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CREATE CHANGE

A 10-YEAR ROADMAP

Water Quality Strategy

MACKAY WHITSUNDAY REGION

2025 - 2035

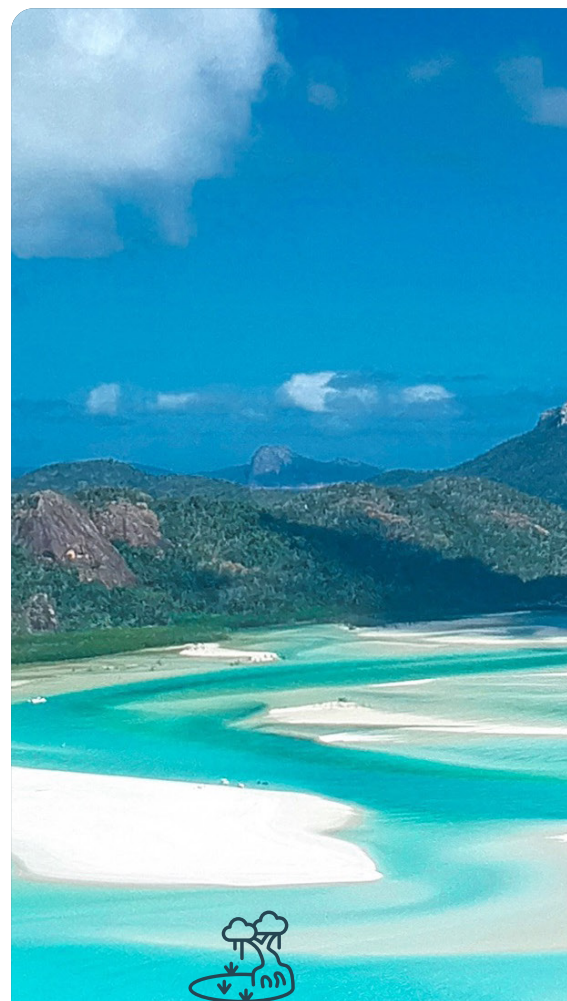


About the Mackay Whitsunday Region

The Mackay Whitsunday region is home to around 175,700 people and seven Traditional Owner groups — Yuwibara, Juru, Gia, Ngaro, Koinjmal, Barada and Widi — and generates approximately \$22 billion for the Queensland economy each year. The region's relatively high rainfall and mineral-rich soils underpin some of Australia's most productive industries, including the nation's largest sugarcane production area, as well as beef cattle grazing, horticulture, mining and tourism.

Despite covering only 2% of the Great Barrier Reef catchment area, the Mackay Whitsunday region contains 20% of its coastline, including over 500 km² of seagrass meadows, more than 3,000 km² of coral reefs, and several nationally significant wetlands, including the Goorganga Plain wetlands complex. In short, the region punches well above its weight in ecological terms.

The choices made on land and how we manage our catchments influence what enters our waterways and reaches the Reef. This Strategy sets out how we can work together to improve coastal and marine water quality and ecosystem health in the region over the next decade.



