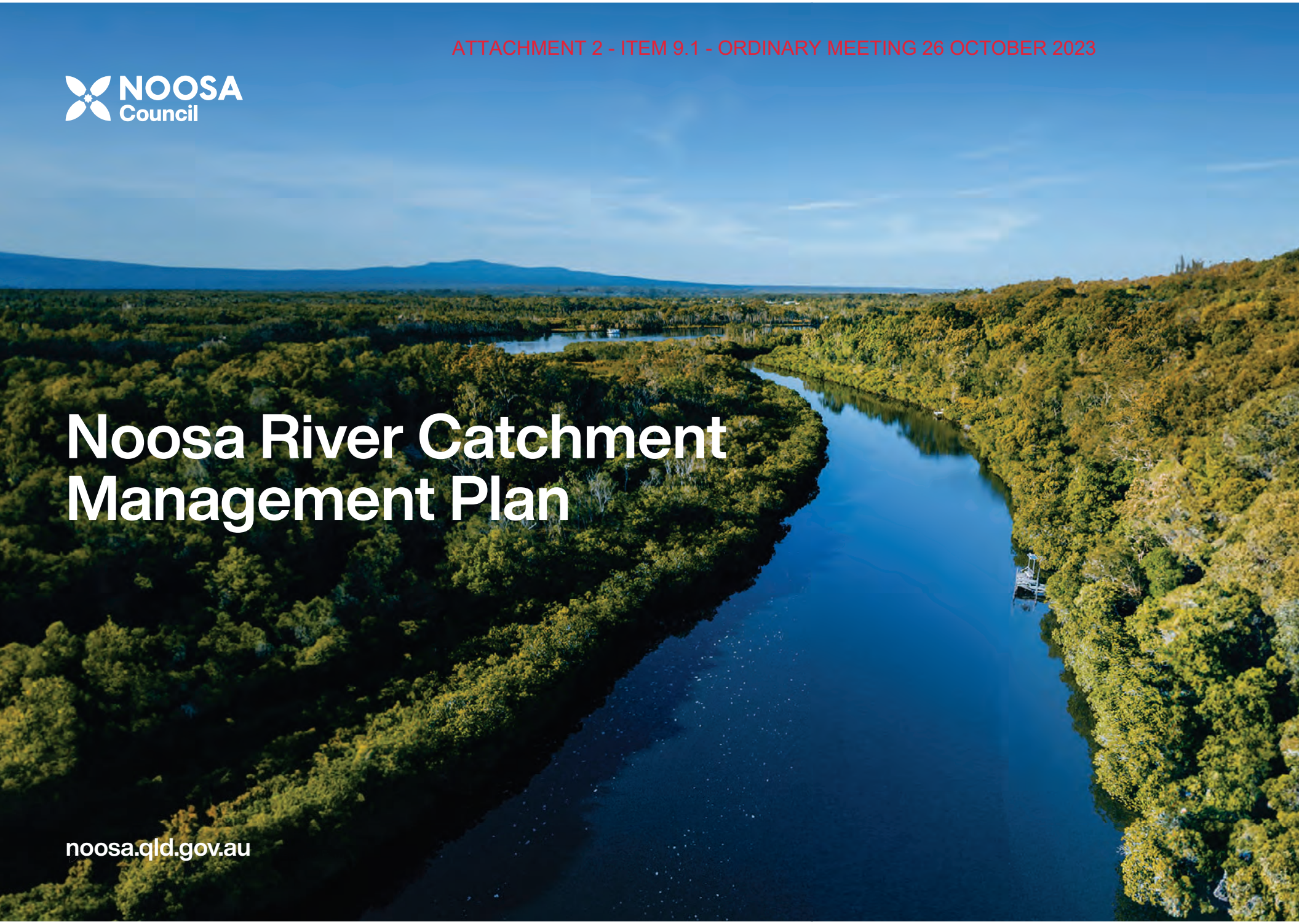
NOOSA Council



Noosa River Catchment Management Plan

noosa.qld.gov.au

Noosa River Catchment Management Plan

The Noosa River catchment is fundamental to Noosa's environment, economy and lifestyle and deserves best practice management for us and future generations.

What the community values about the Noosa River catchment	Threats to the Noosa River catchment	Desired outcomes and implementation actions
— Connection to Country	— Uncoordinated management	— Integrated management model
— Water quality	— Climate change	— Ecosystem health
— Boating	— Erosion and sediment	— Visual and natural amenity
— Recreation	— Degraded wetlands	— Public safety
— Lifestyle	— Urban pollution	— Cultural heritage
— Natural amenity	— Overuse	— Best practice, sustainable river and shoreline infrastructure
— Agriculture and fishing	— Over-fishing	— Economic benefits
— Public safety	— Environmental flows	— Recreation and transport
— River capacity	— Algal blooms	— Sustainable commercial use
	— Fish barriers	

Noosa River catchment:
Part of our heritage, stunning vistas, lifeblood of our community, remarkable water quality, epicentre of business and tourism

Introduction

There are few vistas more stunning than the Noosa River on a sunny day.

This weaving life blood of our community begins as a network of small groundwater-fed everglade streams at Como, travelling 60 km through the Great Sandy National Park, through a series of remarkable lakes, on past the riverside villages of Boreen Point, Noosa North Shore, Tewantin, and Noosaville, to the stunning ocean shoreline at Noosa Heads.

It is a playground for all manner of recreational activities including sailing, fishing, boating, paddling, swimming, and jet skis to name a few. It is as integral to Noosa Shire's charm as are our national parks and beaches.

Equally it is important to our economy and history, with many businesses servicing tourists and locals on, and along the river for many years, following the rich cultural history of the Kabi Kabi Traditional Owners in their love for this special place.

The Noosa River regularly achieves the highest health rating of any river system in south-east Queensland, in part because large areas of land adjoining its headwaters are protected in undisturbed vegetated condition as state forest or national park, yet the river faces challenges with ecosystem health as demonstrated by the lack of shellfish reefs, long term demise of seagrass and growing questions about loss of aquatic invertebrates.

Our community has a deep understanding of the Noosa River and its catchment, shaped by decades of experience, and a shared interest in this highly valued ecosystem.

In 2022 Noosa River's Report Card dropped from an 'A' to a 'B' for the first time in history.[1] This was largely due to the impacts of the major flood event early in the year and illustrates that pressures such as climate change are growing and urgent.

The range of impacts on catchment health must be tackled collaboratively and through a coordinated program of activities as proposed in this plan to maintain the river's outstanding natural attributes including high water quality, diversity of in-stream habitats and high levels of fish production.

The Noosa River is a complex waterway and management of this dynamic system involves multiple agencies across Local, State and Commonwealth governments vested in different locations, impacts, and activities in the catchment. The Noosa River Plan was first prepared in 1997 through a cooperative process involving all stakeholders, including government agencies, Noosa Council, and the community, reviewed in 2004, and again in 2019.

The ecological integrity and natural amenity of the Noosa Shire, its catchment and river ecosystems are central to our identity, prosperity, and wellbeing as a Shire. We must work together to maintain and strengthen our river ecosystems in the face of growing pressures, including climate change, and the benefits that flow from them.

[1] Healthy Land & Water (2022) Ecosystem Health Monitoring Report Card.

Structure of the plan

The Noosa River Catchment Management Plan is structured to provide:

- An overview of the planning context and strategic partners
- A description of the catchment characteristics including values and ecosystem services
- Management areas for different sections of the catchment to help highlight key management issues
- Identification of threats to protecting catchment values
- High level risk assessment to help prioritise management options
- Goals, objectives, and management actions to guide implementation.

A detailed monitoring and evaluation plan will be developed to help track progress and success in implementing the plan.

The Noosa River Catchment Management Plan 2023 – 2028 is a whole-of-catchment management plan that provides a framework for:

- *sustainable management actions that protect and improve the overall health of the Catchment*
- *a strong science base and monitoring to understand condition and trends*
- *collaboration and shared ownership with key stakeholders*
- *investment prioritisation and coordination*
- *implementation, review, and continual improvement.*

1. Noosa River catchment planning context

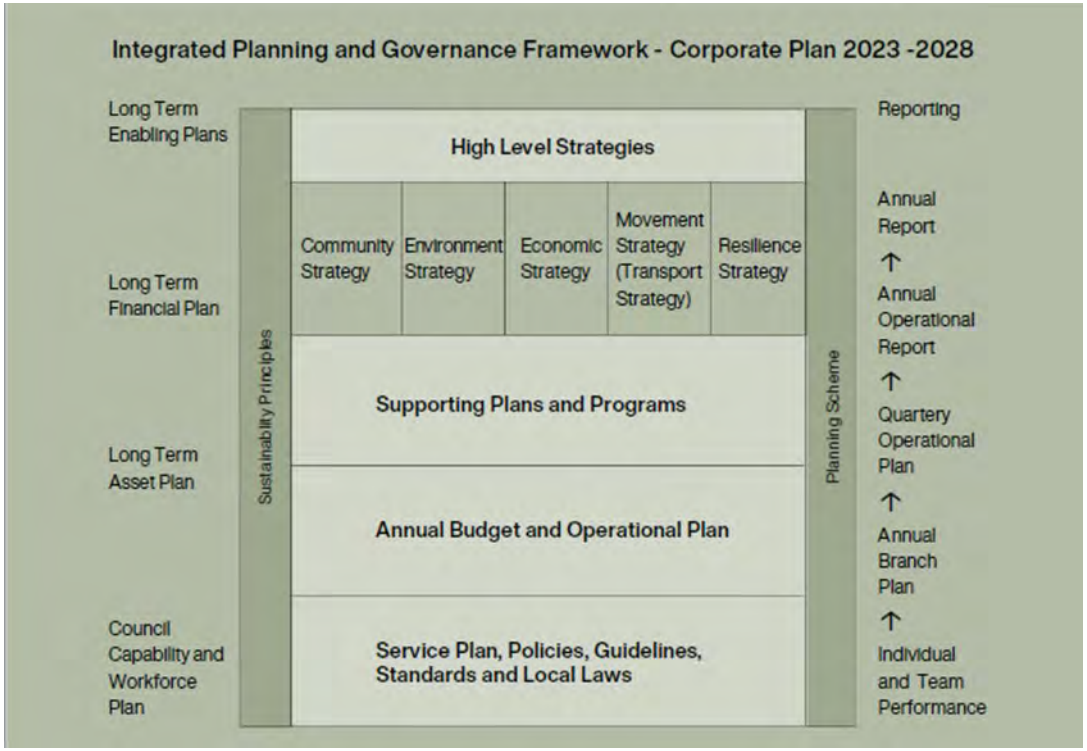
The Noosa River Catchment Management Plan (the plan) sits within the supporting plans and programs section of Council's Integrated Planning and Governance Framework, under Council's Corporate Plan and Environment Strategy.

Council's Corporate Plan includes objectives for Noosa's Environment, to which this plan aligns.

The **Noosa Environment Strategy** provides the overarching strategic direction for the plan. It identifies several high-level strategies, targets, and commitments by Council to the protection and enhancement of Noosa River. This was designed in response to the community's collective desire to maintain the naturalness of open spaces, manage impacts on our natural environment, use natural resources sustainably, and build community awareness about what people can do to maintain a healthy environment. The implementation strategies are embedded within the plan's monitoring and evaluation framework.

In addition to the Noosa Environment Strategy, the plan complements and works alongside many other plans and programs.

The Noosa River Catchment Management Plan builds on this framework and updates the previous Noosa River Plan to summarise the condition and pressures for the catchment and identify a program of targeted management actions, aligned with the South East Queensland Natural Resource Management Plan.



2. Our partners

Our local partners

The Noosa catchment is privileged to be supported by numerous passionate and committed community-based organisations and local citizens. Their local knowledge, expertise and continual contribution to the management and protection of the Noosa River is vital and highly valued.

A range of formal and informal collaboration arrangements exist between Council and these organisations. Many also have their own annual work plans and strategic guiding documents. A few examples of our many local partners include:

- Kabi Kabi People's Aboriginal Corporation
- Noosa and District Landcare (N&DL)
- Noosa Integrated Catchment Association (NICA)
- Noosa Biosphere Reserve Foundation (NBRF)
- Mary River Catchment Coordinating Committee (MRCCC)
- The Nature Conservancy (TNC)
- Noosa Parks Association
- Tourism Noosa
- Environmental Education Hub
- Community and residents' associations

It is acknowledged that all residents and visitors who work, live, and play in the Noosa River catchment have an important role to play. Different user groups will be important community partners for individual actions.

Council's Community and Environment Grants are intended to help organisations and individuals to meet community and environmental needs, build community skills and resilience and develop and maintain community infrastructure. The Grants Program is a key mechanism supporting implementation of this plan.

Our regional and government partners

One of the complexities of managing the Noosa River system is that it is governed by a range of agencies, each with different responsibilities at the national, state, and local level. For catchment management to be effective there needs to be a concerted and coordinated approach, genuine commitment from all stakeholders, and a willingness to invest.

Each agency has a range of regulatory and non-regulatory roles and responsibilities. Many are also important investors in the work that we do. Our key regional and government partners include:

- Healthy, Land and Water (HL&W)
- Department of Environment and Science (DES) & Queensland Parks and Wildlife Service (QPWS)
- Maritime Safety Queensland (MSQ)
- Department of Agriculture and Fisheries (DAF)
- Department of Resources (DoR)
- Department of Regional Development, Manufacturing and Water (DRDMW)
- Local Government Association of Queensland (LGAQ)
- Unitywater
- Seqwater
- Sunshine Coast Council (SCC)
- University of the Sunshine Coast (UniSC)
- The University of Queensland (UQ)

- Griffith University (GU)

A full list of our regional and government partners and relevant management arrangements is provided in Appendix 1. Stakeholders consulted in the development of this plan are referenced in Appendix 3.

The Noosa River catchment

The Noosa River catchment

The Noosa River comprises a rich diversity of cultural and natural assets and intrinsic values that are of local, regional, national, and international significance.

For thousands of years the Noosa River has provided a focal point for Kabi Kabi Traditional Owners. The bounty of the river – fish, oysters, pipis - were traded throughout Indigenous communities and shellfish middens were common on the banks of the lower Noosa River.

Fishing seasons were linked to the flowering seasons of certain plants, fish were speared, and oysters accessed by diving.

As part the world's oldest continuing culture, Kabi Kabi People cared for and nourished the river over countless generations. Song lines and totems have woven the river into the fabric of Kabi Kabi traditions, reinforcing a deep spiritual and cultural connection to protect Sea Country and manage it sustainably and holistically for future generations. Much of the health of the river that we all enjoy and benefit from today can be attributed to their lasting custodianship of the catchment.

When Europeans first visited the area, trade in seafood continued, until the resources were gradually depleted by a burgeoning population. Colonial interest in the Noosa area, which began with timber in the early 1860s, saw the river used as a transport corridor for red cedar logs and kauri pines shipped from Tewantin to Brisbane.

Almost a century later, the Noosa community and Council campaigned to challenge major commercial development and sandmining. Through their success, large tracts of natural area are now conserved across the shire including at Noosa North Shore, Tewantin, and Noosa Heads. Noosa National Park was extended from the headland to reach south to Coolum, and Great Sandy National Park was established in the upper Noosa River.

Protecting natural ecosystems and biodiversity within the catchment that connect to and sustain the river through the Noosa planning scheme, vegetation protection laws, conservation land acquisitions and private land conservation have been key to securing the health of the river. While the river is home to remnant populations of intertidal shellfish, their habitat value has been eroded and restoration and rehabilitation of this ecosystem type, and possibly others is required.

Kabi Kabi People maintain a strong and active role in caring for the Noosa River catchment and have expressed a desire for greater engagement and recognition of their cultural heritage, knowledge of the river system, and aspirations.

The Noosa River catchment

Catchment description

In 2017, Council worked with the Queensland Department of Environment and Science and other stakeholders to develop a map journal summarising information from experts and other data sources to develop a collective understanding of how the Noosa River catchment works.[2]

This was a foundational piece of work which used a 'walking the landscape' process, where experts systematically worked through the catchment in a facilitated workshop, to incorporate diverse knowledge on the landscape features and processes, both natural and human. It is the first step in a five-step method logic to develop a Catchment Action Plan.[3] Noosa Council is now at Step 5 in publishing this Plan with endorsement from collaborators.

The Noosa River catchment is one of two major river systems located in the Noosa Shire and covers 63% of the Noosa Local Government Area. The other 36% comprises the Mary River catchment, with a strategic review of the Mary River catchment recently resulting in an updated Mary River Catchment Strategy.[4]

With its headwaters emerging from the Cooloola Section of the Great Sandy National Park, the catchment encompasses around 854 square kilometres and includes a stream network of approximately 1,505 kilometres.

The Noosa River is one of the few Queensland rivers that receives a continuous year-round freshwater inflow. It has substantial groundwater input from several sources including large sand masses and undulating landscapes and is connected via groundwater through a continuous wetland system which extends up to Tin Can Bay.

The narrow freshwaters of the Everglades transition to brackish and saltwater from the northern entrance of Lake Cootharaba, fed by Teewah Creek in the north, and the rural hinterland creeks of Kin Kin, Cooloothin and Ringtail in the west. Noosa Shire's district also includes tannin-stanned coastal creeks that flow directly to the sea.

Over geological time scales, the estuary has changed significantly. Noosa has a broad floodplain, however, since European settlement substantial hardening of the channel and development of riparian edges in the lower Noosa reaches has meant the natural migration of lake and river have been artificially constricted.

On its journey to the sea, the Noosa River passes through several shallow coastal lakes. Lakes Cootharaba and Cooroibah are the largest of these, providing large storage areas which slow down the flow of flood water on its way to the river mouth.[5]

[2] Department of Environment and Science, Queensland (2021) Noosa Catchment Story. Walking the Landscape. WetlandsInfo.

