

# **PRELIMINARY ECOLOGICAL CONSTRAINTS ANALYSIS**

**CARDWELL TROPICAL BIKE TRAILS**

Prepared on behalf of  
**World Trail Pty. Ltd**

February **2021**

# EXECUTIVE SUMMARY

Trend Ecology was engaged by World Trail Pty Ltd to undertake a preliminary ecological constraints analysis for the proposed Cardwell Tropical Bike Trails. The trails are proposed to be constructed on the mountain range to the west of Cardwell, north Queensland. Cardwell is located on the Cassowary Coast, approximately 160km north of Townsville and 180km south of Cairns.

A desktop assessment of the known ecological values underlying the proposed trails was undertaken and the likelihood of occurrence and potential impacts to these ecological values determined. From this assessment the key ecological values that were considered most likely to occur and had the potential to be impacted by the project were established, and relevant environmental legislation reviewed to determine any ecological constraints that may impact the project during the approval phase. In addition to this, potential ways to avoid or reduce impacts were investigated which could reduce the number of environmental approvals and permits required for the project to progress to the construction phase.

## KEY ECOLOGICAL VALUES

The desktop assessment identified the following key ecological values as most likely to occur within the study area. These ecological values have the potential to be impacted by the proposed trails should they be confirmed as present in later phases of the project.

- The Wet Tropics World Heritage Area, considered a matter of national significance for being a world heritage place, a natural heritage place and an indigenous heritage place, is located within the western portion of the study area (Map 3, Appendix 1).
- Areas protected by national park occur within the study area (Map 3, Appendix 1). Due to limited access, these national park areas have been relatively undisturbed to date and remain largely intact in terms of remnant vegetation. These areas provide important habitat for native flora and fauna, and potentially threatened flora and fauna species.
- Presence of some matters of state significance were considered likely to occur within the study area including a protected riverine wetland, protected watercourses and regulated vegetation mapped as category B and R which includes 'of concern' regional ecosystems and essential habitat for threatened species (Maps 8, 11 and 12 – 17, Appendix 1).
- Nine threatened flora species and 24 threatened fauna species considered likely or possible to occur within the study area (Table 10 and Table 11). These threatened species have either national and/or state significance.
- Core habitat for the endangered Southern Cassowary and the Mahogany Glider was mapped throughout the study area (Map 19 – 21, Appendix 1). Both species have national and state significance.
- Modelled species habitat for special least concern animals of national and state significance occurred within the study area (19 – 21, Appendix 1). This is habitat for the Short-beaked echidna, and potential habitat for 63 migratory species made up of marine birds, marine species, terrestrial species and wetland species.

## RELEVANT ENVIRONMENTAL LEGISLATION AND APPROVALS

Based on the current alignment of the trails (i.e., no implementation of the proposed mitigation options provided in this report) and the key ecological values likely present based on desktop analysis, it is expected that a number of environmental approvals and permits will be required before any construction works can begin. Environmental approvals would include:

- EPBC Referral based on the potential for the project being considered a 'controlled action' under the *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth).
- Development application for operational works for clearing native vegetation protected under the *Vegetation Management Act 1999* (Queensland).
- Development application for operational works for that is the taking and interfering with water in a mapped watercourse protected under the *Water Act 2000* (Queensland).
- Local development approvals under the Cassowary Coast Regional Council Planning Scheme.

In addition to the above environmental approvals, the following permits and authorities would be required. These permits come with prescribed conditions in which construction crews will need to abide to ensure impacts to ecological values are minimised.

- Wet Tropics permit to allow construction within the World Heritage Area as prescribed by the *Wet Tropics Management Plan 1998* (reviewed 2020) under the *Wet Tropics World Heritage Protection and Management Act 1993* (Queensland).
- Riverine protection permit to allow construction within watercourses mapped under the *Water Act 2000* (Queensland).
- A s34 agreement, under the *Nature Conservation Act 1992* (Queensland), with Queensland Parks and Wildlife Service to allow construction within national park and state forest areas. As part of the application, a submission report and Environmental Management Plan would be required.
- Authority under section 114 of the *Nature Conservation (Protected Areas Management) Regulation 2017* (Queensland) to undertake prescribed works in protected areas. This authority would require the State to be indemnified.
- Authority under section 56 of the *Forestry Act 1959* (Queensland) to permit interference with forest products under section 39 of the Act. This authority would also require the State to be indemnified.
- A protected plant clearing permit under the *Nature Conservation Act 1992* (Queensland), though this is dependent on whether protected plants are found during field surveys and cannot be avoided.

These approvals and permits are what would be required based on the current trail alignments and the key ecological values known only from the desktop assessment. There is also potential that other environmental approvals and documentation may be required, but these are dependent on the results of field ecological surveys to be conducted during the next phase of the project and only if any confirmed ecological values cannot be avoided through realignment of trails or by implementing sensitive construction techniques. Such documentation and approvals include biodiversity offsets under the *Environmental Offsets Act 2014* (Queensland) or *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth), and a Species Management Plan for tampering with a protected animals breeding place under the *Nature Conservation Act 1992* (Queensland).

A number of mitigation options for reducing impacts have been proposed throughout this report. If these mitigation options are deemed feasible it would reduce the number of environmental approvals and permits required to progress this project to the construction phase. While these environmental approvals and permits may be required should impacts not be mitigated, most are unlikely to cause implications for the project to proceed to construction phase other than adding time and costs to the project. The main cause for concern would be getting the development application for clearing of native vegetation under the *Vegetation Management Act 1999* (Queensland) approved to construct Trail 1. To do so, would require the need to prove that Trail 1 in the 7 Sisters section is 'necessary' and there are no other alternative options such as removing this trail entirely or relocating it to already cleared areas or within state forest. Advice regarding the realignment of this trail has been provided in the *Discussion* section of this report which could void the requirement for this approval if deemed feasible.

#### ABBREVIATIONS THROUGHOUT THE REPORT

Abbreviation	Definition
AHD	Australian Height Datum
Cth	Commonwealth
DAF	Department of Agriculture and Fisheries
EPBC Act	Environment Protection Biodiversity Conservation Act
GBR	Great Barrier Reef
MNES	Matter of National Environmental Significance
MSES	Matter of State Environmental Significance
NC Act	Nature Conservation Act
Qld	Queensland
QPWS	Queensland Parks and Wildlife Service
RE	Regional ecosystem
VMA	Vegetation Management Act
WHA	World Heritage Area
WTMA	Wet Tropics Management Authority

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# INTRODUCTION

## 2.1 PROJECT BACKGROUND AND LOCATION

Trend Ecology was engaged by World Trail Pty Ltd to undertake a preliminary ecological constraints<sup>1</sup> analysis of the Cardwell Tropical Bike Trails, which are proposed on the mountain range to the west of Cardwell, in north Queensland. Cardwell is located within the Cassowary Coast Regional Council area, approximately 160km north of Townsville and 180km south of Cairns (Map 1, Appendix 1).

World Trail has undertaken the concept trail alignments for three sections of trails named 7 Sisters, Lookout Hill and Attie Creek Hill (Map 2, Appendix 1). These three sections comprise a total of 25 individual bike trails, covering a total 88.4km in length and an underlying area of land of approximately 1000 hectares.

## 2.2 SCOPE OF THE ECOLOGICAL CONSTRAINTS ANALYSIS

This ecological constraints analysis aimed to determine the ecological values<sup>1</sup> that potentially exist in the vicinity of the proposed trails, as these have the potential to be impacted by construction and use of the trails and will likely cause constraints in terms of environmental approvals<sup>1</sup> before the project can progress to the construction phase.

To determine the ecological values most likely to be present within the vicinity of the proposed trails, this analysis focussed on the total area underlying the proposed trail alignments, as opposed to individual trails. This area will be referred to as the 'study area' throughout the remainder of the report.

The objectives of the ecological constraints analysis were to:

- Undertake a desktop assessment (review of all available databases and relevant information) of the study area to determine the key ecological values that are likely to occur or are known to occur.
- Assess the potential for the area to support habitat for threatened<sup>1</sup> species and communities by undertaking a likelihood of occurrence assessment. This assessment determined which ecological values have been recorded within 5km of the study area or were deemed likely, possible or unlikely to occur based on location and habitat suitability. Ecological values that have been recorded or were considered likely or possible to occur pose the greatest constraints to the proposed project in terms of environmental approvals.
- Identify any government environmental legislation (federal, state and local) that applies to the study area and the proposed project to determine the environmental approvals and permits that may be required for the project to progress to the construction phase.
- Provide mitigation options and recommendations (such as preliminary trail alignment changes) to avoid key ecological values and reduce environmental impacts, which would reduce environmental approval and permit requirements if deemed feasible.

This report outlines the findings of the preliminary ecological constraints<sup>1</sup> analysis and provides supporting documentation for World Trail's Feasibility Study of the Cardwell Tropical Bike Trails.

## 2.3 STUDY AREA DESCRIPTION AND ENVIRONMENTAL SETTING

The study area comprised the total area underlying the proposed trails, which covers approximately 1000 hectares to the west of Cardwell township (Map 2, Appendix 1). The study area was made up of three land tenures: national park, state forest and one small

<sup>1</sup> *Ecological Constraints:* Implications for development projects relating to the protection of ecological values under current environmental legislation.

*Ecological Values:* Qualities of the natural world that are considered to be of importance for either a regions biodiversity or its ecosystem function and integrity. These qualities are often in decline due to human pressures and are protected under current environmental legislation. Examples include threatened species and remnant vegetation.

*Environmental Approvals:* Includes authorities, permits and licences that are required under various legislation by local, state and federal governments.

*Threatened:* Plants or animals that are at risk of extinction.

section of state land (opposite the Cardwell Golf Course; Table 1 and Map 3, Appendix 1). The Wet Tropics World Heritage Area (WHA) was also mapped in the western portion of the study area (Table 1 and Map 3, Appendix 1). This WHA is located mostly within national park though overlaps slightly with state forest boundaries.

Table 1 Land tenure over the study area	Tenure	Trail Section
	State Land (Lot 2 USL38696)	7 Sisters – Trail 1
	State Forest	7 Sisters - All trails except Trail 1 Lookout Hill – All trails Attie Creek – Trail 15, 16 and 18
	National Park	Attie Creek – All trails except 15, 16 and 18
	Wet Tropics WHA	Attie Creek – Trails 17, 18, 19, 20, 21, 22, 23, 24 and 25

World Trail has designed the concept trail alignments for the study area and have formed three sections of trails. These are named 7 Sisters, Lookout Hill and Attie Creek Hill (Maps 4-6, Appendix 1). These sections occur on three separate hill areas to the west of the Cardwell township. These hills range in elevation from 10-230m Australian Height Datum (AHD) for 7 Sisters, from 10-140m AHD for the Lookout Hill, and from 110-850m AHD for Attie Creek Hill. The 7 Sisters and Lookout Hill sections traverse the Cardwell State Forest, while most of the Attie Creek Hill section traverses the Girringun National Park (Map 3, Appendix 1).

The study area is situated in the Wet Tropics bioregion<sup>1</sup> of Queensland. This region typically experiences monsoonal summers and dry winters. Mean annual rainfall for Cardwell is 2111mm, with most rain falling between November and April (Bureau of Meteorology 2021). A number of freshwater streams occur throughout the study area, most of which are stream order 1 and 2. These streams are seasonal or spring fed rainforest streams.

The Cardwell State Forest area is relatively disturbed due to the planting of pine plantations for timber production, though some patches of native vegetation remain. The Girringun National Park contains relatively undisturbed remnant vegetation, with the exception of the walking trails that exist to Attie Creek Falls, and the swimming hole at Deadhorse Creek (Map 1, Appendix 1). Areas of remnant vegetation that remain throughout the study area likely contain a range of vegetation communities including rainforest, open and closed forest and grasslands.

## 2.4 RELEVANT ENVIRONMENTAL LEGISLATION

The environmental legislation provided and described in Table 2 were considered the most relevant to the project and were investigated to determine the potential constraints in terms of environmental approvals based on potential impacts to key ecological values.



<sup>1</sup> Bioregion: Relatively large land areas characterised by broad, landscape-scale natural features and environmental processes that influence the functions of entire ecosystems. There are 13 bioregions recognised throughout Queensland.

**Table 2** Relevant environmental legislation

Legislation	Description	Applicable Land Tenures
COMMONWEALTH (Cth) Environment Protection and Biodiversity Conservation Act 1999	<p>The purpose of the <i>Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)</i> is to protect and manage nationally and internationally important flora and fauna<sup>1</sup>, ecological communities and heritage places. These are considered matters of national environmental significance<sup>1</sup> (MNES). The <i>EPBC Act</i> recognises nine MNES:</p> <ul style="list-style-type: none"> <li>- World heritage properties</li> <li>- National heritage places</li> <li>- Wetlands of international importance (RAMSAR)</li> <li>- Nationally threatened species and ecological communities</li> <li>- Migratory species</li> <li>- Commonwealth marine areas</li> <li>- The Great Barrier Reef Marine Park</li> <li>- Nuclear actions</li> <li>- A water resource (relates to coal seam gas and large coal mining development).</li> </ul> <p>The <i>EPBC Act</i> applies where a development project is likely to have a significant impact<sup>1</sup> on a MNES, in which the project is to be referred to the Department of Sustainability, Environment, Water, Population and Communities for assessment as to whether the action<sup>1</sup> is a 'controlled action'<sup>1</sup> requiring Commonwealth approval.</p> <p>A protected matters database search can be conducted which lists all MNES that are considered likely to occur within a given area. This search determines what MNES are most relevant to proposed development projects and have the potential to be impacted.</p>	All tenures
STATE Vegetation Management Act 1999	<p>The purpose of the <i>Vegetation Management Act 1999 (VMA)</i> is to regulate the clearing of native vegetation in Queensland, through conserving remnant vegetation, preventing the loss of biodiversity and maintaining ecological processes. The VMA applies to all vegetation, other than in state forests, national parks, forest reserves and certain other tenures defined under the <i>Forestry Act 1959 (Qld)</i> and the <i>Nature Conservation Act 1992 (NC Act; Qld)</i>.</p> <p>The VMA uses a series of maps to determine what vegetation is regulated and would require assessment should it be cleared for development. Regulated vegetation<sup>1</sup> is categorised by its level of protection:</p> <ul style="list-style-type: none"> <li>- Category A (Vegetation offsets/compliance notices)</li> <li>- Category B (Remnant vegetation)</li> <li>- Category C (High-value regrowth vegetation)</li> <li>- Category R (Reef regrowth watercourse vegetation)</li> <li>- Category X (Exempt clearing work on Freehold, Indigenous and Leasehold land)</li> </ul> <p>Categories containing remnant vegetation are then classified into protection types for regional ecosystems<sup>1</sup> (RE): endangered, of concern or least concern. These have different levels of protection under the VMA. The VMA also regulates the clearing of vegetation that is considered essential habitat for species of national and state significance (i.e., those listed in the regulations associated with the EPBC Act and NC Act).</p> <p>The purpose of the VMA is achieved by providing assessment benchmarks for the <i>Planning Act 2016 (Qld)</i> for development that is considered 'assessable'. For vegetation clearing, these assessment benchmarks are provided in the State Code 16: Native Vegetation Clearing. Assessment against these benchmarks is required through the development application process.</p>	State Land

<sup>1</sup> Action: A project, development, an activity or an alteration of any of any of these things.

Controlled Action: If the proposed action is likely to be significant it is called a 'controlled action'. See also significant impact definition.

Flora and fauna: Plant and animal life respectively.

Matters of National Environmental Significance: Ecological values that have national importance and are protected under the EPBC Act. Includes world heritage places, national heritage places, wetlands of international importance, nationally threatened species and ecological communities, migratory species etc.

Regional Ecosystem: Vegetation communities in a bioregion that are consistently associated with a particular combination of geology, landform and soil. Categories:

Endangered: Native ecosystems that have less than 10% of their pre-clearing extent remaining.

Of Concern: Native ecosystems that have between 10 and 30% of their pre-clearing extent remaining

Least Concern: Native ecosystems that have more than 30% of their pre-clearing extent remaining.

Regulated Vegetation: Native vegetation that is regulated in terms of clearing under the Vegetation Management Act 1999 (Qld).

Significant Impact: An impact which is important, notable or of consequence, having regard to its context and integrity. Impact will depend on the sensitivity, value and quality of the environment which will be impacted, the intensity, duration, magnitude and geographic extent of the activity.

	Legislation	Description	Applicable Land Tenures
STATE	Nature Conservation Act 1992	<p>The purpose of the <i>NC Act</i> is to protect Queensland's natural areas and biota, through the creation of national parks, reserves, conservation areas and the protection of Queensland's threatened and special flora and fauna. The NC Act regulates development in protected areas and where protected species have been recorded by upholding a permit and licensing system for the taking and keeping of native wildlife.</p> <p>The Queensland Parks and Wildlife Service (QPWS) is responsible for the management of national parks, as well as state forests (under the <i>Forestry Act 1959</i>(Qld)). The <i>Nature Conservation (Protected Areas Management) Regulation 2017</i> (Qld) outlines the permitted uses in protected areas. Any activity not permitted would require an authority.</p> <p>The new regulations (Nature Conservation (Animals) Regulation 2020 and Nature Conservation (Plants) Regulation 2020) that came into effect in August 2020 provide lists of flora and fauna species that are considered to be extinct, extinct in the wild, critically endangered, vulnerable, near threatened, least concern and special least concern<sup>1</sup>. All these species are considered matters of state environmental significance<sup>1</sup> (MSES) and should they be present in the vicinity of any proposed development, may result in permit requirements under the NC Act to interfere with them.</p> <p>The NC Act has allowed for the flora survey trigger mapping to exist, which shows 'high risk' areas for protected plants (under the NC Act) and is used to assist flora survey and clearing permit requirements for proposed developments.</p>	All tenures
	Wet Tropics World Heritage Protection and Management Act 1993	The <i>Wet Tropics World Heritage Protection and Management Act 1993</i> is the Queensland legislation that sets out the protective requirements for the Wet Tropics of Queensland WHA. The Wet Tropics Management Authority (WTMA) manages the WHA under the legislation and does so through the use of the Wet Tropics Management Plan 1998 (reviewed 2020; the Management Plan). The Management Plan only applies in areas mapped within the WHA.	National Park and State Forest, over which the WHA is mapped
	Water Act 2000	<p>The purpose of the <i>Water Act 2000</i> is to sustainably plan, manage and protect the State's water resources. Waters mapped in the watercourse identification map (<i>Water Act 2000</i>) are protected under this Act. Activities within 'mapped' waters may require a riverine protection permit, including destroying vegetation, excavating or placing fill.</p> <p>The purpose of the <i>Water Act 2000</i> is achieved through assessment benchmarks in the <i>Planning Act 2016</i> (Qld) for development that is considered 'assessable' (provided in State Code 10: Taking of Interfering with Water). Assessment against these benchmarks is required through the development application process.</p>	All tenures
STATE	Forestry Act 1959	<p>The <i>Forestry Act 1959</i>(Qld) regulates native timber harvesting in Queensland, through the Department of Agriculture and Fisheries (DAF), and regulates plantation forests on state land which are managed by HQ Plantations Pty Ltd under a plantation licence.</p> <p>Any activity likely to interfere with forestry products that is not permitted by DAF or HQ Plantations would require an authority under section 56 of the Act.</p>	State Forest
LOCAL	Cassowary Coast Regional Council Planning Scheme	<p>The Cassowary Coast Regional Council Planning Scheme was developed in accordance with the superseded <i>Sustainable Planning Act 2009</i>(Qld) as a framework for managing development in the Cassowary Coast Regional Council area over the next 10 years.</p> <p>The Cassowary Coast Regional Council Planning Scheme provides zoning that facilitates the location of preferred and acceptable land uses. It also identifies overlays that reflect state and local level interests and provides assessment benchmarks for each overlay that development needs to comply through the development application process.</p>	All tenures

<sup>1</sup> Matters of State Environmental Significance: Ecological values considered to have state (Queensland) importance and are protected under various state environmental legislation. Includes regulated vegetation, wetlands, protected areas, fish habitat areas, state protected threatened species etc.

Threatened Species categories: Extinct: A species no long in existence, having died out.

Extinct in the wild: A species that longer exists in its natural habitat, and only exists within captivity.

Critically Endangered: A species that is at extremely high risk of becoming extinct.

Endangered: A species that is at high risk of becoming extinct.

Vulnerable: A species that is at high risk of becoming endangered in the wild.

Near Threatened: A species that is likely to become endangered in the near future.

Least Concern: Lowest risk, a widespread and abundant species.

Special Least Concern: Species protected under the NC Act, defined as a least concern plant that is subject to harvesting pressure due to its commercial value or special characteristics, (e.g., orchids) or a least concern animal considered iconic or important to cultural identity (Echidna, Platypus and migratory species).

# METHODOLOGY

## 3.1 DESKTOP ASSESSMENT

The desktop assessment involved a review of all relevant environmental databases, maps and legislation to identify the ecological values that could potentially occur within the study area and could potentially be impacted by the proposed project (Table 3).

**Table 3** Information sources reviewed during the desktop assessment

Type	Source	
Database Searches	EPBC Act Protected Matters Search Tool (5km buffer)	
	Map of Queensland Wetland Environmental Values	
	Watercourse Identification Map ( <i>Water Act 2000</i> )	
	Vegetation Management Report	Regulated Vegetation Management Map Vegetation Management Supporting Map Protected Plants Flora Survey Trigger Map
	Wildlife Online report (5km buffer)	
	Biomaps report (5km buffer)	
	Development Assessment Mapping System	
	Wet Tropics Plan Zoning Map Edition 3.0	
	Aerial Imagery	Queensland Globe 2021 Google Earth Pro 2021
		Planning Maps

## 3.2 LIKELIHOOD OF OCCURRENCE ASSESSMENT

Threatened species, if found present within the study area, cause constraints to development projects due to potential for impacts. From a desktop perspective, a likelihood of occurrence assessment can be undertaken to determine the likelihood these species will be found within the study area and provide an indication of potential impacts and the environmental approvals that might be required before the project can progress to the construction phase. This assessment can also inform field ecological surveys in later phases of the project. More information regarding the recommended field surveys is provided in the *Recommendations* section of this report and information regarding the expected environmental approvals is provided in the *Discussion* section of this report.

A likelihood of occurrence assessment for each database identified threatened flora and fauna species was undertaken and determined which species were 'recorded' or considered 'likely', 'possible' or 'unlikely' to occur (Table 4)

**Table 4)** based on existing confirmed records, suitability of habitat mapped in the study area, location of 'high risk areas' mapped on the flora survey trigger map, MSES maps, professional judgement and local knowledge. The results of this assessment have been provided in Appendix 2 and 3.

**Table 4** Explanation of terms used in the likelihood of occurrence assessment

Terms	Description
Recorded	At least one confirmed record (Wildnet) of the species exists within 5km of the study area.
Likely	The study area was located within the known species distribution and had suitable habitat mapped.
Possible	Suitable habitat was mapped within the study area, however it is outside of the current distribution range of the species, though likely coincides with historical distributions.
Unlikely	The study area was located outside of the current distribution of the species and/or no suitable habitat for the species was mapped in the study area.

# RESULTS

## 4.1 DATABASE OVERVIEW

The databases reviewed and brief explanation of the ecological values found during the desktop assessment have been provided in Table 7 (over page). This table also discusses which trails will impact on identified ecological values, possible mitigation options for avoiding such impacts and the environmental approvals pathway for each option. More detailed information regarding mitigation options and environmental approvals is provided in the *Discussion* section of this report.

## 4.2 LISTED WORLD HERITAGE PROPERTIES

The EPBC protected matters search identified two MNES listed as world heritage properties within 5km of the study area. These properties are protected under the *EPBC Act* (Cth) and have been described in Table 5.

The Great Barrier Reef (GBR) WHA starts at the coastline and extends seaward past the GBR outer shelf. The study area is not located within this WHA and is unlikely to cause significant impacts to it, hence has been deemed unlikely to cause constraints to the project. The Wet Tropics WHA however was mapped in the western portion of the study area and underlies some of the Attie Creek Hill trails (Map 7, Appendix 1).

**Table 5** World heritage properties listed as occurring within 5km of the study area

World Heritage Property	Status	Ecological Constraint
Great Barrier Reef	Declared Property	No
Wet Tropics of Queensland	Declared Property	Yes

*Notes: Properties considered unlikely to occur or cause constraints to the project have been greyed out.*

## 4.3 LISTED NATIONAL HERITAGE PROPERTIES

The EPBC protected matters search identified two MNES listed as national heritage properties within 5km of the study area. These properties are protected under the *EPBC Act* (Cth) and have been described in Table 6.

These listed properties relate again to the GBR and Wet Tropics WHAs. As described above in Section 3.2, the study area is not located within the GBR WHA and therefore unlikely to cause constraints to the project, however the Wet Tropics WHA is mapped in the western portion of the study area and underlies some of the Attie Creek Hill trails (Map 7, Appendix 1).

**Table 6** National heritage properties listed as occurring within 5km of the study area

National Heritage Property	Status	Ecological Constraint
<b>NATURAL</b>		
Great Barrier Reef	Listed Place	No
Wet Tropics of Queensland	Listed Place	Yes
<b>INDIGENOUS</b>		
Wet Tropics World Heritage Area	Within Listed Place	Yes

*Notes: Properties considered unlikely to occur or cause constraints to the project have been greyed out.*

**Table 7** Assessment of database information

Ecological Values	Database Source	Reference	Search Results	Trails Impacted			Mitigation Options	Environmental Approval Pathway
				7 Sisters	Lookout Hill	Attie Creek		
<b>FEDERAL</b>								
<ul style="list-style-type: none"> <li>- Listed Heritage Places</li> <li>- Threatened Ecological Communities</li> <li>- Threatened Species</li> <li>- Migratory Species</li> </ul>	EPBC Act Protected Matters Search	Appendix 5	Database search identified that a number of MNES were likely present within 5km of the study area, including two world heritage properties, three national heritage places, two listed threatened ecological communities, 49 listed threatened species and 56 listed migratory species known or considered likely to occur within 5km of the study area.	To be confirmed during recommended field ecological surveys (future phase of the project).			N/A Some mitigation options may be feasible but are reliant on results of the field ecological surveys	EPBC Referral to be submitted for approval by the Minister. Results of the field ecological survey required to inform the EPBC Referral.
<b>STATE</b>								
Wet Tropics World Heritage Area	Wet Tropics Management Plan zoning maps	Map 7, Appendix 1	Wet Tropics WHA mapped over some of the Attie Creek Hill section.	NIL	NIL	Trails 17, 18, 19, 20, 21, 22, 23 and 25	Option 1 No change Option 2 Realignment or removal of impacted trails	Wet Tropics Management Authority Permit required to construct within the WHA. N/A
Girringun National Park	Girringun National Park Management Statement 2013 (DNPRSR 2013)	Map 3, Appendix 1	Girringun National Park mapped over most of the Attie Creek Hill section. Management Statement in place to conserve natural and cultural values of the national park.	NIL	NIL	Trails 16 - 25	Option 1 No change Option 2 Realignment or removal of impacted trails	Agreement (s34) required from QPWS to undertake prescribed works N/A
Wetlands	Map of Queensland Wetland Environmental Values	Maps 8 - 10, Appendix 1	Riverine wetland mapped along a watercourse in the 7 Sisters section. This wetland is protected under the VMA and is only relevant on specified land tenures (excludes national parks and state forest)	Trails 10 and 11	NIL	NIL	Option 1 No change Option 2 Realignment of impacted trails Option 3 Construction of a bridge over the wetland	N/A N/A but impacts to a sensitive ecosystem would be reduced if trails can be realigned outside of the mapped wetland. N/A but impacts to a sensitive ecosystem would be reduced if a bridge can be constructed over the wetland.
Protected watercourses	Watercourse Identification Map (Water Act 2000)	Map 11, Appendix 1	Three protected watercourses mapped within the study area - Attie Creek, One Mile Creek and an unnamed tributary.	Trails 2, 7 and 11	Trail 12	Trails 15 and 16	Option 1 No change Option 2 Realignment of impacted trails Option 3 Potentially for downgrading the watercourses so they are no longer protected under the Act	<ul style="list-style-type: none"> <li>- Riverine Protection Permit to disturb within a mapped watercourse.</li> <li>- Development Application for 'operational works' that is the taking and interfering with water in a 'mapped' watercourse, lake or spring.</li> </ul> N/A There is a possibility that the watercourses in the vicinity of the proposed trails do not meet the definition of a watercourse. To confirm this, a field assessment undertaken by a suitably qualified person would be required to assess the watercourses as per the definition under the <i>Water Act 2000</i> . If the watercourses do not meet the definition, an application can be made to downgrade these watercourses. A pre-lodgement meeting with the State Government would be required to discuss this process.
Regulated and protected native vegetation	Regulated Vegetation Management Map	Maps 12-14, Appendix 1.	Category B (remnant vegetation), Category R (regrowth watercourse vegetation) and Category X (non-remnant) mapped throughout the study area. Only relevant to land tenures protected under the VMA (excludes national park and state forest) which is the state land parcel that is traversed by Trail 1 in the 7 Sisters section. This area is mapped as Category B (remnant vegetation).	Trail 1	NIL	NIL	Option 1 No change	Development Application for 'operational works' for clearing native vegetation would be required to construct Trail 1. However, there may be issues with getting this application approved. Please see <i>Discussion</i> section for more information regarding this.

Ecological Values	Database Source	Reference	Search Results	Trails Impacted			Mitigation Options	Environmental Approval Pathway
				7 Sisters	Lookout Hill	Attie Creek		
Regulated and protected native vegetation	Vegetation Management Supporting Map	Maps 15-17, Appendix 1	Least concern REs, Of concern REs and Essential Habitat mapped throughout the study area. Only relevant to land tenures protected under the VMA (excludes national park and state forest) which is the state land parcel that is traversed by Trail 1 in the 7 Sisters section. This area is mapped as an Of Concern RE and Essential Habitat				Option 2 Removal of Trail 1 from the design or relocation of Trail 1 through state forest or an already cleared area.	N/A
Threatened Flora species	Protected Plants Flora Survey Trigger Map	Map 18, Appendix 1	No 'high risk areas' on the flora survey trigger map (protected under the <i>NC Act</i> (Qld)) were mapped in the study area	NIL	NIL	NIL	N/A	N/A
Threatened Flora and Fauna species	Wildlife Online	Appendix 5	Two threatened flora and 12 threatened fauna species listed under the <i>NC Act</i> (Qld) have been recorded within 5km of the study area.	To be confirmed during recommended field ecological surveys (future phase of the project).			N/A Some mitigation options may be feasible but are reliant on results of the field ecological surveys	If confirmed during the field survey and flora species or fauna habitat cannot be reasonably avoided, the following approvals may be required: <ul style="list-style-type: none"> <li>- Protected plant clearing permit</li> <li>- Biodiversity Offsets</li> <li>- Development of a Species Management Plan for tampering with a protected animals breeding place</li> </ul>
- Threatened Flora and Fauna species - Special Least Concern Fauna species	Biomaps Report	Appendix 5	Nine threatened birds, one threatened insect, nine threatened mammals, two threatened reptiles and five threatened plants recorded within 5km of the study area. 18 special least concern birds (migratory) and one special least concern mammal recorded within 5km of the study area. These are protected under the <i>EPBC Act</i> (Cth) and/or <i>NC Act</i> (Qld).	To be confirmed during recommended field ecological surveys (future phase of the project).			N/A Some mitigation options may be feasible but are reliant on results of the field ecological surveys	As above
- Protected Wildlife Habitat - Special Least Concern Fauna habitat	Matters of State Environmental Significance Mapping	Maps 19-21, Appendix 1	'Core habitat' for the Southern Cassowary and Mahogany Glider mapped over most of the study area. Wildlife habitat for a special least concern animal (Short-beaked Echidna) also mapped over most of the study area.	Trail 1, 3, 4, 5, 6, 7, 8, 9, 10 and 11	All trails	All trails	N/A Some mitigation options may be feasible but are reliant on results of the field ecological surveys	As above
<b>LOCAL</b>								
Local Matters	Cassowary Coast Regional Council Planning Scheme	N/A	The study area traverses a number of different zones within the planning scheme, including environmental management and conservation, rural, emerging community and township zones. Overlay codes are also triggered, including but not limited to the Environmental Significance Overlay and Bushfire Hazard Overlay.	To be confirmed as part of the approvals phase of the project.			N/A	Pre-lodgement meeting required with Cassowary Coast Regional Council to define approval process and requirements. Field investigations may be required. No further analysis as part of this preliminary ecological constraints analysis.

Notes: Ecological value not mapped or relevant to the study area has been greyed out.

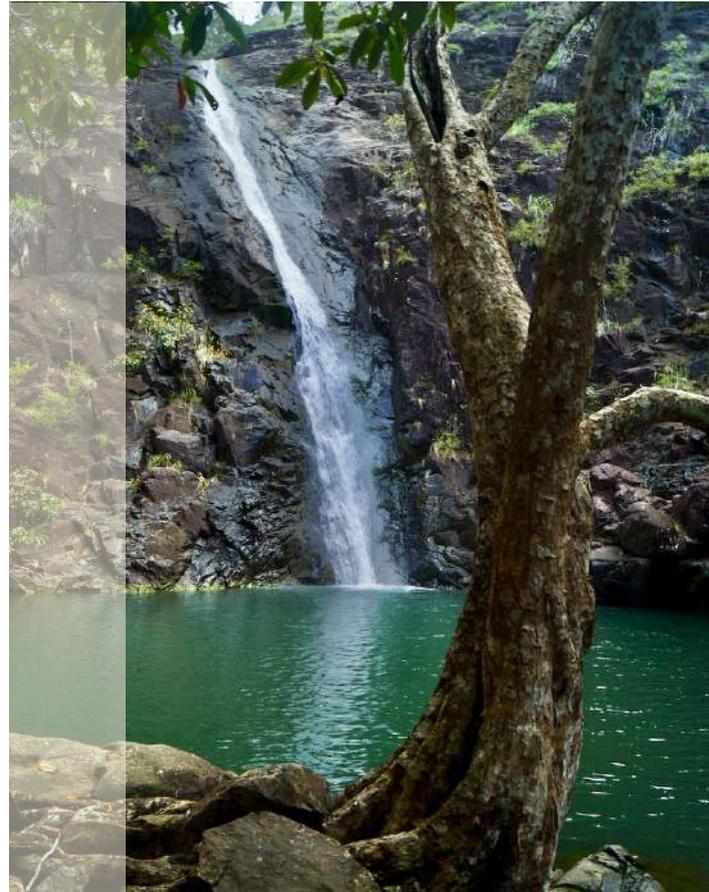
N/A = Not applicable

## 4.4 WETLANDS

Wetlands can have both state and national environmental significance, making them protected under multiple legislation, some of which applies to the proposed project.

