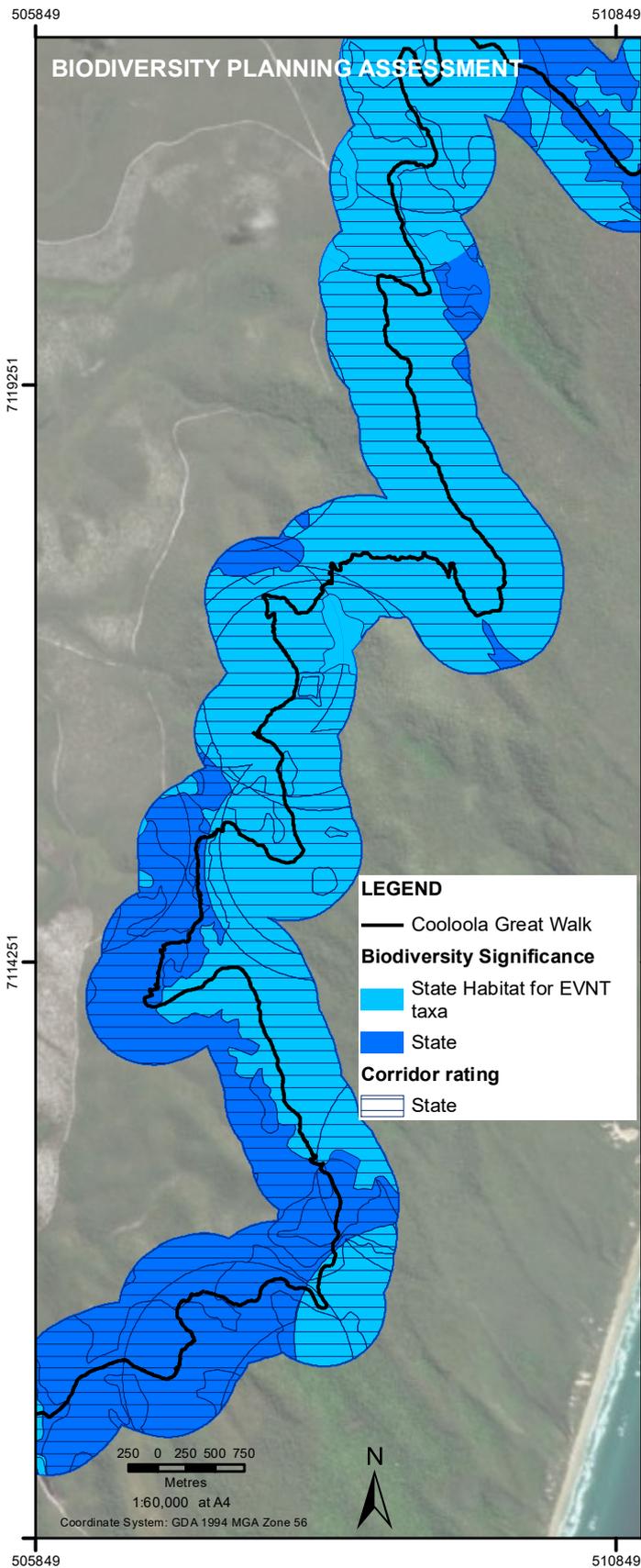
Figure: 3.3 a

Title: Ecological Desktop Assessment - Other Notable Ecological Values within the Study Area

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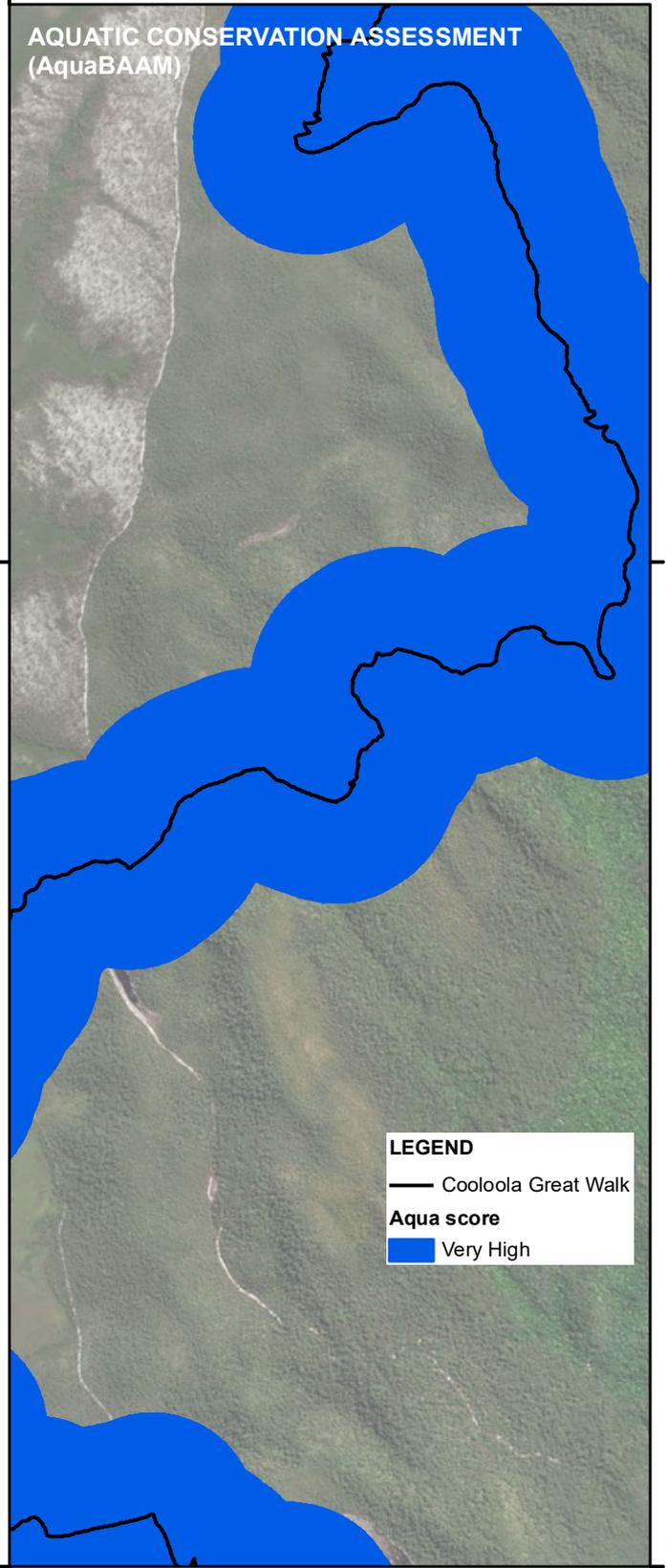
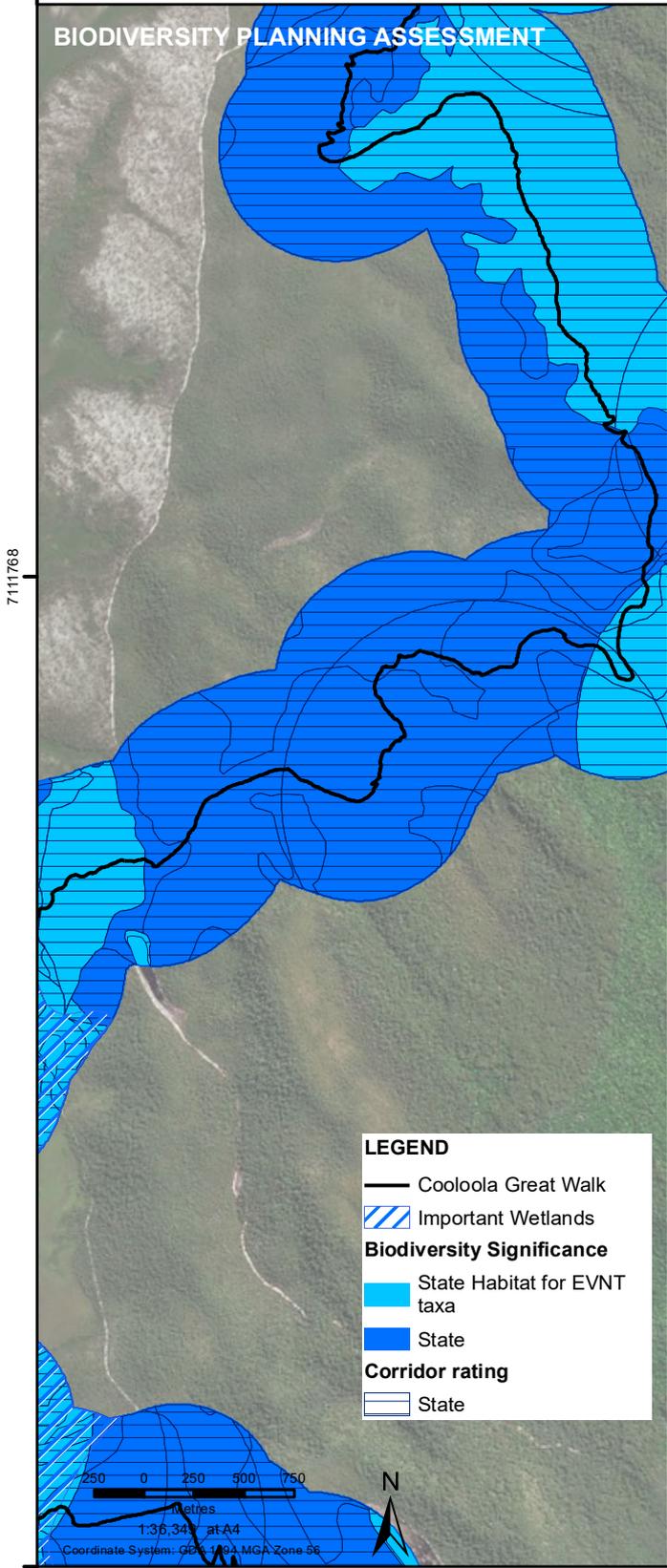
Figure: 3.3 b

