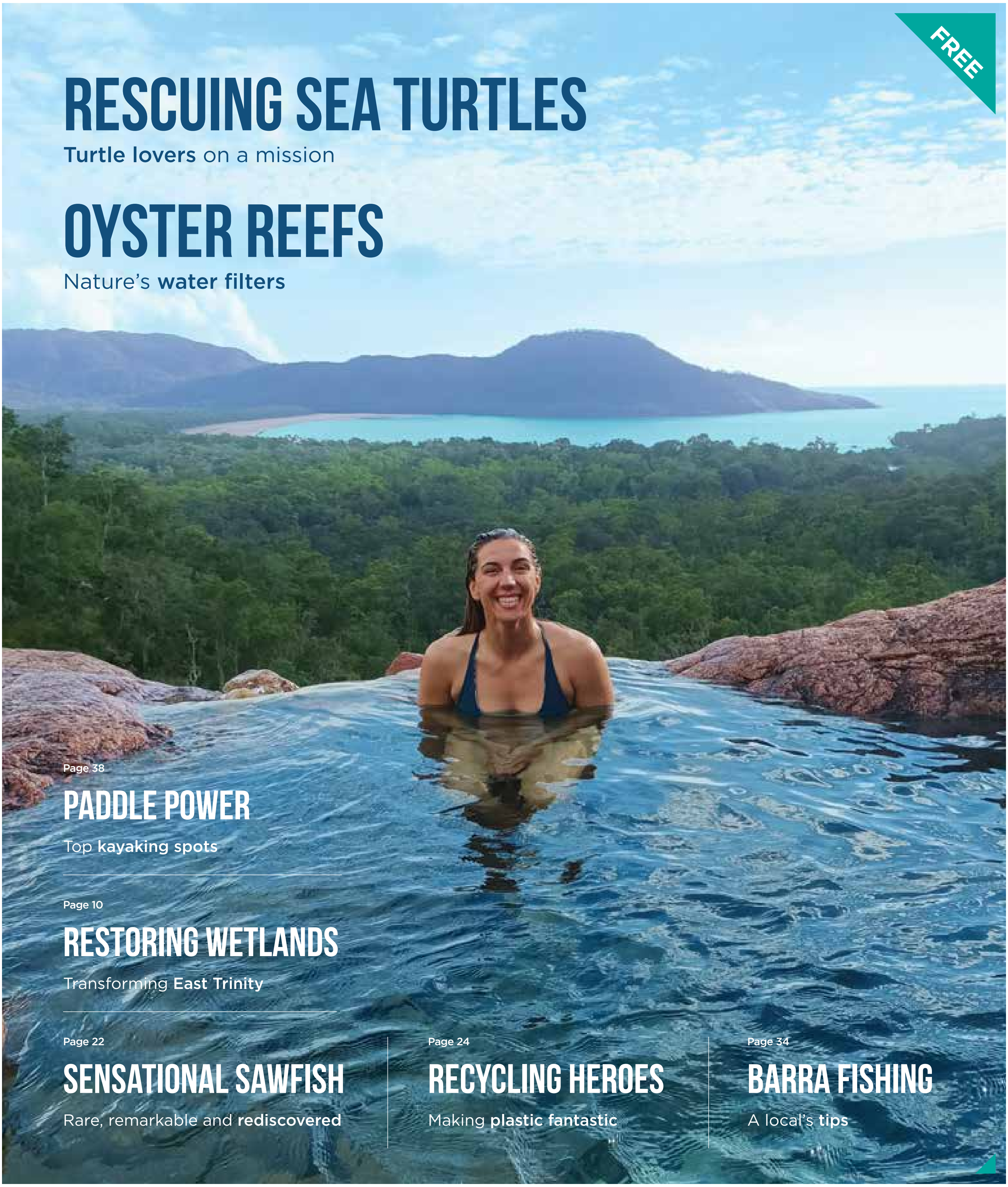
Fifth Edition

reef and rivers

YOUR **WET TROPICS WATERWAYS** LIFESTYLE & ENVIRONMENT MAGAZINE



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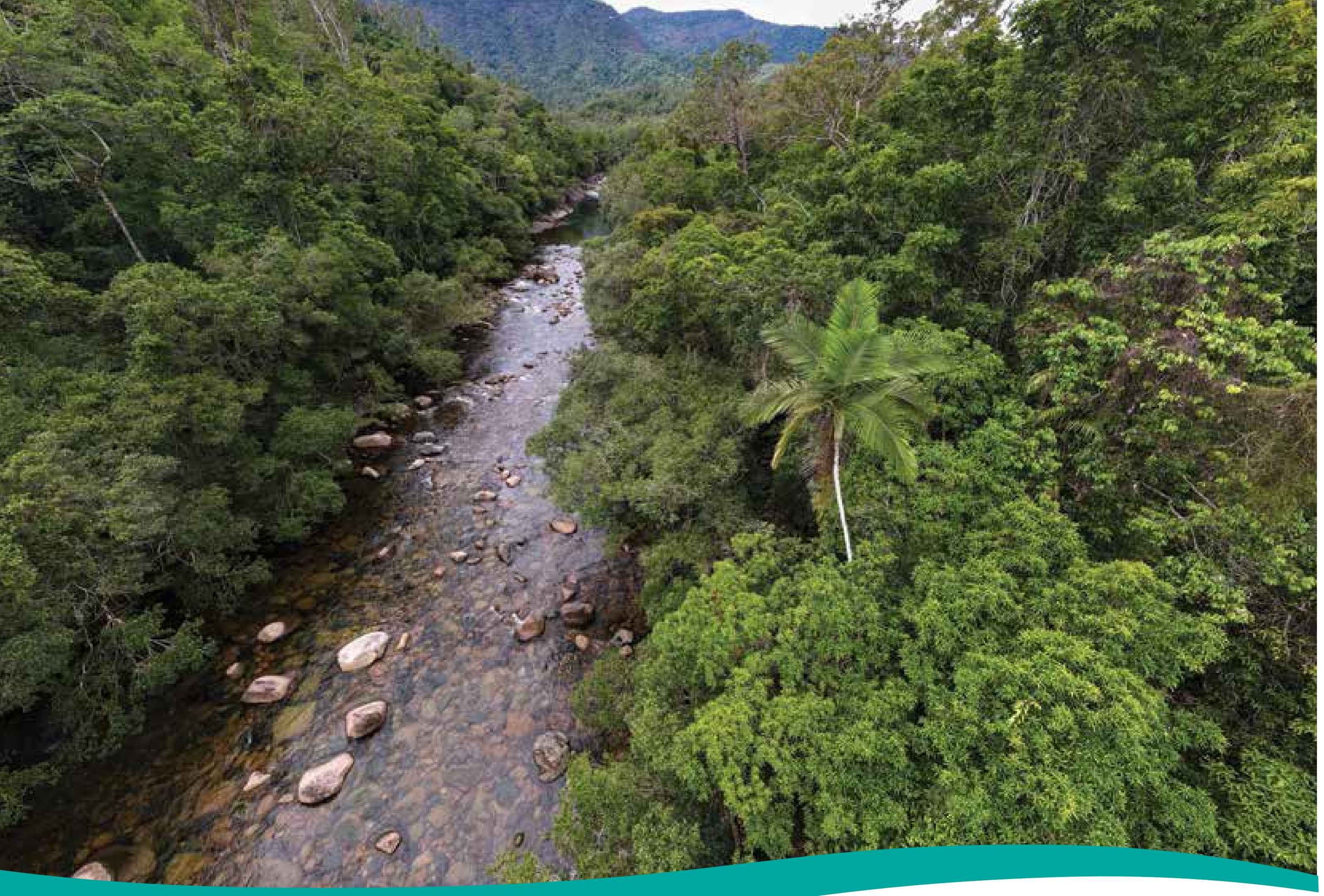

Wet Tropics Waterways

www.wettropicswaterways.org.au

WORKING TOGETHER TO **ENHANCE OUR WATERWAYS**

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WELCOME

Welcome to the fifth edition of Reef and Rivers Magazine.

