# Noosa Environment Strategy 2019

*Noosa, different by nature*

NOOSA COUNCIL

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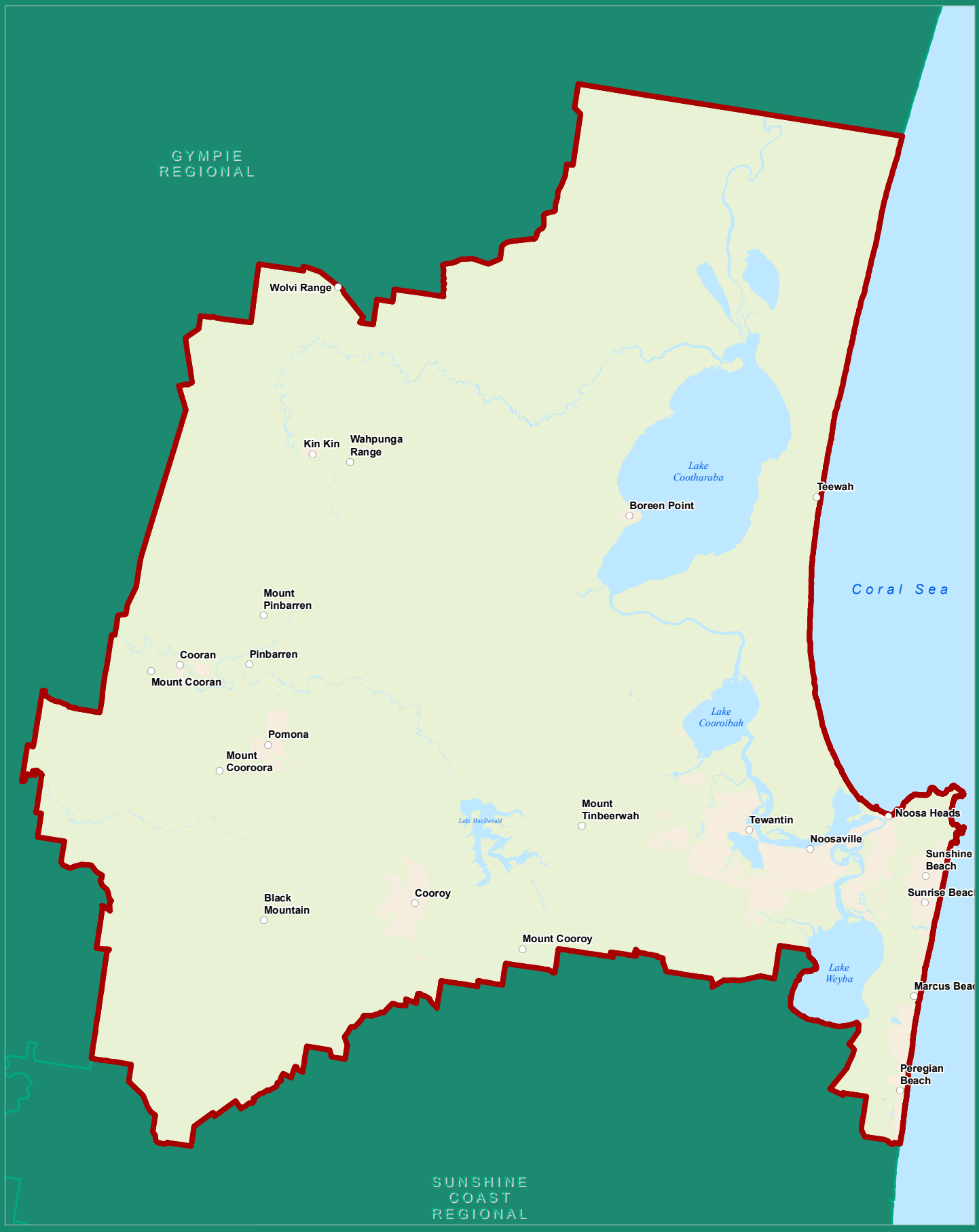
## Acknowledgements

Council wishes to thank all interested stakeholders who have provided their time and energy to help guide the development of this strategy.

## Disclaimer

Information contained in this document is based on available information at the time of writing. All figures and diagrams are indicative only and should be referred to as such. This is a strategic document which deals with technical matters in a summary way only. Council or its officers accept no responsibility for any loss occasioned to any person acting or refraining from acting in reliance upon any material contained in this document




Noosa Shire is located in South East Queensland, approximately 120 kilometres north of Brisbane. The region is bounded by the Gympie local government area in the north and west, and the Sunshine Coast local government area in the south. The Shire encompasses a total land area of 871 sq km with more than 800 kilometres of roads and nearly 450 kilometres of bikeways.

In recognition of Noosa's outstanding values and approach to sustainability, Noosa Shire and its coastal waters was designated as a Noosa Biosphere® Reserve by the United Nations Educational, Scientific and Cultural Organisation (UNESCO) under the Man and the Biosphere Program in 2007.

# Contents

# Introduction

The vision of Noosa Council is Noosa: different by nature. Nowhere is this more clearly illustrated than our commitment to environment and sustainability.

For thousands of years, Noosa's natural environment has been integral to the Kabi Kabi (Gubbi Gubbi) people's cultural values, customs and spiritual beliefs. Aboriginal peoples have been environmental stewards of the region around Noosa for millennia and still maintain a deep relationship today with the biodiversity, waterways and wetlands of the area.

Historically, Noosa has chosen a different path to other areas of south-east Queensland and today we reap the benefits, with large tracts of retained vegetation, the healthiest waterways in the region, and an engaged and active community.

These great strengths also form the basis of our economy as people travel from all over the world to enjoy Noosa's natural environment. The value of the Noosa brand also provides great opportunities for new 'smart' and 'green' industries to develop and thrive, diversifying our economy beyond tourism, whilst offering high economic value and low environmental impact.

More than 50 years of environmental activism, dating back to 1962 when Dr Arthur Harrold established the Noosa Parks Association, has resulted in a community that places a high value on the natural environment. It has also resulted in a community that seeks to live sustainably and reduce its impact on that environment.

The purpose of this Environment Strategy is to provide a long-term, overarching framework to maintain and continually improve on this historical trajectory. It recognises that Noosa will continually strive for a higher standard in the way we manage and live in our environment. It includes clear strategies, targets and a range of outcomes that Noosa Council seeks to achieve, in partnership with the community.

The Environment Strategy will help prioritise investment and deliver an integrated approach to managing Noosa's environment. It also seeks to recognise the role Council can play in achieving these intended outcomes, and how we can work with other management agencies and the Noosa community to achieve excellence in environmental management.

## Policy and planning context

The Environment Strategy is guided by Council's Corporate Plan, Sustainability Principles and Environment and Sustainable Living Policy. It is also informed by applicable international, Commonwealth and State legislation and policy.

In 2015 Noosa Council adopted a set of six Sustainability Principles to ensure consideration of sustainability across all areas of Council business;

1. Resources are sustainably managed so that the lifestyle of the community is preserved, without compromising the ability of future generations to meet their own needs.
2. Noosa's economy is prosperous, diverse and protective of its unique environment.
3. Noosa residents belong to a community that values its diversity, accessibility and affordability.
4. Noosa's community is inclusive, connected and resilient and encourages participation and information sharing.
5. Noosa's community benefits from quality places and programs that enhance wellbeing and support creative, active and healthy lifestyles.
6. Good governance is achieved through effective and efficient decision making, made in the interests of the community.

The Environment Strategy, alongside the Local Economic Plan, Social Strategy, Transport Strategy and Noosa Planning Scheme, form the key strategic policy documents of Noosa Council. The Environment Strategy is intended to inform planning, guide decision making, drive implementation, prioritise action and investment, and set a shared vision.

To this end, the Strategy will help guide appropriate enviornmental and sustainablity outcomes to drive implementation, prioritise action and investment, and set a shared vision.

The Strategy provides the overarching guidance for the development and implementation of a broad range of environment-related plans that contain many of the detailed actions, responsibilities and timeframes for delivery.

The Environment Strategy includes an implementation plan that identifies this planning framework, key actions for delivery in the first few years, and a clear framework for monitoring and evaluation of the success of the Strategy.

## Environment Principles

The following principles from Council's Environment & Sustainable Living Policy will help guide strategic decisions, investment and prioritisation of environmental and sustainability initiatives.

Noosa Council will work with the community to:

- Build shared values, understanding and appreciation of Noosa's natural environment.
- Build strong partnerships and whole-of-community effort to protect and enhance the environment and to conserve its resources.
- Preserve indigenous cultural heritage as part of our environment and engage with traditional owners about matters affecting the environment.
- Recognise interconnections between people, livelihoods, lifestyle, economy and the natural environment, and ensure this approach is included in management planning and project delivery.
- Reduce human impacts on the environment by avoiding and minimising such impacts before resorting to mitigation, offsets or rehabilitation.
- Take an integrated approach to protecting native flora and fauna as well as aquatic ecosystems to build on existing biodiversity and connectivity across the landscape.
- Increase the resilience of the community, the economy and our natural assets to environmental hazards and climate change.
- Ensure ecological sustainability is fully integrated into decision making in order to help secure the continued availability of natural resources for present and future generations.
- Use an evidence-based approach to managing the environment and adapt appropriately as new information arises.
- Apply the precautionary approach to environmental decision making where there is uncertainty, to avoid or minimise harm.
- Actively communicate with the broad community to improve awareness and build capacity around environmental issues.


The principles of the Environment and Sustainable Living Policy will be delivered through the Environment Strategy, the Noosa Planning Scheme, other strategies, and supporting environmental plans and policies.

## Structure

The Environment Strategy commences with an overview of the planning and policy context, as well as feedback from the community on issues and priorities. The document then outlines the 'Big Picture' for our environment and sustainability in terms of:

- valuing our environment
- celebrating and building on our successes
- the need for continuous learning and adaptive management
- identifying risks and challenges.

The remainder of the Strategy is structured under 4 themes:

- Biodiversity
- Waterways, Wetlands and Coasts
- Sustainable Living
- Climate Change Adaptation and Resilience

Each theme includes:

| | |
|---|---|
| **Goals** | The desired state Council seeks to maintain or achieve over the next 10 years |
| **Strategies** | Strategies to guide the organisation and its partners to focus their combined efforts and to share in the delivery |
| **Targets** | Measurable indicators with a baseline to track progress for each of the identified strategies |
| **Outcomes** | The desired outcomes Council is seeking to achieve |

Within the Implementation Plan there is a summary of each of the targets presented throughout the Environment Strategy, with a baseline and description of how we will measure our progress.

## Feedback from the Noosa community

Feedback from the community has contributed to the shaping of this Environment Strategy. Community groups with an interest in the environment and sustainability attended a number of Council forums to discuss and workshop key issues and priorities for the Environment Strategy in 2017 and 2018.

A total of 26 community groups participated. The broader community was also invited to comment on priorities for the Environment Strategy through Council's Your Say Noosa webpage in July and August 2018, and then on the draft itself in February and March 2019.