Title: Ecological Desktop Assessment - Other Notable Ecological Values within the Study Area

Project: Premium Ecotourism Products – Cooloola Great Walk

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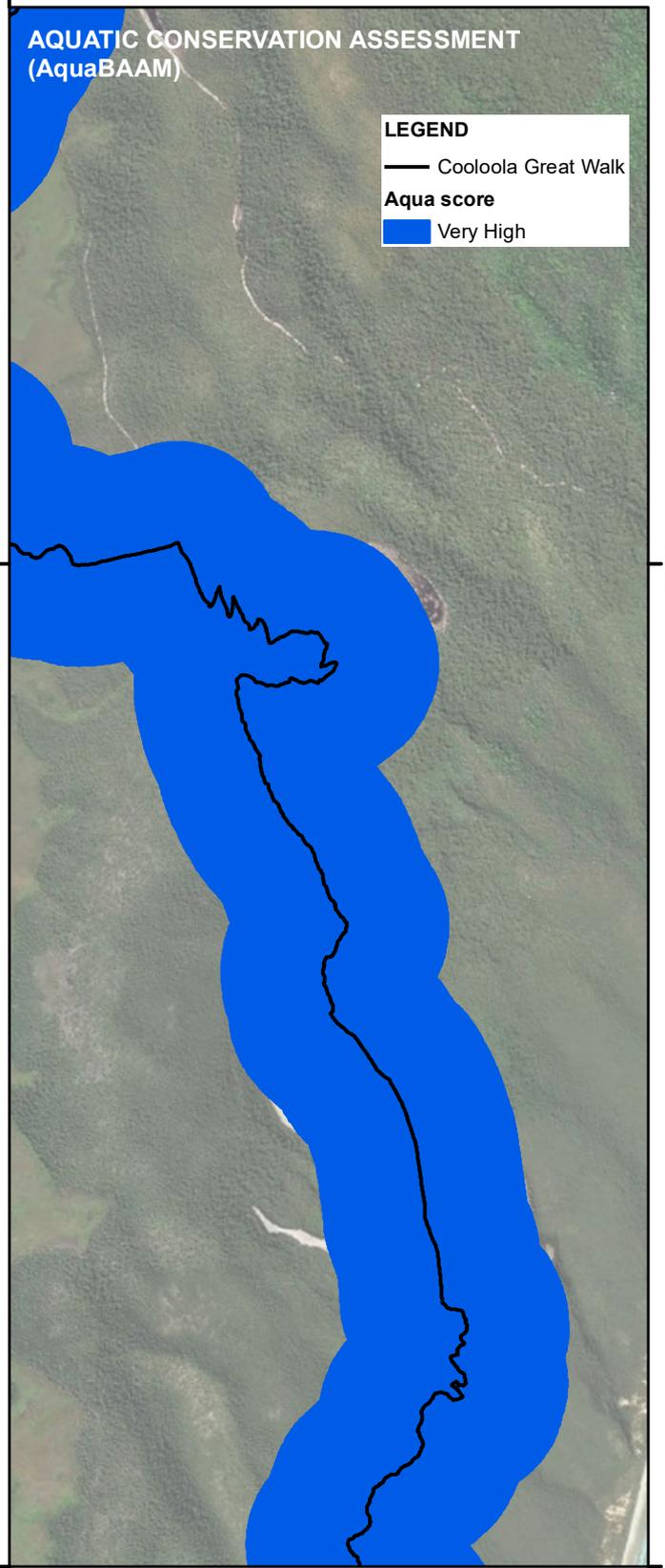
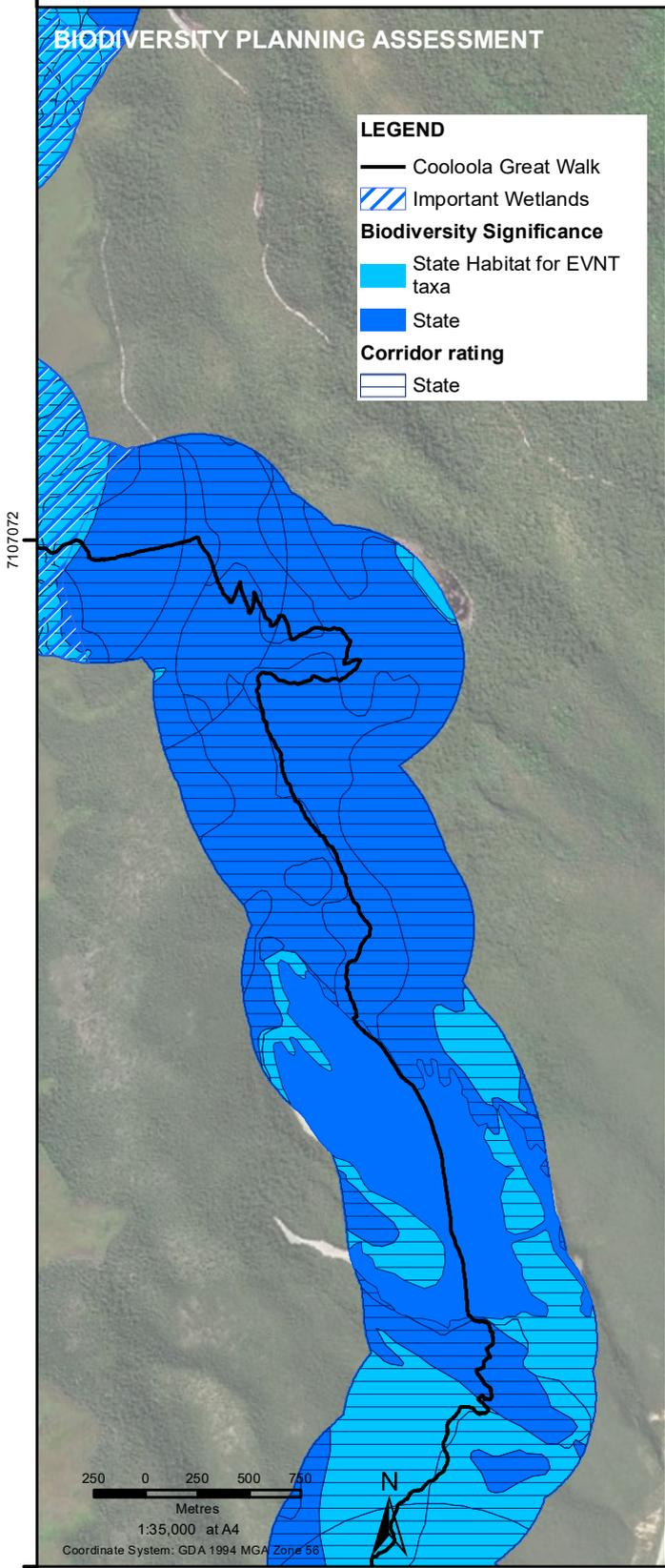
Drawn By: KM Reviewed by: JA Date: 5/03/2019

Figure: 3.3 c
Title: Ecological Desktop Assessment - Other Notable Ecological Values within the Study Area
Project: Premium Ecotourism Products – Cooloolool Great Walk
Client: Department of Environment and Science



