



Sunshine Coast Council  
Marine Turtle Conservation Plan 2023-2033  
PART A — Strategic Plan  
*Making tracks together*

Edition August 2023

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#### **Reference document**

This document should be cited as follows:

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#### **Cover image**

Adriana Watson Photography.

## Traditional Acknowledgement

Sunshine Coast Council acknowledges the Sunshine Coast Country, home of the Kabi Kabi peoples and the Jinibara peoples, the Traditional Custodians, whose lands and waters we all now share.

We recognise that these have always been places of cultural, spiritual, social and economic significance. The Traditional Custodians' unique values, and ancient and enduring cultures, deepen and enrich the life of our community.

We commit to working in partnership with the Traditional Custodians and the broader First Nations (Aboriginal and Torres Strait Islander) communities to support self-determination through economic and community development.

Truth telling is a significant part of our journey. We are committed to better understanding the collective histories of the Sunshine Coast and the experiences of First Nations peoples. Legacy issues resulting from colonisation are still experienced by Traditional Custodians and First Nations peoples.

We recognise our shared history and will continue to work in partnership to provide a foundation for building a shared future with the Kabi Kabi peoples and the Jinibara peoples.

We wish to pay respect to their Elders — past, present and emerging, and acknowledge the important role First Nations peoples continue to play within the Sunshine Coast community.

Together, we are all stronger.



Image: TurtleCare citizen scientists collect data on a nesting turtle at Buddina. Photo: Adriana Watson.

"The Sunshine Coast TurtleCare Program is one of the best community responses to care of turtles and their habitats that I have seen in more than 50 years of researching and managing marine turtles. Now more than ever we need more highly trained and dedicated community volunteers to help battle increasing threats such as climate change and marine pollution to bring our populations of marine turtles back from the brink of extinction. But we must work together and act now."

Dr Colin Limpus  
Chief Scientist, Aquatic Threatened Species, Queensland Government



Image: Loggerhead turtle nesting at sunset on Buddina. Photo: Helga Dalla.



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# Preface

The Sunshine Coast is blessed with the wonders and richness of a biodiverse natural environment. Within a fast-growing urban community and popular tourism destination, our world-famous beaches and coastal waters provide critical habitat for six species of marine turtles. As the global environment changes, these habitats, together with our local climate, are forecast to be an important refuge for future populations of these marine turtles.

Ensuring that turtles and people co-exist in our region into the future provides both challenges and opportunities for our community. This Marine Turtle Conservation Plan (the Plan or MTCP) has been developed to explore and address these, and to map a path of action to ensure the best outcomes for all.

Marine turtles are long-lived animals—at least 100 years—foraging in waters along the Queensland coast and internationally. Every summer, the Sunshine Coast community welcomes the arrival of our two species of nesting marine turtles—the critically endangered loggerhead turtle and the vulnerable green turtle. Between October and March, the loggerhead and green turtles can be found nesting on Sunshine Coast beaches, which is then followed by the emergence of hundreds of turtle hatchlings making their way to the ocean for their long journey ahead.

The Plan has been prepared in collaboration with Sunshine Coast Council officers and elected representatives, Kabi Kabi First Nation Peoples, Queensland Government representatives, scientific experts (through a Technical Advisory Panel) and community leaders of TurtleCare, Coolum and North Shore Coast Care and Bribie Island Turtle Trackers citizen science volunteers.

The Kabi Kabi First Nation Peoples are the traditional custodians for the land and sea country covered by this

Plan and marine turtles are of enormous practical, cultural, and spiritual significance to them. This Plan therefore includes their input and prescribes involvement of Kabi Kabi peoples in current and future management.

The Sunshine Coast TurtleCare volunteers, Coolum and North Shore Coast Care and Bribie Island Turtle Trackers comprise more than 250 trained citizen scientist volunteers, who help manage and protect our nesting marine turtles and their hatchlings. The volunteers work on behalf of our Sunshine Coast community to ensure that the intergenerational responsibility of marine turtle conservation is achieved.

We, the community, and Sunshine Coast Council (SCC or Council) that have created this Plan, recognise that risks arising from climate change are an overwhelming threat that require urgent action, and believe that our local actions can help deliver global benefits, and demonstrate global leadership, for marine turtles and people. Our Plan supports our vision to be Australia's most sustainable region —Healthy, Smart, Creative — and is a clear demonstration of our commitment to marine turtle conservation. The Plan recognises the need for people and turtles to co-exist and 'make tracks together' on the path to recovery.





## Executive Summary

All populations of marine turtle found on the Sunshine Coast are depleted to the point that every turtle, every nest, every egg and every hatchling matter to population recovery.

### Purpose of the Plan

This Marine Turtle Conservation Plan supports efforts by the Queensland and Australian Governments to stop the decline of depleted stocks, support recovery and maintain functional populations of marine turtles on the Sunshine Coast through managing threats to population viability. The Plan will guide Council decision-making to achieve future conservation and management goals for nesting marine turtles and hatchlings within the Sunshine Coast Local Government Area (LGA). It is particularly focused on the nesting and hatchling success of the critically endangered loggerhead and vulnerable green turtle populations.

### High Value Turtle Habitat — ‘Critical to Survival’

Marine turtles are an essential part of the Sunshine Coast environment, and the Sunshine Coast environment is essential to the future of marine turtles. The region, with relatively cooler temperatures than more northern turtle habitat, provides critical nesting sites that produce a higher proportion of the male hatchlings that are essential for long-term recovery of turtle populations. The Sunshine Coast environment is likely to become increasingly important in the future as predicted climate change progresses, and this Plan seeks to optimise the benefits for both marine turtles and people living in or visiting the region.

### Threat Management

All populations of marine turtles found on the coast are depleted or severely depleted and subject to ongoing threats to the point that now every turtle, every nest, every egg and every hatchling matter to population recovery, and direct management intervention will be increasingly required. The most significant threats to the region’s marine turtles include altered temperatures from climate change, urban light pollution, terrestrial predation, entanglement by and ingestion of marine debris, habitat modification, recreational activities, accidental death as fisheries by-catch, chemical and terrestrial discharge, and vessel disturbance.



Image: Loggerhead Turtle nesting during the afternoon at Shelly Beach. Photo: Peter Pascoe.



Coolum and North Shore Coast Care citizen scientists collecting data on a nesting loggerhead turtle. Photo: Coolum and North Shore Coast Care.

“ Greater levels of human intervention are likely to be required to achieve the nesting and hatchling success rates necessary for recovery of populations found on the Sunshine Coast. ”



Image: TurtleCare citizen scientist observing a loggerhead turtle hatchling entering the ocean. Photo: Adriana Watson.

## Vision

The long-term vision of this Plan is:

**'Marine turtles surviving and thriving on the Sunshine Coast, co-existing in harmony with people.'**

Achieving this vision will require a reduction in all manageable threats to allow for the conservation status of these marine turtles to improve to a point at which they can be removed from Queensland and Commonwealth threatened species lists by 2122<sup>1</sup>.