Top themes from community input:

### Maintain the naturalness of open spaces

People recognise the value of the natural environment in contributing to Noosa's lifestyle, economy, local character, recreation opportunities, as well as their own personal health and wellbeing.

Keeping Noosa "clean and green" and maintaining the unique balance of greenspace and urban density is important. This includes keeping a natural look to public landscaping, maintaining native vegetation around developments, and continuing to manage population growth within sustainable limits.

### Manage impacts on our natural environment

Protection of wildlife habitats and rehabilitation of degraded areas is identified as an important issue. Managing visitor impacts on natural areas and continuing active weed management are also key concerns.

Residents understand the importance of protecting our coastal dune system from human impacts and the need to build resilience to beach erosion. This will become increasingly important under climate change scenarios.

There are calls for improved waste and stormwater management practices, particularly for litter, plastic rubbish and other pollutants to be kept from entering waterways. Managing activities on and around the Noosa River to ensure the catchment stays healthy is also highlighted.

### Sustainable use of natural resources

There is recognition of the need to live and build sustainably. There are calls to increase recycling and to promote composting to reduce waste to landfill. People wish to see Noosa doing its bit to reduce emissions through greater energy efficiency opportunities and increased take-up of solar power for businesses and households. Minimising soil degradation and improving rural land management practices is also considered a priority, along with supporting and promoting sustainable local food production. Sustainable fishing practices is a key resource management issue, with local concerns about declining fish stocks.

### Stronger community awareness

Supporting behaviour change is considered to be an important role for Council and community groups.

This includes building awareness of what individuals and businesses can do to maintain a healthy, diverse and clean environment including protecting our native wildlife, preventing pollution, reducing waste, responding to climate change, and landscaping with native species.

Continuing to build a strong culture of care for our environment amongst existing and new residents is also emphasised.

# The Big Picture

## Valuing our environment

There is a deep and intrinsic connection between all living things and their environment. In appreciating that connection, humans may find a sense of harmony and peace. From the tiniest detail in the veins of a leaf to our expansive landscapes, we can be inspired by the beauty, complexity and richness of our environment. The Traditional Owners of the Noosa area, the Kabi Kabi (Gubbi Gubbi), had a deep understanding and appreciation of this important connection over millennia. This understanding continues today.

Noosa's environment encompasses our natural assets, landscapes and unique biodiversity, including the physical and biological surrounds in which plants, people and other animals live and interact. It is also includes the built environment we create and the choices we make about how we move around, live and work in our environment.

There are ecological and biophysical processes that we depend on for healthy ecosystems and human wellbeing such as productive soils for food supply, clean drinking water, clean air and natural areas for recreation. These requirements underpin the local economy, lifestyle and community health. Protecting, managing and enhancing our biodiversity, landscape corridors, waterways, coastal ecosystems, marine systems and rural landscapes will provide for a more healthy and resilient future.

## Building on our successes

Through strong partnerships between Council and the community, Noosa has established a successful basis from which to carefully manage the natural environment, and in turn drive successful economic and sustainable living outcomes.

**Noosa's strengths and successes include:**

- **A long-standing shared vision** and active community support built around valuing the natural environment and sustainable ways of living. This has been embraced by the broad community and successive recent Councils. Like-minded individuals and families are attracted to live in Noosa and make conscious environmental choices in their homes and businesses where they can.
- **Effective engagement and partnerships** with the community. This collaboration helps to turn sustainability principles into real action. Having common values, understanding and knowledge builds the capacity of the community to be strong advocates. Noosa has a highly engaged community, high rate of volunteerism and many enthusiastic community groups that help deliver important on-ground projects, as well as important research, education and advocacy.
- Council's **clear principles around sustainability** and environment standards, including strong controls on vegetation clearing and land use through the Noosa Planning Scheme.
- **Careful management of growth and development** and a commitment to a sustainable population based on environmental protection, biophysical constraints, infrastructure and lifestyle preferences.
- **Attention to detail** in planning and building design focused on balance with the natural environment. This has helped develop Noosa's strong sense of place, identity and scenic amenity.
- **Significant environmental achievements** including large areas of land under conservation protection and the Noosa River being one of the healthiest in south-east Queensland.
- **Strong drive to support local businesses and industry** (with a focus on growing clean, green, smart, high-value, locally grown/made products and services) to diversify and sustain a healthy local economy and environment.

## Noosa Biosphere

In recognition of Noosa's outstanding values and approach to sustainability, Noosa Shire and its coastal waters was designated as a Noosa Biosphere® Reserve by the United Nations Educational, Scientific and Cultural Organisation (UNESCO) under the Man and the Biosphere Program in 2007.

Noosa Council has strategic oversight of the Biosphere and supports the Noosa Biosphere Reserve® Foundation (NBRF) in its undertaking of significant and innovative conservation projects.

In partnership with other stakeholders, the NBRF has delivered a range of projects including vegetation restoration works in the upper Kin Kin Creek, research into koala distribution and health using detection dogs, and investigations into restoring aquatic ecosystems.

The Noosa Community Biosphere Association is a separate but supportive organisation to the Noosa Biosphere. Its role is to engage with the community and encourage participation in the Biosphere through celebration of our Noosa home, its people and places.

In 2018 Council, supported by the NBRF, submitted a 10-year review of the Biosphere Reserve. This review demonstrated that over the time since the Biosphere designation there has been a significant increase in land under protection for its natural values, sustained economic growth despite population stabilisation, more formal engagement with Traditional Owners, and an increased focus on scientific research.

The Noosa Biosphere Reserve covers 110,728ha and extends 3 nautical miles offshore.

## Continuous learning

Key to protecting and enhancing Noosa's unique natural assets is adopting a process of continuous learning. This includes being adaptable and open to new opportunities and developing a greater understanding of the interrelationships between people and our environment.

To achieve greater conservation and sustainability outcomes in Noosa, planning and management needs to be based on:

- robust scientific and evidence-based research, monitoring and an ongoing review process
- prioritised actions, solutions and clear targets
- strong partnerships across Council, community and industry to drive positive change
- ongoing and effective behaviour change programs.

The Environment Strategy takes an adaptive management approach that builds in targets and regular reviews to ensure we integrate learnings and that we adapt over time.

Council delivers activities to help raise environmental awareness, such as the 'Towards Zero Waste' education program currently being run with schools.

Through the process of developing the Environment Strategy there is an opportunity to review current programs as well as identify additional initiatives that would increase environmental awareness, inspire action, and help influence behaviour change.

## Responding to change

Our rapidly changing world brings both challenges and opportunities for Noosa Shire. In its latest (2019) Global Risks Report, the World Economic Forum ranked 'extreme weather events'; 'failure of climate change mitigation and adaptation'; 'man-made environmental damage and disasters'; 'major biodiversity and ecosystem collapse'; and 'water crises' amongst the top ten risks facing society (ranked 1st, 2nd, 6th, 8th and 10th respectively).

Many countries have now acknowledged that in fact the world is in a climate emergency and that climate tipping points have been reached, demonstrated by loss of species, unprecedented drought and bushfires.

Closer to home, changes to the local and regional climate will have an effect on all aspects life and the environment in Noosa, as it will both amplify underlying risks and create new ones.

Responding to these challenges requires changing the way we manage our environment, embracing new technologies, strengthening and diversifying our local economy, and providing for informed and resilient communities.

Every challenge to Noosa presents an opportunity for better outcomes for our community and our environment.

Capitalising on these opportunities involves working together and supporting all sectors in our community so each is more knowledgeable, adaptable and readily able to respond to change and take advantage of new opportunities.

This includes adopting new technologies, enhanced building designs, better land management practices, future-proofing Council operations and making more resource-efficient choices.

Although Noosa Shire does not experience the same rapid growth as other areas of south-east Queensland, it is not immune to a range of threats and challenges:

- **Local developments** can impact on important habitats and wildlife corridors and potentially increase sediment and other pollutants entering our waterways.
- **Weeds and feral animals** continue to pose a threat to Noosa's biodiversity values and agricultural land.
- **Climate change**, sea level rise and more extreme weather phenomena such as extreme temperatures and rainfall, flood, erosion and fire will continue to impact local communities and threaten the environment.
- **Litter, wastewater, stormwater and chemical spills** may affect waterway health and endanger marine animals and plants.
- **Loss of productive soils in the rural areas** can cause sediment to mobilise and pollute waterways while reducing agricultural production.
- **Increasing visitor numbers** can cause damage to sensitive ecosystems and habitats such as dunes, salt marsh and intertidal areas.
- **Threatened fauna** are subject to a range of natural and human impacts that can further cause decline in their populations.
- **High population turnover** (residents arriving and leaving) requires continuous effort by Council, ensuring Noosa's long term vision is understood and accepted by a changing community.

# Biodiversity

## Goal

By 2030 the condition and extent of our natural ecosystems has improved.

Biodiversity is part of all environments on our planet - terrestrial, aquatic and marine. It is not static, but constantly changing. It can be increased by genetic change and evolutionary processes, and it can be reduced by a range of threats which lead to population decline and even extinction.

Noosa Shire is located within the south-east Queensland Bioregion, an area of exceptionally high biodiversity, lying in the zone where tropical and temperate land zones overlap. This provides for a set of conditions that support a great variety of plants and animals.

Noosa has a large variety of all three levels of biodiversity; at the genetic, species and ecosystem level. These are supported by a wide range of ecosystem types, including rainforests, beaches, woodlands, wetlands, lakes, rivers, forests, mountains and marine areas.

Conserving biodiversity is an essential part of safeguarding the biological life support systems on Earth, collectively described as ecosystem services. These are fundamental to our physical, social, cultural and economic well-being. It is also simply the right thing to do, to ensure that those that come after us get to wonder at the natural beauty of the environment we enjoy today.

Noosa's biodiverse ecosystems and landscapes are important for their inherent values as well as providing essential services to the local community:

- trees and plants filter carbon and provide the clean air we breath
- wetland ecosystems filter pollutants from our water and support fish production
- bacteria and fungi break down organic matter and improve the soil conditions needed to grow our food
- vegetated catchments and riparian areas along waterways help to capture and slow down rainfall runoff, protecting waterway health and reducing flood risk
- waterways and marine environments provide opportunities for recreation and support our fisheries resources
- bushland areas provide spaces for recreation and nature appreciation, to exercise, relax and reflect
- coastal ecosystems provide recreation, cultural values and scenic vistas important to Noosa's identity and character.

A healthy natural environment contributes to our quality of life and is vital in supporting Noosa's economy and community. It takes a whole-of-community effort to ensure we preserve, enhance and celebrate our local native plants, animals, and ecosystems, so they remain healthy, resilient and valued by all the community.

3 core strategies identified in this theme are:

- protect and enhance existing ecosystems, vegetation networks and habitats
- expand vegetation networks and habitat
- improve long-term survival for threatened species and ecological communities

## Strategy 1.1 Protect and enhance existing ecosystems, vegetation networks and habitats

### Target

By 2030, there is no net loss of ecosystem values across the shire, and the condition of Council's priority bushland reserves are enhanced.

Noosa Shire's reserve system contributes towards a large, well-connected network of core protected areas. These extend across a diverse cross-section of ecosystem types and altitudinal ranges that link public and private lands. Many of these areas are large and highly biodiverse.