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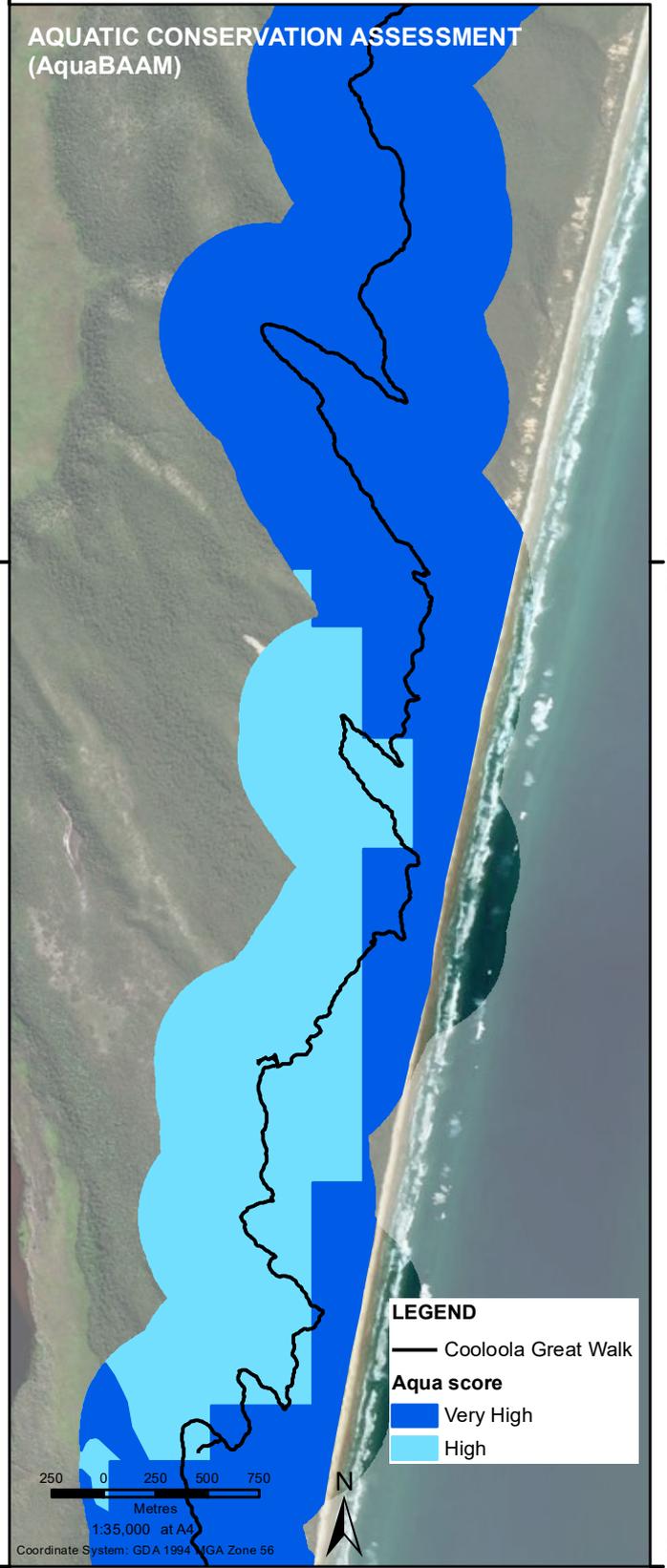
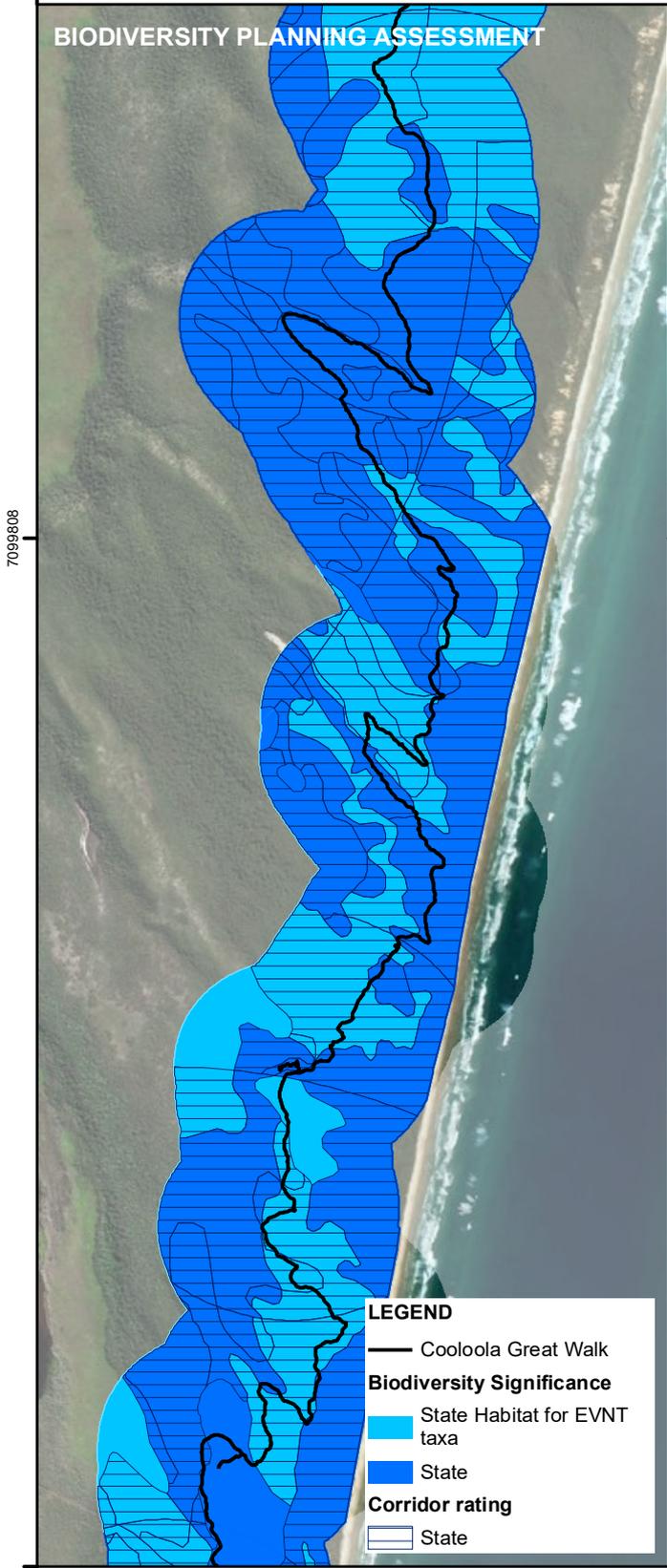
Data Sources:
 South East Queensland Biodiversity Planning Assessment - Version 4.1
 Directory of important wetlands - Queensland
 Aquatic Conservation Assessment – South East Queensland v 1.1 – Riverine results, Riverine results by buffered streams, and Non-riverine results

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Figure: 3.3 d
Title: Ecological Desktop Assessment - Other Notable Ecological Values within the Study Area
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Client: Department of Environment and Science





Data Sources:
 South East Queensland Biodiversity Planning Assessment - Version 4.1
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Figure: 3.3 e
Title: Ecological Desktop Assessment - Other Notable Ecological Values within the Study Area
Project: Premium Ecotourism Products – Coolooloolo Great Walk
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- Class 5 – Minor to major works (capital or non-capital) creating a new, or enlarging an existing, footprint, and/or altering the fabric of a cultural heritage place where:
 - The action will have, or is likely to have, a significant impact on a matter of national or state environmental significance and/or Aboriginal and Torres Strait Islander cultural heritage and/or historic/shared cultural heritage. Class 5 includes actions that will impact marine plants or a declared Fish Habitat Area and do not comply with all of the requirements for accepted development.

In terms of ecological values, the “Impact Assessment Checklist” includes MNES and MSES, as well as values of regional or local significance.

It is understood an area up to 3,000m² is likely to require clearing of vegetation and associated habitat for each eco-accommodation node, with up to four nodes to be established in total along the trail (i.e. a total direct impact of 1.2 hectares). In terms of potential impacts to adjacent habitat and associated flora and fauna, it is assumed all waste (including wastewater) will be contained within the disturbance area and there will be strict controls on the use of campfires, as well as activities that may influence animal behaviour (e.g. noise, light). Under these conditions it is expected that the proposed eco-accommodation would be considered “minor works creating a new footprint”.

The values within the study area are not “poorly known”, and the proposed minor works creating a new footprint may have a significant impact on MNES and/or MSES within the study area (depending on the specific value present), but are considered unlikely to have a significant impact upon general ecological values.

Consequently, it is expected the proposed eco-accommodation would either meet the definition of a Class 2 impact (where no MNES are likely to be present or no significant impacts upon MNES or MSES are expected) or a Class 5 impact (where significant impacts upon MNES or MSES are likely).

In defining each of the heat mapping categories, consideration was also given to the overarching principle of relevant State and Commonwealth government environmental protection policies relating to impact management, in that impacts should be avoided as much as possible in the first instance.

Based on the above factors, the heat mapping categories developed from this assessment are:

- High risk/constraint: significant impacts upon MNES or MSES are likely, or the value is of relatively high conservation significance and has relatively high sensitivity to impacts such that avoidance is warranted.
- Medium risk/constraint: value is of relatively high or moderate conservation significance, and significant impacts upon MNES or MSES may occur at specific locations (i.e. subject to on-ground assessment), or avoidance should be considered where possible.
- Low risk/constraint: value is of relatively moderate or low conservation significance, significant impacts upon MNES or MSES are unlikely, and impacts to ecological values in general are considered relatively low such that avoidance is not considered necessary.