Most of the study area remains outside of wetland protection areas, with the exception of one riverine wetland (protected under the *VMA* (Qld)) that is mapped following a watercourse within the 7 Sisters section. This riverine wetland is traversed by Trails 10 and 11 (see Maps 8-10, Appendix 1).

Such riverine wetlands are protected under the state legislated VMA to address the loss and degradation of wetland systems as this results in declining water quality (particularly to the GBR) and loss of biodiversity. The VMA however is only triggered on specified land tenures, which excludes national park and state forest areas. The impacted trails are located within these excluded land tenures and as such would not require environmental approvals should the trails traverse the mapped wetland area. There are implications in terms of environmental impacts however should these trails traverse the wetland system. This is discussed in detail in the *Discussion* section of this report.



## 4.5 WATERCOURSES

Watercourses mapped on the watercourse identification map (*Water Act 2000*) are protected under the *Water Act 2000* (Qld) and are considered a MSES. The *Water Act 2000* is applicable regardless of the land tenure and is triggered when any disturbance to a mapped watercourse is proposed, including clearing any vegetation, placing fill or structures within the bed of the watercourse, or extracting fill from the watercourse.

Three protected watercourses were mapped within the study area and include the lower portions of Attie Creek, One Mile Creek and an unnamed tributary near Lookout Hill (Map 11, Appendix 1). Trails that traverse these protected watercourses include Trails 2, 7 and 11 in the 7 Sisters section, Trail 12 in the Lookout Hill section, and Trails 15 and 16 in the Attie Creek Hill section.

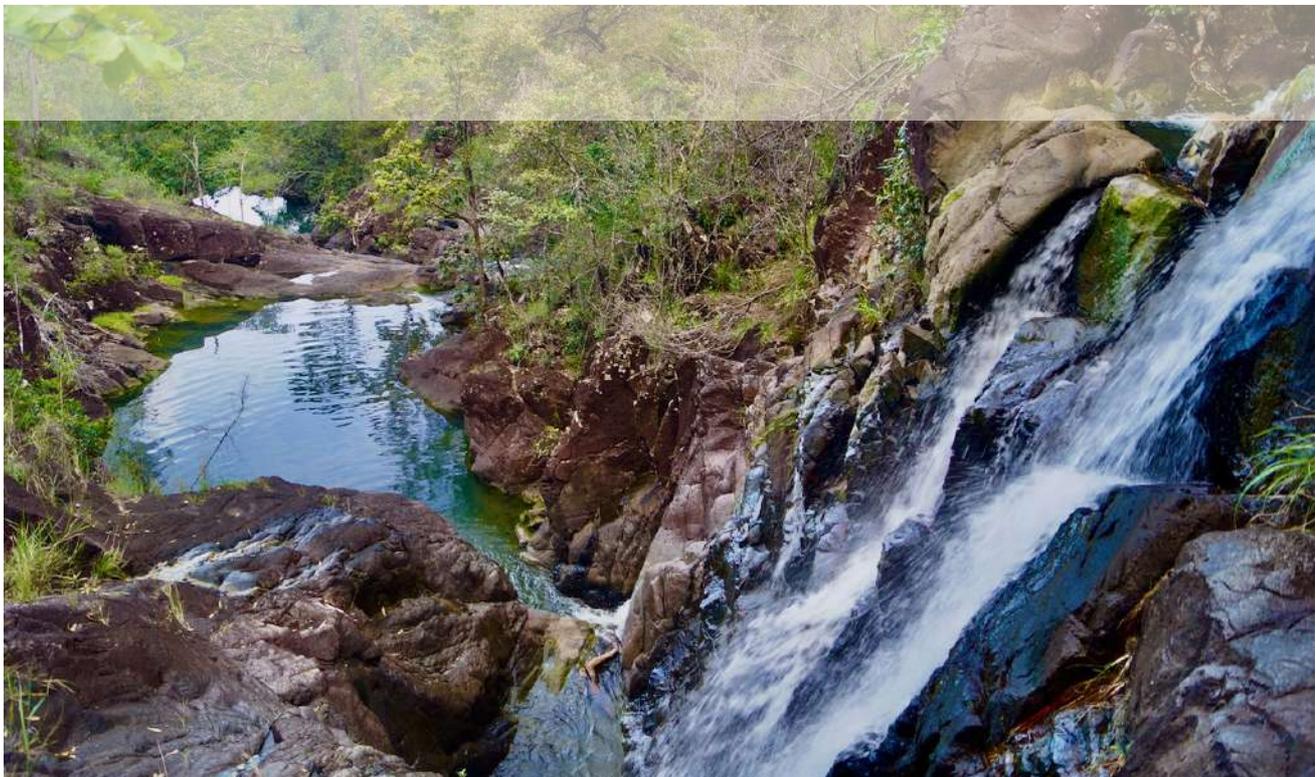
## 4.6 PROTECTED FLORA

### 4.6.1. State Mapped Vegetation Communities

Native vegetation communities are regulated under the VMA in Queensland. Regional ecosystems mapped as 'of concern' and 'endangered' have increased levels of protection when it comes to vegetation clearing, compared to those mapped as 'least concern', and are more likely to require biodiversity offsets should these REs be cleared. The VMA however is only triggered on specified land tenures, of which national parks and state forest are excluded. Hence, the only trail that would require approvals under the VMA if vegetation is to be cleared, is Trail 1, which is located within state land. Further discussion on mitigation options and the environment approval process required for this trail to be constructed is provided in Table 7 and the *Discussion* section of this report.

While the VMA is not triggered by the rest of the trail network, the vegetation mapping that is provided by the state government in administering the VMA is particularly useful and could be used to inform mitigation options to reduce impacts from the trails regardless of whether environmental approvals are required or not. Impacts from the trails on vegetation communities would include direct loss of vegetation and habitat along the length and width of the trails, which is particularly important in REs mapped as of concern or endangered. These maps will also be used to guide the methods used in the recommended field ecological surveys and may be used in indirect ways when it comes to other environmental approvals, such as determining suitable threatened species habitat for an EPBC Referral.

The regulated vegetation map identified most of the study area as Category B (remnant vegetation), with some areas mapped as Category R (watercourse regrowth vegetation; Maps 12-14, Appendix 1). These regulated vegetation areas are classified into a number of 'least concern' and 'of concern' REs on the RE mapping (Maps 15-17, Appendix 1). The REs mapped throughout the study area are described in Table 8. The 'of concern' REs pose the greatest ecological constraints due to stricter vegetation clearing regulations and the increased potential for biodiversity offset requirements. Most of the study area, where remnant vegetation was mapped, was also mapped as essential habitat (Maps 15-17, Appendix 1). The other category mapped on the regulated vegetation map is Category X, which is considered non-remnant, and is not regulated under the *VMA* (Qld; Maps 12-14, Appendix 1).



**Table 8** Regional ecosystems present throughout the study area

Trail Section	RE	Description	Category	Structure	VMA Class
7 SISTERS	RE7.3.20b	<i>Corymbia intermedia</i> and <i>Syncarpia glomulifera</i> , or <i>C. intermedia</i> and <i>Eucalyptus pellita</i> , or <i>S. glomulifera</i> and <i>Allocasuarina</i> spp., or <i>E. cloeziana</i> , or <i>C. torelliana</i> open forest (or vine forest with these emergents) on alluvial fans at the base of ranges. Vegetation Community 7.3.20b: <i>E. pellita</i> , <i>C. intermedia</i> <i>C. tessellaris</i> , open forest often with <i>Acacia celsa</i> , <i>A. cincinnata</i> , <i>A. mangium</i> and <i>A. flavescens</i> , with vine forest understorey. Alluvial fans of wet rainfall zones, lowlands and foothills	R	Mid-dense	Of Concern
	RE7.3.21a	<i>Eucalyptus portuensis</i> +/- <i>Corymbia intermedia</i> open forest to woodland on alluvium on alluvial fans at the base of ranges. Vegetation Community RE7.3.21a: <i>E. portuensis</i> , <i>C. intermedia</i> +/- <i>E. drepanophylla</i> +/- <i>E. platyphylla</i> +/- <i>E. tereticornis</i> +/- <i>C. tessellaris</i> +/- <i>Lophostemon suaveolens</i> +/- <i>Syncarpia glomulifera</i> open forest to woodland. May include small areas of <i>Acacia leptostachya</i> dominated communities. Alluvial fans of lowlands, of the wet and moist rainfall zones.	B and R	Mid-dense	Of Concern
	RE7.3.25b	<i>Melaleuca leucadendra</i> +/- vine forest species open forest to closed forest on alluvium fringing streams. Vegetation Community 7.3.25b: <i>M. leucadendra</i> and <i>Eucalyptus tereticornis</i> , layered open forest, and closed forest with a vine forest understorey. Stream levees and prior streams on well-drained sandy clay loam alluvial soils. Riverine wetland or fringing riverine wetland.	B	Mid-dense	Of Concern
	RE7.12.24a	<i>Eucalyptus portuensis</i> and <i>Corymbia intermedia</i> open forest to woodland (or vine forest with <i>E. portuensis</i> and <i>C. intermedia</i> emergents) on foothills and uplands on granite and rhyolite. Vegetation Community 7.12.24a: <i>E. portuensis</i> , <i>C. intermedia</i> <i>E. drepanophylla</i> , <i>E. platyphylla</i> , <i>E. tereticornis</i> , <i>C. tessellaris</i> , <i>Lophostemon suaveolens</i> , <i>Syncarpia glomulifera</i> open forest to woodland. Foothills, of the wet and moist rainfall zones.	B and R	Mid-dense	Least Concern
	RE7.12.24b	<i>Eucalyptus portuensis</i> and <i>Corymbia intermedia</i> open forest to woodland (or vine forest with <i>E. portuensis</i> and <i>C. intermedia</i> emergents) on foothills and uplands on granite and rhyolite. Vegetation Community 7.12.24b: <i>C. intermedia</i> , <i>E. portuensis</i> , <i>E. drepanophylla</i> , <i>E. platyphylla</i> , <i>C. tessellaris</i> , <i>E. tereticornis</i> , <i>Syncarpia glomulifera</i> , <i>Lophostemon suaveolens</i> , <i>L. confertus</i> woodland to low woodland with <i>Xanthorrhoea johnsonii</i> and <i>Cycas media</i> . Foothills, of the wet and moist rainfall zones.	B	Mid-dense	Least Concern
	RE7.12.25a	<i>Eucalyptus cloeziana</i> open forest to woodland on granite and rhyolite, often on poorly drained soils. Vegetation Community 7.12.25a: <i>E. cloeziana</i> open forest, south of Tully. Granite and rhyolite.	B	Mid-dense	Of Concern
	LOOKOUT HILL	RE7.3.21a	<i>Eucalyptus portuensis</i> +/- <i>Corymbia intermedia</i> open forest to woodland on alluvium on alluvial fans at the base of ranges. Vegetation Community RE7.3.21a: <i>Eucalyptus portuensis</i> , <i>Corymbia intermedia</i> +/- <i>E. drepanophylla</i> +/- <i>E. platyphylla</i> +/- <i>E. tereticornis</i> +/- <i>C. tessellaris</i> +/- <i>Lophostemon suaveolens</i> +/- <i>Syncarpia glomulifera</i> open forest to woodland. May include small areas of <i>Acacia leptostachya</i> dominated communities. Alluvial fans of lowlands, of the wet and moist rainfall zones.	R	Mid-dense

Trail Section	RE	Description	Category	Structure	VMA Class
LOOKOUT HILL	RE7.12.24a	<i>Eucalyptus portuensis</i> and <i>Corymbia intermedia</i> open forest to woodland (or vine forest with <i>E. portuensis</i> and <i>C. intermedia</i> emergents) on foothills and uplands on granite and rhyolite. Vegetation Community 7.12.24a: <i>Eucalyptus portuensis</i> , <i>Corymbia intermedia</i> , <i>E. drepanophylla</i> , <i>E. platyphylla</i> , <i>E. tereticornis</i> , <i>C. tessellaris</i> , <i>Lophostemon suaveolens</i> , <i>Syncarpia glomulifera</i> open forest to woodland. Foothills, of the wet and moist rainfall zones.	B and R	Mid-dense	Least Concern
	RE7.3.10a	Simple-complex mesophyll to notophyll vine forest on moderately to poorly drained alluvial plains of moderate fertility. Vegetation Community 7.3.10a: Mesophyll vine forest. Moderately to poorly drained alluvial plains, of moderate fertility. Lowlands of the very wet and wet zone.	B	Dense	Of Concern
	RE7.3.20b	<i>Corymbia intermedia</i> and <i>Syncarpia glomulifera</i> , or <i>C. intermedia</i> and <i>Eucalyptus pellita</i> , or <i>S. glomulifera</i> and <i>Allocasuarina</i> spp., or <i>E. cloeziana</i> , or <i>C. torelliana</i> open forest (or vine forest with these emergents) on alluvial fans at the base of ranges. Vegetation Community 7.3.20b: <i>Eucalyptus pellita</i> , <i>Corymbia intermedia</i> , <i>C. tessellaris</i> , open forest often with <i>Acacia celsa</i> , <i>A. cincinnata</i> , <i>A. mangium</i> and <i>A. flavescens</i> , with a very well-developed vine forest understorey. Alluvial fans of the very wet and wet rainfall zones, of the lowlands and foothills	R	Mid-dense	Of Concern
ATTIE CREEK HILL	RE7.3.21a	<i>Eucalyptus portuensis</i> +/- <i>Corymbia intermedia</i> open forest to woodland on alluvium on alluvial fans at the base of ranges. Vegetation Community RE7.3.21a: <i>Eucalyptus portuensis</i> , <i>Corymbia intermedia</i> +/- <i>E. drepanophylla</i> +/- <i>E. platyphylla</i> +/- <i>E. tereticornis</i> +/- <i>C. tessellaris</i> +/- <i>Lophostemon suaveolens</i> +/- <i>Syncarpia glomulifera</i> open forest to woodland. May include small areas of <i>Acacia leptostachya</i> dominated communities. Alluvial fans of lowlands, of the wet and moist rainfall zones.	B and R	Mid-dense	Of Concern
	RE7.3.45b	<i>Corymbia clarksoniana</i> +/- <i>C. tessellaris</i> +/- <i>E. drepanophylla</i> open forest to open woodland on alluvial plains. Vegetation Community 7.3.45b: <i>Corymbia clarksoniana</i> woodland to open forest. May include small areas of <i>Acacia leptostachya</i> shrubland. Alluvial plains.	B	Mid-dense	Least Concern
	RE7.12.1a	Simple-complex mesophyll to notophyll vine forest of moderately to poorly drained granites and rhyolites of moderate fertility of the moist and wet lowlands, foothills and uplands. Vegetation Community 7.12.1a: Mesophyll to notophyll vine forest. Lowlands and foothills of the very wet and wet rainfall zones. Granite and rhyolite.	B	Dense	Least Concern
	RE7.12.5a	<i>Eucalyptus pellita</i> +/- <i>Corymbia intermedia</i> open forest, or <i>Acacia mangium</i> and <i>Lophostemon suaveolens</i> open forest, (or vine forest with these species as emergents), on granite and rhyolite. Vegetation Community: 7.12.5a: <i>Eucalyptus pellita</i> , <i>Corymbia intermedia</i> and <i>C. tessellaris</i> open forest with <i>Acacia celsa</i> , <i>A. cincinnata</i> , <i>A. mangium</i> and <i>A. flavescens</i> . Very wet and wet rainfall zones, on granite and rhyolite.	R	Mid-dense	Of Concern

Trail Section	RE	Description	Category	Structure	VMA Class
ATTIE CREEK HILL	RE7.12.5b	<i>Eucalyptus pellita</i> +/- <i>Corymbia intermedia</i> open forest, or <i>Acacia mangium</i> and <i>Lophostemon suaveolens</i> open forest, (or vine forest with these species as emergents), on granite and rhyolite. Vegetation Community: 7.12.5b: <i>Eucalyptus pellita</i> , <i>Corymbia intermedia</i> and <i>C. tessellaris</i> open forest with <i>Acacia celsa</i> , <i>A. cincinnata</i> , <i>A. mangium</i> and <i>A. flavescens</i> , with a very well-developed vine forest understorey. Very wet and wet rainfall zones. Granite and rhyolite	B	Mid-dense	Of Concern
	RE7.12.7a	Simple to complex microphyll to notophyll vine forest, often with <i>Agathis robusta</i> or <i>A. microstachya</i> , on granites and rhyolites of moist foothills and uplands. Vegetation Community 7.12.7a: Complex notophyll vine forests (with emergent <i>Agathis robusta</i> ). Foothills and uplands on granite and rhyolite north of the Herbert River. Moist rainfall zone.	B	Dense	Least Concern
	RE7.12.24a	<i>Eucalyptus portuensis</i> and <i>Corymbia intermedia</i> open forest to woodland (or vine forest with <i>E. portuensis</i> and <i>C. intermedia</i> emergents) on foothills and uplands on granite and rhyolite. Vegetation Community 7.12.24a: <i>Eucalyptus portuensis</i> , <i>Corymbia intermedia</i> <i>E. drepanophylla</i> , <i>E. platyphylla</i> , <i>E. tereticornis</i> , <i>C. tessellaris</i> , <i>Lophostemon suaveolens</i> , <i>Syncarpia glomulifera</i> open forest to woodland. Foothills, of the wet and moist rainfall zones.	B	Mid-dense	Least Concern
	RE7.12.25a	<i>Eucalyptus cloeziana</i> open forest to woodland on granite and rhyolite, often on poorly drained soils. Vegetation Community 7.12.25a: <i>Eucalyptus cloeziana</i> open forest, south of Tully. Granite and rhyolite.	B and R	Mid-dense	Of Concern
	RE7.12.26a	<i>Syncarpia glomulifera</i> +/- <i>Corymbia intermedia</i> +/- <i>Allocasuarina</i> spp. open forest, or <i>Lophostemon suaveolens</i> , <i>Allocasuarina littoralis</i> , <i>C. intermedia</i> shrubland +/- vine forest spp. on exposed ridgelines or steep slopes on granite and rhyolite. Vegetation Community 7.12.26a: <i>Syncarpia glomulifera</i> , <i>Allocasuarina torulosa</i> and/or <i>A. littoralis</i> open forest and woodland. Uplands and highlands, often on steep slopes, of the wet rainfall zone. Granite and rhyolite.	B	Mid-dense	Least concern
	RE7.12.26c	<i>Syncarpia glomulifera</i> +/- <i>Corymbia intermedia</i> +/- <i>Allocasuarina</i> spp. open forest, or <i>Lophostemon suaveolens</i> , <i>Allocasuarina littoralis</i> , <i>C. intermedia</i> shrubland +/- vine forest spp. on exposed ridgelines or steep slopes on granite and rhyolite. Vegetation Community 7.12.26c: <i>Corymbia intermedia</i> , <i>Syncarpia glomulifera</i> , <i>Lophostemon confertus</i> closed forest with <i>Allocasuarina torulosa</i> and <i>Banksia aquilonia</i> . Uplands and highlands, of the wet to moist rainfall zone. Granite and rhyolite.	B	Mid-dense	Least concern
	RE7.12.26d	<i>Syncarpia glomulifera</i> +/- <i>Corymbia intermedia</i> +/- <i>Allocasuarina</i> spp. open forest, or <i>Lophostemon suaveolens</i> , <i>Allocasuarina littoralis</i> , <i>C. intermedia</i> shrubland +/- vine forest spp. on exposed ridgelines or steep slopes on granite and rhyolite. Vegetation Community 7.12.26d: <i>Syncarpia glomulifera</i> , <i>Corymbia intermedia</i> , <i>Allocasuarina littoralis</i> , <i>Banksia aquilonia</i> , <i>Acacia flavescens</i> woodland to low woodland with <i>Xanthorrhoea johnsonii</i> . Foothills and uplands of the moist rainfall zone. Granite and rhyolite.	B	Mid-dense	Least concern

Trail Section	RE	Description	Category	Structure	VMA Class
ATTIE CREEK HILL	RE7.12.37i	Rock pavements and seepage areas of wet lowlands, uplands and highlands of the eastern escarpment and central range (excluding Hinchinbrook Island and Bishop Peak) on granite and rhyolite, with <i>Allocasuarina</i> spp. shrublands and/or sedgeland. Vegetation Community 7.12.37i: Bare rock pavements associated with <i>Allocasuarina</i> spp. (Sheoaks) shrublands and/or sedgeland on seepage areas of wet lowlands, uplands and highlands of the eastern escarpment and central range (excluding high granite areas of Hinchinbrook Island and Bishops Peak). Rock pavements and outcrops. Granite and rhyolite.	B	Other	Of Concern
	RE7.12.53b	<i>Corymbia clarksoniana</i> +/- <i>C. tessellaris</i> , +/- <i>Eucalyptus drepanophylla</i> +/- <i>C. intermedia</i> open forest to woodland, or <i>E. drepanophylla</i> woodland, of moist to dry lowlands, foothills and uplands on granite and rhyolite. Vegetation Community 7.12.53b: <i>Corymbia clarksoniana</i> , <i>C. tessellaris</i> , +/- <i>Eucalyptus drepanophylla</i> , <i>E. tereticornis</i> , <i>E. platyphylla</i> , <i>Lophostemon suaveolens</i> and <i>C. dallachiana</i> woodland and open forest. Coastal lowlands and foothills. Granite and rhyolite.	B	Mid-dense	Least concern
	RE7.12.60b	<i>Melaleuca viridiflora</i> +/- <i>Corymbia clarksoniana</i> +/- <i>Eucalyptus platyphylla</i> woodland to open forest on granite and rhyolite. Vegetation Community 7.12.60b: <i>Corymbia clarksoniana</i> , and/or <i>C. intermedia</i> , +/- <i>Lophostemon suaveolens</i> open woodland to low open woodland with a prominent secondary tree layer of <i>Melaleuca viridiflora</i> , and often with <i>Xanthorrhoea johnsonii</i> in the ground stratum. Granite and rhyolite. Floodplain (other than floodplain wetlands).	B	Sparse	Of Concern

## 4.6.2. Listed Threatened Ecological Communities

Threatened ecological communities are protected under the *EPBC Act* (Cth). The desktop assessment identified two listed threatened ecological communities that were mapped as likely to occur within 5km of the study area (in the protected matters search report; provided in Appendix 5). These threatened ecological communities have been described in Table 9.

The *Broad leaf tea-tree (Melaleuca viridiflora) woodlands in high rainfall coastal north Queensland* ecological community occurs where *M. viridiflora* is dominant in the canopy, shrubs are typically absent with a ground layer of grasses, sedges and forbs (TSSC 2012). This ecological community is restricted to the Wet Tropics and Central Mackay Coast bioregions in Queensland and is found near coastal and floodplain locations where it becomes seasonally inundated. This ecological community corresponds with REs 7.3.8 and 7.5.4 in the Wet Tropics (TSSC 2012). These REs were not mapped as present in the study area (see Maps 15-17, Appendix 1) and the elevation of the study area is likely too high for this swampy ecological community, hence it was deemed unlikely that this ecological community would exist within the study area.

The *Littoral Rainforest and Coastal Vine Thickets of Eastern Australia* ecological community is a complex of rainforest and coastal vine thickets that can be found along the east coast of Australia. This ecological community occurs within 2km of the coastline and its structure is influenced by its proximity to the sea and salt laden winds (TSSC 2015f). This ecological community corresponds with REs 7.2.1a-i, 7.2.2a-h, 7.2.5a, 7.2.6b, 7.11.3b, 7.12.11d in the Wet Tropics. These REs were not mapped as present in the study area (see Maps 15-17, Appendix 1) hence it was deemed unlikely that this ecological community would exist within the study area.

Confirmation of the presence of these threatened ecological communities however should be determined in the recommended field ecological survey to be completed at a later stage of the project.

**Table 9** Listed threatened ecological communities potentially occurring within the study area

Description	Conservation Status	Type of Presence	Likelihood of occurrence
Broad leaf tea-tree ( <i>Melaleuca viridiflora</i> ) woodlands in high rainfall coastal north Queensland	Endangered	Community likely to occur within 5km	Unlikely
Littoral Rainforest and Coastal Vine Thickets of Eastern Australia	Critically Endangered	Community likely to occur within 5km	Unlikely

Notes: Threatened ecological community considered unlikely to occur have been greyed out.

## 4.6.3. Protected Flora Survey Trigger Map

No polygons identified as 'high risk areas' on the protected flora survey trigger map occurred within the study area (Map 18, Appendix 1). This indicates that no protected plants under the *NC Act* (Qld) are known to be present within the study area and therefore there is no requirement for a protected plants flora survey to be conducted prior to construction. Field surveys are however likely to be required for other protected matters including for protected fauna, threatened ecological communities and verifying regional ecosystems. These surveys have the potential to identify protected plants within the study area. Should protected plants be identified during field surveys, and these cannot be avoided by the trail alignments, a protected plant clearing permit will be required and environmental offsets may apply. Recommendations pertaining to future field ecological survey have been provided in the *Recommendations* section of this report.

## 4.6.4. Conservation Significant Flora (i.e., Threatened)

Threatened species (both flora and fauna) are protected under both state and federal legislation. Any threatened species confirmed as present in the study area has the potential to cause constraints to the project due to potential impacts. Their presence will be confirmed during recommended field ecological surveys, however the likelihood of occurrence assessment undertaken in this desktop assessment provides an indication of which species are most likely to occur and therefore have the potential to cause constraints to the project. More information regarding the recommended field survey is provided in the *Recommendations* section

of this report and information regarding the expected environmental approvals required if their presence is confirmed is provided in the *Discussion* section of this report.

The wildlife online and biomaps databases together identified five threatened flora species that have previously been recorded within 5km of the study area (wildlife online and biomaps reports provided in Appendix 5). These threatened species are protected under the *NC Act* (Qld), with some also protected under the *EPBC Act* (Cth). The EBPC protected matters search identified an additional five flora species protected under the *EPBC Act* (Cth) as potentially occurring within 5km of the study area or the species habitat occurred within 5km of the study area (protected matters search report provided in Appendix 5).

Of these ten threatened flora species, the likelihood of occurrence assessment (provided in Appendix 2) identified nine threatened flora species as being either recorded, likely or possible to occur within the study area which could possibly cause constraints to the project should they be confirmed as present during recommended field ecological surveys (Table 10).

**Table 10** Significant flora species potentially occurring within the study area

Scientific Name	Common Name	Status		Database <sup>3</sup>		
		QLD <sup>1</sup>	AUS <sup>2</sup>	BIOMAPS	WO	PMST
<i>Comesperma praeaelsum</i>	-	V	-	✓	✓	
<i>Drosera adela</i>	Lance-leaved Sundew	NT	-	✓		
<i>Eulophia bicallosa</i>	Green Corduroy Orchid	NT	-	✓		
<i>Genoplesium tectum</i>	Cardwell Midge Orchid	E	E			✓
<i>Habernaria xanthantha</i>	Freak Rein Orchid	NT	-	✓		
<i>Myrmecodia beccarii</i>	Ant Plant	V	V	✓	✓	✓
<i>Phaius pictus</i>	-	V	V			✓
<i>Tephrosia leveillei</i>	-	-	V			✓
<i>Zeuxine polygonoides</i>	Velvet Jewel Orchid	V	V			✓

<sup>1</sup>Queensland Status (*NC Act*): CE = Critically Endangered, E = Endangered, V = Vulnerable, NT = Near Threatened, - = not protected under the *NC Act*.

<sup>2</sup>Australian Status (*EPBC Act*): CE = Critically Endangered, E = Endangered, V = Vulnerable, - = not protected under the *EPBC Act*

<sup>3</sup>Database: WO = Wildlife Online, PMST = Protected Matters Search Tool



## 4.7 PROTECTED FAUNA

### 4.7.1. Conservation Significant Fauna (i.e., Threatened)

Threatened fauna species are protected under both state and federal legislation and have the potential to cause constraints to the project should they be confirmed as present during recommended field ecological surveys. The likelihood of occurrence assessment however provides an indication of which threatened fauna species are most likely to occur and therefore have the potential to cause project constraints.

The wildlife online and biomaps databases together identified nine birds, one insect, nine mammals and two reptiles listed as threatened having been recorded previously within 5km of the study area (wildlife online and biomaps reports provided in Appendix 5). These threatened species are protected under the *NC Act* (Qld), with some also protected under the *EPBC Act* (Cth). The EBPC protected matters search identified an additional 31 flora species protected under the *EPBC Act* (Cth) as potentially occurring or the species habitat occurred within 5km of the study area (protected matters search report provided in Appendix 5).

Of these 52 threatened species, the likelihood of occurrence assessment (provided in Appendix 3) identified 24 threatened fauna species as being either recorded, likely or possible to occur within the study area which could possibly cause constraints to the project should they be confirmed as present during recommended field ecological surveys (Table 11).

**Table 11** Significant fauna species potentially occurring within the study area

Scientific Name	Common Name	Status		Database <sup>3</sup>		
		QLD <sup>1</sup>	AUS <sup>2</sup>	BIOMAPS	WO	PMST
BIRDS						
<i>Casuarus casuarus johnsonii</i> (southern population)	Southern Cassowary	E	E	✓	✓	✓
<i>Cyclopsitta diophthalma macleayana</i>	Macleay's Fig-Parrot	V	-	✓	✓	
<i>Erythrotriorchis radiatus</i>	Red Goshawk	E	V			✓
<i>Hirundapus caudacutus</i>	White-throated Needletail	V	V	✓	✓	
<i>Turnix olivii</i>	Buff-breasted Button-quail	E	E			✓
<i>Tyto novaehollandiae kimberli</i>	Masked Owl	V	V			✓
FISH						
<i>Stiphodon semoni</i>	Opal Cling Goby	-	CE			✓
FROGS						
<i>Litoria dayi</i>	Australian Lace-lid	V	V			
<i>Litoria nyakalensis</i>	Mountain Mistfrog	CE	CE			✓
INSECTS						
<i>Hypochrysops apollo apollo</i>	Apollo Jewel (Wet Tropics)	V	-	✓	✓	
MAMMALS						
<i>Dasyurus hallucatus</i>	Northern Quoll	-	E			✓
<i>Dasyurus maculatus gracilis</i>	Spotted-tailed Quoll	E	E	✓		✓
<i>Hipposideros diadema reginae</i>	Diadem Leaf-nosed Bat	NT	-	✓		
<i>Hipposideros semoni</i>	Semon's Leaf-nosed Bat	E	V			✓
<i>Macroderma gigas</i>	Ghost Bat	E	V			✓
<i>Mesembriomys gouldii rattoides</i>	Black-footed Tree-rat	-	V	✓		✓
<i>Petauroides volans</i>	Greater Glider	V	V			✓
<i>Petaurus gracilis</i>	Mahogany Glider	E	E	✓	✓	✓
<i>Phascolarctos cinereus</i>	Koala	-	V			✓
<i>Pteropus conspicillatus</i>	Spectacled Flying-fox	E	E	✓		✓
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	-	V			✓
<i>Rhinolophus robertsi</i>	Large-eared Horseshoe Bat	-	V			✓
<i>Saccolaimus saccolaimus nudicluniatus</i>	Bare-rumped Sheath-tailed Bat	E	V	✓		✓
<i>Taphozous australis</i>	Coastal Sheath-tail Bat	NT	-	✓		

<sup>1</sup> Queensland Status (NC Act): CE = Critically Endangered, E = Endangered, V = Vulnerable, NT = Near Threatened, - = not protected under the NC Act.

<sup>2</sup> Australian Status (EPBC Act): CE = Critically Endangered, E = Endangered, V = Vulnerable, - = not protected under the EPBC Act.

<sup>3</sup> Database: WO = Wildlife Online, PMST = Protected Matters Search Tool

## 4.7.2. Migratory Fauna

Migratory<sup>1</sup> species are protected under both state and federal legislation and have the potential to cause constraints to the project should they be confirmed as present during recommended field ecological surveys. The likelihood of occurrence assessment however provides an indication of which migratory species are most likely to occur and therefore have the potential to cause constraints to the project.

The biomaps report identified 18 migratory species (all birds) having been recorded previously within 5km of the study area (biomap report provided in Appendix 5 and migratory species list provided in Appendix 4). These migratory species are considered 'special least concern' and are protected under the *NC Act* (Qld). Some of these species are also protected under the *EPBC Act* (Cth).

The EBPC protected matters search identified an additional 45 migratory species made up of marine birds, marine species, terrestrial<sup>1</sup> species and wetland species as potentially occurring or the species habitat occurred within 5km of the study area which could possibly cause constraints to the project should they be confirmed as present during recommended field ecological surveys (protected matters search report provided in Appendix 5 and migratory species list provided in Appendix 4).