[3] Department of Environment and Science, Queensland (2021) Catchment Action Plan/Resilient Rivers Initiative, WetlandInfo.

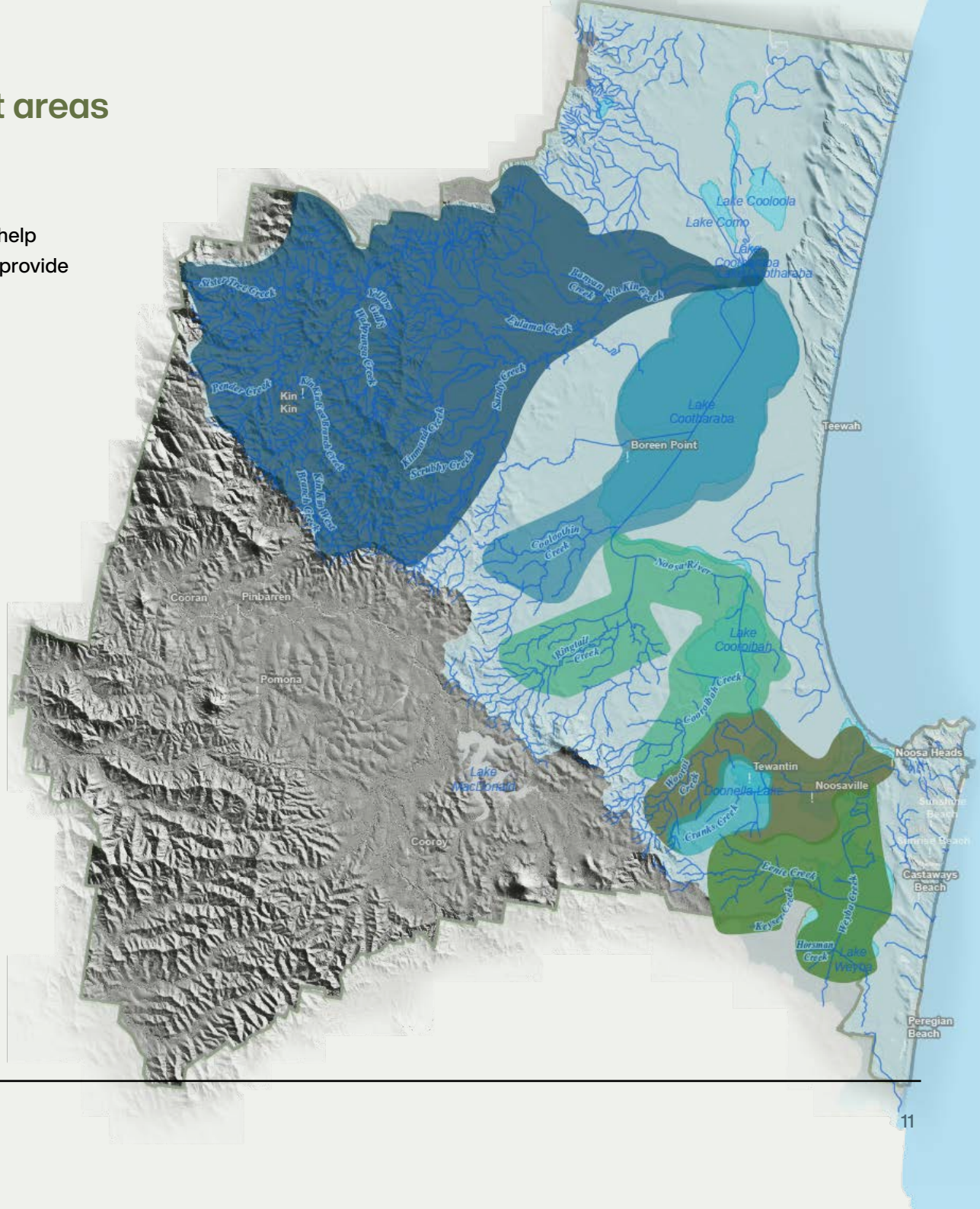
[4] Mary River Catchment Strategy Review 2022. Available from: https://mrccc.org.au/.

[5] Noosa Council (2016) Noosa Shire Flood Management Plan.

Noosa River catchment management areas

Noosa River catchment management areas have been identified to help distinguish management focuses for sections of the catchment and provide further context and rationale for prioritising interventions.

- Headwaters
- Lake Cootharaba
- Lake Cooroibah
- Tewantin to Noosa Heads
- Lake Doonella
- Lake Weyba



Noosa River catchment management areas

Steep headwaters

Steep headwaters comprise mostly confined drainage lines and waterways that are intermittent in nature, and are located around the Wahpunga Range, Mount Pinbarren, Black Mountain and Cooroy.

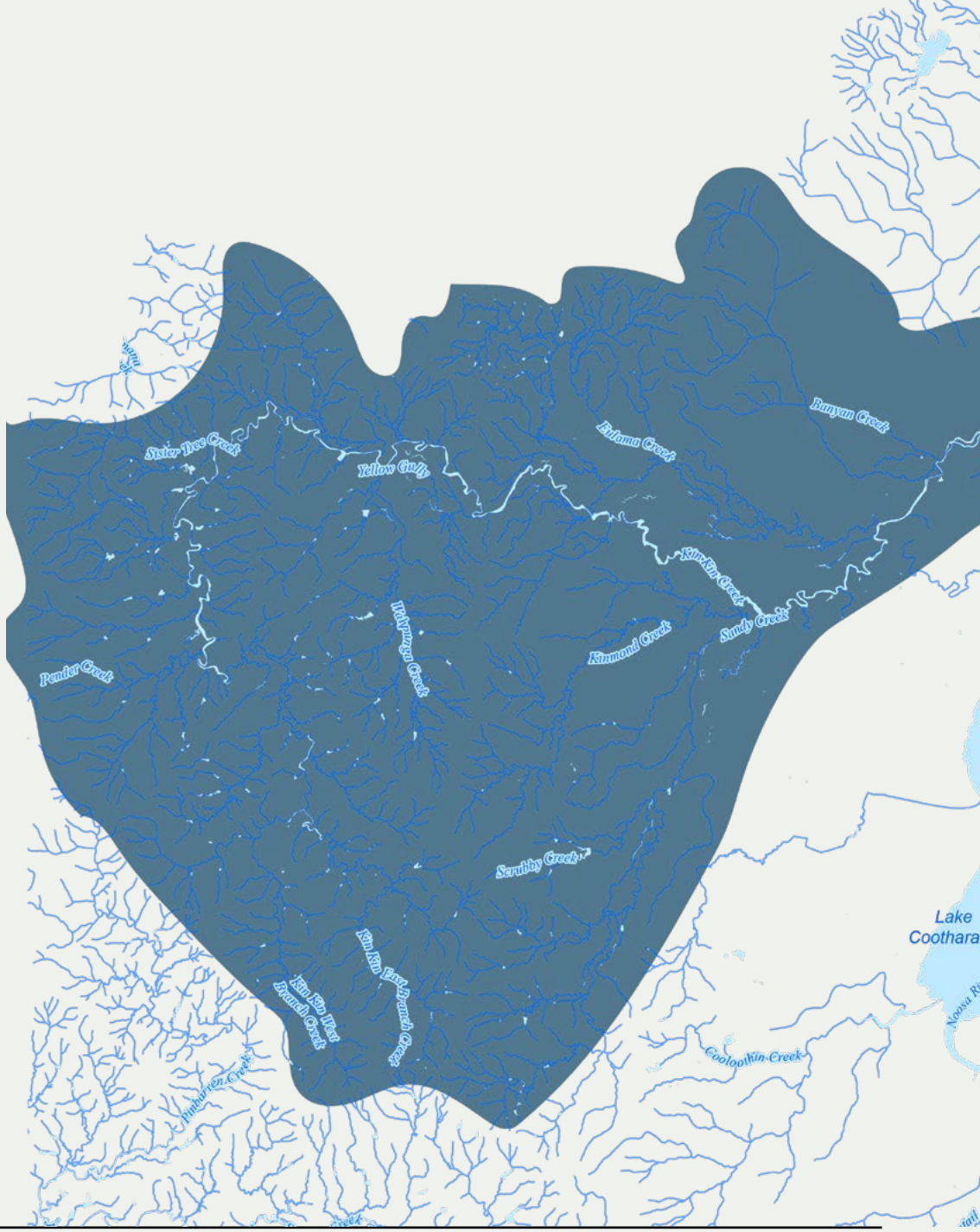
Mass failures (landslips) occurred in the 2011, 2013 and 2022 floods, and when these occur in the steep headwater areas, sediment, and other debris flow down the hillside into the waterway networks below impacting water quality, aquatic habitats, and fisheries. It is therefore imperative land above the 80-90 metre contour is managed sensitively to maintain deep rooted trees and shrubs to ensure the integrity of the fragile steep headwaters.

Kin Kin Creek, to the north-west of the lake is a deep water creek, wide at the entrance to the lake with substantial water flow and influence on the Noosa River. Ongoing delivery of the Keeping it in Kin Kin project will help reduce declines in water quality due to high sediment loads delivered from the upper catchment.

Council has provided support through grants to the Keeping It In Kin Kin project delivered by Noosa & District Landcare, aimed at reducing the mobilisation of soil in the upper Kin Kin Creek catchment and reducing fine sediment loads from entering Lake Cootharaba.

To date, 4.59km of riparian vegetation has been restored across a total area of 10.67 hectares, establishing 19,371 plants, installing cattle exclusion fencing across 2.48km, and treating more than 10 hectares of Cats Claw Creeper and Madeira Vine.

In September 2021, the project received a Michel Batisse Award for its integrated and collaborative approach to achieving healthy land, soil and water management and biodiversity conservation.

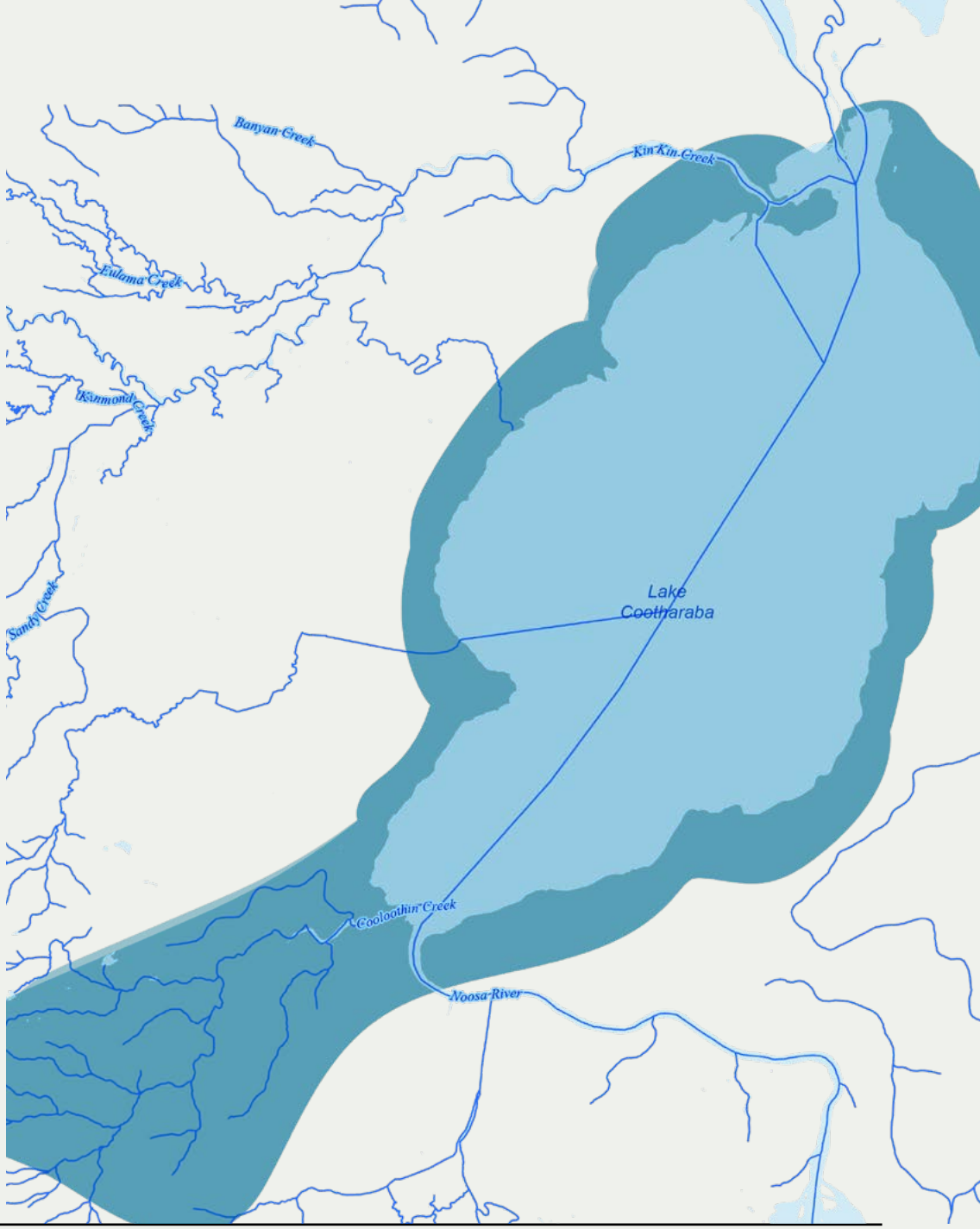


Noosa River catchment management areas

Lake Cootharaba

This lake is an extensive water body mostly bordered by National Park or other public lands and its riparian vegetation is predominantly intact. The ongoing restoration of foreshore vegetation at the lake's downstream junction with the Noosa River, along with the headwaters of Cooloothin Creek, which flows into Ringtail Creek adjoining the south-western corner of the lake, will assist in achieving the desired outcomes for aquatic and terrestrial ecosystem health, water quality and visual amenity.

Onsite effluent disposal impacts from the lakeside village of Boreen Point and surrounds is an important management priority for the catchment.



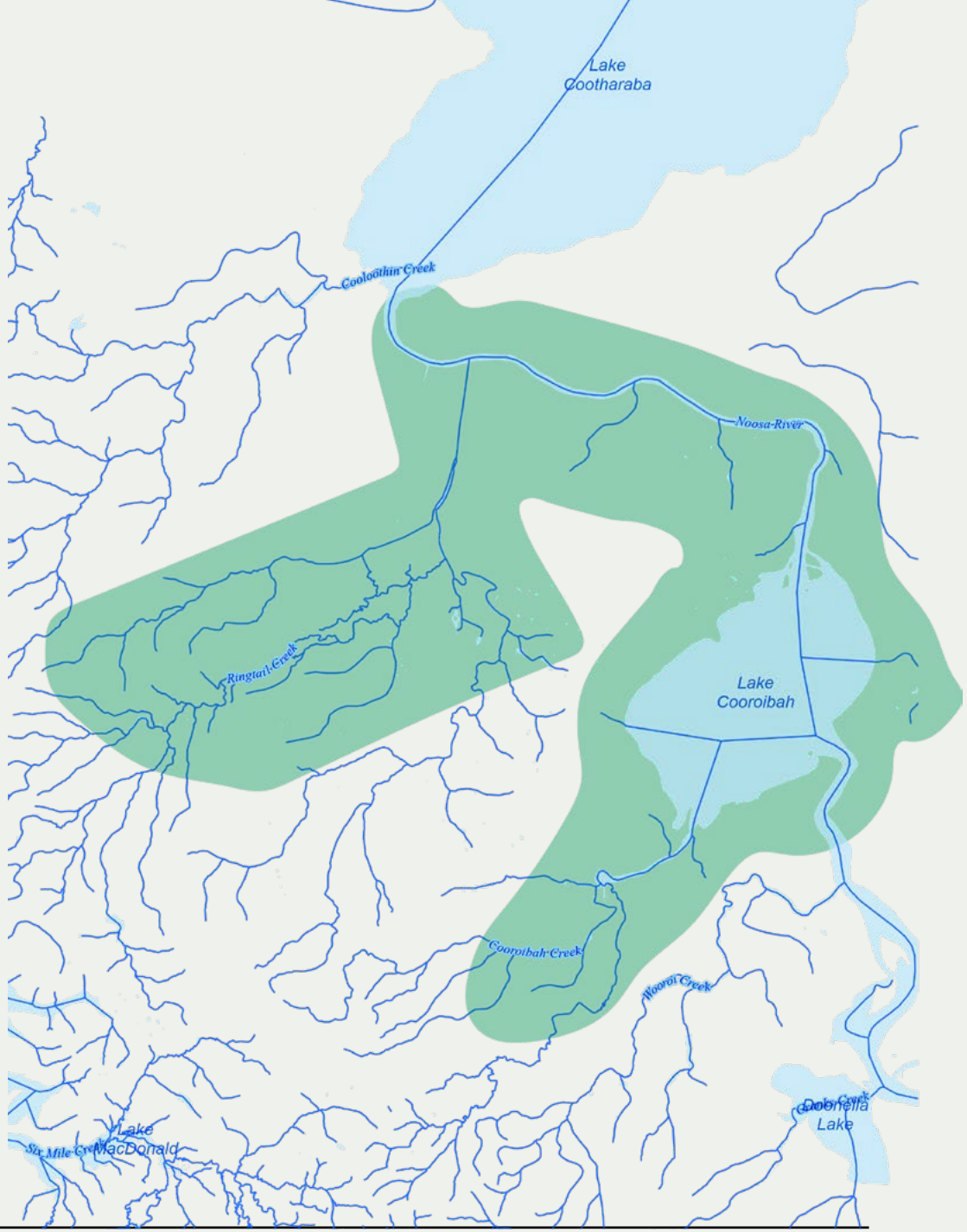
Noosa River catchment management areas

Downstream to Tewantin

Downstream of Lake Cootharaba to Tewantin includes Lake Cooroibah, Johns Landing Nature Refuge, and a ski run area.

