

Wonga Beach

DRAFT FORESHORE MANAGEMENT PLAN

May 2021





Alluvium recognises and acknowledges the unique relationship and deep connection to Country shared by Aboriginal and Torres Strait Islander people, as First Peoples and Traditional Owners of Australia. We pay our respects to their Cultures, Country and Elders past and present.

Artwork by Vicki Golding. This piece was commissioned by Alluvium and has told our story of water across Country, from catchment to coast, with people from all cultures learning, understanding, sharing stories, walking to and talking at the meeting places as one nation.

This report has been prepared by Alluvium Consulting Australia Pty Ltd for Douglas Shire Council under the contract titled 'WO5429 Foreshore Management Plan'.

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Version: 2 – draft
Date issued: May 2021
Issued to: Melissa Mitchell
Citation: Alluvium, 2021, Draft Foreshore Management Plan: Wonga Beach, report prepared by Alluvium Consulting Australia and Wild Environmental for the Douglas Shire Council.

Cover image: Mangrove coastline, Shutterstock

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1 Introduction

The coastline is an important place for many Australians, providing significant social and cultural value. This is especially so for many residents of the Douglas Shire who have identified these unique coastal landscapes and natural ecosystems among some of the most important factors attracting people to this coastline (DSC 2019a). The Douglas Shire coastline also has high tourism value, attracting many visitors to the area.

The Eastern Kuku-Yalanji and Yirriganydi peoples are the Traditional Custodians of the Land and Sea Country within the Douglas Shire. They have lived in and cared for this region for thousands of years, represented in important cultural sites throughout the Shire, and the memories and experiences of its people; past, present and future.

Douglas Shire Council (DSC) has an extensive 111 km long coastline that extends from Degarra in the north to south of Wangetti. The Shire is well known for its diverse coastline and its proximity to the Great Barrier Reef. Much of the Shire is within the Wet Tropics World Heritage Area and its dynamic coast consists of a variety of sandy beaches, rocky headlands and coastal rainforests.

The region's beaches and foreshore areas are important both to people and to the ecosystems around them. Coastal landscapes provide essential habitat for life on the foreshore and provide visual and recreational amenity to the people. Healthy coastal ecosystems are necessary to promote the resilience of plant and animal communities to coastal hazard impacts. Denser vegetation types are also effective in reducing the destructive forces of a storm tide for communities and infrastructure landward of the foreshore.

However, these ecosystems are experiencing ongoing disturbance as a result of erosion, vehicle and pedestrian access, weeds and pest species, illegal dumping, and runoff from stormwater and agricultural land. These factors threatening dune stability and reducing the erosion buffer often result in vegetation loss, impacts to native fauna species, and changes in ecosystem structure.

To help manage and protect these important coastal zones, DSC has developed five Foreshore Management Plans (FMPs) for the Wonga, Newell, Cooya, Four Mile and Oak Beaches.

1.1 Purpose

In 2019, DSC developed the Resilient Coast Strategic Plan 2019-2029 (referred to henceforth as the Strategy) and have committed to undertake actions to reduce the impacts of coastal hazards, such as erosion and coastal flooding, and activities in the coastal zone. A priority outcome of the Strategy is to undertake dune protection, maintenance and monitoring. This encompasses the foreshore area and is the focus of the FMP.

The FMPs will help to guide Council in the protection, maintenance and management of the coastline and foreshore, while maintaining the natural character of the area and respecting ecological, cultural and social values of these coastal reserves.

The plans will:

- Ensure there is a **shared understanding** of the social, cultural, environmental and economic values and uses of the foreshore zone
- Identify options for the **proactive management** of vulnerable areas of the foreshore zone over the next 5 years
- Help **improve and maintain** the vegetation cover and condition in the foreshore zone.

The Interim Wonga Beach Foreshore Management Plan was developed in 2020 primarily to manage the use of all-terrain vehicles (ATVs) on the beach for recreational purposes (DSC 2020). The Interim FMP set out the approval process for ATV use on the beach and actions for dune protection and maintenance. It is intended that the Wonga Beach FMP will incorporate the actions set out in the Interim FMP to maintain the values of the community.



1.2 Foreshore Management Plan area

Wonga Beach is a coastal community located on a broad sandy embayment that extends along the coastline south of the Daintree River for approximately 10 km (Figure 1) (DSC 2019b, DSC 2020). The sandy embayment that forms Wonga Beach is part of a beach ridge system.

Wonga Beach is one of the main settlements in the Douglas Shire. There are more than 500 residential dwellings and a number of tourist facilities. The settlement is located at the southern end of the sandy embayment. As of the 2016 census, there were 975 residents at Wonga Beach (ABS 2017), most of whom reside there permanently.

1.3 Implementation

These foreshore management plans were developed in consultation with each beach community as well as residents and ratepayers in the whole Shire to inform the management actions and planning decisions for the area. These actions have been tailored to incorporate what the community values about their foreshore and how the foreshore is used.

The Wonga FMP outlines actions for dune protection, including weed species for removal, native vegetation species for regeneration, and pedestrian and vehicle access management. It also provides a schedule for implementation to allow Council to prioritise actions for the area. This FMP remains non-statutory but once approved by Council provides an informed and proactive guide for the future management of Wonga Beach.



Figure 1. Wonga Beach foreshore management area.

2 Study area and planning context

Wonga Beach is a coastal community located on sandy beach between Rocky Point and the Daintree River. There is a variety of land zoning uses and ecological communities at Wonga Beach. The following section outlines the DSC land zoning and vegetation and faunal communities that have been identified in literature review and validated during site visits and surveys.

2.1 Legislative, policy and strategy setting

Coastal management is guided by Commonwealth, State and local legislation. The legislation results in a complex structure of rights and responsibilities. Key legislation, plans, policies and strategies relevant to foreshore management are summarised in Table 1.

Table 1. Summary of the legislation, policy, plans and strategies relevant to foreshore management

Legislation	Relevance
<i>Biosecurity Act 2014</i>	<ul style="list-style-type: none"> • This Act provides a comprehensive biosecurity framework to manage the impacts of animal and plant diseases and pests. • The purpose of this Act is to: <ul style="list-style-type: none"> ○ Provide a framework for an effective biosecurity system for Queensland. ○ Ensure the safety and quality of animal feed, fertilisers and other agricultural inputs. ○ Help align responses to biosecurity risks in the State with national and international obligations and requirements. • The purpose of the Act is also to manage risks associated with emerging, endemic and exotic pests and diseases.
<i>Coastal Protection and Management Act 1995</i>	<ul style="list-style-type: none"> • This Act aims to provide for the protection, conservation, rehabilitation and management of the coastal zone, including its resources and biological diversity. • This Act considers the goal, core objectives and guiding principles of the National Strategy for Ecologically Sustainable Development in the use of the coastal zone. • This Act ensures that decisions about land use and development safeguard life and property from the threat of coastal hazards. • This Act encourages the enhancement of knowledge of coastal resources and the effect of human activities on the coastal zone.
<i>Planning Act 2016</i>	<ul style="list-style-type: none"> • This Act provides for an efficient, effective, transparent, integrated, coordinated and accountable systems of land use planning and development assessment to facilitate the achievement of ecological sustainability by: <ul style="list-style-type: none"> ○ Coordinating and integrating planning at the local (i.e., planning schemes), regional and State scales ○ Managing the process and effects of development on the environment (including managing the use of premises).
<i>Vegetation Management Act 1999</i>	<ul style="list-style-type: none"> • This Act aims to regulate the clearing of vegetation by: <ul style="list-style-type: none"> ○ Managing the environmental effects of clearing. ○ Regulating clearing in a way that conserves remnant vegetation that is an endangered regional ecosystem, an of concern ecosystem, or a least concern regional ecosystem. ○ Ensuring clearing does not cause land degradation and allows for sustainable land use.



Legislation	Relevance
<i>Environmental Protection Act 1994</i>	<ul style="list-style-type: none"> ○ Preventing the loss of biodiversity, maintain ecological processes, and reduce greenhouse gas emissions.
<i>Nature Conservation Act 1992</i>	<ul style="list-style-type: none"> ● This Act aims to conserve nature while allowing for the involvement of indigenous people in the management of protected areas. ● This is to be achieved by a conservation strategy for QLD that declares and manages protected areas, protects native wildlife and habitats, ensures use of protected wildlife and areas to be ecologically sustainable, and allows cooperative involvement of Aboriginal and Torres Strait Islander people.
<i>Environment Protection and Biodiversity Conservation Act 1999</i>	<ul style="list-style-type: none"> ● This Act aims to provide protection of the environment, promote ecologically sustainable development and the conservation of biodiversity. ● The Act aims to promote the use of indigenous knowledge of biodiversity through a cooperative approach to the protection and management of environments.
<i>Queensland Local Government Act 2009</i>	<ul style="list-style-type: none"> ● This Act provides a system of local government in Queensland, including: <ul style="list-style-type: none"> ○ The way in which a local government is constituted and the nature and extent of its responsibilities and powers. ● A system of local government in Queensland that is accountable, effective, efficient and sustainable.
Local Laws	<ul style="list-style-type: none"> ● Local laws sit within the Local Government Act 2009 and under the Act a local government may make and enforce any local law that is necessary or convenient for the good rule and local government of its local government area. ● This legislation sets out the laws for the Douglas Shire Council area, including animal management, community and environmental management, local government areas, and facilities.



2.2 Zoning

Land use

The DSC Planning Scheme (2018) has been used to understand the boundaries between different land uses (Figure 2) (DSC 2018a). At Wonga Beach, the primary land uses within or immediately adjacent to the foreshore area are conservation, recreation and open space, and residential, including low density and rural. These land uses have implications for the management of the foreshore area. Changes within these zones can have flow-on impacts to the foreshore area, including:

- habitat fragmentation
- runoff
- illegal clearing and planting, including weed dispersal and growth
- impacts on fauna (light and noise pollution, road kills).

Conservation zone

The conservation zone provides for the protection, restoration and management of areas identified to support significant biological diversity and ecological integrity (DSC 2018a). Relevant outcomes identified in the Douglas Planning Scheme for the conservation zone include (DSC 2018a):

- Protection of biological diversity, ecological integrity and scenic amenity.
- Recreational or other uses of areas are consistent with the management plans of the controlling authority so that conservation and scenic values of these areas are not adversely affected.
- Any use of land in private ownership does not affect the environmental, habitat, conservation or scenic values of that land or surrounding area.
- Any low intensity facilities based on the appreciation of the natural environment or nature based recreation only establish where there is a demonstrated need and provided they have a minimal impact on the environmental and scenic amenity values of the site or surrounding area.
- The provisions of the Return to Country Local Plan facilitate economic and social opportunities on traditional Indigenous lands.
- Further lot reconfigurations other than amalgamations, boundary realignments to resolve encroachments, or for the practical needs of essential community infrastructure, or to facilitate Return to Country outcomes do not occur.

Recreation and open space

The purpose of the recreation and open space zone is to provide for informal recreation where the built form is not essential to the enjoyment of the space, parks that serve the recreational needs of residents and visitors, and a range of organised activities that require a level of built infrastructure (DSC 2018a). Relevant outcomes to the recreation and open space zone include (DSC 2018a):

- Areas are provided for active sport and recreation to meet community needs.
- Open space is accessible to the general public for a range of outdoor sport and recreation activities.
- A range of functional and accessible open spaces, including local and regional parks and linkages, are available for the use and enjoyment of residents and visitors.
- Ancillary structures and buildings such as shelters, amenity facilities, picnic tables and playgrounds are provided where necessary.
- Sport and recreation areas are planned and designed to enhance community liveability, scenic amenity and provide a retreat from developed areas.
- The use of sport and recreation areas does not unduly affect the amenity of adjacent areas particularly residential areas.

Residential

Within Wonga Beach, there are low density and rural residential areas adjacent to the foreshore area. Low density residential areas provide for predominantly dwelling houses supported by community uses and small-scale services and facilities that cater for local residents (DSC 2018a). The purpose of the low density residential zone will be achieved through the following relevant outcomes (DSC 2018a):

- Development maintains a high level of residential amenity having regard to traffic, noise, dust, odour, lighting and other locally specific impacts.
- Development reflects and enhances the existing low density scale and character of the area.
- Development is reflective and responsive to the environmental constraints of the land.
- Development is supported by necessary community facilities, open space and recreational areas and appropriate infrastructure to support the needs of the local community.

Rural residential areas provide for rural residential development on large lots (DSC 2018a). Relevant outcomes to the rural residential land zone include (DSC 2018a):

- Development preserves the environmental, scenic amenity and topographical features of the land by integrating an appropriate scale of residential activities among these features.
- Development provides a high level of residential amenity.
- Development provides for the safe use of on-site wastewater treatment systems for effluent disposal with systems designed for varied soil type, slopes and prolonged periods of wet weather.

Native Title

Native Title determination recognises the holders to exercise their rights to traditional law and customs. A section of Wonga Beach is held under Native Title by the Eastern Kuku Yalanji People (see Figure 2) (NNTT 2020).





Figure 2. Douglas Shire Council Planning Scheme and Native Title land use zoning within the Wonga Beach foreshore area (DSC 2018; NNTT 2020).



2.3 Coastal hazards

The upper section of Wonga Beach is vulnerable to coastal erosion (DSC 2019b). This erosion may be temporary or permanent. Temporary erosion is generally caused by storms, winds or waves, and the beach rebuilds during calmer periods. Permanent erosion is more likely to occur over the longer-term due to rising sea levels or significant changes to sediment transport dynamics where sand becomes lost to the coastal system. Erosion may impact the foreshore area, including the vegetation, wildlife habitats, infrastructure, recreational uses or values.

Foreshore management precinct

The foreshore precinct at Wonga Beach, which is the focus of this FMP, has been designated as the zone between the low tide mark, landward to the edge of the low density residential zone. The area between the low tide mark and highest astronomical tide (HAT) line has been included in the foreshore area in order to accommodate for the use of ATVs along the beach in this intertidal zone.

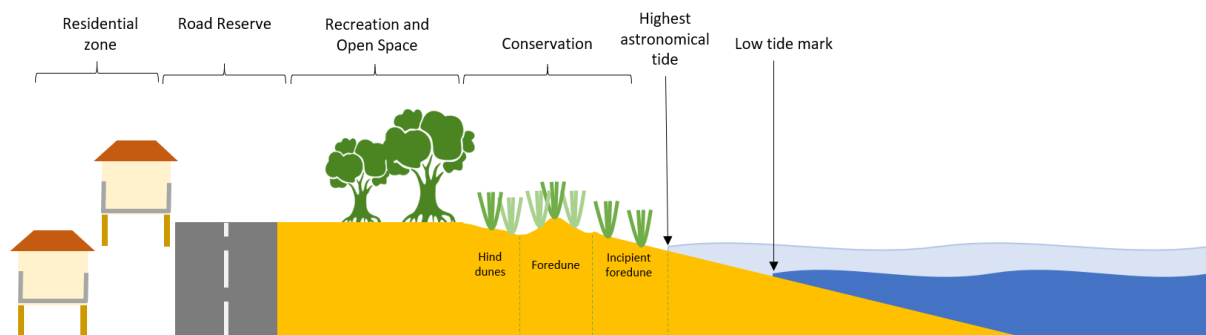


Figure 3. *Graphic representation of the Wonga Beach foreshore management precinct.*

The foreshore area includes the dune system behind the beach, immediately landward of the HAT mark and is made up of the following three key sections (Figure 3):

- **Incipient foredune:** a windblown platform that forms in front of the foredune, however is not present on all beaches. This is where vegetation such as grasses and creepers first establish and provides a protective buffer to erosion, and storm effects, including winds and waves.
- **Foredune:** the main sandy formation and is of greater height than the incipient dune. Larger vegetation species establish here, including shrubs, which provide greater wind protection.
- **Hind dune:** a smaller dune system behind the foredune. These systems tend to be well established, including larger vegetation species such as trees.

3 Foreshore values

The Wonga Beach foreshore is valued for a number of reasons. These values support the management of the foreshore area. The following section outlines the social, cultural and environmental values that have been identified for the Wonga Beach foreshore area, as well as describing any threats or challenges to these values.

3.1 Knowledge sharing and community engagement

The Wonga Beach community has previously been engaged through the Strategy and as part of the development of the Interim Wonga Beach Foreshore Management Plan. The findings from the survey as part of the Strategy found that there are anecdotal reports of sand loss from the northern end of Wonga Beach (DSC 2018b).

An additional community survey was undertaken as part of a Draft Vehicles on Beaches General Policy. A draft policy was distributed to households for comment, publicised on Council's website, advertised in the local paper and physical copies were made available at Wonga Beach Servo (DSC 2019c). Council received 85 submissions, representing 187 residents. Over two-thirds (69 %) of the respondents were supportive of the use of ATVs/quad bikes along the beach, while the remainder of respondents were neutral (3 %) or against (28 %) their use. However, the majority of respondents objected to the proposal to issue permits for ATV use at Wonga Beach. There was the belief amongst some residents that the conditions set out in the interim plan were too limiting.