4.2 SUMMARY OF ECOLOGICAL VALUES AND ASSIGNED HEAT MAPPING CATEGORIES

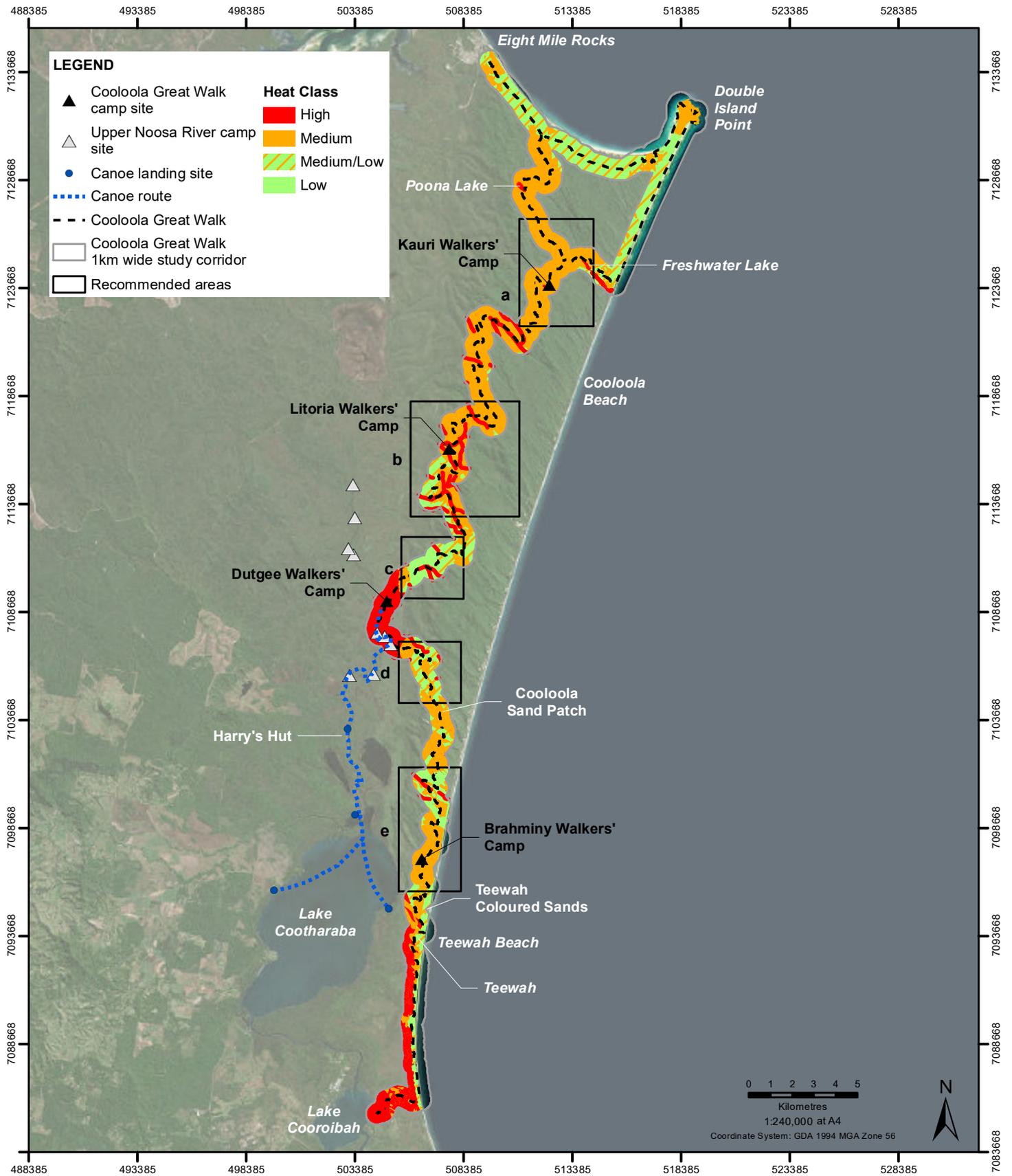
Table 4.1 summarises the ecological values identified within the study area as part of this assessment, along with the assigned heat mapping category based on each value’s relative conservation significance and the likelihood of significant impacts. The resultant heat map is provided as **Figure 4.1**.

Table 4.1. Ecological values within the study area and assigned heat mapping categories.

Value	Relative Conservation Significance	Likelihood of Significant Impact ¹	Assigned Heat Mapping Category
MNES			
EPBC Act listed threatened flora species and threatened fauna species with specialised habitat preferences and/or restricted home ranges (i.e. Three-toed Snake-tooth Skink, Wallum Sedgefrog, Oxleyan Pygmy Perch, Australian Painted Snipe, Southern Emu-wren, Black-breasted Button-Quail)	High (listed at the national level)	May significantly impact the local population at specific locations (e.g. important foraging or breeding sites)	Medium (mapped extent based on the State's essential habitat, as well as other REs representing important habitat where not otherwise mapped as high or medium) ²
EPBC Act listed threatened fauna species with relatively broad habitat preferences and/or large home ranges (i.e. Spotted-tailed Quoll, Red Goshawk, Painted Honeyeater, Greater Glider, Koala, Grey-headed Flying-fox)	High (listed at the national level)	Unlikely to impact the local population	Low
Non-threatened EPBC Act listed migratory species (i.e. Oriental Cuckoo, Latham's Snipe, Black-faced Monarch, Satin Flycatcher, Eastern Osprey, Glossy Ibis, Rufous Fantail, Spectacled Monarch)	Medium (listed at the national level, but not threatened)	Unlikely (will not substantially modify important habitat or impact a significant proportion of the population)	Low
MSES			
Of Concern REs	Medium (not Endangered)	Unlikely, although avoidance should be considered where possible, given their Of Concern status	Medium
Least Concern Wetland REs	Medium (not Endangered or Of Concern, but relatively biodiverse and important for maintaining ecological processes)	May be a significant impact at specific locations	Medium
Essential Habitat	Medium (recognised at the state level as important habitat)	Unlikely, although avoidance should be considered where possible, given the potential importance of these mapped areas for threatened species	Medium
Wetlands of high ecological significance	High (recognised as relatively important wetlands)	Significant impact to MSES likely	High
Protected Wildlife Habitat for NC Act listed threatened flora species and threatened fauna species with specialised habitat preferences and/or restricted home ranges (i.e. Common Death Adder, Tusked Frog, Wallum Froglet, Wallum Rocketfrog, Wallum Sedgefrog, Oxleyan Pygmy Perch, Richmond Birdwing, Ground Parrot, Plumed Frogmouth, Australian Painted Snipe, Southern Emu-wren, Black-breasted Button-Quail)	Medium (listed at the state level)	May significantly impact the local population at specific locations (e.g. important foraging or breeding sites)	Medium (mapped extent based on State essential habitat, as well as other REs representing important habitat where not otherwise mapped as high or medium) ² Medium – Low (mapped extent based on high risk areas on State flora survey trigger mapping) ³
Protected Wildlife Habitat for NC Act listed threatened fauna species with relatively broad habitat preferences and/or large home ranges (i.e. Glossy Black-Cockatoo, Spotted-tailed	Medium (listed at the state level)	Unlikely to impact the local population	Low

Value	Relative Conservation Significance	Likelihood of Significant Impact ¹	Assigned Heat Mapping Category
Quoll, Red Goshawk, Painted Honeyeater, Powerful Owl, Greater Glider, Koala)			
Protected Wildlife Habitat for NC Act listed special least concern species with specialised habitat preferences and/or restricted home ranges (i.e. Platypus)	Low (listed at the state level, but not threatened)	May significantly impact the local population at specific locations (e.g. important foraging or breeding sites)	Medium (mapped extent based on waterway mapping)
Protected Wildlife Habitat for NC Act listed special least concern species with relatively broad habitat preferences and/or large home ranges (i.e. Short-beaked Echidna)	Low (listed at the state level, but not threatened)	Unlikely to impact the local population	Low
Fish Habitat Areas	Medium (recognised at the state level as important habitat)	Significant impact to MSES likely	High
Waterways Providing for Fish Passage	Medium (recognised at the state level as important habitat)	Significant impact to MSES likely	High ⁴
Marine Plants	Medium (recognised at the state level as important habitat)	Significant impact to MSES likely	High
Other			
Nationally Important Wetlands	High (recognised as relatively important wetlands)	Significant impact likely	High (avoidance warranted)
Terrestrial habitat of State biodiversity significance (as identified through BAMB)	Medium (recognised at the state level as important habitat)	n/a (significance of impacts generally linked to MSES as outlined above)	n/a (avoidance not practical)
Terrestrial habitat within a State biodiversity corridor (as identified through BAMB)	Medium (recognised at the state level as important habitat)	Unlikely to impact corridor values	n/a (avoidance not practical)
Areas scoring very high under the AquaBAMB aquatic conservation assessment	Medium (recognised at the state level as important habitat)	n/a (significance of impacts generally linked to MSES as outlined above)	n/a (avoidance not practical)

1. With reference to DotE (2013, 2014) in relation to MNES and DSDIP (2014) in relation to MSES.
2. This includes least concern REs 12.2.9 (one of the communities included under the common name 'wallum', which represents potential habitat for numerous threatened species) and 12.9-10.4 (which represents potential habitat for threatened flora species such as *Acacia attenuata*).
3. High risk areas shown on the State's flora survey trigger mapping represent all land within a 2km radius of a threatened flora species record, regardless of whether any suitable habitat for the species exists within this mapped area. This will overestimate the extent of suitable habitat and occurrence of threatened flora species, such that a slightly lower level of constraint is warranted where no values otherwise fitting the medium or high heat mapping categories exist.
4. all mapped watercourses (including those not recognised as providing for fish passage) have been mapped under this category, assuming their avoidance would be desirable from both an ecological and hydrological constraint perspective.