This section of the river is a natural river corridor in largely conservation tenure, with estuarine waters and wetland vegetation, characterised by mangroves and tidal flats.

Restoration of vegetation on the inland side, after past clearing of private lands, will deliver improved bank stability and riparian habitat, and enhanced scenic amenity including adequate vistas, tranquil natural settings, parklands, and river sections with moderate or low levels of built shoreline infrastructure. The restriction of boat speeds and exclusion of Personal Water Craft (e.g. jetskis) through this section of the river retains amenity, delivers environmental benefits and helps mitigate bank erosion.



Noosa River catchment management areas

Tewantin to Noosa Heads

As the river widens from Lake Cooroibah to Lake Doonella, the character of the riverscape progressively changes, with increasing residential, tourist and commercial development.

This section of the river begins where Wooroi Creek enters the river at the North Shore ferry crossing and includes Makepeace, Sheep and Goat islands.

Further downstream, the Noosaville reach has been a strong focus for Maritime Safety Queensland where speed and anchoring restrictions are being considered to improve visual amenity and safety.

This part of the estuary is a focal point for recreation and visitor activities and is one of the busiest waterways in South East Queensland during holiday periods, due to its popularity, relatively small scale, and limited landside parking associated with public and commercial recreational infrastructure.

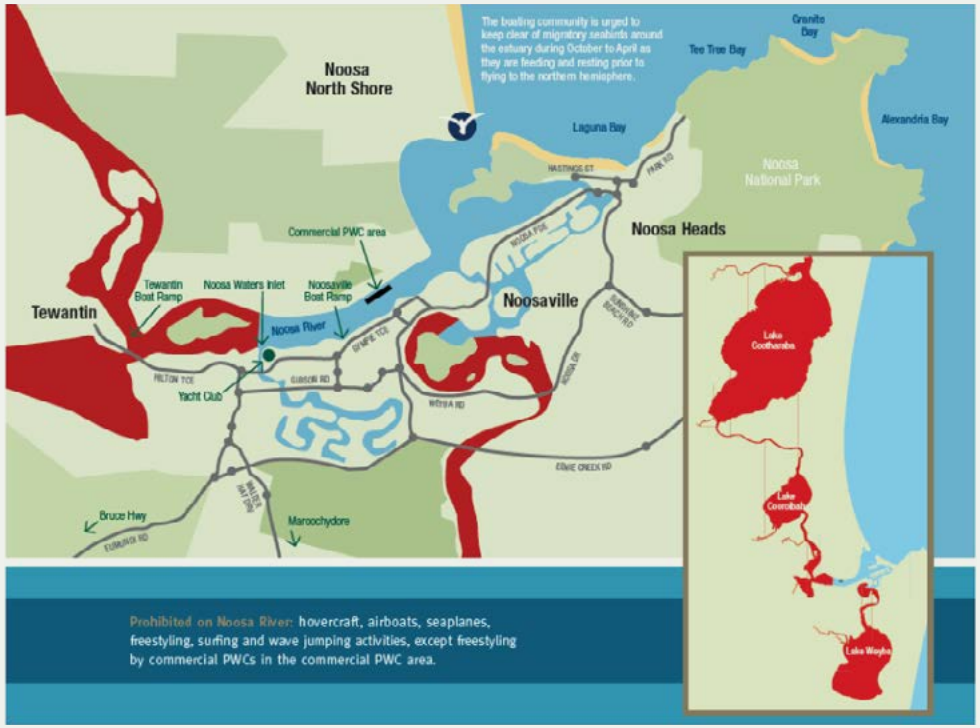
This often results in conflicting uses where commercial operators, powered and non-powered water sports enthusiasts, and swimmers compete for limited space. The area also includes the Noosa North Shore ferry, a ski run area, and a commercial jet ski zone.

Noosa River catchment management areas

Tewantin to Noosa Heads

Throughout the entire management area, nature-based solutions for infrastructure, and management of stormwater and other sources of pollution are a priority for investment.

Many species of migratory birds shelter in the estuary, including a variety of terns, sandpipers and plovers. The Noosa North Shore therefore includes an exclusion zone, where all vehicles, domestic animals and horses are excluded.



Noosa River Personal Watercraft areas and the Noosa River Marine Zone

Noosa River catchment management areas

Lake Doonella

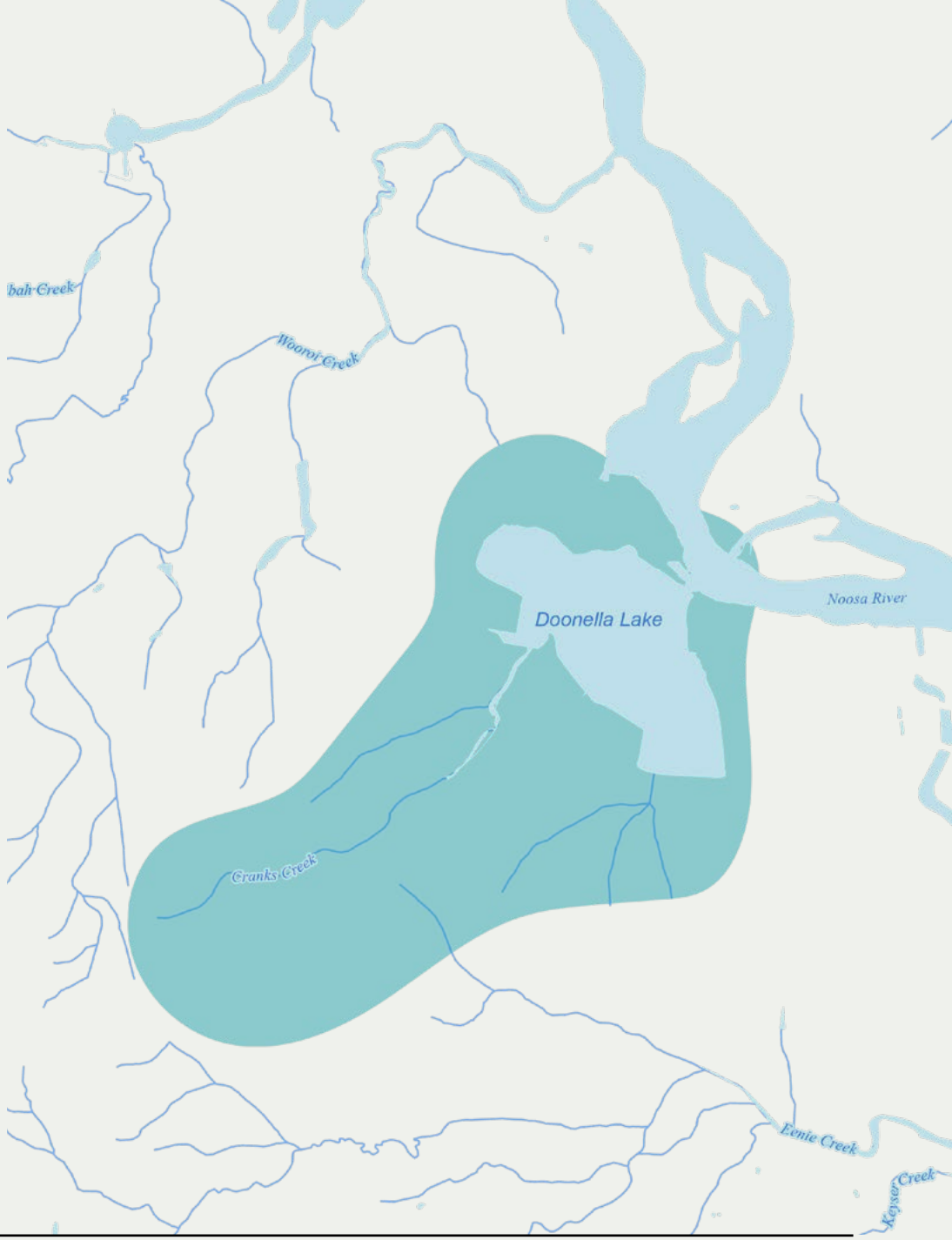
Lake Doonella's historical entrance was low-lying, and its substantial riparian edge would have allowed overflow during floods allowing sediments to deposit on the floodplain rather than remaining in the channel.

Later, land was reclaimed to reduce the bridge length from Tewantin to Noosaville, artificially constraining the lake's entrance. In the mid-70s export of sediment into the lake from both upstream and the entrance from the main river channel now means there is insufficient flow at the entrance to allow sediment to exit the shallow basin.

This is a shallow tidal lake with a mostly natural shoreline fringed by mangroves and Melaleuca woodland, as well as housing on its northern side.

The lake is reserved for quiet low impact nature-based recreation to maintain the ecological, scenic and fisheries values. The limited channels and shallow waters restrict boat access to small craft and paddling.

Management of stormwater and other sources of pollution and ongoing restoration of foreshore vegetation around the lake will help protect aquatic and terrestrial ecosystem health and water quality.



Noosa River catchment management areas

Lake Weyba

Lake Weyba is a shallow tidal lake within a substantially natural environment with vegetated foreshores and extensive National Park areas adjoining the eastern shores and north-west section.

Located south of the Noosa River estuary, its tidal connection to the river is through Weyba Creek, a shallow meandering estuarine channel flanked by wetland and seagrass beds. The catchment draining to Lake Weyba includes Noosa's industrial estate as well as overland and groundwater flows from Noosa's Municipal Landfill.

The shallowness of the lake and creek, as well as the vulnerability of its environmental values, limit the ability of medium sized craft to venture onto its waters. In particular, the seagrass beds are easily disturbed by boat traffic.

Land adjoining the southern and south-western section of the lake is situated in the Sunshine Coast local government area and has been developed as low intensity rural residential development. Urban development also exists at the northern end of Lake Weyba as well as fronting Weyba Creek.

The retention of a broad natural riparian edge and large vegetated areas are critical for ecosystem health and the filtration of run-off the lake and creek system.

Ecology and biodiversity

Approximately 42% of Noosa Shire is protected for conservation, compared to just 9% for Queensland. Large areas of undisturbed bushland adjoining the headwaters of the river are protected as National Park or State Forest, and over 100 Council-managed Bushland Conservation Reserves are located throughout the catchment.

Stream bank vegetation in the catchment remains good (89% cover), and wetland extent remains excellent (88% cover) in the freshwater reaches. The extent of wetland habitat in the estuary also remains excellent, with 90% of mangroves and saltmarshes remaining.

The upper reaches of the river are near pristine and unmodified, and this natural ecology and character changes progressively closer to the river mouth. The river foreshores are mostly developed through the lower reaches around Tewantin, Noosaville, and Noosa Heads, with some areas of Noosa North Shore and around the lakes still maintaining a natural riparian edge.

Significant parts of the catchment's freshwaters and estuary are designated 'high ecological value' under the Environmental Protection (Water) Policy 2009. The management intent for these waters is to maintain them as undeveloped.

The Noosa River wetlands and Lake Weyba are listed in the Wetlands of National Importance Directory and constitute a groundwater-fed connected system which provides discharge to swamps, springs, creeks, lakes, the estuary, and coastal environment.

These wetlands play an important hydrological and ecological role including:

- Groundwater recharge and discharge.
- Surface water infiltration.
- Flood control through short-term storage of floodwaters.
- Habitat for populations of native plants and animals, including threatened species.
- Habitats for animals at vulnerable stages in their life cycles.
- Refuge for animals during drought conditions which are growing in frequency and intensity due to climate change.
- Refuge for biodiversity adapting to sea level rise.

This spectacular and extensive system of freshwater brackish and saline lakes, marshes, heathlands, and estuary is one of few such complex wetland systems on the eastern-Australian seaboard.

There is 6,075ha of declared *Fish Habitat Areas* (FHAs) within the Noosa Shire. Queensland's FHA networks are protected against physical disturbance from coastal development.

Most of Noosa's FHAs are classified 'management A' (of the highest value) and are vital to the commercial and recreational fisheries of the region. These areas historically include extensive seagrass and oyster beds, although this has substantially declined. The intertidal zone of the more vegetated riverbanks facilitate the growth of mangroves forests which feature all seven of the Sunshine Coast's known mangrove species, and saltmarsh areas, and are also home to the Water Mouse (*Xeromys myoides*), whose protection is listed as a Matter of National Environmental Significance.

The Noosa River is unique among Queensland estuaries in that it transitions from freshwater to hypersaline waters in the lakes. The freshwater lowlands provide habitat for endangered freshwater fish, such

as the Honey Blue-eye (*Pseudomugil mellis*) and Oxleyan Pygmy Perch (*Nannoperca oxleyana*), while the estuary harbours Australian bass, bream, flathead, dart, garfish, jewfish, mangrove jack, sea mullet, tailor and whiting, as well as mud and sand crabs, and many species of prawns.

Surveys of migratory shorebirds have revealed the Noosa River mouth, sandbanks, and adjoining Noosa North Shore as an area of 'National and International Importance' for shorebird conservation in Australia. More than 50 species of shorebirds have been recorded, including many species protected under international agreements.

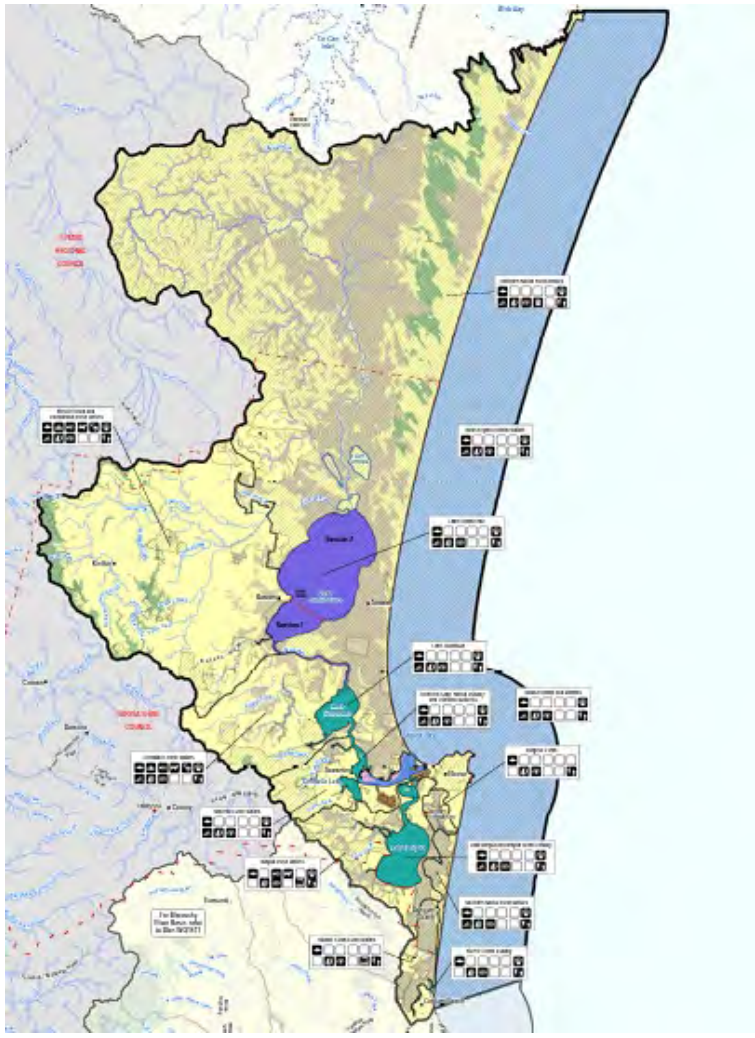
Water quality

Since 2001, Noosa Council has been part of one of Australia's most comprehensive freshwater, estuarine and marine monitoring programs, delivered by the Department of Environment and Science.

Southeast Queensland's Natural Resource Management agency, Healthy Land & Water, uses the *Ecosystem Health Monitoring Program* data to provide an annual health assessment of the region's major catchments, estuaries, and Moreton Bay. It delivers a Report Card rating from A (excellent) to F (poor) for each river catchment, based on the monitoring results.

For 18 years, Noosa's Report Card consistently achieved an A- (excellent condition) rating, and the best in the region, until for the first time in 2022 following significant flooding events depositing large amounts of sediment, when a B (good condition) was reported.

The monitoring also picks up long-term trends in pollutant loads in Noosa's waterways which have increased due to an increase in sediment (mud) and nutrients generated from the land. The data also shows increased nutrient and decreased water clarity throughout the river reaches downstream of Lake Cootharaba, including Lake Cooroibah and the lower Noosa estuary.

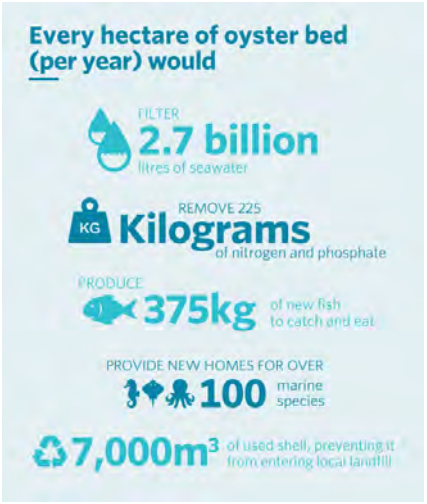


Noosa River Environmental Values and Water Quality Objectives (2019)

The rocky foundations for oyster reef ecosystems have been laid at four restoration sites in the Noosa River estuary – Tewantin, Goat Island, and two sites in lower Weyba Creek.