## 4.7.3. Modelled habitat for threatened species and special least concern wildlife

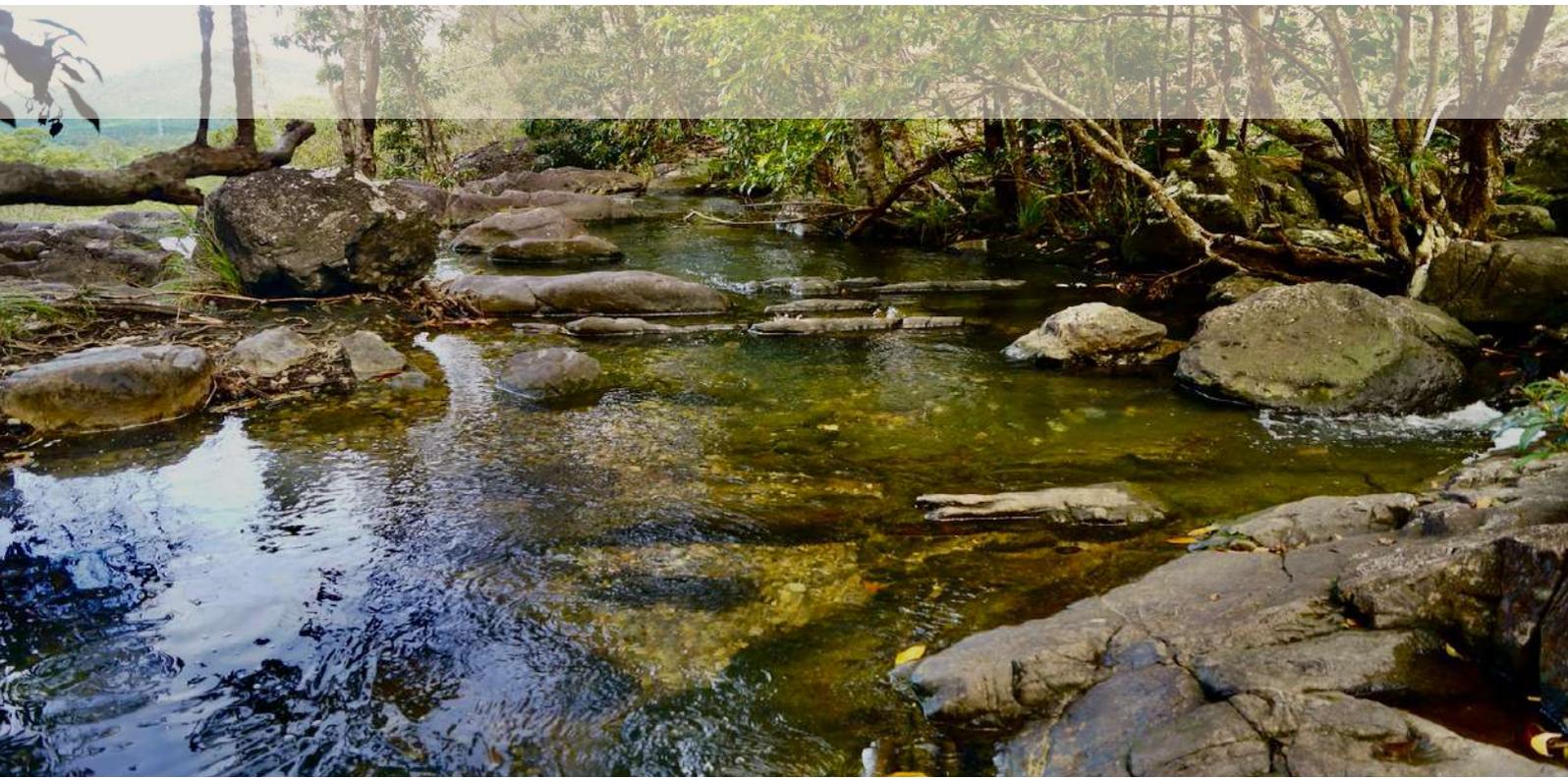
Threatened species habitat is protected under both state and federal legislation and has the potential to cause constraints to the project should it be confirmed as present during recommended field ecological surveys. Modelled habitat however provides an indication of where protected habitat is likely to occur which could potentially cause constraints to the project.

The MSES modelled habitat suitability mapping showed significant areas of wildlife habitat for endangered or of concern wildlife throughout the study area (Maps 19-21, Appendix 1). These areas corresponded to 'core habitat' for either the Southern Cassowary and/or the Mahogany Glider, which are both endangered and protected under the *NC Act* (Qld) and *EPBC Act* (Cth).

Modelled wildlife habitat for a special least concern animal was also mapped in some parts of the study area, namely overlapping Trail 1, 3 and 9 in the 7 Sisters section (Map 19, Appendix 1). Special least concern fauna species are protected under the *NC Act* (Qld). This habitat was identified as habitat for *Tachyglossus aculeatus*, the Short-beaked echidna, which was recorded within 5km of the study area in 1991 (biomap report provided in Appendix 5).

<sup>1</sup> *Migratory:* An animal that migrates from one country to another, at regular times of the year, often over long distances

*Terrestrial:* A plant or animal that lives on land, as opposed to living in water or within trees (arboreal).



# DISCUSSION

## 5.1 KEY ECOLOGICAL VALUES

This desktop assessment has highlighted the ecological values that potentially exist within the study area and have the potential to be impacted by the construction and use of the proposed trails should they be confirmed as present in the vicinity of the proposed trails. These ecological values have been identified through available data, maps, and local knowledge and are the best indication of the ecological values that would be present in the study area without doing field surveys.

The key ecological values identified for the study area were those considered most likely to occur based on the desktop assessment. These key ecological values are most likely to be impacted by the project and could cause constraints in terms of environment approval requirements should they be confirmed as present within the study area. The key ecological values for the study area include:

- The Wet Tropics WHA is mapped in the western portion of the study area in the Attie Creek Hill section. This WHA is considered a MNES and is listed for being a world heritage place, a natural heritage place and an indigenous heritage place.
- The presence of a *VMA* (Qld) protected riverine wetland in the 7 Sisters section of the study area.
- The presence of three 'mapped' watercourses protected under the *Water Act 2000* (Qld) and considered MSES.
- Much of the study area is mapped as MSES regulated vegetation (categories B and R) with many of these areas mapped as 'of concern' regional ecosystems and essential habitat.
- Nine threatened flora species either recorded or considered likely or possible to occur within the study area. These threatened species are MNES and/or MSES.
- There were 24 threatened fauna species either recorded or considered likely or possible to occur within the study area. These threatened species are MNES and/or MSES.
- Modelled habitat for special least concern animals, protected under the *NC Act* (Qld) and considered MSES. These include the Short-beaked Echidna which has previously been recorded within 5km of the study area, 18 migratory species (all birds) that have previously been recorded within 5km of the study area, and an additional 45 migratory species (56 total listed under the *EPBC Act* (Cth) made up of marine birds, marine species, terrestrial species and wetland species considered possible to occur within the study area based on habitat suitability.
- Modelled 'Core' habitat for the Southern Cassowary and the Mahogany Glider, both listed as endangered under the *NC Act* (Qld) and *EPBC Act* (Cth), making them MNES and MSES.
- Most of the Attie Creek Hill section is located within a protected area, considered national park. This area has been relatively undisturbed to date due to limited access. It remains largely intact in terms of remnant vegetation, and potentially provides important habitat for conservation significant threatened flora and fauna species.

## 5.2 POTENTIAL IMPACTS

Mountain bike trails, such as those proposed, are constructed as a form of nature based recreation and are typically constructed in a way that minimises or avoids key ecological values wherever possible (e.g., through keeping vegetation clearing to the width of the trails only, implementing sensitive construction techniques and avoiding key habitat features). Nature based recreation can also positively increase awareness and education around our natural biodiversity which can promote the protection of our natural environments. While there are positives to such a project, there remains some potential for localised impacts purely from disturbance to land and habitat during construction and use of the trails, and direct and indirect impacts to key ecological values should they be found present during ground-truthing surveys (recommended during later stages of the project) and they cannot be reasonably avoided.

To reduce potential impacts, it is recommended that the trails be realigned or sensitive construction techniques (mitigation options) implemented where possible to best avoid areas of significant ecological value. Some mitigation options based on the results of this desktop assessment have been provided in *Section 4.3* of this report, with further mitigation options likely to result from the results of the recommended field ecological surveys which will take place during the next phase of the project. It is also expected that the trail construction company would implement a maintenance and management program to ensure that impacts continue to be managed throughout the life of the trails and not just during the construction phase.

Some potential ecological impacts and possible mitigation options to take into consideration during construction and management phases of the project have been provided in Table 12. These impacts unfortunately cannot be avoided through realignment of the trails, but can be reduced through the implementation of sensitive trail construction techniques, educating trail users and implementing a successful management and maintenance program for the life of the trails. Mitigation options may not be limited to those provided in this table, and trail construction companies may be able to identify others during the approval, construction and management phases of the project that could also be implemented to further reduce impacts.

**Table 12** Potential ecological impacts and some options for mitigation

Potential Ecological Impact	Some Mitigation Options
Direct vegetation and habitat loss from construction clearing	<ul style="list-style-type: none"> <li>- Keep trail widths to the minimum required width wherever possible.</li> <li>- Clear only small trees where necessary and avoid large habitat trees.</li> <li>- Place trails in open areas where possible to limit the need to remove shrubs and trees.</li> </ul>
Potential for weeds to be introduced (e.g., seeds carried on construction machinery, footwear and bike tyres).	<ul style="list-style-type: none"> <li>- Ensure construction machinery and footwear are clean prior to works and before moving to new areas.</li> <li>- Educate trail construction workers about weed spread and implement procedures to ensure footwear is cleaned frequently.</li> <li>- Place footwear/bike tyre cleaning stations at all start points for the trails.</li> </ul>
Potential for trampling of vegetation along the edges of trails or the illegal collection of special flora species (e.g., orchids).	<ul style="list-style-type: none"> <li>- Implement edging (e.g., using cut logs from clearing) in areas where trampling might be an issue (such stop points) or areas considered sensitive habitats (to be advised by the field ecological survey).</li> <li>- Avoid constructing in areas identified as hotspots for special flora (to be advised by the field ecological survey).</li> <li>- Educate trail users through signage on the importance of not trampling vegetation and for leaving ecosystems intact (e.g., 'leave only footsteps, take only memories').</li> </ul>
Potential for erosion, mobilisation of sediment and changes to water flow, water quality, habitat for aquatic species at creek crossings.	<ul style="list-style-type: none"> <li>- Avoid sensitive aquatic habitats (will be advised by the field ecological survey) or implement sensitive construction techniques to limit sediment mobilisation and changes to flow.</li> <li>- Implement erosion and sediment control structures in areas deemed to be an issue.</li> <li>- Construct trails in a way that diverts rain runoff to the edges of the trail.</li> <li>- Consider closing the trails during periods of heavy rainfall when trails are likely to be damaged by users and sediment is more likely to become mobile.</li> </ul>
Disturbance to native wildlife through human presence, noise and vibration from construction crews and trail users.	<ul style="list-style-type: none"> <li>- Avoid sensitive habitat areas (will be advised by the field ecological survey) and known breeding places for fauna, especially threatened fauna species.</li> <li>- Avoid clearing good quality habitat areas, such as clearing trees that contain nests, large habitat trees, rocky habitat areas that are ideal for reptiles etc.</li> <li>- Implement sensitive clearing and construction techniques wherever possible, such as hand clearing and building to reduce machinery noise and vibration.</li> <li>- Engage a fauna spotter catcher during construction to remove and relocate any disturbed fauna from habitat to be removed.</li> </ul>
Creation of new trails or diversions by trail users.	<ul style="list-style-type: none"> <li>- Implement a management and maintenance program that ensures any fallen trees/debris are removed quickly to stop trail users forming diversion trails around fallen trees etc.</li> <li>- Implement edging (e.g., using cut logs from construction) in areas where diversion trails are most likely to occur, such as in overly open and low vegetated areas.</li> <li>- Consider closing the trails during/after storms to allow for clean-up crews to assess the trails and remove any fallen trees/debris.</li> </ul>
Potential for littering (includes food scraps).	<ul style="list-style-type: none"> <li>- Provide fauna safe bins at trail start and end points.</li> <li>- Provide signage on the importance of not leaving rubbish and food scraps on the trails.</li> </ul>

## 5.3 CURRENT STATUTORY CONSTRAINTS AND POTENTIAL MITIGATION OPTIONS

The key ecological values for the project were assessed in relation to relevant environmental legislation. The proposed trail alignments traverse a number of land tenures that fall under differing jurisdictions and are therefore managed under different environmental legislation. The result of this is the need to gain a number of environmental approvals and permits before construction of the trails can begin.

The following information outlines the applicable environmental legislation, the environmental approvals and permits that will be required based on the current trail alignments and options that may be feasible to implement to avoid the need for such approvals. If trails can avoid key ecological values within the study area, less environmental approvals and permits are expected which will reduce the overall time and costs for the project, as well as reduce the impact of the trails on our environment and biodiversity.

### 5.3.1. EPBC Act 1999 (Cth)

The *EPBC Act* is a Commonwealth legislation that applies to all tenures of land underlying the proposed trail alignments. Under this legislation, a person must not, without approval under the Act, take an action that is likely to have a 'significant impact' on a MNES, which includes listed world heritage and national heritage properties, threatened species, threatened ecological communities and listed migratory species.

A significant impact is defined within the *Significant Impact Guidelines* (DoE 2013) as an impact which is important, notable or of a consequence, having regard to its context or intensity. A significant impact will depend on the sensitivity, value, quality of the environment to be impacted upon, as well as the intensity, duration, magnitude and geographic extent of the impact.

The Act requires a person proposing to take an action that has the potential to impact on MNES to contact the Commonwealth Minister for the Environment (through the Department of Sustainability, Environment, Water, Populations and Communities) for a decision on whether or not the action will be a 'controlled action' and therefore require an approval.

Based on the key ecological values identified for the study area, the proposed trails have the potential to impact on the following MNES:

- The Wet Tropics of Queensland World Heritage property
- The Wet Tropics Heritage Area (Natural and Indigenous Values)
- Nine threatened flora and 24 threatened fauna species listed under the Act
- Up to 56 migratory species listed under the Act.

Based solely on this desktop assessment and the identified key ecological values either present or considered likely to be present, there is potential for the project to impact on MNES. Should these impacts occur and be deemed 'significant', the project would be considered a 'controlled action' under the *EPBC Act*. Confirmation of this however cannot be determined until key ecological values are ground-truthed during field ecological surveys and all avoidance and mitigation options implemented. Ultimately, a submission of an EPBC Referral would still be required to gain a decision on the project as either a 'controlled' or 'not a controlled' action by the Minister even after all mitigation options have been implemented.

At this preliminary stage, there may be some feasible mitigation options to relocate some trails outside the Wet Tropics WHA in the Attie Creek section, which would effectively stop any impact to the WHA and reduce overall impacts to MNES. These options are described further under *Section 4.3.4* of this report. Should it not be possible to relocate these trails and they remain within the WHA, this will increase the likelihood that the project will be considered a 'controlled action' under the *EPBC Act* due to the potential for significant impact to the WHA, which is considered a MNES for three reasons – world heritage place, natural heritage place and indigenous heritage place.

### 5.3.2. Vegetation Management Act 1999 (Qld)

The *VMA* is a state legislation that applies to native vegetation and vegetated wetlands, only on land not subject to protected areas (i.e., national park and state forest). Therefore, the only parcel of land in which the *VMA* would be applicable to this project is the unallocated state land parcel underlying Trail 1 in the 7 Sisters section of the study area. This land parcel has a lot on plan - Lot 2 USL38696, and is located directly opposite the Cardwell Golf Course (Map 4, Appendix 1).

This land parcel is mapped with an 'of concern' RE (category B regulated vegetation) with essential habitat (Map 12 and 15, Appendix 1). Vegetation clearing on this parcel of land for the purpose of constructing a bike trail is not considered 'exempt clearing work' and therefore would require a development application for operational works for native vegetation clearing. This development application would be referred to the State Assessment Referral Agency (SARA) for assessment.

All development applications relating to vegetation clearing are impact assessed by SARA on the minimise, mitigate then offset approach. To gain approval of the develop application to clear vegetation on this parcel of land, Trail 1 would need to be considered 'necessary' and evidence provided that there are no other feasible alternatives to the location of Trail 1, for example using already cleared areas including current roads, tracks and firebreaks. Alternatively, to cease the requirement for the development application, a feasible option may be to remove this trail from the trail network altogether or relocate it so that it runs through state forest land, as opposed to state land (see Map 3, Appendix 1 for location of protected areas).

In addition to the above, the *VMA* also provides protection for riverine wetland areas. One riverine wetland was mapped following a watercourse within the 7 Sisters section and was traversed by Trails 10 and 11. As this area falls within state forest, the *VMA* does not apply, hence this wetland is unlikely to cause constraints to the project in terms of required environmental approvals. However, to further reduce environmental impacts caused by the trails, realignment of Trails 10 and 11 around the riverine wetland feature could be undertaken or the implementation of sensitive construction techniques (e.g., bridges) may suffice.

### 5.3.3. Nature Conservation Act 1992 (Qld)

The *NC Act* is a state legislation that applies to all tenures of land underlying the proposed concept trail alignments: including state land, state forest (also managed under the *Forestry Act 1959* (Qld)) and national park. Within all land tenures, the *NC Act* protects state threatened flora and fauna (MSES) that are listed within the *Nature Conservation (Animals) Regulation 2020* and *Nature Conservation (Plants) Regulation 2020*. A licensing system is in place to protect native wildlife (flora and fauna) species, through the regulation of taking, keeping, using or moving wildlife for commercial, recreational or other purposes. Depending on the activity, a permit, licence or authority may be required. This will depend on the results of the field ecological survey and whether or not threatened species or habitat are confirmed as present in the vicinity of the trails and cannot be avoided. If confirmed during the field survey and flora species or fauna habitat cannot be reasonably avoided, the following approvals may be required:

- Protected plant clearing permit
- Biodiversity Offsets
- Development of a Species Management Plan for tampering with a protected animals breeding place and engagement of a fauna spotter catcher during construction works.

In addition to the above licensing system, the *NC Act* gives additional protection to areas set aside as 'protected areas', of which national parks are included. The relevant regulations relating to the management of national parks are the *Nature Conservation (Protected Areas) Regulation 1994* and the *Nature Conservation (Protected Areas Management) Regulation 2017*. QPWS are the primary division that has been given authority to manage and maintain protected areas and state forests (non-plantation areas) in Queensland. Both the *NC Act* and *Forestry Act 1959* (Qld) provide guiding legislation for QPWS. QPWS support recreational activities on land they manage if consistent with the management principles for protected areas and forests under the *NC Act* and the *Forestry Act 1959* (Qld). Under these Acts, national parks and state forests are to be managed to provide preservation of the area's natural condition and protection of the area's cultural resources and values; ensure that only use of the area is nature based and ecologically sustainable; provide opportunities for educational and recreational activities, and provide opportunities for ecotourism in a way that is consistent with the area's natural and cultural resources and values.

QPWS may enter into an agreement (under s34 of the *Nature Conservation Act 1999*, Qld) with external groups (e.g., Cassowary Coast Regional Council) to undertake activities if they are for a purpose that is consistent with the management principles and management plan (if available) for the subject area. Construction, maintenance and use of bike trails and other facilities would require such an agreement to be put in place. An application would need to be lodged with QPWS along with a submission report describing the proposed activity and providing details on public interests, reasonable alternatives, ecological sustainability and how the trails will be constructed and maintained in accordance with the applicable management principles and management plans for the national park. The application would also require an Environmental Management Plan to be developed describing operational procedures to be used to minimise impacts and ongoing site management.

In addition to the s34 agreement, an authority under section 114 of the *Nature Conservation (Protected Areas Management) Regulation 2017*(Qld) would be required to undertake prescribed works in protected areas under specified conditions. This authority would also require the State to be indemnified.

As the proposed concept trail alignments fall mostly within national park and state forest, it is likely that the mentioned agreements/authorities will be required regardless of any trail realignments that occur prior to construction.

#### 5.3.4. Forestry Act 1959 (Qld)

The *Forestry Act 1959*(Qld) is a state legislation that was put in place to regulate timber harvesting in Queensland. Native timber harvesting under this Act is administered by DAF, while plantation forests on state land are managed by HQPlantations Pty Ltd under a plantation licence. Any activity likely to interfere with forestry products, that is not undertaken by DAF or HQ Plantations, would require an authority under section 56 of the Act. This authority would allow an activity to take place of forestry land under section 39 of the Act. This authority would also require the State to be indemnified.

As most trails within the 7 Sisters and Lookout Hill sections are located within state forest, it is likely authority will be required regardless of any trail realignments that occur prior to construction.

#### 5.3.5. Wet Tropics World Heritage Protection and Management Act 1993, and the Wet Tropics Management Plan 1998 (reviewed 2020)

The *Wet Tropics World Heritage Protection and Management Act 1993* (Qld) is a state legislation that applies only to areas mapped within the Wet Tropics WHA. The *Wet Tropics Management Plan 1998*(reviewed 2020) regulates activities within the mapped WHA that have the potential to affect world heritage values. These activities are regulated through a zoning and permitting scheme which designates which activities are allowed and where. The WHA is broken up into three zones called A, B and C. These zones have been established according to differing management purposes and relate to the integrity, physical and social settings of the areas mapped within each zone. This zoning scheme allows different types of activities in each zone, in accordance with the management intent and integrity of that zone. Explanation of the management intent of each zone is provided in Table 13.

**Table 13** Wet Tropics Management Plan zones

Zone	Purpose and Management Intent
Zone A	Land within Zone A has a high degree of integrity and is remote from disturbances. The main management purpose of Zone A is to protect and conserve the world heritage values and integrity of the land. Other management purposes include: If the land is disturbed, to restore and enhance the world heritage values and integrity of the land if, and to the extent, it is reasonably practicable; and to enable visitors to access parts of the land in the zone to appreciate and enjoy the area.
Zone B	Land within Zone B has a high degree of ecological integrity and it is in a natural state but is not necessarily remote from disturbances. The main management purpose of Zone B is to protect and conserve the world heritage values and integrity of the land. Other management purposes include: If the land is disturbed, to restore and enhance the world heritage values and integrity of the land if, and to the extent, it is reasonably practicable; and to enable visitors to access parts

	of the land in the zone to appreciate and enjoy the area; and to be a buffer between Zone A and community services infrastructure.
Zone C	<p>Land within Zone C already contains disturbances which are often associated with existing community infrastructure. The main management purpose of Zone C is to protect and enhance the world heritage values and integrity of the land subject to accommodating community services infrastructure and visitor infrastructure, and particular existing uses of parts of the zone shown on the zoning map; and to minimise any adverse impact of activities allowed to be carried out in the zone on the world heritage values and integrity of the land.</p> <p>Other management purposes include ensuring, so far as is reasonably practicable, that any visitor infrastructure on land in the zone is built and maintained in a way that is ecologically sustainable and is sensitively integrated into the surrounding landscape and enhances visitors understanding and appreciation of the natural and cultural heritage of the area.</p>

Part of the proposed trail alignment, in Attie Creek Hill section, traverse Zone A of the Wet Tropics WHA (Map 3, Appendix 1). All other trail sections remain outside the mapped world heritage zoning area. The land within the WHA is also considered national park and state forest, which causes constraints to the project in two ways:

1. A Wet Tropics permit would be required to construct any trails within the WHA. This permit will have prescribed conditions placed on construction activities to minimise impacts to the WHA. Due to the multiple jurisdictions (WHA, national park and state forest) there are a couple of options for permits to construct in this section of the trail:
  - a. Under the amended Management Plan, a walking or cycling track is considered to be 'limited visitor infrastructure' under section 33f. Limited visitor infrastructure is a permitted activity in all zones, however requires a permit to be issued for construction. If a trail construction company (e.g., World Trail) is to construct the trail in this section, an application for a Wet Tropics permit would be required, with approval of the permit by the WTMA prior to construction.
  - b. As this section of the trail is also within national park (protected area) and state forest, Queensland Parks and Wildlife Service (QPWS) can either:
    - Issue the Wet Tropics permit to the trail construction company as the chief executive of the *NC Act* (Qld) under section 77(2) of the Management Plan, or
    - Undertake the responsibility to construct this section of the trail, which would not require a Wet Tropics permit. This option would require QPWS to undertake a self-assessment of the Wet Tropics permit principles and criteria, as well as the management principles prescribed for protected areas under the *NC Act* (Qld). QPWS would act as the 'nature conservation chief executive' under section 30 of the Management Plan to perform this option.

Discussions would need to be had with either the WTMA or QPWS in regard to the permit process, completing a permit application and providing supporting documentation on impacts.

2. Proposing to construct trails within the WHA will increase the likelihood that the project will be considered a 'controlled action' by the Minister under the *EPBC Act* (Cth). This is due to the potential for significant impact to the WHA which is considered a MNES for three reasons - world heritage place, natural heritage place and indigenous heritage place. This would require a referral to the Australian Government Minister for the Environment for approval prior to construction.

These constraints add approval time and costs to the project, as well as increase the likelihood of impacts to the ecological and indigenous values of the Wet Tropics WHA. To avoid this, a feasible option may be to relocate the impacted trails in the Attie Creek Hill section to outside of the WHA. This would cease the need for a Wet Tropics permit and reduce the likelihood that the project will be considered a 'controlled action' under the *EPBC Act* and require an EPBC Referral (though this would still be dependent on the presence of other listed MNES such as threatened and migratory species, and whether impacts to these can be avoided). If the trails are to remain within the WHA, impacts should be reduced wherever possible to reduce the likelihood that the action will be considered a 'controlled action' in the EPBC Referral. Some options for reducing impacts include but are not limited to implementing sensitive construction techniques, hand building wherever possible, minimising trail widths wherever possible, providing education to trail users and limiting weed spread.

### 5.3.6. Water Act 2000 (Qld)

The *Water Act 2000* is a state legislation that applies only to watercourses, drainage features, lakes and springs mapped on the watercourse identification map (*Water Act 2000*). Three such watercourses are mapped within the study area, and the proposed concept trail alignment traverses these watercourses in a number of locations. Any watercourse crossings to occur within these mapped watercourses are likely to cause constraints to the project in two ways:

1. Requirement for riverine protection permit under the *Water Act 2000*(Qld). Any activity that will destroy vegetation, excavate or place fill within a 'mapped' watercourse requires a permit. This permit may have prescribed conditions placed on construction activities to minimise impacts to the watercourses. This permit application would need to be made and in place prior to construction within the mapped watercourses. These applications are made through the Department of Natural Resources, Mines and Energy with no application fee required. Some permit exemptions are available for landholders and Councils, but only for the purpose of installing/maintaining instream infrastructure (e.g., bridges) or for restoration purposes, which do not apply here.
2. Requirement for a development application for 'operational works' that is the taking and interfering with water in a 'mapped' watercourse, lake or spring. This development application would be referred to the SARA for assessment.

These constraints add approval time and costs to the project, as well as increase the likelihood of impacts to the ecological values of the area. There are some mitigation options that may be feasible to avoid impacts to these mapped watercourses, including realigning of some trails to avoid creek crossings, which would cease the need for both the riverine protection permit and the development application for operational works. Most of the impacted trails only traverse the 'mapped' watercourses at the beginning or end points of the trails (e.g., Trails 2, 7, 11 and 16). In these locations, access could be provided through already cleared roads/tracks through the watercourse to avoid the need to clear vegetation to provide a crossing. In the case of Trails 12 and 15 that cross a protected watercourse in the middle of the trail, the impacted areas could be realigned to track alongside the 'mapped watercourses' or place watercourse crossings in areas outside of the 'mapped' watercourse area. Using bridges to cross these mapped watercourses may also be a feasible option, however if vegetation needs to be removed along the banks of the mapped watercourse to construct the bridge, this will still trigger the need for the riverine protection permit and the development application.

There may also be a possibility that the watercourses in the vicinity of the proposed trails do not meet the definition of a watercourse, in which case the *Water Act 2000* would not apply and the riverine protection permit and development application would no longer be required. To confirm this, a field assessment undertaken by a suitably qualified person would be required to assess the watercourses as per the definition under the *Water Act 2000*. If the watercourses do not meet the definition, an application can be made to downgrade these watercourses and remove them from the mapping. A pre-lodgement meeting with the State Government would be required to discuss this process.

### 5.3.7. Cassowary Coast Regional Council Planning Scheme

The proposed trails traverse multiple zones within the Cassowary Coast Regional Council Planning Scheme zoning maps, including environmental management and conservation, rural, emerging community and township zones. The study area is also subject to some overlay codes including but not limited to the environmental significance overlay and bushfire hazard overlay. As a result, it is likely the project will require assessment against this local legislation. A pre-lodgement meeting with the Cassowary Coast Regional Council is recommended during the next phase of the project to determine full development application requirements.

## 5.4 PRIORITY LIST FOR REALIGNMENT OPTIONS

A number of realignment options have been discussed to reduce impacts and reduce the number of environmental approvals required for the project. Table 14 provides a list of the realignment options and gives them priority based on the mitigation of impacts and reduction of environmental approvals required. These realignments options are based solely on the desktop analysis. Further realignments may also be possible to reduce impacts following the recommended field ecological surveys.

**Table 14** Priority list for realigning trails

Priority	Trails to realign	Trail Section	Trigger	Realignment Options	Why realign?	Result if realigned
1	Trail 1	7 Sisters	VMA (Regulated vegetation) on state land	Realign to already cleared areas (roads/tracks/firebreaks) or relocate to state forest areas.	Construction of this trail requires a development application for operational works for clearing native vegetation. There may be issues with getting this approved due to the need to prove Trail 1 is 'necessary' and prove there are no feasible alternatives to removing or relocating to already cleared areas, or within state forest.	Realignment or relocation would cease the requirement for a development application.
2	Trails 2, 7, 11	7 Sisters	Mapped Watercourses protected under the Water Act 2000	<ul style="list-style-type: none"> <li>- The start of Trails 2 and 7 could use the existing road/roadside to cross One Mile Creek.</li> <li>- The end of Trail 11 could track along the eastern side of Attie Creek, rather than cross the creek (this would also require part of Trail 15 in the Attie Creek section to be realigned)</li> </ul>	Any disturbance to mapped watercourses (removing vegetation, placing fill or infrastructure etc) requires a riverine protection permit and a development application for operational works that is the taking and interfering with water in a 'mapped' watercourse, lake or spring.	If trails are realigned to either use existing watercourse crossings (e.g., existing roads) or to track alongside them rather than through them it would cease the need for both the riverine protection permit and the development application.
	Trail 12	Lookout Hill		Trail 12 would need to be realign in a few parts: <ul style="list-style-type: none"> <li>- Track alongside the Unnamed tributary instead of crossing it in multiple locations.</li> <li>- Realign around the upper limit of One Mile Creek</li> </ul>		
	Trails 15 and 16	Attie Creek		<ul style="list-style-type: none"> <li>- The middle part of Trail 15 could be realigned to track along the eastern side of Attie Creek and meet up with the realigned Trail 11.</li> <li>- The start of Trail 16 could use the existing road/roadside to cross One Mile Creek and track along the western side of this creek.</li> </ul>		
3	Trails 17, 18, 19, 20, 21, 22, 23 and 25	Attie Creek	Wet Tropics WHA	Removal of these trails from the WHA and possibly relocating them within state forest or national park areas.	<ul style="list-style-type: none"> <li>- Constructing trails within the WHA, while is possible as it aligns with the management intent of the Wet Tropics management zone in which they are located, it would require a Wet Tropics permit which may include conditions placed on construction and maintenance to ensure impacts are minimised.</li> </ul>	<p>If trails are removed or relocated it would cease the requirement for a Wet Tropics permit.</p> <p>An EPBC Referral will likely still be required due to potential for impacts to threatened and migratory species, however the</p>

					<ul style="list-style-type: none"> <li>- Also triggers the requirement for an EPBC Referral as the WHA is protected under the EPBC Act. Impacts to the WHA would need to be minimised wherever possible to ensure that the Minister does not grant the activity a 'controlled action' which would increase application requirements and impose conditions on construction and maintenance programs.</li> </ul>	likelihood that the Minister will find the action to be a 'controlled action' is greatly reduced.
4	Trails 10 and 11	7 Sisters	Riverine Wetland	<ul style="list-style-type: none"> <li>- The end of Trail 10 could be realigned to meet Trail 11 further to the east which would remove the need for a wetland crossing or a bridge could be constructed so the wetland is not impacted.</li> <li>- Trail 11 could be realigned around the upper limit of the mapped wetland to remove the need for a wetland crossing or a bridge could be constructed so the wetland is not impacted.</li> </ul>	While disturbing this riverine wetland to construct a crossing does not trigger the VMA due to the land tenure being state forest, impacts can still be reduced through realignment or by constructing bridges.	Impacts to a sensitive area are reduced.

# CONCLUSION

This desktop assessment has identified a number of key ecological values that have the potential to occur within the study area, which could be impacted by the proposed project should they be confirmed as present within the study area. If confirmed, these key ecological values could potentially cause constraints to the proposed project if they cannot be reasonably avoided or impacts minimised. To determine the actual presence of key ecological values and likely impacts from the proposed project, an extensive field ecological survey would be required. Recommendations for this field survey have been provided in the *Recommendations* section of this report.

Once the results from this field survey are known, mitigation and avoidance options can be implemented to reduce impacts to key ecological values should they be present in the study area. These mitigation and avoidance options will be fundamental in ensuring the project is approved through all levels of government and can progress through to the construction phase.

# RECOMMENDATIONS

It is recommended that where possible from a trail construction point of view, the mitigation options provided in the *Discussion* section of this report be implemented. By implementing these measures, some of the key ecological values identified can be avoided outright, which would reduce impacts and reduce the need for some environmental approvals. Should some or all of these mitigation options not be feasible, field investigations to confirm the presence of such ecological values would be required to determine impacts and inform environmental approvals.

It is recommended that extensive field ecological surveys be completed during the next phase of the project to confirm the presence of the key ecological values identified in this constraints analysis. These would determine the true impact of the trails and provide further mitigation options to avoid 'high risk' values. Due to the large number of threatened and migratory species considered likely to occur, vast areas mapped as 'of concern' REs, and 'core habitat' for the endangered Southern Cassowary and Mahogany Glider mapped over most of the study area, extensive field surveys covering the entire trail alignment would be required to confirm the 'on-ground' presence of these ecological values. The field surveys should at a minimum include:

- Validation of RE mapping, targeted threatened flora surveys using a 10m buffer either side of the proposed trails (total 20m width) and targeted threatened fauna surveys. Due to the large size of the study area, targeted fauna surveys should take place only at representative sites containing suitable habitat. Targeted fauna survey techniques should comply with applicable EPBC survey guidelines for species listed as potentially present within the study area.
- Timing of field surveys should be planned during the peak flowering periods for threatened flora and peak activity periods for threatened fauna. Due to the large number of threatened flora and fauna considered likely to occur, optimal surveying periods do not coincide. To overcome this, the best approach would be to conduct a main survey event and smaller follow-up surveys at other critical time periods. The main survey event should occur from September to December (spring and early wet season) which is an optimal time for flowering for most flora species, an optimal time for vegetation surveys and coincides with increased activity during the breeding season for most fauna species including amphibians, the Southern Cassowary and the Masked Owl. Follow-up targeted surveys would be required during May and June to catch the critical flowering periods of threatened flora species not picked up during the main survey event.