4%
of Wetlands in GBR
Catchment



175,700
People



7
Traditional Owner
Groups



3000km²
Coral Reef



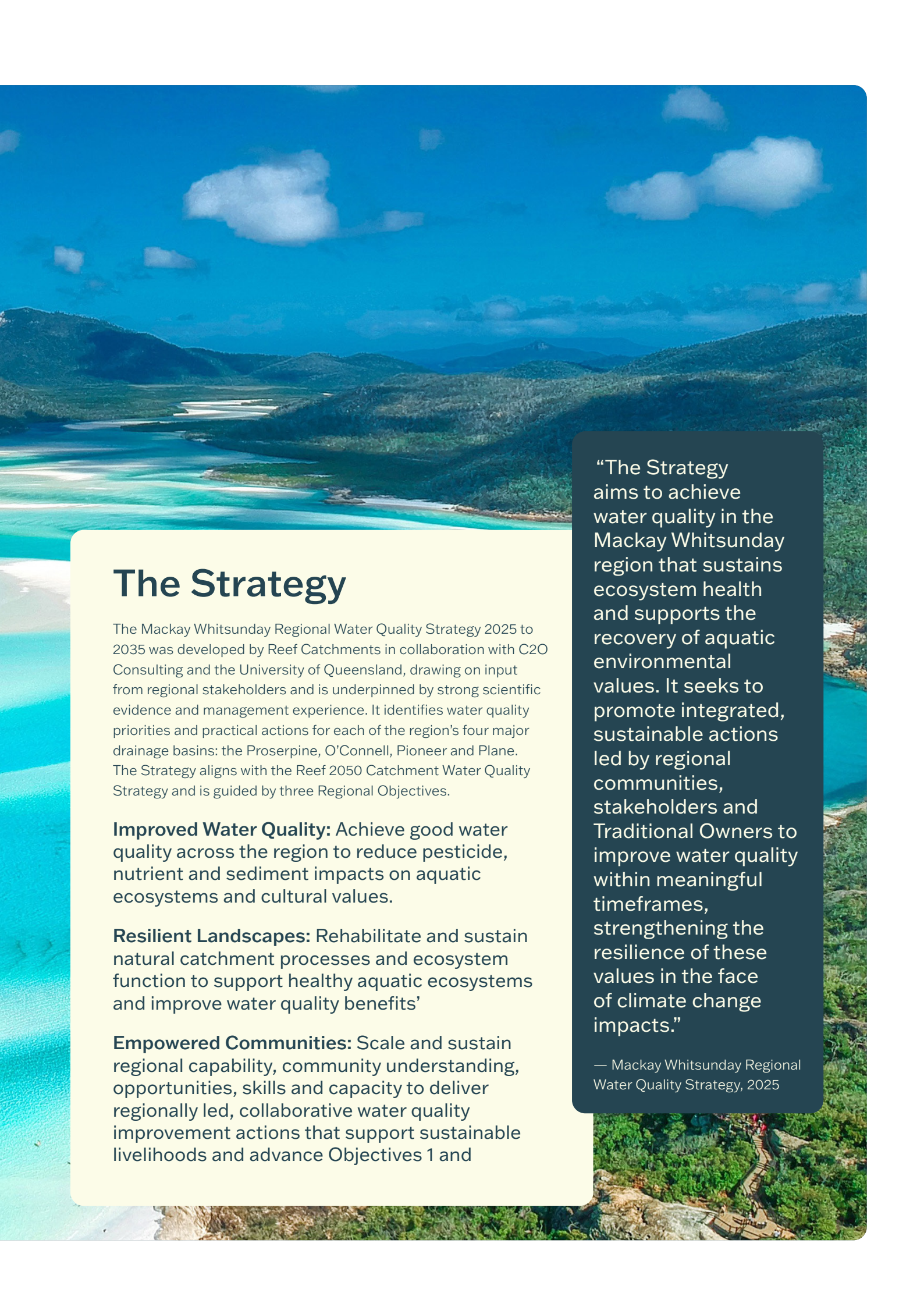
\$22b
Economy



20%
of Coastline and 2%
of GBR Catchment



500km²
Seagrass



The Strategy

The Mackay Whitsunday Regional Water Quality Strategy 2025 to 2035 was developed by Reef Catchments in collaboration with C2O Consulting and the University of Queensland, drawing on input from regional stakeholders and is underpinned by strong scientific evidence and management experience. It identifies water quality priorities and practical actions for each of the region's four major drainage basins: the Proserpine, O'Connell, Pioneer and Plane. The Strategy aligns with the Reef 2050 Catchment Water Quality Strategy and is guided by three Regional Objectives.

Improved Water Quality: Achieve good water quality across the region to reduce pesticide, nutrient and sediment impacts on aquatic ecosystems and cultural values.

Resilient Landscapes: Rehabilitate and sustain natural catchment processes and ecosystem function to support healthy aquatic ecosystems and improve water quality benefits'

Empowered Communities: Scale and sustain regional capability, community understanding, opportunities, skills and capacity to deliver regionally led, collaborative water quality improvement actions that support sustainable livelihoods and advance Objectives 1 and

“The Strategy aims to achieve water quality in the Mackay Whitsunday region that sustains ecosystem health and supports the recovery of aquatic environmental values. It seeks to promote integrated, sustainable actions led by regional communities, stakeholders and Traditional Owners to improve water quality within meaningful timeframes, strengthening the resilience of these values in the face of climate change impacts.”