The largest protected reserve is the Cooloola section of the Great Sandy National Park. Connectivity between large areas of private and public land assist with maintaining the diversity, abundance and health of many native species. The vegetation networks that extend along waterways and form Noosa's wetlands and coastal environments assist in protecting water quality and play an important role in buffering foreshores from erosion, capturing sediment and filtering runoff across the catchment.

Existing small vegetation patches and urban habitats are also important for providing habitat and supporting species survival. This includes the vegetated road reserve network, which plays a role in providing habitat and connectivity across the shire.

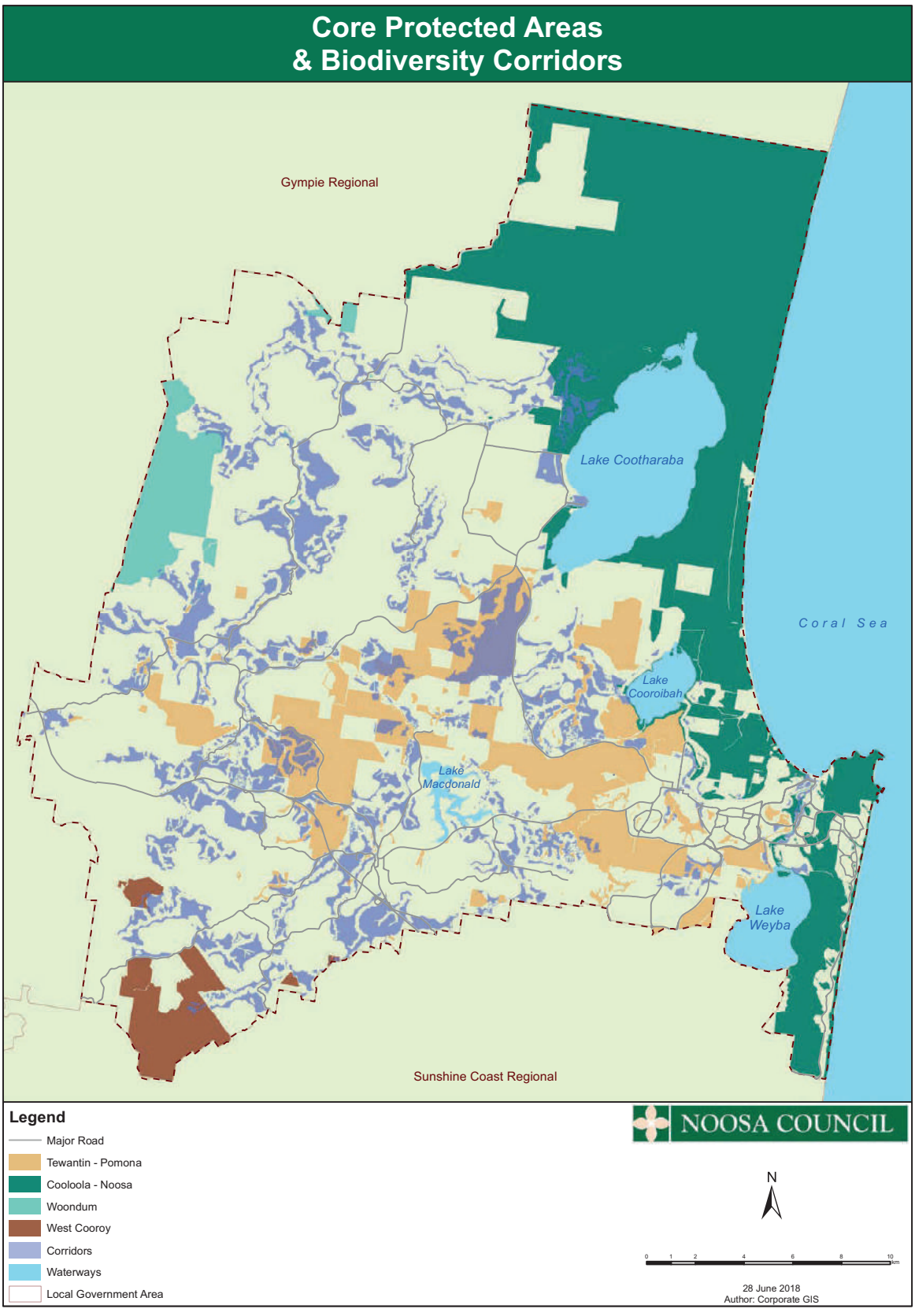
Ecosystems function are at their best when they are as close to their natural state as possible, the condition that has resulted in the co-evolution of the species that inhabit them.

Ecosystems in Noosa Shire are impacted by a range of threats including weeds, feral animals, development, vegetation clearing, pollution, urban runoff and climate change.

There are a range of statutory and non-statutory measures to protect and enhance existing ecosystems, vegetation networks and habitats. The Noosa Planning Scheme helps protect high value biodiversity and riparian corridors. It provides additional protection to matters not covered by State and Commonwealth legislation such as high value regrowth and vegetation and species that are considered to be locally significant.

Outside statutory protection there are a range of programs helping to improve the condition of ecosystems, vegetation and habitat. Noosa Council owns and manages over 180 bushland reserves and, in partnership with community volunteers, is undertaking site stabilisation works, weed control and plantings to restore the natural ecology of these reserves. Council also partners with private landholders through conservation agreements to promote and support similar works on private land to further expand the Noosa conservation estate.

Different government agencies have responsibility for managing Noosa's protected areas, with the State Government managing National Parks and State Forests. For public land not under Council control, Council can play an advocacy and support role with other government land managers to improve environmental outcomes.




Map: Core Protected Areas and Biodiversity Corridors

## Strategy 1.2 Expand vegetation networks and habitat

### Target

By 2030, half of all land in the Noosa Shire is managed for its environmental values

An extensive protected reserve system across Noosa Shire plays a critical role in conservation management for the region, and this is continually growing.

Impacts from development, vegetation clearing, encroachment into habitat areas, and fragmentation of vegetation across the landscape put pressure on ecosystem health and species survival. In addition, the projected changes to Noosa's climate are expected to further undermine the resilience of many local systems. Many patches of vegetation in the hinterland areas are important 'stepping stones' for species but are vulnerable to edge effects such as weeds, and land-use encroachment.

Expanding and linking core protected areas into areas of high biodiversity significance helps protect vital ecosystems from encroachment or fragmentation by development and also enhances connectivity.

To this end, Council has an active acquisitions program and a private landholder conservation program, funded through the Environment Levy.

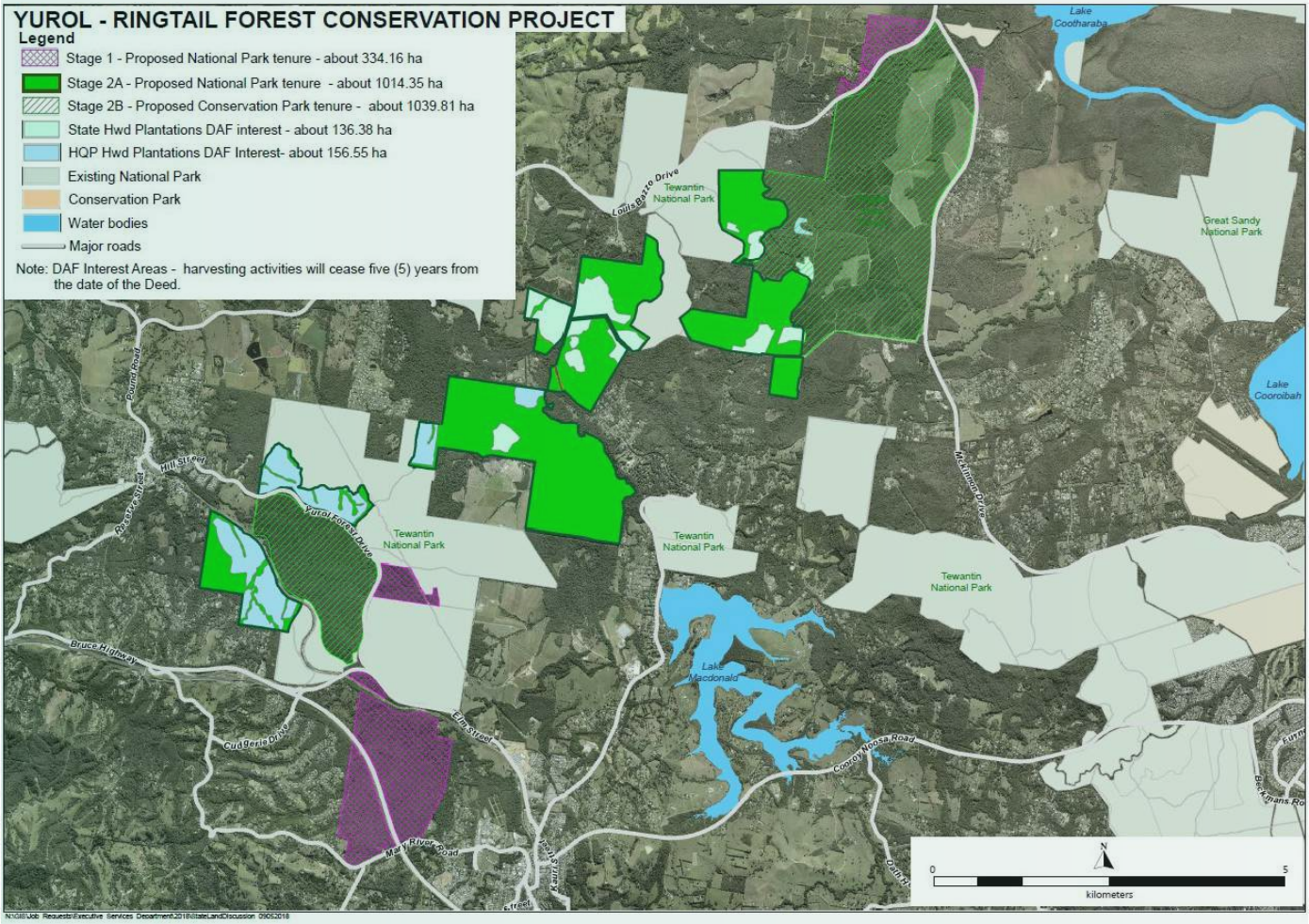
Rehabilitating and restoring habitat connectivity across the landscape enables fauna movement, enhances genetic diversity, and facilitates species and habitat migration. Consolidating core protected areas and biodiversity corridors is an important focus for Noosa Shire in the face of a changing climate and predicted changes in the distribution of plant and animal populations.

Noosa is also fortunate to have many private landholders with a strong commitment to conservation, carrying out work on their land. Over 300 of these landholders are members of Land for Wildlife program and there are 19 landholders who have placed voluntary covenants on their land to secure its permanent protection.

## Yurol-Ringtail State Forest Conservation Project

The Yurol-Ringtail State Forest Conservation Project is one of the largest conservation projects undertaken in Noosa Shire. Project funding partners include Noosa Parks Association, State Government and Noosa Council.