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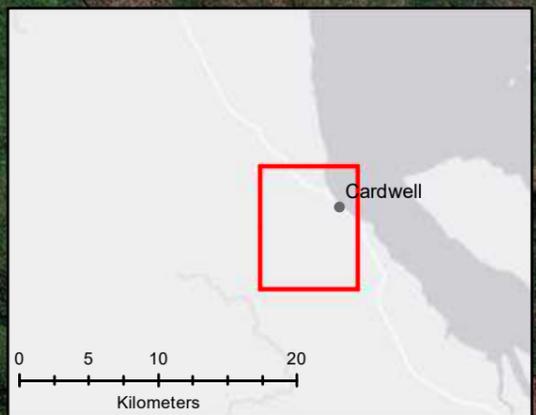
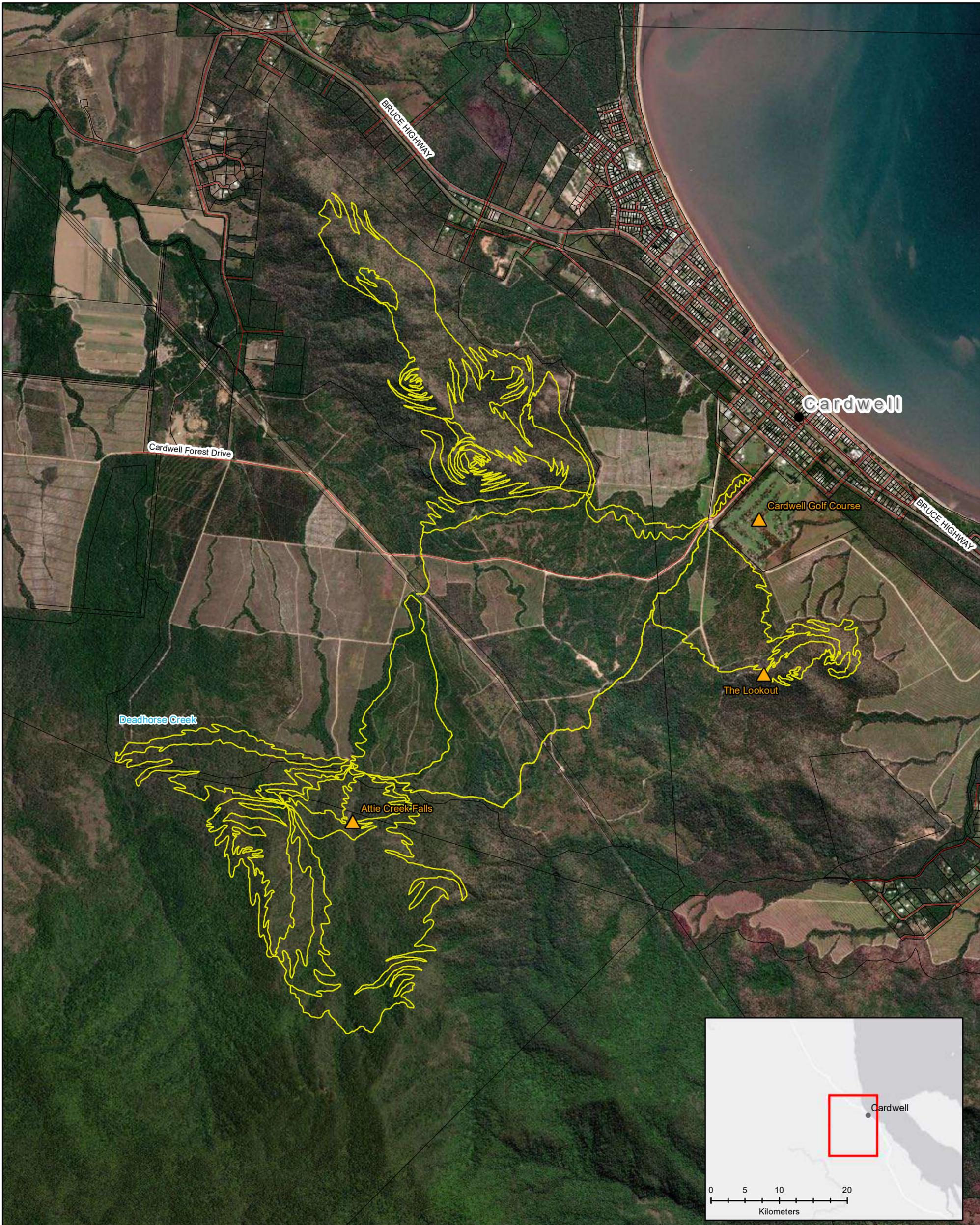
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- Threatened Species Scientific Committee. (2016f). *Conservation Advice: Petauroides volans, Greater Glider*.
- Threatened Species Scientific Committee. (2016g). *Conservation Advice: Saccolaimus saccolaimus nudicluniatius*.
- Threatened Species Scientific Committee. (2015a). *Conservation Advice: Calidris ferruginea, Curlew Sandpiper*.
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# APPENDICES

## Appendix 1 - Maps

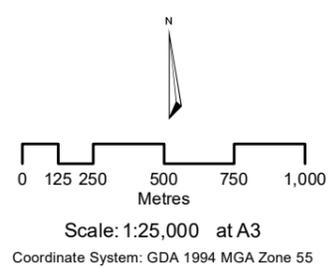
- Map 1: Site Location Map
- Map 2: Trail Sections Map
- Map 3: Protected Areas Map
- Map 4: Trail Alignment – 7 Sisters
- Map 5: Trail Alignment – Lookout Hill
- Map 6: Trail Alignment – Attie Creek Hill
- Map 7: Wet Tropics WHA Zoning
- Map 8: MSES Wetlands Map – 7 Sisters
- Map 9: MSES Wetlands Map – Lookout Hill
- Map 10: MSES Wetlands Map – Attie Creek Hill
- Map 11: Watercourse Identification Map (Water Act 2000)
- Map 12: Regulated Vegetation – 7 Sisters
- Map 13: Regulated Vegetation – Lookout Hill
- Map 14: Regulated Vegetation – Attie Creek Hill
- Map 15: Regional Ecosystems – 7 Sisters
- Map 16: Regional Ecosystems – Lookout Hill
- Map 17: Regional Ecosystems – Attie Creek Hill
- Map 18: Flora Survey Trigger Map
- Map 19: Modelled Wildlife Habitat Map – 7 Sisters
- Map 20: Modelled Wildlife Habitat Map – Lookout Hill
- Map 21: Modelled Wildlife Habitat Map – Attie Creek Hill



**SITE LOCATION**

- Legend**
- Landmarks
  - Roads
  - Property Boundaries
  - Concept Trail Alignments

**Preliminary Ecological Constraints Analysis - Cardwell Tropical Bike Trails**



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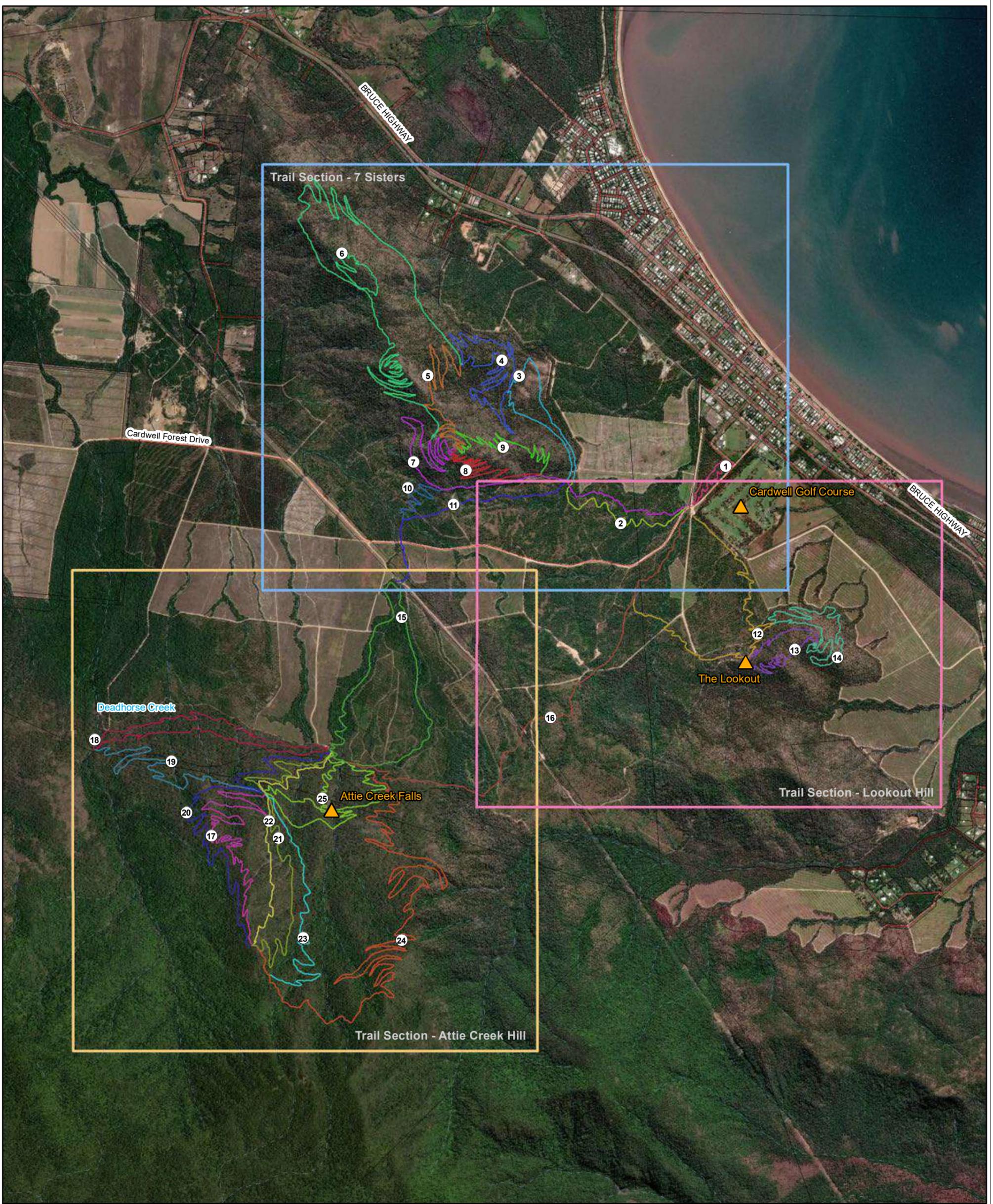
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### TRAIL SECTIONS

#### Legend

- Landmarks
- Roads
- Creeks and Rivers
- Property Boundaries
- Trail Sections**
- 7 Sisters
- Attie Creek Hill
- Lookout Hill

#### Concept Trail Alignments

- 7 Sisters**
- Cardwell Trail 1
  - Cardwell Trail 2
  - Cardwell Trail 3
  - Cardwell Trail 4
  - Cardwell Trail 5

- Cardwell Trail 6
- Cardwell Trail 7
- Cardwell Trail 8
- Cardwell Trail 9
- Cardwell Trail 10
- Cardwell Trail 11

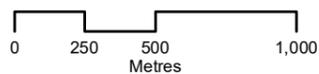
- Lookout Hill**
- Cardwell Trail 12
  - Cardwell Trail 13
  - Cardwell Trail 14
  - Cardwell Trail 15

- Attie Creek Hill**
- Cardwell Trail 16
  - Cardwell Trail 17
  - Cardwell Trail 18
  - Cardwell Trail 19
  - Cardwell Trail 20
  - Cardwell Trail 21

- Cardwell Trail 22
- Cardwell Trail 23
- Cardwell Trail 24
- Cardwell Trail 25

### Preliminary Ecological Constraints Analysis - Cardwell Tropical Bike Trails

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Scale: 1:25,000 at A3  
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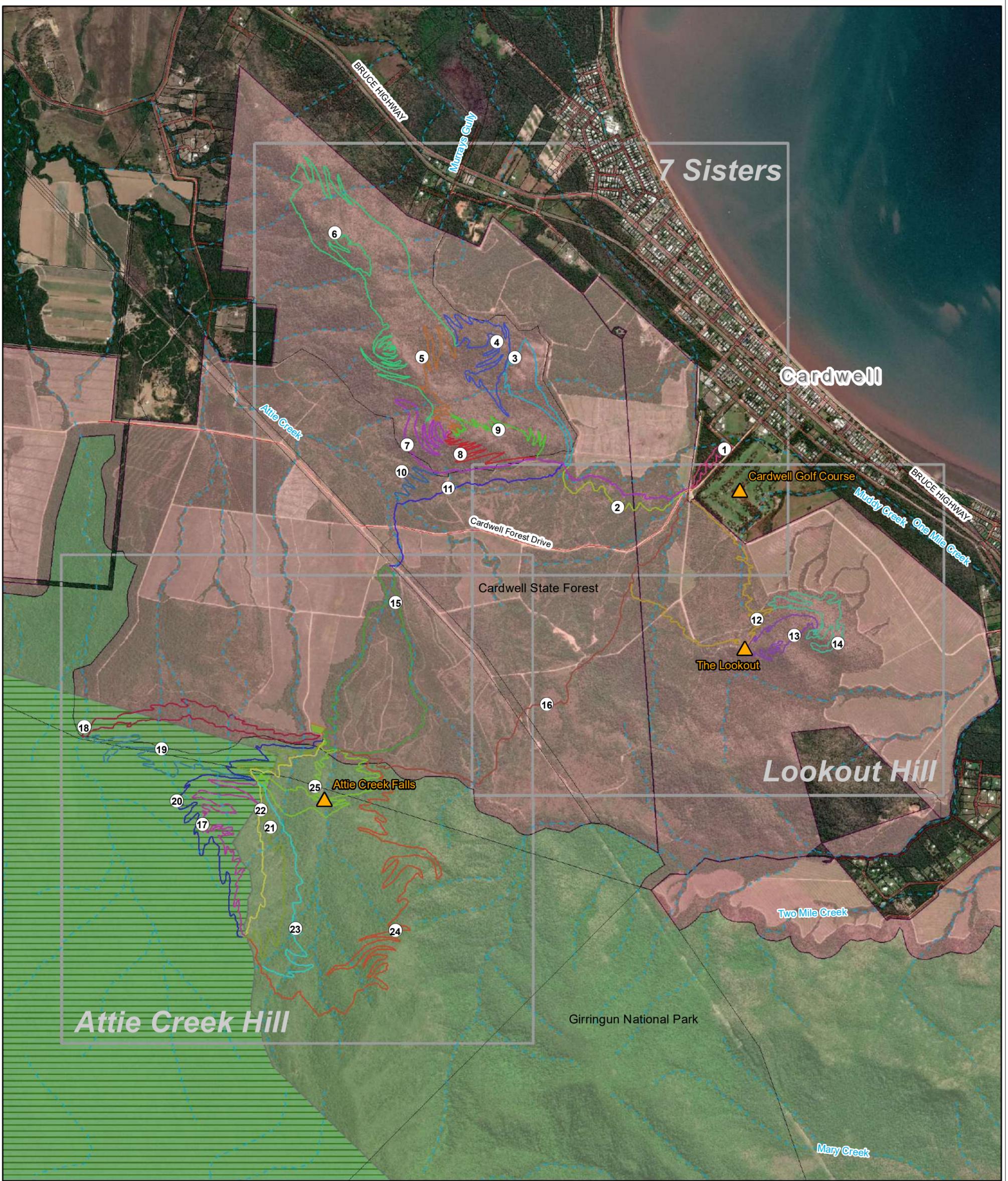
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**PROTECTED AREAS**

**Legend**

- Landmarks
- Roads
- Creeks and Rivers
- Property Boundaries
- Trail Sections
- Concept Trail Alignments (other trail sections)
- Attie Falls Event Area Ring
- Attie Falls Event Area / Car Park

**Protected Areas**

- National Park
  - State Forest
- Wet Tropics Management Plan Review 2019**
- Zone A
  - Zone B
  - Zone C

**Concept Trail Alignments**

- |                  |                     |                         |                   |
|------------------|---------------------|-------------------------|-------------------|
| <b>7 Sisters</b> | Cardwell Trail 7    | Cardwell Trail 13       | Cardwell Trail 19 |
| Cardwell Trail 1 | Cardwell Trail 8    | Cardwell Trail 14       | Cardwell Trail 20 |
| Cardwell Trail 2 | Cardwell Trail 9    | <b>Attie Creek Hill</b> | Cardwell Trail 21 |
| Cardwell Trail 3 | Cardwell Trail 10   | Cardwell Trail 15       | Cardwell Trail 22 |
| Cardwell Trail 4 | Cardwell Trail 11   | Cardwell Trail 16       | Cardwell Trail 23 |
| Cardwell Trail 5 | <b>Lookout Hill</b> | Cardwell Trail 17       | Cardwell Trail 24 |
| Cardwell Trail 6 | Cardwell Trail 12   | Cardwell Trail 18       | Cardwell Trail 25 |

**Preliminary Ecological Constraints Analysis  
Cardwell Tropical Bike Trails**

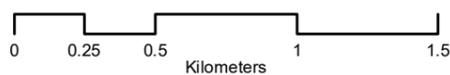
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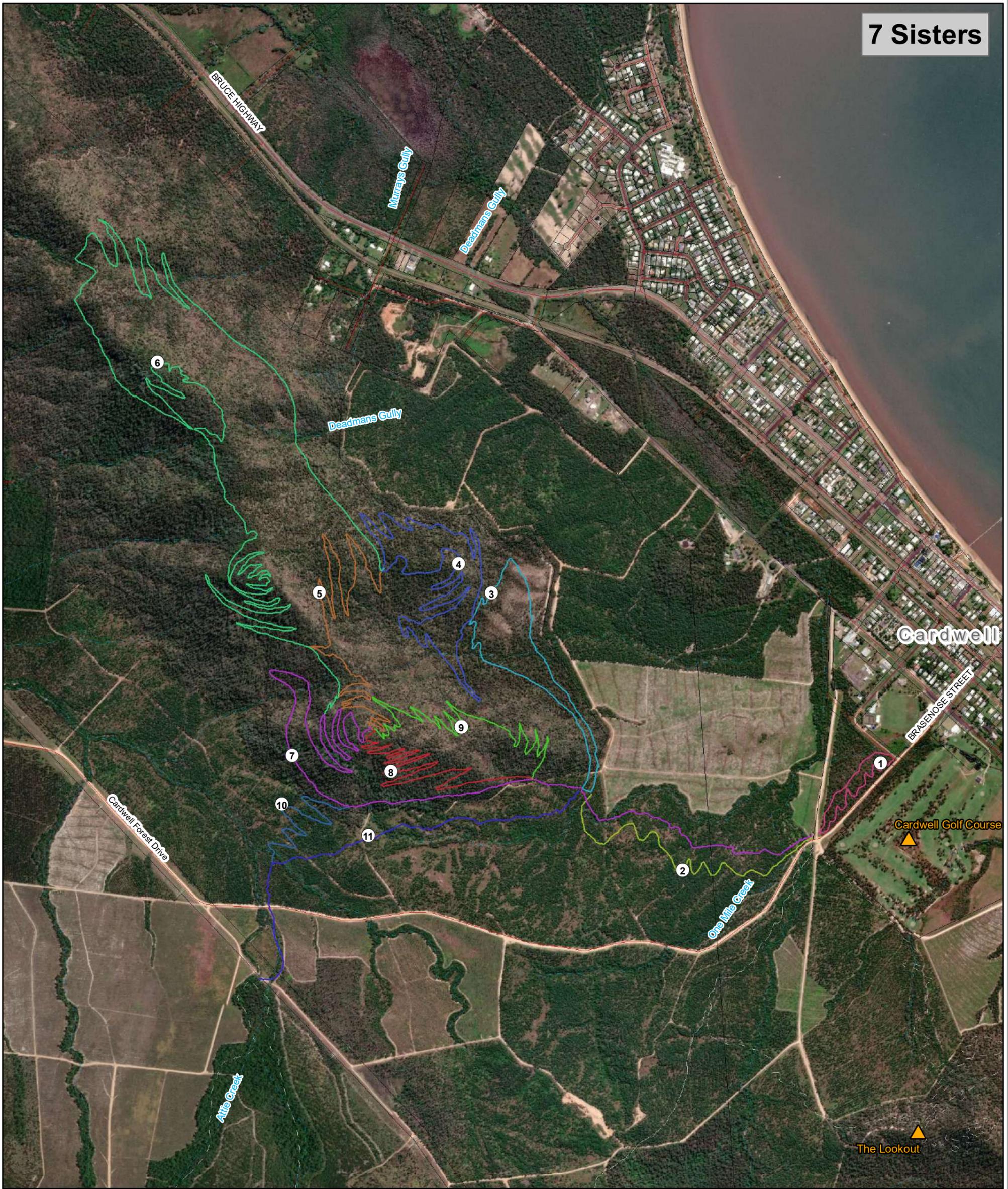
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# 7 Sisters

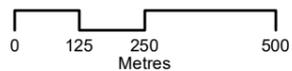


## TRAIL SECTIONS - 7 SISTERS

### Legend

- Landmarks
  - Roads
  - Creeks and Rivers
  - Property Boundaries
  - Concept Trail Alignments (other trail sections)
- | Concept Trail Alignments |                   |
|--------------------------|-------------------|
| 7 Sisters                |                   |
|                          | Cardwell Trail 6  |
|                          | Cardwell Trail 1  |
|                          | Cardwell Trail 2  |
|                          | Cardwell Trail 3  |
|                          | Cardwell Trail 4  |
|                          | Cardwell Trail 5  |
|                          | Cardwell Trail 7  |
|                          | Cardwell Trail 8  |
|                          | Cardwell Trail 9  |
|                          | Cardwell Trail 10 |
|                          | Cardwell Trail 11 |

## Preliminary Ecological Constraints Analysis Cardwell Tropical Bike Trails



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# Lookout Hill

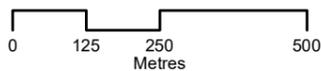


## TRAIL SECTIONS - LOOKOUT HILL

### Legend

- Landmarks
  - Roads
  - Creeks and Rivers
  - Property Boundaries
  - Concept Trail Alignments (other trail sections)
- | Concept Trail Alignments |                   |
|--------------------------|-------------------|
| Lookout Hill             | Cardwell Trail 14 |
| Cardwell Trail 12        | Attie Creek Hill  |
| Cardwell Trail 13        | Cardwell Trail 16 |

## Preliminary Ecological Constraints Analysis Cardwell Tropical Bike Trails



Scale: 1:12,000 at A3  
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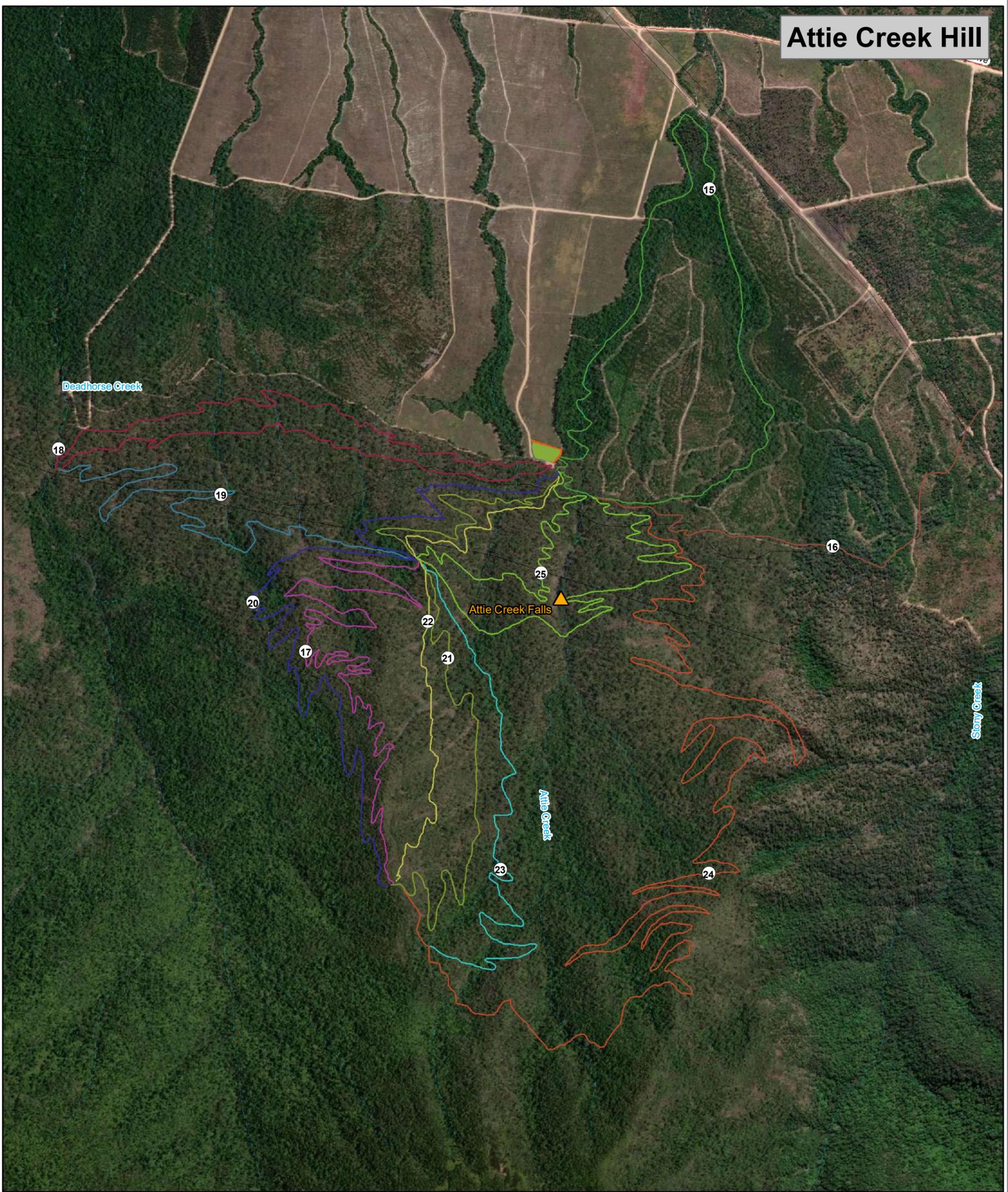
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# Attie Creek Hill

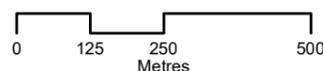


## TRAIL SECTIONS - ATTIE CREEK HILL

### Legend

- |   |                                 |                   |
|---|---------------------------------|-------------------|
| Landmarks                                       | <b>Concept Trail Alignments</b> | Cardwell Trail 20 |
| Roads   | <b>Attie Creek Hill</b>         | Cardwell Trail 15 |
| Creeks and Rivers                               | Cardwell Trail 16               | Cardwell Trail 21 |
| Property Boundaries                             | Cardwell Trail 17               | Cardwell Trail 22 |
| Concept Trail Alignments (other trail sections) | Cardwell Trail 18               | Cardwell Trail 23 |
| Attie Falls Event Area                          | Cardwell Trail 19               | Cardwell Trail 24 |
| Attie Falls Event Area / Car Park               |                                 | Cardwell Trail 25 |

## Preliminary Ecological Constraints Analysis Cardwell Tropical Bike Trails



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**WET TROPICS MANAGEMENT PLAN ZONES -**

**Legend**

**Label**

- Landmarks
- Roads
- Creeks and Rivers
- Property Boundaries
- Trail Sections
- Concept Trail Alignments (other trail sections)
- Attie Falls Event Area Ring
- Attie Falls Event Area / Car Park

**Wet Tropics Management Plan Review 2019**

- Zone A
- Zone B
- Zone C

**Concept Trail Alignments**

<b>7 Sisters</b>		
Cardwell Trail 1	Cardwell Trail 8	Cardwell Trail 13
Cardwell Trail 2	Cardwell Trail 9	Cardwell Trail 14
Cardwell Trail 3	Cardwell Trail 10	Cardwell Trail 15
Cardwell Trail 4	Cardwell Trail 11	Cardwell Trail 16
Cardwell Trail 5	Cardwell Trail 12	Cardwell Trail 17
Cardwell Trail 6		Cardwell Trail 18
<b>Lookout Hill</b>		
Cardwell Trail 7	Cardwell Trail 13	Cardwell Trail 19
Cardwell Trail 8	Cardwell Trail 14	Cardwell Trail 20
Cardwell Trail 9	Cardwell Trail 15	Cardwell Trail 21
Cardwell Trail 10	Cardwell Trail 16	Cardwell Trail 22
Cardwell Trail 11	Cardwell Trail 17	Cardwell Trail 23
Cardwell Trail 12	Cardwell Trail 18	Cardwell Trail 24
	Cardwell Trail 25	

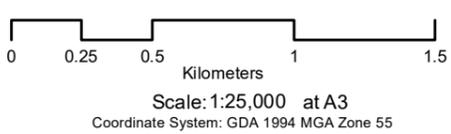
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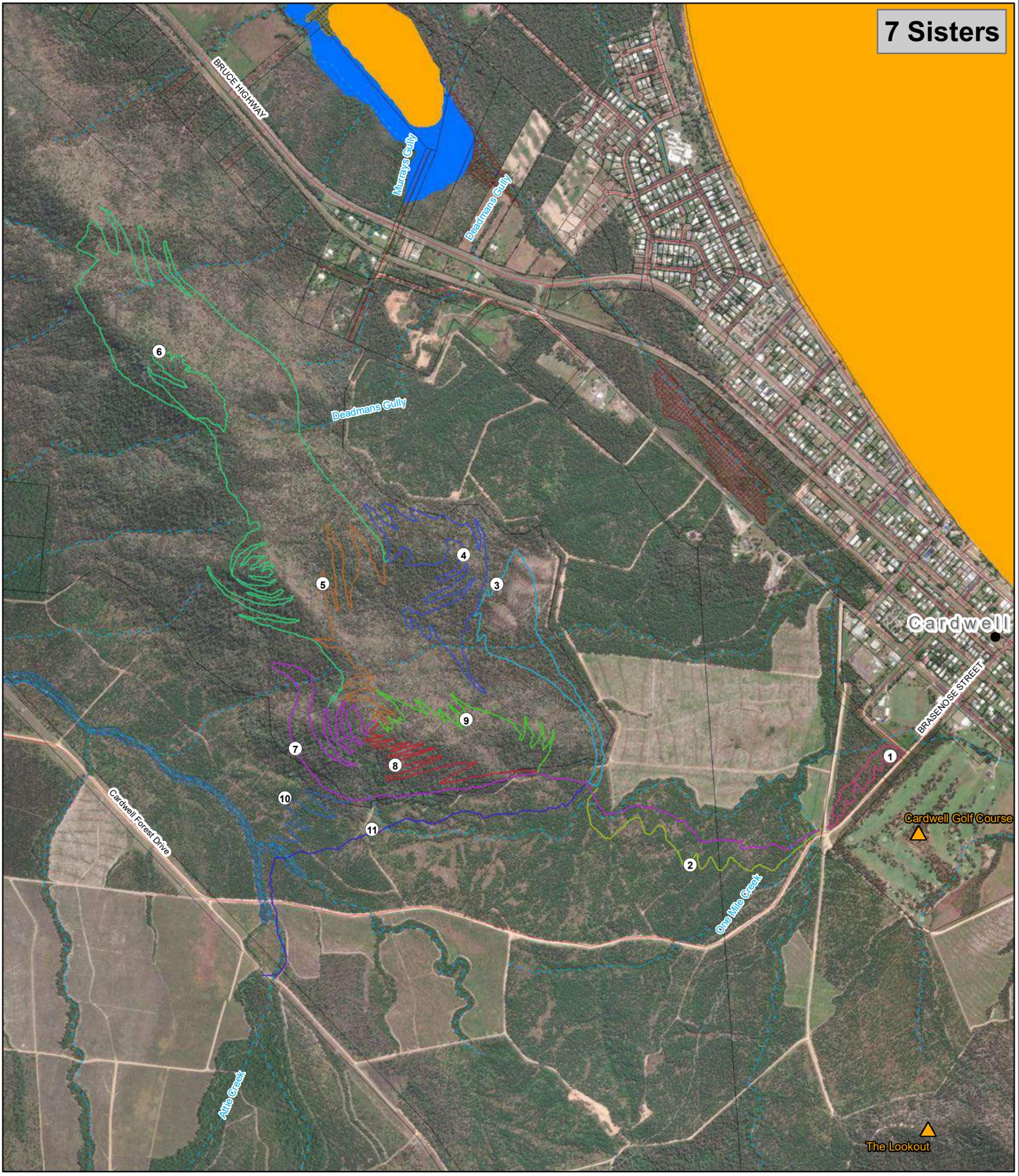
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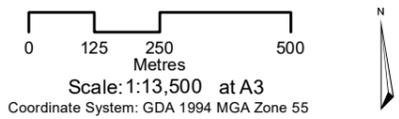
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## WETLAND AREAS - 7 SISTERS

- Legend**
- Landmarks
  - Roads
  - Creeks and Rivers
  - Property Boundaries
  - Concept Trail Alignments (other trail sections)
- Wetland Areas**
- E\_WB - Estuarine wetland (from waterbody data)
  - R\_WB - Riverine wetland (from waterbody data)
  - E\_RE - Estuarine wetland (from regional ecosystem data)
  - R\_RE - Riverine wetland (from regional ecosystem data)
  - P\_RE - Palustrine wetland (from regional ecosystem data)

- Concept Trail Alignments**
- 7 Sisters**
- Cardwell Trail 1
  - Cardwell Trail 2
  - Cardwell Trail 3
  - Cardwell Trail 4
  - Cardwell Trail 5
  - Cardwell Trail 6
  - Cardwell Trail 7
  - Cardwell Trail 8
  - Cardwell Trail 9
  - Cardwell Trail 10
  - Cardwell Trail 11