— Mackay Whitsunday Regional Water Quality Strategy, 2025

Water Quality

In the Mackay Whitsunday Region

There are three types of pollutants that are the primary concern for the Great Barrier Reef: nutrients, fine sediment and pesticides (nitrogen including dissolved inorganic nitrogen, or DIN, and phosphorus). Each has distinct sources, pathways into waterways and impacts on aquatic ecosystems.

Dissolved Inorganic Nitrogen (DIN) and other nutrients

Despite covering just 2% of the Great Barrier Reef's catchment area, the region contributes 8.4% of the total dissolved inorganic nitrogen (DIN) load, with a modelled annual average of around 777 tonnes. DIN loads have increased by 1.8 to 4.5 times compared to pre-development rates, driven largely by fertiliser use. Elevated concentrations of phosphorus are also characteristic of water quality conditions in the Mackay Whitsunday region.

Manageable sources: Sugarcane (51% of DIN from 17% of land area) and urban areas and sewage treatment plants (12%).

Fine Sediment

The modelled annual average fine sediment load from the region is approximately 429 kilotonnes, representing a 3.3 to 5.8 times increase on pre-development rates. Streambank erosion drives 78% of the fine sediment load.

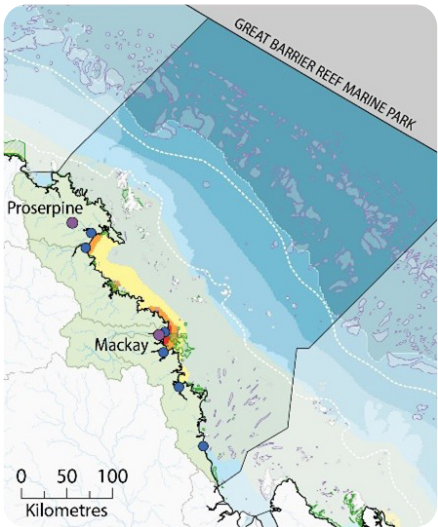
Manageable sources: Streambank and grazing areas (88% of fine sediment load).

Pesticides

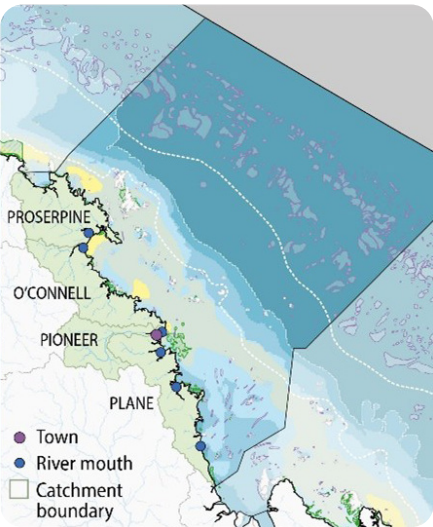
The Mackay Whitsunday region has the highest pesticide risk of any Great Barrier Reef region, with all four basins consistently rated 'Poor' to 'Very Poor' since 2016. More than 90% of the total pesticide risk can be attributed to just six chemicals, with diuron and imidacloprid the dominant contributors. Over a wet season, pesticide concentrations in the region can affect an average of up to 42% of aquatic species, against a government target to protect at least 99%. Pesticide exposure extends into inshore marine environments, reaching seagrass beds, coral reefs and Dugong Protection Areas.

Manageable sources: Pesticide application in sugarcane (primary), horticulture, irrigated and dryland cropping, and urban areas.

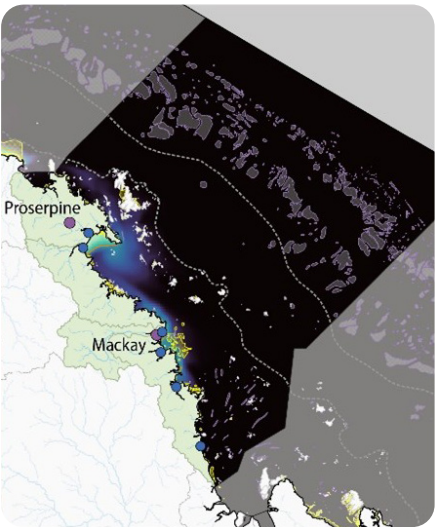
DIN Exposure



TSS Exposure



Pesticides - Diuron*



*2016-2017 monitoring year



Ecosystem Condition and Management Response

Ecosystem condition at a glance

Ecosystem	Condition
Coral reefs	Poor
Seagrass meadows	Moderate
Freshwater floodplain wetlands	Poor where monitored in Proserpine and Plane basins (no data for O'Connell or Pioneer)
Estuaries	Moderate to Very Good depending on basin