For the current FMP, a survey was distributed to the Wonga Beach community and wider Douglas Shire residents and ratepayers to understand how they use and what they value about the foreshore zone, and how they would like to see it managed. The survey was advertised through the Council Foreshore Management Plans site, Facebook, community noticeboards, emails to residents and community groups, and physical copies available at Council offices. The survey ran from 31st March to 23rd April 2021 and received a total of 317 responses from residents and community groups throughout the Douglas Shire. The largest response was received from residents and ratepayers at Wonga Beach, with 86 responses received, most being permanent residents (homeowners).

Social values

The majority of respondents at Wonga Beach live adjacent or within 1 km of the foreshore area. Most of the respondents also visited the foreshore at least once a week. This information indicates that the foreshore area is significant to residents and ratepayers at Wonga Beach.

Residents predominantly use the Wonga Beach foreshore for exercise and relaxation (Figure 4). The next most common uses for the foreshore area are meeting family and friends, fishing and walking the dog. Wonga Beach residents use ATVs along the beach for recreation and to access fishing spots on the Daintree River. The foreshore is used less often for BBQs, recreation and using the playground. In some cases, the residents are using the foreshore area as an extension of their yard.



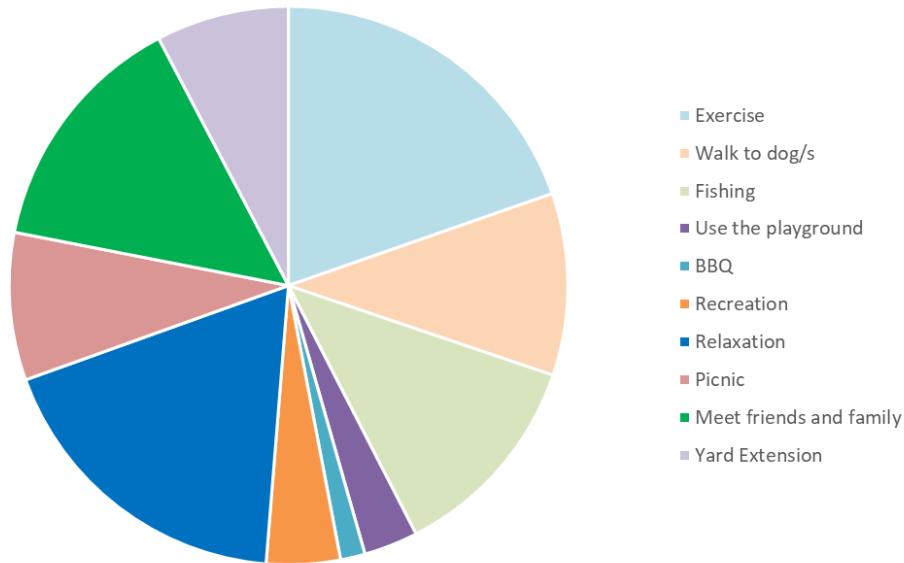


Figure 4. *The most common uses of the foreshore area at Wonga Beach.*

Sense of place

Wonga Beach residents most value the unspoilt natural beauty, peace and serenity of the foreshore, including ocean views and proximity to the Daintree River. They also value the abundance of wildlife, including shorebirds, turtles and other marine animals. The vegetation and space that the beach provides for recreation and as a meeting place is also highly valued.

The northern end of Wonga Beach is referred to as the “North Wonga Beach Protection Reserve” and is recognised as Native Title land held by the Eastern Kuku Yalanji people (CRC 2012). Traditional uses for this land include camping and hunting (CRC 2012). Marine turtles are very important for the Eastern Kuku Yalanji people. Turtles connect the tribes at Wonga Beach and further afield. They are also an important traditional food source. There are also a number of culturally significant sites along the foreshore. These include graves near Lifu Close and at the southern end of Marlin Drive.

There are anecdotal reports of environmentally significant sites at Wonga Beach. These require further investigation and monitoring. However, they are likely to include bird nesting and feeding sites at the northern end of Wonga Beach, turtle nesting sites, littoral rainforest along the foreshore and the dune vegetation.

Concerns and threats

The survey raised some concerns, particularly around infrastructure and threats to the foreshore, including vegetation. The residents identified that there is a lack of infrastructure to support residents, including walking paths, exercise equipment and places to socialise. They feel that more needs to be done to protect the vegetation along the foreshore in order to preserve the natural amenity of Wonga Beach and provide habitat for native animals.

Some residents also identified the use of vehicles, including four-wheel drives (4WD) and ATVs, on the beach as a concern and threat to the overall beach state. It is believed that these vehicles have contributed to the destruction of vegetation and widening of access paths, loss of habitat for native animals and causing noise pollution. Illegal camping is also contributing to noise pollution and results in rubbish dumping. However, it can be noted that vegetation loss may also be caused by erosion during storms and through illegal clearing. Weeds along the foreshore also pose a threat to the native vegetation.

3.2 Environmental values

The vegetation cover varies along Wonga Beach. The most developed areas in the southern-most management precincts of Old Wonga, New Wonga and Giblin Street north to Pinnacle Village have only a narrow area of

mapped remnant foreshore vegetation between 80 to 100 m wide. The vegetation in these areas is heavily impacted by the illegal clearing to maintain views and access for ATVs and pedestrians. From Pinnacle Village north to the Daintree River there is more intact remnant vegetation with good connectivity to surrounding vegetation and few illegal access tracks.

Flora composition

Vegetation mapping of the northern section of Wonga Beach indicates that approximately 17 different Regional Ecosystems (RE) types are supported (DOR 2020). The three REs that dominate the foreshore vegetation community at Wonga Beach are 7.2.1c, 7.2.2g and 7.2.7a. The RE descriptions, Vegetation Management (VM) Class, Biodiversity (BD) Status and local representation are summarised in Table 2 and Figure 5. A full list of the REs at Wonga Beach is provided in Attachment A. The local representation of vegetation in the dune system at Wonga Beach is summarised in Table 3.

Table 2. Regional Ecosystems (RE) of Wonga Beach

RE	Mapped RE description	VM Class ¹	BD Status ²	Local representation
7.2.1c	Closed forest with <i>Calophyllum inophyllum</i> , <i>Terminalia arenicola</i> , <i>Dillenia alata</i> , <i>Myristica insipida</i> , <i>Planchonella obovata</i> , <i>Millettia pinnata</i> , and <i>Hibiscus tiliaceus</i> . Beach ridge deposits adjacent to the foredune, in the very wet rainfall zone.	E	E	A closed to semi-closed woodland dominated by <i>Terminalia catappa</i> , <i>Calophyllum inophyllum</i> and <i>T. Arenicola</i> . Also present were <i>Ptychosperma elegans</i> , <i>Ficus macrocarpa</i> , and <i>Entada rheedii</i> .
7.2.2g	Vine forest with <i>Hibiscus tiliaceus</i> and <i>Calophyllum australianum</i> . Intermittently inundated narrow dune swales	OC	E	<i>Hibiscus tiliaceus</i> and <i>Calophyllum inophyllum</i> is present through much of the assessed areas however impacts in the hind area are higher and the lower strata are frequently removed or the vegetation has been replaced with stands of coconut trees (<i>Cocos nucifera</i>).
7.2.7a	Complex of open shrubland to closed shrubland, grassland, low woodland and open forest. Includes pure stands of <i>Casuarina equisetifolia</i> , and <i>Acacia crassicaarpa</i> , <i>Syzygium forte</i> subsp. <i>forte</i> , <i>Calophyllum inophyllum</i> and <i>Pandanus</i> spp. woodland to open forest. Beach strand and foredune.	OC	E	<i>Casuarina equisetifolia</i> , <i>Thespesia populnea</i> and <i>Terminalia</i> spp. form the dominant tree layer with occasional <i>Pandanus cookii</i> . The coastal facing edge is dominated by shrubs, <i>Scaevola taccada</i> , <i>Wollastonia uniflora</i> and <i>Vitex rotundifolia</i> , vines <i>Vigna marina</i> and <i>Ipomoea pes-caprae</i> , and grasses and sedges <i>Ischaemum muticum</i> , <i>Thuarea involute</i> and <i>Cyperus pedunculatus</i> .

¹ VM Class: LC – Least Concern, OC – Of Concern, E – Endangered.

² BD Status: NC – No Concern, OC – Of Concern, E – Endangered.



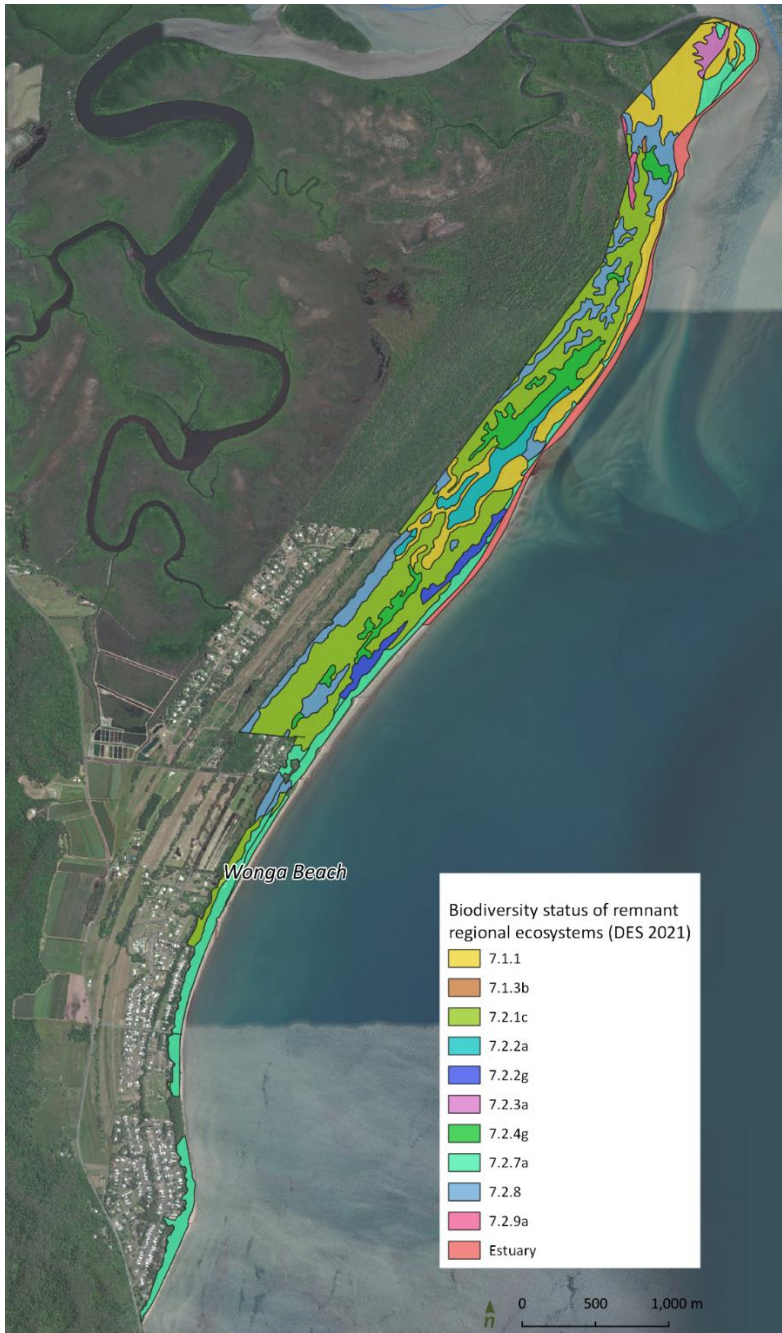


Figure 5. Remnant regional ecosystems at Wonga Beach (DES 2021).

Table 3. Dune vegetation composition and condition at Wonga Beach

Zone	Vegetation	Comments
	Beach vines – coastal jack bean (<i>Canavalia rosea</i>), coastal morning glory (<i>Ipomoea pes-caprae</i>) and dune bean (<i>Vigna marina</i>)	
Incipient dune	Grasses and sedges – <i>Ischaemum muticum</i> , <i>Thuarea involute</i> , <i>Paspalum vaginatum</i> and <i>Cyperus pedunculatus</i>	<ul style="list-style-type: none"> • Most exposed area • Prone to atypical erosion – vegetation removed or impacted by anthropogenic activity
	Shrubs – sea daisy (<i>Wollastonia uniflora</i>) and sea lettuce (<i>Scaevola taccada</i>)	

Foredune	Trees and shrubs – beach she oak (<i>Casuarina equestifolia</i>), beach almonds (<i>Terminalia catappa</i> , <i>Terminalia arenicola</i>), beauty leaf (<i>Calophyllum inophyllum</i>), boxwood (<i>Planchenella obovata</i>) and pandanus (<i>Pandanus cookii</i>) Vines – match box bean (<i>Entada rheedii</i>) and <i>Smilax calophyllum</i>	<ul style="list-style-type: none"> • Supports larger trees and shrubs
Hind dune	Littoral rainforest and vine forest	<ul style="list-style-type: none"> • Little vegetation in residential precincts

Conservation significance

A number of conservation significant flora species have been mapped for Wonga Beach. These species are listed as threatened or near threatened by the *Nature Conservation Act (NCA) 1992*, the *Environment Protection and Biodiversity Conservation Act (EPBC Act) 1999* or under an international treaty. The full list of these species is provided in Attachment B.

The remnant vegetation is mapped as 'Essential Habitat' for the southern cassowary. Wonga Beach vegetation is also mapped as a high-risk area for protected plants under the VM Act and vegetation clearing in these areas triggers the requirement for a protected plant survey by a suitably qualified person.

Habitat fragmentation

The foreshore vegetation in the less urbanised areas of Wonga Beach is well connected to surrounding vegetation communities allowing fauna movement within and between these communities and, as a result, minimising impacts due to population isolation. The altered vegetation in the urbanised areas often lacks the shrub layer that would allow for protected movement of fauna through the coastal vegetation and beach front areas minimising connectivity in these areas. Canopy dwelling and nesting species may still inhabit these areas and the impacts are more likely to be associated with other anthropogenic activity such as noise from recreational vehicles. Vegetation at either end of this narrow strip of vegetation however remains well connected to good condition remnant vegetation.

Towards the southern end of Wonga Beach where the vegetation is more disturbed, there are a number of factors that may be causing this. These factors and their potential impacts on the area's ecology are listed in Table 4.

Table 4. Disturbances and their impacts to the flora and fauna of Wonga Beach

Disturbance	Potential impacts to ecology
Dune erosion	<ul style="list-style-type: none"> • Further loss of vegetation and fauna habitat • Loss of sea turtle nesting habitat through loss of the foredune vegetation • Increase foredune slope and decreasing suitability for nesting sea turtles • Reduced biodiversity
Vegetation loss	<ul style="list-style-type: none"> • Increases in foreshore dune erosion • Exposure of hind dune systems and vegetation that are less adapted to extreme weather events • Loss of breeding and roosting habitat for nesting shorebirds and sea turtles • Loss of food trees for southern cassowary
Vehicular/ATV access	<ul style="list-style-type: none"> • Impacts to vegetation, including removal • Increased potential for erosion within the foreshore area • Damage to turtle nests • Noise disturbance to fauna • Introduction of weed species • Potential petrochemical spills



Disturbance	Potential impacts to ecology
Weeds	<ul style="list-style-type: none"> • Compete with native species for resources – light, nutrients, space • Reduced biodiversity of flora • Loss of habitat and food plants for conservation significant species • Create barriers for connectivity and fauna population dispersal
Pest animals	<ul style="list-style-type: none"> • Predation of native animals • Sea turtle nest predation • Reduced fauna populations and diversity
Stormwater and agricultural runoff	<ul style="list-style-type: none"> • Impacts to marine fauna • Increased sediment runoff and resulting increases in nearshore turbidity • Increased nutrient loads and subsequent algal blooms
Coconut debris	<ul style="list-style-type: none"> • Fallen fronds and fruit reduce recruitment of native species • Reduced opportunity for sea turtle nesting • Increase habitat for rodents and potential bird egg predation

Fauna

Wonga Beach provides habitat features for many fauna of conservation significance, including nesting turtles, shorebirds and other notable species. The foreshore vegetation provides a number of ecological services for coastal fauna. Larger tree species within the foredune areas provide marine turtle nesting habitat as the vegetated areas provide the ideal temperature and protection for incubation and hatchling survival. These larger tree species also provide roosting habitat for shorebirds during the intertidal period. The littoral rainforest contains food tree species for the endangered southern cassowary, including *Terminalia sp.*, *Syzygium sp.*, *Barringtonia sp.* and fig species. The full list of these species is provided in Attachment B.