Collectively, these 30 reef patches are known as the Huon Mundy Reefs. They have been designed to include characteristics of historic oyster reefs while fitting in with the modern environmental condition and wide range of human uses of the Noosa River today.

Bringing back Australia's most threatened marine ecosystem, the native oyster reef reintroduces structurally complex habitat for fish and invertebrates, a diverse range of food, improved local fish populations, better water clarity and an overall increase in biodiversity. All of these benefits improve the resilience of the river system to threats such as climate change.



4. How the community values the Noosa River catchment

The residential population of the Noosa Shire is just over 57,000 people, however during peak holiday periods this figure can increase markedly with overnight visitors and day visitors. This seasonal influx results in high volumes of boat traffic on the river and high numbers of people using foreshore areas along the lower reaches of the estuary.

The more developed areas of the river provide a livelihood for many, including commercial fishing and tourism. Commercial jetty operations supply a diverse range of motorised and non-motorised watercraft for ecotours and hire, while the popularity of recreational fishing throughout the estuary and offshore supports local businesses. These industries rely on a healthy river system and collectively provide residents and visitors with a host of recreational opportunities and freshly caught seafood.

A healthy and functioning Noosa River system provides a wide range of values for cultural, social, and economic benefits to the community. These are sometimes referred to as ecosystem services, and more recently, nature's contributions to people.[6] Identifying and understanding the goods and services that an ecosystem generates is important to help decision-makers:

- understand the value of benefits provided by an ecosystem to human health and wellbeing
- understand how people use an ecosystem
- understand what is important to people, to serve as a framework for communicating an environment's importance to the public
- help mitigate or manage the impacts of changes in services.[7]

Protecting and proactively managing these services and values provides the focus for the sustainable management of the Noosa River catchment.

Since 2001, strategies and plans have been developed to help protect the Noosa River catchment and the river system.[8][9][10] This has involved extensive stakeholder and community consultation including workshops, online surveys, multi-agency and stakeholder groups, and individual consultation. Values highlighted over this time are outlined below.

Connection to Country

It is critical that the Indigenous historical, cultural, environmental and conservation heritage of the Noosa River system is protected, respected, and enhanced. This will be achieved by:

- ensuring Kabi Kabi are key partners in implementation of this plan, as well as monitoring and evaluation efforts
- providing access to Kabi Kabi to fulfil on Country cultural obligations and to map, record and store information and stories of sacred places and areas of high cultural significance
- providing protection to cultural heritage values to a level that sustains cultural and spiritual obligations

[6] Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (2019). Summary for Policymakers of the IPBES Global Assessment Report on Biodiversity and Ecosystem Services.
[7] Department of Environment and Science (2022). Identify existing and potential intrinsic values and ecosystem services (2022).
[8] Noosa Integrated Catchment Association (2001). Noosa Integrated Catchment Management Strategy.
[9] Noosa Council (2004) Noosa River Plan.
[10] Noosa Council (2019) Noosa River Plan (draft).

- continuing and extending community, indigenous and stakeholder consultation
- all sharing responsibility to respect, protect and learn from cultural heritage.

Caring for Country

The Kabi Kabi Healthy Country Plan 2023-2033 sets out a strategic approach to Country management in preparation for native title determination (Kabi Kabi Healthy Country Plan 2023-33, shared with permission).[11]

Council supports Kabi Kabi aspirations to play a greater role in caring for Country including efforts to establish a Kabi Kabi Land and Sea Ranger program. Council considers this program as a critical element to protecting and enhancing the health of, and restoring our connection to the river, and in the monitoring and evaluation of this plan.

Water quality

The community values a river that is clean enough to swim in, boat in, that is visually pleasing, low in suspended sediments and organic and inorganic pollutants, and is home to a diversity of life.

Inclusive decision making

The incredibly rich cultural significance to the Kabi Kabi and other Indigenous people, combined with the complex management arrangements and involvement of many community-based non-government and special interest groups reiterates the importance of enabling genuine shared and inclusive decision-making. The local and regional community strongly value the opportunity to be involved and participate in addressing the often sensitive and complex management of the Noosa River.

Boating and recreational fishing

Boating and recreational fishing is extremely popular along the 70km of waterway and wetland. In 2022 there were more than 4,700 boats registered in the Noosa Shire.[12] Key species targeted by recreational fishers include bream, flathead, tailor, whiting and prawns.[13]

Nature-based recreation

The protected and open space areas of the Noosa catchment provide recreational activities such as walking, bike riding and bird watching while the waterways of the catchment support swimming, fishing, motor boating, paddling, surfing, and many other water-based activities.[14] These activities provide substantial social and health benefits.

Tourism

Noosa welcomes more than 2 million overnight and daytrip visitors per annum,[15] who contribute around $1.7 billion annually to the economy and employs approximately 4,000 people. Noosa is one of Australia's premier holiday

[11] Kabi Kabi Healthy Country Plan 2023-2033 (shared, with permission).
[12] Queensland Department of Transport and Main Roads (2022).
[13] Noosa River System - Assessment of the status and options for recovery of prawns & estuarine biodiversity in the Noosa River (2019).
[14] Department of Environment and Science, Queensland (2021) Noosa Catchment Story. Walking the Landscape. WetlandsInfo.
[15] Tourism Research Australia (TRA) and Economy.ID 2022

destinations, with a focus on sectors including accommodation, experiences/adventure, wedding, food, surfing, and sustainable tourism across the region.[16] The tourism value is set to increase with the Brisbane 2032 Olympic Games bringing more visitors to the region.

Lifestyle and natural amenity

Elements of, and protection of the natural environment were considered the strongest contributors to lifestyle in Noosa Council's first Liveability Survey,[17] and the Noosa River was ranked as Noosa's second top attraction by visitors, after Noosa National Park. Amenity-led migration has been influential in the Noosa Shire since the 1980s, and key attractors include beautiful vistas, tranquil natural settings, parklands, and river sections with moderate or low levels of shoreline infrastructure. The natural character and amenity of Noosa and its river has been a key driver for visitation and in-migration for decades. It contributes to Noosa's green image and unique brand providing a drawcard for new business, investment, and new residents. Local residents specifically value the connection to the land, scenic amenity, the peace and quiet - escape from hustle and bustle, and the sense of place and close community.

Agriculture, primary production, and rural tourism

Agriculture is another attraction for living in the area.[18] Its future and productivity requires sustainable land management. The hinterland local freshwater creeks and wetlands provide water for stock and crop irrigation and play a pivotal role in a productive catchment. The waterways of the catchment also support commercial fishing and ecotourism.

Public safety & river carrying capacity

Public safety for the Noosa River includes safe access to public shorelines and the ability to undertake in-water river activities in a low-risk environment.

This is a key community concern.

Managing the growing diversity of uses on and around the river that are competing for limited space has required a careful balancing of values that considers public safety and other factors such as user satisfaction, environmental protection, economy, flood control and climate change. Since the early beginnings of Noosa River planning, this has called for a management approach that looks at these values multi-dimensionally and recognises there is an ultimate carrying capacity of the river system that needs to be planned and monitored.

[16] Destination Tourism Noosa Plan 2021-2022.
[17] Noosa Liveability Study Executive Summary (2022).
[18] County Noosa (2019) Rural Enterprise Program Final Report.

5. Threats to protecting catchment values and ecosystem services

Key threats to the Noosa River catchment were identified by scientific experts and land managers and endorsed by the community via feedback during the drafting of the 2019 Noosa River Plan.

In 2023 Council again sought expert advice on the prioritisation of actions based on the values and benefits, and a rapid, high-level assessment of the threats and proposed management actions was undertaken in the development of this plan and is presented in Appendix 2.

This provided a starting point for further detailed analysis and a full review of the latest literature on each threat at an appropriate scale.

Lack of a sustainable and coordinated approach for river planning

The number of State Government agencies and authorities involved in management of the Noosa River Catchment outlined in Appendix 1 highlight the complexity of undertaking a sustainable and coordinated approach, requiring a detailed understanding of a broad suite of legislation.

Without a formalised approach to integrated catchment management, investment maybe limited and ad hoc, and projects and programs may not reach the scale or impact required to achieve the management objectives.

For this reason, development of an integrated and collaborative governance arrangement for the Noosa River catchment is included as a very high priority in the Implementation Actions.

Climate change

The Australian Government's recent State of the Environment Report 2021 found that impacts of climate-related pressures on the coastal environment are fast outweighing impacts of population and industry and are expected to worsen in the future.

While sea level rise is likely to have the most profound impacts on our river system, riparian and wetland habitats in the catchment are also expected to experience more frequent and intense disturbance during heavier rainfall events, and more extensive and destructive flooding such as loss of soil and nutrients from riparian zones and wetland silting.

These areas will also become more susceptible to weed incursions. During extended dry conditions, and periods of extreme heat, environmental flows and water quality are likely to decline and affect aquatic life and recreational activities.

Other documented impacts include:

- Increased sea and river temperatures that have the capacity to:
    - Increase the acidity of the water, impacting on some species.
    - Disrupt the breeding cycles of some species.
    - Cause harmful algal blooms.
    - Cause tropical species to move further south, with associated environmental and social impacts.
    - Cause deoxygenation of waters, leading to more frequent fish kills.
- Sea level rise, which:

    - increases the risk of inundation of coastal communities, wetlands and infrastructure, and erosion of riverbanks.
    - increases saline intrusion and inundation into the river and coastal freshwater resources, which can impact irrigation for agriculture, parks and gardens and groundwater dependent ecosystems.
- More variable rainfall and evapotranspiration, which can change freshwater recharge and impact the ability of biodiversity to adapt.
- More frequent and intense bushfires which can impact wetlands and coastal heath, and lead to increased sedimentation and ash washing into the river, further reducing water quality.
- More frequent and severe storm events can also:
    - Increase flow of pollutants and contaminants into the river and wetlands.
    - Increase erosion on stream banks due to storm surge and wave action.
    - Increase coastal flooding.
    - Reduce water quality through sedimentation and eutrophication.

The Implementation Actions set out a range of initiatives to build the Noosa River catchment's resilience to climate change.

Erosion and sediment

The hinterland sub-catchments within the broader Noosa River catchment have the potential to flash flood, delivering sediment-laden runoff to waterways and wetlands when it rains, especially in former timbered areas which have typically been replaced by agricultural lands and road networks.

This transition has involved broad clearing across the landscape (including hill slopes) for crop growing and animal raising and has made these areas vulnerable to soil loss. The runoff can contain elevated quantities of sediment, nutrients, and chemical contaminants such as fertilisers and pesticides, and microbial contaminants such as animal faeces, impacting aquatic health.

The Kin Kin sub-catchment is the largest area of modified landscape in the Noosa catchment and a major source of sediment entering waterways.

In 2017 Council commissioned a condition assessment of Shire's waterways which included an assessment of their recovery potential as a result of rehabilitation efforts. The condition assessment demonstrated steep headwaters in Noosa consistently occur at the 80-90 metre contour, and above this contour mass failures (landslips) have occurred in large flood events. Fine clay sediments of the hinterland slopes, floodplains and creekbanks contribute significant sediment load to our waterways particularly after events, remaining suspended for long durations.

In 2018 a study of benthic biodiversity in the Noosa River was commissioned to compare results from an earlier study in 1998. The sampling results showed an overall decline of 30-65% in the number of benthic fauna sampled, compared with 1998.[19] The study's authors suggested the primary cause for the decline is the amount of sediment in the river and its regular resuspension.

[19] Skilleter, Moffitt, Loneragan (2019). Assessment of the status and options for recovery of prawns and estuarine biodiversity in the Noosa River.

Similarly, a study of the current and historical distribution of seagrass in the Noosa estuary commissioned in 2021 revealed an estimated 83% of the total area of seagrass had been lost between 1987 and 2020.[20] The primary cause of this decline was identified as mobilisation of sediment particularly during flooding events which then reduce light penetration in shallow areas of the river system.

Council continues to work with research partners to determine appropriate responses to these threats.

Rural dirt roads

Water quality results from across the Shire are revealing rural roads such as Sheppersons Lane and Wahpunga Lane as major sources of pollution.

A study in the West Tarago catchment, ~85km east of Melbourne, Victoria demonstrated unsealed roads contribute 20 to 60 times more sediment than undisturbed forest and about 10 times more sediment than harvested areas on a per unit area basis.[21] Incorporating stormwater quality improvement measures into road design practices is therefore a high priority to protect aquatic ecosystems.

Degraded wetlands

Riparian areas and wetlands are important to water quality and the overall health of the river catchment due to their vital hydrological and ecological roles in filtering surface runoff, regulating water temperatures and providing habitat for wildlife and fish. These habitats can be impacted by weeds and pest animals, as well as human uses including vegetation clearing, overgrazing and urban development, and in some instances, recreational use.

When degraded riparian areas in the estuary are coupled with high levels of boat wash, accelerated streambank erosion occurs which further diminishes the environmental services these habitats provide.

Several key initiatives are underway to help conserve riparian areas and wetlands on public and private lands and reduce sedimentation including:

- Environment Levy land acquisition program.
- Land for Wildlife.
- Voluntary Conservation Agreements.
- Bushland Conservation Reserve management.
- Community Bushland Care Program.
- The Keeping it in Kin Kin partner Project.
- Noosa Living Foreshores Project.
- Nature-based Solutions for Flood Resilience Project.
- Coastal Wetlands Restoration Project.
- The Noosa Planning Scheme.
- Council's Encroachment Policy.

The 2017 Waterways Assessment study completed by Noosa & District Landcare, the Mary River Catchment Coordinating Committee and Healthy Land & Water provides an excellent assessment of Noosa waterways to inform the Noosa River Catchment Management Plan and rehabilitation strategies. Council sees advancing riparian restoration and

[20] Ecological Service Professionals (2021). Current and historical distribution of seagrass in the Noosa Estuary.

[21] Motha, J.A., Wallbrink, P.J., Hairsine, P.B. and Grayson, R.B., 2003. Determining the sources of suspended sediment in a forested catchment in southeastern Australia. Water resources research, 39(3).

investment opportunities with local and regional partners as a key priority.[22]

Urban pollution

Urban runoff is a mixture of treated wastewater and treated and untreated stormwater. It is a major source of pollution delivered to waterways via the stormwater network and contains sediments, nutrients, chemical and microbial contaminants, and gross pollutants such as litter.

In addition to high concentrations of people using the urban area, natural ground surface areas are converted to hardstand areas increasing the speed of runoff and preventing the natural cycling of nutrients, which instead flow in an elevated and unprocessed manner directly to waterways during rain events. Faster runoff increases stream bank erosion and affects the breeding activities of aquatic flora and fauna.

In addition, other activities throughout urban areas pose the risk of chemicals being released into stormwater systems. These range from high intensity industrial or commercial land uses that require an environmental licence to operate, to household grade release of chemicals or pool water to stormwater systems.

Water Sensitive Urban Design (WSUD) features include water quality treatment devices to reduce the amount of pollutants, and detention devices such as rainwater gardens, play a key role in reducing stormwater velocity and pollutants entering waterways.

In new residential developments, bioretention basins, Gross Pollutant Traps, sediment basins and litter traps are common WSUD stormwater quality treatment. Bioretention basins are a hybrid engineered and vegetated filtration device used to remove sediment, nutrients, and litter from urban stormwater runoff.

Council has a statutory management responsibility under the Environment Protection Act to ensure the quality of stormwater leaving new residential development achieves the State Planning Policy's pollution reduction targets and in existing residential developments, water pollutant loads to receiving waters are required to meet defined levels.

Schedule 6 of the Noosa Plan 2020 covers subtropical and sustainable design principles and provides further guidance to ensure that development within Noosa Shire incorporates water sensitive urban design principles to manage stormwater.

Council is also exploring the use of Healthy Land & Water's Water by Design program and Monash University's Water Sensitive Cities framework.

In 2016 an initial stormwater pollution investigation of the Noosaville industrial estate revealed pollution had occurred and impacted the local waterway. A further comprehensive investigation of 132 businesses across the Shire also revealed a high level of noncompliance.

Council has been working in partnership with local businesses to provide information on environmental compliance and share knowledge. However, a formalised risk-based annual inspection program of these non-Environmental Authority licensed industrial operations is required to

[22] Noosa Shire – Waterways Assessment (2017).

monitor activities for the protection of Noosa's waterways under the Environment Protection Act.

Commercial operators and individuals can also reduce their contribution to polluting stormwater by avoiding the following practices:

- Littering
- Building sites without erosion controls in place (sediment runoff when it rains).
- Back washing swimming pools and spas with sand and/or dematiaceous earth filter to the stormwater (releases of pathogens/chemicals).
- Release of runoff of paint/cleaning substances from cleaning and painting roofs.
- Release of runoff of hydrocarbons/cleaning substances from car washing.
- Disposing of left over paint and chemicals into the stormwater system.
- Applying lawn chemicals.
- Changing motor oil on driveways.
- Disposing of pet waste into, or nearby waterways or the stormwater network.
- Illegal dumping of rubbish and recyclables.

In response to the Queensland State Government single-use plastics ban and the Five-year roadmap for action on single-use plastic items introduced in 2021, hospitality businesses have switched to sustainable takeaway packaging alternatives. Audits conducted in popular precincts during 2023 by Noosa Council's Waste Branch revealed commercially compostable takeaway packaging now accounts for an estimated 75% of waste collected from public bins in precinct locations throughout the Shire. While sustainable alternatives have been successfully adapted, litter behaviour has not changed – community led clean-ups are still finding straws, cutlery and other takeaway packaging along the foreshore and waterways however, instead of these items consisting of plastics (eventually producing micro and nano plastics), they are now consisting of wood, paper, and bio plastics.