Climate context

Climate change is the greatest long-term threat to the Great Barrier Reef. Improving water quality is the most effective action this region can take to strengthen Reef resilience and support ecosystem recovery between disturbances. Achieving the water quality needed to sustain Reef ecosystems requires significantly more action, delivered at greater scale and sustained over time.

Management response required

The Strategy uses a four-level **Management Response framework** to define how intensively each pollutant must be managed in each basin.

Response level	What it means
Foundational	Pollutant exposure is Minimal , therefore maintain current good condition. Protect against future risks.
Proactive	Pollutant exposure is Low , therefore prevent emerging risks from becoming bigger problems.
Accelerated	Pollutant exposure is Moderate , therefore actively reduce pollutant exposure with targeted, coordinated action.
Intensive	Pollutant exposure is High , therefore urgent, large-scale, multi-land use intervention required.

Basin	Pesticides	Nutrients	Sediment
Proserpine	Intensive	Accelerated	Foundational
O'Connell	Intensive	Accelerated	Accelerated
Pioneer	Intensive	Accelerated	Accelerated
Plane	Intensive	Accelerated	Proactive

How the Strategy works: three action areas, four response levels

The Strategy is built around a clear framework that connects the **Why, What and How** of water quality management, showing how the actions that are implemented at the basin scale will lead to the outcome desired at the regional scale, which in turn support achievement of the outcomes at the Great Barrier Reef scale.

It synthesises evidence on water quality problems, ecosystem conditions and management solutions to develop strategic, practical actions, basin by basin. It defines not just what improvements need to be made, but the scale and urgency of actions, and how delivery should be designed to match the barriers facing landholders, councils and NRM practitioners.

Action Area I

Sustainable Land Use and Management

Prioritises areas and actions to reduce pollutants at their primary sources.

The focus is on sustainable land management practices that reduce pesticides, nutrients and sediment entering waterways at the source. For sugarcane, this means precision nutrient management, reduced pesticide application rates, improved irrigation scheduling, and switching to lower-risk products. For grazing lands, it means maintaining ground cover above 70%, managing stocking rates, and keeping cattle out of riparian zones. Urban areas have a role too, through stormwater treatment and sewage treatment upgrades.

Action Area II

Natural Systems Repair

Prioritises landscapes for rehabilitation, which filter and buffer pollutants, and aquatic ecosystems for recovery – including streambank and riparian zones, gullies, wetlands, fish passages, seagrass and coral ecosystems.

Even with improved land management, decades of land clearing, wetland loss or modification, and streambank degradation mean that the region's natural filtration systems are compromised. This action area targets the repair of streambanks, riparian vegetation, wetlands and fish passage barriers, restoring the landscape's capacity to capture, attenuate and process pollutants before they reach the Reef. Streambank rehabilitation is the highest priority across most basins given its dominant role in sediment generation.

Action Area III

Scaled Delivery translates Action Areas I and II into action and delivery strategies

Prioritised and scaled management actions and delivery pathways that are tailored to the basin's pollutant sources and water quality drivers, and the capacity, opportunities, and motivations of its land managers.

Even the best technical solutions will fail without effective delivery. This action area addresses the practical areas such as access to expertise, trusted extension networks, economic incentives, peer-to-peer learning, and decision-support tools, that determine whether landholders and managers actually adopt improved practices. Research shows that capability in the region is generally strong, but the key barriers are opportunity (time, cost and access to support) and efficacy (belief that individual actions make a difference). Delivery must be designed to address these specifically.