This year marks a special milestone as the Wet Tropics Waterways partnership celebrates 10 years of working together to protect and improve the health of our waterways – from rainforest creeks all the way to the Great Barrier Reef.

A key achievement of this decade-long collaboration is the annual Wet Tropics Waterway Health Report Card, which tracks the condition of our waterways and helps identify changes, trends, and challenges.

This magazine builds on the report card by sharing the stories of the people, projects and partnerships making a real difference on the ground – all working towards healthier waterways.

We hope this edition inspires you to get involved. We all have a role to play in keeping our waterways clean, healthy and thriving. Enjoy.

Simon Costanzo

Independent Chair, Wet Tropics Waterways

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We acknowledge the traditional custodians of the land and sea on which we live and work, and pay our respect to elders past, present and future.

CREEK SPEAK

Hear from people who live and breathe Wet Tropics waterways, for work and pleasure.

JOSH PALMER

***River Guide**, Back Country Bliss Adventures*
Waterways: Mossman River

What do you love most about working in our waterways?

The ever-changing nature of the environment. No two days are the same, whether it's spotting different types of wildlife, observing changes in the river day to day, or taking in the incredible natural beauty. There's always something new to appreciate.

Best experience

Watching a platypus come out and play during one of our tours. With crystal-clear water, we had a perfect view. And to our surprise, the platypus wasn't shy at all. It was an awesome moment.

What changes have you seen over the years?

I started guiding here after Cyclone Jasper so I never experienced the river before the floods in December 2023. But I've noticed a strong resurgence in wildlife over the last year. The river is constantly evolving, with new channels forming and the rainforest gradually restoring itself. One striking change has been a significant increase in Gympie Gympie (stinging tree), which is a sign of the surrounding forest's natural regeneration.

If you had one message...

Protecting our environment, so future generations can appreciate its natural beauty, is so important. Enjoy it, respect it, and leave no trace.

WENDY FINLAYSON

***Farmer** and water sampler*
Waterways: Murray River catchment

What do you love most about working in our waterways?

I take water samples in creeks, and farm work also has me working around creeks and rivers that run through our properties. I love seeing how much life and activity there is in the creeks and drains on our farm. You come across such a variety. There are fish, birds and reptiles - including cassowaries and the odd crocodile.

Best experience

Definitely the encounters with wildlife. And seeing how our farming culture can work in with our waterways. The local Indigenous people still fish and camp on our waterways and it's great to know they're impressed with how we're looking after it.

What changes have you seen over the years?

In recent years, I've seen tilapia move into our local waterways (a species that was introduced into Australia in the 1970s as an ornamental fish and is now a major threat to native biodiversity), which has had a massive impact on local species. There are also more encounters with crocodiles as they're being spotted further upstream.

If you had one message...

We all need to work together to make a difference.

ROBERT AMBRUM

***Jaragun** Ecoservices*
Waterways: Babinda Creek & Russell River

What do you love most about working in our waterways?

I grew up being on Country, living down the road from Babinda Creek and the Russell River. I still live close by. Over the years I've always loved spending time in our waterways. They have become my backyard. I now work on and around the waterways every day and I love it.

Best experience

Working alongside the rangers and making a difference by restoring our Country, planting trees and fixing our waterways. Doing this with my family is what makes it the best experience. We are working together and working with different age groups.

What changes have you seen over the years?

The build-up of sediment in the creek, less sooty grunters, and tilapia taking over, which is sad to see. On the other hand, there are improvements. We are putting trees back to stabilise creek and riverbanks, which stops erosion that's causing some shallowness in the waterways.

If you had one message...

No matter how small it is, every individual can do things to help look after Country and waterways, to reduce things like pollution and over-fishing. Our waterways deserve respect. They are the giver of life to our people.

RACHEL PLATTE

***Coordinator**, Mulgrave Landcare & Catchment Group*
Waterways: Mulgrave River catchment

What do you love most about working in our waterways?

The Wet Tropics environment is an endless source of inspiration. So much greenery and so many opportunities to get involved. I'm also loving learning which plants don't mind living with a bit of saltwater.