Ultimately, 2400ha of State Forest land will transfer over to National Park over a 10 year period. 750ha of pine plantation is to be restored to a natural condition, making this project one of the largest ecological restoration projects in South-east Queensland and a project of great significance to Council and the community. Once restored it will provide important connectivity across the Noosa landscape supporting vital habitat for native flora and fauna.




Map: Yurol-Ringtail State Forest project provides a significant extension to the core protected area network linking Pomona to the Noosa River

## Strategy 1.3 Improve long-term survival for threatened species and ecological communities

### Target

By 2030, populations of key threatened indicator species remain viable.

There are currently 128 fauna and flora species that are listed as endangered, vulnerable or near threatened under State and Commonwealth environment legislation that occur in Noosa Shire. There are also 3 nationally-declared Threatened Ecological Communities, and 32 Endangered and 'Of Concern' Regional Ecosystems listed by the State.

Over the last decade the representation of ecosystems has generally stabilised but there has been changes to the distribution and abundance of native species in the developed coastal zone. Some species have benefited from some development while other species have declined.

There are a range of threats to flora and fauna species including clearing for development and rural purposes, disease, vehicle strike, bushfire, predation, competition for nesting hollows, changes to groundwater and declining food availability.

Climate change also has the potential to significantly impact threatened species survival through changes in temperature and rainfall patterns.

A priority of the Environment Strategy is to conserve important ecological communities and the habitat that sustains individual fauna and flora species. This includes minimising threatening processes. As well as habitat conservation at the broad landscape level, some species require interventions at the site level to address critical threats. Site specific management responses for threatened species will continue to be identified and implemented.

As a key local land manager, Council has a role in helping threatened species through protecting and enhancing ecosystems and habitat that fauna and flora require for survival.

For example, 28 threatened species have been recorded in the Yurol-Ringtail State Forest area including the Koala (Phascolarctos cinereus), Spotted-tailed Quoll (Dasyurus maculatus), Giant Barred Frog (Mixophyes iteratus) and the Swamp Stringybark (Eucalyptus conglomerata).

Council and environment groups are rehabilitating former pine forest in this area and it is anticipated that this will not only be of benefit to koalas but also many other fauna and flora species.

# Outcomes - Biodiversity

A. Mapped remnant vegetation and important regrowth vegetation is protected through the planning scheme and also through state and commonwealth legislation.

B. Priority ecosystem areas in Council's bushland reserves are enhanced and managed to be responsive to changing environmental conditions.

C. High biodiversity value lands, and cleared lands suitable for ecological restoration, are protected through Environment Levy acquisition or supported through private land conservation.

D. Ecological linkages and connecting habitat areas are improved and rehabilitated to increase landscape connectivity and species resilience.

E. Community conservation partnerships on public and private land are developed to deliver successful biodiversity conservation outcomes.

F. Terrestrial and aquatic ecosystems, as well as fauna and flora species, are protected from significant human impacts.

G. Invasive pest species are managed strategically to reduce impacts on native species and habitats, as well as recreation and tourism values.

# Waterways, Wetlands and Coasts

## Goal

By 2030, our waterways, wetlands and coasts are healthy, resilient to change and valued by the community.

Noosa Shire consists of the Noosa River catchment (63%) and Mary River catchment (36%). There is also a small area (1%) of the north Maroochy River catchment in Noosa Shire. The Noosa and Mary Rivers and their catchments offer a range of ecosystem services to residents and visitors including fisheries, water resources, flood regulation, recreational use and cultural learnings.

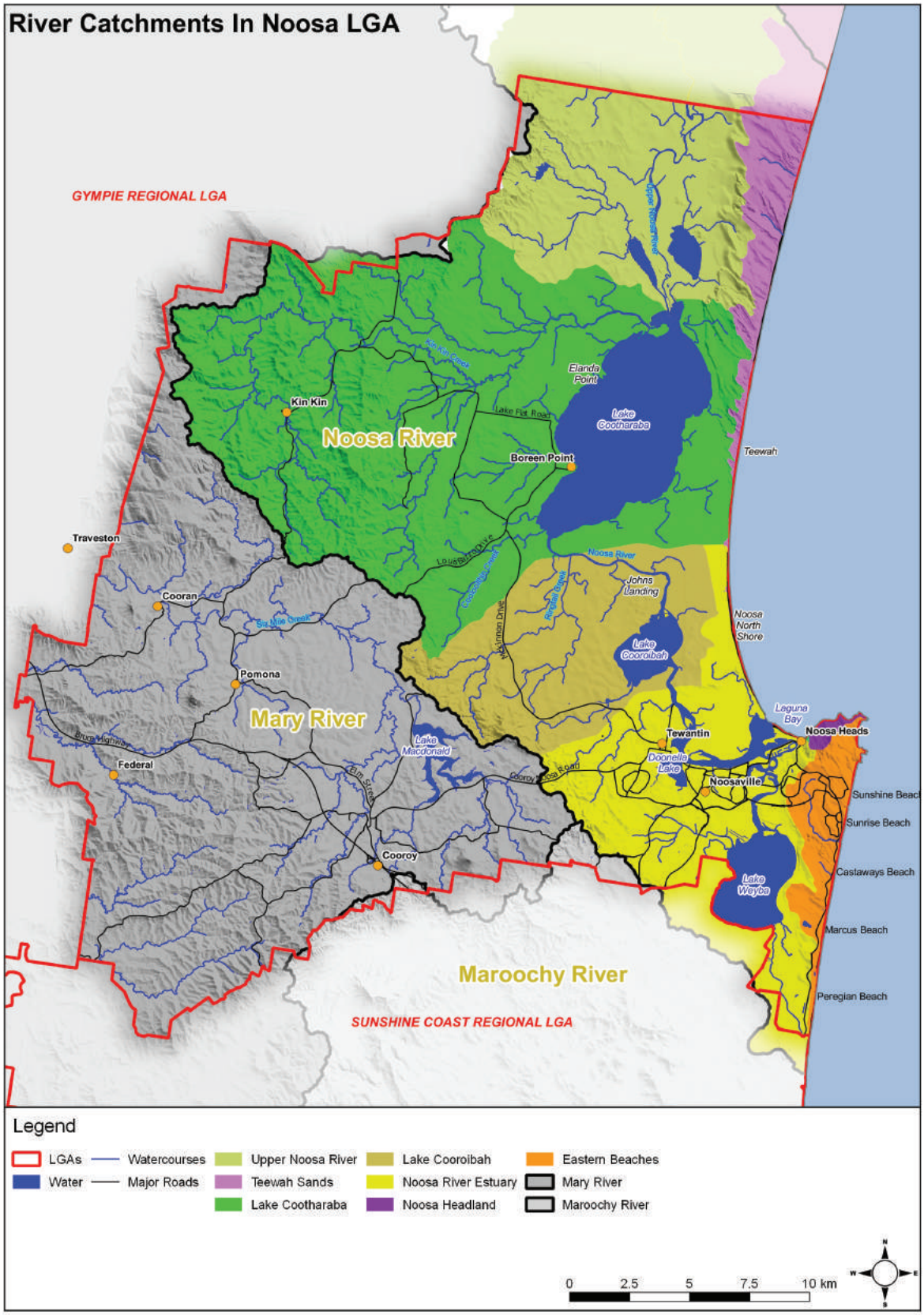
The Noosa River is south-east Queensland's healthiest waterway. It has listed wetlands of national significance and contains the largest riverine seagrass in south-east Queensland. The upper catchment of the Mary River includes the railway towns and villages of Cooroy, Pomona and Cooran. It is largely a rural catchment characterized by cattle grazing, small crops, hobby farms and large vegetated areas. Rural land use in this catchment greatly influences the survival of downstream species such as the endangered Mary River Cod (Maccullochella mariensis) and the Mary River Turtle (Elusor macrurus).

In the coastal areas, Noosa Shire consists of long sandy beaches interrupted only by the rocky headland of Noosa National Park. Protected by the predominant south-easterly winds, Granite Bay, Little Cove and Noosa Main Beach are a very popular destinations for beachgoers and surfers. Teewah Beach is also in great demand for fishing, camping and 4WDs, particularly during holidays and weekends.

3 core strategies are identified in this theme:

- maintain & improve the health of waterways, wetlands & catchments
- protect and enhance coastal environments and vegetated buffers to coastal foreshores
- manage waterways and coasts to protect environmental values while enabling sustainable public access, recreation and commercial use.

Photo: Wetlands are habitat for many plant and animal species and play a significant role in maintaining water quality


River Catchments In Noosa LGA
GYMPIE REGIONAL LGA
Noosa River
Mary River
Maroochy River
SUNSHINE COAST REGIONAL LGA
Kin Kin
Boreen Point
Elanda Point
Lake Cootharaba
Lake Flat Road
Teewah
Traveston
Cooran
Six Mile Creek
Pomona
Bruce Highway
Federal
Lake Macdonald
Kin Kin Creek
Cooroy Noosa Road
Cooroy
Noosa River
Johns Landing
Noosa North Shore
Lake Cooroibah
McKinnon Drive
Laguna Bay
Noosa Heads
Tewantin
Doonella Lake
Noosaville
Sunshine Beach
Sunrise Beach
Castaways Beach
Lake Weyba
Marcus Beach
Peregian Beach
Legend
LGAs
Water
Watercourses
Major Roads
Upper Noosa River
Teewah Sands
Lake Cootharaba
Lake Cooroibah
Noosa River Estuary
Noosa Headland
Eastern Beaches
Mary River
Maroochy River
0
2.5
5
7.5
10 km

## Strategy 2.1: Maintain and improve the health of waterways, wetlands and catchments

### Target

By 2030, the Noosa River and Mary River sub-catchments within Noosa Shire achieve an A rating (or equivalent) for their environmental health.

## Mary River Catchment

The Mary River Catchment is a large water catchment stretching from Maleny to Hervey Bay, draining through the Great Sandy Strait, a Ramsar listed wetland and into the southern Great Barrier Reef. The upper part of the Mary River catchment in the south-west of the shire includes Six Mile, Skyring, Blackfellow, Happy Jack and Middle Creeks. The Mary River catchment also supplies a significant amount of drinking water to Noosa Shire, draining through the catchment to the Lake Macdonald water reservoir.

Land use within this sub-catchment influences the ecological health of the Mary River and the conservation of threatened species such as the Mary River Turtle (Elusor macrurus), Mary River Cod (Maccullochella mariensis) and the Australian Lungfish (Neoceratodus forsteri).

Much of the catchment is highly modified for agricultural and urban uses. Remaining remnant vegetation and riparian corridors along waterways help maintain water quality and provide habitat for a diversity of mammals, birds, reptiles, amphibians and insects.

Like other river systems, the upper Mary sub-catchments suffer from erosion of riverbanks and sediment mobilisation, reduced water quality, fragmentation of riparian buffers and faunal corridors, and impacts from stock and other agricultural practices. There is an opportunity to restore riparian corridors along creek lines and improve land use management practices through collaborative working relationships with landholders.

The Mary River Catchment Strategy was developed in 1996 to ensure the sustainable use of land, water and vegetation resources. The strategy continues to be an important guiding document for land and water management for the catchment.