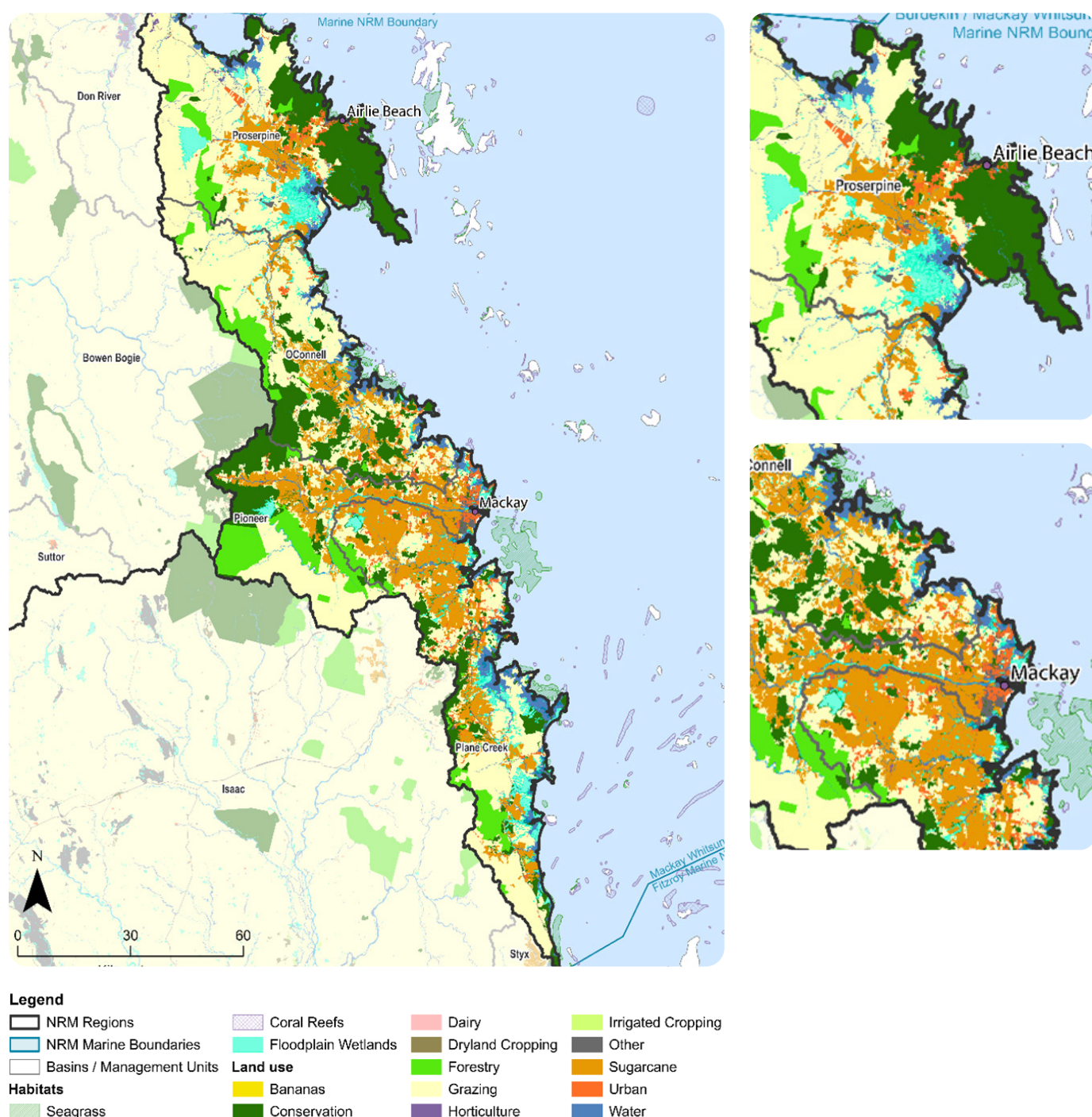
Basin Priorities 2025 to 2035

A coordinated, multi-pollutant management response is required for all four basins. This includes Intensive management action for pesticides across the basins and Accelerated nutrient management in targeted sub-catchments. Accelerated sediment management is required in targeted sub-catchments of the O'Connell and Pioneer basins, localised Proactive management in Plane Creek basin and Foundational management in Proserpine basin.

Freshwater floodplain wetland hazard exposed areas require Intensive management for all pollutants due to more localised exposure risks (with the exception of Accelerated management of sediment in Plane basin).