Best experience

There are a few. During a MangroveWatch outing in the Mulgrave River a few years ago I was on filming duty and a crocodile swam very swiftly under the tinny, through crystal clear waters. Another favourite was seeing mangrove crabs in the house and yard – about 50 of them - in the flooding after Cyclone Jasper. Some were new recordings for the Mulgrave River and maybe even the extended range. They were all uploaded to iNaturalist. A third highlight would be seeing translucent prawns skipping over the road during a 3.5 metre tidal event.

What changes have you seen over the years?

I've seen eroded areas continue to erode and very well treed areas staying stable.

If you had one message...

Plant more trees! They're great for river health. And the wider the riparian zone, the better when it comes to withstanding changing and dynamic times.

GEOFF COLLINS

***Program Manager**, OzFish Unlimited & Adjunct Research Fellow, TropWATER*
Waterways: Herbert, Tully, Russell & Mossman rivers

What do you love most about working in our waterways?

As an aquatic ecologist, the diversity of native fish and crustaceans. We have some of the best in Australia. And some of the freshwater fish and yabbies are incredibly colourful.

Best experience

Fishing in some of the catchments (both freshwater and saltwater) is very good, and the clarity of the water provides some great opportunities for swimming and snorkelling. I've had a couple of really good days on the Tully and Russell rivers catching (and releasing) sooty grunters and jungle perch.

What changes have you seen over the years?

The main change I've seen is the spread of invasive fish. We are now getting tilapia in the lower Herbert. Even three to four years ago we weren't seeing them in most locations. We are also seeing some positive changes in land-use, but it's happening at a very slow pace.

If you had one message...

Don't put aquarium fish in waterways. Some of them do an incredible amount of damage to our native fish and it's very hard to contain them once they're established.

TURTLE **warrior**

"There's a saying: 'Look into the eye of a turtle and you're **looking into the soul**'."

Jenny Gilbert has been a turtle lover for many years. It probably all dates back to when she was a young vet in New Guinea, regularly wandering through a marketplace buying up sea turtles – not to eat but to release back into the ocean.

"They're just amazing," she says. "I think the thing about them is they are an ancient breed. They've been around for over 150 million years."

As a founder of the Turtle Rehabilitation Centre in Cairns, Jenny now oversees and coordinates three turtle rescue facilities, and partners with other regional groups. She has put Cairns on the map as a turtle-loving city and has cleverly combined rescue and rehabilitation with ecotourism and awareness campaigns.

This year she received $600,000 from the Queensland Government to set up another centre, on Green Island.

"So now we have James Cook University where we rehabilitate and nurse damaged turtles and the Cairns Aquarium in town which is a triage centre where they're monitored every day. And then there's Fitzroy Island - their resort with cocktails and afternoon siestas before they go back out to sea."

PLANS FOR GREEN ISLAND

"Green Island is going to be very different. It'll be more of an education centre. We want to have Indigenous kids and displaced kids out there working on country, and with a range of animals, not just turtles.

"We'll also be joining with Quicksilver (a local Reef tour company) which does a program on seagrass, fish and dugongs."

So how did Jenny become the face of sea turtle rescue and a 'go-to' researcher on turtles who negotiates with business leaders and politicians for funding assistance for a wholly volunteer organisation?

HATCHING 52 TURTLE EGGS

"We came here to the vet clinic (Marlin Coast Veterinary Hospital) and somebody brought in 52 turtle eggs that a dog had been digging up at Trinity Park. I put a light on them and hatched the whole 52 and released them, which was fantastic."

Word got about and Jenny was asked to treat a sick turtle at the then Cairns Aquarium and one thing led to another.

She says a team of "wonderful volunteers" have made it all possible. Her regulars range in age from 18 to 75, and help care for, feed and monitor the reptiles.

"There are many reasons why we are all here. Turtles have a personality, and they're smart. They're the number one species people want to see on the Great Barrier Reef. And they are a keystone species, they're indicators of ocean health.

"People are drawn to turtles because of their longevity. They've been around for so long - they've gone through the dinosaur age, and they've come out the other end."

She says one of the most frightening statistics she learned at a recent conference was that by 2060 turtles will be extinct if threats to the species don't stop.

THE BIGGEST THREAT TO TURTLES?