## Preliminary Ecological Constraints Analysis Cardwell Tropical Bike Trails

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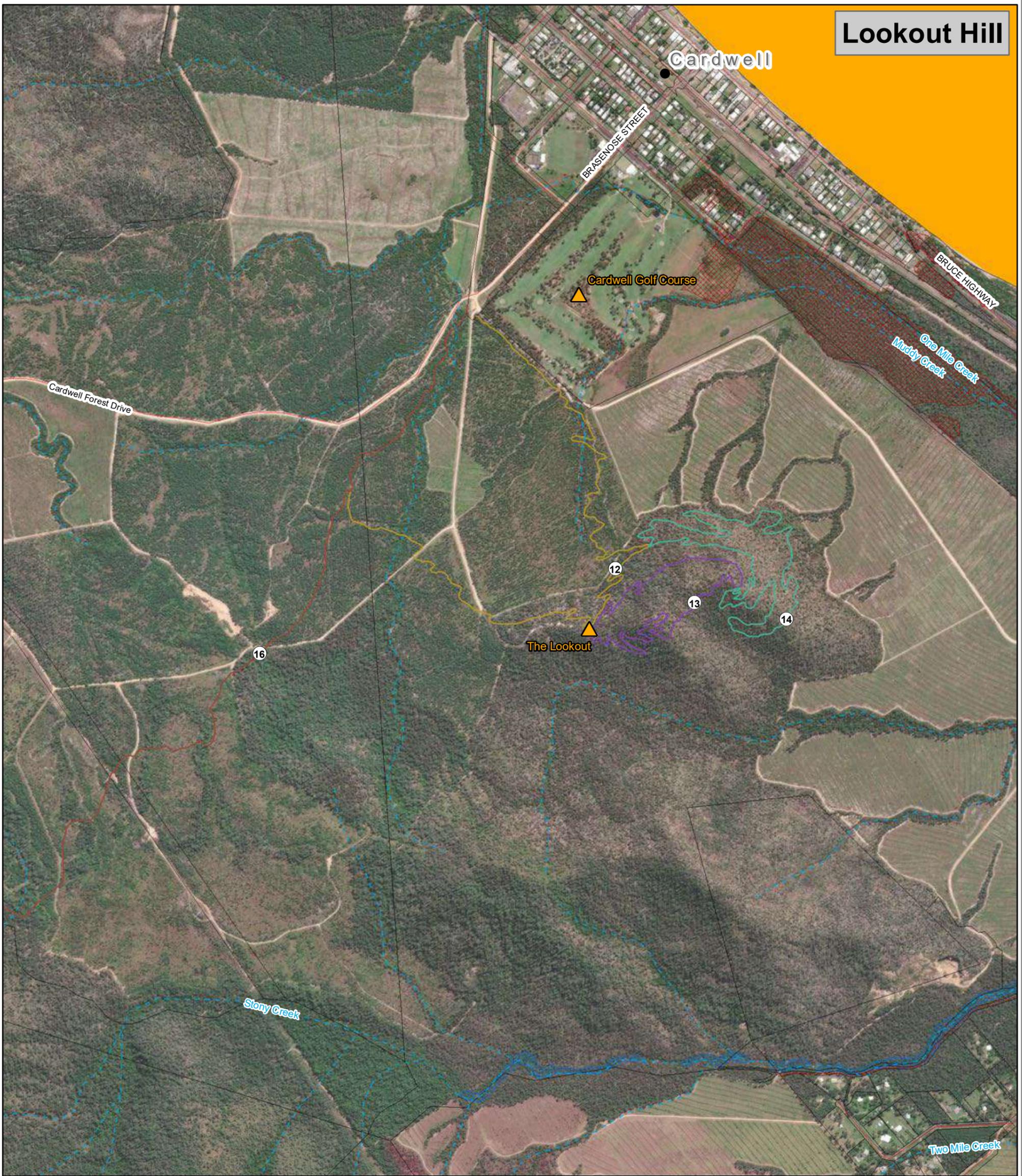
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# Lookout Hill

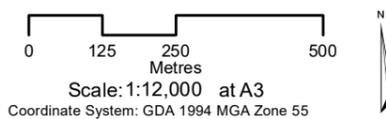


## WETLAND AREAS - LOOKOUT HILL

### Legend

- Landmarks
  - Roads
  - Creeks and Rivers
  - Property Boundaries
  - Concept Trail Alignments (other trail sections)
  - E\_WB - Estuarine wetland (from waterbody data)
  - R\_RE - Riverine wetland (from regional ecosystem data)
  - P\_RE - Palustrine wetland (from regional ecosystem data)
- Concept Trail Alignments**
- Lookout Hill Cardwell Trail 12
  - Attie Creek Hill Cardwell Trail 13
  - Cardwell Trail 14
  - Cardwell Trail 16

## Preliminary Ecological Constraints Analysis Cardwell Tropical Bike Trails



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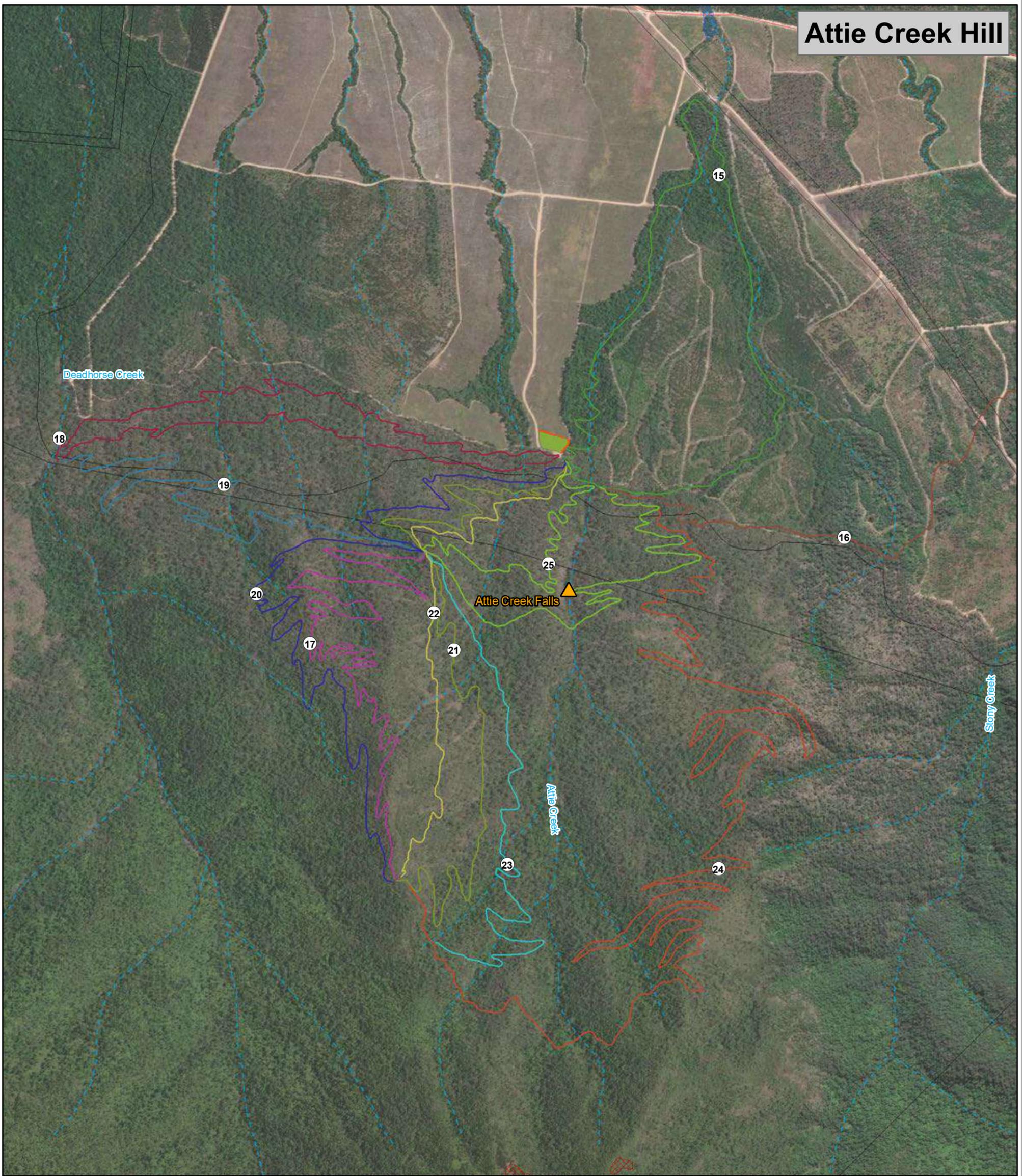
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# Attie Creek Hill



## WETLAND AREAS - ATTIE CREEK HILL

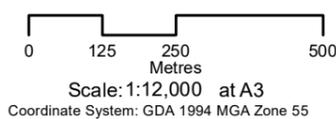
### Legend

- Landmarks
- Roads
- Creeks and Rivers
- Property Boundaries
- Concept Trail Alignments (other trail sections)
- Attie Falls Event Area Ring
- Attie Falls Event Area / Car
- Wetland Areas**
- R\_RE - Riverine wetland (from regional ecosystem data)
- P\_RE - Palustrine wetland (from regional ecosystem data)

### Concept Trail Alignments

- |                         |                   |
|-------------------------|-------------------|
| <b>Attie Creek Hill</b> | Cardwell Trail 20 |
| Cardwell Trail 15       | Cardwell Trail 21 |
| Cardwell Trail 16       | Cardwell Trail 22 |
| Cardwell Trail 17       | Cardwell Trail 23 |
| Cardwell Trail 18       | Cardwell Trail 24 |
| Cardwell Trail 19       | Cardwell Trail 25 |

## Preliminary Ecological Constraints Analysis Cardwell Tropical Bike Trails



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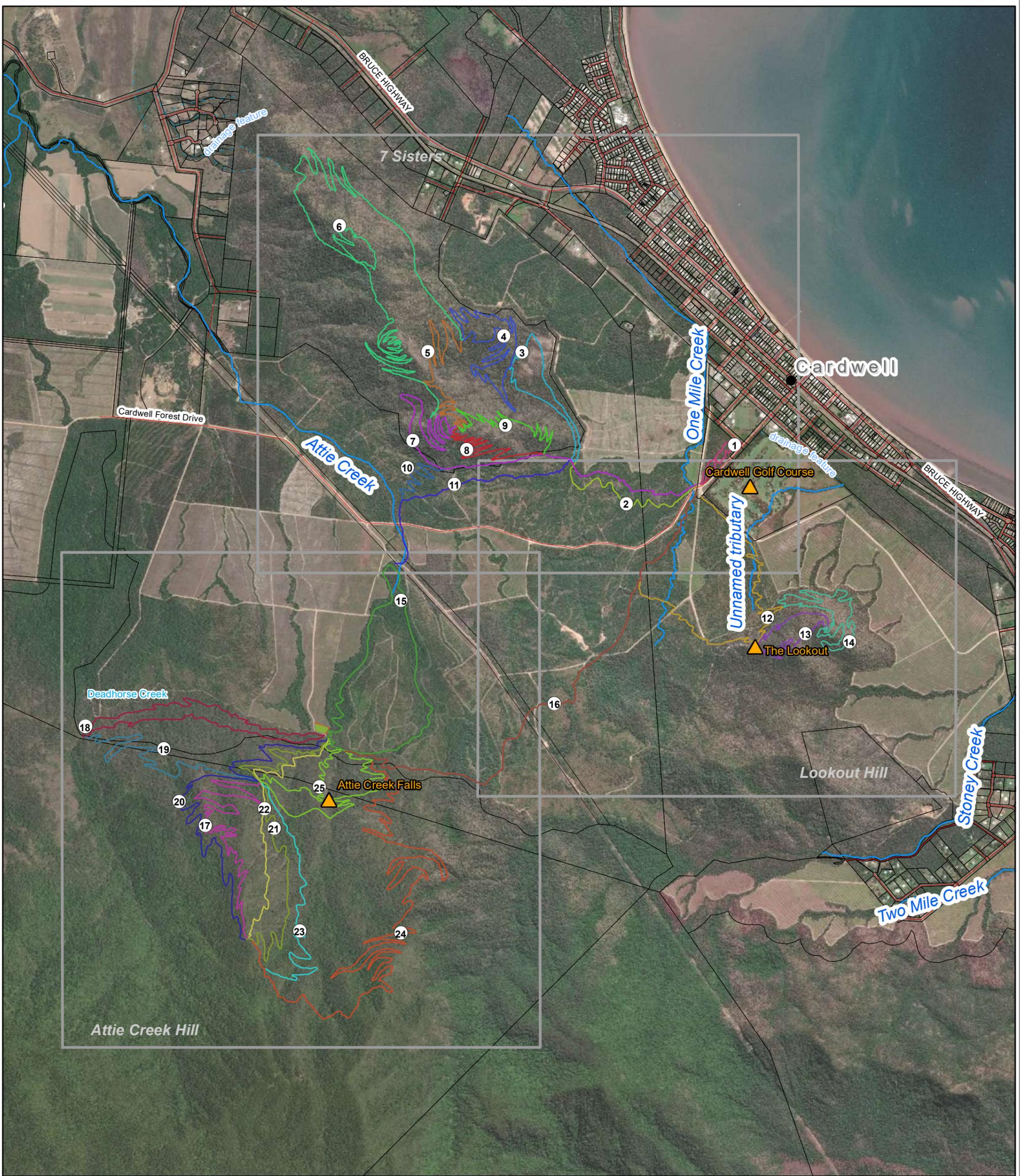
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**WATERCOURSE IDENTIFICATION MAP (WATER ACT 2000)**

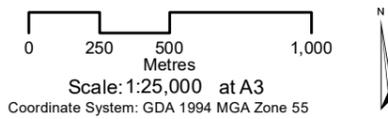
**Preliminary Ecological Constraints Analysis  
Cardwell Tropical Bike Trails**

- Legend**
- Landmarks
  - Watercourse (Water Act 2000)
  - Drainage Features (Water Act 2000)
  - Roads
  - Property Boundaries
  - Trail Sections
  - Attie Falls Event Area Ring Road
  - Attie Falls Event Area / Car Park

- Concept Trail Alignments**
- |                  |                   |                   |                   |
|------------------|-------------------|-------------------|-------------------|
| <b>7 Sisters</b> | Cardwell Trail 7  | Cardwell Trail 13 | Cardwell Trail 19 |
| Cardwell Trail 1 | Cardwell Trail 8  | Cardwell Trail 14 | Cardwell Trail 20 |
| Cardwell Trail 2 | Cardwell Trail 9  | Cardwell Trail 15 | Cardwell Trail 21 |
| Cardwell Trail 3 | Cardwell Trail 10 | Cardwell Trail 16 | Cardwell Trail 22 |
| Cardwell Trail 4 | Cardwell Trail 11 | Cardwell Trail 17 | Cardwell Trail 23 |
| Cardwell Trail 5 | Cardwell Trail 12 | Cardwell Trail 18 | Cardwell Trail 24 |
| Cardwell Trail 6 | Cardwell Trail 13 | Cardwell Trail 19 | Cardwell Trail 25 |

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# 7 Sisters



## REGULATED VEGETATION MANAGEMENT MAP - 7 SISTERS

**Legend**

**Label**

- Landmarks
- Roads
- Creeks and Rivers
- Property Boundaries
- Concept Trail Alignments (other trail sections)

**Regulated Vegetation**

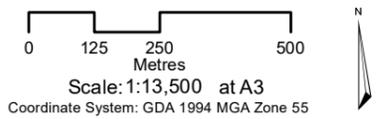
- Category B area
- Category C area
- Category R area
- Category X area
- Water

**Concept Trail Alignments**

**7 Sisters**

- Cardwell Trail 1
- Cardwell Trail 2
- Cardwell Trail 3
- Cardwell Trail 4
- Cardwell Trail 5
- Cardwell Trail 6
- Cardwell Trail 7
- Cardwell Trail 8
- Cardwell Trail 9
- Cardwell Trail 10
- Cardwell Trail 11

## Preliminary Ecological Constraints Analysis Cardwell Tropical Bike Trails



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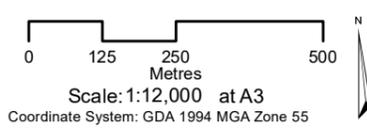
# Lookout Hill



## REGULATED VEGETATION MANAGEMENT MAP - LOOKOUT HILL

- Legend**
- Label**
- Landmarks
  - Roads
  - Creeks and Rivers
  - Property Boundaries
  - Concept Trail Alignments (other trail sections)
- Concept Trail Alignments**
- Lookout Hill**
- Cardwell Trail 14
  - Cardwell Trail 13 **Attie Creek Hill**
  - Cardwell Trail 12
  - Cardwell Trail 16
- Regulated Vegetation**
- Category B area
  - Category R area
  - Category X area
  - Water

## Preliminary Ecological Constraints Analysis Cardwell Tropical Bike Trails



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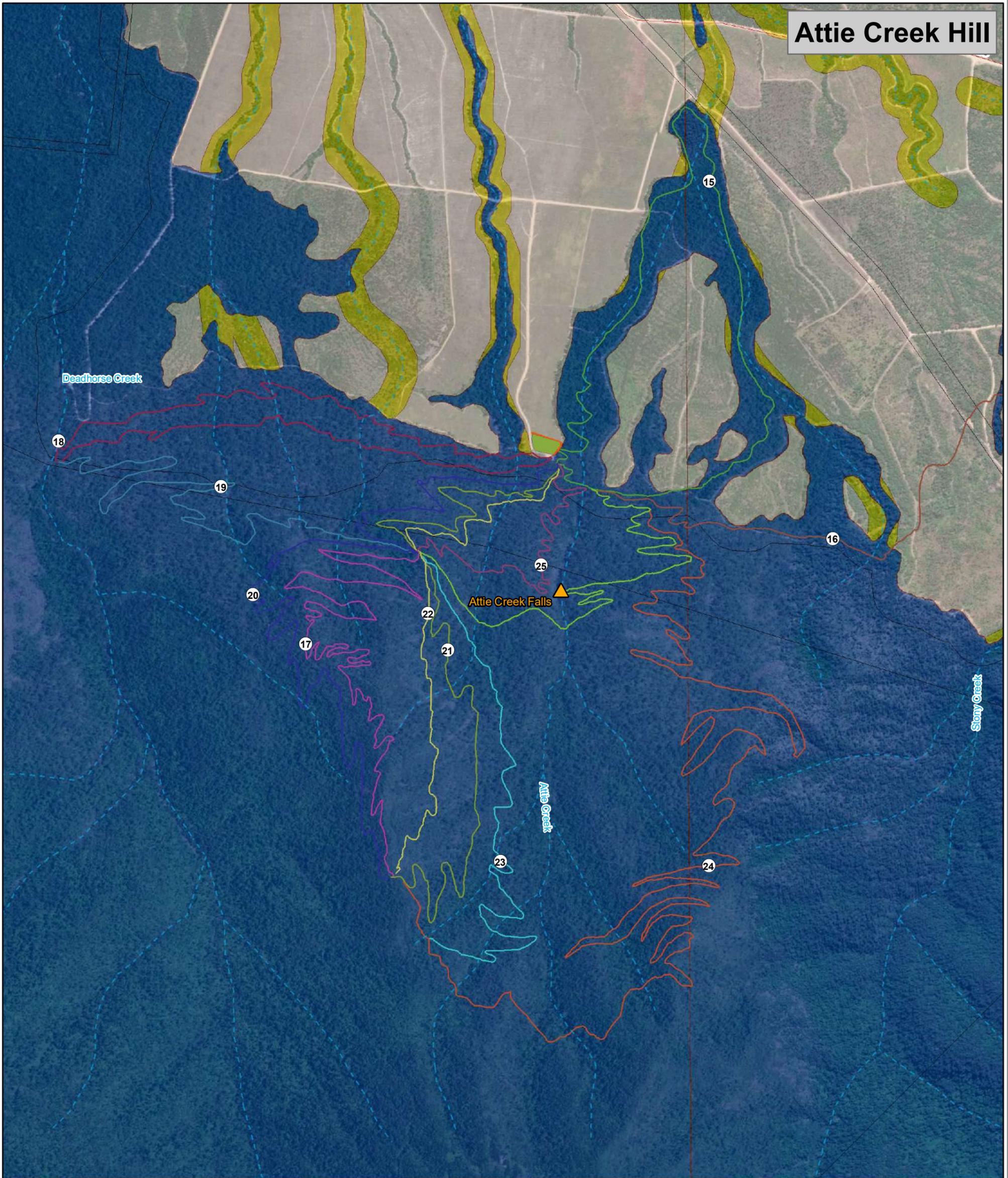
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# Attie Creek Hill



## REGULATED VEGETATION MANAGEMENT MAP - ATTIE CREEK HILL

**Legend**

**Label**

- Landmarks
- Roads
- Creeks and Rivers
- Property Boundaries
- Concept Trail Alignments (other trail sections)
- Attie Falls Event Area Ring Road
- Attie Falls Event Area / Car Park

**Regulated Vegetation**

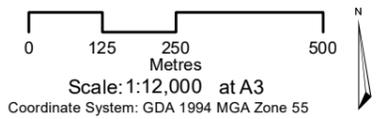
- Category B area
- Category R area
- Category X area

**Concept Trail Alignments**

**Attie Creek Hill**

- Cardwell Trail 15
- Cardwell Trail 16
- Cardwell Trail 17
- Cardwell Trail 18
- Cardwell Trail 19
- Cardwell Trail 20
- Cardwell Trail 21
- Cardwell Trail 22
- Cardwell Trail 23
- Cardwell Trail 24
- Cardwell Trail 25.1
- Cardwell Trail 25.2

## Preliminary Ecological Constraints Analysis Cardwell Tropical Bike Trails



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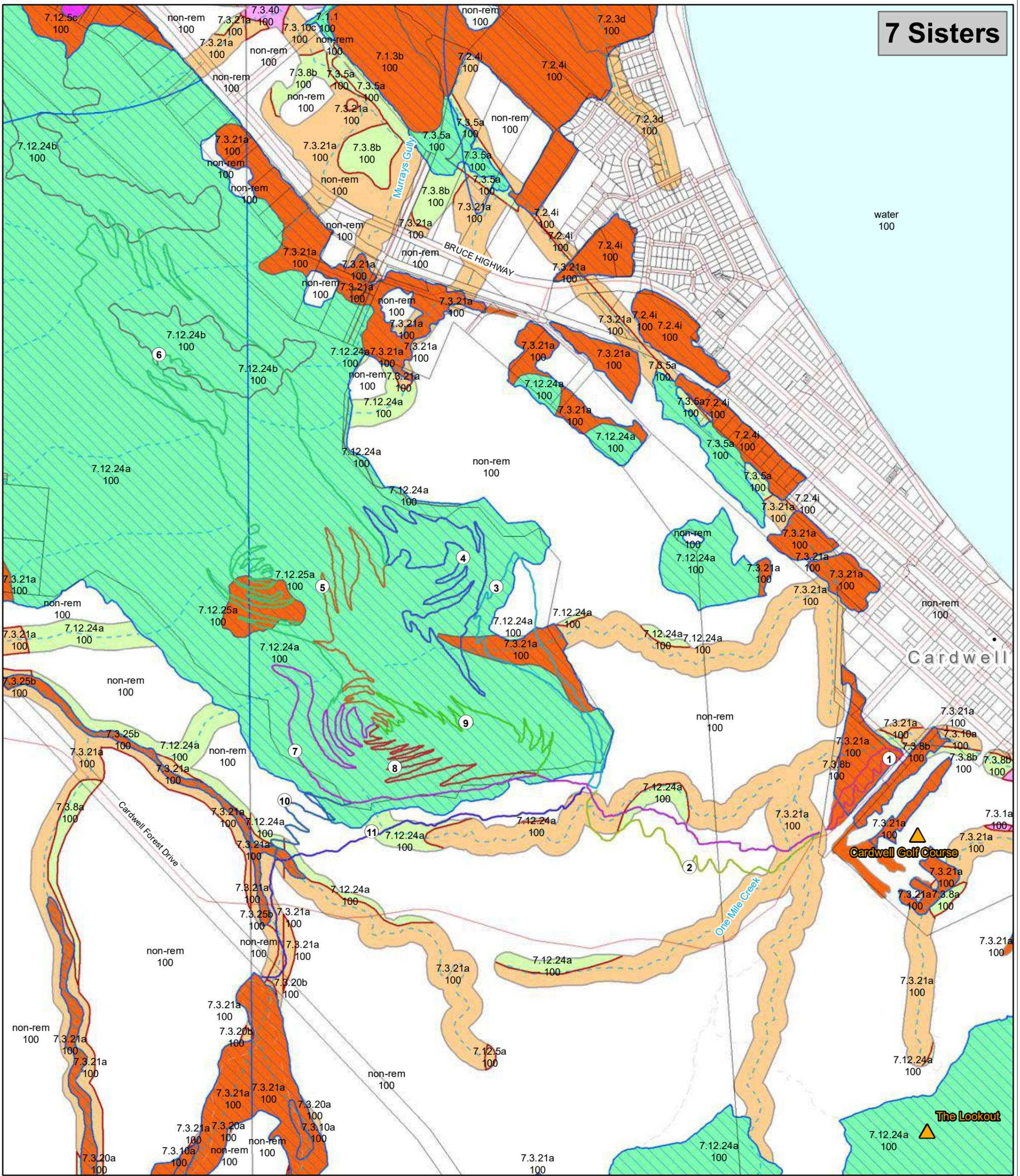
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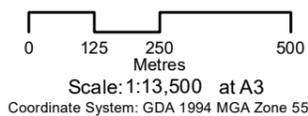
# 7 Sisters



## REGIONAL ECOSYSTEMS AND ESSENTIAL HABITAT - 7 SISTERS

Legend	
<b>Label</b>	<b>VMA Regional Ecosystem Map</b>
Landmarks	Category A or B area containing endangered
Roads	Category A or B area containing of concern
Creeks and Rivers	Category A or B area that is least concern
Property Boundaries	Category C or R area containing endangered
Concept Trail Alignments (other trail sections)	Category C or R area containing of concern
<b>MSES Regulated Vegetation</b>	Category C or R area that is of least concern
Essential Habitat	Water
	Non-remnant
	<b>Concept Trail Alignments</b>
	<b>7 Sisters</b>
	Cardwell Trail 1
	Cardwell Trail 2
	Cardwell Trail 3
	Cardwell Trail 4
	Cardwell Trail 5
	Cardwell Trail 6
	Cardwell Trail 7
	Cardwell Trail 8
	Cardwell Trail 9
	Cardwell Trail 10
	Cardwell Trail 11

## Preliminary Ecological Constraints Analysis Cardwell Tropical Bike Trails



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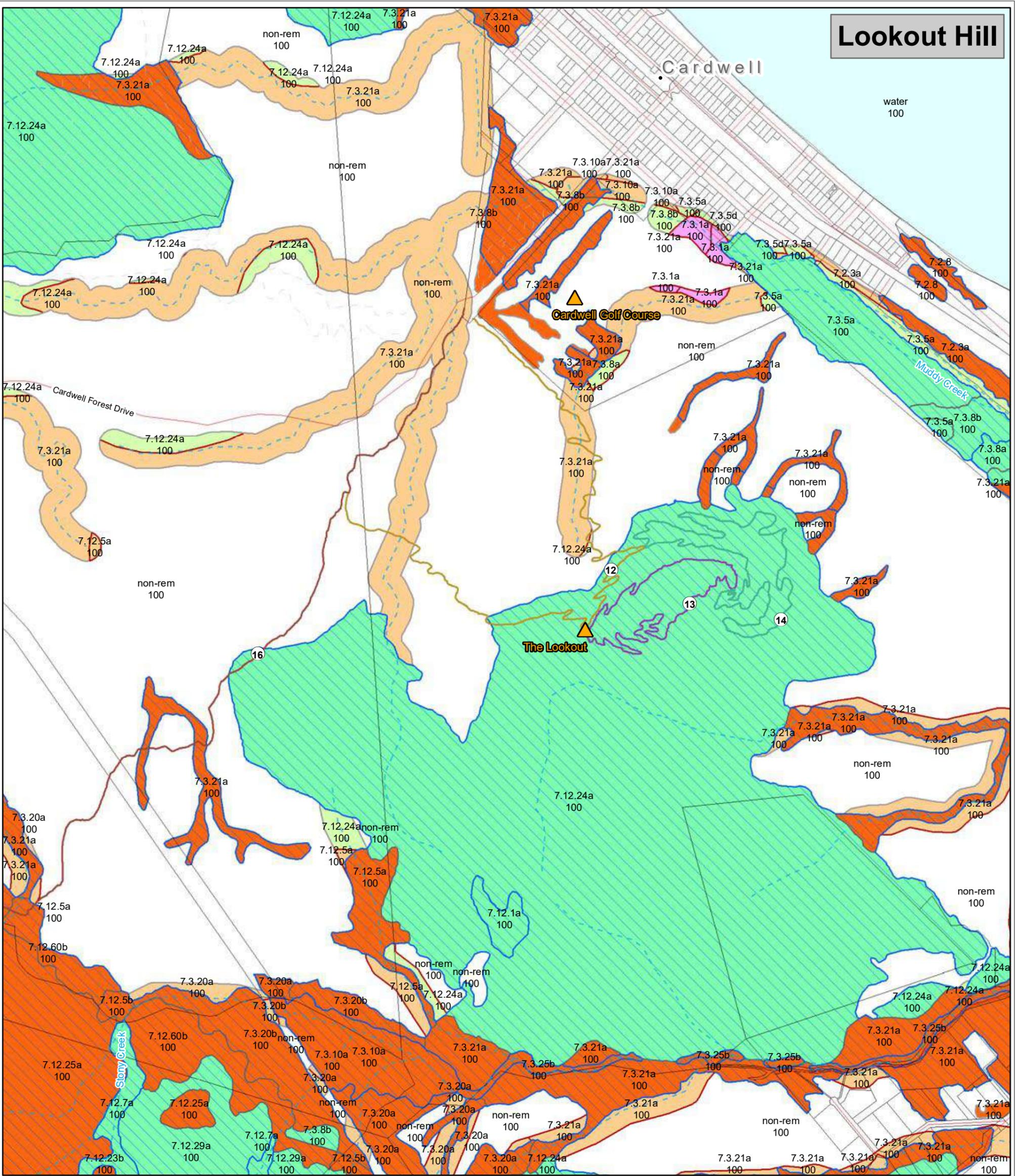
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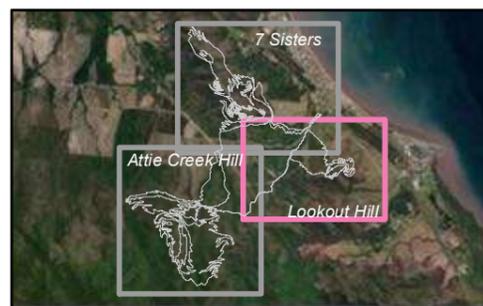
# Lookout Hill



## REGIONAL ECOSYSTEMS AND ESSENTIAL HABITAT - LOOKOUT HILL

Legend	
<b>Label</b>	<b>VMA Regional Ecosystem Map</b>
▲ Landmarks	Category A or B area containing of concern
— Roads	Category A or B area that is least concern
- - - Creeks and Rivers	Category C or R area containing endangered
□ Property Boundaries	Category C or R area containing of concern
- - - Concept Trail Alignments (other trail sections)	Category C or R area that is of least concern
<b>MSES Regulated Vegetation</b>	Water
□ Essential Habitat	Non-remnant
	<b>Concept Trail Alignments</b>
	<b>Lookout Hill</b>
	— Cardwell Trail 12
	— Cardwell Trail 13
	— Cardwell Trail 14
	<b>Attie Creek Hill</b>
	— Cardwell Trail 16

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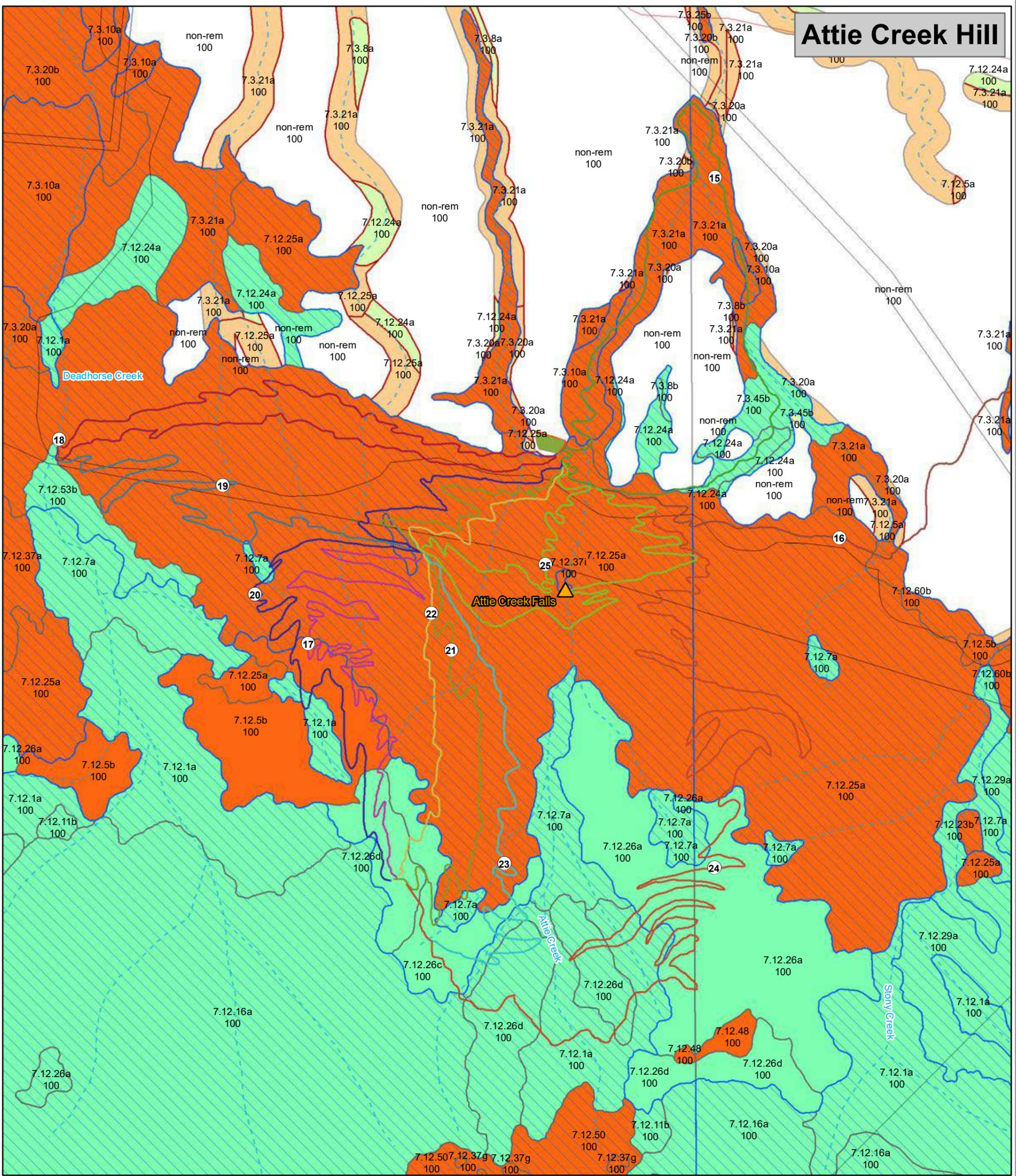
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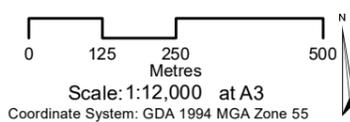
# Attie Creek Hill



## REGIONAL ECOSYSTEMS AND ESSENTIAL HABITAT - ATTIE CREEK HILL

Legend		VMA Regional Ecosystem Map		Concept Trail Alignments	
	Landmarks		Category A or B area containing of concern		Cardwell Trail 15
	Roads		Category A or B area that is least concern		Cardwell Trail 16
	Creeks and Rivers		Category C or R area containing of concern		Cardwell Trail 17
	Property Boundaries		Category C or R area that is of least concern		Cardwell Trail 18
	Concept Trail Alignments (other trail sections)		Non-remnant		Cardwell Trail 19
	Attie Falls Event Area Ring Road				Cardwell Trail 20
	Attie Falls Event Area / Car Park				Cardwell Trail 21
	Essential Habitat				Cardwell Trail 22
					Cardwell Trail 23
					Cardwell Trail 24
					Cardwell Trail 25