Reduced vegetation clearing, riparian vegetation and wetland modification/loss is required and increased revegetation and wetland rehabilitation that improves connectivity, water quality and ecosystem service functions.

The priority actions below focus on basin-specific issues and hotspots; shared management actions for sugarcane, grazing and urban areas are summarised on the following page.



Proserpine Basin

28% of region

Grazing 50%

Conservation 23%

Sugarcane 10%

The most northerly basin, containing the region's largest remaining freshwater wetland area: the Goorganga Plains complex, a wetland of national significance. Edgumbe Bay and Repulse Bay are Fish Habitat Areas (FHAs) and Dugong Protection Areas (DPAs).

Sugarcane areas are the dominant source of total DIN loads (43%), followed by urban areas and sewage treatment plants (12%). Fine sediment loads are the lowest in the region (32 kilotonnes per year), with streambank (40%) and grazing (24%) areas the primary sources. Pesticide risk is consistently Very High in the Proserpine River – the biggest contributors are imidacloprid (an insecticide) and diuron (a herbicide)

Actions for Sustainable Land Use and Management:

- Actively reduce DIN in sugarcane, followed by urban and point sources. Sugarcane is also likely to be the primary source of phosphorus (although information is limited).
- Actively reduce sediment exposure on freshwater floodplain wetlands.
- Expedite reductions in pesticide risk from sugarcane, followed by horticulture, irrigated and dryland cropping, grazing and non-agricultural land uses.

Actions for Natural Systems Repair:

Evaluate drivers of poor wetland condition, with focus on protection and rehabilitation of the Goorganga Plains wetland complex, construction of small-scale treatment systems, and issues associated with ponded pastures and management of Weeds of National Significance.

- Support research, development and implementation of coral and seagrass restoration activities. Investigate drivers of poor inshore coral reef condition in Repulse Bay and the Whitsunday Islands.
- Rehabilitation of streambanks at priority hotspots including Eden Lassie Creek and Thompson Creek.
- Support fish barrier removal to restore ecological connectivity.

O'Connell Basin

26% of region

Grazing 50%

Conservation 20%

Sugarcane 13%

The region's sediment hotspot, contributing 50% of the total fine sediment load despite covering 26% (214 kilotonnes annual average load) of the area. Steep terrain and high rainfall amplify erosion risk. Only 132 hectares of natural unmodified freshwater floodplain wetland remain from an original 751 hectares. Grazing (38%) and sugarcane (39%) areas are the dominant source of DIN. Pesticide risk is Moderate to High, and imidacloprid and diuron are the major contributors to the risk.

Actions for Sustainable Land Use and Management:

- Protection and rehabilitation of streambanks, with priority sites at Murray Creek and St Helens Creek.
- Reduce sediment erosion in grazing; address hillslope erosion in the upper catchment.
- Actively reduce DIN in sugarcane, followed by urban and point sources. Sugarcane is also likely to be the primary source of phosphorus (although information is limited).
- Expedite reductions in pesticide risk from sugarcane, followed by horticulture, dryland cropping, grazing and non-agricultural land uses.

Focus areas for Natural Systems Repair:

- Survey freshwater floodplain wetland condition and validate wetland hazard assessments.
- Investigate potential seagrass and coral interventions close to high value ecosystems such as the Midge, Repulse and Sand Bay Fish Habitat Areas, and the Repulse Bay, Stewart Peninsular-Newry Island-Ball Bay and Ball Bay-Sand Bay Dugong Protection Areas

Pioneer Basin

18% of region

Grazing 31%

Conservation 21%

Sugarcane 19%

Forestry 18%

The smallest and most intensively developed basin. Sugarcane contributes 68% (annual average load) of DIN, the highest proportion of any basin. Pesticide risk is High to Very High, and diuron and imidacloprid are major contributors. Streambank areas are the primary sources of fine sediments (82%). Only 227 hectares of natural unmodified freshwater floodplain wetland remain, with 92% of the original extent lost or modified.

Actions for Sustainable Land Use and Management:

- Actively reduce DIN and other nutrients in sugarcane, followed by urban and point sources. Sugarcane is also likely to be the primary source of phosphorus (although information is limited).
- Expedite reductions in pesticide risk from sugarcane, followed by horticulture and dryland cropping, grazing and non-agricultural land uses.