## Primary Goal

Recognising the long timeframes required to achieve our vision, a Primary Goal provides intermediate guidance for marine turtle management on the Sunshine Coast:

**'Supporting the recovery of self-sustaining populations of marine turtles on the Sunshine Coast by reducing threats, improving habitat quality and strengthening community-based management.'**

<sup>1</sup> Three successive generations of sustained population growth are required before a species can be removed from the threatened species list — in the case of marine turtles that means about 100 years (and even then, the population is unlikely to return to original levels of abundance).



Coolum and North Shore Coast Care citizen scientists collecting data on a nesting turtle. Photo: Coolum and North Shore Coast Care.



## The Plan to achieve our Vision

To achieve our long-term vision and primary goal, this Plan sets out desired outcomes and conservation directions under three overlapping and mutually supportive themes:

01

Strategic planning and policy guidance for turtle-sensitive lighting and coastal development

02

Regional marine turtle recovery actions

03

Sunshine Coast community based TurtleCare program delivery

The Plan identifies conservation directions and actions under each of these themes (Part B: Implementation plan)—to further strengthen the existing highly successful community-based volunteer TurtleCare program and associated citizen science activities. These actions include strong education, awareness, and ongoing engagement with Kabi Kabi First Nation Peoples and the broader community, ensuring people and marine turtles co-exist in harmony on the Sunshine Coast.

The Plan also proposes improved governance arrangements to coordinate ongoing implementation, evaluation and improvement of the Plan, in partnership with a range of stakeholders across the broader Sunshine Coast region.

Greater levels of human intervention are likely to be required to achieve the nesting and hatchling success rates necessary for recovery of stocks found on the Sunshine Coast. Therefore, an adaptive management approach has been identified as essential to allow appropriate response, ensure learning and improve approaches from ongoing experience.



## United Nations Sustainable Development Goals

As we advance our vision as Australia’s most sustainable region — Healthy. Smart. Creative. the environmental, social, cultural and economic activities across the region must be carefully balanced to ensure we advance our vision sustainably.

The United Nations Sustainable Development Goals (UNSDGs) for peace, prosperity, people and planet provide a comprehensive and internationally recognised framework for us to collectively align

the way we each live, work, learn and play every day — and form an important foundation of the performance measurement framework of our Biosphere.

Council is demonstrating regional leadership by committing to embed the UNSDGs in our strategies, plans and associated progress reporting. Each Corporate Plan goal identifies how it contributes to the UNSDGs and, in doing so, assists to progress our Sunshine Coast Biosphere aim and objectives.



# Our global commitment

This Plan embeds the United Nations Sustainable Development Goals (UNSDGs) into its actions. The United Nations Sustainable Development Goals for peace, prosperity, people and planet provide a comprehensive and internationally recognised framework to collectively align the way we each live, work, learn and play every day.

**UNSDG 04** — There are numerous actions under theme three of this plan, Community-based TurtleCare program delivery, that deliver on the targets within the quality education goal by providing key knowledge and skills for youth, women and men, indigenous people and persons with disabilities. (Targets: 4.3, 4.4, 4.5 and 4.7)

**SDG06** — This plan identifies actions that deliver improved water quality and aquatic ecosystem protection through supporting community partnerships, improving waste management initiatives and achieving beyond compliance for water treatment (Targets: 6.3, 6.6, 6.b).

**SDG 10** — This plan promotes social and economic inclusion of all, noting a desired outcome for Kabi Kabi First Nations peoples to be fully integrated into marine turtle management — the knowledge, culture, traditions, traditional rights, interests, management capacity and customary obligations are respected, valued and promoted (Targets: 10.1 and 10.2).

**SDG11** — Theme one of this plan, turtle-sensitive lighting and coastal development, supports efforts to safeguard cultural and natural heritage and provides sustainable development planning outcomes for turtle conservation by providing a statutory instrument through the planning scheme (Targets 11.4 and 11.a).

**SDG 12** — This plan aims to substantially reduce waste generation, such as marine debris and light pollution and has a vision for 'Marine turtles surviving and thriving on the Sunshine Coast, co-existing in harmony with people' (Targets: 12.4, 12.5 and 12.8)

**SDG 13** — This plan integrates coastal hazard adaptation strategies and undertakes planning, active management and awareness-raising to strengthen resilience and adaptive capacity for marine turtle nesting success (Targets: 13.1, 13.2 and 13.3).

**SDG 14** — There are numerous activities under all three themes of focus in this plan that are relevant to life below water, in particular, reduction of marine plastic and light pollution, sustainable management and protection of coastal ecosystems and the contribution to marine scientific knowledge through partnerships with our community (Targets: 14.1, 14.2, 14.5 and 14.a)

**SDG 15** — The primary goal of this plan aligns with Life on Land by supporting the recovery of self-sustaining populations of marine turtles on the Sunshine Coast by reducing threats, improving habitat quality and strengthening community-based management (Targets: 15.1, 15.5, 15.8, 15.9 and 15a).



In June 2022, our Sunshine Coast local government area was recognised by the United Nations Educational, Scientific and Cultural Organisation (UNESCO) as a biosphere reserve—where responsible development and people living sustainably sit alongside active conservation.

Our region has joined a global effort of 738 biospheres in 134 countries to balance the environmental, social, cultural and economic needs of today, without compromising the ability to meet the needs of future generations.

Our region's international recognition as a special place where people are living, working, learning and playing

sustainably highlights the values of our region that we are seeking to protect and enhance, brings new opportunities and a range of possible benefits to our natural environment, community, lifestyle and economy.

Being recognised as a UNESCO Biosphere reserve and maintaining this credential is our region's commitment to create a positive legacy for future generations. Every resident, visitor, business and government entity has a key role to play in maintaining and enhancing the Sunshine Coast Biosphere reserve for our children, grandchildren and all those who will enjoy the prosperity, beauty and liveability of our region into the future.



## Strategic alignment

### Environment and Liveability Strategy 2017

The Environment and Liveability Strategy, 2017 builds a pathway to a healthy environment and liveable Sunshine Coast in 2041. The natural environment and how it can be preserved and enhanced, as well as the liveability of the region is the primary focus — enabling a good quality of life for all residents and supporting a strong economy in an accessible and well-connected built environment.

By implementing our threatened species management plans we are protecting and enhancing our natural landscapes and its inhabitants and delivering on the Strategic Pathways of the Environment and Liveability Strategy. We are connecting our valued habitat areas to support our native flora and fauna and providing the community with opportunities to participate in conservation and to experience the natural environment. Our protection, sustainable use and enjoyment of our dunes, rocky-shores and near shore marine waters protect our threatened local turtle species. We build resilience into our region by proactively planning for climate change, and build knowledge to enable evidence-based decisions.

### Sunshine Coast Community Strategy 2019-2041

The Sunshine Coast Community Strategy 2019-2041, focuses on inclusive communities by supporting the growth of social connection and collaboration through a place-based approach. Place based planning is an enduring concept in this strategy. Outcomes sought include an emphasis on active transport, community facilities, including supporting facilities, parks, open space and civic spaces, affordable living options, smart infrastructure and sense of place in the public realm.