Community groups such as the Mary River Catchment Coordinating Committee (MRCCC) play a key role in engaging with and advocating for improvements to farm practices, riparian restoration and erosion, and sediment control projects.

## Noosa River Catchment

With its headwaters in the Cooloola Section of the Great Sandy National Park, the Noosa River is south-east Queensland's healthiest river system. This shallow water body includes Lake Como, Lake Cooloola, Lake Cootharaba, Lake Cooroibah, Lake Doonella and Lake Weyba. Noosa River aquatic ecosystems include intertidal mangrove and saltmarsh communities, seagrass beds, mudflats, sandy benthic substrates, creeks, river beaches, and artificial rock revetments and structures in the lower Noosa River catchment.

The diversity of marine ecosystems provides habitat for marine animals and plants. Many species of migratory birds roost and feed on sand and mud flats in the lower Noosa estuary during spring and summer. The Vulnerable Water Mouse (Xeromys myoides) has been recorded in the Noosa River catchment and lives in saltmarsh, mangroves and adjacent freshwater wetland habitat.

The Noosa River is consistently awarded an A rating, under the Healthy Land and Water monitoring program, based on environmental condition, as well as social and economic benefit.

Whilst the condition of the Noosa River is very good, it is still not immune from a range of potential threats. Recent research has shown a concerning decline in benthic invertebrates in the lower Noosa River over the past 20 years. As these species are an integral part of the food chain, these declines are very concerning, and the causes and long-term impact of this decline is still unknown.

Regional climate projections indicate Noosa can expect increased water temperatures, more intermittent water inflows, and more intense rainfall events leading to more severe erosion and pollutant mobilisation. Increased frequency and depth of tidal inundation of terrestrial areas not currently exposed to saline waters is expected as a result of sea-level rise. These factors are expected to further increase the pressures on our river systems.

There are a large number of stakeholders with interests in the management of Noosa River. The State Government controls land, marine safety, and fisheries, while local government has land use planning controls and responds to reports of pollution. There are many commercial operators in the river, and the estuary is very popular recreation area for residents and visitors alike. Because of the large number of stakeholders and diversity of interests, the Noosa River Plan aims to take an integrated management approach to attempt to balance the needs of all parties. Given the large number of stakeholders with interest in the River, Council will proactively seek collaborative partnerships to ensure multiple interests are considered and combined efforts occur towards mutual objectives for the River and its management.

The Noosa Planning Scheme regulates development and aims to avoid and mitigate impacts on ecosystems and habitats. Through mapping of biodiversity values, the planning scheme identifies significant biodiversity areas and interconnecting vegetation corridors. Strict development codes aim to minimise downstream impacts from development, control sediment, and protect native vegetation, species habitat and water quality.

## Wetlands

Wetlands are areas of land covered permanently or temporarily in water. They are often at the interface of large waterbodies such as rivers, lakes and oceans. Plants and animals that live in wetlands have unique qualities to cope with changes in water depth and condition. Similar to corridors of vegetation across the landscape, wetlands offer connectivity for fauna and play an essential role in maintaining water quality for river systems. Both the Mary River and Noosa River catchments have significant wetland areas.

Lake Cootharabah

The upper Mary River catchment includes Melaleuca swamp, grass, sedge and herb swamp, lakes and artificial wetlands. These important wetlands act as a filter for water that ultimately flows into the Great Sandy Marine Park at the southern end of the Great Barrier Reef.

The Noosa River system is listed on the Directory of Important Wetlands in Australia (DIWA). The Noosa River wetlands consist of mangroves, saltmarshes, melaleuca swamps, wet heath, grass sedge and herb swamp, sand window lakes as well as artificial wetlands such as dams and irrigation channels.

Many of these wetlands are groundwater dependent and require permanent or intermittent groundwater reserves to maintain healthy ecosystems. Coastal creeks are also groundwater dependant and provide habitat for species such as the endangered Oxleyan Pigmy Perch (Nannoperca oxleyana). Projected changes to precipitation patterns, and saline intrusion into coastal aquifers as a result of climate change and sea-level rise may have adverse impacts on these systems.

Wetlands and coastal creeks are at risk from development and vegetation clearing. Developments can also reduce groundwater recharge through increased hardstand areas and accelerated overland flows. Acid sulfate soils disturbed through earthworks, drainage and development can cause ‘fish kills’ and damage infrastructure because of elevated acidity in the soils and runoff.

Wetlands often have unique aquatic and ecotonal fauna and flora assemblages, and can be impacted by invasive plant and animal species. Introduced fish may prey on native fish species or outcompete them for food, while water weeds can smother wetlands and reduce ecosystem health for native aquatic species.

Human activities can also impact on coastal creeks and associated wetlands. For example the environment and water quality of Burgess Creek has been altered as a consequence of treated sewerage discharge into the waterway.

The Noosa Planning Scheme is a key mechanism to avoid and mitigate impacts to wetland areas. Development is required to control sediment and runoff, avoid acid sulfate soil exposure, and provide separation buffers to wetlands to help minimise impacts. Stormwater controls and constructed bio-basins are required to be built and properly maintained to capture and filter runoff and allow continued groundwater recharge.

The Noosa Planning Scheme, Noosa River Plan and the Mary River Catchment management plans will continue to guide priority actions to maintain the environmental health of Noosa’s wetland and groundwater systems.

## Strategy 2.2: Protect and enhance coastal environments and vegetated buffers to coastal foreshores

### Target

By 2030, maintain the extent of vegetated buffers and improve diversity of coastal ecosystems.

Noosa's coastal environments, including sand dunes, beaches, marine areas and coastal wetlands, provide a variety of habitats for native plants and animals, and also provide for recreation uses, tourism and our coastal lifestyle.

The marine areas of Noosa, like other SEQ coastal waters, are a transitional area for temperate and tropical species, and therefore include a broad diversity of ecosystems and species. Rocky headlands provide habitat for molluscs, soft corals, crustaceans and algae while deeper rocky shelves are home to soft and hard corals and seaweeds, providing food and protection to fish and turtles.

Coastal creeks from Peregian Beach to Noosa Heads feed directly into the ocean. Some of these creeks are habitat for important freshwater fish such as the vulnerable Honey Blue-Eye (Pseudomugil mellis) and the endangered Oxleyan Pygmy Perch (Nannoperca oxleyana). Wallum ecosystems at the headwaters of coastal creeks are highly acidic and support the Wallum Froglet (Crinia tinnula) and Wallum Sedgefrog (Litoria olongburensis), both listed as vulnerable species.

The Noosa Shire has 41kms of open beach which provides habitat for intertidal invertebrate species, and birds such as Pied Oystercatchers (Haematopus longirostris) that feed on them. Endangered Loggerhead Turtles (Caretta caretta) and Vulnerable Green Turtles (Chelonia mydas) nest on open beaches between November and March each year, and young turtles hatch 6-12 weeks later. The Noosa River estuary is a resting and feeding ground for migratory birds. Some of these birds travel from as far as the Arctic to avoid the northern hemisphere winter.

The condition of coastal waters is very much influenced by nearby rivers. The Noosa River feeds into Laguna Bay and affects offshore marine areas. The Great Sandy Marine Park and the Great Barrier Reef are also influenced by outflows from the Mary River. Urban stormwater discharge is the primary source of litter pollution entering rivers and the ocean, directly impacting on birds, marine mammals and turtles.

Coastal foreshores are dynamic, changing over time in response to weather, tides, waves, ocean currents, sand deposition and erosion. During severe weather events, coastal hazards such as erosion and storm tide inundation can threaten built assets, communities and natural environments. These coastal hazards will be exacerbated by climate change due to more extreme weather conditions and sea level rise.

Human activities including development, infrastructure, and vegetation clearing need to be minimised and carefully managed within coastal areas to allow natural coastal processes of erosion and accretion to continue, and to protect existing coastal resources. Protection of the important buffering function of vegetated dune systems and foreshore areas is critical to improving resilience to coastal hazards.

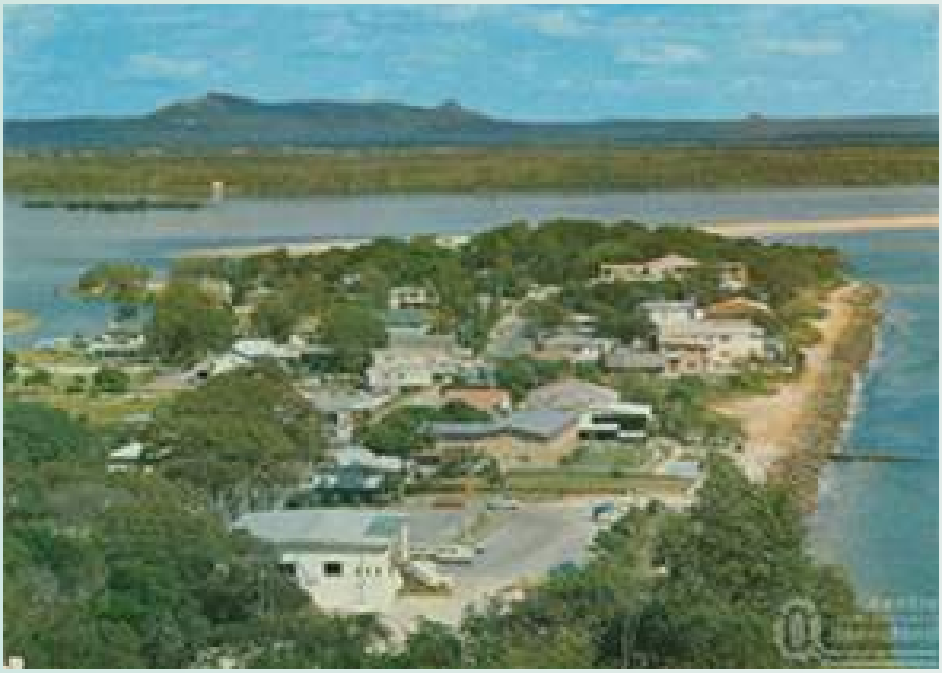
Recreation and visitor numbers continue to increase the demand on coastal resources through public access and a variety of tourism and recreational activities. Proactive coastal management of sensitive areas requires clear and consistent regulation, well managed access of public areas, active dune revegetation, and education and information sharing with the community.

Across the coastal zone the State Government manages tidal waters and Council manages public land within and above the intertidal zone. The Noosa Planning Scheme regulates development across all land tenures within the Shire. Integrated coastal management is required to address the range and complexity of issues within the coastal zone and Council works with State agencies, environment groups and landholders to cooperatively manage a range of issues.

## Noosa River Mouth

In response to flooding and wave damage from cyclone David in 1976, the Noosa River mouth was shifted further west and the area now known as Noosa Spit revegetated. In more recent times, sand bags and rocks were placed along the river edge to further protect the Spit and Dog Beach.

The Noosa Spit is a recreational hub and kitesurfing is a popular activity at the river mouth. Some low beach areas and dune systems on Noosa North Shore are excluded from 4WDs and dogs to protect feeding and nesting grounds for migratory bird species. Between 2013 and 2018 more than 95,000m3 of sand was placed on Noosa Main beach for beach nourishment.