Actions for Natural Systems Repair:

- Accelerate sediment reductions through protection and rehabilitation of streambanks, with a focus on Upper Cattle Creek.
- Fish barrier removal and modification to restore ecological connectivity.
- Survey wetland condition and validate wetland hazard assessments as a priority: protecting what remains is critical.

Plane Basin

28% of region

Grazing 38%

Sugarcane 26%

Conservation 15%

The basin with the highest DIN load in the region (total annual average load 229 tonnes) and the largest sugarcane area at approximately 65,000 hectares. Sandy Creek is among the most pesticide-affected waterways in the entire Great Barrier Reef catchment area. Pesticide risk is consistently Very High at Sandy Creek but lower in the southern part of the basin. Major contributors are diuron and imidacloprid. Over 78% of natural freshwater floodplain wetlands have been lost or modified.

Actions for Sustainable Land Use and Management:

- Expedite reductions in pesticide risk from sugarcane, followed by horticulture, irrigated and dryland cropping, grazing and non-agricultural land uses.
- Actively reduce DIN in sugarcane. Sugarcane is also likely to be the primary source of phosphorus (although information is limited). Address urban DIN contribution: urban areas and sewage treatment plants contribute 14% of the Plane basin's DIN load, the highest urban contribution in the region.
- Reduce sediment erosion in grazing south of Sarina.

Focus areas for Natural Systems Repair:

- Protection and rehabilitation of streambanks
- "Investigate potential interventions for freshwater floodplain wetlands, seagrass and coral in proximity to high value areas such as the Broad Sound, Cape Palmerston-Rocky Dam and West Hill Fish Habitat Areas and Ince Bay Dugong Protection Area.

How to Get Involved

Every land manager, Traditional Owner group, council, industry body, government agency and community organisation in the Mackay Whitsunday region can contribute. The actions below reflect the Strategy's priority actions and are the evidence-based practices most likely to make a measurable difference.