Council's premiere citizen science program TurtleCare has strong strategic alignment with the Sunshine Coast Community Strategy. The TurtleCare program is a highly-valued volunteer program where Council is able to strengthen the health and wellbeing of our community. Council's TurtleCare program promotes inclusive, connected and resilient community through ongoing training and capacity-building, trust and shared values.



Figure 1: Sunshine Coast Marine Turtle Nesting bioregion



# 1. Introduction

Marine turtles have been around for the best part of 240 million years — living, breeding, and nesting on the Sunshine Coast long before there were suburbs and town centres. The Sunshine Coast is a fast-growing urban community and a world-renowned tourism destination that is located about an hour (53 km) north of the Queensland capital, Brisbane. Most of the region's population of 356,000 (forecast to exceed 500,000 by 2041) live within 16 beach suburbs that stretch along a 52 km coastline of predominately white sandy beaches, punctuated by rocky headlands and coastal rivers and streams.

Despite having survived and thrived for millions of years, over the last several hundred years many marine turtle populations—including those found on the Sunshine Coast—have been pushed towards extinction by a combination of human-related threats. Urgent action is now required to reduce these threats, reverse the decline, and help recover self-sustaining populations of these iconic marine animals in our region.

Queensland was a pioneer in marine turtle management and continues to be a leader<sup>(1)</sup>. The current community-based Sunshine Coast TurtleCare Program is regarded as one of the best of its kind in Australia<sup>(2)</sup>. These are part of a proud tradition and strong foundation on which future efforts will be built.

This Marine Turtle Conservation Plan represents the maturity of the TurtleCare Program over the past 17 years and sets out the conservation directions for marine turtle management on the Sunshine Coast over the next decade and beyond. It has been prepared as a guide and information tool for a range of users including Council, turtle volunteers, delivery partners and the broader community. The Plan considers threats and management arrangements at the international, national, state and regional scale and identifies practical measures that can be implemented by Sunshine Coast Council and its partners on the Sunshine Coast, to help recover our local marine turtle populations—a case of thinking globally and acting locally.

The Plan supplements a range of existing marine turtle recovery plans developed at the international, national, and state levels and provides considered best practice approaches that have been informed by experience from other jurisdictions<sup>(3) (1) (4)</sup>. It builds on and should be read in conjunction with the national Recovery Plan for Marine Turtles in Australia, the Queensland Marine Turtle Conservation Strategy and Single Species Action Plan for the Loggerhead Turtle (*Caretta caretta*) in the South Pacific Ocean.

Marine turtles that regularly forage or nest along the Sunshine Coast are part of genetically distinct populations (called stocks) that are severely depleted (by 90%) and subject to a range of continuing threats and pressures<sup>(5)</sup>. Operating in combination, these threats must be reduced if the stocks are to recover to previous natural levels of abundance.

In the same way that threats are cumulative, so are the benefits of recovery actions—a combination of many targeted local actions can help aid population recovery while global efforts to address climate change and other overarching threats are implemented. Therefore, this Plan aims to further strengthen the national and international recovery efforts by addressing relevant threats that are under the control and influence of Sunshine Coast Council and our community. It provides partners, the community and decision-makers with a clear framework of actions for maintaining and recovering the marine turtle stocks of the Sunshine Coast marine turtle nesting bioregion (Figure 1).

## Purpose and Scope

The purpose of the Plan is to support a growing TurtleCare citizen science management program and guide Council decision-making to achieve future conservation and management goals for nesting marine turtles and hatchlings within the Sunshine Coast LGA.

The Plan is particularly focused on the nesting and hatchling success of the critically endangered loggerhead and vulnerable green turtle populations, however, specific measures to recover these two stocks will have flow on benefits for all other marine turtle species found in the coastal waters of the Sunshine Coast.



## 2. The Journey Ahead: Pathway to Marine Turtle Recovery

### Vision

Consistent with the national Recovery Plan and the Queensland Marine Turtle Conservation Strategy—this Plan aims to stop the decline and support the recovery of depleted stocks and maintain functional populations of the six species of marine turtles found on the Sunshine Coast. The focus of this Plan is on the nesting populations of loggerhead and green turtles. The long-term vision is:

**Marine turtles surviving and thriving on the Sunshine Coast, co-existing in harmony with people.**

Achieving the vision will require reduction in all manageable threats to allow the conservation status of these marine turtles to improve to a point at which they can be removed from Queensland and Commonwealth threatened species lists by 2122<sup>2</sup>. Recognising the long timeframes required to achieve the vision, a Primary Goal provides intermediate guidance for marine turtle management on the Sunshine Coast.

### Primary Goal

**Supporting the recovery of self-sustaining populations of marine turtles on the Sunshine Coast by reducing threats, improving habitat quality and strengthening community-based management.**

### Framework of Actions

A comprehensive framework of actions and success indicators has been developed to guide the journey ahead and achieve the Plan's vision and primary goal. The details of this framework are included in Part B: Implementation Plan—developed through stakeholder workshops and further refined and tested with expert panels and Sunshine Coast Council focus groups.

The framework, structured around three overlapping and mutually supportive themes, provides a strategically and practically aligned delivery model for the Plan. The themes are:

- 01** *Turtle-sensitive lighting and coastal development.*
- 02** *Regional marine turtle recovery actions.*
- 03** *Sunshine Coast community based TurtleCare program delivery.*

<sup>2</sup> Three successive generations of sustained population growth are required before a species can be removed from the threatened species list—in the case of marine turtles that means about 100 years (and even then, the population is unlikely to return to original natural levels of abundance).

“ The targets are ambitious but potentially achievable through the active support of a turtle-friendly community to implement the necessary recovery actions. ”



Image: Council officers and TurtleCare Citizen Scientist undertaking nest success data collection at Bribie Island. Photo: Emily Gregory.

For each theme, the journey ahead is explained using:

- essential **background** information (where are we now?)
- long-term **desired** outcome (where do we want to be?)
- **conservation directions** and actions to achieve desired outcomes (how are we going to get there?)
- success indicators including targets and performance measures (are we on track?)

Taken together, the actions identified under all three themes are expected to support the recovery of marine turtles on the Sunshine Coast in line with recognised contemporary practice<sup>(1)</sup>.

The actions identified in the framework include an annual Implementation Plan in collaboration with delivery partners. The Implementation Plan includes proposed timings—now (1-2yrs), next (3-5yrs) and later (5-10yrs).

The actions described in the Plan are intentionally ambitious, necessarily realistic, and have been tested through Sunshine Coast Council expert focus groups and the Technical Advisory Panel. Some targets identified in the success indicators are higher than those in the national Recovery Plan and considered necessary to recover depleted stocks in the face of increasing threats such as climate change. The targets are ambitious but potentially achievable through the active support of a turtle-friendly community to implement the necessary recovery actions.



Image: Loggerhead turtle hatchlings crawling to the ocean. Photo: Adriana Watson.