Noosa Main Beach 1962

Noosa Main Beach 2006

## Strategy 2.3: Manage waterways and coasts to protect environmental values while enabling sustainable public access, recreation and commercial use

### Target

By 2030, Noosa has a sustainable fishing industry and increased opportunity for recreational fishing.

Noosa's waterways and beaches are a major attraction for visitors and residents. Visitors are particularly drawn to Noosa Main Beach, the stretch of beaches from Sunshine to Peregian Beach, Noosa National Park, Noosaville foreshore, Noosa North Shore and the Great Sandy National Park. Large numbers of visitors flock to beaches and waterways during school holidays and on weekends.

High levels of visitation can place significant pressure on foreshores which provide a buffer against erosion and protect coastal communities. Indiscriminate access by pedestrians, as well as 4WDs driving on intertidal areas, can cause erosion and environmental damage which can be difficult to repair. Not addressing these factors is likely to undermine the resilience of foreshores to climate change driven rises in sea level and extreme weather events.

A focus for the Environment Strategy is to continue to protect our important waterways and foreshores but still allow access for recreation and commercial activities where this can be demonstrated to be environmentally sustainable over the long term. This requires a range of measures including:

- adequate separation and vegetated buffers between development and active erosion zones
- managing the type and intensity of recreational and commercial uses to ensure they are compatible with environmental and amenity values
- ensuring commercial activities do not proliferate into public areas and adhere to environmental standards
- controlled access to foreshores through fencing, signage and regulation
- protection and rehabilitation of dunes, intertidal areas and riparian vegetation
- minimising and management of encroachments onto dunal systems that impact vegetation and cause erosion
- collaboration with community groups to protect and manage waterway health.

Conservation of coastal areas is complicated by the range of different land managers involved. Council will engage, partner with, and advocate for better outcomes in coastal areas, which are not always within its direct responsibility.

# Outcomes - Waterways, wetlands and coasts

A. Water quality, riparian areas and catchment health is protected and improved by partnering with landholders and stakeholders to actively manage and rehabilitate priority stream reaches.

B. Aquatic biodiversity is improved through the preservation and enhancement of diverse instream, riparian and wetland habitats.

C. The physical processes and dynamics of our rivers, wetlands, groundwater and coasts are well understood to support effective long-term management options.

D. Waterways, wetlands and coastal environments are protected, managed and maintained in their natural state, and are enhanced to support healthy and diverse ecosystems.

E. Recreational and commercial fishing is managed in a sustainable way so there is no long-term decline in fish abundance and diversity.

F. Point source and diffuse pollution is identified and effectively managed to reduce impacts on waterways, wetlands and coasts.

G. The quality and quantity of groundwater, surface water and wastewater discharge is optimised to minimise impacts to receiving waters, aquatic ecosystems and human health.

H. The impacts of human use are carefully managed to protect ecosystem health and visual amenity, as well as to ensure the sustainable use of waterways and foreshores for residents, visitors and commercial operators.

I. Noosa Council works effectively with all agencies with management responsibilities for waterways, wetlands and coastal areas.

# Sustainable living

**Goal**

By 2030 the Noosa community is living in an increasingly sustainable manner and is carbon neutral.

The natural environment sustains and fulfils human life through 'ecosystem services'. Ecosystem services are the benefits provided to humans through the transformation of natural resources into the flow of essential goods and services such as clean air, water and food. The sustainability of communities and economies depends upon our ability to maintain or restore the ecological functions of both urban and rural landscapes. Yet our current lifestyles are impacting on the very ecological services that sustain us. If everyone lived like the average Australian we would need around 5 planets to support us – but we only have one.

Sustainable living means moving from a "take-make-waste" society to a circular economy that is based on renewable energy sources, eliminates waste and pollution, and keeps products and services in use. Sustainable living means living in built and natural environments in a way that reduces and minimises impacts on natural resources, and contributes to the preservation and restoration of ecological services on both a local and global scale.

Noosa Shire has an ongoing role to play both locally and globally in promoting sustainable living. Noosa's shared community vision for the environment, as well as strong community partnerships that successfully advocate for and improve the environment, will continue to be important for driving an ecologically sustainable approach to Noosa's prosperity.

Environment and sustainability will need to move beyond locally and regionally-focused actions to a deeper sense of responsibility for our global environment. Noosa's resource consumption, energy use and carbon pollution contributes to global environmental impacts and both the Noosa Council and the Noosa community have a responsibility to 'think and act globally'.

It may no longer be enough to gradually reduce emissions but in fact in a state of climate emergency it will be necessary to reduce and reverse global warming, necessitating new and immediate forms of action as a community to avoid exponential impacts on our health and environment.

We all have the capacity to influence change by taking action.

This theme is progressed through the following 3 strategies:

- reduce waste to landfill
- encourage incorporation of more sustainable building elements
- adopt sustainable agricultural practices.

Other sustainable living issues, such as transport, tourism, housing accessibility and affordability, and urban design, are closely interrelated to the issues covered here. They are the focus of existing Council strategic documents such as the Transport Strategy, Local Economic Plan, Social Strategy and the Noosa Planning Scheme.

## Strategy 3.1: Reduce waste to landfill

### Target

By 2030, all green waste and food waste is diverted from landfill.

The amount of waste disposed of to landfill in Noosa Shire is costly to manage, is land intensive, and contributes considerable greenhouse gas emissions into the atmosphere. Noosa Council encourages the development of a circular economy, where resources are kept in use for as long as possible, and the community extracts the maximum value from them before transforming them, wherever possible, to a new usable resource.

Council is working with neighbouring councils on a more regional approach to recycling, including opportunities for processing of food and green waste, and also glass recycling. A number of waste minimisation measures for various waste streams have already been implemented, including garden, construction and demolition materials, metals, polystyrene, timber, batteries, paper, cardboard, e-waste, mattresses and recyclable packaging material.

Council also coordinates various community waste initiatives, such as:

- fortnightly garden waste service for residents in urban areas
- public place recycling in high profile public places
- investigation and enforcement action for illegal dumping of materials with surveillance at key hotspot sites
- resource recovery activities at Eumundi-Noosa Road Recovery Centre, including the sale of recoverable goods on site
- dog waste dispensers with compostable bags
- Towards Zero Waste Education Program to encourage better recycling, promote the take up of the garden waste service, encourage residents to compost food waste, and support commercial composting by restaurants and grocery markets
- partnering with organisations such as Plastic Free Noosa to eliminate single-use plastics
- investigations into using green waste compost for agricultural land.

Council is introducing a food and green waste collection service to achieve zero food and green waste going to landfill. This will be supported by a behaviour change campaign and will also involve encouraging events, cafés and restaurants to eliminate single-use plastics, use biodegradable and/or recyclable products as part of their takeaway food and beverage sales.

The Queensland Government waste strategy sets a target for all Queenslanders to reduce their overall generation of waste by 5% by 2024. The Strategy proposes a 55% recycling rate in domestic, commercial and industrial waste (in 2018, the Noosa community is at 45%) and an 80% recycling rate in construction and demolition waste (in 2018, the Noosa community is already at 90%). Council's Waste Reduction and Recycling Plan identifies specific actions towards achieving this. The State Government has also introduced a ban on single use plastic bags and a container deposit scheme which also helps divert waste from landfill.

Council will continue to reduce waste to landfill in accordance with the Waste Reduction and Recycling Plan through the following strategies:

- regular auditing of waste streams
- enabling the correct use of bins for resource collection through education, behavioural change and enforcement
- investigation into alternative waste treatment opportunities
- reduction of waste at source through education, incentives and behavioural change programs
- improvements to the current landfill gas capture rate.

## Strategy 3.2: Encourage incorporation of more sustainable building elements

### Target

By 2030, sustainable building outcomes are delivered through regulation, education and showcasing best practice design.

Noosa's subtropical climate and relaxed living provides opportunities for sustainable design outcomes that are cost effective, resource efficient, comfortable and attractive. Many sustainable design outcomes also increase the resilience of building occupants to climate-related stressors, such as extreme heat.

Many architectural elements in Noosa have developed in response to the subtropical climate and have their foundations in traditional Queenslander-style architecture. Modern interpretations have results in a distinctive 'Noosa style' which is both aesthetically appealing and responsive to the natural landscape and climate.

Exemplary designs use timber features, have thin or fine edges, appear lightweight, adopt sustainable design elements and do not dominate the landscape.

Sustainable building design elements include:

- energy and water efficiency, including lighting, electrical appliances, heat pumps, plus water tanks for gardens, toilets and laundry
- landscape design that retains endemic vegetation and maximises water permeability to provide for stormwater filtration and groundwater recharge
- renewable energy generation including photovoltaic solar power
- sustainable building materials with low environmental impact that are natural, durable, reusable, recyclable or made from recyclable or sustainably-sourced material
- waste management that provides for 'avoiding, reusing and recycling' during demolition, construction, operation and disposal
- passive energy design that takes advantage of local climate to maintain a comfortable inside temperature range, thus reducing energy use and reducing the need for heating and cooling
- indoor environmental quality including airflow, natural light and views
- strong connection to the natural environment, linking inside with the outdoors
- native species in landscape design, including maximising retention of existing vegetation to provide for local biodiversity.

The Noosa Planning Scheme sets design standards for new developments and redevelopments based on subtropical design principles. This includes building designs that respect topography, local character, appropriate climate orientation, native wildlife habitat and water quality. These design standards complement the Queensland Development Code requirements for sustainable buildings relating to energy efficiency, water conservation and outdoor living areas.

The Noosa Design Principles and the Noosa Planning Scheme encourage the use of sustainable building design and architectural elements suitable to Noosa, as well as Universal Design elements to ensure buildings are accessible to a range of ages and abilities. Council will continue to pursue actions to achieve this strategy, including:

- auditing the current stock of carbon neutral buildings within the Noosa Shire
- embedding carbon neutral design into the built environment
- partnering with local developers to promote and educate consumers on the carbon neutral design and construction requirements
- promoting exemplar sustainable design
- advocacy for more stringent building design standards in State legislation and codes
- partnering with research organisations to determine the most climate suitable and responsive sustainable design features for Noosa Shire
- updating of the Noosa Design Principles as new knowledge and technology becomes available.

## Strategy 3.3: Adopt sustainable agricultural practices

### Target

By 2030, 80% of all grazing land achieves best practice management for agriculture.

Over the last four decades increased fragmentation of agricultural land has resulted in significant pressure on rural land productivity in Noosa Shire. Since the late 1970s new hinterland residents have acquired land for lifestyle purposes, rather than primary production. This trend is starting to abate as small scale farming becomes more popular and local markets grow.

Unsustainable land uses and agricultural practices can result in both reduced productivity of the land and increased downstream impacts. Overstocking in small allotments reduces the percentage of ground cover and increasing erosion hazards, and the potential for sedimentation into waterways.

Historic clearing has exacerbated the risk of landslips in very steep land, where deep rooted native vegetation has been replaced by shallow rooted grasses for cattle. Revegetation, carbon farming and farm forestry reduce these threats to an extent.