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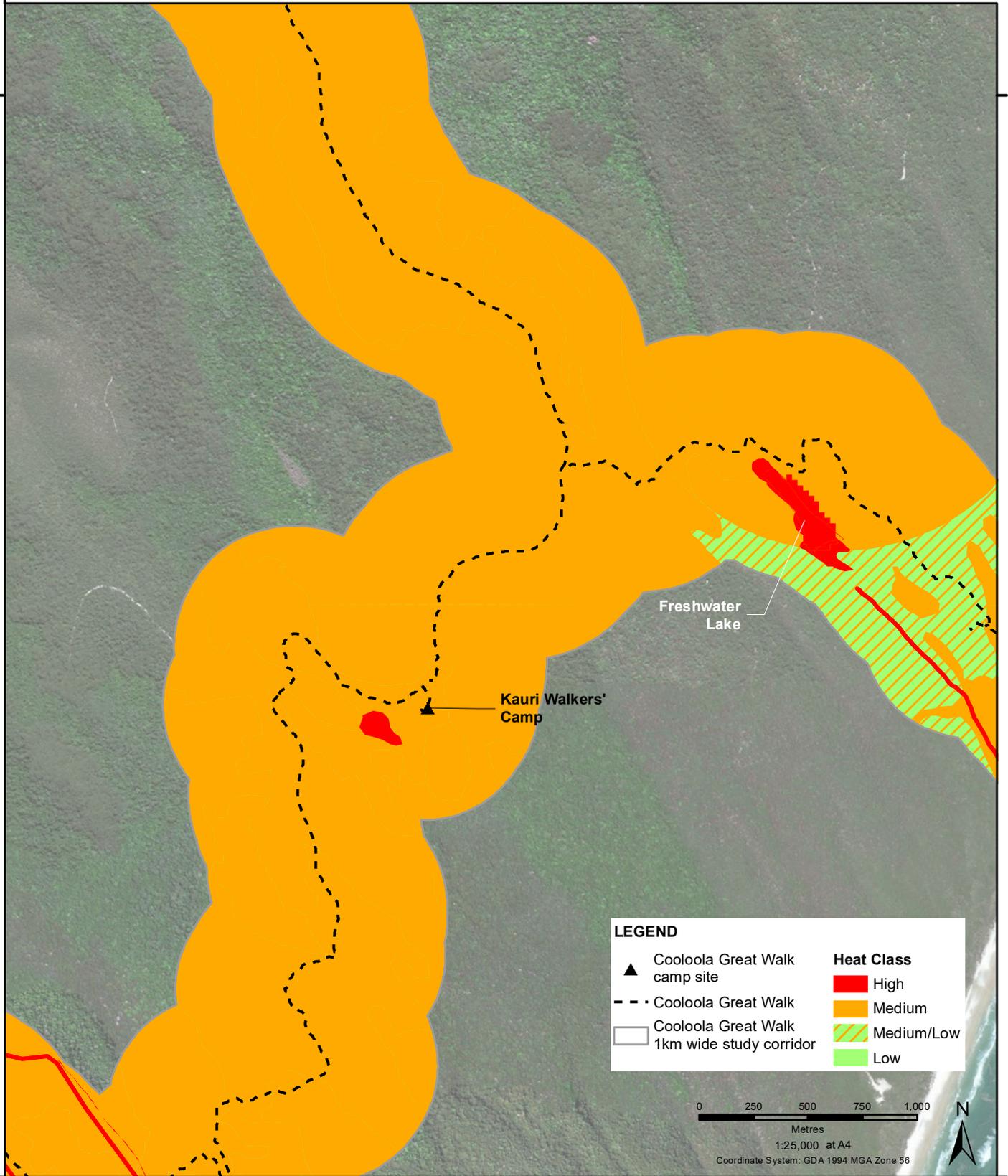
Figure: 4.1

Title: Ecological Desktop Assessment - Environmental Values Heat Map

Project: Premium Ecotourism Products – Cooloola Great Walk

Client: Department of Environment and Science





LEGEND

▲	Cooloola Great Walk camp site	Heat Class
- - -	Cooloola Great Walk	High
□	Cooloola Great Walk 1km wide study corridor	Medium
		Medium/Low
		Low

0 250 500 750 1,000
Metres
1:25,000 at A4
Coordinate System: GDA 1994 MGA Zone 56



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Drawn By: KM Reviewed by: JA Date: 5/03/2019

Figure: 4.1a
Title: Ecological Desktop Assessment - Environmental Values Heat Map
Project: Premium Ecotourism Products – Cooloola Great Walk
Client: Department of Environment and Science



Litoria Walkers' Camp

LEGEND

▲	Cooloola Great Walk camp site	Heat Class
- - -	Cooloola Great Walk	High
□	Cooloola Great Walk 1km wide study corridor	Medium
		Medium/Low
		Low