Farmers and land managers

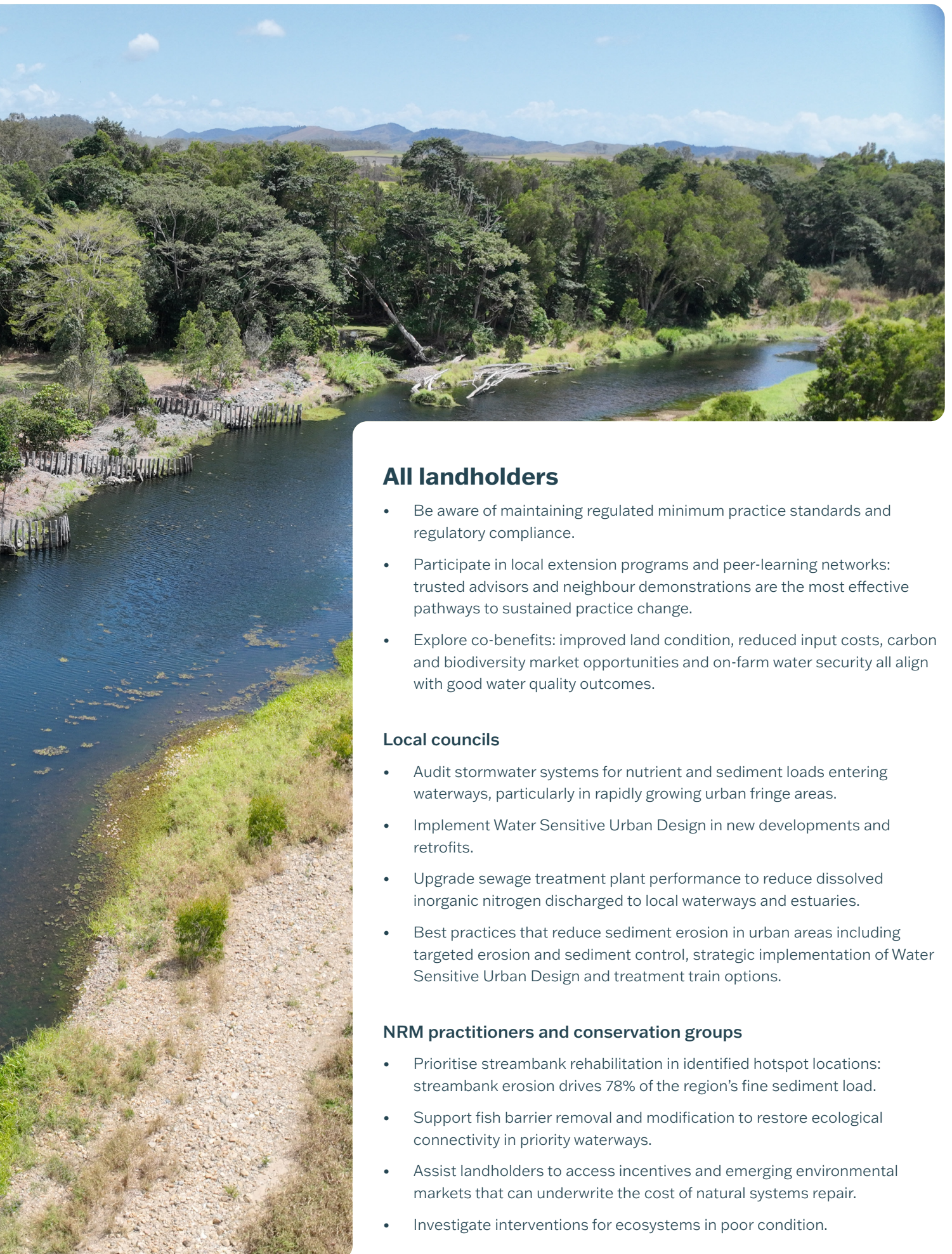
Sugarcane growers

- Adopt holistic, farm-specific nitrogen accounting and address soil constraints, improve soil health, address drainage, waterlogging and irrigation management.
- Reduce pesticide application rates, use lower-risk products where possible and optimise timing relative to rainfall forecast.
- Explore precision application technologies and integrated pest management to reduce chemical loads.
- Work with your mill on scheduling and harvest timing to avoid high-risk application windows.
- Adopt best practices that reduce phosphorus runoff and sediment erosion

Grazing land managers

- Maintain ground cover above 70% through the late dry season to guard against hillslope erosion.
- Match stocking rates to available feed, pasture spelling and reseeding, selective grazing with fencing, and improved herd management, ahead of the wet season and conduct regular land condition assessments.
- Fence cattle out of riparian zones and consider streambank revegetation.
- Manage linear features including unsealed roads and implement feral animal control.





All landholders

- Be aware of maintaining regulated minimum practice standards and regulatory compliance.
- Participate in local extension programs and peer-learning networks: trusted advisors and neighbour demonstrations are the most effective pathways to sustained practice change.
- Explore co-benefits: improved land condition, reduced input costs, carbon and biodiversity market opportunities and on-farm water security all align with good water quality outcomes.

Local councils

- Audit stormwater systems for nutrient and sediment loads entering waterways, particularly in rapidly growing urban fringe areas.
- Implement Water Sensitive Urban Design in new developments and retrofits.
- Upgrade sewage treatment plant performance to reduce dissolved inorganic nitrogen discharged to local waterways and estuaries.
- Best practices that reduce sediment erosion in urban areas including targeted erosion and sediment control, strategic implementation of Water Sensitive Urban Design and treatment train options.

NRM practitioners and conservation groups

- Prioritise streambank rehabilitation in identified hotspot locations: streambank erosion drives 78% of the region's fine sediment load.
- Support fish barrier removal and modification to restore ecological connectivity in priority waterways.
- Assist landholders to access incentives and emerging environmental markets that can underwrite the cost of natural systems repair.
- Investigate interventions for ecosystems in poor condition.



Get involved

To find out more about the Mackay Whitsunday Regional Water Quality Strategy, or to connect with delivery programs in your area, contact Reef Catchments.

Phone: (07) 4968 4200

Website: reefcatchments.com.au



Australian Government

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The Mackay Whitsunday Regional Water Quality Strategy 2025 to 2035 was developed by Reef Catchments in collaboration with C2O Consulting (coasts|climate|oceans) and the University of Queensland, with funding from the Australian Government's Landscape Repair Program. The accompanying Synthesis Report provides the full evidence base underpinning this Strategy.