"Humans," she says bluntly. Forget the natural threats of weather conditions, loss of feeding grounds, crocodiles and sharks.

"You've got marine debris – and the breakdown of this debris into chemicals that accumulate in their food source. You've got discarded fishing apparatus. They've also found heart drugs, antibiotics, all those drugs we use, in animals. You have heavy metal toxicity, boat strikes, illegal hunting… There are so many threats."

She says the community is finding ways to help and that's heartening - through beach cleans ups, nest protection cages, monitoring, and of course, rescuing. Public awareness is growing, and it is the best way to drive change, she says.

JENNY'S TURTLE FACTS

- Turtles travel thousands of kilometres for feeding and to get to their breeding grounds.
- They don't start breeding until they are between 20 and 50 years old.
- They only breed every two to seven years.
- They lay up to 150 eggs at a time.
- The babies hatch between 50 and 60 days later.

WHERE THE REEF MEETS the rainforest

Thousands of butterflies glide over the ocean between our beaches and tropical islands during winter. We talk to Ashley Field about this phenomenon, and about the importance of beachside rainforest.

Have you ever seen a butterfly out over the ocean, kilometres from the Wet Tropics mainland, and wondered where in the world it is going? How about thousands of butterflies, travelling in a cluster?

Cairns botanist and naturalist Ashley Field says it's an amazing sight. He has seen dense clouds of butterflies off Cairns, Kurrimine Beach and Mission Beach over the years, as well as thousands gathered on shorelines from Port Douglas to Halifax Bay preparing to take flight.

"You'll see them roosting on twigs in the undergrowth, in their thousands, ready to fly, waiting for the right conditions, circling in the undergrowth," he says.

MASSES OF BUTTERFLIES

"They can wait for weeks or months. Then they're off over the ocean, flying together in a direct path to an island. I've seen masses of Blue Tiger butterflies in a gentle glide, low to the water, on their way to Fitzroy Island, and others going out to Hinchinbrook Island, the Barnard and Family islands or to one of the biggest areas of Palm and Magnetic Islands.

"It's always when the sea is very calm and it's spectacular every time."

During winter a range of butterfly species – from Blue Tigers to Common Crows - migrate from inland dry vine forests to mainland littoral rainforests and then on to our islands. It's called 'overwintering'. They put their lives on hold, not eating or drinking much, not bothering to be territorial and, with their hormones switched off, not reproducing.

Without the eating and drinking, they need to stay in a moist environment. "The islands can be slightly warmer and more humid, with a more stable climate, so that may be why they go there," Ashley says. "Many fly back at the end of October with the lull in the winds."

RAINFOREST REFUGES

He says littoral rainforest – a unique type of forest native to our coastline and islands – is extremely important to the migratory process. The butterflies rely on host plants in these forests for nectar and shelter, and it's mutually beneficial because they're pollinators for forest species.

But littoral rainforest is critically endangered. Urban development competes with these now patchy forest areas for ocean views, and the forests are also up against non-native species and climate change, with sea level rises and the threat of more intense and frequent cyclones.

Aside from supporting butterflies, littoral rainforest is important for the coastline. The many roots of its trees and plants stabilise our foreshores, and it's a buffer for winds and for our mangrove areas. It's also home to more than 70 threatened species and plants, from the southern cassowary to the magnificent broodfrog.

HOW WE CAN HELP

Organisations have been meeting across the Wet Tropics to talk about ways to better protect littoral rainforest, known as the 'rainforest that meets the reef'.

Scientists from CSIRO and James Cook University have worked with the Queensland Herbarium to update littoral rainforest mapping and have also mapped potential sea-level rise and storm surge scenarios so we can better evaluate the potential impacts of proposed developments and climate change.

Terrain NRM, the region's natural resource management organisation, has brought together researchers, Traditional Owners, government agencies and coastal councils to identify the most important, vulnerable and improvable areas of littoral rainforest. With funding from the Australian Government, it is planning partnership projects to remove non-native species from littoral rainforest in the Hinchinbrook, Cassowary Coast and Douglas regions.