## Preliminary Ecological Constraints Analysis Cardwell Tropical Bike Trails



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### FLORA SURVEY TRIGGER MAP

- Legend**
- Landmarks
  - Roads
  - Creeks and Rivers
  - Property Boundaries
  - Concept Trail Alignments (other trail sections)
  - Attie Falls Event Area Ring Road
  - Attie Falls Event Area / Car Park
  - High Risk Area
  - Trail Sections

- Concept Trail Alignments**
- |                  |                   |                   |                   |
|------------------|-------------------|-------------------|-------------------|
| Cardwell Trail 1 | Cardwell Trail 8  | Cardwell Trail 13 | Cardwell Trail 19 |
| Cardwell Trail 2 | Cardwell Trail 9  | Cardwell Trail 14 | Cardwell Trail 20 |
| Cardwell Trail 3 | Cardwell Trail 10 | Cardwell Trail 15 | Cardwell Trail 21 |
| Cardwell Trail 4 | Cardwell Trail 11 | Cardwell Trail 16 | Cardwell Trail 22 |
| Cardwell Trail 5 | Cardwell Trail 12 | Cardwell Trail 17 | Cardwell Trail 23 |
| Cardwell Trail 6 | Cardwell Trail 18 | Cardwell Trail 24 | Cardwell Trail 25 |

### Preliminary Ecological Constraints Analysis Cardwell Tropical Bike Trails

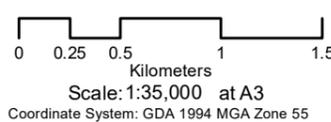
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## FLORA AND FAUNA OF CONSERVATION SIGNIFICANCE & LEAST CONCERN HABITAT- 7 SISTERS

### Legend

- |  |   |
|--|---|
| Landmarks  | <b>Concept Trail Alignments 7 Sisters</b> |
| Roads  | Cardwell Trail 1                          |
| Creeks and Rivers                                    | Cardwell Trail 2                          |
| Property Boundaries                                  | Cardwell Trail 3                          |
| Concept Trail Alignments (other trail sections)      | Cardwell Trail 4                          |
| MSES Wildlife Habitat (Special Least Concern Animal) | Cardwell Trail 5                          |
| MSES Wildlife Habitat (Endangered or Vulnerable)     | Cardwell Trail 6                          |
|  | Cardwell Trail 7                          |
|  | Cardwell Trail 8                          |
|  | Cardwell Trail 9                          |
|  | Cardwell Trail 10                         |
|  | Cardwell Trail 11                         |

## Preliminary Ecological Constraints Analysis Cardwell Tropical Bike Trails

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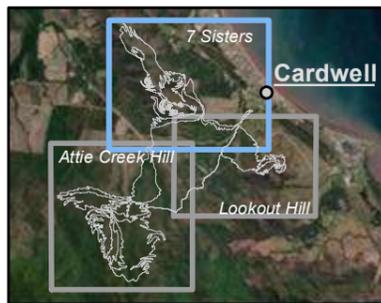
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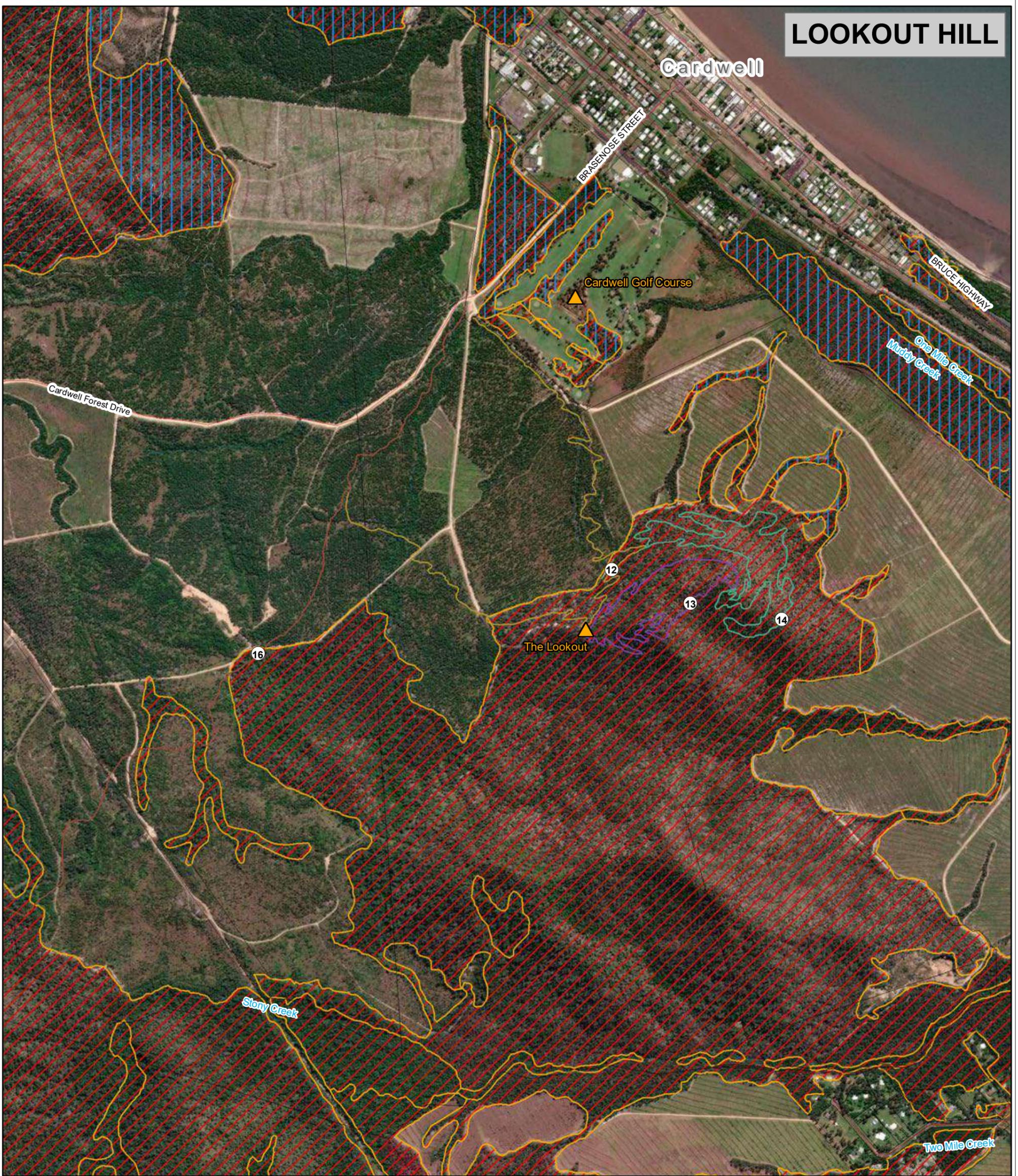
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# LOOKOUT HILL



## FLORA AND FAUNA OF CONSERVATION SIGNIFICANCE & LEAST CONCERN HABITAT- LOOKOUT HILL

### Legend

- Landmarks
  - Roads
  - Creeks and Rivers
  - Property Boundaries
  - Concept Trail Alignments (other trail sections)
  - MSES Wildlife Habitat (Special Least Concern Animal)
  - MSES Wildlife Habitat (Endangered or Vulnerable)
- Concept Trail Alignments Lookout Hill**
  - Cardwell Trail 12
  - Cardwell Trail 13
  - Cardwell Trail 14
  - Attie Creek Hill**
  - Cardwell Trail 16

## Preliminary Ecological Constraints Analysis Cardwell Tropical Bike Trails

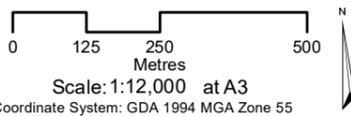
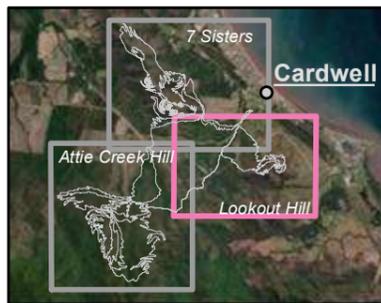
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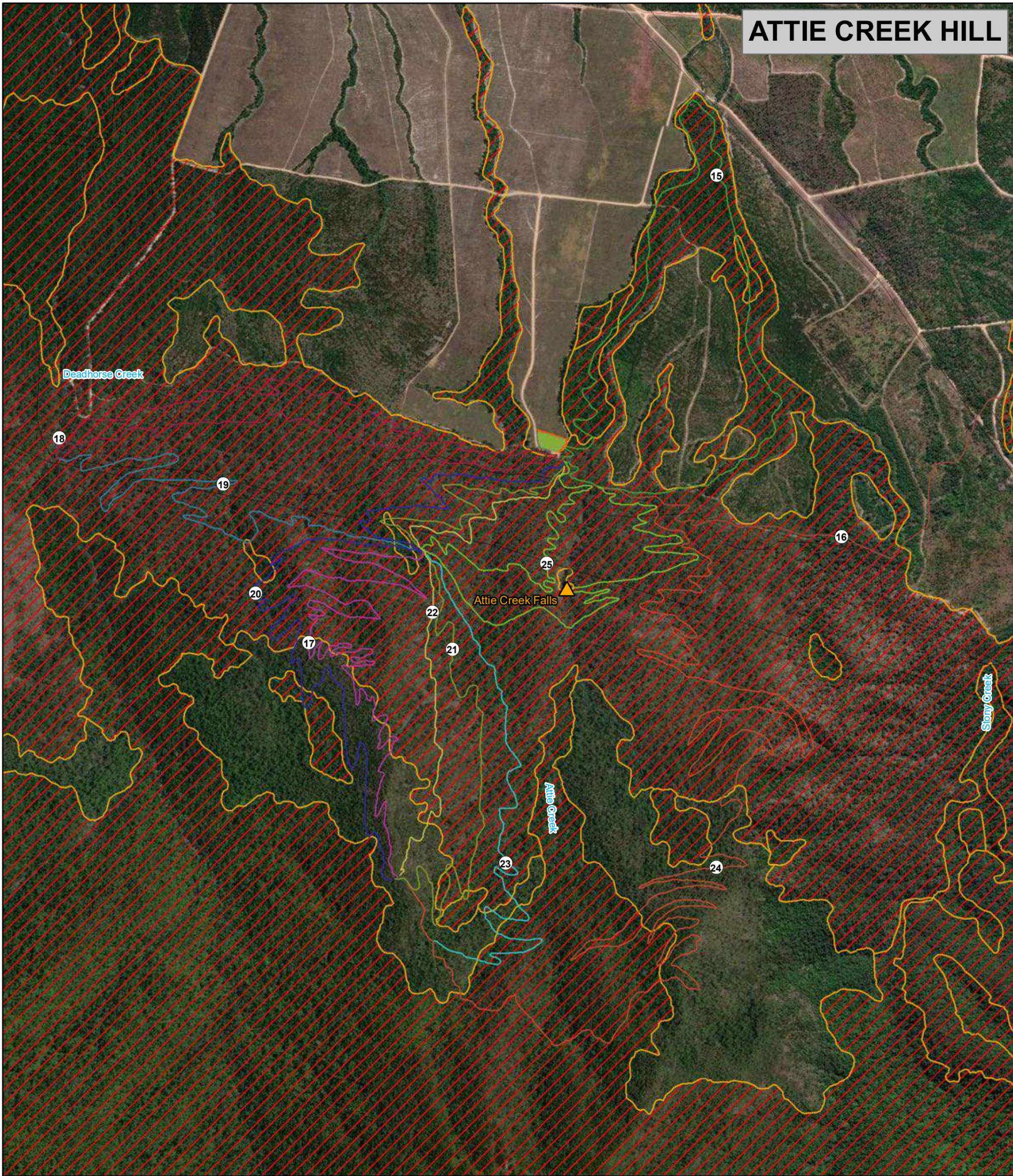
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# ATTIE CREEK HILL



## FLORA AND FAUNA OF CONSERVATION SIGNIFICANCE & LEAST CONCERN HABITAT- ATTIE CREEK HILL

### Legend

- |  |                                 |
|--|---------------------------------|
| Landmarks  | <b>Concept Trail Alignments</b> |
| Roads  | <b>Attie Creek Hill</b>         |
| Creeks and Rivers                                    | Cardwell Trail 15               |
| Property Boundaries                                  | Cardwell Trail 16               |
| Concept Trail Alignments (other trail sections)      | Cardwell Trail 17               |
| MSES Wildlife Habitat (Special Least Concern Animal) | Cardwell Trail 18               |
| MSES Wildlife Habitat (Endangered or Vulnerable)     | Cardwell Trail 19               |
| Attie Falls Event Area Ring                          | Cardwell Trail 20               |
| Attie Falls Event Area / Car Park                    | Cardwell Trail 21               |
|  | Cardwell Trail 22               |
|  | Cardwell Trail 23               |
|  | Cardwell Trail 24               |
|  | Cardwell Trail 25               |

## Preliminary Ecological Constraints Analysis Cardwell Tropical Bike Trails

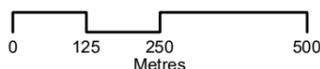
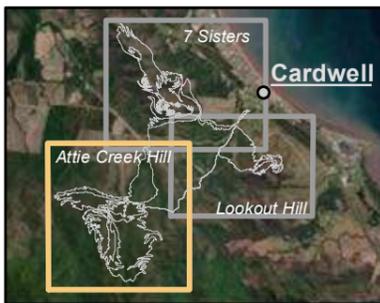
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## Appendix 2 – Likelihood of occurrence for threatened flora

Scientific Name	Common Name	Status		Latest Record	Habitat Description	Likelihood of Occurrence	Rational for Likelihood Ranking
		QLD <sup>1</sup>	AUS <sup>2</sup>				
<i>Comesperma praeclsum</i>	-	V	-	1978	This species is known only from two restricted localities, at Five Mile Creek to the south of Cardwell, and Hinchinbrook Island, where it occurs in tall dense shrubland and heathland communities (Wang 1995). One confirmed record (Wildnet; Biomaps) of this species occurs within 5km of the study area from 1978. This record is from the Five Mile Creek area.	Recorded	One record recorded within 5km, there was also suitable dense shrubland habitat mapped within the study area, making it likely that this species occurs in the study area.
<i>Drosera adela</i>	Lance-leaved Sundew	NT	-	1980	This sundew species (carnivorous) that occurs within a restrictive distribution, from Tully to Hinchinbrook Island in north Queensland. This species is known to occur along creek beds and moss-covered rocks along creeks in rainforest, open forest, mesophyll vine forest and in eucalypt forest (ATRP 2020). Two confirmed records (Biomaps) of this species occur within 5km of the study area, with the latest record from 1980.	Recorded	Two records recorded within 5km. There are also plenty of creeks within rainforest, open forest, vine forest and eucalypt forest mapped within the study area, making it likely that this species occurs in the study area.
<i>Eulophia bicallosa</i>	Green Corduroy Orchid	NT	-	1992	A terrestrial orchid species that grows in woodland and rainforests along the coast of Queensland, Northern Territory and the Kimberley region of Western Australia (Jones 2006). One confirmed record (Wildnet; Biomaps) of this species occurs within 5km of the study area from 1992.	Recorded	One record recorded within 5km. Suitable woodland/rainforest habitat was mapped within the study area, making it likely this species occurs.
<i>Genoplesium tectum</i>	Cardwell Midge Orchid	E	E	-	A deciduous terrestrial orchid with a single leaf, that grows as an individual or in small loose groups (Jones 1991). This species is known only from one vicinity, where it occurs in National Park near Sunday Creek, to the south of Cardwell (Jones 1991b). This species is recorded in scrub not far from the creek and is situated among dense sedges and low shrubs in woodland dominated by <i>Melaleuca viridiflora</i> (Dockrill 1969).	Possible	The study area was outside of the distribution that this species is currently found, however suitable habitat was mapped within the study area.
<i>Habernaria xanthantha</i>	Freak Rein Orchid	NT	-	1979	A terrestrial orchid species that grows in moist to wet woodlands, from Cape York, south to Proserpine in north Queensland (Jones 2006). One confirmed record (Wildnet; Biomaps) of this species occurs within 5km of the study area from 1979.	Recorded	One record recorded within 5km. Suitable woodland habitat containing moist creek environments mapped in the study area.

Scientific Name	Common Name	Status		Latest Record	Habitat Description	Likelihood of Occurrence	Rational for Likelihood Ranking
		QLD <sup>1</sup>	AUS <sup>2</sup>				
<i>Myrmecodia beccarii</i>	Ant Plant	V	V	2016	<p>This species is a bulbous epiphyte that has a special associated (mutualistic symbiosis) with the Golden Ant, <i>Philidris cordatus</i> which lives within the chambers of the tuber, and the Apollo Jewel Butterfly, <i>Hypochrysops apollo apollo</i> (listed as vulnerable under the NCA in Queensland) which lays its egg only on the tuber of this plant (Moss 2014).</p> <p>This species is known from coastal woodlands and mangroves between Ingham and Cooktown, in north Queensland (TSSC 2008a). Occurs in open woodland dominated by the following host trees: <i>Melaleuca viridiflora</i>, <i>Lophostemon suaveolens</i> or mangroves (Forster 2000). Seven confirmed records (Wildnet; Biomaps) of this species occur within 5km of the study area, with the latest record from 2016.</p>	Recorded	Suitable habitat containing the host species - <i>M. viridiflora</i> and <i>L. suaveolens</i> , occurs throughout the study area. Seven records have been recorded within 5km of the study area.
<i>Phaius australis</i>	Lesser Swamp Orchid	E	E	-	<p>A terrestrial orchid that occurs from northern NSW to Cairns in north Queensland. It is however rare in its northern region, with only 1 or 2 records and those populations thought to be destroyed (Benwell 1994).</p> <p>This species is commonly associated with coastal wet heath/sedgeland wetlands, swampy grassland or swampy forest (Barry 2005, NSW DECCW 2005)</p>	Unlikely	No suitable wetland habitat mapped in the study area. This species is also considered rare in north Queensland and is thought to have been destroyed from its last known populations in the north.
<i>Phaius pictus</i>	-	V	V	-	A terrestrial orchid that is known from Kirrama Range to the north of Cardwell, to the Bloomfield River, near Cooktown in north Queensland (TSSC 2008b). This species is restricted to rainforests from 0-600m elevation, in sheltered sites close to streams (TSSC 2008b).	Possible	The study area was slightly outside of the known distribution of this species, however suitable rainforest habitat was mapped in the study area.
<i>Tephrosia leveillei</i>	-	-	V	-	<i>Tephrosia leveillei</i> is a perennial herb that is only known from six locations from north of Townsville to Chillagoe in north Queensland (Queensland Herbarium 2008). It has been recorded in in <i>Eucalyptus</i> and <i>Corymbia</i> dominated woodlands (Queensland Herbarium 2008).	Possible	Study area is not located within a known location, however it borders on the edge of the region where habitat is likely to occur. There was also suitable <i>Eucalyptus</i> and

Scientific Name	Common Name	Status		Latest Record	Habitat Description	Likelihood of Occurrence	Rational for Likelihood Ranking
		QLD <sup>1</sup>	AUS <sup>2</sup>				
							<i>Corymbia</i> woodlands mapped in the study area, potentially providing suitable habitat.
<i>Zeuxine polygonoides</i>	Velvet Jewel Orchid	V	V	-	<i>Zeuxine polygonoides</i> is a miniature, deciduous, terrestrial orchid that grows amongst leaf litter in moist shady sites in rainforests and adjacent to streams. Altitude range for this species is 450-820m (Dockrill 1992). This species is known to occur from the Cardwell Range, north of Ingham, to Kuranda in north Queensland (Australian National Herbarium 2009, Queensland Herbarium 2009).	Likely	The study area is located within the known distribution area for this species. Suitable elevation and rainforest habitat was mapped in the Attie Creek Hill section for this species to potentially occur.

<sup>1</sup> Queensland Status (NC Act): CE = Critically Endangered, E = Endangered, V = Vulnerable, NT = Near Threatened, SLC = Special Least Concern, - = not protected under the NC Act.

<sup>2</sup> Australian Status (EPBC Act): CE = Critically Endangered, E = Endangered, V = Vulnerable - = not protected under the EPBC Act.

Note: Species considered unlikely to occur have been greyed out. - in latest records means not record exists for this species within 5km of the study area.

### Appendix 3 – Likelihood of occurrence for threatened fauna

Scientific Name	Common Name	Status		Latest Record	Habitat Description	Likelihood of Occurrence	Rational for Likelihood Ranking
		QLD <sup>1</sup>	AUS <sup>2</sup>				
<b>BIRDS</b>							
<i>Calidris canutus</i>	Red Knot	E	E	-	A migratory shorebird from Siberian, that spends the non-breeding season in Australia. This species migrates to the Australian coastline during summer. When in Australia, this species inhabits mudflats, sandflats and sandy beaches along sheltered coasts (TSSC 2016a).	Unlikely	This migratory bird is a shorebird that typically only inhabits the shoreline. This habitat does was not mapped within the study area.
<i>Calidris ferruginea</i>	Curlew Sandpiper	CE	CE	-	A migratory shorebird from Siberian, that spends the non-breeding season in Australia (during summer). This species occurs around the coast but has occasionally been observed inland. Some non-breeding birds stay in Australia during the typical breeding season. On the coast, this species inhabits intertidal mudflats, estuaries, bays, inlets as well as non-tidal swamps. When recorded inland, they have been observed around ephemeral and permanent lakes, dams, waterholes (TSSC 2015a).	Unlikely	This migratory shorebird typically only inhabits the shoreline, but occasional occurs near inland waters. Some seasonal watercourses exist in the study area, however it is unlikely these provide suitable long term habitat for this species
<i>Calidris tenuirostris</i>	Great Knot	CE	CE	1985	This migratory bird species from Siberia migrates to Australia during the summer months, in its non-breeding season. This species has been recorded throughout the entire Australian coast, with a few scattered records inland. It's typical habitat is sheltered coastal areas with large mudflats and sandflats (Higgins and Davies 1996). One confirmed record (Biomaps) of this species occurred within 5km during 1985.	Recorded within 5km but unlikely to occur within the study area	This migratory bird is a shorebird that typically only inhabits coastal shorelines. This habitat was not mapped within the study area. While this species has been recorded within 5km, these recordings were from shoreline areas.
<i>Casuaris casuaris johnsonii</i> (southern population)	Southern Cassowary	E	E	2019	The southern population of the Southern Cassowary is a large flightless bird that inhabits rainforests and associated vegetation communities within the Wet Tropics of north Queensland. The Wet Tropics extends from Ingham to Cooktown (Latch 2007). There have been 32 confirmed records (Biomaps) within 5km, with the latest record from 2019.	Recorded	Multiple records have been recorded within 5km. Rainforest habitat around Cardwell is known to support the Cassowary with their presence well known by locals, hence the study area is likely to support habitat for this species.
<i>Charadrius leschenaultii</i>	Greater Sand Plover	V	V	2011	A migratory shorebird from Mongolia and north-west China, that spends the non-breeding season in Australia, during the Australian summer. In Australia, this species is strictly coastal, inhabiting littoral and estuarine habitats (TSSC 2016b). Six confirmed records (Biomaps) of this species occur within 5km of the study area, with the latest record from 2011.	Recorded within 5km but unlikely to occur within the study area	This species was recorded within 5km however only from shoreline areas. This migratory shorebird typically only inhabits the shoreline and the study area

Scientific Name	Common Name		Status		Latest Record	Habitat Description	Likelihood of Occurrence	Rational for Likelihood Ranking
			QLD <sup>1</sup>	AUS <sup>2</sup>				
<i>Charadrius mongolus</i>	Lesser Plover	Sand	E	E	1999	A migratory shorebird from Siberia, Russia and Mongolia, that spends the non-breeding season in Australia, during the Australian summer. In Australia, this species is strictly coastal, preferring sandy beaches, mudflats, estuaries, sand-flats and dunes (TSSC 2016c). Three confirmed records (Biomaps) of this species occur within 5km of the study area, with the latest record from 1999.	Recorded within 5km but unlikely to occur within the study area	estuarine habitats, which do not occur in the study area.  While this species has been recorded within 5km, these recordings were from shoreline areas. This migratory bird is a shorebird that typically only inhabits the shoreline. This habitat was not mapped in the study area.
<i>Cyclopsitta diophthalma macleayana</i>	Macleay's Parrot	Fig-	V	-	2004	A rare subspecies that only occurs in rainforests from the Atherton Tablelands to Townsville in north Queensland (Simpson and Day 2010). Twelve confirmed records (Biomaps) of this species occur within 5km of the study area, with the latest record from 1999.	Recorded	Twelve records have been recorded within 5km. The study area is within the distribution range of this subspecies, and rainforest habitat was mapped in the study area making it likely this species occurs.
<i>Erythrotriorchis radiatus</i>	Red Goshawk		E	V	-	This species is a large hawk that inhabits coastal and sub-coastal open forests and woodlands, tropical savannahs traversed by forested rivers, edges of rainforest. This species rarely breeds in fragmented native vegetation and has a large home range for foraging (200km <sup>2</sup> ).  This species has a widespread distribution extending from mid coast NSW north to northern Western Australia and extending inland throughout Queensland and the Northern Territory (TSSC 2015b).	Possible	This species has a very wide distribution, though suitable woodland and rainforest habitat, and forested streams were mapped in the study area. Therefore, making it possible this species occurs.
<i>Esacus magnirostris</i>	Beach Stone-Curlew		V	-	2007	A shorebird that occurs on open undisturbed beaches, islands, reefs and intertidal sand and mudflats. It is distributed from Manning River in New South Wales, north along the coast through Queensland, Northern Territory to Onslow in Western Australia (Birdlife 2020). 8 confirmed records (Biomaps) of the Beach Stone-Curlew occur within 5km of the study area, with the latest record from 2007.	Recorded within 5km but unlikely to occur within the study area	While this species has been recorded within 5km, these recordings were from shoreline areas. This shorebird typically only inhabits the shoreline which does not occur within the study area. .
<i>Falco hypoleucos</i>	Grey Falcon		V	V	-	This medium sized raptor occurs in arid and semi-arid parts of Australia, and is often observed in timbered lowland plains, particularly acacia shrublands near vegetated watercourses.  This species has a large distribution and likely occurs over much of inland arid Australia but appears to be absent from coastal Cape York south to Victoria and across to southern Western Australia (TSSC 2020).	Unlikely	This species typically inhabits inland arid and semi-arid areas, and appears to be absent from coastal areas, including those in north Queensland where the study area is located.

Scientific Name	Common Name	Status		Latest Record	Habitat Description	Likelihood of Occurrence	Rational for Likelihood Ranking
		QLD <sup>1</sup>	AUS <sup>2</sup>				
<i>Fregatta grallaria grallaria</i>	White-bellied Storm-Petrel	-	V	-	A pelagic shorebird known to breed on small offshore islets and rocks in the Lord Howe Island Group (McAllan <i>et al.</i> 2004). Its pelagic distribution is however poorly understood and possibly extends north to the Coral Sea off Queensland and south to the Tasman Sea and New Zealand (Marchant and Higgins 1990).	Unlikely	This bird inhabits pelagic waters and islands and therefore unlikely to be observed.
<i>Hirundapus caudacutus</i>	White-throated Needletail	V	V	2008	A large swift that occurs over most types of habitat, but often in wooded areas, including open forest and rainforest. This species is widespread in eastern and south-eastern Australia where it has been recorded from the coast to inland areas west of the Great Dividing Range (TSSC 2019) Four confirmed records (Biomaps) of this species occur within 5km of the study area, with the latest record from 2008.	Recorded	Four records have been recorded within 5km of the study area. Also, rainforest and open forest habitat within the study area likely provides suitable habitat for this species.
<i>Limosa lapponica baueri</i>	Western Alaskan Bar-tailed Godwit	V	V	2011	A migratory shorebird that has a large global range with some spending the non-breeding season in Australia. This species has been recorded in coastal areas of all states, inhabiting mudflats, sandflats and sandy beaches (TSSC 2016d). Seven confirmed records (Biomaps) occur within 5km, with the latest record being from 2011.	Recorded within 5km but unlikely to occur within the study area	This species has been recorded within 5km, these were from shoreline areas. This migratory shorebird typically only inhabits the shoreline, which does not occur in the study area.
<i>Numenius madagascariensis</i>	Eastern Curlew	E	CE	2015	Australia's largest shorebird migrates from Russia and China to the Australian coastline during its non-breeding season which is winter. Commonly associated with sheltered coasts, estuaries and coastal lagoons, occasionally on beaches and coral reefs (TSSC 2015c). Six confirmed records (Biomaps) of this species occur within 5km of the study area, with the latest record being from 2015.	Recorded within 5km but unlikely to occur within the study area.	While this species has been recorded within 5km, these recordings were from shoreline areas. This migratory shorebird typically only inhabits the shoreline and estuaries, which does not occur in the study area.
<i>Poephila cincta cincta</i>	Southern Black Throated Finch	E	E	-	This finch has suffered dramatic population decline over the last decade, with only two general locations known to now support the species: Townsville region and scattered sites in central-eastern Queensland. This species occurs mainly in grassy, open forests, typically dominated by <i>Eucalyptus</i> , <i>Corymbia</i> and <i>Melaleuca</i> , and is always near a permanent water source especially during their breeding season (typically within 1.5km, and 400m when breeding; NRA 2007, SPRAT 2020a).	Unlikely	While suitable foraging and nesting habitat was mapped within the study area, it is considered unlikely to occur as this species is no longer known to occur north of the Townsville region.
<i>Rostratula australis</i>	Australian Painted Snipe	E	E	-	A wading bird that inhabits shallow freshwater wetlands both ephemeral and permanent throughout all States/Territories of Australia. It is most common throughout eastern Australia. The wetlands that it inhabits are typically associated with a good cover of grasses, rushes and reeds, with low scrub or open timber forest (TSSC 2013).	Unlikely	No suitable wetland areas were mapped within the study area to support this species.

Scientific Name	Common Name	Status		Latest Record	Habitat Description	Likelihood of Occurrence	Rational for Likelihood Ranking
		QLD <sup>1</sup>	AUS <sup>2</sup>				
<i>Turnix olivii</i>	Buff-breasted Button-quail	E	E	-	This species is a small bird that occurs in north Queensland, having been recorded from Ingham to Coen. This species inhabits short and sparse grasslands over rocky terrain, occasionally observed in rainforest and woodland with open spaces (Garnett and Crowley 2000).	Possible	Some grassland habitat was mapped in the study area. Should this habitat or sufficient open space within woodlands exist, it is possible this species occurs in the study area.
<i>Tyto novaehollandiae kimberli</i>	Masked Owl	V	V	-	A large owl found throughout from north Queensland to northern Western Australia (Garnett et al. 2011). This species has previously been recorded in riparian forest, rainforest, open forest, Melaleuca swamps and mangroves, and requires a large foraging area (SPRAT 2020b) and large hollowed trees for nesting (TSSC 2015d). This species has been recorded on four occasions in the Kennedy Valley from 2016-2020, approximately 13km to the north of the study area (Krunes 2021).	Likely	The study area contains suitable foraging and nesting habitat and is located within its known distribution. This species has also been recorded 13km from the study area and with the large foraging area this species requires it is likely it uses the study to forage and/or nest.
<b>FISH</b>							
<i>Stiphodon semoni</i>	Opal Cling Goby	-	CE	-	A small fish that is confined to a limited number of rainforest streams in for north-east Queensland. These streams have significant flow and direct access to marine habitats (Thuesen et al. 2009). This species has been recorded from tributaries of the Daintree, Mulgrave and Russell Rivers but it's possible distribution extends throughout all Wet Tropics rainforest streams that drain into estuaries (Ebner and Thuesen 2010).	Possible	While not having been recorded within or adjacent to the study area, suitable stream habitat was mapped throughout the study area.
<b>FROGS</b>							
<i>Litoria dayi</i>	Australian Lace-lid	V	V	-	This frog species is endemic to the Wet Tropics, originally extending from Paluma to Cooktown. It has however disappear from many upland sites throughout the Wet Tropics and is only occasionally recorded in some lowland areas (McDonald 1992; Richards et al. 1993). This frog species associates with rainforest and rainforest margins and prefers fast flowing rocky streams (Czechura et al. 1987).	Likely	The study area is within the historical distribution areas for this species, and suitable rainforest stream habitat was mapped within the study area.
<i>Litoria nyakalensis</i>	Mountain Mistfrog	CE	CE	-	This frog species is endemic to the Wet Tropics, originally extending from Cardwell to the Daintree in north Queensland. It has however disappeared and has not been recorded since 1990 (Richards et al. 1993). This frog species is known from upland rainforest and wet sclerophyll forest along fast flowing streams with riffles (McDonald 1992).	Possible	While this species has not been recorded since 1990, the study area is within the historical distribution area, and suitable rainforest stream habitat was mapped making it possible for this species to occur.

Scientific Name	Common Name	Status		Latest Record	Habitat Description	Likelihood of Occurrence	Rational for Likelihood Ranking
		QLD <sup>1</sup>	AUS <sup>2</sup>				
<b>INSECTS</b>							
<i>Hypochrysops apollo apollo</i>	Apollo Jewel (Wet Tropics subspecies)	V	-	1995	A medium sized butterfly that is restricted to coastal areas adjacent to the Wet Tropics from Cooktown to Ingham. This species is usually observed in Melaleuca woodland and wetlands, where the larval food plants, <i>Mymecodia beccarii</i> , occur (Moss 2014). Six confirmed records (Wildnet: Biomaps) of this species occur within 5km of the study area, with the latest record being from 1995.	Recorded	This species has been recorded within 5km. The study area is located within its known distribution and suitable habitat containing the food plant's host species - <i>M. viridiflora</i> and <i>L. suaveolens</i> was mapped the study area making it likely this species occurs.
<b>MAMMALS</b>							
<i>Balaenoptera musculus</i>	Blue Whale	-	E		A whale species with a widespread distribution throughout the coastal waters of Australia where it migrates to feed, breed and calving during the Australian summer (Branch 2007).	Unlikely	The study area is located more than 700m from the shoreline and will have no impacts on coastal waters in which these whales inhabit.
<i>Dasyurus hallucatus</i>	Northern Quoll	-	E	-	This species occurs from south of Rockhampton to Weipa in north Queensland (McGoldrick 2013). Occupies a range of habitat including rocky areas, eucalypt forest and woodlands, rainforests, sandy lowlands and beaches, shrubland, grasslands and desert (TSSC 2005). This species however, requires some form of rocky area for denning purposes with surrounding vegetated habitats used for foraging (SPRAT 2020h).	Likely	The study area is located within its known distribution and it is likely the suitable rocky areas exist for this species to den within the study area.
<i>Dasyurus maculatus gracilis</i>	Spotted-tailed Quoll	E	E	1920	This species historically occurred from Paluma to Cooktown in north Queensland but is now thought to be confined to two population areas: Windsor and Carbine Tablelands, and the Atherton Tablelands. It is known from upland closed forests, lowland notophyll, mesophyll and wet sclerophyll forests (Long and Nelson 2010). Dens have been found in tree hollows, logs and rock crevices (Qld DERM 2006). Two confirmed records (Biomaps) of this species occur within 5km of the study area, with the latest record being from 1920.	Recorded	This species was recorded two times within 5km, however these date back to 1920. This species is thought to now be confined in areas outside of the study area. While this is the case, the study area does contain suitable habitat and potentially den sites making it possible this species occurs
<i>Dugong dugon</i>	Dugong	V	-	1999	A large mammal found in tropical and subtropical coastal waters. Distribution is from the Queensland/New South Wale border, north through Queensland, Northern Territory and south to Shark Bay in Western Australia (DAWE 2020). This species has been recorded three times within 5km, with the latest record being from 1999.	Recorded within 5km but unlikely to occur within the study area.	While this species has been recorded within 5km, these were from marine waters. This marine species inhabits shallow coastal waters, which does not occur in the study area.