Litter in and around Noosa's waterway is common. Hotspots of distributed litter include stormwater outlets, the river foreshores, popular fishing locations, islands in the river and along the beaches. A large portion of litter collected in these areas is plastic and can be traced back to incorrect disposal of rubbish in urban areas upstream. Litter most commonly finds its way into the river through direct deposition or through stormwater drains that are distributed throughout urban areas. Council seeks to implement a source reduction program.

An amazing cross-section of dedicated volunteers of all ages, act individually or together for coordinated river and beach clean-ups throughout the year.

NICA's River Ranger volunteers fill a 1000L skip bin every 2 months with discarded items and litter from the lower Noosa River estuary.

Surfrider Foundation volunteers collect 5 tonnes of rubbish annually along the Noosa North Shore to Double Island Point.

NICA regularly coordinates Clean Up Australia Day events with many volunteers contributing hundreds of hours. The 2023 river clean up removed 25 sacks and more than 3,500 items of rubbish of diverse types, materials and sizes from the foreshores and shallows of Noosa Estuary, through Tewantin, Noosaville, Noosa North Shore and Weyba Creek. More than 60% of the rubbish was plastic.

Read more about Plastic Free Noosa's efforts to reduce single-use plastic at https://www.plasticfreenoosa.org/.

Recreational and commercial use

The Noosa River Marine Zone, in place since 2009, regulates some boating-related uses, however these rules are not well understood and are frequently not observed by the recreational boating public.

In July 2022, there were 979,000 Queenslanders with boat licenses and 274,000 registered boats, making it the largest boating state in Australia. This leads to high demand for marine infrastructure to service this growth and safety issues on the river.

As a focal point for recreation and visitor activities, the Noosaville Reach is placed under increasing pressure during peak visitor periods, with numerous motorised and non-motorised vessels competing for limited water.

For many years there has also been a proliferation of abandoned and derelict vessels in the river, anchored vessels left unattended for long periods of time, and swing moorings located in seagrass meadows of declared FHAs causing seagrass decline.

These vessels often occupy prime positions along the river and contribute to congestion, clutter, and safety concerns for other river users. People live on the river without the required approvals with some on-board occupants discharging waste directly into the river.

Noosa Council will continue to work with Maritime Safety Queensland to advocate for a timed limit on anchoring in the Noosa River, and regular policing of liveaboard waste disposal practices.

Recreational and commercial fishing

The Noosa River system and healthy fisheries are critical to the Noosa region environmentally, socially, and economically.

The river has a long history of recreational and commercial fishing in the estuary and offshore marine waters. Historical fisheries research highlights that during the late 19th century, an increasing demand for oysters led to sections of the river and lakes being privatised and leased to settlers. A booming commercial fishing industry emerged with the Noosa River and lakes providing a significant quantity of commercial fish to the region as far as Brisbane.

Today commercial fishing in the river and surrounds includes an Inshore Net Fishery (N1), a Beam Trawl Fishery (T5) and an Ocean Beach Net Fishery (K8).

Commercial fishing records are limited and there is very little available information on recreational catches. Council has provided input to multiple state government fisheries reform processes and will continue to work with the Department of Agriculture and Fisheries to ensure recreational and commercial fishing is undertaken in a sustainable way so there is no long-term further decline in fish abundance and diversity.

In collaboration with researchers and HL&W, a baseline to monitor the biodiversity and abundance of fish and fisheries will be developed to help optimise estuarine restoration plans. Council plans to review this method and adopt environmental DNA (eDNA) monitoring in conjunction with underwater surveys currently being undertaken by University of the Sunshine Coast and Healthy Land & Water. eDNA methods capture, extract, and analyse genetic material shed into the environment by plants, animals and other organisms detect species without directly observing organisms.

The recommended approach to manage sustainable fisheries is to take an ecosystem-based approach focused on the management of biodiversity.

Aiming for 60% biomass and a 33.3% no take of all bioregions in the Noosa River estuary meets Australia's commitment to the Convention on Biological Biodiversity at the local level.[23]

Environmental flows

Environmental flows in the upper catchment are threatened by increased water extraction and waterway barriers such as dams. Council is working with Seqwater and the Department of Regional Development, Manufacturing and Water to ensure water planning projects maintain environmental flows.

On-site sanitary wastewater systems

The collection and disposal of wastewater in Noosa's urban areas is through a municipal wastewater system, operated by Unitywater, however in rural areas and smaller settlements, wastewater is managed through a variety of on-site wastewater systems.

Council has oversight of residential on-site wastewater treatment facilities and conducts a program of formal audits of wastewater facilities across 3,109 septic installations, 2,830 secondary or advanced secondary systems and a further 206 properties relying on holding tanks on regulated pump out by a liquid waste transport contractor.

Council receives around 7,000 service reports annually from contractors servicing these systems and conducts an average of 200 inspections annually. A review of 200 audit results demonstrated 115 wastewater systems were found to be non-compliant.

If not appropriately managed and monitored, these systems have the potential to leak sewage effluent across and below the varied types of receiving environments. Furthermore, human illnesses associated with failed on-site treatment can be caused by E. coli, Giardia, Hepatitis A, Cryptosporidium and Salmonella.

In 2016 a background study of on-site effluent disposal was undertaken to inform the new Planning Scheme.[24] This required advanced secondary on-site wastewater systems and other approved wastewater treatments be installed for new developments and for these to be located above the defined flood level to minimise water quality impacts to downstream environments. However, greater attention is warranted towards the operation and maintenance of the approved systems to ensure ongoing protection of public health and environmental values.

Algal blooms

From 2002 to 2006, and again in 2017, *Hincksia sordida*, a non-toxic brown alga periodically 'bloomed' in Laguna Bay.

It forms dense patches within the surf zone of Noosa's Main Beach with large quantities of the alga washing up on the beach. These algal blooms have occurred during spring or early summer and coincided with popular holiday periods and recreational use of the beach and ocean. All other beaches south of Main Beach are not affected by Hincksia.

The presence of *Hincksia* is visually unappealing to swimmers and decomposing alga on the beach can emit a sulphurous odour which also

[23] The Convention on Biological Diversity (2016).

[24] Noosa Council (2016) On-site effluent disposal in Noosa Shire.

deters beach goers. Previous studies and trials aimed at finding the source of *Hincksia* proved inconclusive, and removing the vast biomass of the alga from Laguna Bay was expensive and logistically challenging.

Several workshops with experts have been held to ensure a more proactive strategy for monitoring and disposal is in place should *Hincksia* blooms occur again.

Barriers to fish passage

The Noosa River is recognised as important habitat for commercially and recreationally significant fish species, with many listed for their biodiversity conservation significance.

Fish require passage throughout the river system as part of their life cycles for the purposes of breeding and spawning, feeding, juvenile migration, predator avoidance, and territorial behaviour.

Man-made structures such as weirs, culverts, causeways, bridges, and dams can form partial or complete barriers which inhibit fish movement. This can be through actual physical barriers which inhibit fish movement or through alteration of the natural flow conditions. Other barriers include weed and sediment chokes, or chemical barriers such as pollution or acidification of waterways.

An initial assessment conducted in 2017 identified 100 barriers using criteria based on connectivity length, stream class and habitat quality. Barriers were prioritised for remediation.

The loss of longitudinal and lateral connectivity in waterways imposed by instream barriers is considered a widespread contributor to the reduction in diversity, abundance and distribution of fish and other aquatic fauna. A growing body of evidence supports the need for undertaking a systematic program of barrier remediation.

The Noosa River's lakes operate as a settlement area for sediments entering from upstream or into their mouth during flood events, as has been observed at Lake Doonella. Continual settlement of sediments in the lakes over time has the potential to affect fish passage through those systems.

6. High-level catchment risk assessment

Understanding how the values of the Noosa River catchment are being adversely affected by these threats is an important consideration for developing and prioritising appropriate management responses. A table presenting a high-level assessment of the threats impacting the ecological or intrinsic values of the Noosa River catchment as well as the community or existence values, and the risk assessment framework used is provided in Appendix 2. This high-level risk assessment has been used to inform the identification and prioritisation of the management actions.

The risk assessment summary highlights several threats that could be considered a higher priority due to the presence of multiple impact pathways and/or their ability to cause a moderate-high level of risk to multiple values. Overall, the ecological values were assessed to have the highest risk due to their presence over extensive portions of the catchment. Protecting the intrinsic values of the catchment also has a direct benefit to the community values.

Climate change presents a range of threats from sea level rise, more frequent and intense rainfall events and extended dry and hot conditions. Corresponding impacts range from increased erosion and sediment runoff to harmful algal blooms, low ecological flows, and increased flooding. Most threats associated with climate change introduce a high level of risk to both ecological and community values. While climate change mitigation (emissions reduction) is urgently required, catchment management actions need to focus more on adaptation and

Kabi Kabi Country is of great cultural and spiritual significance. It has mountains, rivers, lakes, ceremonial grounds, women's and men's cultural sites, old camping sites, and burial sites which are sacred to the Kabi Kabi people.

Ancient pathways were travelled to attend festivals, ceremonies, and access seasonal resources, connecting Stories and songlines.

We must all look after these sites and protect them from ineffective planning processes and development.

Kabi Kabi see the river as the lifeblood of Noosa, connecting mountain rainforests to coastal dunes. Indigenous worldview looks at caring for Country holistically as an entire system, with every part intricately and often intangibly connected to the rest.

In consultation with the Kabi Kabi Peoples Aboriginal Corporation, it was agreed not to assess risk to cultural values as complex systems cannot be understood by studying parts in isolated silos. Kabi Kabi emphasised that along with government and the business community, everyone from the farmer grazing cattle upstream to the homeowner living near the mouth can play a role as everything connects through the river. We must work together to protect the entire catchment from ineffective planning processes and unsustainable development, both because of its cultural and intrinsic value as well as the immense benefit it provides to our liveability and wellbeing.

building the resilience of the ecological, social, and economic systems to climate change impacts.

Sediment runoff (and erosion) was identified in nearly all threat categories of climate change, steep headwaters and sediment, rural dirt roads, urban pollution, degraded riparian areas, and barriers to fish passage, and was identified to have moderate to high levels of risk across nearly all values. This highlights the extensive and varied point and diffuse sources of sediment to the catchment and its management priority.

Risks associated with sewage from on-site wastewater systems and discharge from vessels was also considered to have a high risk to the protection of the values. It has the potential to create high-risk for water quality and most community values including, recreation, lifestyle, and tourism. Contamination and odour for sewage are high-risk as they could negatively impact human health and amenity for tourism and lifestyle.

Barriers to fish passage present a high risk to the intrinsic value of biodiversity and affect community values related to the presence of fish in the environment, for example fishing.

While this high-level assessment of risk is useful for action planning and prioritisation, a detailed analysis of the system is required to better understand how the ecological, social, cultural, and economic systems function, and how direct and indirect threats may individually or cumulatively affect the region's values and ecosystem services. This will occur as part of the first year of implementation of the plan.

7. Goal and management objectives

The goal for the Noosa River catchment is to **protect and enhance the health and resilience of the Noosa River catchment.**

This goal will be achieved through the successful delivery of several inter-related management objectives. These objectives reflect the values and services that have been identified for the catchment as being important and meaningful to the local community, as well as targeting the priority threats.
The management objectives to be achieved by 2030 align with relevant strategies identified in the Noosa Environment Strategy, and Noosa's Corporate Plan 2023-2028.

8. Desired outcomes

Desired outcomes to deliver the Vision for the Noosa River catchment are set out below and are designed to protect, maintain, or enhance the characteristics that define the Noosa River. Development and activities are to be consistent with these.

Sustainable and coordinated approach for river and catchment planning

a. In full recognition of Noosa's UNESCO Biosphere Reserve status and vision, the Noosa River catchment is increasingly valued as living proof that by respecting Country and living in harmony with nature, we inspire happy, healthy, thriving communities.
b. Stakeholder engagement ensures integrated and sustainable outcomes and actions occur that are responsive to identified threats and management initiatives for the river.
c. The river has a sustainable carrying capacity and requires a balanced approach to the management and protection of river and catchment values.
d. Collaborative governance arrangements guide holistic natural resource management and sustainable development across the Noosa River catchment to provide ecological, community and economic benefits.
e. Significant ecological areas, vegetation and other natural features and landforms within and along the river system are conserved and protected, through consideration of such mechanisms as a Conservation Park.
f. Advocacy occurs at the local, State, Commonwealth, and international level to engage, inspire and facilitate partners and community to promote a balance between people and nature.
g. An integrated systems approach is applied to on-river management to achieve safe people, healthy waterways, safe vessels, and nature-based recreation.

A Conservation Park established in the Fish Habitat Areas (FHA) of the Noosa River, under the Nature Conservation Act (1992), would provide the necessary statutory head of power for integrated river management. It would provide for Council to work in close alignment with State Government under a trustee agreement, joint management plan and multi-agency coordination group. The Noosa River Conservation Park would be managed in accordance under the Act to:

" (a) conserve and present the area's cultural and natural resources and their values; and
(b) provide for the permanent conservation of the area's natural condition to the greatest possible extent; and
(c) provide opportunities for educational and recreational activities in a way consistent with the area's natural and cultural resources and values; and
(d) ensure that any commercial use of the area's natural resources, including fishing and grazing, is ecologically sustainable."

A conservation park presents various opportunities in terms of:

- *Greater compliance support to State agencies*
- *Attracting funding and investment for wetland and riparian management, scientific monitoring, and biodiversity interventions*
- *Council potentially having more responsibilities and say in the management of the river*
- *Providing an education and awareness piece to drive greater community ownership with a focus on biodiversity and protection of species' habitats within and adjacent to the conservation park.*
- *Providing explicit recognition that all current Noosa River FHA regulations and management principles are retained and that existing commercial fishing can continue with Department of Agriculture and Fisheries being the arbiter of fishing sustainability.*

Aquatic and terrestrial ecosystem health

a. Aquatic and terrestrial flora and fauna and their habitats, and riparian ecosystems are protected from any potential adverse impacts resulting from development and activities in the river system or on tidal lands, and degraded habitats and ecosystems are rehabilitated or restored to highest state possible and actively managed.
b. Bank erosion and sediment loadings are not increased or accelerated by development or activities in the river system or on tidal lands.
c. Dredging of sand from within the river system, only occurs where:
    i. there is a clear demonstrated public benefit; and
    ii. no feasible and prudent alternatives are available; and
    iii. it can be demonstrated that the intrinsic values and resources of the river system can be sustainably managed and protected, including water quality, fisheries resources and bed and bank habitats.
d. Nature-based solutions are prioritised over hard infrastructure solutions.
e. The ecological health and economic and recreational values of fisheries resources are protected through:
    iv. the protection of endangered or vulnerable species, nursery grounds and feeding areas; and
    v. managing fish stocks at sustainable levels; and
    vi. the equitable allocation of fisheries resources amongst the recreational, commercial, Indigenous and tourist charter sectors; and
    vii. reducing and minimising bycatch in fishing operations; and
    viii. avoiding habitat degradation and species loss.

See also Part 3.3.4 from the Noosa Plan 2020 available at: https://www.noosa.qld.gov.au/downloads/file/2481/part-3-strategic-framework

Water quality

a. The water quality of the Noosa River system is protected to the extent that:
    i. best practice environmental control measures are in place to sustain and improve water quality and maintain the Environmental Protection Policy Water Quality Objectives for all water types throughout Noosa; and
    ii. sources of pollutants entering stormwater and tributaries are addressed.
    iii. stormwater pollution loads are minimised by intercepting and treating stormwater; and
    iv. the release of any pollutants into the river system is prevented, including the discharge of waste from vessels; and
    v. clearing of bed and bank habitat and riparian lands is controlled to maintain natural filters; and
    vi. measures are in place to ensure that bank, gully, overland and mass land movement erosion, and consequential sediment loadings are minimised; and

vii. rural unsealed roads and associated culvert crossings are managed to minimise sediment runoff to improve water quality.

b. Sewage collection and on-site wastewater treatment systems are designed, managed, and maintained to enable appropriate nutrient removal and to minimise adverse impacts on water quality.
c. By 2030, zero litter enters the Noosa River system.
d. Stormwater pollution and trade waste contributions are addressed.

Visual amenity

a. The visual amenity of the Noosa River system is protected and enhanced by:
    i. ensuring that the special scenic qualities of the river system and vistas to and from the river system are identified and protected; and
    ii. integrating development with the landform and landscape to minimise the contrast between the natural and built environment; and
    iii. using materials and finishes that are sympathetic to the waterway character; and
    iv. considering the cumulative and incremental effect of structures and activities on and adjacent to the river system; and
    v. Derelict vessels are referred to Maritime Safety Queensland's War on Wrecks program.

Public safety

a. In-water activities such as boating and swimming are monitored and managed for their compatibility and risk in terms of speed limits, boating types and size, intensity and extent of use and user behaviours.
b. Distance off regulations are monitored and enforced and apply to non-powered craft as well as swimmers.
c. Boats are not anchored in the river channel.
d. Anchored vessels have navigation lights illuminated outside of daylight hours.
e. The public understands and complies with waterways regulations.
f. Privately owned shoreline and in-water infrastructure is legal, maintained in good condition, meets best practice, or achieves this when upgraded, and has a low intrinsic safety risk to the public in terms of design, extent, or placement.
g. Illegal or inappropriate infrastructures including hard structures and river access points, which pose a risk to public safety, are decommissioned and accesses closed, and sites rehabilitated.
h. Shoreline or in-water public infrastructure such as access points, seawalls, aids to navigation etc, is maintained in good working order, and where replaced, is done so accordance with best practice.

i. Development or activities maintain the safety and access rights of the public over public owned foreshore lands.