Pest species

During the site inspection, a number of environmental weeds were identified at Wonga Beach, one of which is the coconut palm. According to the most recent audit, there are approximately 3,665 coconut palm specimens on Wonga Beach (DSC 2015). The environmental weeds were identified at Wonga Beach are summarised in Table 5. Environment weeds pose a threat to the biodiversity of a habitat and can kill native vegetation, establishing a monoculture.

Table 5. Weed species identified at Wonga Beach (BQ 2020, Conn 2021, DSC 2015, Murphy et al. 2016)

Scientific name	Common name	Dispersal Method	Environmental Impacts
<i>Cocos nucifera</i>	Coconut palm	<ul style="list-style-type: none"> • Large nuts which fall from trees • Nuts germinate if uneaten 	<ul style="list-style-type: none"> • Identified as a transformer weed in littoral (coastal) rainforests • Outcompetes native species for space, light and nutrients • Falling nuts and fronds cause physical damage to species below
<i>Sphagneticola trilobata</i>	Singapore daisy	<ul style="list-style-type: none"> • Spreads by cuttings from slashing and pruning 	<ul style="list-style-type: none"> • Outcompetes native species for space, light and nutrients • Invades lawns, irrigated areas, and around drains
<i>Sansevieria trifasciata</i>	Mother-in-law's tongue	<ul style="list-style-type: none"> • Spreads by dumping of garden waste • Seeds spread by birds and other animals 	<ul style="list-style-type: none"> • Forms dense infestations • Outcompetes native species for space, light and nutrients • Tends to form monoculture

Scientific name	Common name	Dispersal Method	Environmental Impacts
<i>Bryophyllum delagoense</i>	Mother of millions	<ul style="list-style-type: none"> • Spread by floodwaters • Spread by animals, vehicles and garden waste 	<ul style="list-style-type: none"> • Invades coastal dunes, grasslands and woodlands • Outcompetes native species for space, light and nutrients • Very poisonous to humans and livestock
<i>Opuntia sp.</i>	Prickly pear	<ul style="list-style-type: none"> • Spread by birds and animals eating the fruit • Spread by animals and floods moving broken stems 	<ul style="list-style-type: none"> • Outcompetes native species for space and nutrients, esp. in hot, dry conditions • Can harm animals and prevent them from eating
<i>Cenchrus echinatus</i>	Mossman River grass	<ul style="list-style-type: none"> • Spreads via spiny burrs which become attached to animals, vehicles and clothing • Burrs can also be dispersed by water 	<ul style="list-style-type: none"> • Outcompetes native plants for light, moisture and nutrients • Burrs can injury or irritate animals and humans

Vegetation management

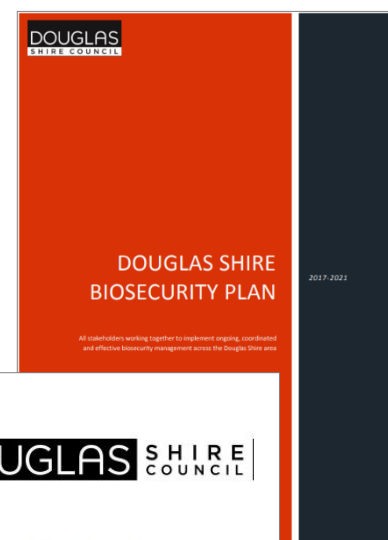
Douglas Shire Council has a number of instruments to manage the vegetation at Wonga Beach. The Coconut Management Plan (DSC 2015) defines the objectives for the management of coconut palms on Council-controlled land. The plan identifies the coconut trees within a given location and provides an assessment of the potential risk, distribution, impacts and associated costs of management.

The Douglas Shire Biosecurity Plan (2017-2021) guides the management of invasive biosecurity matter as well as locally declared pests (plants and animals) as outlined in the *Biosecurity Act 2014*. Under this plan, there are programs being undertaken by DSC to eradicate pest species. Prioritisation of pest species is based on several factors, including (DSC 2017):

- Existing plans and priorities on a national, state and local level
- Impacts and threats
 - Conservation and biodiversity
 - Riparian or aquatic environment
 - Agricultural or production
 - Residential and urban areas
- Capacity to manage
 - Achievability
 - Current extent

These programs include (relevant to vegetation) (DSC 2017):

- Siam Weed Eradication Program
- Hiptage eradication Program
- Miconia Species (Four Tropical Weeds Eradication Program)



3.3 Amenity and liveability

There are a number of facilities and access points for residents and tourists to engage in recreational activities at Wonga Beach. The accessibility and recreational uses of the Wonga Beach foreshore area are summarised in this section and the management implications are discussed.

Infrastructure

There is limited infrastructure at the northern end of Wonga Beach due to its minimal development. North of Pinnacle Village the only infrastructure is one informal beach access track. South of Pinnacle Village, the number of access tracks increases, including formal, private and informal beach access tracks.

The Old Wonga Esplanade is the closest road running parallel to the beach and forms the landward limit of the foreshore area. There is a stormwater drain along Marlin Drive at the southern end of Wonga Beach. Anecdotally, runoff from the drain appears to be causing erosion along the foreshore and is contributing to vegetation loss, particularly of larger trees.

Boat access at Wonga Beach is limited to the boat ramp at the Council Caravan Park along the Esplanade. Four-wheel drives are able to launch boats from the beach at this point. However, there is the concern that motorists are using this point to illegally access and drive 4WDs and other vehicles along the beach. These vehicles have the potential to cause erosion and negatively impact vegetation and essential wildlife habitats.

Passive recreation

Wonga Beach also offers the opportunity for residents and tourists to engage in passive recreational activities. Examples of such activities include:

- walking along the beach and foreshore
- bird watching
- horse riding
- fishing at the Daintree River mouth.

These activities are relatively low impact but can still affect the foreshore condition. If foreshore users create informal access tracks through the vegetation to access the foreshore and beach, this can lead to a loss of vegetation, destabilisation of the sand or soil which may lead to erosion or dune destabilisation, and it could also contribute to habitat loss and destruction. Activities such as bird watching and horse riding will have similar impacts on the foreshore in relation to access. The impact of fishing will largely be a result of vehicle access to the Daintree River mouth, including vegetation clearing for access tracks and driving on the sand where there are important and sensitive wildlife habitats. Dumping of fishing nets or waste may also occur.

Pedestrian access

There are a number of known access tracks to Wonga Beach. Based on the latest data from a Council survey, there is a total of 48 recorded access beach tracks. Of these 48 tracks, six are formalised access paths, three are private accessways to houses, and the remainder are informal access tracks. The creation of informal access tracks presents challenges to foreshore management, particularly with regards to illegal vegetation clearing and dune destabilisation.

Vehicular use of beaches, trail bikes and horse riding

Wonga Beach residents highly value the freedom to use recreational vehicles on the beach, including ATVs. For many years, residents have been using ATVs along the beach and it is considered a significant aspect of their lifestyle (DSC 2020a). Residents also use ATVs to access the Daintree River mouth, which has highly valued recreational fishing amenity. Prior to the Interim FMP for Wonga Beach, ATV use had not been approved but was generally accepted within the community. Following community consultation alongside the development of the Interim FMP, ATV use has been allowed along Wonga Beach for residents only through a permit application process (DSC 2020a). This is outlined in Subordinate Local Law No. 1, Schedule 26 and is restricted to ATVs only (DSC 2020b).

Vehicle use along the foreshore and beach can impact vegetation, beach condition and wildlife habitats. Vegetation can be impacted through clearing for access as well as direct vehicle impacts when habitats, such as dunes, are driven over. The sand can be more easily eroded when driven over, particularly the soft sand above the intertidal zone (between the low tide mark and HAT). Additionally, faunal habitats are placed under pressure if driven over. There is anecdotal evidence of vulnerable wildlife habitats, such as turtles and shorebirds.

Dog off-leash areas

At North Wonga Beach, from Giblin Street to Vixies Road, there is an off-leash dog area along the beach. Dogs pose a risk to fauna as they may attack or scare vulnerable species, particularly when off-leash.

Camping

There are two locations at Wonga Beach where public and private camping may occur. These sites are located outside of the foreshore area, however, visitors to these campgrounds access the foreshore area for a variety of uses. There is a beach access point on the beachfront near Pinnacle Village at the northern end of Wonga Beach Esplanade, which is used by pedestrians and ATVs. There is also a boat ramp and pedestrian beach access points at the Council Caravan Park. These access points may cause loss of vegetation and dune destabilisation. Additionally, there is anecdotal evidence of illegal camping in other areas along the foreshore and rubbish dumping has been observed. Illegal camping may also result further vegetation clearing, and habitat loss and fragmentation.



4 Management precincts

The Wonga Beach foreshore area has been broken up into six management precincts to tailor management actions specific to each precinct. The six precincts are (Figure 6):

- Precinct 1 – Daintree River to North Wonga Beach
- Precinct 2 – Native Title area
- Precinct 3 – Pinnacle Village to Giblin St
- Precinct 4 – Giblin St to Wonga Beach Rd
- Precinct 5 – Wonga Beach Rd to Janbal St
- Precinct 6 – Janbal St to Wonga Beach Park.

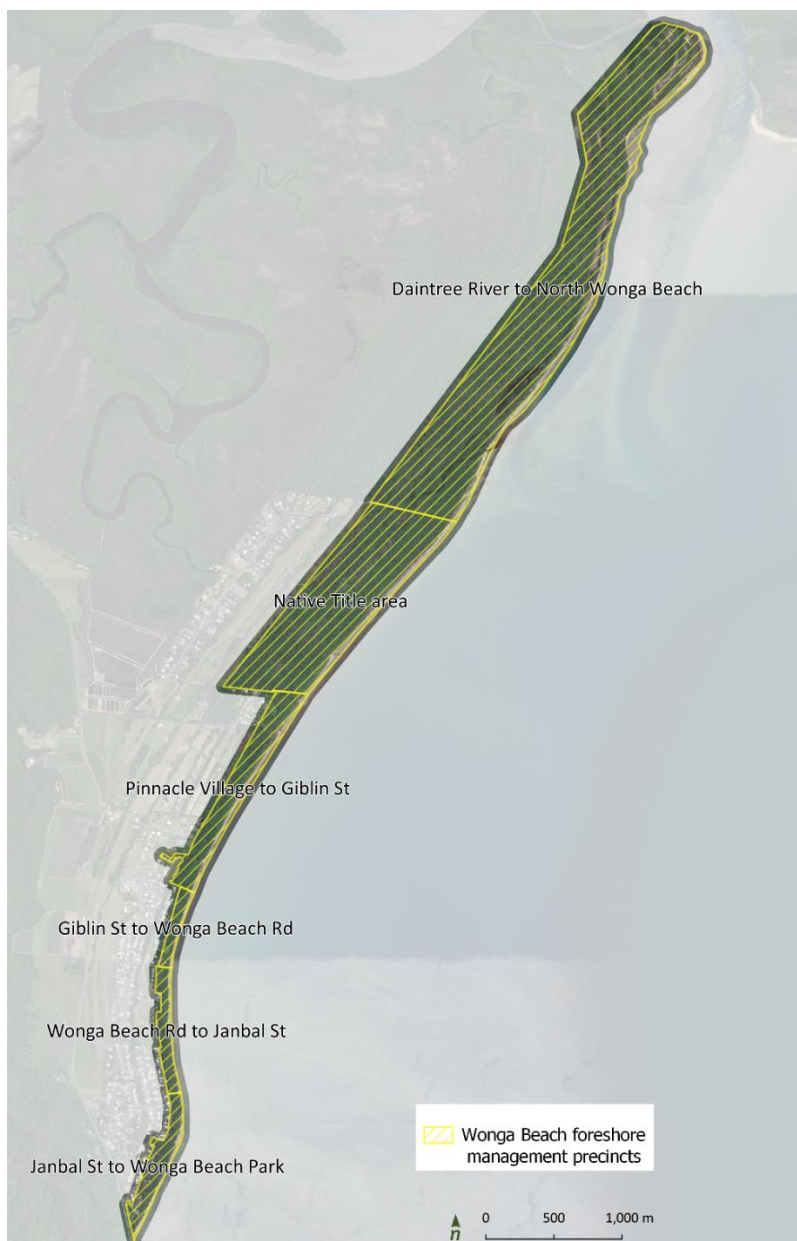


Figure 6. *Wonga Beach foreshore management precincts.*

The threats and challenges within each management precinct are summarised in Table 6. These threats and challenges have been identified through the background review, site inspections and community engagement feedback.

Table 6. Wonga Beach foreshore precinct threats and challenges

Precinct	Key foreshore threats and challenges
<p><u>1 – Daintree River to North Wonga Beach</u></p> <p>Unpopulated precinct and falls under land for conservation.</p>	<ul style="list-style-type: none"> • ATVs driving on soft sand above the intertidal zone – driving on the hard packed sand between the HAT and low tide marks reduces the likelihood of erosion. • Vehicle, pedestrian and other access along foreshore within potential sensitive and vulnerable habitats, including turtle and shorebird nesting areas – access above the intertidal zone during nesting and hatching season may pose a threat to vulnerable species.
<p><u>2 – Native Title area</u></p> <p>Encompasses the Native Title area and is designated to conservation.</p>	<ul style="list-style-type: none"> • ATVs driving on soft sand above the intertidal zone – driving on the hard packed sand between the HAT and low tide marks reduces the likelihood of erosion. • Informal access tracks through land designated to conservation, including illegal vegetation clearing – these activities may not meet the outcomes of the conservation zone code, including biological diversity, ecological integrity and scenic amenity. • Vehicle, pedestrian and other access along foreshore within potential sensitive and vulnerable habitats, including turtle and shorebird nesting areas – access above the intertidal zone during nesting and hatching season may pose a threat to vulnerable species.
<p><u>3 – Pinnacle Village to Giblin St</u></p> <p>Includes land for conservation and recreation and open space.</p>	<ul style="list-style-type: none"> • ATVs driving on soft sand above the intertidal zone – driving on the hard packed sand between the HAT and low tide marks reduces the likelihood of erosion. • Illegal clearing to create informal beach access tracks through the vegetation in the foreshore area – these activities may not meet the outcomes of the Conservation zone code, including biological diversity, ecological integrity and scenic amenity. • Environmental weeds present – may impact the conservation value within the precinct.
<p><u>4 – Giblin St to Wonga Beach Rd</u></p> <p>Land designated for recreation and open space, including Council Caravan Park, and pedestrian and boat access points.</p>	<ul style="list-style-type: none"> • ATVs driving on soft sand above the intertidal zone – driving on the hard packed sand between the HAT and low tide marks reduces the likelihood of erosion. • Vehicle, pedestrian and other access along foreshore within potential sensitive and vulnerable habitats, including turtle and shorebird nesting areas – access above the intertidal zone during nesting and hatching season may pose a threat to vulnerable species. • Environmental weeds present – may impact the conservation value within the precinct. • Illegal clearing to create informal beach access tracks through the vegetation in the foreshore area – these activities may not meet the outcomes of the Conservation zone code, including biological diversity, ecological integrity and scenic amenity.
<p><u>5 – Wonga Beach Rd to Janbal St</u></p> <p>Small area of land for recreation and open space.</p>	<ul style="list-style-type: none"> • ATVs driving on soft sand above the intertidal zone – driving on the hard packed sand between the HAT and low tide marks reduces the likelihood of erosion. • Vehicle, pedestrian and other access along foreshore within potential sensitive and vulnerable habitats, including turtle and shorebird nesting areas – access above the intertidal zone during nesting and hatching season may pose a threat to vulnerable species. • Illegal clearing to create informal beach access tracks through the vegetation in the foreshore area – these activities may not meet the outcomes of the Conservation zone code, including biological diversity, ecological integrity and scenic amenity.
<p><u>6 – Janbal St to Wonga Beach Park</u></p> <p>Includes land designated for recreation and open space.</p>	<ul style="list-style-type: none"> • ATVs driving on soft sand above of the intertidal zone – driving on the hard packed sand between the HAT and low tide marks reduces the likelihood of erosion. • Illegal clearing to create informal beach access tracks through the vegetation in the foreshore area and designated Recreation and Open Space land use zone – these activities may impact the biological diversity, ecological integrity and scenic amenity.



5 Management plan

The following section outlines the adaptive management approach to address the threats and challenges that have been identified for the Wonga Beach foreshore area. The objectives for management have been identified in order to inform measures for management success. Priorities have also been set to appropriately guide management of the foreshore threats and challenges over the immediate, medium and longer-term timeframes. The objectives and priorities shape the management actions for each precinct. In addition, any monitoring and evaluation activities that are to take place following the implementation of the actions will also be summarised to measure the progress of the foreshore management.