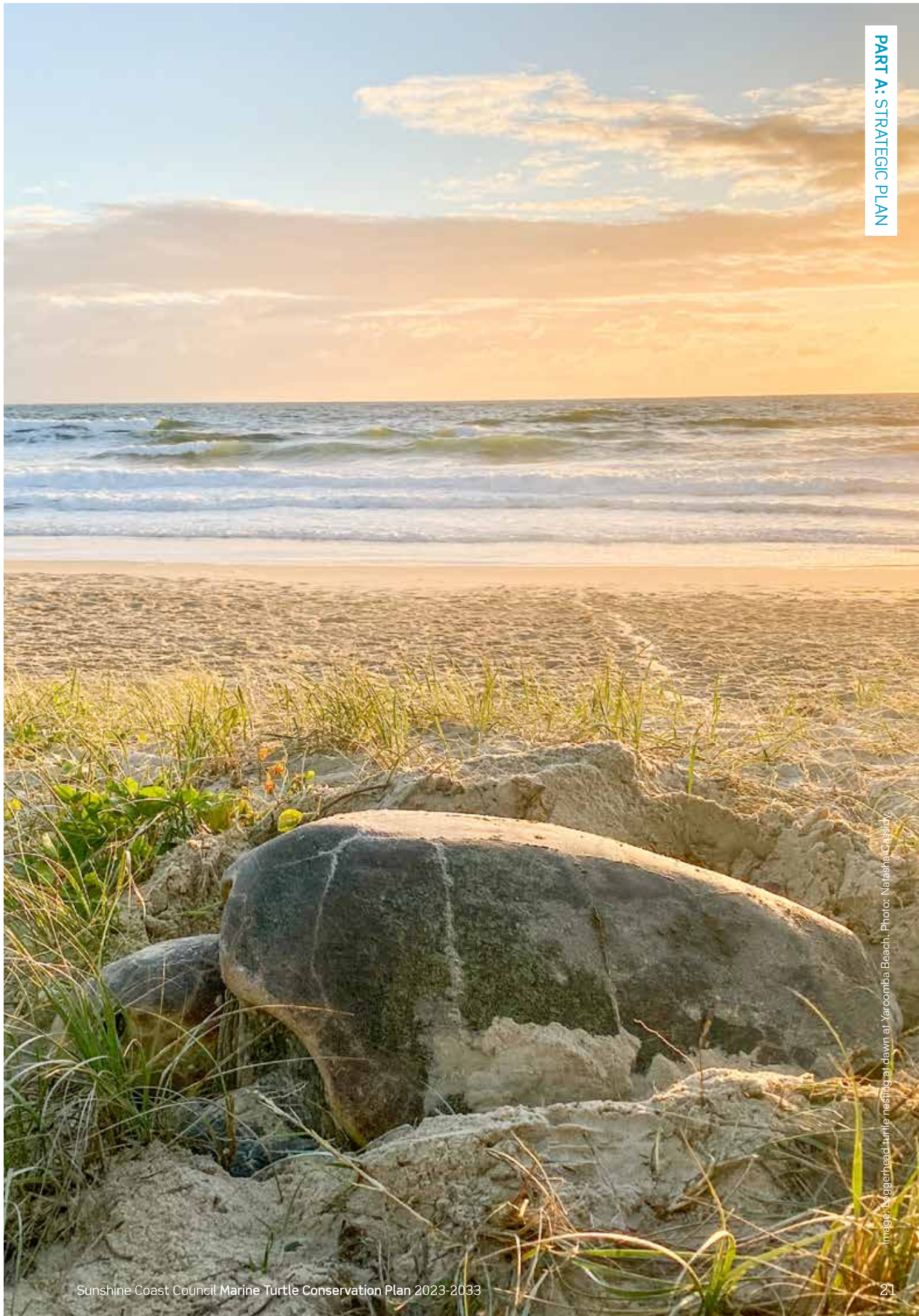


Image: Loggerhead turtle nesting at dawn at Yaroomba Beach. Photo: Natasha Cassidy.



## 3. Context

### The Sunshine Coast and marine turtles

Six of the world's seven species of marine turtle have been recorded on the Sunshine Coast<sup>3</sup>. The region is home to three species of marine turtle and three others have been recorded visiting adjacent marine waters or stranded (alive, dead, or moribund) on Sunshine Coast beaches.

The six species found in the region are:

- 1 Loggerhead turtle (*Caretta caretta*)**  
Caretta caretta (nesting on Sunshine Coast beaches; foraging and breeding in surrounding inshore and offshore reefs, rocky shores, and islands).
- 2 Green turtle (*Chelonia mydas*)**  
Chelonia mydas (nesting on Sunshine Coast beaches; foraging and breeding in surrounding inshore and offshore reefs, rocky shores, and islands).
- 3 Hawksbill turtle (*Eretmochyls imbricata*)**  
Eretmochyls imbricata (foraging and breeding in surrounding inshore and offshore reefs, rocky shores, and islands).
- 4 Olive ridley turtle (*Lepidochyls olivacea*)**  
Lepidochyls olivacea (vagrants uncommonly found in adjacent waters).
- 5 Flatback turtle (*Natator depressus*)**  
Natator depressus (vagrants uncommonly found in adjacent waters).
- 6 Leatherback turtle (*Dermochelys coriacea*)**  
Dermochelys coriacea (occasionally foraging and migrating in adjacent waters).

Marine turtles are migratory species and frequently travel long distances between breeding seasons and across international boundaries. In the case of the loggerhead turtle, hatchlings undergo a once-in-a-lifetime journey—travelling thousands of kilometres across the South Pacific Ocean to the coast of South America before returning to eastern Australian waters as sub-adults at about 16 years of age<sup>(5)</sup>. Here they remain for the rest of their adult life.

The life history traits of marine turtles make them vulnerable to a wide range of anthropogenic threats. These traits include decades to reach maturity, high natural mortality of hatchlings and small juveniles, strong fidelity to breeding areas, migrating over long distances to breed, and use of both terrestrial and marine environments to complete their lifecycle. At the same time, marine turtles have traits that contribute to population resilience, including each stock being supported by multiple breeding locations and widely dispersed foraging populations.

Whilst all Sunshine Coast beaches have the potential for turtle nests, there are physical conditions which favour some nesting beaches. Buddina and Shelly beaches typically record many more nests than any other beaches as demonstrated in Figure 2<sup>(6)</sup>.

<sup>3</sup> Profiles for the turtle stock nesting on the Sunshine Coast and for non-nesting turtle stock found on the Sunshine Coast are included in Appendix 2 are identified on Council's website.

## Conservation status and policy framework

Sunshine Coast marine turtle nesting beaches are 'habitat critical to survival for the critically endangered loggerhead Turtle'.

All marine turtles are recognised as species of conservation concern under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the Convention on the Conservation of Migratory Species of Wild Animals (CMS, also known as the Bonn Convention) and the 2000 IUCN (International Union for Conservation of Nature) Red List of Threatened Species.