Cultural heritage

a. The Indigenous, historical, environmental and conservation cultural heritage of the Noosa River system is protected, respected, and not harmed by:
    i. providing environmental protection to cultural heritage values to a level that sustains cultural and spiritual obligations; and
    ii. continuing and extending community, indigenous and stakeholder consultation; and
    iii. all sharing responsibility to protect and respect cultural heritage.
b. Kabi Kabi aspirations to play a greater role in caring for country including efforts to establish a Kabi Kabi Land and Sea Ranger program are supported.

Jetties and pontoons (public and private)

a. Jetties, pontoons, and wharves are designed to avoid cluttering of the Noosa River system and any conflicts with other water and foreshore uses.
b. Construction of pontoons is prioritised over jetties to adapt to the impacts of extreme weather events and are for the primary purpose of providing access to vessels and additionally for public recreation purposes in the case of public infrastructure.
c. Large jetties and pontoons capable of serving other uses, such as for private recreational purposes, are not permitted in the Noosa River system.
d. Extensions to on-site recreational areas over the Noosa River system are not permitted unless there is a clear demonstrated public benefit and public support.
e. New private jetties and pontoons on or adjoining public lands in the Noosa River system are not permitted, except in accordance with the State Coastal Management Plan.
f. New private jetties and pontoons on or connected to freehold land (used for existing or future residential and tourist purposes) are not permitted in largely undeveloped tidal waterways or undeveloped sections of tidal waterways, in accordance with the State Coastal Management Plan, unless they are of state economic importance; or
    i. there are existing private jetties on or connected to neighbouring freehold land and the proposal is infill (located between the neighbouring existing structures); and
    ii. the new structure does not result in the need for the construction of revetment walls or hardening of the riverbank.
g. Appropriate design and management controls are in place to prevent the release of prescribed water contaminants to the Noosa River during the construction of river infrastructure.

Boat ramps

a. Public boat ramps are designed and operated to:

i. provide functional, safe, and convenient boat access to the river system under average demand conditions; and
ii. ensure public access and use of public foreshore lands; and
iii. minimise impacts on surrounding local streets and residences.

b. A new proposed boat ramp at Chaplin Park is not supported due to the planning, tenure, and character impacts this would have on the park.
c. Boat ramps, public foreshores and adjacent car parks are not used for commercial transactions associated with water-based recreation, and the hiring of watercraft.
d. Boat ramps and launching sites are managed to ensure there are dedicated vessel queuing facilities where needed.

Moorings

a. Moorings are confined to designated mooring areas that:
i. avoid adverse impact on fish habitat and other natural values of the river system; and
ii. avoid adverse cumulative impact to the visual qualities of the river system; and
iii. provide for the safe and suitable mooring of vessels; and
iv. do not conflict with safe navigation and users of swimming beaches.
b. Sufficient mooring space is provided for the short-term mooring of visiting offshore vessels close to amenities provided by the Noosa Yacht and Rowing Club, and for events sponsored by the Lake Cootharaba Sailing Club.

Living onboard watercraft

a. The use of watercraft for permanent living onboard is restricted within the Noosa River system and recognised as an inappropriate use of the Noosa River with respect to issues of amenity, public health, and equity.
b. The location and numbers of vessels on the Noosa River used for temporary living onboard does not impact upon the visual amenity and safety of the waterway and are eventually phased out.
c. Wastewater holding system disposal is effectively monitored and enforced to ensure nil discharge into the Noosa River system.
d. Commercial short-stay accommodation on vessels at anchor in the river or attached to private jetties is not permitted.

Aquatic businesses

a. Businesses catering to the aquatic sector (marine, estuarine and freshwater) use best practice environmental management by ensuring that such services:
i. are low key, clean, and service oriented; and

ii. operate without deleterious impact on immediate, surrounding, or downstream environments and environmental processes.

b. New aquatic business operations are designed to:
    i. provide a high level of amenity, including ensuring low ambient noise levels; and
    ii. avoid causing any adverse increase in congestion and safety risks within the waterway; and
    iii. prevent any net loss of public access to the foreshore or of public usability of the waterway; and
    iv. incorporate energy efficiency principles in the design and operation.

Commercial operations

a. Any new business should not increase the overall scale and intensity of commercial operations on the Noosa River:
    i. commercial water-based businesses are required to operate from an approved commercial jetty; and
    ii. operation of a commercial business from anchor or an authorised buoy mooring is not permitted; and
    iii. floating shops used for commercial purposes attached to a jetty are not permitted; and
    iv. sale of food from a vessel to customers on the banks of the Noosa River is not permitted.
b. Commercial development on and adjacent to Noosa River is not increased or expanded beyond existing building footprints and structures within existing leased areas.
c. No additional commercial leases are created on or adjacent to the Noosa River.
d. Commercial operations use best practice environmental management by ensuring that such uses:
    i. provide for a quality and diverse range of recreation and visitor activities with a nature-based theme; and
    ii. operate without deleterious impact on immediate, surrounding, or downstream environments and environmental processes.
e. Commercial development is designed to:
    i. provide for uses for marine facility purposes only, including water transport and boat hire;
    ii. is compatible with the scenic values of the waterway and ensure public access and use of public foreshore lands; and
    iii. use materials, natural finishes and colours that blend with the surrounding natural landscape; and
    iv. provide a high level of amenity, including ensuring low ambient noise levels; and
    v. avoid causing any adverse increase in congestion within the waterway or surrounding local streets and residences; and
    vi. incorporate energy efficiency principles in the design and operation.
f. The loading and unloading of passengers is confined to the commercial lease areas of the respective commercial operation.
g. The slipway accessed from Mill Street provides essential infrastructure for waterfront based marine industries and is limited to this existing commercial lease area adjoining Chaplin Park.

See also Part 7.2.3.3, 7.2.4.3, and 7.2.5.3 of the Noosa Plan 2020, available at: https://www.noosa.qld.gov.au/downloads/file/2482/part-7-local-plan-codes for the local plan assessment criteria for Tewantin, Noosaville and Noosa Heads.

See also Part 9.4.9, available at: https://www.noosa.qld.gov.au/downloads/file/2492/part-9-development-codes, for reference to the Waterways Works Code.

Motorised water sports and transportation

a. Motorised water sports and transportation are conducted in a manner that:
    i. minimises adverse impact on the natural and cultural values of the river system; and
    ii. considers the amenity and safety of other water users and surrounding land uses, including maintaining low ambient noise levels; and
    iii. conforms with the low-key recreation character of the Noosa River system.
b. Hovercraft, airboats, seaplanes, helicopters, and other such uses, that generate high noise levels or that are otherwise intrusive, are not permitted to operate within or on the Noosa River system.
c. Personal water craft use is restricted to transiting the river channel downstream of Noosa Waters Inlet to the river mouth in accordance with agreed zones.
d. Commercial jet ski use is restricted to the commercial jet ski area located in the lower estuary.
e. Freestyling, surfing and wave jumping activities, except freestyling by commercial personal water craft in the commercial area, are not permitted in the Noosa River system.
f. Water skiing and wakeboarding in the river is only allowed in the two water ski runs between Tewantin and Lake Cooroibah, between the hours of 8am and 5pm daily.
g. Provision is made for appropriate, efficient, and economical public transport to key destinations on the Noosa River.
h. Waterway transport links are established on the Noosa River and opportunities for future links are preserved.
i. Ferry access to the Noosa North Shore is retained and a bridge across the Noosa River is not constructed.
j. Infrastructure and services are designed to give priority to pedestrians, cyclists, scooters and public transport over private cars and personal motorised water craft.

Links to 2023-2028 Corporate Plan objectives

Theme	Objective
	1.1 Maintain and improve water quality and the health of waterways, wetlands, and catchments

Environment	1.2 Partner with landowners and community groups to manage, protect and regenerate natural environment assets, improve resilience, and incorporate Indigenous knowledge
	1.3 Fund and deliver Coastal Foreshore and Coastal Hazard Management Plans to protect and enhance coastal and foreshore areas
	1.4 Discover, respect, conserve and celebrate Noosa's unique heritage values in all forms, for current and future generations
	1.5 Deliver expanded vegetation networks, rehabilitation and habitat across the Shire and advocate to the State and Federal Governments to assist funding environmental action
	1.6 Partner with community to improve the health and water quality management of Noosa and Mary Rivers and Eastern Beaches through whole of catchment management to protect environmental values while enabling sustainable public access, recreation, and commercial use
	1.7 Deliver and partner with State and Federal Governments to protect threatened and vulnerable species identified in the Environment Strategy
	1.8 Reinforce Noosa Design Principles to shape the look and feel of our distinctive built environment to ensure it responds to our climate, environment, and unique character
Liveability	2.2 Fund and deliver accessible and improved, parks, open spaces, walking and cycle paths and trails, including greening our paths and cycleways to meet contemporary needs
	2.3 Nurture arts and culture to enrich the identity and vibrancy of communities, highlight local talent, celebrate First Nations culture, and encourage creative participation and expression
	2.6 Facilitate strong, vibrant, inclusive communities where people have a sense of belonging and are active participants in a rich community life
	2.7 Fund and deliver sustainable assets and facilities and associated services responding to the changing needs of the community and the challenges and opportunities of the future
	2.8 Provide opportunities to enhance the health, wellbeing, and safety of our communities
Prosperity	3.2 Partner with industry and education stakeholders in programs to address workforce and skills shortages and to develop a suite of training programs and initiatives that meet the future workforce skills of Noosa including pathways to employment
	3.3 Work with agricultural organisations and agencies to support and educate landholders on regenerative agriculture methods and promote local and sustainable food production
	3.4 Investigate a rural/hinterland innovation hub to support our hinterland communities and grow our rural, artisan and creative industries
	3.7 Deliver the Waste program focused on accelerating actions and solutions including circular economy opportunities to cut waste and pollution, keep products and materials in use and regenerate natural systems
	3.8 Partner with industry, innovative and research organisations to bring awareness, investment, and develop innovative outcomes for the Shire

Future	4.1 Deliver the Reconciliation Action Plan (RAP) to build trust and respect with First Nations People including our Traditional Owners, the Kabi Kabi people; and our community
	4.2 Complete and implement the Destination Management Plan in partnership with the community and Tourism Noosa to protect Noosa's quality of life, environment, and iconic places through planning for sustainable visitation and events
	4.3 Improve opportunities for increased inclusion of young people in community engagement and decision making to provide relevant services, activities, and opportunities
	4.4 Proactively participate in regional planning and advocacy to ensure our current and future communities' needs are identified to maintain the important role Noosa plays in the wider SEQ and Wide Bay regions
	4.5 Implement a place-based approach to working with individual towns/villages and address their specific needs within a 'whole-of-Council' framework
	4.6 Prepare and plan for the Olympics and Paralympics 2032 to leverage the opportunities for our community leading up to 2032 and ensuring there is a legacy benefit beyond
	4.7 Fund and deliver the Climate Change Response Plan to support the Council, community, and the local economy to build resilience and preparedness for climate risks and to achieve zero net emissions by 2026
	4.8 Deliver best practice approaches to combat and plan for natural disasters and climate change including supporting safety, preparedness, resilience, and recovery capacity
	4.9 Undertake Scenario Planning to explore potential future challenges and opportunities to help the Shire prepare and respond responsibly
Excellence	5.2 Continue to deliver a financially sustainable Council that has the resources now and into the future to achieve its strategic objectives. This will be supported through the introduction of enhanced sustainability reporting and performance indicators, as well as ESG (environment social and governance) accounting practices as guided by statutory requirements
	5.3 Embrace technology and innovative practices to support the provision of contemporary, efficient, and effective levels of service for Council operations
	5.5 Provide robust and transparent governance systems to build and strengthen community trust, supported by the implementation of an enterprise risk and opportunity management framework
	5.6 Increase opportunities for meaningful collaborative community engagement which is highly representative of our community, especially our youth
	5.7 Partner with other government agencies, commercial business, and social enterprises to activate opportunities which will diversify Council's revenue base or create alternative funding streams
	5.8 Mature the asset management framework and systems to ensure robust asset management practices are in place that deliver well-maintained quality assets

9. Implementation Actions

Management Objective 1. Protect and enhance coastal environments and vegetated buffers to coastal foreshores

The following resources have been considered in the development of the Implementation Plan actions for this management objective:

- **Noosa Environment Strategy and Implementation Plan**
- **Noosa Coastal Hazard Adaptation Plan**
- **Climate Change Response Plan**
- **Noosa Plan 2020 – Planning Scheme for Noosa Shire**
- **Noosa Local Laws**
- **Department of Environment and Science Noosa Area Draft Management Plan 2021**
- **Eastern Beaches Foreshore Reserves Management Plan**
- **Queensland Coastal Contingency Action Plan for ship-sourced pollution – oil and chemical spills**

#	Action	Management area						Corporate Plan objective	Council department/ branch lead	Primary collaborators	Priority (VH, H, M, L)	Status
		Headwaters	Lake Cootharaba	Lake Cooroibah	Tewantin to Noosa Heads	Lake Doonella	Lake Weyba					
1.1	Consider the establishment of a Conservation Park across FHAs to protect and improve the health, biodiversity, and species habitats of the Noosa River Catchment							1.1, 1.4, 1.5, 1.6, 1.7, 2.8, 3.8, 4.1, 4.4, 4.7, 4.8, 5.2, 5.5, 5.7	Environment Services	Kabi Kabi DAF DES	VH	Within existing resources Funding for development of a collaborative Management Plan and ongoing management subject to future budget considerations

#	Action	Management area						Corporate Plan objective	Council department/ branch lead	Primary collaborators	Priority (VH, H, M, L)	Status
		Headwaters	Lake Cootharaba	Lake Cooroibah	Tewantin to Noosa Heads	Lake Doonella	Lake Weyba					
1.2	Under the Living Foreshores program, conduct a Coastal Wetland Restoration Prioritisation Study using best-practice science and a co-benefits approach for biodiversity resilience, coastal protection, cultural heritage, water quality, fisheries, and blue carbon							1.1, 1.3, 1.5, 3.8, 4.7, 4.8	Strategy & Sustainability	UQ Kabi Kabi	H	Funding for prioritisation FY23/24 Funding for implementation subject to future budget considerations
1.3	Partner with Kabi Kabi on Phase 2 of the Coastal Wetland Restoration Prioritisation Study to improve extent and condition mapping for coastal wetland ecosystems in the Noosa River catchment, ground-truth sites and assess cultural heritage values and Indigenous-led blue carbon opportunities for prioritised sites							1.1, 1.2, 1.5, 1.6, 1.7, 3.8, 4.7, 5.2, 5.7	Strategy & Sustainability	Kabi Kabi UQ HL&W	H	Subject to future budget considerations
1.4	Partner with key stakeholders to implement a Coastal Wetland Restoration Pilot Project at one of the identified priority sites							1.1, 1.2, 1.5, 1.6, 1.7, 1.8, 3.8, 4.7, 5.2, 5.7	Strategy & Sustainability	Kabi Kabi UQ HL&W	H	Funding subject to future budget considerations
1.5	Implement restoration projects along estuary edges							1.1, 1.2, 1.3, 1.6, 2.2, 4.7	Environment Services	NICA TNC	M	Subject to future budget considerations
1.6	Continue to monitor and manage Huon Mundy (oyster) Reefs including oyster gardening, reef seeding and community engagement actions							1.1, 1.2, 1.4, 1.6, 3.8, 5.6	Environment Services	TNC NICA Kabi Kabi	H	Funded for FY23/24 Agreement with TNC in place for ongoing monitoring

#	Action	Management area						Corporate Plan objective	Council department/ branch lead	Primary collaborators	Priority (VH, H, M, L)	Status
		Headwaters	Lake Cootharaba	Lake Cooroibah	Tewantin to Noosa Heads	Lake Doonella	Lake Weyba					
1.7	Consider the feasibility of other aquatic restoration projects for aquatic invertebrates and marine plants							1.1, 1.2, 1.6, 3.8, 5.6	Environment Services	TNC UniSC UQ Kabi Kabi	H	Within existing resources Funding for restoration activities available FY23/24
1.8	Update the assessment of seagrass coverage and seagrass restoration site prioritisation including assessing dominant pressures contributing to seagrass decline							1.1, 1.5	Environment Services	Consultant Universities	H	Funded for FY23/24
1.9	Develop a groundwater monitoring program to improve understanding of groundwater supply and groundwater dependent ecosystems							1.1, 1.3, 3.8, 4.7	Strategy & Sustainability	UQ DES	M	Initial groundwater monitoring underway Further funding subject to future budget considerations
1.10	Undertake a hydrodynamic study in Lake Doonella to investigate siltation and determine management options							1.1, 1.6	Infrastructure Services	Consultant	H	Funded for FY23/24
1.11	Develop and implement a Lake Doonella Foreshore Management Plan							1.1, 1.2, 1.5, 1.6, 2.2, 2.6, 2.8, 5.6	Environment Services	Residents	H	Within existing resources for scoping FY23/24 Implementation funding subject to future budget considerations