"The good news is littoral rainforest is a pretty resilient type of forest if we give it its space and keep weeds out," Ashley says. "And it produces a lot of fruit, which birds and bats rely on for food just as butterflies do, so the fruit seeds and pollen are moved to other areas for germination."

LITTORAL RAINFOREST – WHAT IS IT?

- Rainforest and vine thickets, usually within two kilometres of our coastline.
- Most spectacular example? Cape Tribulation. It's also at Bramston, Kurrimine, Mission and Forrest Beach, and our islands.
- The peppermint stick insect is one of its quirky inhabitants.
- Grows mainly on beach sands but can even grow on coral rubble.
- Protects our coastline from erosion.

wasteland

TO WETLAND

Twenty-five years ago, **East Trinity Reserve** was an “acid wasteland”. Scientists and land managers have returned it to a thriving wetland and Traditional Owners have exciting plans for the area.

BEFORE

AFTER

Michelle Martens clearly remembers the first time she saw East Trinity Reserve.

“A bund wall separated the reserve from Trinity Inlet,” the soil scientist says. “Outside the wall there were healthy mangroves but the ground inside was coated in rust-red iron deposits that smothered everything except the acid-tolerant melaleuca trees.

“The soils, creeks and drains were highly acidic.”

That was back in the Year 2000. The Queensland Government had bought the land – a 940-hectare backdrop to Cairns on the other side of Trinity Inlet – three decades after it was drained and tidal-gated for sugar cane farming.

Those changes exposed soils to the air that were naturally high in iron sulfide. They reacted with oxygen to release sulfuric acid along with iron, aluminium and other metals. And rain washed the acid and metals from the soil into creeks and Trinity Inlet. It led to mangroves dying, fish kills and unsuccessful cane farming.

Michelle was a land resource officer straight out of university back then and she joined an East Trinity team that has, over the decades, worked with land managers and scientists including Traditional Owners, rangers, geochemists, hydrologists and biologists.

Scientists from the Queensland Government devised a method called Lime-Assisted Tidal Exchange to neutralise the soil (rather than bringing in a mind-boggling 21,000 truckloads of lime). They modified the floodgates so that they no longer stopped the tide, instead letting the right amount of water in on every tide to keep the acidified soils wet. And they treated tidal water with hydrated lime to neutralise extra acidity and make sure the outgoing tide didn’t take iron and other metals with it.

Permanently wetting the soils created conditions that stopped new acid production and also allowed soil bacteria to neutralise acidity within the soil itself.

“Seeing the first tiny mangrove in an iron-stained drain three years after remediation work started was exciting,” Michelle says. “And finding seagrass growing in areas that used to be highly acidic is one of my favourite examples of how this site has transformed to a healthy estuarine environment.”

Twenty-five years since restoration work started, the area remains a managed wetland system. But there is no longer any need to treat it with hydrated lime – a major milestone for a dedicated team of land managers who monitor the quality of the water on an ongoing basis.

“Before remediation work began, an estimated 3000 tonnes of sulfuric acid had been flowing into Trinity Inlet annually from the Firewood Creek catchment,” Michelle says. “We’ve stopped that from happening. The reserve is now a national demonstration site supporting research and conservation.

“As a whole, the wetland is full of life – with healthy mangroves, fish and also crocodiles. And the restored wetland has brought Traditional Owners back on Country.”