1:30,000 at A4

Coordinate System: GDA 1994 MGA Zone 56



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Figure: 4.1b

Title: Ecological Desktop Assessment - Environmental Values Heat Map

Project: Premium Ecotourism Products – Cooloola Great Walk

Client: Department of Environment and Science



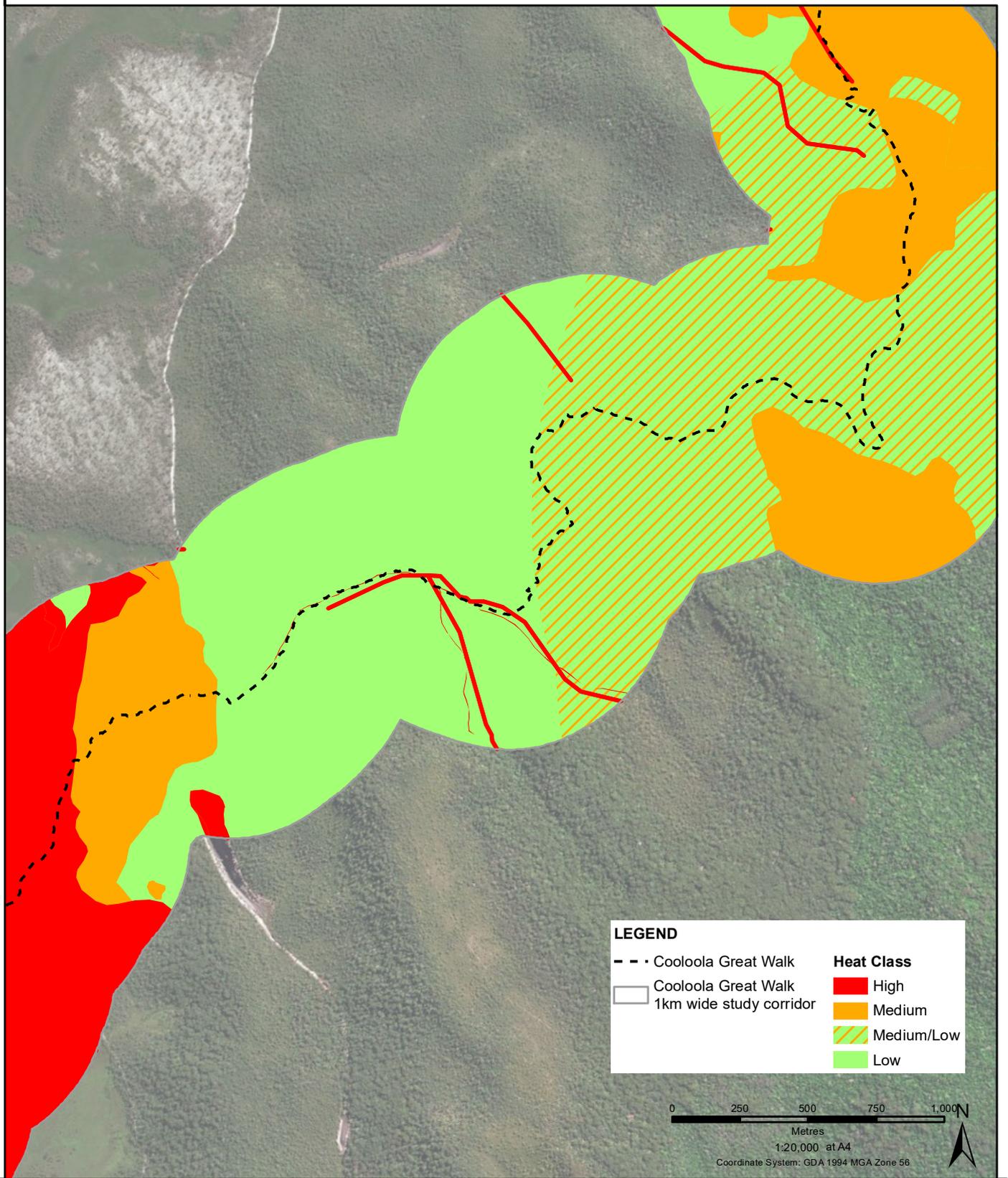
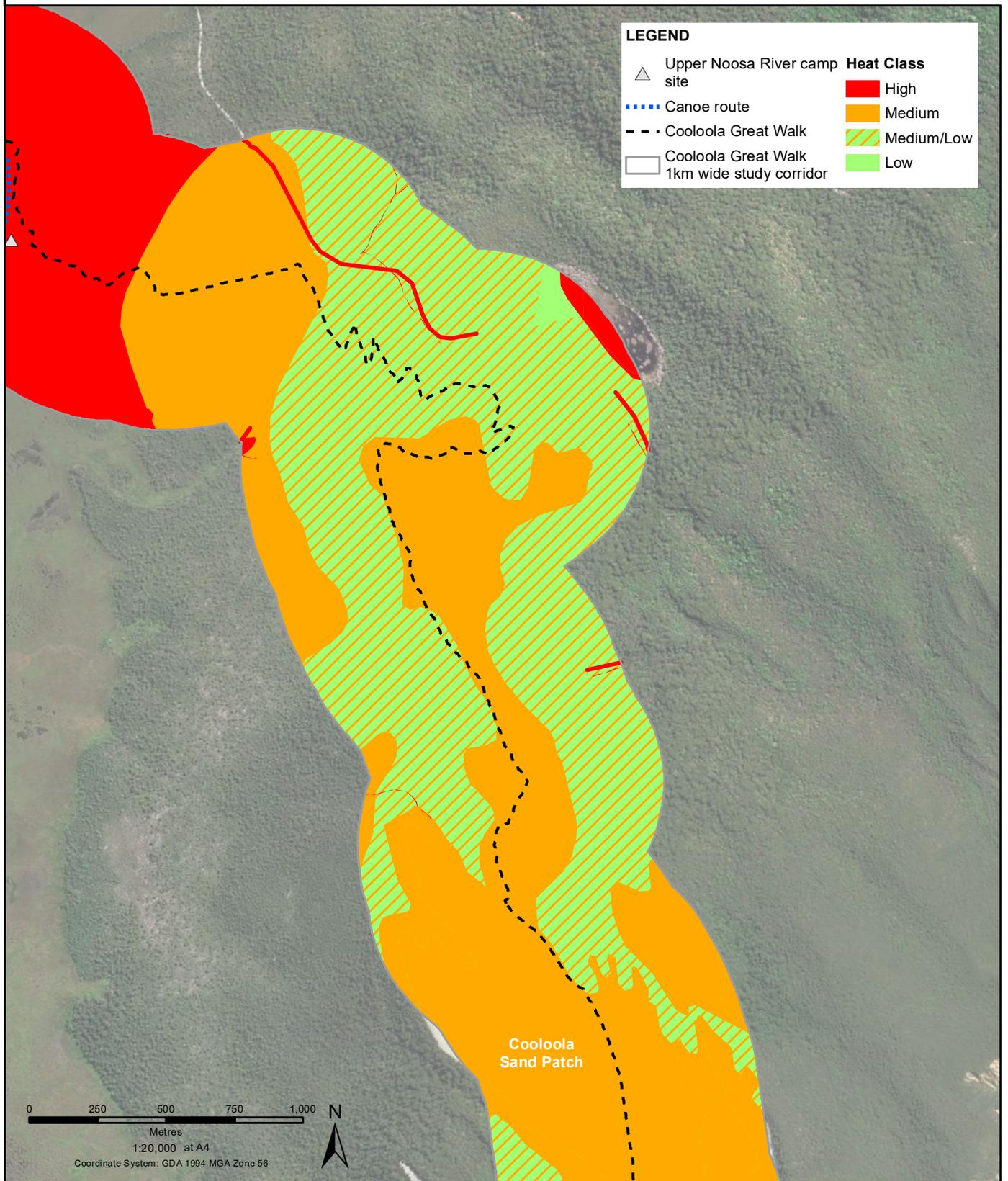


Figure: 4.1c
Title: Ecological Desktop Assessment - Environmental Values Heat Map
Project: Premium Ecotourism Products – Cooloola Great Walk
Client: Department of Environment and Science



LEGEND

△	Upper Noosa River camp site	Heat Class
●●●●	Canoe route	High
- - -	Cooloola Great Walk	Medium
□	Cooloola Great Walk 1km wide study corridor	Medium/Low
		Low



MAP KEY

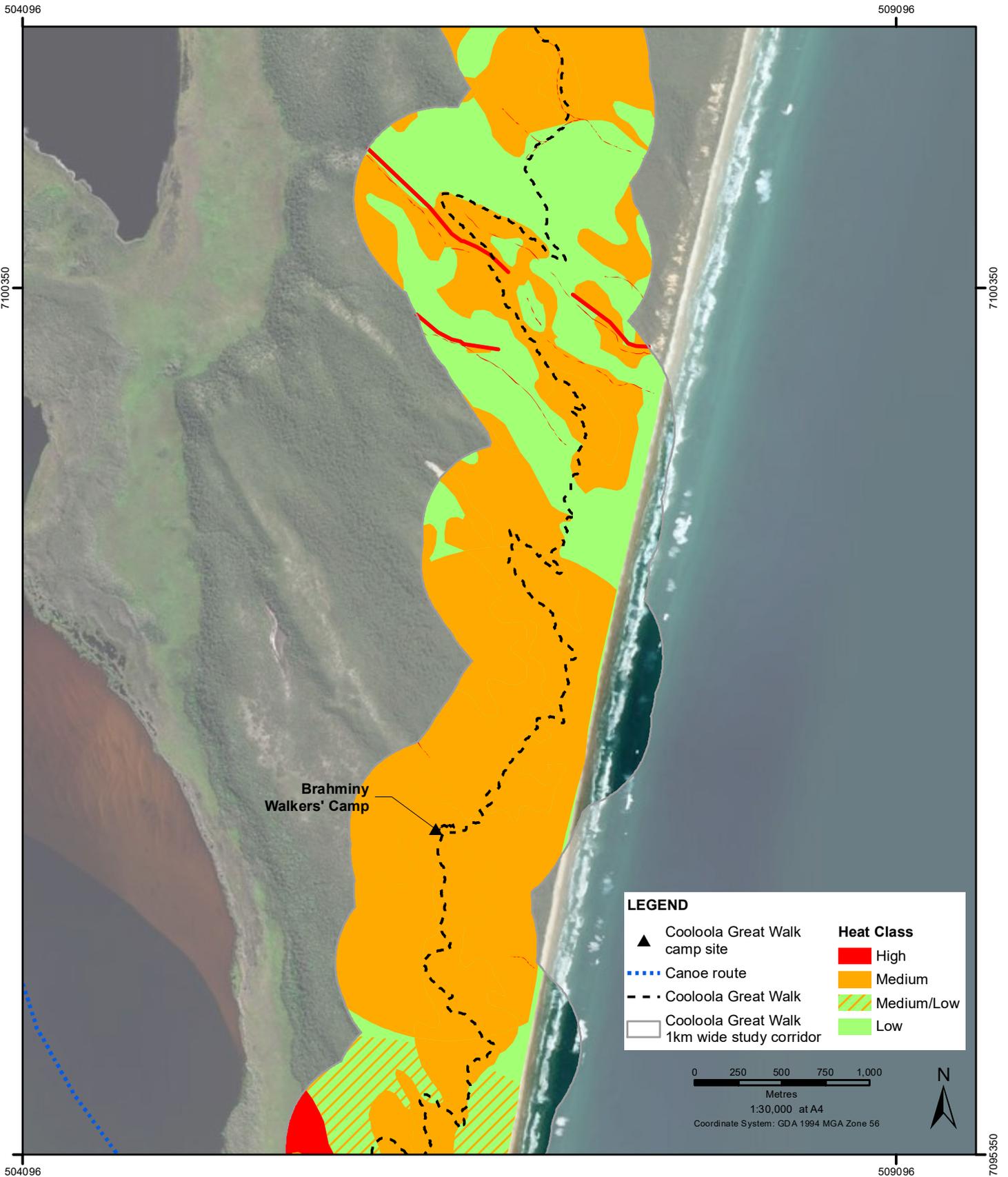
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, Esri, IGN, Kantam, NL, Ordnance Survey, Esri, Japan, METI, Esri, China (Hong Kong), Swisstopo, OpenStreetMap contributors, and the GIS User Community
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Drawn By: KM Reviewed by: JA Date: 5/03/2019

Figure: 4.1d
Title: Ecological Desktop Assessment - Environmental Values Heat Map
Project: Premium Ecotourism Products – Cooloola Great Walk
Client: Department of Environment and Science





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Figure: 4.1e
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4.3 CONCLUSION

It is understood preference will be given to locating the proposed eco-accommodation nodes in close proximity to the four existing walkers' camps along the Cooloola Great Walk, given they have been positioned at intervals that align with the intended duration of each day of walking along the trail. This would also promote the use of existing access networks for servicing, maintenance and emergency purposes as much as possible, as well as facilitate the opportunity for tour operators to offer both accommodation options within a single tour group.