All six species of marine turtles on the Sunshine Coast are protected under a range of international, national, state, and local mechanisms. Specifically, the leatherback, loggerhead and olive ridley turtles are listed under the Australian Government's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), and the *Queensland Nature Conservation Act 1992*, (NCA) as endangered and may become extinct if the threats to their survival continue. The green, hawksbill and flatback turtles are each listed as vulnerable under the EPBC (hawksbill are listed as endangered under the NCA) and may become endangered under the EPBC (or extinct under the NCA in the case of hawksbill) if threats continue.

Due to a significant decline in population numbers, the United Nations Environment Program (UNEP) prepared a Single Species Action Plan for the Loggerhead Turtle (*Caretta caretta*) in the South Pacific Ocean. This was ratified by the Australian Government and other international signatory states in 2014<sup>(4)</sup>. Further to this in 2017, the **Commonwealth Government** developed the Recovery Plan for Marine Turtles in Australia which identified the area from Pumicestone Passage to Double Island Point as 'habitat critical to survival' for the loggerhead turtle<sup>(5)</sup> (Figure 2). In 2020 the Commonwealth also released

The Recovery Plan for Australian Marine Turtles identified the area from Pumicestone Passage to Double Island Point as Habitat Critical to survival for the loggerhead turtle.

National Light Pollution Guidelines for Wildlife Including Marine Turtles, Seabirds and Migratory Shorebirds<sup>(6)</sup>. Each of these documents are a foundation for management recommendations in this Plan.

There is no contemporary practice of traditional hunting on the Sunshine Coast, however under section 211 of the *Native Title Act 1993*, turtles may be legally hunted by Aboriginal and Torres Strait Islander people for personal, domestic, or non-commercial communal needs. Analysis of the interplay between various State and Commonwealth laws relating to Indigenous harvest is complex and described in more detail in the national Recovery Plan.

The Sunshine Coast Marine Turtle Conservation Plan is complemented by the Queensland Marine Turtle Conservation Strategy<sup>(7)</sup> which has been developed by the Queensland Government as an update to the original 2018 strategy<sup>(7)</sup>.



Sunshine Coast turtle nesting abundance



Figure 2. Sunshine Coast turtle nesting abundance



Image: Council officers and TurtleCare citizen scientists assisting the Queensland Museum research and engagement. Photo: Adriana Watson.

## The values of marine turtle conservation on the Sunshine Coast

Marine turtles and the Sunshine Coast have a mutually dependent relationship—marine turtles are an essential part of the Sunshine Coast environment, and the Sunshine Coast environment is essential to the future of marine turtles. Maintaining healthy marine turtle populations is also important more broadly for Queensland's biodiversity, maintaining Indigenous cultural heritage, and supporting the Queensland economy by adding to world-class tourism and research opportunities.

The following values (Table 1) of marine turtles on the Sunshine Coast underpin the priorities identified later in the Plan. These values were identified through engagement with Kabi Kabi First Nation Peoples, Sunshine Coast Council representatives, team leaders from TurtleCare, Coolum and North Shore Coast Care and Bribie Island Turtle Trackers.

It is clear from these values that the relationship between marine turtles and the Sunshine Coast environment is likely to become increasingly important in the future and this Plan seeks to optimise the benefits for both marine turtles and people living in or visiting the region.

“ Maintaining healthy marine turtle populations is also important more broadly for Queensland’s biodiversity, maintaining Indigenous cultural heritage, and supporting the Queensland economy by adding to world-class tourism and research opportunities. ”

**Table 1.** The identified values of Marine Turtles and Marine Turtle Conservation on the Sunshine Coast

Value	Significance — Sunshine Coast
Significant nesting population	Loggerhead turtles nesting on the Sunshine Coast make up approximately 4% of the south-west Pacific breeding population (anything above 1% is considered significant). The Sunshine Coast also provides a potential insurance population if the major loggerhead rookery at Mon Repos were to fail.
Highly regarded volunteer program, citizen science and long-term data	<p>With over 250 volunteers and 17 years of citizen science, the Sunshine Coast community-based volunteer turtle programs are regarded as among the best in Australia. The long-term data set collected by volunteers is critical to the success of the program.</p> <p><b>Review of Sunshine Coast marine turtle nesting data (2005-2016) — Summary*</b></p> <ul style="list-style-type: none"> <li>• <b>Total of 742 clutches</b> of Loggerhead turtle eggs were laid between Bribie Island and Noosa</li> <li>• <b>71% of crawls</b> up the beach resulted in a clutch of eggs being laid</li> <li>• <b>78% of eggs</b> resulted in hatchlings reaching the ocean</li> <li>• <b>30% of nests</b> were relocated due to threats such as erosion, storm tides and artificial light</li> <li>• <b>Nesting population</b> is neither increasing or decreasing, and shows normal demographic features for loggerhead and green turtles of Queensland</li> </ul> <p>*Based on standardised data collected by Sunshine Coast citizen scientists — TurtleCare, Coolum and North Shore Coast Care and Bribie Island Turtle Trackers<sup>(6)</sup>.</p>
Majority male hatchlings (ecologically appropriate sex ratios)	Sunshine Coast beach sand temperatures are mostly cooler than other nesting areas in Queensland and therefore uniquely produce majority male hatchlings—except for Shelly Beach. Elsewhere in Queensland sand temperatures on nesting beaches are leading to an unsustainable feminisation and potential collapse of populations over the next generation (because there are too few males available for breeding) <sup>(9)</sup> .
Climate change refugia	In response to increasing temperatures in higher latitudes, turtles are predicted to undertake a southward shift in nesting distribution over future decades and the Sunshine Coast is likely to provide increasingly important alternative nesting sites. Another potential response is that some species are nesting earlier in the season, during milder temperature conditions.
Kabi Kabi First Nations culture	This Plan provides an opportunity to celebrate and further strengthen Traditional Custodians’ connections to turtles and the marine ecosystem.

Note: Table continued on page 28

Table 1. The identified values of Marine Turtles and Marine Turtle Conservation on the Sunshine Coast