5.1 Management objectives

Objectives are useful for measuring the success of the management actions undertaken. They are based on the community values identified through the engagement process. The objectives will guide the metrics for monitoring and evaluation of the management actions. They can be applied at the whole of foreshore (community) and precinct scale.

Management objectives for Wonga Beach foreshore

- Maintain the overall natural form and function of the beach.
- Enhance and maintain vegetation condition – littoral rainforests, dune vegetation for vulnerable species and to prevent dune erosion.
- Build positive behaviour change outcomes to minimise adverse impacts of foreshore use.
- Proactively undertake weed management to restore native vegetation habitats.
- Monitor the presence and health of potential turtle and shorebird nesting sites in foreshore areas.
- Enforce illegal clearing local laws to prevent further establishment of unauthorised and informal beach access tracks.

5.2 Management prioritisation

Prioritisation of the management actions has been assigned as immediate, medium-term or future.

1

Immediate (recommend implementation within next 12 months)

Actions for immediate prioritisation include sites where weeds are present and it is necessary to eradicate the weeds and revegetate the site with native vegetation cover. Environmental weeds pose a significant threat to the values of the Wonga Beach residents, including the natural habitats and wildlife. Actions also revolve around access and use of the foreshore area, such as for ATVs, fishing or pedestrians. The uses may pose a threat the sensitive habitats and management actions are focussed on minimising the impact.

2

Medium-term (recommend implementation within next 2-3 years)

Medium term priority actions are recommended to be implemented within the next two to three years. These actions are important for the management of the foreshore precinct, however, they require community engagement and education to understand their benefits. There is an element of community involvement with the medium-term actions.

3 **Future** (recommend implementation within 5 years)

Future management actions are those that first require an evaluation of the outcomes from immediate to medium-term actions that have been undertaken before being implemented. It is recommended that future actions are implemented within five years of the plan's adoption. This timeframe allows sufficient time for immediate actions to be implemented and their progress and success to be evaluated.



5.3 Management actions

Management actions and their priorities for the Wonga Beach foreshore are summarised in Table 7. Maps of the management actions for each precinct are provided in Attachment C.

Table 7. Wonga Beach foreshore precinct management objectives and actions

Concerns and management actions	All precincts	Precinct 1	Precinct 2	Precinct 3	Precinct 4	Precinct 5	Precinct 6
<u>Objective 1:</u> Reduce the likelihood of erosion of sand from the foreshore area resulting from vehicle access.							
<u>A1.1:</u> Enforce ATV driving on hard packed sand only within a window either side of low tide in the intertidal zone by restricting ATV use to Wonga Beach residents with approved permits (see Attachment D for conditions). Local Laws Officers to undertake random beach patrols as part of enforcement.		1	1	1	1	1	
<u>A1.2:</u> Undertake a community awareness program, including mailouts to ATV users and foreshore signage informing of appropriate speeds and environmental impacts of ATV use on the beach and the region's values, information to be provided at campgrounds and tourist-related businesses.	1						
<u>A1.3:</u> Establish a permit-only access system for a lockable bollard at the Caravan Park boat ramp to restrict illegal 4WD access to the beach. Applicants must provide boat registration details to gain a permit/access. Vehicles are strictly prohibited on or around vegetated areas. Undertake sand scraping on an as-needed basis to maintain a graduated and safe boat access.					1		
<u>A1.4:</u> Undertake a multicriteria analysis as part of a feasibility assessment to formalise the boat ramp access with a suitable material, maintaining safe access and preventing erosion.					3		
<u>A1.5:</u> Retain this precinct as off-limits to ATVs, regardless of approved permit. Sign on beach and at access points to note this is an ATV prohibited zone. Local Laws Officers to undertake random beach patrols as part of enforcement.							1

Concerns and management actions

All precincts

Precinct 1

Precinct 2

Precinct 3

Precinct 4

Precinct 5

Precinct 6

Objective 2: Protect sensitive and vulnerable habitats, including dune vegetation, and turtle and shorebird nesting sites, from vehicle, pedestrian and other access in the foreshore area.

A2.1: Undertake beach monitoring for turtle and shorebird nesting sites in collaboration with Indigenous Rangers and local environmental groups at during nesting and hatching seasons to understand the impact foreshore access may have on these habitats. Survey vegetation cover to assess revegetation requirements to support nesting.

1

1

1

1

1

Objective 3: Preserve the conservation zone, including biological diversity, ecological integrity and scenic amenity by minimising activities that affect these values.

A3.1: Undertake revegetation with native species (see Attachment E) within a 10 m buffer landward of the HAT mark to begin regeneration of land designated to Conservation that has been cleared for informal access and to protect against erosion.

3

2

2

2

2

A3.2: Formalise and maintain defined access tracks and appropriately sign at beach and land entrance. This is to minimise the impact on the frontal dune.

1

1

1

1

1

Objective 4: Restore the conservation value of the foreshore area by reducing the presence and impact of environmental weeds.

A4.1: Establish a weed eradication and maintenance program to remove environmental weeds present in the foreshore area and undertake revegetation with native species (See Attachment E).

1

1

A4.2: Undertake a community education program to communicate knowledge around foreshore weeds, including transfer and establishment, awareness and management.

2

5.4 Monitoring and evaluation

The success of the immediate priority management actions is measured through monitoring and evaluation mechanisms. The monitoring focusses on the sensitive and vulnerable environments, including turtle and shorebird nesting habitats, and key coastal vegetation habitats, as well as the adherence to ATV use in the intertidal zone and boat ramp access.

Nesting habitats

The habitat monitoring will be undertaken to observe where turtle and shorebird nesting habitat is present in the foreshore area. Turtle monitoring should be undertaken based on the Queensland Marine Turtle Field Guide (Attachment F) between November and March to understand the seasonal use of these habitats by turtles (QPWS, DES 2016). Guidelines for shorebird monitoring will need to be developed based on local knowledge. It is recommended that the monitoring be undertaken in partnership with the Indigenous Rangers. In addition, a platform on the DSC website should be created for residents and visitors to submit photos and information regarding any turtle or shorebirds they notice when using the foreshore. The purpose of the habitat monitoring is to understand which species are accessing the foreshore area for nesting and hatching, as well as the vegetation composition of these habitats.

Vegetation

The vegetation monitoring is a simple measure for the percentage of cover and survival success. This monitoring should be undertaken on a yearly basis to record the survival rate. It is recommended that vegetation is monitored on a yearly basis as the end of the wet season.

The purpose of collecting information about the success of revegetation and other site management issues such as exotic plants (environmental weeds), other threats, habitat quality and connectivity, and significant species values is to be able to refine and direct resources accordingly. Flexibility in program delivery is required to maintain the condition of assets such as plantings, respond to threats as they change through time and account for new values if they emerge during the delivery of the project.

Monitoring and evaluation metrics

Table 8 outlines the monitoring and evaluation metrics for the corresponding management action to evaluate the progress and success of implementation. Detailed methods for turtle monitoring and rapid vegetation assessment are provided in Attachment F.

Table 8. Foreshore management action monitoring and evaluation metrics

Management action	Monitoring	Evaluation	Timing
ATV use	<ul style="list-style-type: none"> Compliance of ATV use only in permitted areas 	<ul style="list-style-type: none"> Compliance with location of ATV tracks – whether within or outside of permitted intertidal zone (community group) Community survey to gauge attitudes around restrictions Warnings or fines that have been issued 	Random monitoring of ATV tracks and compliance, quarterly review of monitoring
Boat ramp access	<ul style="list-style-type: none"> Sand movement to inform boat ramp feasibility assessment 	<ul style="list-style-type: none"> Photo and drone capture of erosion scarp and wider beach Citizen science contributions through a CoastSnap monitoring point 	Monthly, event based (pre- and post-event)
Fauna monitoring	<ul style="list-style-type: none"> Nesting species Vegetation composition of nesting habitats 	<ul style="list-style-type: none"> Turtle tracks, bird nests Population dynamics Animal health 	Nesting season

Vegetation monitoring

- Species specific observations to identify which species may be doing poorly
- Weed cover within each of the canopy layers (top 5 transforming weed species)

- Measure of the percentage survival of revegetation
- Percentage survival of key species
- Percentage cover over canopy layers of weeds
- Percentage of bare/disturbed ground
- Natural recruitment
- Habitat connectivity
 - Significant species

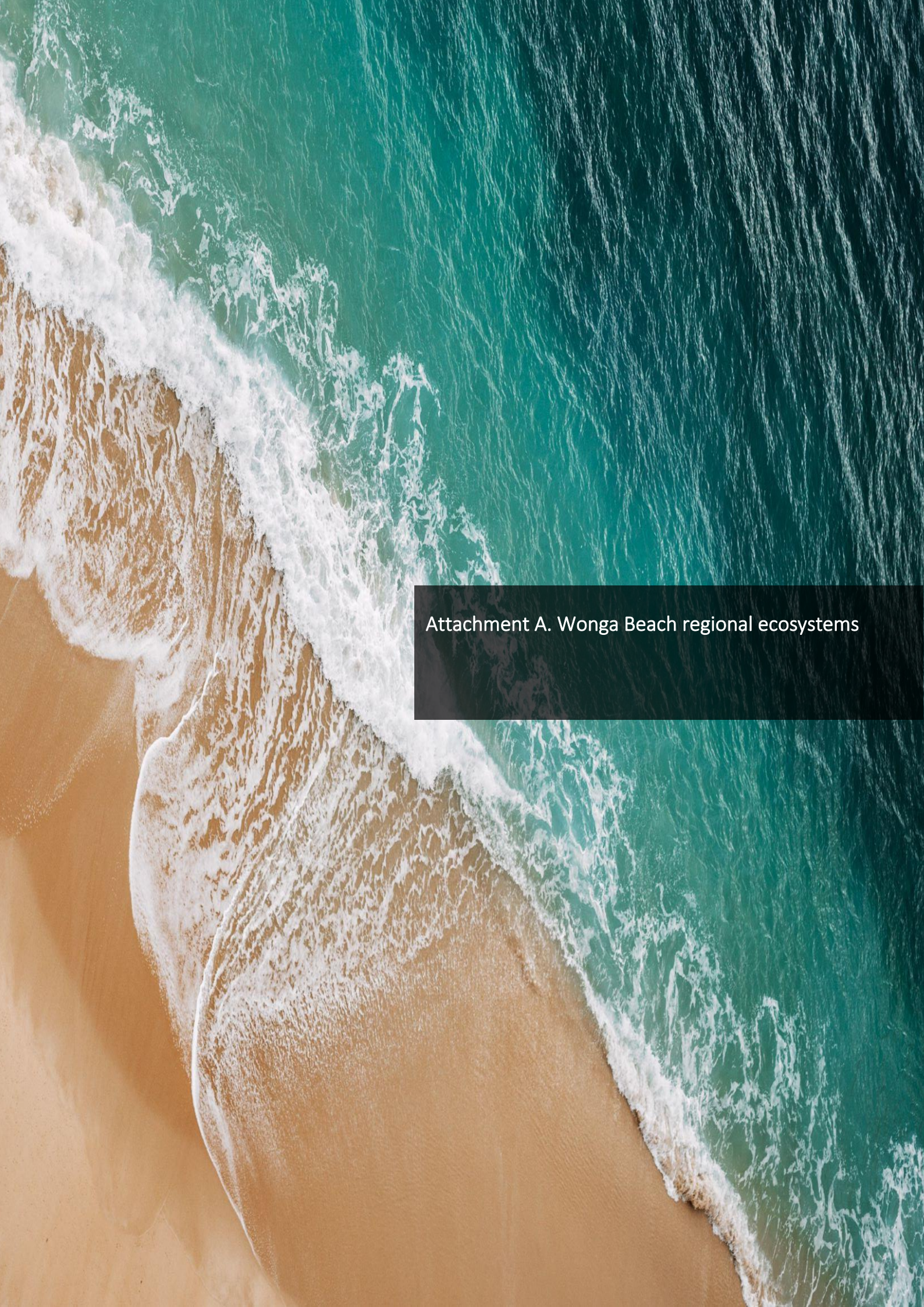
Annual



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Attachment A. Wonga Beach regional ecosystems

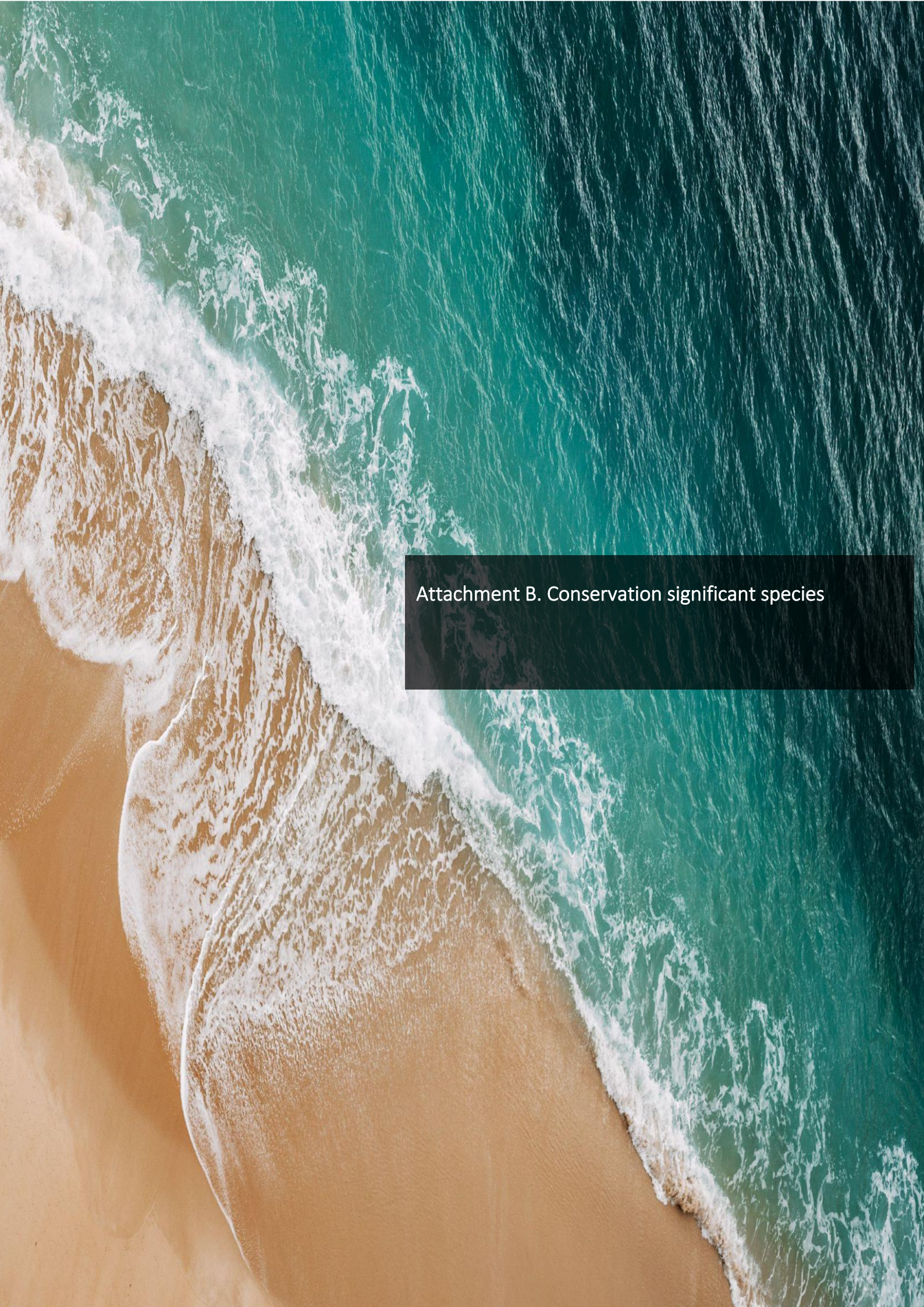
Table 9. Wonga Beach regional ecosystems (REs)