Scientific Name	Common Name	Status		Latest Record	Habitat Description	Likelihood of Occurrence	Rational for Likelihood Ranking
		QLD <sup>1</sup>	AUS <sup>2</sup>				
<i>Hipposideros diadema reginae</i>	Diadem Leaf-nosed Bat	NT	-	2003	This bat species is known from Cape York south to Townsville, and inland to Chillagoe. It occurs in a variety of habitat including lowland rainforest, Melaleuca forests, eucalypt woodland, vine thicket and open woodland, with roosts having been observed in large caves with large chambers, high domed ceilings and multiple entrances (Hourigan 2011a). This species has been recorded (Biomaps) on three occasions within 5km of the study, with the latest record being from 2003.	Recorded	This species has been recorded within 5km of the study area. The study area overlaps with the distribution of this species, and suitable habitat was mapped within the study area making it likely this species exists within the study area.
<i>Hipposideros semoni</i>	Semon's Leaf-nosed Bat	E	V	-	This species distribution is from Cape York to just south of Cooktown, though the southern limit remains unclear. This species mainly inhabits rainforests, monsoon forest, wet sclerophyll forest and open savannah woodland. Daytime roosts include tree hollows, road culverts and shallow caves amongst granite boulders or in fissures (Churchill 2009).	Possible	While the study area is outside of the current distribution area, suitable rainforest and woodland habitat was mapped throughout the study area for this species to possibly occur.
<i>Macroderma gigas</i>	Ghost Bat	E	V	-	The species current range is discontinuous with coastal and near coastal populations in Queensland known from Cape York to Rockhampton. In coastal areas they typically inhabit tropical savanna woodland and rainforests. This species requires large caves or rock crevices for roosting (TSSC 2016e).	Likely	The study area is located within its known distribution and it is likely the suitable caves or large rock crevices exist within the rainforest and woodland areas of the study area.
<i>Megaptera novaeangliae (eastern population)</i>	Humpback Whale	V	V	-	A whale species that annually migrates along the east coast of Australia and have been known to extend past the tip of Cape York. Migration in Australian waters occur during winter and spring months to breed and calve (Dawbin 1966).	Unlikely	The study area is located more than 700m from marine waters
<i>Mesembriomys gouldii rattoides</i>	Black-footed Tree-rat	-	V	2000	This nocturnal mammal exists in eucalypt forests, where hollows for dens are plentiful. It is not known from rainforest habitats. Diet comprises mostly of fruit, including from <i>Pandanus spiralis</i> (Rankmore and Friend 2008). This species has been recorded around Mareeba, with records scattered sparsely across Cape York, however actual distribution is poorly known (TSSC 2015e). One record (Biomaps) occurred within 5km in the Edmund Kennedy National Park in 2000.	Recorded	One record has been recorded within 5km. Also, suitable forest and woodland was mapped within the study area potentially providing suitable habitat for this species.
<i>Orcaella heinsohni</i>	Australian Snubfin Dolphin	V	-	1997	A slow-moving dolphin species that is restricted to coastal and estuarine waters from the Brisbane River, north throughout Queensland, Northern Territory to Onslow in Western Australia (Menkhorst and Knight 2011). This species has been recorded (confirmed records) seven times within 5km of the study area, with the latest record being from 1997.	Recorded within 5km but unlikely to occur within the study area.	While this species has been recorded within 5km, these were from marine waters. This marine species inhabits coastal waters, which does not occur within the study area.

Scientific Name	Common Name	Status		Latest Record	Habitat Description	Likelihood of Occurrence	Rational for Likelihood Ranking
		QLD <sup>1</sup>	AUS <sup>2</sup>				
<i>Petauroides volans</i>	Greater Glider	V	V	-	This glider species is restricted to eastern Australia, from the Daintree in north Queensland to central Victoria. This species has been recorded at elevations from 0 – 1200m. This species is nocturnal and arboreal and is mostly observed in eucalypt forests and woodlands (TSSC 2016f).	Likely	The study area is located within known distribution areas and suitable eucalypt forest and woodlands were mapped in the study area.
<i>Petaurus gracilis</i>	Mahogany Glider	E	E	2009	This glider species is restricted to the southern Wet Tropics, from the Hull River near Tully to Ollera Creek, south of Ingham in north Queensland. This species has been recorded in elevations lower than 120m and is highly mobile and requires vast areas of open forest or woodland to move freely (Parsons and Latch 2007). This species has been recorded (Biomaps) on eight occasions within 5km of the study, with the latest record being from 2009.	Recorded	The study area is located within known distribution areas and suitable open forests and two REs (RE7.3.21 and RE7.3.25) known to be associated with this species were mapped in the study area (Parsons and Latch 2007). This species has also been recorded on multiple occasions within 5km making it likely this species occurs in the study area.
<i>Phascolarctos cinereus</i>	Koala	-	V	-	Historically the range for the Koala extended from the Wet Tropics to the south-east corner of South Australia. In the northern part of the range (Wet Tropics), there are no published population size estimates. Some anecdotal reports of Koala sightings have arisen but being uncommon this suggests very low densities (Gordon et al. 2006). Koalas typically inhabit forests and semi-arid vegetation communities dominated by <i>Eucalyptus</i> species (Martin and Handasyde 1999).	Possible	Sightings of Koalas in the Wet Tropics are uncommon, and MSES koala habitat was not mapped for the study area, however it is in the historical range, and suitable habitat was mapped in the study area making it possible this species occurs.
<i>Pteropus conspicillatus</i>	Spectacled Flying-fox	E	E	2003	This species occurs north of Cardwell in Queensland. Historical records however extend as far south as Brisbane. This species occurs in rainforest, with camps located in or near rainforest areas (Richards 1990). Foraging however, can occur in many vegetation types including mangroves, forests, gardens and orchards (Dennis 2012). This species was recorded on one occasion within 5km in 2003 (Biomaps).	Recorded	This species was recorded on one occasion within 5km, the study area is also located within the known distribution area and suitable rainforest habitat was mapped throughout the study area.
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	-	V	-	Australia's only endemic flying-fox, that occurs from Rockhampton to Victoria (Tidemann 1998). Historically it was recorded in northern Queensland, with the last known recorded in 1912 (Anderson 1912). This species occurs in rainforest, open and closed forests, <i>Melaleuca</i> swamps and Banksia woodlands (Duncan et al. 1999). Roosts occur in vegetation and are typically located near water (van der Ree et al. 2005)	Possible	While this species is thought to be confined in areas outside of the study area, the study area is located within its historical distribution and suitable habitat was mapped within the study area.

Scientific Name	Common Name	Status		Latest Record	Habitat Description	Likelihood of Occurrence	Rational for Likelihood Ranking
		QLD <sup>1</sup>	AUS <sup>2</sup>				
<i>Rhinolophus robertsi</i>	Large-eared Horseshoe Bat	-	V	-	A bat species occurs only in northern Queensland from the Iron Range to Townsville and west to Chillagoe (Pavey and Kutt 2008). This species occurs in lowland rainforest, along gallery forest-lined creeks within open eucalypt forest, <i>Melaleuca</i> forest with rainforest understory, open savannah woodland and tall riparian woodland (Churchill 2009). Roosts have been observed in caves, road culverts, basal hollows of large trees, dense vegetation, rock piles and creek banks (Churchill 2009)	Likely	The study area is located within this species' known distribution and suitable habitat was mapped throughout the study area.
<i>Saccolaimus saccolaimus nudicluniatus</i>	Bare-rumped Sheath-tailed Bat	E	V	2003	This bat occurs in north-eastern Queensland. This species has been recorded mostly in Eucalyptus forests and woodlands, generally near coastal areas, and can be associated with coastal lowland rainforests. Roosts have been observed in deep tree hollows (TSSC 2016g). This species was recorded on one occasion within 5km in 2003 (Biomaps).	Recorded	This species was recorded within 5km, the study area is located within known distribution areas and suitable habitat was mapped making it likely this species occurs.
<i>Taphozous australis</i>	Coastal Sheath-tail Bat	NT	-	2003	This bat occurs along the coast of Queensland from Cape York to Rockhampton. It typically prefers sea caves and rocky clefts to roost, and forages above the canopy in coastal dune scrubland, <i>Melaleuca</i> swamps, open eucalypt forests, grasslands and mangroves. (Hourigan 2011b). This species has been recorded (Biomaps) on one occasion within 5km of the study area in 2003.	Recorded	This species was recorded within 5km, the study area overlaps with the distribution and suitable foraging habitat was mapped making it likely this species occurs.
<i>Xeromys myoides</i>	False Water-rat	V	V	-	A small native rodent that inhabits sedgeland, wet heathland, saltmarsh grassland and mangroves (SPRAT 2020i). This species has been found in two separate areas - the Northern Territory, and central to southern Queensland. It is likely that this species (perhaps historically) occurred throughout the northern coastal parts of Queensland as well.	Unlikely	The study area does not overlap with any mangrove environments, therefore it is unlikely that suitable habitat occurs should it actually exist within northern Queensland.
<b>REPTILES</b>							
<i>Caretta caretta</i>	Loggerhead Turtle	E	E	-	A marine turtle species, that nests on open sandy beaches throughout all of Australia. Nesting occurs November to March (SPRAT 2020j).	Unlikely	The study area is located more than 700m from the shoreline, hence this species is unlikely to occur.
<i>Chelonia mydas</i>	Green Turtle	V	V	2019	A marine turtle species, that nests on coastal beaches throughout all of Australia, above the high tide mark and occasionally in the dune behind the beach. Nesting occurs October to March (SPRAT 2020c). This species has been recorded (confirmed records) on four occasions within 5km of the study area, with the latest record being from 2019.	Recorded within 5km but unlikely to occur within the study area.	While this species was recorded within 5km, these were from marine or shoreline areas. The study area is located more than 700m from the shoreline, hence it's unlikely to occur.

Scientific Name	Common Name	Status		Latest Record	Habitat Description	Likelihood of Occurrence	Rational for Likelihood Ranking
		QLD <sup>1</sup>	AUS <sup>2</sup>				
<i>Crocodylus porosus</i>	Estuarine Crocodile	V	-	2020	The estuarine crocodile is found in coastal marine environments, and occasionally in freshwater systems where they are connected to saltwater and have sufficient deep water. The typically distribution is from Gladstone in Queensland, north through coastal environments of Queensland, Northern Territory to Broome in Western Australia (Australian Museum 2020). This species was recorded (Biomaps) on five occasions within 5km, with the latest record being from 2020.	Recorded within 5km but unlikely to occur within the study area.	While this species was recorded within 5km, these were from marine or shoreline areas. The study area is located more than 700m from the shoreline, and estuaries hence it's unlikely to occur
<i>Dermochelys coriacea</i>	Leatherback Turtle	E	E	-	A marine turtle species, that nests on coastal beaches throughout all of Australia, above the high tide mark and occasionally in the dune behind the beach (TSSC 2008c). Nesting occurs between December and January in Australia (SPRAT 2020d)	Unlikely	The study area is located more than 700m from the shoreline, hence this species is unlikely to occur.
<i>Eretmochelys imbricata</i>	Hawksbill Turtle	E	V	-	A marine turtle species, that nests on coastal beaches from Victoria, north through Queensland and across to northern Western Australia. Nests occur above the high tide mark and occasionally in dunes behind the beach. (SPRAT 2020e)	Unlikely	The study area is located more than 700m from the shoreline, hence this species is unlikely to occur.
<i>Lepidochelys olivacea</i>	Pacific Ridley Turtle	E	E	-	A marine turtle species, that nests on coastal beaches, above the high tide mark and occasionally in the dune behind the beach. Nesting occurs between March to October in northern Australia (SPRAT 2020f)	Unlikely	The study area is located more than 700m from the shoreline, hence this species is unlikely to occur.
<i>Natator depressus</i>	Flatback Turtle	V	V	-	A marine turtle species, that nests on coastal beaches, above the high tide mark and occasionally in the dune behind the beach. Nesting can occur throughout the year, with most nesting occurring between June and August in northern Australia (SPRAT 2020g)	Unlikely	The study area is located more than 700m from the shoreline, hence this species is unlikely to occur.
<b>SHARKS</b>							
<i>Carcharodon carcharias</i>	White Shark	-	V	-	This shark species has been recorded off coastal waters from central Queensland, around the south coast of Australia to north-west Western Australia but may occur around northern Australian coasts (Last and Stevens 2009)(Last and Stevens 1994).	Unlikely	The study area is located more than 700m from marine waters, hence this species is unlikely to occur.
<i>Pristis pristis</i>	Freshwater Sawfish	-	V	-	The Freshwater Sawfish is a member of the Ray family. It has been recorded in river and estuarine environments, and up to 100km offshore, where it inhabits the sandy or muddy bottom environment (TSSC 2014a).	Unlikely	The study area is located more than 700m from marine waters and estuaries, hence this species is unlikely to occur.

Scientific Name	Common Name	Status		Latest Record	Habitat Description	Likelihood of Occurrence	Rational for Likelihood Ranking
		QLD <sup>1</sup>	AUS <sup>2</sup>				
<i>Pristis zijsron</i>	Green Sawfish	-	V	-	The Green Sawfish is a member of the Ray family. It occurs in river and estuarine environments as well as inshore marine waters, where it inhabits the sandy or muddy bottom environment (SPRAT 2020k).	Unlikely	The study area is located more than 700m from marine waters and estuaries, hence this species is unlikely to occur.
<i>Rhincodon typus</i>	Whale Shark	-	V	-	The Whale Shark can occur in waters off all coasts of Australia but most common off northern Western Australia, Northern Territory and Queensland (Last and Stevens 1994)	Unlikely	The study area is located more than 700m from marine waters, hence this species is unlikely to occur.

<sup>1</sup>Queensland Status (NC Act): CE = Critically Endangered, E = Endangered, V = Vulnerable, NT = Near Threatened, SLC = Special Least Concern, - = not protected under the NC Act.

<sup>2</sup>Australian Status (EPBC Act): CE = Critically Endangered, E = Endangered, V = Vulnerable - = not protected under the EPBC Act.

Note: Species considered unlikely to occur have been greyed out. - in latest records means not record exists for this species within 5km of the study area.

## Appendix 4 – Migratory species (EPBC Act and special least concern under the NC Act)

Scientific Name	Common Name	Database <sup>1</sup>			Latest Record
		BIOMAPS	WO	PMST	
<b>MARINE BIRDS</b>					
<i>Anous stolidus</i>	Common Noddy	✓		✓	1972 (1)
<i>Apus pacificus</i>	Fork-Tailed Swift			✓	-
<i>Fregata ariel</i>	Lesser Frigatebird			✓	-
<i>Fregata minor</i>	Great Frigatebird			✓	-
<i>Gelochelidon nilotica</i>	Gull-billed Tern	✓			2000 (5)
<i>Hydroprogone caspia</i>	Caspian Tern	✓			2016 (10)
<i>Sternula albifrons</i>	Little Tern			✓	
<i>Sterna dougallii</i>	Roseate Tern	✓			2007 (1)
<i>Thalasseus bergii</i>	Crested Tern	✓			2016 (9)
<b>MARINE SPECIES</b>					
<i>Anoxypristis cuspidata</i>	Narrow Sawfish			✓	-
<i>Balaenoptera edeni</i>	Bryde's Whale			✓	-
<i>Balaenoptera musculus</i>	Blue Whale			✓	-
<i>Carcharhinus longimanus</i>	Oceanic Whitetip Shark			✓	-
<i>Carcharodon carcharias</i>	White Shark			✓	-
<i>Caretta caretta</i>	Loggerhead Turtle			✓	-
<i>Chelonia mydas</i>	Green Turtle	✓	✓	✓	2019 (4)
<i>Crocodylus porosus</i>	Estuarine Crocodile	✓		✓	2020 (5)
<i>Dermochelys coriacea</i>	Leatherback Turtle			✓	-
<i>Dugong dugon</i>	Dugong	✓		✓	1999 (3)
<i>Eretmochelys imbricata</i>	Hawksbill Turtle			✓	-
<i>Lamna nasus</i>	Mackerel Shark			✓	-
<i>Lepidochelys olivacea</i>	Olive Ridley Turtle			✓	-
<i>Manta alfredi</i>	Reef Manta Ray			✓	-
<i>Manta birostris</i>	Giant Manta Ray			✓	-
<i>Megaptera novaengliae</i>	Humpback Whale			✓	-
<i>Natator depressus</i>	Flatback Turtle			✓	-
<i>Orcaella heinsohni</i>	Australian Snubfin Dolphin	✓		✓	1997 (7)
<i>Orcinus orca</i>	Killer Whale			✓	-
<i>Pristis pristis</i>	Freshwater Sawfish			✓	-
<i>Pristis zijsron</i>	Green Sawfish			✓	-
<i>Rhincodon typus</i>	Whale Shark			✓	-
<i>Sousa chinensis</i>	Indo-Pacific Humpback Dolphin			✓	-
<b>TERRESTRIAL SPECIES</b>					
<i>Cuculus optatus</i>	Oriental Cuckoo	✓		✓	2003 (2)
<i>Hirundapsus caudacutus</i>	White-throated Needletail	✓	✓	✓	2008 (4)
<i>Hirundo rustica</i>	Barn Swallow			✓	-
<i>Monarcha melanopsis</i>	Black-faced Monarch	✓		✓	2003 (6)
<i>Monarcha trivirgatus</i>	Spectacled Monarch	✓		✓	2014 (31)

Scientific Name	Common Name	Database <sup>1</sup>			Latest Record
		BIOMAPS	WO	PMST	
<i>Motacilla cinerea</i>	Grey Wagtail			✓	-
<i>Motacilla flava</i>	Yellow Wagtail			✓	-
<i>Myiagra cyanoleuca</i>	Satin Flycatcher	✓		✓	1999 (1)
<i>Rhipidura rufifrons</i>	Rufous Fantail	✓		✓	2014 (27)
<b>WETLAND SPECIES</b>					
<i>Actitis hypoleucos</i>	Common Sandpiper	✓		✓	2007 (3)
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper			✓	-
<i>Calidris canutus</i>	Red Knot			✓	-
<i>Calidris ferruginea</i>	Curlew Sandpiper			✓	-
<i>Calidris melanotos</i>	Pectoral Sandpiper			✓	-
<i>Calidris ruficolis</i>	Red-necked Stint	✓			2001 (3)
<i>Charadrius laschenaultii</i>	Greater Sand Plover	✓		✓	2011 (6)
<i>Charadrius mongolus</i>	Lesser Sand Plover	✓		✓	1999 (3)
<i>Gallinago hardwickii</i>	Latham's Snipe			✓	-
<i>Gallinago megala</i>	Swinhoe's Snipe			✓	-
<i>Gallinago stenura</i>	Pin-tailed Snipe			✓	-
<i>Limosa lapponica</i>	Bar-tailed Godwit			✓	-
<i>Numenius madagascariensis</i>	Eastern Curlew	✓	✓	✓	2015 (6)
<i>Numenius minutus</i>	Little Curlew			✓	-
<i>Numenius phaeopus</i>	Whimbrel	✓		✓	2016 (11)
<i>Pandion haliaetus</i>	Osprey			✓	-
<i>Plegadis falcinellus</i>	Glossy Ibis	✓			2000 (3)
<i>Pluvialis fulva</i>	Pacific Golden Plover	✓			2011 (6)
<i>Pluvialis squatarola</i>	Grey Plover			✓	-
<i>Tringa brevipes</i>	Grey-tailed Tattler	✓		✓	2011 (7)
<i>Tringa nebularia</i>	Common Greenshank	✓		✓	2002 (2)
<i>Xenus cinereus</i>	Terek Sandpiper	✓		✓	1995 (1)

<sup>1</sup>Database: WO = Wildlife Online, PMST = Protected Matters Search Tool.

Note - Numbers in brackets represent the number of records for that species. - in latest records means not record exists for this species within 5km of the study area.

## Appendix 5 – Database Search Reports

Report 1: Wildlife Online Report

Report 2: Biomaps

Report 3: Protected Matters Search Report



# Queensland Government

## Wildlife Online Extract

Search Criteria: Species List for a Specified Point

Species: All

Type: Native

Status: Rare and threatened species

Records: All

Date: All

Latitude: -18.2835

Longitude: 146.0034

Distance: 5

Email: emily@trendecology.com.au

Date submitted: Wednesday 27 Jan 2021 13:39:57

Date extracted: Wednesday 27 Jan 2021 13:40:02

The number of records retrieved = 14

### **Disclaimer**

As the DSITIA is still in a process of collating and vetting data, it is possible the information given is not complete. The information provided should only be used for the project for which it was requested and it should be appropriately acknowledged as being derived from Wildlife Online when it is used.

The State of Queensland does not invite reliance upon, nor accept responsibility for this information. Persons should satisfy themselves through independent means as to the accuracy and completeness of this information.

No statements, representations or warranties are made about the accuracy or completeness of this information. The State of Queensland disclaims all responsibility for this information and all liability (including without limitation, liability in negligence) for all expenses, losses, damages and costs you may incur as a result of the information being inaccurate or incomplete in any way for any reason.

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Apodidae	<i>Hirundapus caudacutus</i>	white-throated needletail		V	V	2
animals	birds	Burhinidae	<i>Esacus magnirostris</i>	beach stone-curlew		V		4
animals	birds	Casuariidae	<i>Casuarus casuarius johnsonii</i> (southern population)	southern cassowary (southern population)		E	E	4
animals	birds	Psittacidae	<i>Cyclopsitta diophthalma macleayana</i>	Macleay's fig-parrot		V		6/4
animals	birds	Scolopacidae	<i>Numenius madagascariensis</i>	eastern curlew		E	CE	2/1
animals	birds	Scolopacidae	<i>Limosa lapponica baueri</i>	Western Alaskan bar-tailed godwit		V	V	2/1
animals	insects	Lycaenidae	<i>Hypochrysops apollo apollo</i>	Apollo jewel (Wet Tropics subspecies)		V		5
animals	mammals	Delphinidae	<i>Orcaella heinsohni</i>	Australian snubfin dolphin		V		1
animals	mammals	Dugongidae	<i>Dugong dugon</i>	dugong		V		1
animals	mammals	Petauridae	<i>Petaurus gracilis</i>	mahogany glider		E	E	2
animals	reptiles	Cheloniidae	<i>Chelonia mydas</i>	green turtle		V	V	4
animals	reptiles	Crocodylidae	<i>Crocodylus porosus</i>	estuarine crocodile		V		4
plants	land plants	Polygalaceae	<i>Comesperma praecelsum</i>			V		1/1
plants	land plants	Rubiaceae	<i>Myrmecodia beccarii</i>			V	V	6

#### CODES

I - Y indicates that the taxon is introduced to Queensland and has naturalised.

Q - Indicates the Queensland conservation status of each taxon under the *Nature Conservation Act 1992*. The codes are Extinct in the Wild (PE), Endangered (E), Vulnerable (V), Near Threatened (NT), Least Concern (C) or Not Protected ( ).

A - Indicates the Australian conservation status of each taxon under the *Environment Protection and Biodiversity Conservation Act 1999*. The values of EPBC are Conservation Dependent (CD), Critically Endangered (CE), Endangered (E), Extinct (EX), Extinct in the Wild (XW) and Vulnerable (V).

Records – The first number indicates the total number of records of the taxon for the record option selected (i.e. All, Confirmed or Specimens).

This number is output as 99999 if it equals or exceeds this value. The second number located after the / indicates the number of specimen records for the taxon.

This number is output as 999 if it equals or exceeds this value.

# WildNet Records

## Conservation Significant Species List

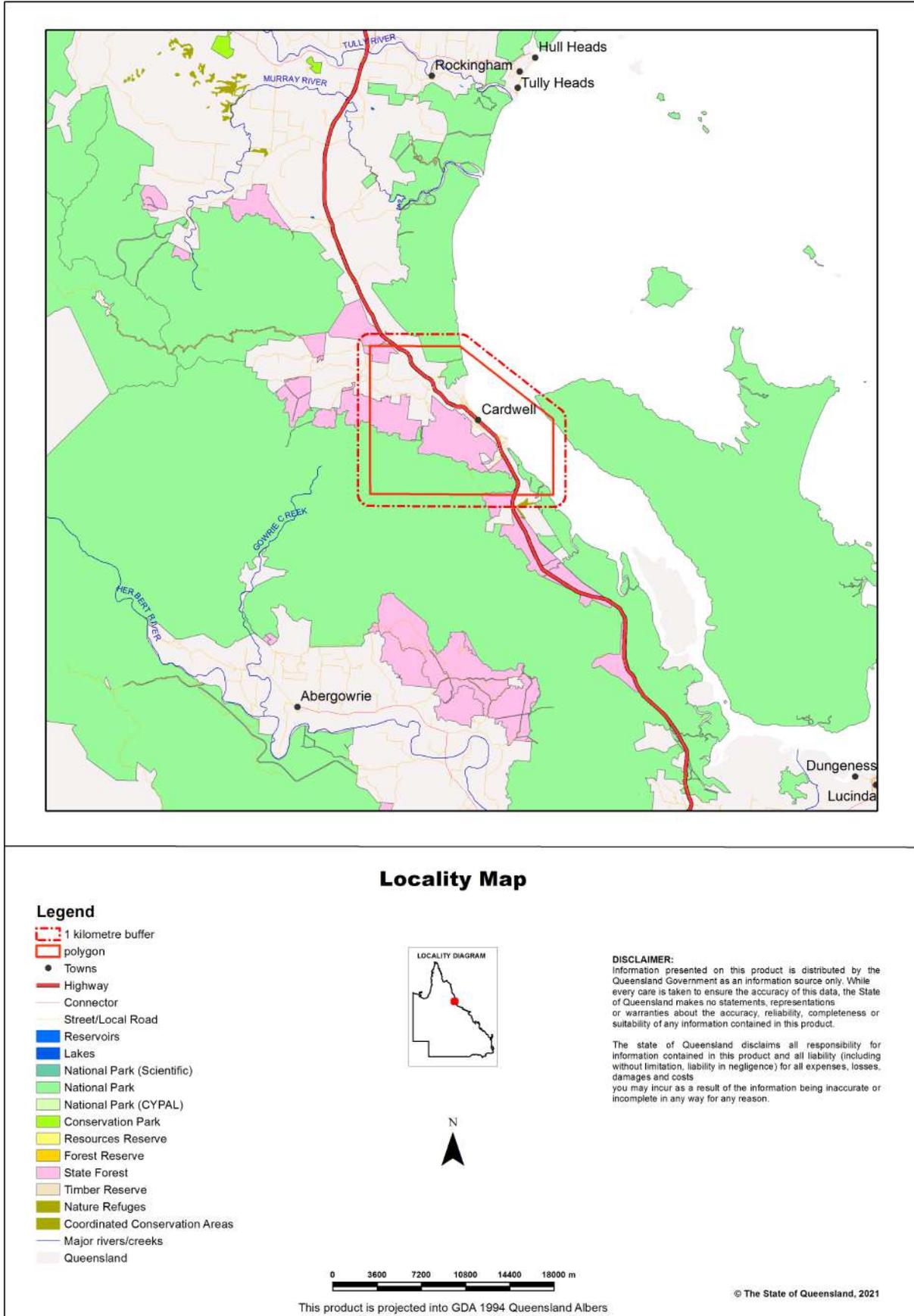


For the selected area of interest 15857.08ha

Current as at 30/01/2021

WildNetCSspecieslist

### Map 1. Locality Map



## Summary Information

The following table provides an overview of the area of interest .

**Table 1. Area of interest details**

Size (ha)	15,857.08
Local Government(s)	Cassowary Coast Regional
Bioregion(s)	Wet Tropics
Subregion(s)	Kirrama - Hinchinbrook, Tully
Catchment(s)	Herbert, Murray, Hinchinbrook Island

### Protected Area(s)

The following estates and/or reserves are located in the area of interest:

Hinchinbrook Island National Park

Girringun National Park

Cardwell State Forest

Girramay National Park

### World Heritage Area(s)

The following World Heritage Areas are located in the area of interest:

Great Barrier Reef

Wet Tropics of  
Queensland

### Ramsar Area(s)

No Ramsar Areas are located within the area of interest.

## Conservation Significant Species List

### Introduction

This Conservation Significant Species List report is derived only from records from the WildNet database managed by the Department of Environment and Science. Other data sources may provide additional information on species occurrence.

Conservation significant species are species listed:

- as [threatened](#) or near threatened under the Nature Conservation Act 1992;
- as threatened under the [Environment Protection and Biodiversity Conservation Act 1999](#) or
- [migratory species](#) protected under the following international agreements:
  - o Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention)
  - o China-Australia Migratory Bird Agreement
  - o Japan-Australia Migratory Bird Agreement
  - o Republic of Korea-Australia Migratory Bird Agreement

The WildNet dataset is constantly being enhanced and the taxonomic and status information revised. If a species does not occur in the report, it does not mean it doesn't occur there and listed species may also no longer inhabit the area.

Table 2 lists the species recorded within the area of interest and its one kilometre buffer.

**Table 2. Conservation significant species recorded within the area of interest and its one kilometre buffer**

Taxon Id	Kingdom	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
1702	Animalia	Aves	Accipitridae	<i>Pandion cristatus</i>	eastern osprey	SL	None	1	13	19/10/2007

Taxon Id	Kingdom	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
1971	Animalia	Aves	Apodidae	<i>Hirundapus caudacutus</i>	white-throated needletail	V	V	0	4	23/02/2008
1958	Animalia	Aves	Burhinidae	<i>Esacus magnirostris</i>	beach stone-curlew	V	None	0	8	13/11/2007
1087	Animalia	Aves	Casuariidae	<i>Casuarius casuarius johnsonii</i> (southern population)	southern cassowary (southern population)	E	E	0	32	02/07/2019
1948	Animalia	Aves	Charadriidae	<i>Charadrius leschenaultii</i>	greater sand plover	V	V	4	6	05/11/2011
1936	Animalia	Aves	Charadriidae	<i>Charadrius mongolus</i>	lesser sand plover	E	E	1	3	24/11/1999
1944	Animalia	Aves	Charadriidae	<i>Pluvialis fulva</i>	Pacific golden plover	SL	None	4	6	05/11/2011
1736	Animalia	Aves	Cuculidae	<i>Cuculus optatus</i>	oriental cuckoo	SL	None	1	2	17/01/2003
1916	Animalia	Aves	Laridae	<i>Anous stolidus</i>	common noddy	SL	None	0	1	09/01/1972
1886	Animalia	Aves	Laridae	<i>Gelochelidon nilotica</i>	gull-billed tern	SL	None	1	5	18/07/2000
1896	Animalia	Aves	Laridae	<i>Hydroprogne caspia</i>	Caspian tern	SL	None	2	10	08/11/2016
1897	Animalia	Aves	Laridae	<i>Sterna dougallii</i>	roseate tern	SL	None	0	1	17/10/2007
1895	Animalia	Aves	Laridae	<i>Thalasseus bergii</i>	crested tern	SL	None	0	9	08/11/2016
1595	Animalia	Aves	Monarchidae	<i>Monarcha melanopsis</i>	black-faced monarch	SL	None	4	6	17/01/2003
1599	Animalia	Aves	Monarchidae	<i>Myiagra cyanoleuca</i>	satin flycatcher	SL	None	0	1	18/07/1999
1597	Animalia	Aves	Monarchidae	<i>Symposiachrus trivirgatus</i>	spectacled monarch	SL	None	2	31	04/08/2014
1165	Animalia	Aves	Psittacidae	<i>Cyclopsitta diophthalma macleayana</i>	Macleay's fig-parrot	V	None	9	12	26/05/2004
1578	Animalia	Aves	Rhipiduridae	<i>Rhipidura rufifrons</i>	rufous fantail	SL	None	2	27	04/08/2014
1885	Animalia	Aves	Scolopacidae	<i>Actitis hypoleucos</i>	common sandpiper	SL	None	0	3	24/09/2007
1880	Animalia	Aves	Scolopacidae	<i>Calidris ruficollis</i>	red-necked stint	SL	None	0	3	25/11/2001
1856	Animalia	Aves	Scolopacidae	<i>Calidris tenuirostris</i>	great knot	CR	CE	0	1	19/10/1985
1867	Animalia	Aves	Scolopacidae	<i>Limosa lapponica baueri</i>	Western Alaskan bar-tailed godwit	V	V	1	7	05/11/2011
1843	Animalia	Aves	Scolopacidae	<i>Numenius madagascariensis</i>	eastern curlew	E	CE	1	6	16/12/2015
1845	Animalia	Aves	Scolopacidae	<i>Numenius phaeopus</i>	whimbrel	SL	None	1	11	08/11/2016
1860	Animalia	Aves	Scolopacidae	<i>Tringa brevipes</i>	grey-tailed tattler	SL	None	1	7	05/11/2011
1853	Animalia	Aves	Scolopacidae	<i>Tringa nebularia</i>	common greenshank	SL	None	0	2	09/03/2002
1827	Animalia	Aves	Scolopacidae	<i>Xenus cinereus</i>	terek sandpiper	SL	None	0	1	27/10/1995
1825	Animalia	Aves	Threskiornithidae	<i>Plegadis falcinellus</i>	glossy ibis	SL	None	0	3	27/10/2000
18	Animalia	Insecta	Lycaenidae	<i>Hypochrysops apollo apollo</i>	Apollo jewel (Wet Tropics subspecies)	V	None	0	6	31/12/1995

Taxon Id	Kingdom	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
802	Animalia	Mammalia	Dasyuridae	<i>Dasyurus maculatus gracilis</i>	spotted-tailed quoll (northern subspecies)	E	E	2	2	31/12/1920
1039	Animalia	Mammalia	Delphinidae	<i>Orcaella heinsohni</i>	Australian snubfin dolphin	V	None	0	7	31/10/1997
714	Animalia	Mammalia	Dugongidae	<i>Dugong dugon</i>	dugong	V	None	2	3	30/09/1999
1008	Animalia	Mammalia	Emballonuridae	<i>Saccolaimus saccolaimus nudicluniatus</i>	bare-rumped sheath-tail bat	E	V	0	1	17/01/2003
1010	Animalia	Mammalia	Emballonuridae	<i>Taphozous australis</i>	coastal sheath-tail bat	NT	None	0	1	17/01/2003
1003	Animalia	Mammalia	Hipposideridae	<i>Hipposideros diadema reginae</i>	diadem leaf-nosed bat	NT	None	2	3	17/01/2003
762	Animalia	Mammalia	Muridae	<i>Mesembriomys gouldii</i>	black-footed tree-rat	C	V	0	1	07/03/2000
878	Animalia	Mammalia	Petauridae	<i>Petaurus gracilis</i>	mahogany glider	E	E	0	8	30/12/2009
986	Animalia	Mammalia	Pteropodidae	<i>Pteropus conspicillatus</i>	spectacled flying-fox	E	E	0	1	17/01/2003
838	Animalia	Mammalia	Tachyglossidae	<i>Tachyglossus aculeatus</i>	short-beaked echidna	SL	None	0	1	22/08/1991
37	Animalia	Reptilia	Cheloniidae	<i>Chelonia mydas</i>	green turtle	V	V	0	4	22/07/2019
584	Animalia	Reptilia	Crocodylidae	<i>Crocodylus porosus</i>	estuarine crocodile	V	None	0	5	26/09/2020
11623	Plantae	Equisetopsida	Droseraceae	<i>Drosera adelae</i>	None	NT	None	2	2	12/08/1980
8203	Plantae	Equisetopsida	Orchidaceae	<i>Eulophia bicallosa</i>	None	NT	None	1	1	23/10/1992
12816	Plantae	Equisetopsida	Orchidaceae	<i>Habenaria xanthantha</i>	None	NT	None	1	1	03/02/1979
12656	Plantae	Equisetopsida	Polygalaceae	<i>Comesperma praecelesum</i>	None	V	None	1	1	07/10/1978
12228	Plantae	Equisetopsida	Rubiaceae	<i>Myrmecodia beccarii</i>	None	V	V	1	7	07/08/2016

**Taxon Id:** Unique identifier of the taxon from the WildNet database.

**NCA:** Queensland conservation status of the taxon under the *Nature Conservation Act 1992* (Least Concern (C), Critically Endangered (CR), Endangered (E), Extinct (EX), Near Threatened (NT), Extinct in the Wild (PE), Special Least Concern (SL), and Vulnerable (V)).