The heat mapping presented in **Figure 4.1** indicates the following in relation to those sections of the trail in close proximity to each of the four existing walkers' camps.¹

- The area surrounding Kauri Walkers' Camp is likely to offer suitable locations for an eco-accommodation node, subject to on-ground assessment to identify any areas that should be avoided. A particular focus would be the presence of any threatened flora species and/or important habitat for threatened fauna species (refer area "a" on **Figures 3.1-3.3** and **4.1**).
- The area surrounding Litoria Walkers' Camp is likely to offer suitable locations for an eco-accommodation node, subject to on-ground assessment. A particular focus would be confirming the location of defined watercourses and the presence of any threatened flora species and/or important habitat for threatened fauna species. Certain areas to the south of the existing camp are likely to be less constrained, based on this preliminary desktop assessment (refer area "b" on **Figures 3.1-3.3** and **4.1**).
- The area surrounding Brahminy Walkers' Camp is likely to provide a number of suitable locations for an eco-accommodation node, subject to on-ground assessment to identify any areas that should be avoided. A particular focus would be the presence of any threatened flora species and/or important habitat for threatened fauna species (refer area "e" on **Figures 3.1-3.3** and **4.1**).
- The area surrounding Dutgee Walkers' Camp should be avoided, given its location within a wetland of State and National importance.

Suitable locations are likely to occur approximately 2km to the north or 5km to the south of the existing camp (refer areas "c" and "d" on **Figures 3.1-3.3** and **4.1**).

5.0 POTENTIAL APPROVALS

5.1 COMMONWEALTH APPROVAL

Under the EPBC Act, a person must not take an action that has, will have or is likely to have a significant impact on MNES without approval from the Australian Government Minister for the Environment and Energy. Before taking an action that could have a significant impact on MNES, the proposed action must be referred to the Minister for a determination as to whether or not the proposed action will need formal assessment and approval under the EPBC Act.

Based on the results of this desktop assessment, it is considered unlikely that the proposed eco-accommodation would result in significant impacts upon MNES, unless one or more accommodation nodes were located within or adjacent to an area containing threatened plant species or an important foraging or breeding site for a threatened fauna species. The presence of such values would need to be determined through targeted field survey and, if confirmed as present, all potential impacts associated with the installation and operation of the proposed infrastructure would need to be identified and assessed against the Commonwealth's Significant Impact Guidelines (DotE 2013) to determine if a referral is warranted.

5.2 STATE APPROVALS

The QPWS Procedural Guide for assessing the impact of QPWS actions on natural and cultural values indicates the proposed actions may be exempt from seeking approval for actions/development works under the NC Act, such as obtaining clearing permits for works that may impact plant species listed as threatened or near threatened under the NC Act, and working under an approved Species Management Plan for carrying out works that involve tampering with a native animal breeding place. However, approvals under other State legislation may be required, subject to any exemptions that apply.

¹ Any conclusions regarding suitability are based solely on ecological constraints, and do not take into account other constraints such as cultural values, access, landform, etc. It should also be acknowledged that this is a preliminary

assessment limited by the accuracy and completeness of the desktop information used.

Most State approvals are coordinated through the *Planning Act 2016*, under which a number of State Codes may need to be addressed, subject to any exemptions that apply.

In this case, the entire Study Area falls within the Coastal Management District. Consequently, the proposed actions may need to address State Code 8: Coastal development and tidal works, which requires the significance of impacts to all MSES identified in this report to be assessed against the *Significant Residual Impact Guideline* (DSDIP 2014).

Based on the results of this desktop assessment, it is considered unlikely that the proposed eco-accommodation would result in significant impacts upon MSES, unless one or more accommodation nodes were located within or adjacent to:

- a State-mapped wetland;
- an area containing threatened plant species or an important foraging or breeding site for a threatened or special least concern fauna species;
- a declared fish habitat area;
- a waterway providing for fish passage; and/or
- an area containing marine plants.

The presence of such values would need to be determined through targeted field survey and, if confirmed as present, all potential impacts associated with the installation and operation of the proposed infrastructure would need to be identified and assessed against the *Significant Residual Impact Guideline* (DSDIP 2014) to determine if a significant residual impact was likely. Justification would then need to be provided as to why the impact could not be further avoided or mitigated to insignificant levels, following which an offset would need to be proposed to compensate for the residual impact.

The proposed actions may also need to address State Codes 11 (Removal, destruction or damage of marine plants), 12 (Development in a declared fish habitat) and 18 (Constructing or raising waterway barrier works in fish habitats) if impacts upon the MSES addressed by these codes were not able to be avoided.

It is recommended a pre-lodgement meeting with planners from the Department of State Development, Manufacturing, Infrastructure and Planning is arranged to clarify approval requirements under the *Planning Act 2016*.

6.0 REFERENCES

Department of State Development, Infrastructure and Planning (DSDIP) (2014). Significant Residual Impact Guideline for matters of state environmental significance and prescribed activities assessable under the Sustainable Planning Act 2009, Queensland Environmental Offsets Policy, December 2014. Queensland Government, Brisbane.

Department of the Environment (DotE) (2013). Matters of National Environmental Significance: Significant Impact Guidelines 1.1. Commonwealth of Australia, Canberra.

Department of the Environment (DotE) (2014). EPBC Act referral guidelines for the vulnerable koala (combined populations of Queensland, New South Wales and the Australian Capital Territory). Commonwealth of Australia, Canberra.

APPENDIX A

Regional Ecosystems mapped within the Study Area

List of Regional Ecosystems mapped within the Study Area.

Abbreviations: VM Act status = status under the *Vegetation Management Act 1999* (Queensland); E = Endangered; OC = Of Concern; LC = Least Concern.

Table A.1. Regional Ecosystems mapped within the Study Area

RE Code	VM Act Status	General Description	Wetland RE	Other Features
12.1.3	LC	Mangrove shrubland to low closed forest on marine clay plains and estuaries.	Yes	Contains marine plants. Also recognised habitat for threatened fauna species including Water Mouse <i>Xeromys myoides</i> .
12.2.1	OC	Notophyll/evergreen notophyll vine forest generally with abundant <i>Archontophoenix cunninghamiana</i> or <i>A. alexandrae</i> in north of bioregion. Occurs on moist/wet, valley floors of parabolic dunes.		Habitat for threatened plant species including <i>Archidendron lovelliae</i> and <i>Cryptocarya foetida</i> .
12.2.3	OC	Araucarian microphyll/notophyll vine forest. <i>Backhousia myrtifolia</i> common in understorey on Fraser Island and Cooloola and forms low canopy in places. Occurs on parabolic dunes.		
12.2.4	OC	<i>Syncarpia hillii</i> and <i>Lophostemon confertus</i> tall open to closed forest with vine forest understorey ('wet sclerophyll'). Occurs on parabolic dunes.		
12.2.5	LC	Open forest to low closed forest. Species can include <i>Corymbia intermedia</i> , <i>Lophostemon confertus</i> , <i>Banksia integrifolia</i> subsp. <i>integrifolia</i> , <i>B. aemula</i> , <i>Callitris columellaris</i> , <i>Acacia</i> spp., <i>Livistona</i> spp. and <i>Endiandra sieberi</i> . <i>Melaleuca quinquenervia</i> in swales. Understorey generally shrubby and can include vine forest species. Occurs on Quaternary coastal dunes, beach ridges and sandy banks of coastal streams.		
12.2.6	LC	<i>Eucalyptus racemosa</i> subsp. <i>racemosa</i> , <i>Corymbia intermedia</i> , <i>C. gummifera</i> , <i>Angophora leiocarpa</i> and <i>E. pilularis</i> shrubby or grassy woodland to open forest. Occurs on Quaternary coastal dunes and beaches. Dunes with deeply leached soils.		