RE	Description	VM Class	BD Status
7.1.1	Mangrove closed scrub to open forest. Sheltered coastlines, estuaries, and deep swales between dunes, on fine anaerobic silts, inundated with saline water at high tide.	LC	NC
7.1.2a	<i>Sporobolus virginicus</i> grassland, samphire open forbland to sparse forbland and bare salt pans on plains adjacent to mangroves	OC	OC
7.1.3b	<i>Melaleuca quinquenervia</i> open forest to woodland, and shrubland to closed scrub. Transitional saline areas. Palustrine wetland (e.g., vegetated swamp).	OC	E
7.2.1c	Closed forest with <i>Calophyllum inophyllum</i> , <i>Terminalia arenicola</i> , <i>Dillenia alata</i> , <i>Myristica insipida</i> , <i>Planchonella obovata</i> , <i>Millettia pinnata</i> , and <i>Hibiscus tiliaceus</i> . Beach ridge deposits adjacent to the foredune, in the very wet rainfall zone.	E	E
7.2.1e	Simple notophyll vine forest with <i>Syzygium angophoroides</i> , on sands of beach origin. Dune sands. Floodplain (other than floodplain wetlands)	E	E
7.2.2a	Notophyll vine forests, often with <i>Acacia</i> emergents. Species commonly include <i>Cupaniopsis anacardioides</i> , <i>Diospyros geminata</i> , <i>Canarium australianum</i> , <i>Alphitonia excelsa</i> , <i>Acacia crassicaarpa</i> , <i>Pleiogynium timorensis</i> , <i>Chionanthus ramiflorus</i> , <i>Mimusops elengi</i> , <i>Polyalthia nitidissima</i> , <i>Millettia pinnata</i> , <i>Geijera salicifolia</i> , <i>Ficus opposita</i> , <i>Sersalisia sericea</i> , <i>Terminalia muelleri</i> , <i>T. arenicola</i> , <i>Drypetes deplanchei</i> , and <i>Exocarpos latifolius</i> . Lowlands on dune sands, of the moist and dry rainfall zones.	OC	E
7.2.2g	Vine forest with <i>Hibiscus tiliaceus</i> and <i>Calophyllum australianum</i> . Intermittently inundated narrow dune swales.	OC	E
7.2.3a	<i>Corymbia tessellaris</i> , <i>C. clarksoniana</i> (and/or <i>C. intermedia</i>), <i>Melaleuca dealbata</i> +/- <i>Lophostemon suaveolens</i> woodland to closed forest, with <i>Acacia mangium</i> , <i>A. crassicaarpa</i> , <i>Canarium australianum</i> and <i>Deplanchea tetraphylla</i> . Unweathered low prograding beach dunes, predominantly of Holocene age.	OC	OC
7.2.3e	<i>Corymbia intermedia</i> open forest, with a very well-developed vine forest understorey (due to infrequent burning). Beach ridges, predominantly of Holocene age. (BVG1M: 9e)	OC	OC
7.2.4g	<i>Melaleuca dealbata</i> +/- <i>M. leucadendra</i> woodland to open forest. Weathered relict beach ridges. Palustrine wetland (e.g., vegetated swamp).	OC	OC
7.2.7a	Complex of open shrubland to closed shrubland, grassland, low woodland and open forest. Includes pure stands of <i>Casuarina equisetifolia</i> , and <i>Acacia crassicaarpa</i> , <i>Syzygium forte</i> subsp. <i>forte</i> , <i>Calophyllum inophyllum</i> and <i>Pandanus</i> spp. woodland to open forest. Beach strand and foredune.	OC	E
7.2.8	<i>Melaleuca leucadendra</i> (weeping tea tree) open forest to woodland. Sands of beach origin.	OC	E



7.2.9a	<i>Melaleuca quinquenervia</i> open forest to woodland and shrubland. Dune swales and swampy sandplains of beach origin. Palustrine wetland (e.g., vegetated swamp).		
7.3.10f	Simple notophyll vine forest with <i>Syzygium angophoroides</i> . Swampy alluvial plains. Floodplain (other than floodplain wetlands).	OC	E
7.3.46	<i>Lophostemon suaveolens</i> (swamp mahogany) open forest to woodland. Alluvial plains.	E	E
7.3.5a	<i>Melaleuca quinquenervia</i> open forest, woodland and shrubland. Lowlands of the very wet and wet rainfall zone, on poorly drained peaty humic gley soils where the water table is near or above the ground for most of the year. Palustrine wetland (e.g., vegetated swamp).	LC	E
7.3.9b	<i>Corymbia tessellaris</i> , <i>Acacia crassicarpa</i> , <i>Melaleuca leucadendra</i> , <i>M. viridiflora</i> woodland to open forest. Coastal flats and broad drainage lines. May include areas with some mixing with marine sediments and dune sands. Floodplain (other than floodplain wetlands).	E	E





Attachment B. Conservation significant species

Flora

Table 10. Conservation significant flora at Wonga Beach

Botanical name	Common name	EPBC Status ³	NC Act ⁴
<i>Acriopsis emarginata</i>	Pale chandelier orchid	V	V
<i>Canarium acutifolium</i>		V	V
<i>Vappodes lithocola</i>	Dwarf butterfly orchid	E	
<i>Carronia pedicellate</i>		E	E
<i>Chingia australis</i>		E	E
<i>Cyclophyllum costatum</i>		V	V
<i>Dendrobium mirbelianum</i>	Dark-stemmed antler orchid	E	E
<i>Dendrobium nindii</i>	Blue antler orchid	E	E
<i>Endiandra cooperana</i>		E	E
<i>Myrmecodia beccarii</i>	Ant plant	V	V
<i>Phaius australis</i>	Lesser swamp orchid	E	E
<i>Phaius pictus</i>	Forest swamp orchid	V	V
<i>Phalaenopsis amabilis subsp. rosenstromii</i>	Native moth orchid	E	
<i>Phlegmariurus dalhousieanus</i>	Blue tassel-fern	E	CE
<i>Vappodes phalaenopsis</i>	Cooktown orchid		

³ Environment Protection and Biodiversity Conservation (EPBC) Act score: V – Vulnerable, NT – Near Threatened, E – Endangered, CE – Critically Endangered

⁴ Nature Conservation (NC) Act score: V – Vulnerable, NT – Near Threatened, E – Endangered, CE – Critically Endangered



Fauna

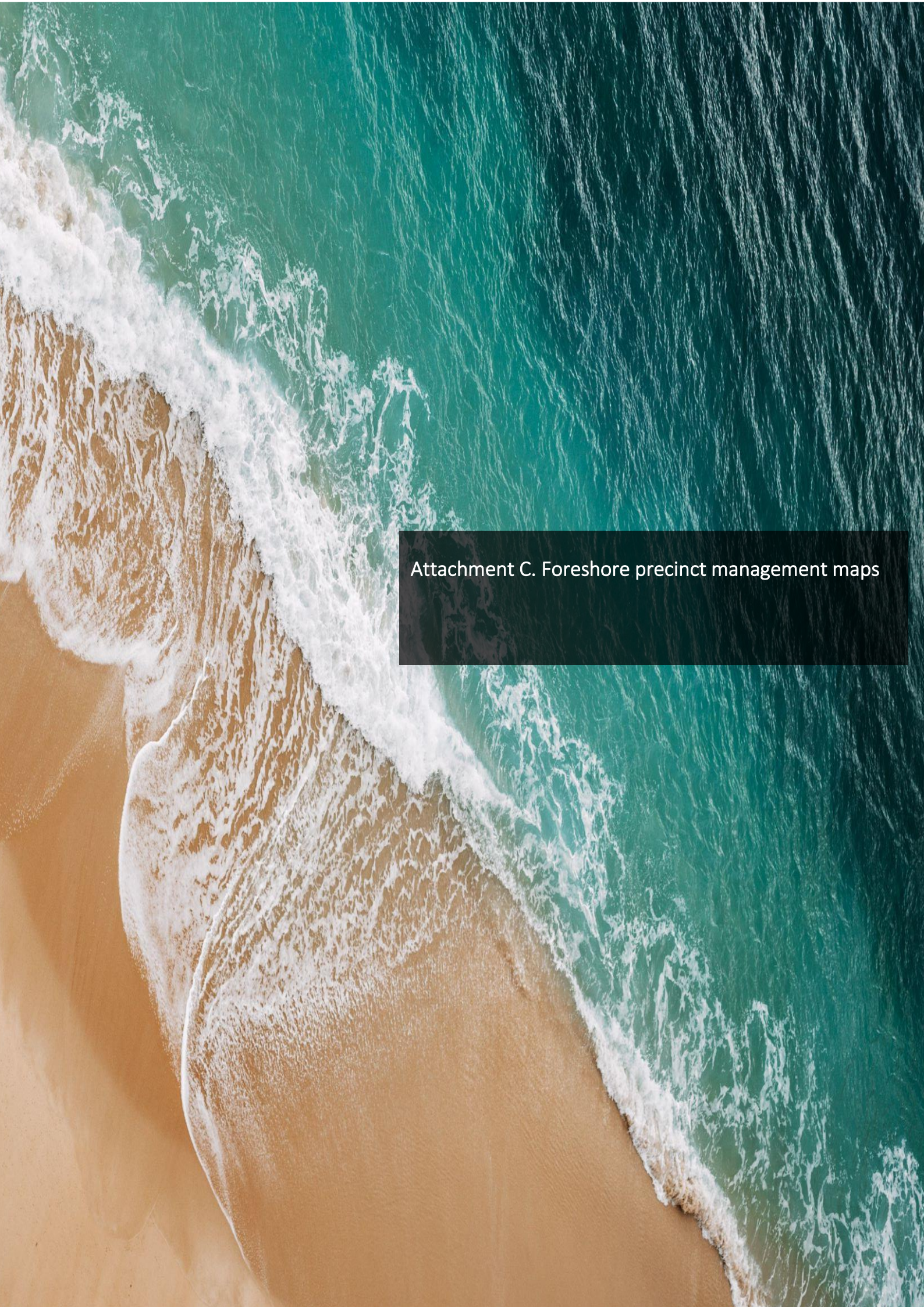
Table 11. Conservation significant fauna at Wonga Beach

Scientific name	Common name	EPBC Act ⁵	NC Act ⁶	Likelihood of occurrence
Shorebirds				
<i>Esacus magnirostris</i>	Beach-stone curlew	—	V	Likely
<i>Casuarius casuarius johnsonii</i>	Southern cassowary	E	E	Possible
<i>Calidris ferruginea</i>	Curlew sandpiper	CE	CE	Likely
<i>Numenius madagascariensis</i>	Eastern curlew	CE	E	Likely
<i>Charadrius mongolus</i>	Lesser sand plover	E	E	Likely
<i>Charadrius leschenaultii</i>	Greater sand plover	V	V	Likely
<i>Calidris canutus</i>	Red knot	E	E	Likely
Sea turtles				
<i>Natator depressus</i>	Flatback turtle	V	V	Likely
<i>Chelonia mydas</i>	Green turtle	V	V	Likely
<i>Eretmochelys imbricata</i>	Hawksbill turtle	V	E	Likely
<i>Dermochelys coriacea</i>	Leatherback turtle	E	E	Possible
<i>Caretta caretta</i>	Loggerhead turtle	E	E	Likely
<i>Lepidochelys olivacea</i>	Olive ridley turtle	E	E	Likely
Other				
<i>Hirundapus caudacutus</i>	White-throated needletail	V	V	Likely
<i>Crocodylus porosus</i>	Estuarine crocodile	—	V	Likely

⁵ Environment Protection and Biodiversity Conservation (EPBC) Act score: V – Vulnerable, NT – Near Threatened, E – Endangered, CE – Critically Endangered

⁶ Nature Conservation (NC) Act score: V – Vulnerable, NT – Near Threatened, E – Endangered, CE – Critically Endangered





Attachment C. Foreshore precinct management maps



Figure 7. Wonga Beach foreshore precinct 1 management actions.

Precinct 2 covers the Native Title area that belongs to the Eastern Kuku Yalanji People.

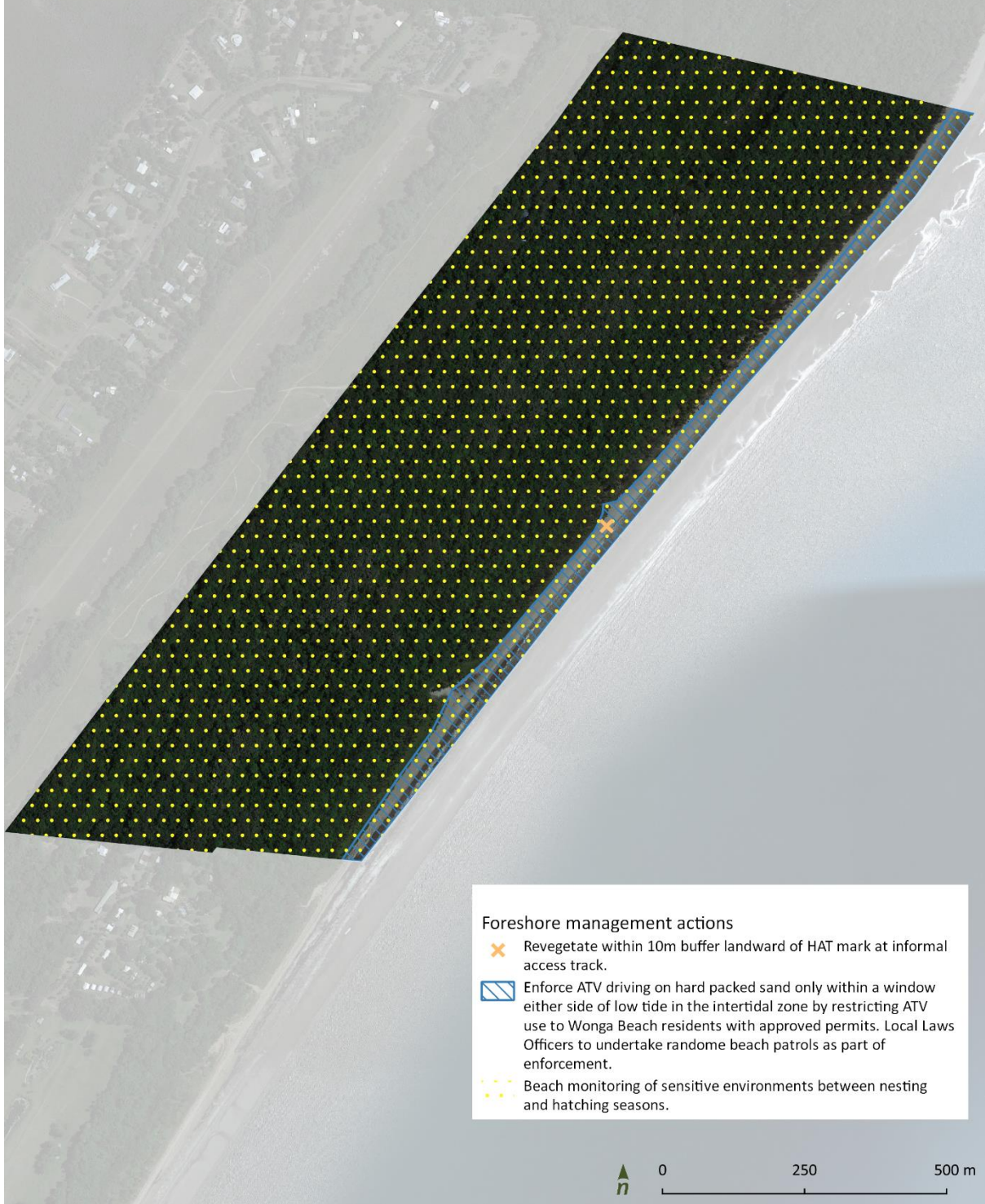


Figure 8. Wonga Beach foreshore precinct 2 management actions.



Figure 9. Wonga Beach foreshore precinct 3 management actions.



Figure 10. Wonga Beach foreshore precinct 4 management actions.



Figure 11. Wonga Beach foreshore precinct 5 management actions.



Figure 12. Wonga Beach foreshore precinct 6 management actions.

An aerial photograph of a beach. The top half of the image shows deep turquoise ocean water with white foam from a wave breaking. The bottom half shows a wide, sandy beach with a thin layer of water and foam washing onto the shore. The text 'Attachment D. ATV use conditions' is centered in a dark rectangular box over the water.

Attachment D. ATV use conditions

The following outlines the conditions and approval criteria for ATV use. This information has been adapted from the Interim Wonga Beach Foreshore Management Plan (DSC 2020a).