Value	Significance — Sunshine Coast
Keystone species	Protecting and enhancing marine turtle habitats provide co-benefits for many native species and people (healthy turtles=healthy coast=healthy ecosystems=healthy community).
Regional drawcard and lifestyle quality	Marine turtles are a locally iconic animal for the Sunshine Coast community and visitors. The cultural connections for the Kabi Kabi First Nation Peoples; history of citizen science and academic research; and community-led management are all potential drawcards and help make the Sunshine Coast a great place to live, work and play.
The long game — intergenerational stewardship	Every year, when hatchlings emerge from the beach, a new page in the turtle story begins and an opportunity to build inter-generational connections within and between the population of people and marine turtles living on and visiting the Sunshine Coast.  Every hatchling has a one in 1,000 chance of surviving ocean life and grows very slowly, reaching breeding age at around 30 years. With a growing marine turtle sensitive community, the hatchlings protected by this generation of Sunshine Coast residents and visitors will become the adult nesting females that return to our shores for future generations to see, experience and enjoy.
A team of turtle ambassadors with the will and skill to intervene	Recovering marine turtle populations on the Sunshine Coast may increasingly need labour intensive interventions such as clutch relocations, intensive predator control, individual nest shading, targeted irrigation to maintain ideal sand moisture levels, and importantly, public education.
Healthy coastal environments — good for turtles, good for people	Marine turtles and humans both need and want healthy coastal environments—clean coastal waters and estuaries; sandy beaches with natural dune vegetation and shade for cool sand; popular surf beaches by day turtle maternity sites by night; intact dune landscapes providing coastal stability essential for turtle nesting and protecting residential communities. These shared interests mean we can and should co-exist in harmony, safe in the knowledge that efforts to protect natural coastal habitats will benefit people as much as marine turtles.
Recognised as a turtle sensitive community—leading the way	Building on the highly successful TurtleCare program, the Sunshine Coast can be increasingly recognised as a global leader in community-based marine turtle conservation.
Part of our vision to be Australia's most sustainable region	Recovering marine turtle populations on the Sunshine Coast is consistent with council's aspiration to be Australia's most sustainable region—Healthy. Smart. Creative. Community stewardship for marine turtles also supports the SCC Biosphere Reserve, celebrating people living in harmony with nature.



Image: Coolum and North Shore Coast Care citizen scientist undertaking careful nest relocation. Photo: Cheryl Wright.



## 4. Addressing Threats to Marine Turtles on the Sunshine Coast

Marine turtles that regularly forage or nest along the Sunshine Coast are part of genetically distinct populations (called stocks) that are severely depleted (by as much as 90%). Local management efforts on the Sunshine Coast are a small but essential piece in the global puzzle to recover all depleted marine turtle populations.

Using the same methods as the national Recovery Plan, the Queensland Marine Turtle Conservation Strategy (2022) provides an updated risk assessment for each marine turtle stock inhabiting the Sunshine Coast <sup>(3)</sup> <sup>(1)</sup>

A combination of historic and continuing human-caused threats operating at the local to global scale hinder the recovery of marine turtle populations in this region. The risk posed by these threats varies depending on the unique characteristics of each marine turtle species and stock, the life phase and behaviour of individual turtles, and the strength of existing habitat protection and management arrangements. Using the same methods as the national Recovery Plan, the Queensland Marine Turtle Conservation Strategy (2022) provides an updated risk assessment for each marine turtle stock inhabiting the Sunshine Coast <sup>(3)</sup> <sup>(1)</sup>.

Based on the national and Queensland threat assessments and consultation with experts and local stakeholders, priority threats to Sunshine Coast marine turtles were identified, with a focus on nesting beaches and inshore foraging habitat. Table 2 lists these threats in further detail.



Image: TurtleCare citizen scientists applying predator exclusion meshing to a nest at Buddina. Photo: Helga Dalla.

Table 2. Priority threats to marine turtles nesting and foraging on the Sunshine Coast beaches and offshore areas

Threat	Significance — Sunshine Coast
Climate change and vulnerability	Increased sand temperature affects incubation success and sex determination. Sea level rise and extreme weather impact nests in beaches and dunes.
Light pollution	Artificial light at night (ALAN) associated with human development is an emerging threat to a wide range of wildlife worldwide <sup>(6)</sup> . Changes in ambient light levels and the night sky horizon can cause a decline in successful marine turtle nesting and disrupt ocean-finding by emerging hatchlings <sup>(3)</sup> <sup>(1)</sup> . With population growth and proximity to a major metropolitan area (Brisbane), the Sunshine Coast is an identified hotspot for altered light horizon impacts.
Terrestrial predation	Ongoing control measures (for example, installing fox exclusion devices on nests) have effectively reduced loss of eggs and hatchlings from predation on Sunshine Coast beaches, from an estimated 27% to less than 3% <sup>(10)</sup> .
Marine debris	The East Australian Current and South East Queensland are local hotspots for loggerhead turtles with ingested debris <sup>(5)</sup> .
Habitat modification	Includes removal of coastal vegetation for views and infrastructure, beach modification for public access; hard infrastructure replacing dunes for erosion control. Where habitat is lost permanently there is likely to be an impact on the viability of the population utilising that habitat.
Recreation activities	When mismanaged, these operations have the potential for disturbing marine turtle nesting, internesting and foraging behaviour, ultimately impacting the viability of the population.
Fisheries by-catch and shark control nets	Reports of two leatherback deaths in South East Queensland in 2020 appear linked to negative interactions with shark control nets. Trawl fisheries by-catch of breeding adults has been largely mitigated in Queensland waters by the legislated use of Turtle Exclusion Devices in 1999.
Chemical and terrestrial discharge	On the Sunshine Coast chemical and terrestrial discharge of sediment and other chemical pollutants can result from urban runoff, effluent treatment, and land use changes in the catchment.
Vessel disturbance	Waters off the Sunshine Coast are a major shipping channel and increasingly a fishing and recreational boating area. This is particularly an issue in shallow coastal foraging habitats (such as the Pumicestone Passage) and internesting areas.

**All stocks of marine turtles found on the Coast are depleted or severely depleted and subject to ongoing threats to the point that now ‘every nest and every egg matter to population recovery’.**

For most marine turtle populations, it is the cumulative impacts of multiple threats operating at different scales that need to be addressed to secure their recovery. However, in the same way that threats are cumulative, the benefits of individual recovery actions can also accumulate. This means that any actions taken locally, even to address relatively lower-level risks, can make a cumulative positive difference for the recovery of marine turtle stocks found along the Sunshine Coast.