#	Action	Management area						Corporate Plan objective	Council department/ branch lead	Primary collaborators	Priority (VH, H, M, L)	Status
		Headwaters	Lake Cootharaba	Lake Cooroibah	Tewantin to Noosa Heads	Lake Doonella	Lake Weyba					
1.12	Implement a Shoreline Erosion Management Plan monitoring program for the river estuary							1.6, 5.8	Infrastructure Services	NICA	H	Funded for FY23/24
1.13	Undertake a survey of reef composition, indicator invertebrates and fish, and visual reef health impacts							1.1, 1.2, 4.3, 4.4	Environment Services	ReefCheck Australia	H	Funded for FY23/24 To be completed in October 2023
1.14	Continue to implement the COASTS Project to integrate coastal data collected across a suite of platforms, ancillary environmental datasets, and numerical models to create an operational monitoring dashboard to build resilience to coastal hazards impacting the Noosa River and open coast							1.1, 1.2, 1.3, 1.5, 1.8, 2.2, 2.7, 2.8, 3.8, 4.5, 4.7, 4.8, 4.9	Strategy & Sustainability	UniSC UQ	H	Funded for FY23/24
1.15	Under the Living Foreshores Noosa program, continue Phase 1 of the Noosaville Foreshore Resilience Project which includes concept designs of living foreshore approaches to build resilience for permanent inundation, storm tide inundation and catchment flooding							1.1, 1.3, 1.8, 2.2, 2.7, 3.8, 4.4, 4.7, 4.8	Strategy & Sustainability Infrastructure Services	Consultant	H	Funded for FY23/24
1.16	Under the Living Foreshores Noosa program, implement Phase 2 of the Noosaville Foreshore Resilience Project which includes detailed design and trialling of living foreshore approaches							1.1, 1.2, 1.3, 1.5, 1.8, 2.2, 2.7, 2.8, 3.8, 4.5, 4.7, 4.8, 4.9	Strategy & Sustainability Infrastructure Services	Consultant	H	Subject to future budget considerations
1.17	Under the Living Foreshores Noosa program, implement Phases 1 and 2 of the Hilton Esplanade Foreshore Resilience Project to build resilience for permanent inundation, storm tide inundation and catchment flooding								Infrastructure Services Strategy & Sustainability	Consultant TNC UniSC Kabi Kabi	H	Grant funded for FY23/24 & FY24/25

#	Action	Management area						Corporate Plan objective	Council department/ branch lead	Primary collaborators	Priority (VH, H, M, L)	Status
		Headwaters	Lake Cootharaba	Lake Cooroibah	Tewantin to Noosa Heads	Lake Doonella	Lake Weyba					
1.18	Ensure monitoring and compliance of the Noosa North Shore exclusion zone to protect migratory shorebird habitat							1.2, 1.7	Local Laws	NICA QPWS	M	Within existing resources
1.19	Develop and implement a Shorebird Conservation Plan for the river estuary							1.1, 1.2, 1.5, 1.6, 1.7, 4.4, 5.6	Environment Services	NICA QPWS	M	Subject to future budget considerations

Management Objective 2. Maintain and improve the health of waterways, wetlands, and catchments

The following resources have been considered in developing the Implementation Actions for this management objective:

- **South East Queensland Natural Resource Management Plan 2009–2031**
- **Noosa Plan 2020 – Part 3.3.4 Biodiversity and Environment**
- **Ecosystem Health Monitoring Program**
- **Aquatic Ecosystem Rehabilitation resources**
- **Noosa Stormwater Guidelines**
- **Noosa Threatened Fauna Recovery Road Map**

In 2022 Council approved its first Threatened Fauna Recovery Road Map, identifying nine species for priority conservation from a range of Broad Vegetation Groups (BVGs) across Noosa Shire.

The species and BVGs relating directly to the Noosa River Catchment Management Plan are:

Combined habitats – Tusked frog
Freshwater waterways, wetlands, and lakes – Mary River turtle
Heaths and coastal communities – Acid frogs
(Wallum froglet, rocket frog and sedge frog)
Saltmarsh and mangroves – Water mouse
Coastal and marine – Loggerhead turtle

The year one priority for implementation of the Road Map is sea turtles.

#	Action	Management area						Corporate Plan objective	Council lead	Primary collaborators	Priority (VH, H, M, L)	Status
		Headwaters	Lake Cootharaba	Lake Cooroibah	Tewantin to Noosa Heads	Lake Doonella	Lake Weyba					
2.1	Consider high level agreements, an integrated and collaborative governance arrangement, and ongoing stakeholder engagement for the Noosa River catchment including technical advisory support on key issues and actions							1.1, 1.2, 1.5, 1.6, 1.7, 3.8, 4.4, 5.5, 5.6	Environment Services	HL&W Kabi Kabi DAF DES DoR MSQ NBRF NICA N&DL MRCCC Tourism Noosa University and research sector	VH	Within existing resources Funding for future governance arrangement subject to future budget considerations
2.2	Enhance communication and engagement to facilitate ongoing community involvement in river management							1.2, 1.6, 2.6, 2.8, 3.3, 3.8, 4.1, 5.5, 5.6	Environment Services		H	Within existing resources
2.3	Develop a Monitoring, Evaluation and Reporting Program using a broad suite of ecological monitoring targets at locally relevant scales to advise local action and management, and aligned with the SEQ Natural Resource Management Plan							1.1, 1.2, 1.3, 1.5, 1.6, 1.7, 3.7, 3.8, 4.4, 4.7, 4.8, 5.2	Environment Services	HL&W Kabi Kabi DAF DES MSQ NICA University and research sector	VH	Funded for FY23/24
2.4	Deploy three telemetry stations in sub-catchments to monitor water quality							1.1, 1.6, 3.8, 4.4, 4.8, 5.2, 5.3, 5.8	Environment Services	MRCCC N&DL NICA HL&W	VH	Funded for FY23/24
2.5	Continue to support the annual HL&W environmental health and water quality reporting process							1.1, 1.2, 1.5, 1.6, 1.7, 3.8, 4.4, 5.2, 5.7	Environment Services	HL&W	H	Funded FY23-25
2.6	Develop a project plan to provide more regular reporting from Council's Integrated Water							1.1, 1.2, 1.6, 2.6, 2.8, 3.8, 4.3, 4.4,	Environment Services	MRCCC	H	Funded for FY23/24

#	Action	Management area						Corporate Plan objective	Council lead	Primary collaborators	Priority (VH, H, M, L)	Status
		Headwaters	Lake Cootharaba	Lake Cooroibah	Tewantin to Noosa Heads	Lake Doonella	Lake Weyba					
	Quality Monitoring Program and water quality improvement projects							4.4, 5.2, 5.3, 5.6, 5.8		N&DL NICA HL&W		
2.7	Finalise the 2023 Noosa Situation Analysis report to analyse trends in water quality across all sites currently sampled in Noosa Shire							1.1, 1.2, 1.5, 1.6, 3.8, 4.4, 5.7	Environment Services	MRCCC N&DL NICA	VH	Funded for FY23/24 Future years subject to future budget considerations
2.8	Implement an on-site sanitary wastewater system inspection program, that includes: - inspections of high priority areas (such as Noosa North Shore) to better understand water quality impacts - priority septic system management actions identified							1.1, 1.6, 2.8, 3.7, 4.5, 5.3	Building and Plumbing	DES	H	Within existing resources
2.9	Maintain regular contact and collaboration with Sunshine Coast Council. Key issues include: • ESC compliance • Water quality monitoring • Disaster management • Blue carbon ecosystems • Marine strandings							1.1, 2.7, 3.8, 4.4, 4.7, 4.8, 4.9, 5.7	Environment Services	SCC	H	Within existing resources
2.10	Analyse existing studies and map priority infrastructure upgrades that will reduce sediment runoff from rural roads							1.1, 1.2, 1.5, 1.6, 1.7, 1.8, 2.7, 3.8, 4.8, 5.8	Environment Services	Australian National University MRCCC	VH	Within existing resources Implementation subject to future

#	Action	Management area						Corporate Plan objective	Council lead	Primary collaborators	Priority (VH, H, M, L)	Status
		Headwaters	Lake Cootharaba	Lake Cooroibah	Tewantin to Noosa Heads	Lake Doonella	Lake Weyba					
												budget considerations
2.11	Ensure compliance with erosion and sediment control standards for Council-managed roadworks and upgrades							1,1, 1.5, 1.6, 2.7, 3.8, 4.8, 5.8	Environment Services	SCC	VH	Within existing resources
2.12	Review/develop guidelines for private driveway management to ensure erosion and sediment runoff is mitigated							1.1, 1.2, 1.5, 1.6	Environment Services Development Assessment	Landholders	M	Subject to future budget considerations
2.13	Ensure all requirements of the State code 18: Constructing or raising waterway barrier works in fish habitats are included in all standards relating to culvert and bridge works within Council infrastructure operations							1.1, 1.5, 1.7, 2.7, 5.8	Environment Services	MRCCC	VH	Within existing resources
2.14	Develop designs for 3 priority biopassage remediation sites								Environment Services	MRCCC N&DL	H	Funded for FY23/24
2.15	Remediate one biopassage pilot site								Infrastructure Services	MRCCC N&DL	H	Subject to future budget considerations
2.16	Include priority catchment and water quality enhancement area (riparian, gully, wetlands) attributes as criteria in Council's Conservation Land Management Plan to inform environmental acquisitions							1.1, 1.2, 1.4, 1.5, 1.6, 1.7, 2.7, 2.8, 3.3, 3.4, 3.8, 4.1, 4.4, 4.8, 5.6	Environment Services	N&DL	M	Within existing resources
2.17	Develop a prioritisation methodology for riparian rehabilitation works								Environment Services	HL&W	VH	Subject to future budget considerations

#	Action	Management area						Corporate Plan objective	Council lead	Primary collaborators	Priority (VH, H, M, L)	Status
		Headwaters	Lake Cootharaba	Lake Cooroibah	Tewantin to Noosa Heads	Lake Doonella	Lake Weyba					
2.18	Through the Conservation Land Management Plan and acquisitions program, preserve and increase riverfront land in conservation tenure								Environment Services	DES	VH	Funded from Environment Levy subject to prioritisation process
2.19	Undertake remediation works in targeted priority locations to address sediment and nutrient mobilisation: - Keeping it in Kin Kin Program - Upper Pinbarren Creek restoration project - Priority Bushland Reserves in Council's Bushland Reserves Strategic Management Plan - Waterway crossing upgrades in section 7 of the Noosa Biosphere Trails - Six Mile Creek restoration project scoping								Environment Services	N&DL	M	Keeping it in Kin Kin is funded via Council grant FY23-25 Funding for all other projects subject to future budget considerations
2.20	Investigate and trial the use of eDNA monitoring techniques for aquatic biodiversity and as a proxy to monitor fish biomass							1.1, 1.7, 3.8, 5.3	Environment Services	GU	M	Subject to future budget considerations
2.21	Investigate the dynamics and impact of riverine sediments in the Noosa River estuary, including: - mapping point sources of sediment by analysing LiDAR data across the Shire - undertaking a preliminary assessment of patterns and impacts - identifying direct and associated monitoring priorities (e.g. river hydrodynamics and overland flows)							1.1, 1.2, 1.5, 3.8, 4.4, 4.8, 5.3, 5.7, 5.8	Environment Services	HL&W	H	Subject to future budget considerations

#	Action	Management area						Corporate Plan objective	Council lead	Primary collaborators	Priority (VH, H, M, L)	Status
		Headwaters	Lake Cootharaba	Lake Cooroibah	Tewantin to Noosa Heads	Lake Doonella	Lake Weyba					
	- Lake Cootharaba sedimentation study											
2.22	Establish a targeted research program for the Noosa River catchment that includes: - development of a research portal for all Noosa River catchment studies undertaken to date - desktop review, research gaps prioritisation (research portfolio) - development of priority project briefs and exploration of grant opportunities							1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 3.3, 3.4, 3.7, 3.8, 4.4, 4.7, 4.8, 4.9, 5.2, 5.5, 5.6, 5.7	Environment Services	HL&W University & research sector	L	Subject to future budget considerations

Management Objective 3. Manage waterways and coasts to protect its values while enabling sustainable and safe public and cultural access, recreation, and commercial use

The following resources have been considered in developing the Implementation Actions for this management objective:

- **Kabi Kabi Healthy Country Plan 2023 - 2033**
- **Noosa Plan 2020 - Part 7.2.4.3**
- **Australian and Queensland governments' Walking the Landscape Framework**
- **Noosa Local Disaster Management plans**
- **Noosa Shire Flood Management Plan**

#	Action	Management area						Corporate Plan objective	Council lead	Primary collaborators	Priority (VH, H, M, L)	Status
		Headwaters	Lake Cootharaba	Lake Cooroibah	Tewantin to Noosa Heads	Lake Doonella	Lake Weyba					
3.1	Support Kabi Kabi to obtain Land and Sea Ranger funding							1.1, 1.2, 1.3, 1.4, 1.6, 1.7, 2.3, 2.8, 3.2, 3.8, 4.1, 4.4, 5.3, 5.6, 5.7	Environment Services	Kabi Kabi	H	Within existing resources
3.2	Support Kabi Kabi aspirations to access Country and the river system, including planning for a river audit and survey								Environment Services	Kabi Kabi	VH	Subject to future budget considerations
3.3	Support partnership groups' and community educational initiatives							1.2, 1.4, 1.6, 2.8, 3.3, 3.7, 3.8, 5.6	Environment Services	Kabi Kabi NICA Environmental Education Hub Plastic Free Noosa TNC	M	Within existing resources and through grant programs
3.4	Update the Noosa River Catchment Flood Study							1.1, 1.3, 1.8, 2.7, 3.8, 4.4, 4.7, 4.8, 4.9	Strategy & Sustainability	LGAQ DES Department of Local Government, Racing and Multicultural Affairs	H	Funded for FY23/24
3.5	Undertake a Scoping Study and update Noosa River & Six Mile Creek flood hydrology								Strategy & Sustainability	Consultant	H	Funded for FY23/24
3.6	Update the Noosa Council Flood Management Plan								Strategy & Sustainability	Consultant	H	Funded for FY23/24

#	Action	Management area						Corporate Plan objective	Council lead	Primary collaborators	Priority (VH, H, M, L)	Status
		Headwaters	Lake Cootharaba	Lake Cooroibah	Tewantin to Noosa Heads	Lake Doonella	Lake Weyba					
3.7	Implement Council's Encroachments Policy including prioritisation for removal of illegal structures							1.1, 1.2, 1.3, 1.5, 1.6, 5.5, 5.8	Environment Services	MSQ	H	Funded for FY23/24 Ongoing annual funding will be required, subject to future budget considerations
3.8	Develop a Noosaville Foreshore Infrastructure Masterplan in consultation with stakeholders							1.2, 1.3, 1.6, 1.8, 2.2, 2.6, 2.7, 2.8, 4.2, 4.4, 4.5, 4.7, 4.8, 4.9, 5.8	Infrastructure Services	Consultant	H	Funded for FY23/24 Implementation subject to future budget considerations
3.9	Complete the Noosa Woods Jetty Feasibility Study							1.6, 2.7, 4.2	Infrastructure Services	MSQ	H	Study funded for FY23/24
3.10	Design the Tewantin-Moorindil St ferry landings/bank stabilisation works							1.1, 1.8, 2.2, 2.7, 4.2, 5.8	Infrastructure Services	MSQ	M	Subject to future budget considerations
3.11	Undertake the Tewantin Doonella bridge renewal								Infrastructure Services	DES	H	Funded for FY23/24
3.12	Implement the Gympie Terrace stormwater upgrade								Infrastructure Services	DES	H	Funded for FY23/24
3.13	Develop the Noosa Parks Masterplan for sustainable use of Noosa Woods							1.2, 1.3, 1.6, 1.8, 2.2, 2.7, 2.8, 4.2, 4.4, 4.8, 4.9, 5.8	Infrastructure Services	Tourism Noosa	H	Funded for FY23/24
3.14	Partner with MSQ to: • Fund on-shore components of boat ramp facilities							1.8, 2.7, 4.2, 4.4, 5.7, 5.8	Infrastructure Services Environment Services	MSQ Community stakeholders	H	Subject to future budget considerations

#	Action	Management area						Corporate Plan objective	Council lead	Primary collaborators	Priority (VH, H, M, L)	Status
		Headwaters	Lake Cootharaba	Lake Cooroibah	Tewantin to Noosa Heads	Lake Doonella	Lake Weyba					
	• Expedite replacement of the Noosa Woods Pontoon, Gympie Terrace Noosaville Pontoon • Lake Street Tewantin Pontoon • Begin planning processes to upgrade facilities at Albert/Thomas Street (Noosaville) Boat Ramp, Hilton Esplanade (Tewantin) Boat Ramp, Hilton Esplanade (Tewantin) Boat Ramp, and Lake Street (Tewantin) Boat Ramp.											
3.15	Initiate a Parking Study to examine car and trailer parking at and near to boat ramps and additional measures to improve capacity through contemporary parking demand management techniques							1.8, 2.7, 4.2, 4.4, 5.7, 5.8	Infrastructure Services Environment Services	Community stakeholders	H	Funded for FY23/24
3.16	Implement the Noosa Yacht & Rowing Club Precinct Plan							1.6, 1.8, 2.2, 2.6, 2.7, 2.8, 4.3, 4.5, 5.6, 5.8	Community Development	Noosa Yacht & Rowing Club Sporting groups	M	Subject to future budget considerations
3.17	Continue to undertake algal monitoring and update the Algae Action Plan to inform future management							1.1, 1.3, 1.6, 3.7, 4.8, 4.9	Environment Services	NICA	H	Funded for FY23/24 Annual funding required
3.18	Develop an early warning system for algae blooms								Environment Services	GU	H	Funded for FY23/24
3.19	Undertake a baseline bioregion analysis to determine a sustainable fisheries monitoring approach							1.1, 1.4, 1.6, 1.7, 3.8, 4.4	Environment Services	DAF UniSC HL&W Ozfish	H	Subject to future budget considerations