Table 12. ATV use conditions by foreshore management precinct

Precinct	Conditions
1	<ul style="list-style-type: none"> • ATV use is permitted by approval only – use prohibited on or near riparian zones, vegetated areas and dune area • ATV use is permitted only on hard packed sand • ATV use to be limited to speeds of 40 km/hr
2	<ul style="list-style-type: none"> • ATV use is permitted by approval only – use prohibited on or near riparian zones, vegetated areas and dune area • ATV use is permitted only on hard packed sand • ATV use to be limited to speeds of 40 km/hr
3	<ul style="list-style-type: none"> • No access via Council-controlled land, except for guests of Pinnacle Village Caravan Park • ATV use is permitted by approval only – use prohibited on or near riparian zones, vegetated areas and dune area • ATV use is permitted only on hard packed sand • ATV use to be limited to speeds of 40 km/hr
4	<ul style="list-style-type: none"> • ATV use is permitted by approval only – use prohibited on or near riparian zones, vegetated areas and dune area • ATV use is permitted only on hard packed sand • ATV use to be limited to speeds of 20 km/hr • ATV use in this precinct limited to residents of New Wonga for the purpose of accessing the main ATV recreation area north of the Giblin St access point
5	<ul style="list-style-type: none"> • ATV use is permitted by approval only – use prohibited on or near riparian zones, vegetated areas and dune area • ATV use is permitted only on hard packed sand • ATV use to be limited to speeds of 20 km/hr • ATV use in this precinct limited to residents of New Wonga for the purpose of accessing the main ATV recreation area north of the Giblin St access point
6	<ul style="list-style-type: none"> • No ATV use south of Janbal St

ATV approval criteria:

- Recreational ATV use limited to Wonga Beach only
- Foreshore and beach access restricted to access points
- Only residents of Wonga Beach are eligible for approval; proof must be provided by a current provisional or full driver's licence with the applicant's current residential address clearly visible
- Only the ATV nominated on the approval is to be driven on the beach
- Two (2) wheeled vehicles, such as trail bikes, or large four wheel drive passenger vehicles will not be considered for approval
- Applicants must have and be able to prove that they have undertaken some form of recognised ATV safety training
- Parents or legal guardians of minors (children 11 years or older) may apply for a permit on behalf of the minor – conditions apply (more details below)



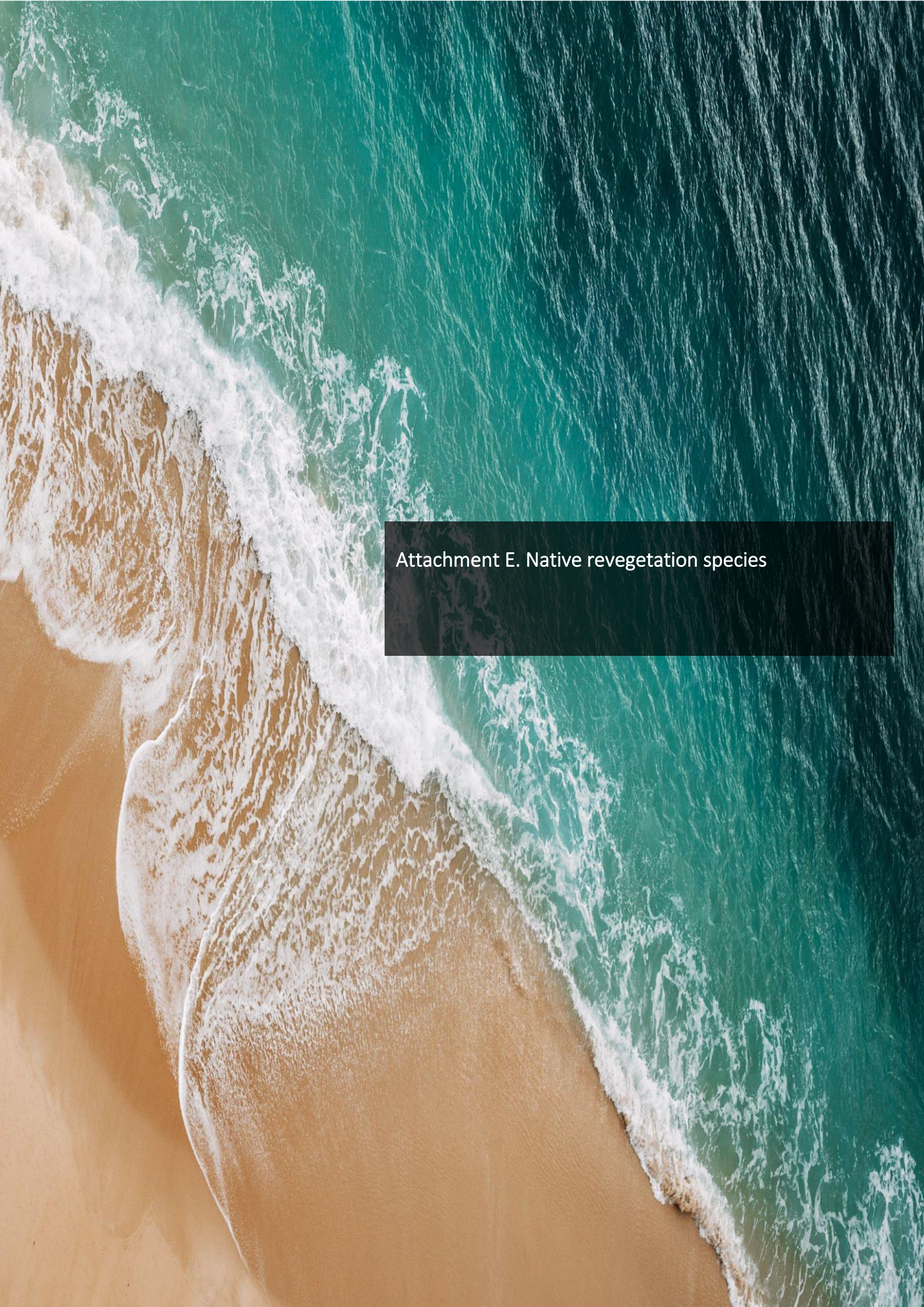
Conditions additional to Subordinate Local Law No. 1, Schedule 26

- ATVs are not to be driven above the high tide mark, on or over frontal dunes or foreshore areas, except when travelling to and from the beach at designated access points
- ATVs will be restricted to travelling on the beach between 8 am and 6:30 pm
- ATVs must not be driven by persons under the influence of intoxicating liquor or drugs
- Hooning, fishtailing and racing of ATVs is not permitted
- Only the ATV nominated on the approval is to be driven on the beach
- ATVs must give way to pedestrians and wildlife at all times
- ATVs must be kept in a good state of repair or an approval will be revoked
- Approval holders will be issued an approval identification sticker or similar which must be visible on the ATV at all times
- ATVs that cannot be registered and legally driven on a road must be pushed or transported by utility or trailer to the designated access point
- Approval holders operating ATVs must wear an approved motorbike helmet and not carry a passenger unless on a seat designated for that purpose, as per Queensland State Law
- Passengers on a vehicle approved for passengers must be at least 8 years of age, as per Queensland State Law
- Approval holders must carry their drivers licence at all times when conducting the activity and provide to an authorised officer on request

Approval for minors (children 11 years or older)

- Parents or legal guardians of minors (children aged 11 years or older) may apply for an approval on behalf of the minor
- Parents or legal guardians must supervise the minor at all times when the ATV is being used on the beach, including any movement of the ATV between home and the beach
- Parents or legal guardians will be responsible for the conduct and behaviour of the minor at all times when the ATV is being used on the beach, including any movement of the ATV between home and beach
- When making an application for approval for a minor, the parent or legal guardian will become legally liable and responsible for any enforcement action taken by Douglas Shire Council with respect to any breaches of the approval (enforcement action may include the issue of a Penalty Infringement Notice)
- ATVs must be the appropriate size for the user and must not be designed to be operated by an adult
- No passengers will be permitted



An aerial photograph of a beach. The top half of the image shows deep turquoise ocean water with white foam from a wave washing onto the shore. The bottom half shows a wide, sandy beach with a light tan color. A dark grey rectangular box is overlaid on the water, containing white text.

Attachment E. Native revegetation species

Table 13. Native revegetation species (Florentine, Pohlman and Westbrooke 2015)

Botanical name ⁷	Common name	Precinct 1	Precinct 2	Precinct 3	Precinct 4	Precinct 5	Precinct 6
<i>Acacia crassicaarpa</i>	Northern golden wattle			✓	✓		
<i>Acacia mangium</i>	Broadleaf salwood			✓	✓		
<i>Acacia oraria</i>	Coastal wattle			✓	✓		
<i>Aglaia elaeagnoidea</i>	Coastal boodyarra			✓	✓	✓	✓
<i>Alphitonia petriei*</i>	Sarsaparilla			✓	✓		
<i>Alyxia spicata</i>	Chain fruit			✓	✓	✓	✓
<i>Atractocarpus fitzalanii</i>	Brown gardenia			✓	✓	✓	✓
<i>Barringtonia asiatica</i>	Mango bark, Mango pine						
<i>Barringtonia calypttrata</i>	Mango pine			✓	✓	✓	✓
<i>Beilschmiedia obtusifolia</i>	Blush walnut			✓	✓	✓	✓
<i>Blepharocarya involucrigera</i>	Rose butternut			✓	✓	✓	✓
<i>Brachychiton acerifolius</i>	Illawarra flame tree			✓	✓	✓	✓
<i>Breynia cernua</i>	Fart bush			✓	✓	✓	✓
<i>Calophyllum inophyllum</i>	Beach calophyllum			✓	✓	✓	✓
<i>Calophyllum sil</i>	Blush touriga						
<i>Canarium vitiense</i>	Canarium			✓	✓	✓	✓
<i>Carallia brachiata</i>	Corky bark, Fresh water mangrove			✓	✓	✓	✓
<i>Casuarina equisetifolia</i>	Beach casuarina			✓	✓	✓	✓

⁷ * denotes pioneer species that will grow and establish quickly, allowing for natural recruitment or planting of secondary species.



Botanical name ⁷	Common name	Precinct 1	Precinct 2	Precinct 3	Precinct 4	Precinct 5	Precinct 6
<i>Cerbera manghas</i>	Dog bane			✓	✓	✓	✓
<i>Chionanthus ramiflora</i>	Native olive			✓	✓	✓	✓
<i>Clerodendrum longiflorum</i>	Long flowered clerodendrum			✓	✓	✓	✓
<i>Colubrina asiatica</i>	Beach berry bush			✓	✓	✓	✓
<i>Cordia subcordata</i>	Sea trumpet						
<i>Crinum pedunculatum</i>	Beach lily, Swamp lily			✓	✓	✓	✓
<i>Cupaniopsis anacardioides</i>	Beach Tamarind			✓	✓	✓	✓
<i>Deplanchea tetraphylla</i>	Golden bouquet tree			✓	✓	✓	✓
<i>Dillenia alata</i>	Red beech			✓	✓	✓	✓
<i>Diospyros compacta</i>	Australian ebony						
<i>Dodonea viscosa</i>	Hop bush						
<i>Elaeodendron melanocarpum</i>	False olive			✓	✓	✓	✓
<i>Eucalyptus plattphylla</i>	Ghost gum						
<i>Euroschinus falcata*</i>	Pink poplar			✓	✓		
<i>Ficus benjamina</i>	Weeping fig			✓	✓	✓	✓
<i>Ficus drupacea</i>	Drupe fig			✓	✓	✓	✓
<i>Ficus microcarpa</i>	Small fruited fig			✓	✓	✓	✓
<i>Ficus opposita</i>	Sandpaper fig			✓	✓	✓	✓
<i>Ficus racemosa</i>	Cluster fig			✓	✓	✓	✓
<i>Ganophyllum falcatum</i>	Daintree hickory			✓	✓	✓	✓
<i>Glochidion harveyanum</i>	Harvey's buttonwood			✓	✓	✓	✓



Botanical name ⁷	Common name	Precinct 1	Precinct 2	Precinct 3	Precinct 4	Precinct 5	Precinct 6
<i>Glochidion philippicum</i>	Daintree cheese tree			✓	✓	✓	✓
<i>Gmelina dalrympleana</i>	White beech			✓	✓	✓	✓
<i>Gomphandra australiana</i>	Buff beech			✓	✓	✓	✓
<i>Guioa acutifolia</i> *	Glossy tamarind			✓	✓		
<i>Haemodorum coccineum</i>	Blood root						
<i>Hibiscus tiliaceus</i>	Coast cottonwood			✓	✓	✓	✓
<i>Intsia bijuga</i>	Kwila			✓	✓	✓	✓
<i>Ipomoea pes-caprae</i>	Coastal morning glory			✓	✓	✓	✓
<i>Jagera pseudorhus</i>	Foambark			✓	✓	✓	✓
<i>Livistona muelleri</i>	Northern Cabbage Tree Palm			✓	✓	✓	✓
<i>Lophostemon suaveolens</i>	Swamp mahogany, swamp box						
<i>Macaranga tanarius</i>	Kamala, Blush macaranga			✓	✓	✓	✓
<i>Mallotus philippensis</i>	Red Kamala			✓	✓	✓	✓
<i>Maytenus fasciculiflora</i>	Orangebark						
<i>Melaleuca leucadendra</i>	Weeping paperbark						
<i>Melaleuca viridiflora</i>	Broad leaved paperbark						
<i>Melia azederach</i>	White cedar						
<i>Micromelum minutum</i>	Lime berry			✓	✓	✓	✓

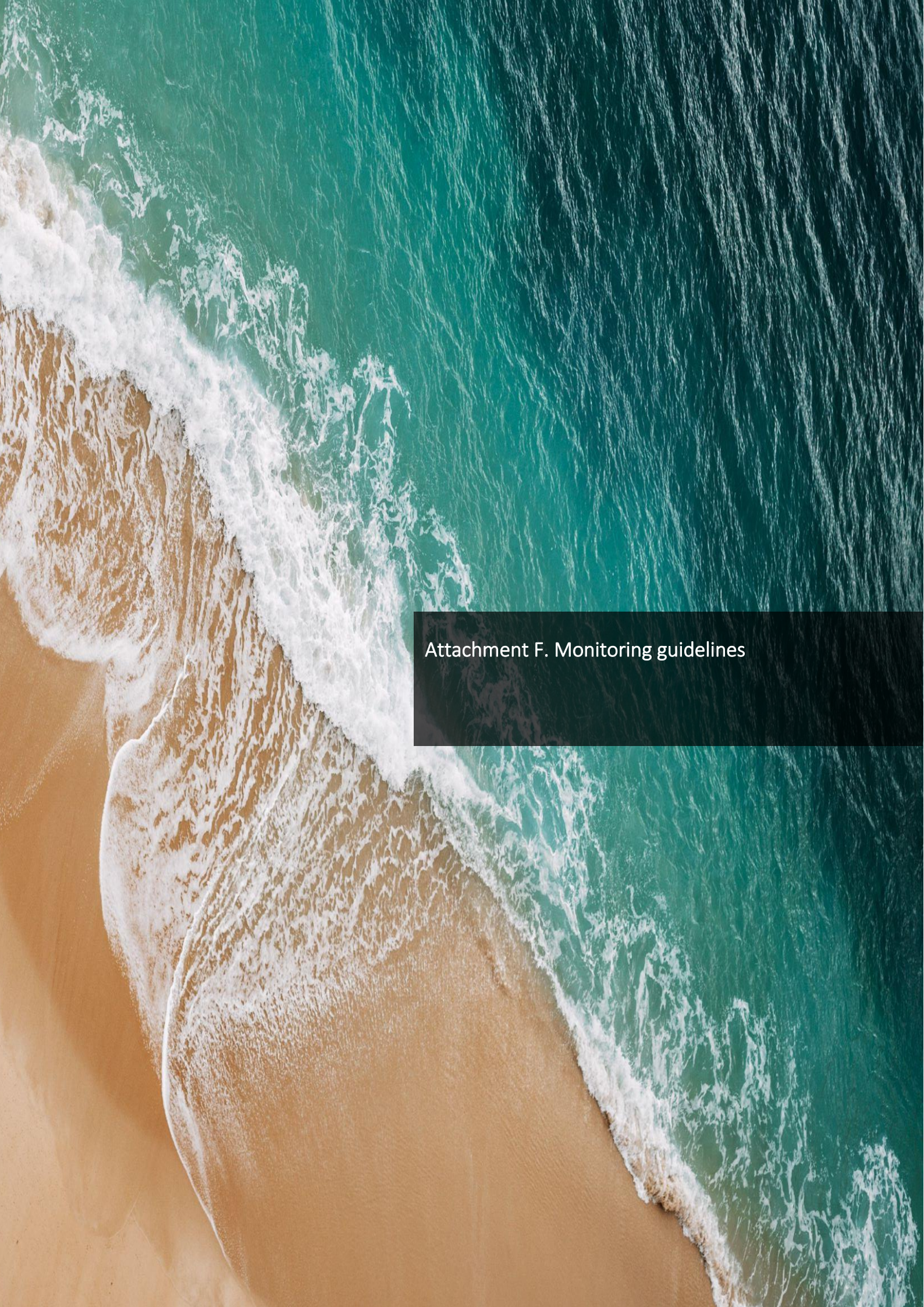


Botanical name ⁷	Common name	Precinct 1	Precinct 2	Precinct 3	Precinct 4	Precinct 5	Precinct 6
<i>Miliusa brahei</i>	Raspberry jelly plant			✓	✓	✓	✓
<i>Millettia pinnata</i>	Pongamia tree			✓	✓	✓	✓
<i>Mimusops elengi</i>	Red coonoo			✓	✓	✓	✓
<i>Mischocarpus exangulatus</i>	Red bell mischocarp			✓	✓	✓	✓
<i>Morinda citrifolia</i>	Rotten cheese fruit			✓	✓	✓	✓
<i>Pandanus tectorius</i>	Beach pandan			✓	✓	✓	✓
<i>Pittosporum ferrugineum</i>	Rusty pittosporum						
<i>Planchonia careya</i>	Cocky apple						
<i>Pleiogynium timorense</i>	Burdekin plum			✓	✓	✓	✓
<i>Polyscias elegans</i>	Celerywood			✓	✓	✓	✓
<i>Pouteria chartacea</i>	Thin leaved coonoo			✓	✓	✓	✓
<i>Pouteria obovata</i>	Yellow boxwood			✓	✓	✓	✓
<i>Premna serratifolia</i>	Coastal premna			✓	✓	✓	✓
<i>Ptychosperma elegans</i>	Solitaire palm			✓	✓	✓	✓
<i>Rhus taitensis</i>	Sumac			✓	✓	✓	✓
<i>Scaevola taccada</i>	Beach lettuce			✓	✓	✓	✓
<i>Schefflera actinophylla</i>	Umbrella tree			✓	✓	✓	✓
<i>Scolopia braunii</i>	Brown birch			✓	✓	✓	✓
<i>Sterculia quadrifida</i>	Peanut tree			✓	✓	✓	✓
<i>Syzygium angophoroides</i>	Yarrabah satinash			✓	✓	✓	✓
<i>Syzygium hemilamprum</i>	Blush satinash			✓	✓	✓	✓