RE Code	VM Act Status	General Description	Wetland RE	Other Features
12.2.7	LC	<i>Melaleuca quinquenervia</i> or rarely <i>M. dealbata</i> open forest. Other species include <i>Eucalyptus tereticornis</i> , <i>Corymbia intermedia</i> , <i>E. bancroftii</i> , <i>E. latisinensis</i> , <i>E. robusta</i> , <i>Lophostemon suaveolens</i> and <i>Livistona decora</i> . A shrub layer may occur with frequent species including <i>Melastoma malabathricum</i> subsp. <i>malabathricum</i> or <i>Banksia robur</i> . The ground layer is sparse to dense and comprised of species including the ferns <i>Pteridium esculentum</i> and <i>Blechnum indicum</i> the sedges <i>Schoenus brevifolius</i> , <i>Baloskion tetraphyllum</i> subsp. <i>meiostachyum</i> , <i>Baumea rubiginosa</i> and <i>Gahnia sieberiana</i> and the grass <i>Imperata cylindrica</i> . Occurs on Quaternary coastal dunes and seasonally waterlogged sandplains usually fringing drainage system behind beach ridge plains or on old dunes, swales and sandy coastal creek levees.	Yes	Habitat for threatened plant species including <i>Phaius australis</i> and <i>P. bernaysii</i> .
12.2.8	LC	<i>Eucalyptus pilularis</i> , <i>E. microcorys</i> , <i>E. resinifera</i> and <i>Syncarpia hillii</i> open forest. Occurs on parabolic high dunes.		
12.2.9	LC	<i>Banksia aemula</i> low open woodland. Mallee eucalypts sometimes present, e.g. <i>Eucalyptus latisinensis</i> . Occurs on Quaternary coastal dunes and sandplains with deeply leached soils.		One of the communities included under the common name 'wallum', which represents potential habitat for numerous threatened species.
12.2.12	OC	Closed or wet heath +/- stunted emergent shrubs/low trees. Characteristic shrubs include <i>Banksia</i> spp. (especially <i>B. robur</i>) <i>Boronia falcifolia</i> , <i>Epacris</i> spp., <i>Baeckea frutescens</i> , <i>Schoenus brevifolius</i> , <i>Leptospermum</i> spp., <i>Hakea actites</i> , <i>Melaleuca thymifolia</i> , <i>M. nodosa</i> , <i>Xanthorrhoea fulva</i> with <i>Baloskion</i> spp. and <i>Sporadanthus</i> spp. in ground layer. Occurs on poorly drained Quaternary coastal dunes and sandplains. Low part of sand mass coastal landscapes where water collects from both overland flow and infiltration from adjoining sand dunes.	Yes	Habitat for threatened plant species including <i>Blandfordia grandiflora</i> and <i>Acacia baueri</i> . Habitat for threatened fauna including Ground Parrot <i>Pezoporus wallicus wallicus</i> .
12.2.14	LC	Strand and fore dune complex comprising <i>Spinifex sericeus</i> grassland <i>Casuarina equisetifolia</i> subsp. <i>incana</i> low woodland/open forest and with <i>Acacia leiocalyx</i> , <i>A. disparrima</i> subsp. <i>disparrima</i> , <i>Banksia integrifolia</i> subsp. <i>integrifolia</i> , <i>Pandanus tectorius</i> , <i>Corymbia tessellaris</i> , <i>Cupaniopsis anacardioides</i> , <i>Acronychia imperforata</i> . Occurs mostly on frontal dunes and beaches but can occur on exposed parts of dunes further inland.		

RE Code	VM Act Status	General Description	Wetland RE	Other Features
12.2.15	LC	Closed sedgeland in coastal swamps and associated water bodies. Characteristic species include <i>Gahnia sieberiana</i> , <i>Empodisma minus</i> , <i>Gleichenia spp.</i> , <i>Blechnum indicum</i> , <i>Lepironia articulata</i> , <i>Baumea spp.</i> , <i>Juncus spp.</i> , and <i>Eleocharis spp.</i> Occurs on Quaternary coastal dunes and beaches. Low part of coastal landscape where water collects from both overland flow and infiltration from adjoining sand dunes.	Yes	
12.2.15f	LC	Permanent and semi-permanent perched lakes. Occurs perched on Quaternary coastal dunes.	Yes	A unique regional ecosystem as there are only 80 perched lakes on sand recorded worldwide.
12.2.15g	LC	Swamps dominated by <i>Empodisma minus</i> , <i>Gahnia sieberiana</i> , other sedges and forbs and shrubs such as <i>Leptospermum liversidgei</i> . Occurs on depressions in coastal sand masses fed by ground water.	Yes	Habitat for threatened species including Wallum Froglet <i>Crinia tinnula</i> . Restricted to Fraser Island, Cooloola area and Moreton Island Unique wetland type colloquially referred to as patterned fens.
12.2.16	OC	Sand blows largely devoid of vegetation		
12.3.4	OC	Open forest to woodland of <i>Melaleuca quinquenervia</i> and <i>Eucalyptus robusta</i> . Occurs fringing drainage lines and on floodplains in coastal areas.	Yes	Habitat for threatened fauna species including the Wallum Froglet <i>Crinia tinnula</i> .
12.3.5	LC	<i>Melaleuca quinquenervia</i> open forest to woodland. Understorey depends upon duration of water logging; sedges and ferns, especially <i>Blechnum indicum</i> , in wetter microhabitats and grasses and shrubs in drier microhabitats. Ground layer species include the grasses <i>Leersia hexandra</i> and <i>Imperata cylindrica</i> , the sedges/rushes, <i>Baumea rubiginosa</i> , <i>Gahnia sieberiana</i> , <i>Lepironia articulata</i> , <i>Schoenus brevifolius</i> and <i>Schoenus scabripes</i> and the fern <i>Lygodium microphyllum</i> . Other tree species that may be present as scattered individuals or clumps include <i>Lophostemon suaveolens</i> , <i>Eucalyptus robusta</i> , <i>E. tereticornis</i> , <i>E. bancroftii</i> , <i>E. latisinensis</i> , <i>Corymbia intermedia</i> , <i>Melaleuca salicina</i> , <i>Livistona australis</i> , <i>Casuarina glauca</i> , <i>Endiandra sieberi</i> . <i>Melastoma malabathricum subsp. malabathricum</i> , <i>Glochidion sumatranum</i> and <i>Melicope elleryana</i> are often in understorey. Occurs on Quaternary alluvium in coastal areas.	Yes	Habitat for threatened flora species including <i>Phaius australis</i> and <i>P. bernaysii</i> . Habitat for threatened fauna including the Wallum Froglet <i>Crinia tinnula</i> .

RE Code	VM Act Status	General Description	Wetland RE	Other Features
12.3.7b	LC	Naturally occurring instream waterholes and lagoons, both permanent and intermittent. Includes exposed stream bed and bars. Occurs in the bed of active (may be intermittent) river channels. Vegetation may occur on infrequently inundated areas.	Yes	Habitat for an extensive range of aquatic flora and fauna.
12.3.11	OC	<i>Eucalyptus tereticornis</i> +/- <i>E. siderophloia</i> and <i>Corymbia intermedia</i> open forest to woodland. <i>Corymbia tessellaris</i> , <i>Lophostemon suaveolens</i> and <i>Melaleuca quinquenervia</i> frequently occur and often form a low tree layer. Other species present in scattered patches or low densities include <i>Angophora leiocarpa</i> , <i>E. exserta</i> , <i>E. grandis</i> , <i>C. trachyphloia</i> , <i>C. citriodora</i> subsp. <i>variegata</i> , <i>E. latisinensis</i> , <i>E. tindaliae</i> , <i>E. racemosa</i> and <i>Melaleuca sieberi</i> . Occurs on Quaternary alluvial plains and drainage lines along coastal lowlands. Rainfall usually exceeds 1000mm/y.		Habitat for threatened fauna species including the Black-breasted Button-quail <i>Turnix melanogaster</i> .
12.3.13	LC	Closed or wet heathland. Characteristic species include <i>Melaleuca thymifolia</i> , <i>Banksia robur</i> , <i>Xanthorrhoea fulva</i> , <i>Hakea actites</i> , <i>Leptospermum</i> spp. and <i>Baeckea frutescens</i> . Occurs on seasonally waterlogged Quaternary alluvial plains along coastal lowlands.	Yes	
12.3.14a	OC	<i>Eucalyptus racemosa</i> subsp. <i>racemosa</i> woodland to open forest. Other canopy species may include <i>Corymbia intermedia</i> , <i>C. gummifera</i> , <i>Eucalyptus latisinensis</i> , <i>E. tindaliae</i> and <i>Melaleuca quinquenervia</i> . Occurs on Quaternary alluvial plains in near coastal areas. Often found on stranded river terraces and higher level Pleistocene alluvium above the floodplain.		Habitat for threatened plant species including <i>Eucalyptus conglomerata</i> .
12.9-10.4	LC	<i>Eucalyptus racemosa</i> subsp. <i>racemosa</i> woodland to open forest. Other species can include <i>Angophora leiocarpa</i> , <i>Eucalyptus seeana</i> , <i>E. siderophloia</i> , <i>Corymbia intermedia</i> , <i>E. tindaliae</i> , with <i>Lophostemon suaveolens</i> , <i>Melaleuca quinquenervia</i> , <i>E. tereticornis</i> common on lower slopes. Occurs on Cainozoic and Mesozoic sediments +/- remnant Tertiary surfaces.		Habitat for threatened plant species including <i>Macrozamia pauli-guilielmi</i> and <i>Acacia attenuata</i> .
12.12.19	OC	Vegetation complex of exposed rocky headlands. Vegetation types include Themeda triandra grassland and wind-sheared shrubland and woodland. Occurs on Mesozoic to Proterozoic igneous headlands.		