**EPBC:** Australian conservation status of the taxon under the *Environment Protection and Biodiversity Conservation Act 1999* (Conservation Dependent (CD), Critically Endangered (CE), Endangered (E), Extinct (EX), Vulnerable (V), and Extinct in the Wild (XW)).

**Specimens:** The number of specimen-backed records of the taxon.

**Records:** The total number of records of the taxon.

**Last record:** Date of latest record of the taxon.

## Links and Support

Other sites that deliver species information from the WildNet database include:

- [Species profile search](#) - access species information approved for publication including species names, statuses, notes, images, distribution maps and records
- [Species lists](#) - generate species lists for Queensland protected areas, forestry areas, local governments and areas defined using coordinates
- [Biomaps](#) - view biodiversity information, including species information approved for publication, and generate reports
- [Qld wildlife data API](#) - access species information approved for publication such as notes, images and records etc.
- [WetlandMaps](#) - view species records, survey locations etc. approved for publication

- [Wetland Summary](#) - view wildlife statistics, species lists for a range of area types, and access species profiles
- [Generalised distribution and densities of Queensland wildlife](#) - Queensland species distributions and densities generalised to a 10 km grid resolution
- [Conservation status of Queensland wildlife](#) - access current lists of priority species for Queensland including nomenclature and status information
- [Queensland Confidential Species](#) - the list of species flagged as confidential in the WildNet database.

Please direct queries about this report to the [WildNet Team](#).

Other useful sites for accessing biodiversity data include:

- [Queensland Government Data](#)
- [Atlas of Living Australia](#)
- [OZCAM - Online Zoological Collections of Australian Museums](#)
- [AVH - Australia's Virtual Herbarium](#)
- [Protected Matters Search Tool](#)

## Disclaimer

Whilst every care is taken to ensure the accuracy of the information provided in this report, the Queensland Government, to the maximum extent permitted by law, makes no representations or warranties about its accuracy, reliability, completeness, or suitability, for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which the user may incur as a consequence of the information being inaccurate or incomplete in any way and for any reason.





# 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: 14/01/21 13:25:25

## [Summary](#)

### [Details](#)

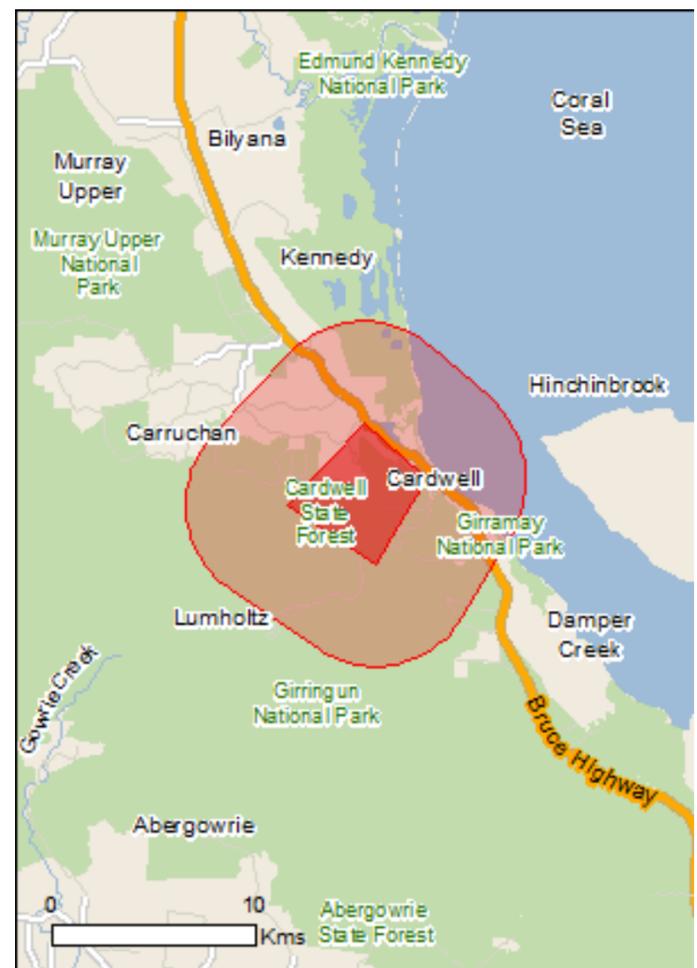
[Matters of NES](#)

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

[Extra Information](#)

### [Caveat](#)

### [Acknowledgements](#)



This map may contain data which are  
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[Coordinates](#)

Buffer: 5.0Km



# 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](#).

<a href="#">World Heritage Properties:</a>	2
<a href="#">National Heritage Places:</a>	3
<a href="#">Wetlands of International Importance:</a>	None
<a href="#">Great Barrier Reef Marine Park:</a>	2
<a href="#">Commonwealth Marine Area:</a>	None
<a href="#">Listed Threatened Ecological Communities:</a>	2
<a href="#">Listed Threatened Species:</a>	49
<a href="#">Listed Migratory Species:</a>	56

## 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.

<a href="#">Commonwealth Land:</a>	None
<a href="#">Commonwealth Heritage Places:</a>	None
<a href="#">Listed Marine Species:</a>	106
<a href="#">Whales and Other Cetaceans:</a>	12
<a href="#">Critical Habitats:</a>	None
<a href="#">Commonwealth Reserves Terrestrial:</a>	None
<a href="#">Australian Marine Parks:</a>	None

## Extra Information

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

<a href="#">State and Territory Reserves:</a>	4
<a href="#">Regional Forest Agreements:</a>	None
<a href="#">Invasive Species:</a>	21
<a href="#">Nationally Important Wetlands:</a>	3
<a href="#">Key Ecological Features (Marine)</a>	None

# Details

## Matters of National Environmental Significance

World Heritage Properties		[ Resource Information ]
Name	State	Status
<a href="#">Great Barrier Reef</a>	QLD	Declared property
<a href="#">Wet Tropics of Queensland</a>	QLD	Declared property

National Heritage Properties		[ Resource Information ]
Name	State	Status
<b>Natural</b>		
<a href="#">Great Barrier Reef</a>	QLD	Listed place
<a href="#">Wet Tropics of Queensland</a>	QLD	Listed place
<b>Indigenous</b>		
<a href="#">Wet Tropics World Heritage Area (Indigenous Values)</a>	QLD	Within listed place

Great Barrier Reef Marine Park		[ Resource Information ]
Type	Zone	IUCN
Conservation Park	CP-18-4046	IV
General Use	GU-16-6004	VI

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
<a href="#">Broad leaf tea-tree (Melaleuca viridiflora) woodlands in high rainfall coastal north Queensland</a>	Endangered	Community likely to occur within area
<a href="#">Littoral Rainforest and Coastal Vine Thickets of Eastern Australia</a>	Critically Endangered	Community likely to occur within area

Listed Threatened Species		[ Resource Information ]
Name	Status	Type of Presence
<b>Birds</b>		
<a href="#">Calidris canutus</a> Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
<a href="#">Casuarius casuarius johnsonii</a> Southern Cassowary, Australian Cassowary, Double-wattled Cassowary [25986]	Endangered	Species or species habitat known to occur within area
<a href="#">Charadrius leschenaultii</a> Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Roosting known to occur within area
<a href="#">Charadrius mongolus</a> Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
<a href="#">Erythrotriorchis radiatus</a> Red Goshawk [942]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Falco hypoleucos</a> Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area

Name	Status	Type of Presence
<a href="#">Fregetta grallaria grallaria</a> White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Hirundapus caudacutus</a> White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Limosa lapponica baueri</a> Bar-tailed Godwit (baueri), Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
<a href="#">Poephila cincta cincta</a> Southern Black-throated Finch [64447]	Endangered	Species or species habitat may occur within area
<a href="#">Rostratula australis</a> Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
<a href="#">Turnix olivii</a> Buff-breasted Button-quail [59293]	Endangered	Species or species habitat likely to occur within area
<a href="#">Tyto novaehollandiae kimberli</a> Masked Owl (northern) [26048]	Vulnerable	Species or species habitat likely to occur within area
<b>Fish</b>		
<a href="#">Stiphodon semoni</a> Opal Cling Goby [83909]	Critically Endangered	Species or species habitat may occur within area
<b>Frogs</b>		
<a href="#">Litoria dayi</a> Australian Lace-lid, Lace-eyed Tree Frog, Day's Big-eyed Treefrog [86707]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Litoria nyakalensis</a> Mountain Mistfrog, Nyakala Frog [1820]	Critically Endangered	Species or species habitat may occur within area
<b>Mammals</b>		
<a href="#">Balaenoptera musculus</a> Blue Whale [36]	Endangered	Species or species habitat may occur within area
<a href="#">Dasyurus hallucatus</a> Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat likely to occur within area
<a href="#">Dasyurus maculatus gracilis</a> Spotted-tailed Quoll (North Queensland), Yarri [64475]	Endangered	Species or species habitat likely to occur within area
<a href="#">Hipposideros semoni</a> Semon's Leaf-nosed Bat, Greater Wart-nosed Horseshoe-bat [180]	Vulnerable	Species or species habitat may occur within area
<a href="#">Macroderma gigas</a> Ghost Bat [174]	Vulnerable	Breeding likely to occur within area
<a href="#">Megaptera novaeangliae</a> Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Mesembriomys gouldii rattoides</a> Black-footed Tree-rat (north Queensland), Shaggy Rabbit-rat [87620]	Vulnerable	Species or species habitat known to occur

Name	Status	Type of Presence within area
<a href="#">Petauroides volans</a> Greater Glider [254]	Vulnerable	Species or species habitat may occur within area
<a href="#">Petaurus gracilis</a> Mahogany Glider [26775]	Endangered	Species or species habitat known to occur within area
<a href="#">Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)</a> Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat may occur within area
<a href="#">Pteropus conspicillatus</a> Spectacled Flying-fox [185]	Endangered	Species or species habitat known to occur within area
<a href="#">Pteropus poliocephalus</a> Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Rhinolophus robertsi</a> Large-eared Horseshoe Bat, Greater Large-eared Horseshoe Bat [87639]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Saccolaimus saccolaimus nudicluniatus</a> Bare-rumped Sheath-tailed Bat, Bare-rumped Sheath-tail Bat [66889]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Xeromys myoides</a> Water Mouse, False Water Rat, Yirrkoo [66]	Vulnerable	Species or species habitat may occur within area
<b>Plants</b>		
<a href="#">Genoplesium tectum</a> Cardwell Midge Orchid [55130]	Endangered	Species or species habitat may occur within area
<a href="#">Myrmecodia beccarii</a> Ant Plant [11852]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Phaius australis</a> Lesser Swamp-orchid [5872]	Endangered	Species or species habitat may occur within area
<a href="#">Phaius pictus</a> [22564]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Tephrosia leveillei</a> [16946]	Vulnerable	Species or species habitat may occur within area
<a href="#">Zeuxine polygonoides</a> Velvet Jewel Orchid [46794]	Vulnerable	Species or species habitat likely to occur within area
<b>Reptiles</b>		
<a href="#">Caretta caretta</a> Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area
<a href="#">Chelonia mydas</a> Green Turtle [1765]	Vulnerable	Breeding known to occur within area
<a href="#">Dermochelys coriacea</a> Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
<a href="#">Eretmochelys imbricata</a> Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area

Name	Status	Type of Presence
<a href="#">Lepidochelys olivacea</a> Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Breeding likely to occur within area
<a href="#">Natator depressus</a> Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area
<b>Sharks</b>		
<a href="#">Carcharodon carcharias</a> White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat may occur within area
<a href="#">Pristis pristis</a> Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Pristis zijsron</a> Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Rhincodon typus</a> 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
<b>Migratory Marine Birds</b>		
<a href="#">Anous stolidus</a> Common Noddy [825]		Species or species habitat likely to occur within area
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat likely to occur within area
<a href="#">Fregata ariel</a> Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area
<a href="#">Fregata minor</a> Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat likely to occur within area
<a href="#">Sternula albifrons</a> Little Tern [82849]		Species or species habitat may occur within area

### Migratory Marine Species

<a href="#">Anoxypristis cuspidata</a> Narrow Sawfish, Knifetooth Sawfish [68448]		Species or species habitat likely to occur within area
<a href="#">Balaenoptera edeni</a> Bryde's Whale [35]		Species or species habitat may occur within area
<a href="#">Balaenoptera musculus</a> Blue Whale [36]	Endangered	Species or species habitat may occur within area
<a href="#">Carcharhinus longimanus</a> Oceanic Whitetip Shark [84108]		Species or species habitat may occur within area
<a href="#">Carcharodon carcharias</a> White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat may occur within area
<a href="#">Caretta caretta</a> Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur

Name	Threatened	Type of Presence
<a href="#">Chelonia mydas</a> Green Turtle [1765]	Vulnerable	within area Breeding known to occur within area
<a href="#">Crocodylus porosus</a> Salt-water Crocodile, Estuarine Crocodile [1774]		Species or species habitat likely to occur within area
<a href="#">Dermochelys coriacea</a> Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
<a href="#">Dugong dugon</a> Dugong [28]		Species or species habitat known to occur within area
<a href="#">Eretmochelys imbricata</a> Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Lamna nasus</a> Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area
<a href="#">Lepidochelys olivacea</a> Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Breeding likely to occur within area
<a href="#">Manta alfredi</a> Reef Manta Ray, Coastal Manta Ray, Inshore Manta Ray, Prince Alfred's Ray, Resident Manta Ray [84994]		Species or species habitat may occur within area
<a href="#">Manta birostris</a> Giant Manta Ray, Chevron Manta Ray, Pacific Manta Ray, Pelagic Manta Ray, Oceanic Manta Ray [84995]		Species or species habitat may occur within area
<a href="#">Megaptera novaeangliae</a> Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Natator depressus</a> Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area
<a href="#">Orcaella heinsohni</a> Australian Snubfin Dolphin [81322]		Species or species habitat known to occur within area
<a href="#">Orcinus orca</a> Killer Whale, Orca [46]		Species or species habitat may occur within area
<a href="#">Pristis pristis</a> Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Pristis zijsron</a> Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Rhincodon typus</a> Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
<a href="#">Sousa chinensis</a> Indo-Pacific Humpback Dolphin [50]		Breeding known to occur within area
<b>Migratory Terrestrial Species</b>		
<a href="#">Cuculus optatus</a> Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat known to occur within area
<a href="#">Hirundapus caudacutus</a> White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area

Name	Threatened	Type of Presence
<a href="#">Hirundo rustica</a> Barn Swallow [662]		Species or species habitat likely to occur within area
<a href="#">Monarcha melanopsis</a> Black-faced Monarch [609]		Species or species habitat known to occur within area
<a href="#">Monarcha trivirgatus</a> Spectacled Monarch [610]		Species or species habitat known to occur within area
<a href="#">Motacilla cinerea</a> Grey Wagtail [642]		Species or species habitat may occur within area
<a href="#">Motacilla flava</a> Yellow Wagtail [644]		Species or species habitat likely to occur within area
<a href="#">Myiagra cyanoleuca</a> Satin Flycatcher [612]		Species or species habitat known to occur within area
<a href="#">Rhipidura rufifrons</a> Rufous Fantail [592]		Species or species habitat known to occur within area
<b>Migratory Wetlands Species</b>		
<a href="#">Actitis hypoleucos</a> Common Sandpiper [59309]		Species or species habitat known to occur within area
<a href="#">Calidris acuminata</a> Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
<a href="#">Calidris canutus</a> Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
<a href="#">Calidris melanotos</a> Pectoral Sandpiper [858]		Species or species habitat may occur within area
<a href="#">Charadrius leschenaultii</a> Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Roosting known to occur within area
<a href="#">Charadrius mongolus</a> Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
<a href="#">Gallinago hardwickii</a> Latham's Snipe, Japanese Snipe [863]		Species or species habitat likely to occur within area
<a href="#">Gallinago megala</a> Swinhoe's Snipe [864]		Roosting likely to occur within area
<a href="#">Gallinago stenura</a> Pin-tailed Snipe [841]		Roosting likely to occur within area
<a href="#">Limosa lapponica</a> Bar-tailed Godwit [844]		Species or species habitat known to occur within area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area

Name	Threatened	Type of Presence
<a href="#">Numenius minutus</a> Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area
<a href="#">Numenius phaeopus</a> Whimbrel [849]		Roosting known to occur within area
<a href="#">Pandion haliaetus</a> Osprey [952]		Species or species habitat known to occur within area
<a href="#">Pluvialis squatarola</a> Grey Plover [865]		Roosting known to occur within area
<a href="#">Tringa brevipes</a> Grey-tailed Tattler [851]		Roosting known to occur within area
<a href="#">Tringa nebularia</a> Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area
<a href="#">Xenus cinereus</a> Terek Sandpiper [59300]		Roosting known to occur within area

## Other Matters Protected by the EPBC Act

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

\* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
<b>Birds</b>		
<a href="#">Actitis hypoleucos</a> Common Sandpiper [59309]		Species or species habitat known to occur within area
<a href="#">Anous stolidus</a> Common Noddy [825]		Species or species habitat likely to occur within area
<a href="#">Anseranas semipalmata</a> Magpie Goose [978]		Species or species habitat may occur within area
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat likely to occur within area
<a href="#">Ardea alba</a> Great Egret, White Egret [59541]		Species or species habitat known to occur within area
<a href="#">Ardea ibis</a> Cattle Egret [59542]		Species or species habitat may occur within area
<a href="#">Calidris acuminata</a> Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
<a href="#">Calidris canutus</a> Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
<a href="#">Calidris melanotos</a> Pectoral Sandpiper [858]		Species or species

Name	Threatened	Type of Presence
<a href="#">Charadrius leschenaultii</a> Greater Sand Plover, Large Sand Plover [877]	Vulnerable	habitat may occur within area Roosting known to occur within area
<a href="#">Charadrius mongolus</a> Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
<a href="#">Chrysococcyx osculans</a> Black-eared Cuckoo [705]		Species or species habitat likely to occur within area
<a href="#">Fregata ariel</a> Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area
<a href="#">Fregata minor</a> Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat likely to occur within area
<a href="#">Gallinago hardwickii</a> Latham's Snipe, Japanese Snipe [863]		Species or species habitat likely to occur within area
<a href="#">Gallinago megala</a> Swinhoe's Snipe [864]		Roosting likely to occur within area
<a href="#">Gallinago stenura</a> Pin-tailed Snipe [841]		Roosting likely to occur within area
<a href="#">Haliaeetus leucogaster</a> White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
<a href="#">Heteroscelus brevipes</a> Grey-tailed Tattler [59311]		Roosting known to occur within area
<a href="#">Hirundapus caudacutus</a> White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Hirundo rustica</a> Barn Swallow [662]		Species or species habitat likely to occur within area
<a href="#">Limosa lapponica</a> Bar-tailed Godwit [844]		Species or species habitat known to occur within area
<a href="#">Merops ornatus</a> Rainbow Bee-eater [670]		Species or species habitat may occur within area
<a href="#">Monarcha melanopsis</a> Black-faced Monarch [609]		Species or species habitat known to occur within area
<a href="#">Monarcha trivirgatus</a> Spectacled Monarch [610]		Species or species habitat known to occur within area
<a href="#">Motacilla cinerea</a> Grey Wagtail [642]		Species or species habitat may occur within area
<a href="#">Motacilla flava</a> Yellow Wagtail [644]		Species or species habitat likely to occur within area
<a href="#">Myiagra cyanoleuca</a> Satin Flycatcher [612]		Species or species habitat known to occur within area

Name	Threatened	Type of Presence
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
<a href="#">Numenius minutus</a> Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area
<a href="#">Numenius phaeopus</a> Whimbrel [849]		Roosting known to occur within area
<a href="#">Pandion haliaetus</a> Osprey [952]		Species or species habitat known to occur within area
<a href="#">Pluvialis squatarola</a> Grey Plover [865]		Roosting known to occur within area
<a href="#">Rhipidura rufifrons</a> Rufous Fantail [592]		Species or species habitat known to occur within area
<a href="#">Rostratula benghalensis (sensu lato)</a> Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area
<a href="#">Sterna albifrons</a> Little Tern [813]		Species or species habitat may occur within area
<a href="#">Tringa nebularia</a> Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area
<a href="#">Xenus cinereus</a> Terek Sandpiper [59300]		Roosting known to occur within area
<b>Fish</b>		
<a href="#">Acentronura tentaculata</a> Shortpouch Pygmy Pipehorse [66187]		Species or species habitat may occur within area
<a href="#">Bulbonaricus davaoensis</a> Davao Pughead Pipefish [66190]		Species or species habitat may occur within area
<a href="#">Choeroichthys brachysoma</a> Pacific Short-bodied Pipefish, Short-bodied Pipefish [66194]		Species or species habitat may occur within area
<a href="#">Choeroichthys sculptus</a> Sculptured Pipefish [66197]		Species or species habitat may occur within area
<a href="#">Choeroichthys suillus</a> Pig-snouted Pipefish [66198]		Species or species habitat may occur within area
<a href="#">Corythoichthys amplexus</a> Fijian Banded Pipefish, Brown-banded Pipefish [66199]		Species or species habitat may occur within area
<a href="#">Corythoichthys flavofasciatus</a> Reticulate Pipefish, Yellow-banded Pipefish, Network Pipefish [66200]		Species or species habitat may occur within area
<a href="#">Corythoichthys intestinalis</a> Australian Messmate Pipefish, Banded Pipefish [66202]		Species or species habitat may occur within area
<a href="#">Corythoichthys ocellatus</a> Orange-spotted Pipefish, Ocellated Pipefish [66203]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
<a href="#">Corythoichthys paxtoni</a> Paxton's Pipefish [66204]		Species or species habitat may occur within area
<a href="#">Corythoichthys schultzi</a> Schultz's Pipefish [66205]		Species or species habitat may occur within area
<a href="#">Cosmocampus maxweberi</a> Maxweber's Pipefish [66209]		Species or species habitat may occur within area
<a href="#">Doryrhamphus dactyliophorus</a> Banded Pipefish, Ringed Pipefish [66210]		Species or species habitat may occur within area
<a href="#">Doryrhamphus excisus</a> Bluestripe Pipefish, Indian Blue-stripe Pipefish, Pacific Blue-stripe Pipefish [66211]		Species or species habitat may occur within area
<a href="#">Doryrhamphus janssi</a> Cleaner Pipefish, Janss' Pipefish [66212]		Species or species habitat may occur within area
<a href="#">Festucalex cinctus</a> Girdled Pipefish [66214]		Species or species habitat may occur within area
<a href="#">Festucalex gibbsi</a> Gibbs' Pipefish [66215]		Species or species habitat may occur within area
<a href="#">Halicampus dunckeri</a> Red-hair Pipefish, Duncker's Pipefish [66220]		Species or species habitat may occur within area
<a href="#">Halicampus grayi</a> Mud Pipefish, Gray's Pipefish [66221]		Species or species habitat may occur within area
<a href="#">Halicampus macrorhynchus</a> Whiskered Pipefish, Ornate Pipefish [66222]		Species or species habitat may occur within area
<a href="#">Halicampus mataafae</a> Samoan Pipefish [66223]		Species or species habitat may occur within area
<a href="#">Halicampus nitidus</a> Glittering Pipefish [66224]		Species or species habitat may occur within area
<a href="#">Halicampus spirostris</a> Spiny-snout Pipefish [66225]		Species or species habitat may occur within area
<a href="#">Hippichthys cyanospilos</a> Blue-speckled Pipefish, Blue-spotted Pipefish [66228]		Species or species habitat may occur within area
<a href="#">Hippichthys heptagonus</a> Madura Pipefish, Reticulated Freshwater Pipefish [66229]		Species or species habitat may occur within area
<a href="#">Hippichthys penicillus</a> Beady Pipefish, Steep-nosed Pipefish [66231]		Species or species habitat may occur within area
<a href="#">Hippichthys spicifer</a> Belly-barred Pipefish, Banded Freshwater Pipefish [66232]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
<a href="#">Hippocampus bargibanti</a> Pygmy Seahorse [66721]		Species or species habitat may occur within area
<a href="#">Hippocampus histrix</a> Spiny Seahorse, Thorny Seahorse [66236]		Species or species habitat may occur within area
<a href="#">Hippocampus kuda</a> Spotted Seahorse, Yellow Seahorse [66237]		Species or species habitat may occur within area
<a href="#">Hippocampus planifrons</a> Flat-face Seahorse [66238]		Species or species habitat may occur within area
<a href="#">Hippocampus zebra</a> Zebra Seahorse [66241]		Species or species habitat may occur within area
<a href="#">Micrognathus andersonii</a> Anderson's Pipefish, Shortnose Pipefish [66253]		Species or species habitat may occur within area
<a href="#">Micrognathus brevirostris</a> thorntail Pipefish, Thorn-tailed Pipefish [66254]		Species or species habitat may occur within area
<a href="#">Microphis brachyurus</a> Short-tail Pipefish, Short-tailed River Pipefish [66257]		Species or species habitat may occur within area
<a href="#">Nannocampus pictus</a> Painted Pipefish, Reef Pipefish [66263]		Species or species habitat may occur within area
<a href="#">Phoxocampus diacanthus</a> Pale-blotched Pipefish, Spined Pipefish [66266]		Species or species habitat may occur within area
<a href="#">Siokunichthys breviceps</a> Softcoral Pipefish, Soft-coral Pipefish [66270]		Species or species habitat may occur within area
<a href="#">Solegnathus hardwickii</a> Pallid Pipehorse, Hardwick's Pipehorse [66272]		Species or species habitat may occur within area
<a href="#">Solenostomus cyanopterus</a> Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area
<a href="#">Solenostomus paradoxus</a> Ornate Ghostpipefish, Harlequin Ghost Pipefish, Ornate Ghost Pipefish [66184]		Species or species habitat may occur within area
<a href="#">Syngnathoides biaculeatus</a> Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area
<a href="#">Trachyrhamphus bicoarctatus</a> Bentstick Pipefish, Bend Stick Pipefish, Short-tailed Pipefish [66280]		Species or species habitat may occur within area
<a href="#">Trachyrhamphus longirostris</a> Straightstick Pipefish, Long-nosed Pipefish, Straight Stick Pipefish [66281]		Species or species habitat may occur within area
<b>Mammals</b>		
<a href="#">Dugong dugon</a> Dugong [28]		Species or species habitat known to occur within area

Name	Threatened	Type of Presence
<b>Reptiles</b>		
<a href="#">Acalyptophis peronii</a> Horned Seasnake [1114]		Species or species habitat may occur within area
<a href="#">Aipysurus duboisii</a> Dubois' Seasnake [1116]		Species or species habitat may occur within area
<a href="#">Aipysurus eydouxii</a> Spine-tailed Seasnake [1117]		Species or species habitat may occur within area
<a href="#">Aipysurus laevis</a> Olive Seasnake [1120]		Species or species habitat may occur within area
<a href="#">Astrotia stokesii</a> Stokes' Seasnake [1122]		Species or species habitat may occur within area
<a href="#">Caretta caretta</a> Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area
<a href="#">Chelonia mydas</a> Green Turtle [1765]	Vulnerable	Breeding known to occur within area
<a href="#">Crocodylus porosus</a> Salt-water Crocodile, Estuarine Crocodile [1774]		Species or species habitat likely to occur within area
<a href="#">Dermochelys coriacea</a> Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
<a href="#">Disteira kingii</a> Spectacled Seasnake [1123]		Species or species habitat may occur within area
<a href="#">Disteira major</a> Olive-headed Seasnake [1124]		Species or species habitat may occur within area
<a href="#">Enhydrina schistosa</a> Beaked Seasnake [1126]		Species or species habitat may occur within area
<a href="#">Eretmochelys imbricata</a> Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Hydrophis elegans</a> Elegant Seasnake [1104]		Species or species habitat may occur within area
<a href="#">Hydrophis mcdowelli</a> null [25926]		Species or species habitat may occur within area
<a href="#">Hydrophis ornatus</a> Spotted Seasnake, Ornate Reef Seasnake [1111]		Species or species habitat may occur within area
<a href="#">Lapemis hardwickii</a> Spine-bellied Seasnake [1113]		Species or species habitat may occur within area
<a href="#">Laticauda colubrina</a> a sea krait [1092]		Species or species habitat may occur within area
<a href="#">Laticauda laticaudata</a> a sea krait [1093]		Species or species

Name	Threatened	Type of Presence
<a href="#">Lepidochelys olivacea</a> Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	habitat may occur within area Breeding likely to occur within area
<a href="#">Natator depressus</a> Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area
<a href="#">Pelamis platurus</a> Yellow-bellied Seasnake [1091]		Species or species habitat may occur within area

## Whales and other Cetaceans [ Resource Information ]

Name	Status	Type of Presence
<b>Mammals</b>		
<a href="#">Balaenoptera acutorostrata</a> Minke Whale [33]		Species or species habitat may occur within area
<a href="#">Balaenoptera edeni</a> Bryde's Whale [35]		Species or species habitat may occur within area
<a href="#">Balaenoptera musculus</a> Blue Whale [36]	Endangered	Species or species habitat may occur within area
<a href="#">Delphinus delphis</a> Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
<a href="#">Grampus griseus</a> Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
<a href="#">Megaptera novaeangliae</a> Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Orcaella brevirostris</a> Irrawaddy Dolphin [45]		Species or species habitat known to occur within area
<a href="#">Orcinus orca</a> Killer Whale, Orca [46]		Species or species habitat may occur within area
<a href="#">Sousa chinensis</a> Indo-Pacific Humpback Dolphin [50]		Breeding known to occur within area
<a href="#">Stenella attenuata</a> Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area
<a href="#">Tursiops aduncus</a> Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
<a href="#">Tursiops truncatus s. str.</a> Bottlenose Dolphin [68417]		Species or species habitat may occur within area

## Extra Information

### State and Territory Reserves [\[ Resource Information \]](#)

Name	State
Girramay	QLD
Girringun	QLD
Girringun	QLD
Melaleuca	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
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#### Birds

Acridotheres tristis Common Myna, Indian Myna [387]		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

#### Frogs

Rhinella marina Cane Toad [83218]		Species or species habitat known to occur within area
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#### 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
Capra hircus Goat [2]		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
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur

Name	Status	Type of Presence within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
<b>Plants</b>		
<p> <i>Annona glabra</i>            Pond Apple, Pond-apple Tree, Alligator Apple, Bullock's Heart, Cherimoya, Monkey Apple, Bobwood, Corkwood [6311]         </p> <p> <i>Cenchrus ciliaris</i>            Buffel-grass, Black Buffel-grass [20213]         </p>		Species or species habitat likely to occur within area
<p> <i>Hymenachne amplexicaulis</i>            Hymenachne, Olive Hymenachne, Water Stargrass, West Indian Grass, West Indian Marsh Grass [31754]         </p>		Species or species habitat likely to occur within area
<p> <i>Lantana camara</i>            Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]         </p> <p> <i>Parthenium hysterophorus</i>            Parthenium Weed, Bitter Weed, Carrot Grass, False Ragweed [19566]         </p>		Species or species habitat likely to occur within area
<p> <i>Salvinia molesta</i>            Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]         </p>		Species or species habitat likely to occur within area

<b>Reptiles</b>		
<p> <i>Ramphotyphlops braminus</i>            Flowerpot Blind Snake, Brahminy Blind Snake, Cacing Besi [1258]         </p>		Species or species habitat likely to occur within area

<b>Nationally Important Wetlands</b>		[ Resource Information ]
Name		State
<a href="#">Edmund Kennedy Wetlands</a>		QLD
<a href="#">Great Barrier Reef Marine Park</a>		QLD
<a href="#">Hinchinbrook Channel</a>		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

-18.266457 146.017886,-18.299383 145.996944,-18.274608 145.957805,-18.2407 145.991794,-18.262545 146.01823,-18.266131 146.017886,-18.266783 146.017886,-18.266457 146.017886

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- [-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](#)
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- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- [-Other groups and individuals](#)

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

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

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## DOCUMENT INFORMATION

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## IMAGES

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