Botanical name ⁷	Common name	Precinct 1	Precinct 2	Precinct 3	Precinct 4	Precinct 5	Precinct 6
<i>(Syn. Acmena hemilampra)</i>							
<i>Tarennia dallachiana</i>	Tree ixora			✓	✓	✓	✓
<i>Terminalia arenicola</i>	Brown damson			✓	✓	✓	✓
<i>Terminalia catappa</i>	Indian almond			✓	✓	✓	✓
<i>Terminalia microcarpa</i>	Damson plum			✓	✓	✓	✓
<i>Terminalia muelleri</i>	Mueller's damson			✓	✓	✓	✓
<i>Thespesia populneoides</i>	Tulip tree			✓	✓	✓	✓
<i>Timonius timon</i>	False fig			✓	✓	✓	✓
<i>Vitex rotundifolia</i>	Beach vitex			✓	✓	✓	✓
<i>Vigna marina</i>	Beach pea			✓	✓	✓	✓





Attachment F. Monitoring guidelines

Rapid Vegetation Assessment Method

Data collection

General survey information	Survey ID	Description of survey					
	Assessor Name/s	Descriptive text					
	Date of record	Date					
	Assessment number	Assessment	1	2	3	4	5
Specific location	General Location	Descriptive text					
	Easting	GPS spatial data					
	Northing	GPS spatial data					
	Spatial uncertainty	GPS spatial data					
Desired cover by year 5							
	Present	1 (1-5)	2 (6-25)	3 (26-50)	4 (51-75)	5 (76-100)	Absent
Under							
Mid							
Over							
Current overall cover							
	Present	1 (1-5)	2 (6-25)	3 (26-50)	4 (51-75)	5 (76-100)	Absent
Under							
Mid							
Over							
Percentage survival of each layer							
	Present	1 (1-5)	2 (6-25)	3 (26-50)	4 (51-75)	5 (76-100)	Absent
Under							
Mid							
Over							
Species specific observations							
	% Understorey		% Mid-storey		% Overstorey		%
Sp. 1							
Sp. 2							
Sp. 3							
Sp. 4							



Sp. 5							
Environmental weeds cover							
	Present	1 (1-5)	2 (6-25)	3 (26-50)	4 (51-75)	5 (76-100)	Absent
Under							
Mid							
Over							
High threat environmental weeds							
	% Understorey		% Mid-storey		% Overstorey		%
Sp. 1							
Sp. 2							
Sp. 3							
Sp. 4							
Sp. 5							
Bare ground created by disturbance							
	Present	1 (1-5)	2 (6-25)	3 (26-50)	4 (51-75)	5 (76-100)	Absent
Vehicles							
People							
Erosion							
Other							
Natural recruitment							
	Absent		Present		%		
Under							
Mid							
Over							
Connectivity							
	Patch size (ha)		Distance (km)		Connection		
Patch 1					H	M	L
Patch 2					H	M	L
Patch 3					H	M	L
Significant species identified							
	Location	Population size	Threat		Proposed response		

Sp. 1				
Sp. 2				
Sp. 3				

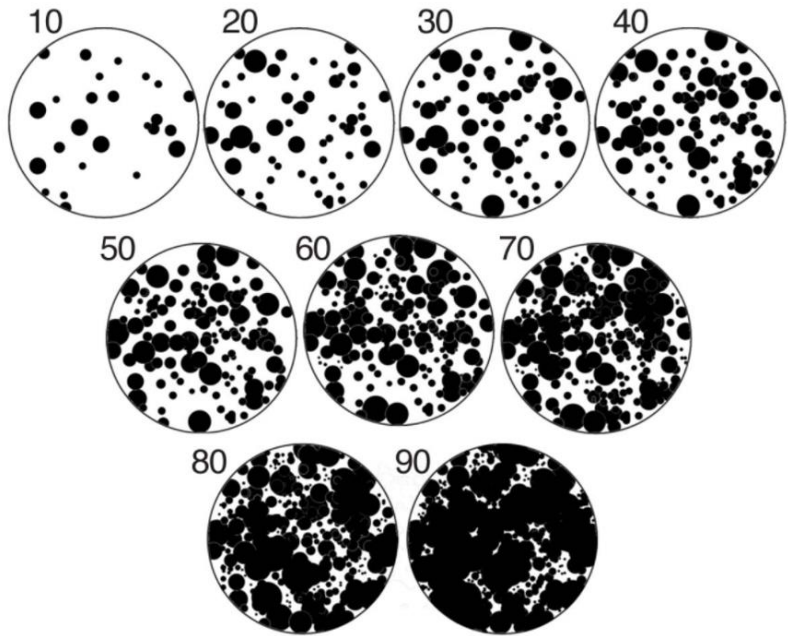


Figure 13. *Schematic representation of percentage cover categories.*



Queensland Marine Turtle Field Guide





Queensland's coast has some of the most important marine turtle nesting sites in the world. Six species of threatened marine turtles nest along our idyllic beaches. These rookeries support significant nesting populations of green, loggerhead, hawksbill, flatback and olive ridley turtles.

One of the most serious threats to nesting turtle populations is the destruction of their eggs and hatchlings by predators. Feral pigs have been found to be responsible for destroying over 70 per cent of turtle nests at nesting beaches on Cape York, continued loss at this rate is not sustainable. Other predators include foxes, dogs, dingoes and goannas.

To reduce predation on marine turtle nests and help the recovery of threatened marine turtle populations, the Australian and Queensland Governments have together invested nearly \$7million in the Nest to Ocean Turtle Protection Program. The program supports predator control and turtle monitoring at priority nesting beaches. It also assists Traditional Owner and

community groups to increase their participation in these important activities.

This field guide has been developed as part of the Nest to Ocean Turtle Protection Program. Correctly identifying marine turtles, and the animals that prey on their nests, provides valuable information about turtle populations and shows where predator control activities are most needed.



Front Cover: Turtle hatchlings © K Jorgen

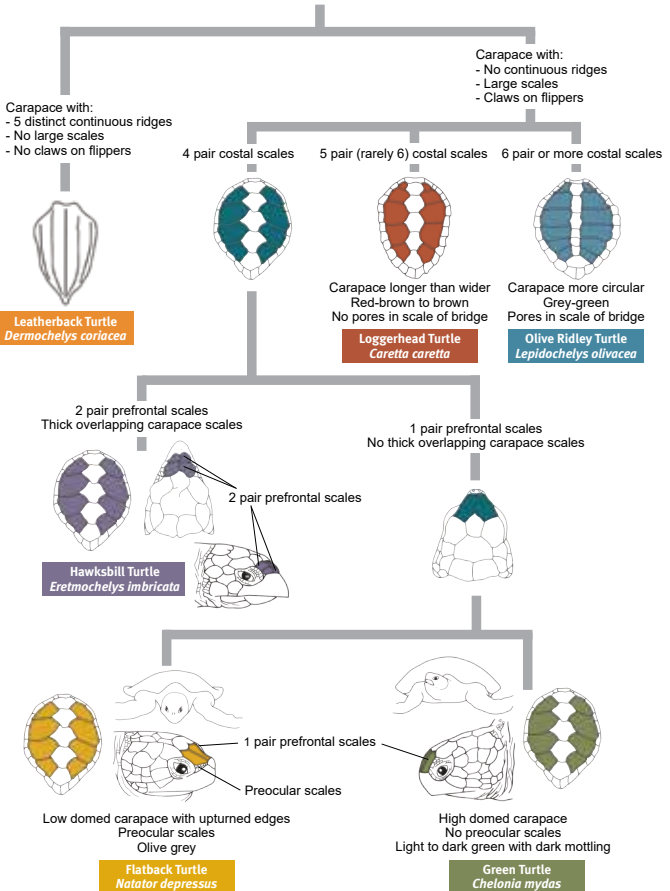
Inside Cover: Steven Marpoondin (APN Cape York) © Brian Ross

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Marine Turtle Species Identification Key

Indo-Pacific Marine Turtles



Photographs of Adults and Hatchlings



Green Turtle *Chelonia mydas*



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Olive Ridley Turtle *Lepidochelys olivacea*



Page 14



Hawksbill Turtle *Eretmochelys imbricata*



Page 18



Loggerhead Turtle *Caretta caretta*



Page 12



Flatback Turtle *Natator depressus*



Page 16



Leatherback Turtle *Dermochelys coriacea*



Page 20

Marine Turtle Track Identification Key

Alternating Stroke

Flipper marks alternate

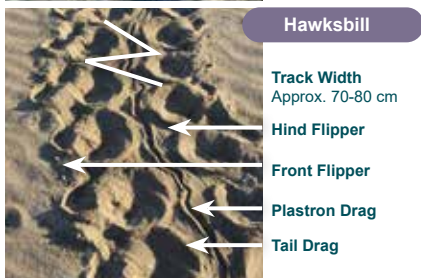
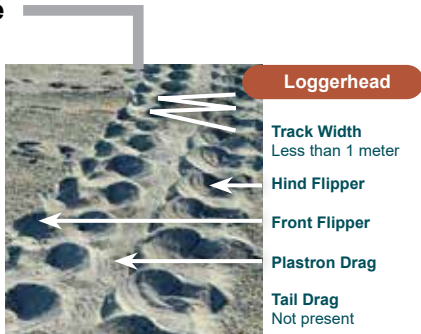


Track Features

Early morning monitoring is best as tracks will deteriorate over time. The clarity of tracks can be affected by flipper damage, terrain, sand moisture, tides, wind and weather. Look for several key identifying features, along different sections of track.

The key track identification features are:

- Stroke Style
- Track Width
- Hind Flipper Marks
- Front Flipper Marks
- Plastron Drag
- Tail Drag



Breast Stroke

Flipper marks
side by side



Green

Track Width
Approx. 94-144 cm

Hind Flipper

Front Flipper

Plastron Drag

Tail Drag



Flatback

Track Width
Approx. 90-100 cm

Hind Flipper

Front Flipper

Plastron Drag

Tail Drag



Leatherback

Track Width
Greater than 2 meters

Hind Flipper

Front Flipper

Plastron Drag
Not Visible

Tail Drag



Track Direction

Clues to determine
track direction:

Turtles push sand
backwards, the higher
sand mound is at the
back.

If track overlaps,
the top track is the
returning track.

Sand is always
thrown back over the
emerging track when
digging.

Measuring Width

Measure from outer
edge of track. This
may be the front or
rear flipper, depending
on species.

Basic Beach Monitoring

Guidelines on how to **Record** data and implement **Action** during a basic beach survey (see page 9). These may be tailored to suit individual monitoring programs and implemented in accordance with training.

Record

Species Identification: Use track or sighting to identify species.

GPS Nest Location: Note GPS coordinates & waypoint number.

False Crawl: Track with no nest.

Extent of Damage: Partial or complete destruction of nest.

Evidence of Predation: Diggings, tracks, sighting.

Predator Identification: Use track or sighting to identify species.

Hatchlings Emerged: Yes, hatchling tracks or sighting.

Tag Information: Note tag ID number and its location on turtle.

Curved carapace length (CCL): From front (where skin and carapace meet), down midline to back edge of carapace (over tail).



Action

Photograph: To verify species and/or nest damage/predation.

Mark Nest: Install marker to indicate nest location (if required).

Bury Eggshells and Mark Track: To avoid record duplication; mark track line above the high tide mark.

Submit Data: Project manager to submit data to the relevant Queensland Department.



Basic Beach Survey

Traverse beach to locate fresh turtle tracks.
Walk along the high tide line or drive on the wet sand just below the high tide mark

Equipment Checklist

- ▣ GPS (Use datum WGS 84 and decimal degrees)
- ▣ Data sheets or charged data recording device
- ▣ Pencil
- ▣ Tape measure
- ▣ Camera
- ▣ Personal safety gear
- ▣ Torch (night monitoring)
- ▣ Spare batteries
- ▣ Monitoring field guide

Record fresh tracks only

Adult Track
No nesting turtle

Adult Track
Nesting turtle

Hatchling Tracks
Hatchlings

Identify Species
refer to
Track Identification
(Pages 6-7)

Identify Species
refer to
Species Identification
(Pages 3-5, 10-21)

Identify Species
if hatchling present
refer to
Species Identification
(Pages 3-5, 10-21)

Is there a nest or is it a false crawl?

Once female has settled into laying or has completed nesting

Nest

False Crawl

Unsure

Record / Action

- Species ID
- GPS Nest Location
- Mark Nest

Record / Action

- Species ID
- False Crawl

Record / Action

- Species ID
- GPS Nest Location
- Mark Nest
- Photograph

Record / Action

- Species ID
- Tag Information
- Curved carapace length
- GPS Nest Location
- Mark Nest

Record / Action

- Species ID
- Hatchlings Emerged
- Marked Nest ID or GPS Nest Location
- Evidence of Predation
- Predator ID
(refer to pages 22-25)

Is nest damaged?

No

Yes

Record / Action

- Extent of Damage
- Evidence of Predation
- Predator ID
(refer to pages 22-25)
- Photograph
- Bury Eggshells

Refer to
Page 8 for
Record / Action
monitoring
protocols

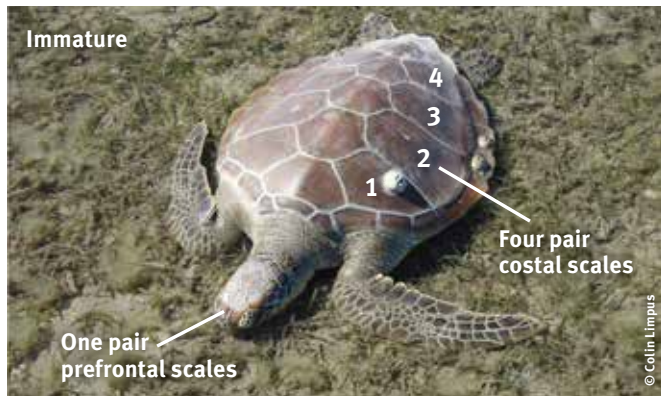
Mark monitored track with a line, above high tide mark, so it's not recorded twice

Continue and complete survey

Submit data forms and photographs for verification to project manager

Green Turtle, *Chelonia mydas*

Status: Nationally Vulnerable, Queensland Vulnerable



Key Identification Features



Breast Stroke Track



Carapace Scales



4 Pair Costal Scales



1 Pair Prefrontal Scales



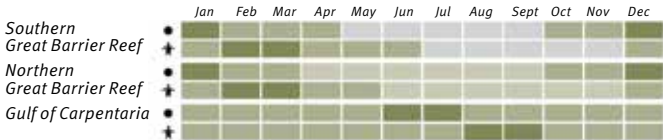
Qld Nesting Sites

Adult: Carapace is a high dome. Colour is light to dark green with dark mottling. Plastron colour is cream-white.

Hatchling: Black-dark brown with white margins, white plastron.