More intensive horticulture and animal industries can result in increased nutrients and contaminants flowing into waterways if management systems, fertilizer and pesticide application are not matched to soil type, crop needs and the proximity to waterways and wetlands.

Sustainable agriculture reduces land degradation and the downstream impacts of food and fibre production, while improving the social and economic outcomes to farmers and the local community. Producers adopting best management practices can increase the carbon stored in our soils, improve the water quality buffers around our waterways and wetlands, and increase habitat and timber production while reducing erosion risks.

To be sustainable an agricultural enterprise needs to:

- make the most efficient use of non-renewable and on-farm resources
- enhance environmental quality and conserve the natural resource base upon which production depends
- integrate natural and biological cycles and controls, while maintaining on-farm biodiversity, and the health of wetlands and waterways
- manage land use to avoid mobilising sediment by not overgrazing, preventing stock from accessing waterways, and minimising soil disturbance during crop rotations.

Our local food value chain is adapting with a number of new entrants practicing free-range, pasture fed, regenerative and organic farming techniques. Some are also focussed on market-garden scale production while others are branching out into cooperative farming ventures. A significant opportunity exists to further grow, diversify and drive production from our urban organic waste streams. The entry of new players has seen the emergence of locally-branded and artisan food production in the Noosa hinterland.

Local farmers' markets, restaurants and consumers are increasing the demand for a range of locally produced higher value dairy products, grass fed and free-range meats, subtropical fruits, vegetables and macadamia nuts. Local food production means residents can reduce the food miles in their diet and this also makes our local supply chains more resilient. However, research shows that most new entrants require considerable training and support to achieve the goal of sustainability.

Council seeks to promote collaborative action to ensure that, as a community, we support farming enterprises that preserve the agricultural land resource, conserve our natural assets, improve water quality and maintain our rural character and scenic amenity. Council has a key role in building partnerships with industry and community groups to grow local produce for local consumption, connect local supply chains and build landholders' capacity for sustainable agriculture.

# Outcomes - Sustainable living

A. Council and community greenhouse gas emissions are avoided, reduced and offset through strong Council leadership, pursuit of multiple benefits and effective actions that are prioritised by impact.

B. Renewable energy usage is maximised and drives a transition to a zero emissions, clean energy future.

C. Effective and enduring Council and community partnerships actively drive the uptake of photovoltaic solar power on buildings.

D. Energy and resource consumption is minimised and managed to reduce costs, waste, water and energy usage, and to avoid environmental impacts.

E. An active local circular economy is supported through such approaches as innovative waste management models that maximise resource recovery and reuse.

F. Buildings, structures and landscaping are responsive to the subtropical climate, are resource efficient and minimise emissions.

G. Sustainable living practices and community capacity are enhanced through strong partnerships within the community, knowledge sharing, best practice showcases, innovative technologies and learning opportunities.

H. Agricultural and food production areas are protected and effectively managed to ensure adaptive and sustainable local production.

# Climate change adaptation and resilience

## Goal

By 2030 the resilience of the Noosa community and environment continues to increase.

Climate change is already presenting new challenges in the way society plans and prepares for disasters, designs developments and infrastructure, and manages our natural environments. Worrying changes in sea surface and air temperatures, ocean pH, and regional sea levels have been occurring over the previous century, and continue to do so at an accelerating rate.

The 2018 Intergovernmental Panel on Climate Change (IPCC) report recognised that to limit global warming to 1.5°C requires urgent action by 2030, and that global net anthropogenic $CO_2$ emissions must decline by about 45% from 2010 levels by 2030 and reach zero by 2050.

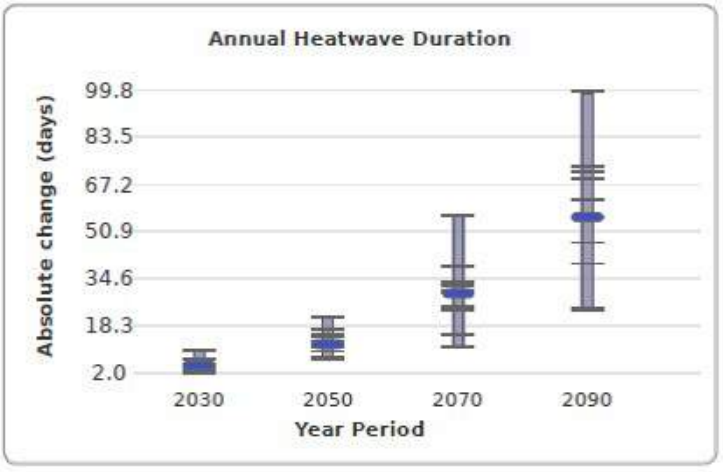
The Commonwealth Scientific and Industrial Research Organisation (CSIRO, 2018) expects significant changes are very likely to occur to Australia's climate without a significant reduction in global greenhouse gas emissions and transformation of land use practices. In the absence of these changes, the human and ecological systems that we currently benefit from – including in Noosa – are expected to be negatively impacted.

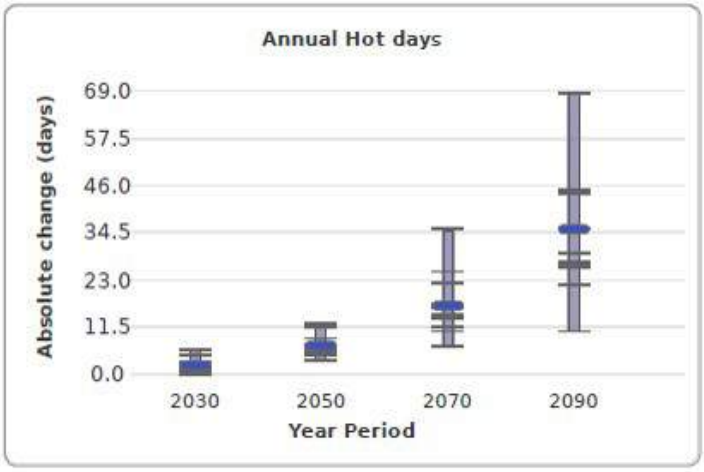
Projections for Noosa show that based on current emissions trajectories, Noosa is likely to experience an increase in the average duration of the longest heatwave in a given year extending from fewer than five days to almost two months. The number of days per year over 35 degrees could increase from fewer than three to over 35, by the end of the twenty first century.

Based on these projections, we can expect increased risks to people, property and natural environments from sea level rise, coastal erosion, storm tide inundation, flooding, bushfires, extreme weather, higher temperatures and changes in seasonal rainfall.

Changes to our climate will affect the way we live, how we recreate, our health and wellbeing, and the health and survival of natural ecosystems and species. In response, this theme is progressed under the following three strategies:

- reduce emissions and resource consumption
- increase community resilience and capacity to adapt to climate change
- manage and restore the natural environment in a way that improves resilience to climate change.




*The Long Paddock - Future Climate Dashboard,* Queensland Government, accessed 22 October 2018

## Strategy 4.1: Reduce emissions and resource consumption

### Target

Noosa Council operations and service activities, and the Noosa community as a whole, will reach zero net emissions by 2026

In 2016, Noosa Council joined 13 other local organisations in signing the Zero Emissions Noosa (ZEN) Community Collaborative Partnership Memorandum of Understanding. These groups included the Noosa Chamber of Commerce & Industry, Tourism Noosa, University of the Sunshine Coast and several local environmental groups. The goal of the ZEN initiative is to achieve zero net greenhouse emission in the Noosa Shire by 2026, through effective engagement with the community, industry and government. The MOU provides a shared commitment to this goal to reduce emissions and work together towards a Zero Emissions Noosa.

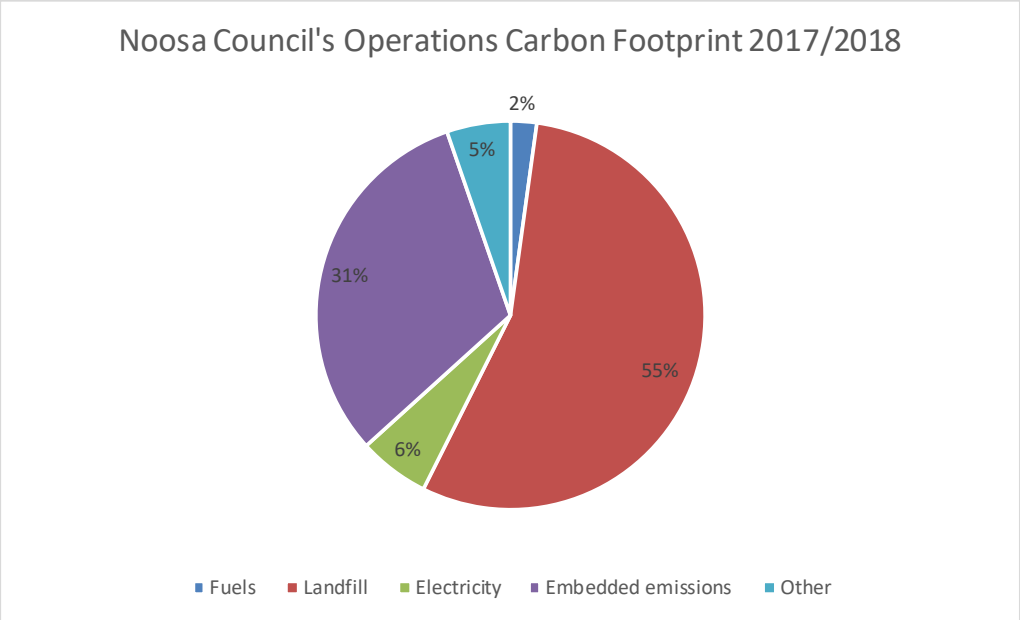
Noosa Shire is vulnerable to the predicted impacts of climate change and not only is it in Council's and the community's interest to contribute to global mitigation of those impacts by reducing our emission of greenhouse gases, governments have a duty of care to take action and consider the impacts of climate change in all its decision making.

We have significant opportunities and resources to reduce emissions at a greater rate than other regions. Therefore a more ambitious target can be pursued, reviewed and updated as the science dictates. Council has set a target to achieve net zero emissions for its operations by 2026, down from 50,000 tonne of $CO_2$ per year in 2017/18. This involves:

- calculating emissions in accordance with the National Carbon Offset Standard (NCOS)
- reducing emissions though emission avoidance, energy efficiency and the use of renewable energy
- offsetting residual emissions.

Council has implemented a Zero Emissions Noosa Organisational Strategy 2016-2026 to establish a decision-making framework to provide a cost-effective way forward for Council to achieve net zero emissions for its own operations by 2026.

About 65% of total emissions result from the landfill, where organic matter such as green waste, paper and food waste decomposes under anaerobic conditions and produce methane. Methane is 28 times more potent a greenhouse gas than $CO_2$.