#	Action	Management area						Corporate Plan objective	Council lead	Primary collaborators	Priority (VH, H, M, L)	Status
		Headwaters	Lake Cootharaba	Lake Cooroibah	Tewantin to Noosa Heads	Lake Doonella	Lake Weyba					
3.20	Continue to have Input to the State's fisheries management reform process for the Noosa region								Environment Services	DAF	M	Within existing resources
3.21	Undertake a full socio-economic study on the value of the river to Noosa, the region, State, and Australia/beyond to quantify river values							1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 2.6, 2.8, 3.8, 4.4, 4.6, 5.2, 5.8	Environment Services	Consultant Kabi Kabi	L	Subject to future budget considerations
3.22	Work with volunteer clean-up groups to identify hotspots, better target effort, and determine location responsibilities							1.1, 1.2, 1.6, 2.6, 3.7, 3.8, 4.3, 5.8	Waste	Plastic Free Noosa NICA Australian Marine Debris Initiative CSIRO	H	Within existing resources
3.23	Develop a schedule of community events to inform waste management and compliance activities										M	Within existing resources
3.24	Develop a baseline of litter entering the river annually and continue annual reporting of waste collection efforts										M	Subject to future budget considerations Data sharing agreement with Australian Marine Debris Initiative underway
3.25	Implement recommendations included in Council's Waste Strategy							1.1, 1.2, 1.6, 3.7, 3.8, 5.6, 5.8			M	Subject to future budget considerations
3.26	Continue to implement Council's Reusables Schemes Program (phase out of single-use takeaway cups and containers)										M	Funded for FY23/24
3.27	Develop a comprehensive database of Council approved boat ramps, jetties, and pontoons (illegal structures to be referred to MSQ)							1.2, 1.5, 4.4	Development Assessments	MSQ	H	Subject to future budget considerations

#	Action	Management area						Corporate Plan objective	Council lead	Primary collaborators	Priority (VH, H, M, L)	Status
		Headwaters	Lake Cootharaba	Lake Cooroibah	Tewantin to Noosa Heads	Lake Doonella	Lake Weyba					
3.28	Update the Commercial Businesses on the Noosa River policy to guide commercial activity							1.1, 1.6, 1.8, 3.8, 5.7	Strategy & Sustainability	DoR	H	Within existing resources
3.29	Support a consolidated interactive mapping tool to inform the Noosa River Catchment Management Plan's Monitoring, Evaluation and Reporting Program							1.1, 1.2, 1.6, 1.7, 4.4, 5.3	Environment Services	NICA MSQ	H	Subject to future budget considerations
3.30	Identify and coordinate vessels to be referred to the War on Wrecks Program or Local Laws via quarterly meetings with MSQ								Environment Services Local Laws	MSQ	H	Within existing resources
3.31	Maintain ongoing liaison with MSQ with regards to the proposed anchoring moratorium								Environment Services	MSQ NICA	H	Within existing resources
3.32	Continue to work with MSQ to regulate the management of anchoring, mooring and liveaboards in the Noosa River								Environment Services	MSQ	H	Subject to future budget considerations
3.33	Continue to work with partner organisations and Kabi Kabi to consider capacity for on river presence to enable monitoring and education								Environment Services	MSQ NICA Kabi Kabi	M	Subject to future budget considerations
3.34	Development of Boating and Personal Water Craft Codes of Practice for the Noosa River								Environment Services	MSQ Kabi Kabi Boating Industry Association Local partners	M	Subject to future budget considerations

Management Objective 4. Ensure sustainable development protects catchment hydrology and water quality

The following resources have been considered in developing the Implementation Actions for this management objective:

- **Noosa Climate Change Response Plan**
- **Sunshine Coast and Noosa Regional Climate Action Roadmap**
- **Noosa Shire Flood Management Plan**

#	Action	Management area						Corporate Plan objective	Council lead	Primary collaborators	Priority (VH, H, M, L)	Status
		Headwaters	Lake Cootharaba	Lake Cooroibah	Tewantin to Noosa Heads	Lake Doonella	Lake Weyba					
4.1	Ensure application of Water Sensitive Urban Design principles during design phase of Council projects							1.1, 1.8, 2.7, 3.8, 4.8, 5.3, 5.8	Infrastructure Services Environment Services	HL&W	H	Within existing resources
4.2	Continue to implement the Noosa Council bioretention basin renewals program								Infrastructure Services Environment Services	Contractors	M	Funded for FY23/24 Ongoing annual funding required
4.3	Implement/retrofit stormwater quality improvement devices based on environmental risk								Infrastructure Services Environment Services	Contractors	M	Subject to future budget considerations
4.4	Commence a stormwater education program							1.1, 1.2, 1.5, 1.6, 2.2, 3.7, 3.8, 5.6, 5.8	Environment Services	Environmental Education Hub	M	Subject to future budget considerations
4.5	Undertake an audit of private development infrastructure to ensure compliance with development approvals							1.1, 1.2, 1.5, 1.6, 1.8, 3.7, 3.8	Infrastructure Services Environment Services	Commercial operators	M	Subject to future budget considerations
4.6	Develop a landholder extension program to educate rural landholders on sustainable land management							1.1, 1.2, 1.5, 1.6, 2.6, 2.7, 3.2, 3.3, 3.4,	Strategy & Sustainability	N&DL	M	Subject to future budget considerations –

								3.7, 3.8, 4.4, 4.7, 4.8, 4.9, 5.6, 5.7	Environment Services			Regional Agriculture Landcare Facilitator program to be investigated

10. Monitoring and evaluation

In February 2022 the first Noosa Environment Strategy Monitoring Report was produced to track progress against the Environment Strategy's implementation. The Environment Strategy sets a target, that by 2030, the Noosa River achieves an A rating (or equivalent) for its environmental health. The Noosa River has been rated at an A- for many years, having only recently dropped to a to B for the first time in the Report Card's history.

This was due to significantly increased pollutant loads from moderate to very high, with sediment [mud] load more than tripling from 349kg/ha in 2021 to 1112kg/ha in 2022. Run-off also delivered very high loads of nitrogen (19.3 kg/ha) and phosphorus (1.6 kg/ha) to waterways. The change was attributed to very high rainfall and river flows experienced over the summer months, transporting pollutants from agricultural peri-urban areas downstream.

From 2023, HL&W will no longer provide Report Card grades and will deliver a Stewardship Report instead of a Report Card in alternate years (beginning 2024) to assist local governments in monitoring trends, tracking progress, and developing local implementation priorities.

A cohesive Noosa River Catchment Monitoring and Evaluation Reporting Program will sit alongside this Plan to build on current monitoring, provide a more comprehensive local picture of ecosystem condition and management needs, and drive iterative catchment management.

This will be consistent with best practice management of the Noosa Biosphere and will be integrated with the Noosa Environment Strategy, the Mary River Catchment Strategy, South East Queensland Natural Resource Management Plan and other relevant monitoring and evaluation frameworks. This will strengthen the Plan's effectiveness in the long term by adopting a regional approach and increasing its measurability, transparency, and accountability.

It is important that the effectiveness of the management actions in the plan are regularly reviewed to:

- Ensure an adaptive approach to management.
- Provide for continuous improvement and learning.
- Inform prioritisation and resourcing of management actions ongoing.

Annual review and monitoring of progress will occur in conjunction with the annual Environment Strategy implementation plan monitoring and evaluation.

Governance frameworks and communications protocols will also accompany the monitoring and evaluation program.

Guidance will also be provided for future river research to help direct where universities and non-government bodies can support scientific understanding and implementation. Partnerships and research collaborations are an essential component of implementation and provide considerable capacity and return on investment, e.g. the TNC Noosa Oyster Ecosystem Restoration Project partnership and several existing research collaborations with Noosa Biosphere Reserve Foundation, UniSC, UQ, Griffith, ANU and others. Council will continue to facilitate and incentivise systematic partnership collaborations. This may then help target larger external funding support from donors, State, or Federal agencies.

Appendix 1 - Noosa River's existing management arrangements

Agency	Responsibilities	Legislation conferring powers
Australian Maritime Safety Authority	Safety and protection of the marine environment and ship-sourced pollution Infrastructure for safe navigation Search and rescue	*Australian Maritime Safety Authority Act 1990*
Commonwealth	Native Title	*Native Title Act 1993*
Department of Environment and Science	Protection of native plants and animals Management of National Parks and other protected areas Licensing of commercial operators using National Parks and other protected areas	*Nature Conservation Act 1992*
	Approvals for structures below high-water mark	*Planning Act 2016* *Coastal Protection and Management Act 1995*
	Approvals for reclamation of land below high-water mark	*Planning Act 2016* *Coastal Protection and Management Act 1995* *Environmental Protection Act 1994*
	Management of development in a coastal management district	*Planning Act 2016* *Coastal Protection and Management Act 1995*
	Allocation of quarry material on State Land below high water	*Coastal Protection and Management Act 1995*
	Investigate and respond to significant pollution events (serious or material environmental harm) via Pollution Hotline 1300 130 372 or pollutionhotline@des.qld.gov.au Non-devolved Environmentally Relevant Activities Fish kills (50+)	*Environmental Protection Act 1994*
	Environmental Values for Water Quality Objectives	Environmental Protection (Water and Wetland Biodiversity) Policy 2019 https://environment.des.qld.gov.au/__data/assets/pdf_file/0029/86663/factsheet-evs-wqos-epp-water.pdf

	Protection of groundwater dependent ecosystems	*Environmental Protection Act 1994*
Department of Seniors, Disability Services and Aboriginal and Torrs Straight Island Partnerships	Duty of care requirements for protection of Aboriginal heritage	*Aboriginal Cultural Heritage Act 2003*
Maritime Safety Queensland	Mooring approvals (overlap with Department of Agriculture and Fisheries) Marine safety including speed limits and distance off Ship safety standards Management of Pilotage Areas e.g. Noosa River Marine Zone	*Transport Operations (Marine Safety) Act 1994*
	Registration and monitoring of commercial and fishing ships Registration of private vessels	
	Prevention of marine pollution	*Transport Operations (Marine Pollution) Act 1995*
	Liveaboards – shipping inspectors have location-based powers Anchoring restrictions	*Transport Infrastructure Act 1994*
Department of Agriculture and Fisheries	Queensland Boating and Fisheries Patrol enforces Marine Safety legislation through surveillance and inspection Implements and enforces compliance with Queensland's fishing rules and regulations Undertakes related education with industry and community groups	*Transport Operations (Marine Safety) Act* *Fisheries Act 1994*
	Fish habitat protection Fisheries (East Coast Trawl) Protection of and permits for taking of marine plants Management Plan - closed fishing areas Issue of Restoration Notices to impose specific requirements for habitat and stock restoration	*Planning Act 2016* *Fisheries Act 1994*
	Resource Allocation for works in a Declared Fish Habitat Area	*Fisheries Act 1994*
Department of Resources	Land tenure: Freehold land	*Land Act 1994*

	Leasehold land Reserves Unallocated State Land	
	Seabed tenure: Leases Licences to occupy foreshores Permits to occupy	*Land Act 1994*
Department of Regional Development, Manufacturing and Water	Licences extraction of surface and groundwater resources	*Water Resources Act*
Healthy Land and Water	Ecosystem Health Monitoring Program	*South East Queensland Natural Resource Management Plan 2009–2031*
Noosa Council	Urban stormwater management - Prescribed Water Contaminant Regulation Control and management of foreshores between high water and low water - includes jetties and commercial boating activities and erosion control measures Management of foreshore and provision of recreation areas and facilities Public health Reserves Boat ramps Roads and parking including trailer parking Ferry service at Tewantin Licensing of jetties	*The Noosa Plan 2020* *Environmental Protection Act 1994* *Planning Act 2016* *Coastal Protection and Management Act 1995* Local Laws (e.g. for jetties and bathing reserves) Policies Strategies
	Addressing climate change risks and improving resilience	*Local Government Act 2009* Local Government Principles (S4(2)) that require risks to be managed and addressed by local government *Queensland Planning Act 2016*

		Queensland State Planning Policy *Disaster Management Act 2003*
	Coordination and management of disasters and emergency events within the Shire	*Disaster Management Act 2003* Local Disaster Management Group & Coordination Centre Local Disaster Management Plan
	Management of foreshore and provision of recreation areas and facilities	*Environmental Protection Act 1994* Development application for operational works on State coastal land
	Management of pollution control under delegation from DES e.g. regulation of environmentally relevant activities	*Environmental Protection Act 1994* Minor water contamination devolved to Council under 440ZG
	Town planning and development control Vegetation and habitat protection	*Integrated Planning Act 1997* Planning Scheme Local Laws (e.g. for vegetation management) Policies
QF5 Noosa - Australian Volunteer Coast Guard	Marine safety patrols and education Radio communications	
Queensland Fire and Emergency Services	Fire and emergency services	*Fire and Emergency Services Act 1990*
Queensland Police Service	Enforces boating safety laws through surveillance and inspection e.g. speed limits, boat licenses, registrations and complaints	Gazetted speed limits
Seqwater	Queensland Bulk Water Supply Authority Essential flood mitigation services Catchment health management Rural farmer irrigation	*Water Act 2000* Mary Valley Scheme
Unitywater	Water quality Sewage treatment plants	*Environmental Protection Act 1994* Environmental Authority

Appendix 2 – Risk Assessment Framework

Minimal risk

Low risk

Moderate risk

High risk

Unknown / TBD

Icon legend to be added, from L-R

Catchment hydrology
Ecology and biodiversity
Water quality
Inclusive decision making
Boating and recreational fishing
Recreation
Tourism
Lifestyle and liveability
Agriculture, primary production, and rural tourism

Threats	Ecological (intrinsic) values			Community values					
Lack of a coordinated approach									
Climate change									
Sea level rise									
More frequent and intense rainfall events									
Increased weed infestations									
Extended dry conditions, and periods of extreme heat									
Decline in environmental flows									
Decline in water quality									
Increase river temperature									
More frequent and intense bushfires with sediment and ash run-off									
Steep headwaters and sediment									
Flash flooding									
Sediment run-off									

Threats	Ecological (intrinsic) values			Community values					
									
Broad clearing with soil loss									
Nutrients and chemical contaminants									
Sediment in the river, and regular resuspension of sediment									
Rural dirt roads									
Sediment from rural roads									
Other pollutant contamination from rural roads									
Degraded wetlands									
Weeds and pest animals									
Anthropogenic uses/activities (clearing, overgrazing, urban development, recreation)									
Damage to cultural values, artefacts, or areas of cultural significance									
Boat wash accelerating streambank erosion									
Urban pollution									
Untreated stormwater									
Increase in hardstand areas									
Elevated and unprocessed nitrogen and phosphorous									
High intensity industrial or commercial land uses									
Release of household grade chemicals									
Release of pool water to stormwater system									
Littering									
Building sites without erosion controls in place and pollutant runoff									
Illegal dumping of rubbish and recyclables (including of plastics that produce micro and nano plastics as they degrade)									
Recreational and commercial use									
Motorised and non-motorised vessels competing for limited water									
Abandoned and derelict vessels in the river									
Anchored vessels left unattended for long periods of time									
Swing moorings located in seagrass meadows									
Discharging vessel waste directly into the river									

Threats	Ecological (intrinsic) values			Community values					
Decline in fish abundance and diversity									
Environmental flows									
Water extraction									
Waterway barriers									
On-site sanitary wastewater systems									
Sewage effluent runoff									
Human illnesses associated with failed on-site treatment									
Algal blooms									
Algal blooms									
Decomposing alga									
Barriers to fish passage									
Physical barriers which inhibit fish movement									
Alteration of the natural flow conditions									
Weed and sediment chokes									
Chemical barriers (pollution or acidification of waterways)									

LIKELIHOOD	LEVEL OF RISK				
Almost certain	Minimal	Low	Moderate	High	High
Likely	Minimal	Low	Moderate	High	High
Possible	Minimal	Minimal	Low	Moderate	High
Unlikely	Minimal	Minimal	Minimal	Low	Moderate
Rare	Minimal	Minimal	Minimal	Minimal	Low
CONSEQUENCE LEVEL	**Insignificant**	**Minor**	**Moderate**	**Major**	**Catastrophic**

Likelihood

Rare	This threat is extremely unlikely to be realised at a level that would impact on the benefit within a 20-year period
Unlikely	This threat is not expected to be realised at a level that would impact on the benefit in a 10-year period but could be expected in a 20-year period
Possible	This threat is not expected to be realised at a level that would impact on the benefit every year, but could be expected in a 10-year period
Likely	This threat is not expected to be continuous but could be expected to be realised at a level that would impact on the benefit every year.
Almost Certain	This threat is expected to be realised at a level that would impact on the benefit frequently through a year or more-or-less continuously.

Consequence

Insignificant	Realisation of this threat would not have a discernible impact on the benefit at a catchment-wide scale
Minor	Realisation of this threat would have only a small or very temporary impact on the benefit at a catchment-wide scale.
Moderate	Realisation of this threat would significantly reduce the benefit over the medium term (5-10 years) at a catchment-wide scale or have major consequences for a sensitive benefit at a local level.
Major	Realisation of this threat would substantially reduce the benefit over an extended period (10-20 years), but not totally or permanently, at a catchment-wide scale, or would have catastrophic consequences for a sensitive benefit at a local level.
Catastrophic	Realisation of this threat would effectively terminate delivery of the benefit either permanently or for a very extended period (>20 years) at a catchment-wide scale.

Appendix 3 – Stakeholder consultation

Traditional Owners, staff and researchers within the following organisations and internal branches of Council have been consulted in the development of the 2023 Noosa River Catchment Management Plan as well as many community members representing a range of sectors:

Kabi Kabi People's Aboriginal Corporation
Noosa Integrated Catchment Association
Noosa & District Landcare Group
Noosa Biosphere Reserve Foundation
Noosa River Stakeholder Advisory Committee
Mary River Catchment Coordinating Committee
Healthy Land & Water
Department of Environment and Science
Department of Agriculture and Fisheries
Maritime Safety Queensland
South East Queensland Council of Mayors
The Nature Conservancy
University of the Sunshine Coast
Noosa Boating and Fishing Alliance
Boating Industry Association
Infrastructure Design & Asset Maintenance
Environment Services
Strategy and Sustainability
Waste Education
Local Laws
Community Engagement
Procurement
Disaster Management
Property
Community Development
Plumbing & Building

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