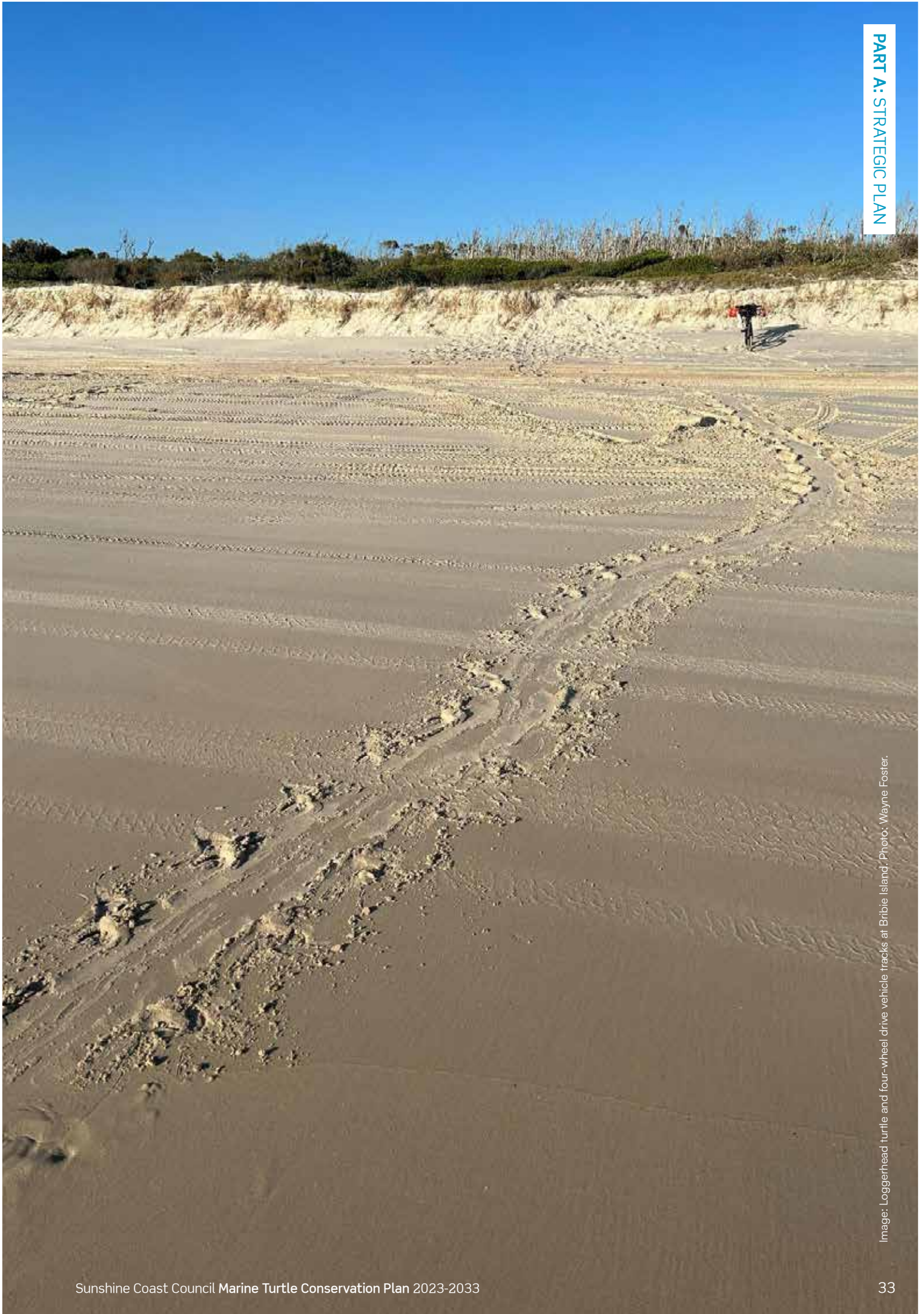


Image: Loggerhead turtle and four-wheel drive vehicle tracks at Bribie Island, Photo: Wayne Foster.



## 5. The Desired Future for Marine Turtles on the Sunshine Coast

In the context of the Vision, and Primary Goal—the desired outcomes for marine turtles on the Sunshine Coast are presented under three overlapping and mutually supportive themes.

### Vision

Marine turtles surviving and thriving on the Sunshine Coast, co-existing in harmony with people.

### Primary goal

Supporting the recovery of self-sustaining populations of marine turtles on the Sunshine Coast by reducing threats, improving habitat quality, and strengthening community-based management.



Image: Trained citizen scientist relocating at-risk turtle eggs. Photo: Adriana Watson.



Image: Loggerhead hatchling turtles. Photo: Claudia Shiels.

## Desired outcomes

The desired future for marine turtle conservation on the Sunshine Coast.

### 01 Turtle-sensitive lighting and coastal development

By 2023 the desired future for marine turtles on the Sunshine Coast is to have:

- DO1** strategic planning and policy guidance tools in place including:
- a regulatory framework for coastal development in the Sunshine Coast LGA that appropriately integrates State interests and the MTCP
  - educational guidance tools to support the development sector, property owners and residents to seek to achieve world best practice turtle sensitive development outcomes
- DO2** development and implementation of lighting policies and standards that deliver a commitment to Dark Sky objectives and a naturally dark coastline at night, with minimisation of direct light sources and ambient light visible from sensitive nesting beaches and adjacent marine areas
- DO3** nesting beaches identified as future climate refugia and protected as part of integrated coastal hazard management.

### 02 Regional Marine Turtle Recovery Actions

By 2023 the desired future for marine turtles on the sunshine coast is to have:

- DO4** the identified threats (that are under the influence of the Sunshine Coast Council) reduced to lowest residual risk level to minimise negative impacts on nesting marine turtle populations
- DO5** sufficient resilient essential habitat to support effective marine turtle nesting, foraging and courtship behaviour
- DO6** maintain current male to female ratios on the Sunshine Coast to ensure continued recruitment of male turtles to the breeding population.

### 03 Community-based TurtleCare Program Delivery

By 2023 the desired future for marine turtles on the sunshine coast is to have:

- DO7** the Sunshine Coast is recognised as a national and international leader in community-based marine and the TurtleCare program is fully integrated into Queensland and Australian strategies
- DO8** Turtlecare (and allied programs) have the capacity to support delivery of monitoring, managing and recovery of marine turtles in line with world best-practice
- DO9** Kabi Kabi First Nation Peoples are fully integrated into marine turtle management — the knowledge, culture and traditions, traditional rights, interests, management capacity and customary obligations are respected, strengthened, valued, and promoted
- D10** a community of residents and visitors value marine turtles and are engaged in turtle conservation —community custodians/stewards.

For each theme and desired outcome, a detailed framework of actions and success indicators has been developed by stakeholder workshops and further refined and tested through expert panels and Sunshine Coast Council technical focus groups. The details of this framework are in Part B. Implementation Plan—this is an essential tool that will guide the journey over the next 10 years to achieve the aspirations of this Plan.



Image: Loggerhead turtle crawling to sea after satellite tracker attachment. Photo: Adriana Watson.



## 6. Governance, Implementing, Evaluating and Reviewing

The MTCP seeks to: Improve coordination and communication between all groups; capitalise on emerging opportunities; and better utilise the collective resources available with a clear, agreed set of priorities and governance processes (Table 3).

**Table 3.** Key delivery partners and stakeholders

Delivery partners and stakeholders	Role/contribution in delivering the MTCP
<b>Sunshine Coast Council</b>	Lead implementation responsibilities and program coordination.
Kabi Kabi First Nation Peoples	Traditional custodians with cultural authority for land and sea country covered by this Plan.
SCC TurtleCare, Coolum and North Shore Coast Care, Bribie Island Turtle Trackers	Citizen scientists that are leading research and monitoring of nesting beaches, and delivery of community engagement and education.
Queensland Department of Environment and Science	Training, coordination, and authorising agency.
Technical Advisory Panel	Independent expert advice on program design and delivery.
South-east Queensland coastal councils (especially neighbouring Noosa and Moreton Bay)	Opportunities for regional collaboration and advocacy for improved management of risks and opportunities.
Broader community	Advocates and practitioners of turtle sensitive behaviour.