Breeding Season

Peak = ■ Nesting = ● Hatchlings = ★



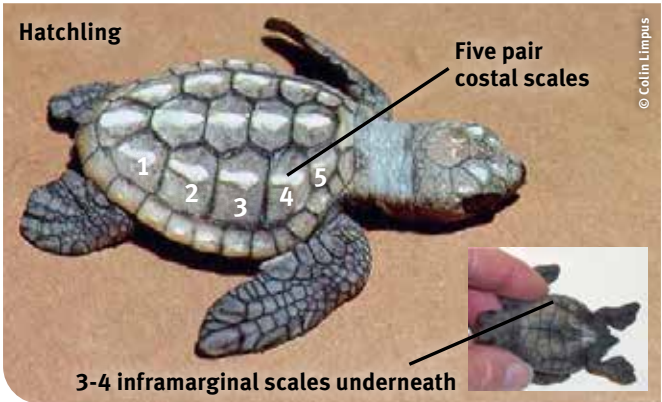
Loggerhead Turtle, *Caretta caretta*

Status: Nationally Endangered, Queensland Endangered

Adult



Hatchling



Loggerhead Turtle

Key Identification Features



Alternating Track



Carapace Scales



5 Pair Costal Scales



Qld Nesting Sites

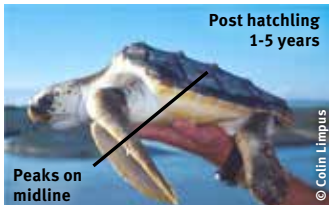
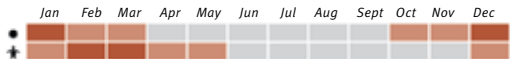
Adult: Carapace is longer than wider. Colour is red-brown to brown. Plastron colour is yellow.

Hatchling: Dark brown with 5 costal scales and dark plastron with 3-4 inframarginal scales.

Breeding Season

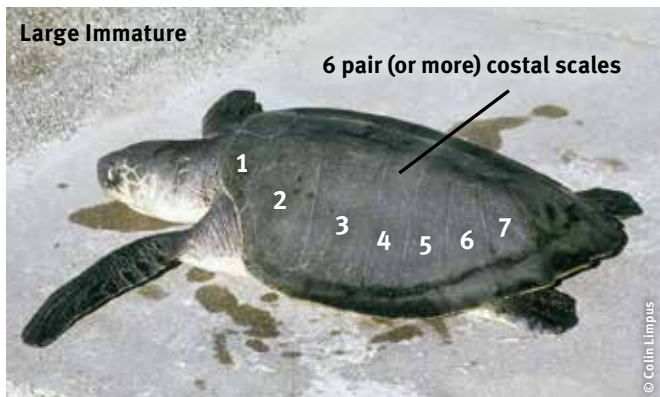
Peak = ■ Nesting = ● Hatchlings = ✦

South Eastern Queensland



Olive Ridley Turtle, *Lepidochelys olivacea*

Status: Nationally Endangered, Queensland Endangered



Olive Ridley Turtle

Key Identification Features



Alternating Track



Carapace Scales



6 Pair (or more) Costal Scales



Qld Nesting Sites

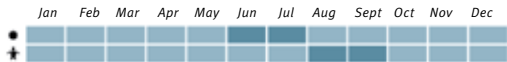
Adult: Carapace is circular. Colour is grey-green with no conspicuous markings. Plastron colour is cream-white.

Hatchling: Charcoal-grey/black-brown on both sides.

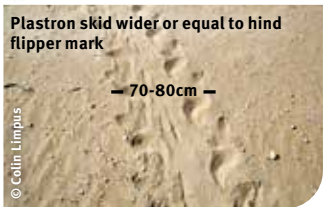
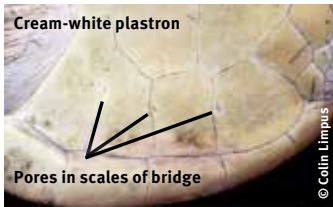
Breeding Season

Peak = Nesting = ● Hatchlings = ★

West Cape

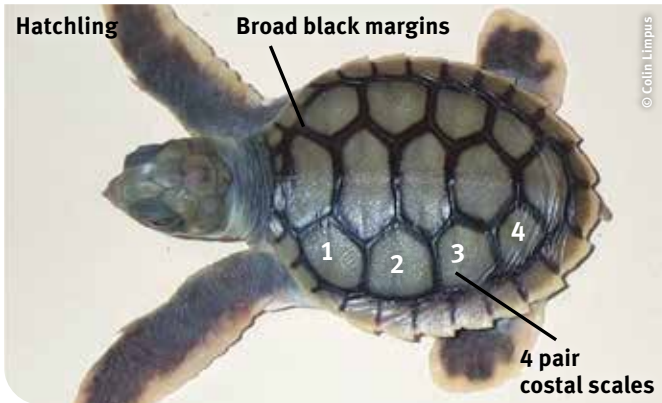


All year, peaks during dry season.



Flatback Turtle, *Natator depressus*

Status: Nationally Vulnerable, Queensland Vulnerable



Key Identification Features



Breast Stroke Track



Carapace Scales



4 Pair Costal Scales



1 Pair Prefrontal Scales



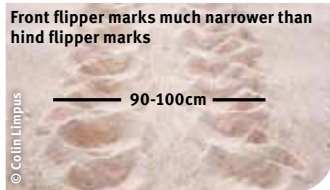
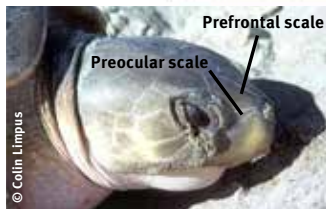
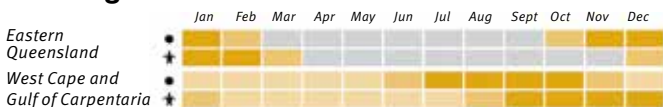
Qld Nesting Sites

Adult: Carapace is a low dome, smooth with upturned edges. Colour is grey to pale-grey or olive. Preocular scales. Plastron is creamy-yellow.

Hatchling: Olive-green, scales with broad black margin. Plastron is a solid white.

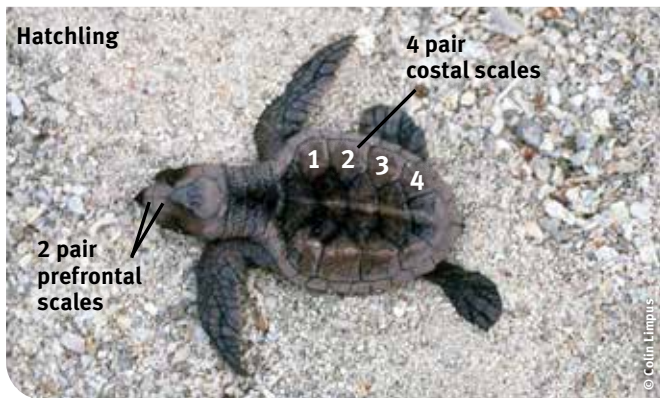
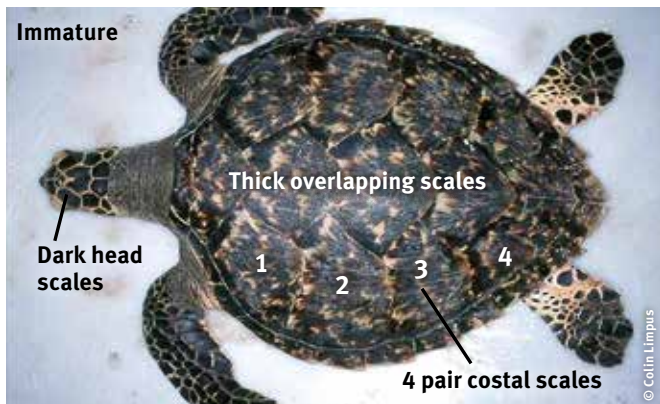
Breeding Season

Peak = ■ Nesting = ● Hatchlings = ★



Hawksbill Turtle, *Eretmochelys imbricata*

Status: Nationally Vulnerable, Queensland Vulnerable



Key Identification Features



Alternating Track



Scales Thick Overlapping



4 Pair Costal Scales



2 Pair Prefrontal Scales



Qld Nesting Sites

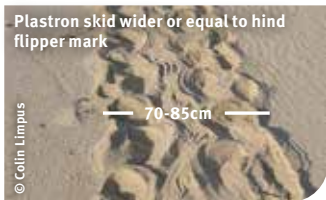
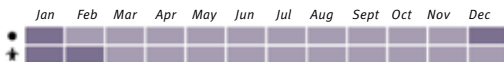
Adult: Carapace has thick overlapping scales. Colour is olive green or brown and is extensively variegated with brown/black markings. Adult plastron is yellow or white with black spots.

Hatchlings: Dark brown.

Breeding Season

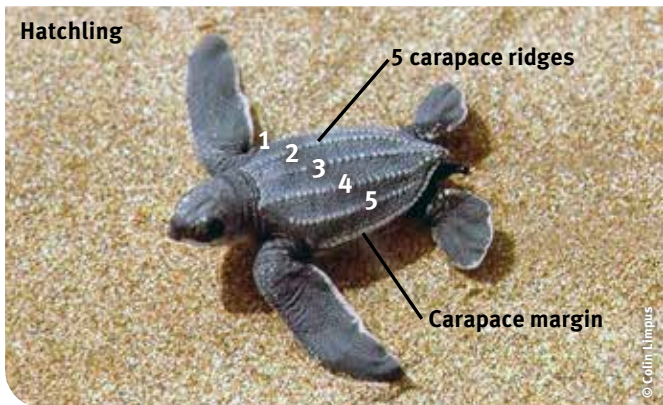
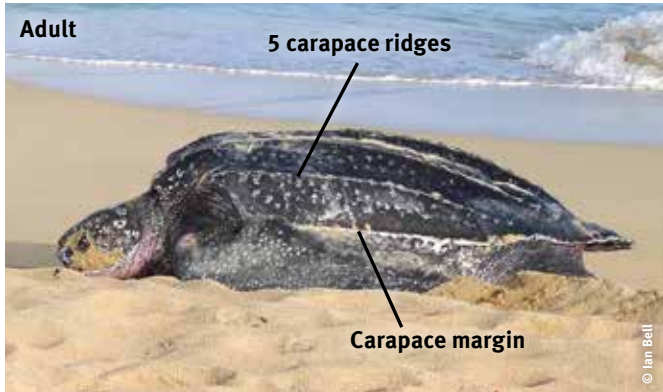
Peak = ■ Nesting = ● Hatchlings = 🚶

Northern Great Barrier Reef and Torres Strait



Leatherback Turtle, *Dermochelys coriacea*

Status: Nationally Vulnerable, Queensland Endangered



Key Identification Features



Breast Stroke Track



No Carapace Scales



5 Carapace Ridges



Qld Nesting Sites

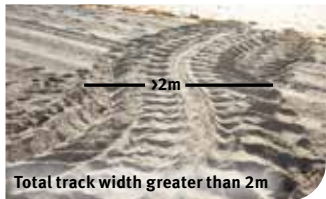
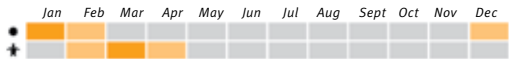
Adult: Carapace is long and pointed. Long ridges run down the length of carapace. Colour is a uniform black-brown. Soft leathery skin.

Hatchlings: Finely beaded, black with white markings on the carapace ridges and plastron.

Breeding Season

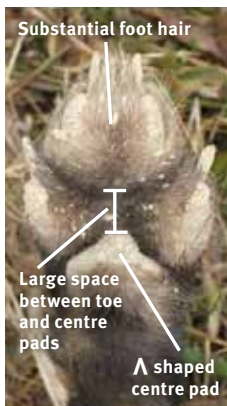
Peak = Nesting = Hatchlings =

South Eastern Queensland



Predator Track Identification

Fox



Track Identification Features

- Front foot is larger than back foot.
- Elongated oval shaped claws, may not show on track.
- Substantial foot hair, sometimes visible on track impression.
- Large space between centre pad and toe pads.
- Centre pad has a distinct inverted V shape.
- Tracks are straight, hind feet reusing front foot impressions.
- Small track width.



Management Options

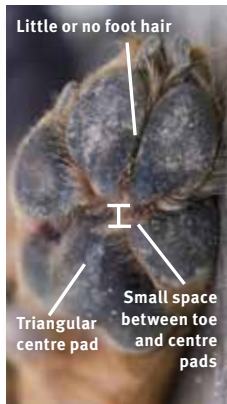
- Den detection and fumigation
- Ground shooting
- Trapping
- Baiting
- Exclusion fencing
- Nest protection (cages)

Wild Dog or Dingo



Track Identification Features

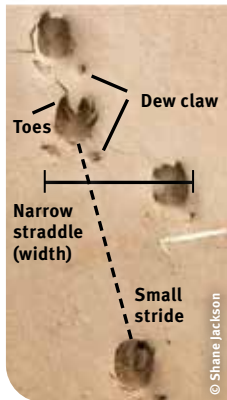
- Front foot is larger than back foot.
- Little or no foot hair in between pads.
- Small space between centre pad and toe pads.
- Centre pad almost triangular.
- Foot imprint rounded.
- Tracks are straight but not as neat and aligned as a fox's track.



Management Options

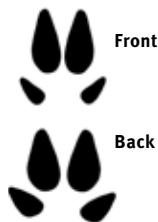
- Ground shooting
- Leg hold trapping
- Baiting (1080 or strychnine)
- Exclusion fencing
- Nest protection (cages)

Feral Pig



Track Identification Features

- Back feet slightly larger than front.
- Foot print consists of a two toe hoof and two dew claws.
- Dew claws distinctive identification feature but may not be present in harder soils.
- Small stride and narrow straddle.



Management Options

- Ground/aerial shooting
- Trapping
- Baiting
- Exclusion fencing
- Nest protection (cages)

Goanna



Track Identification Features

- Both walk and run tracks have alternating foot prints.
- Trail drag usually visible.

Nest Predation Identification

- Goannas burrow into nest at an angle from the side of the nest, not vertical from directly above.
- The burrow is typically domed shape, not circular.



Management Options

- Trapping
- Exclusion fencing
- Nest protection (cages)

Principles of Pest Management

Managing pest animals requires long-term control programs and a variety of approaches. Effective programs are designed around these eight principles:

1. INTEGRATION

Ensuring pest management programs are an integral part of the management of natural areas.

2. PUBLIC AWARENESS

Raising public awareness and knowledge of pests to increase community and individual participation in pest management.

3. COMMITMENT

Gaining a commitment to long term programs by the community, industry groups and government entities.

4. CONSULTATION AND PARTNERSHIP

Establishing partnerships between local communities, industry groups, state government agencies and local governments to achieve a collaborative approach.

5. PLANNING

Consistent planning at local, regional, state and national levels ensures combined resources target the agreed priorities.

6. PREVENTION

Preventing the spread of pests, and using early detection and intervention to control pests.

7. BEST PRACTICE

Using ecologically and socially responsible pest management practices to protect the environment and natural resources.

8. IMPROVEMENT

Research and regular monitoring and evaluating of programs helps improve and refine pest management practices.

Threats to Marine Turtles

Marine turtles are long-lived and slow to mature. Depending on the species they can take anywhere between 8–50 years to reach breeding age. Due to the range of threats, at their different life stages, it is thought that only 1 in 1000 hatchlings will survive to adulthood and then return to the beach to nest. For this reason it is critical to address the range of threats throughout their lifecycle.

Threats include:

- Native and introduced animals predating turtle eggs and hatchlings.
- Vehicles compacting turtle nests or forming tyre ruts that trap hatchlings.
- Humans taking turtle eggs.
- Bycatch of marine turtles in fisheries.
- Marine debris.
- Impact to breeding habitat from coastal development and artificial lighting.
- Deteriorating water quality.
- Unknown and possibly unsustainable levels of turtle harvesting, in and outside Australian waters.

What you can do:

- Support the management of predators such as pigs, dogs and foxes around turtle nesting beaches.
- Report turtle nests and predated turtle nests to your local ranger.
- Keep your dogs on a lead when walking on the beach during nesting/hatchling season.
- Drive slowly on beaches and avoid driving over nests. Drive on the wet sand below the high tide mark to avoid making wheel ruts.
- Pick up marine debris from the beach and waterways.
- Report ghost nets to your local ranger.
- At night, minimise lights on the beach, including campfires.
- Support sustainable, traditional use of adult turtles and turtle eggs.

Acknowledgements

The Queensland Parks and Wildlife Service Nest to Ocean Turtle Protection Program Team would like to acknowledge the contribution of staff from the following organisations in the development of the field guide: Western Cape Turtle Threat Abatement Alliance supported by Cape York Natural Resource Management, Balkanu Cape York Development Corporation, Aak Puul Ngantam, Feralfix, World Wildlife Fund for Nature, and University of Queensland. Also acknowledged is the input and advice of staff from our partnering Australian and Queensland Government departments.

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Prepared by:
**Queensland Parks and Wildlife Service,
Department of Environment and Science.**

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