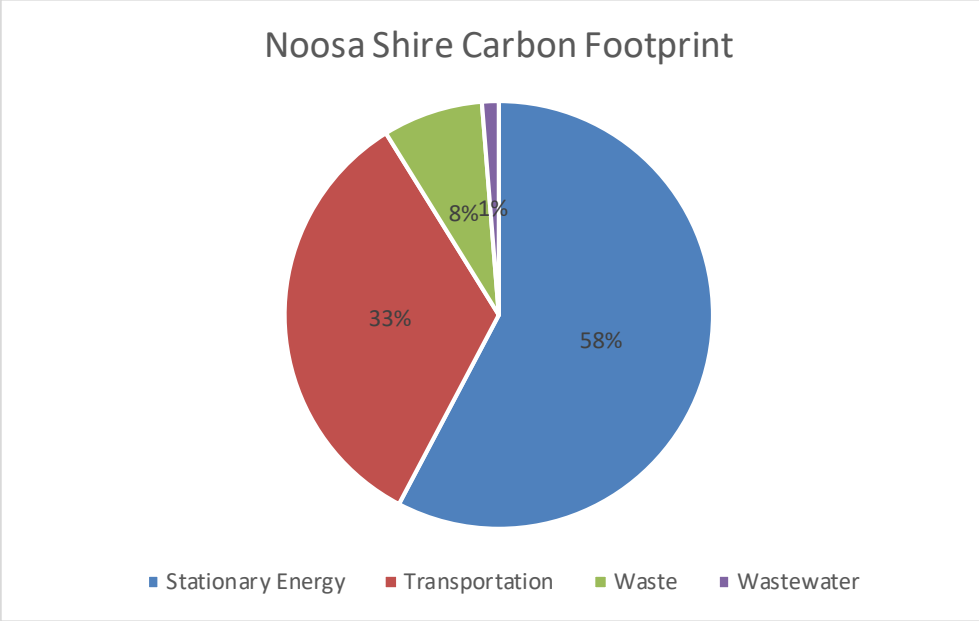
Council extracts the methane and flares or burns it to convert the methane to $CO_2$, and is implementing initiatives to reduce organic matter going to landfill and investigating treatment options.

The Noosa Shire annual community emissions have been estimated at 500,000t $CO_2$, in accordance with the Greenhouse Gas Global Protocol for community-scale greenhouse gas emissions inventories. The largest source of community emissions in Noosa Shire is stationary energy, which mainly comprises electricity consumed by residential buildings as well as commercial and institutional facilities.

As a part of the Noosa community, Noosa Council contributes to the Shire's greenhouse gas emissions, and has direct control over the greenhouse gas emissions of its own operations and services. As well as reducing its own operational emissions however, Council recognises its role to support the Noosa community to reduce its emissions overall in line with the required global emission reductions, and our own targets.

This includes:

- community education, behaviour change and capacity building to transition to a net zero emissions community
- provision of grants to community groups to assist them reduce their own carbon footprint
- facilitation of initiatives/schemes that promote the communities uptake of renewable energy
- lobbying State and Federal government to address barriers to the take up of renewable energy and sustainable building design
- facilitating alternative transport options and infrastructure in line with the Transport Strategy
- working in partnership with community groups to achieve a net zero emissions community.



## Strategy 4.2: Increase community resilience and capacity to adapt to climate change

### Target

By 2030, community awareness, planning and preparedness for natural hazards and climate change is increased.

Being a coastal shire, Noosa is particularly exposed to a number of natural hazards associated with climate change. We can expect our built and natural environments to be increasingly affected over time. Impacts may include:

- more intense and more frequent storms and flooding impacting households, business and tourism
- increased damage to buildings and infrastructure from flooding, storm tides and coastal erosion
- prolonged heat waves and more days over 35 degrees impacting human heath
- increased bushfire risk
- changes in the diversity and distribution of plants and animals
- changes to agricultural productivity and crop suitability due to altered patterns of rainfall and temperature
- increased impact on biodiversity and agricultural land from invasive animal and plants.

Sea level rise will cause additional low-lying areas to be permanently inundated at high tide, including areas around the Noosa River at Cooroibah, Tewantin, Noosaville and North Shore. A projected sea level rise of 0.8m by year 2100 (based on 1990 levels) is factored into long-term land use planning, infrastructure design and asset management.

This places about 1600 existing dwellings in what will become storm tide hazard areas, and around 200 dwellings located within coastal erosion hazard areas.

Through early adaptation planning, decision-making in Noosa will continue to be proactive and well-informed, and responsive to new information as it becomes available. Our focus will be on minimising the impacts of climate change, adapting to changes over time, and increasing our ability to recover quickly in disaster events to minimise disruptions to our community and our economy.

In terms of bushfire hazards, Council carries out bushland reserve fire management to safeguard people and property in a way that also maintains and enhances biodiversity. Existing conservation and bushland management programs are being reviewed in response to climate changes.

Council's Flood Management Plan sets out management actions for managing catchment flooding, relating to planning and policy, disaster management and providing up-to-date flood information and records.


Vertigo Aerial imaging

Council has prepared an overarching Climate Change Response Policy and is also developing a Noosa Shire Climate Change Adaptation Plan. The adaptation plan will focus on risk identification and short, medium and long term responses for coastal erosion, tidal inundation, human health, agriculture, business, built environment, emergency management and biodiversity.

For coastal hazards, a hierarchy of coastal management responses has been established for areas vulnerable to coastal erosion and tidal inundation:

1 AVOID – Avoid further risk in the first instance

Measures are implemented to ensure a 'no worsening' of risks as a result of development, infrastructure works or other decisions.

Through the planning scheme, future risks are avoided by not allowing for the intensification of development in existing hazard areas.

2 PREPARE – Carryout proactive evacuation planning, disaster management and education

Actions are carried out to improve disaster preparedness and information sharing to enhance community safety, health and wellbeing (especially for vulnerable members of the community).

3 ADAPT/ACCOMMODATE - Mitigate risks through careful design and location to reduce risks to an acceptable level

Successful adaptation is a shared responsibility that requires timely action by householders, asset owners, communities, business and government.

Examples include: enforcing minimum building heights for new buildings and extensions in flood hazard areas, locating and designing infrastructure to be effective until the end of its design life with climate change in mind, and preserving and improving natural buffers to foreshore areas to build resilience to coastal erosion.

4 RETREAT – Reposition built structures away from hazard areas where feasible

In some instances it will not be possible to retain some structures in their current position, such as in areas affected by storm tides, flooding or coastal erosion. For example, the Peregian Beach Surf Club was relocated landward after an east coast low destroyed the former building in the 1970s. Similarly, some Council-owned assets in at-risk foreshore areas may need to be relocated where this is feasible.

## Strategy 4.3: Manage the natural environment in a way that improves resilience to climate change

### Target

Ecosystem health of wetlands and riparian areas is improved.

The ecological resilience and capacity of the natural environment to evolve and adapt to the predicted impacts of climate change is best supported though the maintenance and restoration of healthy, well-functioning ecosystems. Healthy vegetated riparian areas provide for riverbank stability, improved water quality, and diversity and movement of species, amongst other benefits.

Vegetation clearing within the headwater areas and sloping land of the Noosa Shire has resulted in erosion of soil slipping into riparian areas. This has impacted both riparian function and water quality of the various catchments. It will also impact on the ability of these ecosystems to deal with changes in water level, storm surge and climate.

Climate change will see changes in ecosystems and plant and animal distributions, exacerbating threats such as weeds and increasing impacts on threatened species and ecological communities.

Building ecosystem resilience requires a multi-pronged approach shared amongst Council, community groups, research agencies and other government and organisations. For Council this includes:

- helping to maintain and enhance important refugia areas and landscape connectivity
- managing land use change and vegetation clearing through the planning scheme and other regulations
- encouraging community partnerships with private landholders and community groups
- acquiring and protecting key properties for conservation, especially those that might facilitate retreat areas for species and habitats into the future
- continuing to protect riparian buffer areas from vegetation clearing and development impacts through the planning scheme
- prioritising those critical biodiversity areas that are likely to persist into the future as the climate changes, including native vegetation along waterways.

# Outcomes - Adaptation and Resilience

A. The Noosa Council and Noosa community are better prepared for natural hazards and climate change through identification and mapping of natural hazards, proactive planning, risk reduction and information sharing.

B. Noosa's natural environment is prepared for climate change through the maintenance, restoration and increase of healthy, well-functioning ecosystems that facilitate diversity and movement of species both within and beyond Noosa Shire.

C. Disruptions to local economic activity and communities due to climate factors are kept to a minimum.

D. Risk assessments, climate adaptation and disaster management are well integrated and use best available information to inform decision-making, systems and processes.

E. Strong ongoing partnerships are established to improve understanding and action on climate adaptation for households, businesses, assets owners, communities and government.

F. Understanding of likely responses of biodiversity and ecosystems to climate change is improved over time and management programs are adjusted where necessary.

G. Transport options for residents and visitors reduce greenhouse gas emissions and minimise other environmental impacts.

# Glossary

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|---|---|
| **Adaptation** | The process of adjustment required to actual or projected climate change and its effects including changes required by plants, animals and people to become better suited to their environment. |
| **Biodiversity** | The variety of life represented by genetics, species and ecosystems, including the related ecological processes. |
| **Built environment** | The buildings, facilities and infrastucture that make up urban areas. |
| **Catchment** | Area of land bounded by natural features such as hills or mountains from which rainwater flows and collects to a low point. |
| **Climate change** | Natural or human induced changes to the climate caused by increased levels of greenhouse gases in the atmosphere. |
| **Coastal foreshore** | Foreshore area between high and low mean spring tide. |
| **Coastal processes** | Natural processes including tides, waves, ocean currents, and sand movement, deposition and erosion. |
| **Core protection areas** | Public lands with a legally secured mechanism to protect the conservation values of the land. |
| **Ecological linkages** | Areas of habitat or scattered vegetation between habitat areas that help provide connectivity for plants and animals across the landscape, aiding species movement and gene exchange. |
| **Fragmentation** | Clearing of native vegetation creating fragmented or disconnected habitat areas. |
| **Greenhouse gas emissions** | Gas emissions that contribute to the greenhouse effect and climate change. Gases include carbon dioxide ($CO_2$), methane (CH4), nitrous oxide (N20), perfluorocarbons (PFCs), sulphur hexafluoride (SF6) and hydrofluorocarbons (HFCs). |
| **Natural environment** | Encompasses living and non-living things that occur naturally. It includes the physical and biological environments and processes in which plants, animals and people depend on and interact within. |
| **Protected habitat** | Important native vegetation and riparian areas which are protected through local, State or Commonwealth statutory mechanisms. |
| **Protected areas** | Public and private lands with a legally secured mechanism to protect the lands' conservation values including national parks, nature refuges, bushland reserves, environmental covenants, and voluntary conservation agreements. |
| **Renewable energy** | Energy generated from natural renewable resources, which are naturally replenished, such as solar, wind and tides. |
| **Resilience** | The capacity of individuals, communities and systems to survive and adapt to changes and stressors they experience. This includes being able to deal with vulnerabilities in ways that create new opportunities. |
| **Riparian areas** | Areas that fringe waterways and wetlands. |
| **Sustainable living** | Living in built and natural environments in a way that reduces and minimises impacts on natural resources to create the least amount of environmental damage for current and future generations. |
| **Wetlands** | Areas of land covered permanently or temporarily in water. |


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