The Sunshine Coast Council is to have lead responsibility for plan implementation, in collaboration with the delivery partners and stakeholders listed above. The responsibilities of this leadership role include approving the Plan; identifying annual implementation priorities; co-ordinating inputs from others; reviewing progress towards the strategy objectives; and, considering opportunities to further improve for capacity to deliver the Plan.

To facilitate collaboration and smooth implementation of the Plan, the establishment of a small Working Group is proposed. Membership will include representatives from Sunshine Coast Council, Kabi Kabi First Nation Peoples, neighbouring Local Government Areas, Department of Environment and Science, leaders from each primary turtle volunteer group and others as required .

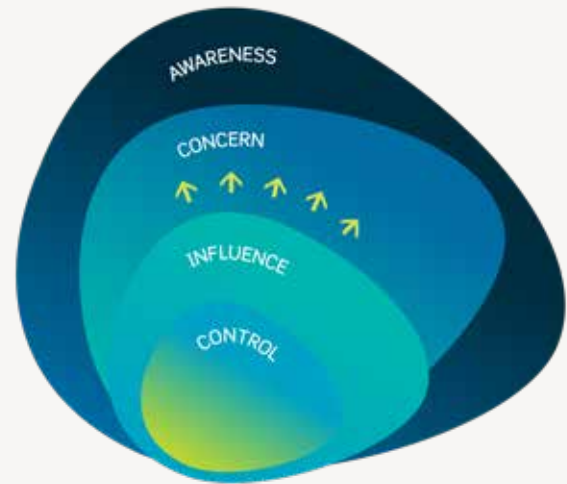


Figure 3. Expanding circles of control, influence, concern, and awareness for marine turtle conservation



Image: TurtleCare citizen scientists and Council officers collecting data on a nesting loggerhead turtle. Photo: Adriana Watson.

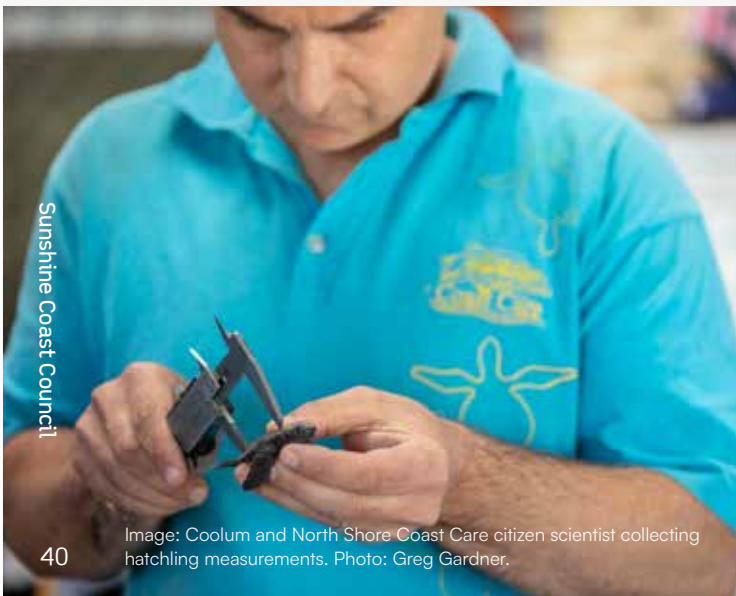


Image: Coolum and North Shore Coast Care citizen scientist collecting hatchling measurements. Photo: Greg Gardner.

Proposed key functions for the Working Group include:

- 1 Sharing of information and facilitation of communication between stakeholders.
- 2 Identification of ways to ensure community input is incorporated into ongoing planning and program delivery.
- 3 Collaborative development of annual implementation plans, containing practical and agreed actions to achieve the short and long-term outcomes of the Plan.
- 4 Development of requests for funding from Council and other Program investors/sponsors.
- 5 Monitoring, reporting on implementation and evaluation of progress towards the desired outcomes.
- 6 Provision of reports to participating organisations, along with recommendations for ongoing review and improvement of the Plan and its implementation.

The circles of awareness, concern, influence, and control shown in Figure 3 provides a useful framework for understanding how Council, Queensland Government and other collaborators can expand their spheres of control and influence, to increasingly address areas of broader concern. It is important to note that many marine turtle recovery actions require input from a range of organisations and Council is not responsible for addressing all the identified threats. However, it can act as a champion to empower others.



## Implementation Plan

The key mechanism for achieving the desired outcomes of the Plan over 10 years is the Part B: Implementation Plan. This prioritises activities, identifies the responsibility for implementation, defines the timing of implementation, and identifies financial and other resources required.

To provide a longer-term approach while maintaining flexibility, it is proposed that the Implementation Plan be a three-year rolling plan with an annual review. Greater detail would be included for the upcoming financial year at each annual review. Individual implementation actions will be included in annual Council work plans, and if required, in project plans involving external parties.

An annual report on activities, outcomes and expenditure will be provided as part of the SCC annual report and to meet specific reporting obligations to DES. A comprehensive evaluation and review of the Plan is to be undertaken every five years.

A small Technical Advisory Panel will be maintained to provide technical advice on implementing the Plan.



Image: Loggerhead turtle hatchling entering ocean at Bokarina. Photo: Adriana Watson.

## Learning and improving with experience

This Plan recognises there are many uncertainties and supports adaptive management through regular monitoring, evaluation, and review, leading to evidence-based decision-making. A ten-year technical report and a citizen science evaluation report, together, have already provided the foundation for the development of this MTCP and will assist with future reviews.

The adaptive management cycle (think, plan, do, learn, and improve) facilitates continuous learning and improvement, based on real-world experience. The annual implementation planning and reporting processes, and working group and Technical Advisory Panel, provide the framework to implement the adaptive management approach.



Image: Coolum and North Shore Coast Care Citizen Scientist collecting egg measurements. Photo: Cheryl Wright.

### TurtleCare program – evaluation highlights

- The program is well-organised and provides a positive, meaningful experience for volunteers, including opportunities to volunteer in other community activities.
- The leadership provided by the Sunshine Coast Council and its recognised expertise in sea turtle conservation is highly regarded.
- Community awareness of the TurtleCare program is very high (90%).
- The program is supporting the Guideline aim to sustain an ongoing marine turtle monitoring program.
- Almost three quarters (74%) of surveyed residents are aware of actions needed to protect marine turtles.
- More than half (56%) of surveyed residents reported learning about turtle conservation by observing TurtleCare volunteers in action.

(Schaffer, V. Community Engagement Evaluation of the TurtleCare Program. University of the Sunshine Coast, 2019.)



Image: Citizen scientists undertaking annual training. Photo: Fanny Delor.



## Ongoing community engagement and empowerment

The Sunshine Coast nesting beaches fortuitously occur directly adjacent to a large urban population, which is home to a dedicated volunteer base. The fostering of conservation volunteerism provides a valuable means of combining community engagement, ecological research, and education to achieve conservation outcomes that might otherwise be unachievable. Ongoing community engagement will be achieved through actions identified in this Plan

Image: TurtleCare citizen scientists engaging with community whilst undertaking nest success data collection. Photo: Leisa Baldwin.



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