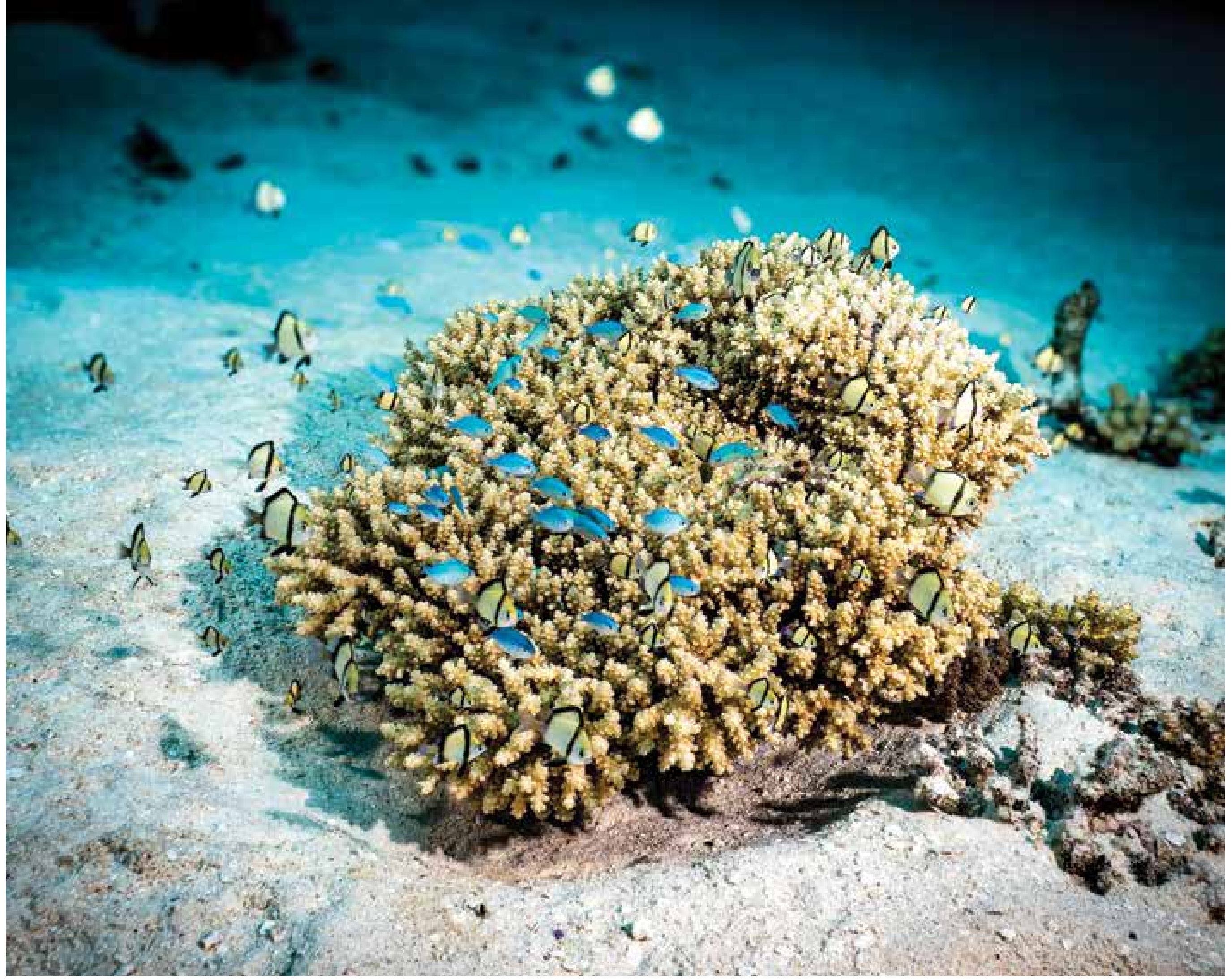
Mandingalbay Yidinji Traditional Owner Vic Bulmer, who manages East Trinity Reserve with others from his mob in partnership with the Queensland Government, says the area was once a food bowl for his ancestors.

“What happened was devastating. Who’d want to see 970 hectares of land become a wasteland? Restoring Country, seeing marine life, bird life and botanical life come back… it’s rewarding.

“There is a very healthy fish population again – from barras and grunter to mangrove jacks. Corridors have been created so that fish can move up through here, having rests on the way, and can spawn inside this area.

“There are 82 species of mangroves, and seagrass in some channels. We have eco tours running and we’re building up capacity for our next venture which includes new infrastructure for more ecotourism.

“We also have a junior ranger program. Bringing this land back is for our future generations.”



CORAL carers

He's been mobbed by giant trevallies and he's chillaxed with everything from turtles to hammerhead sharks... We talk to marine biologist, dive instructor and photographer **Rickard Abom** about his passion for the Great Barrier Reef and conserving its greatness.

Back in his twenties, Rickard Abom bought a one-way ticket from Sweden to a life of diving in the Caribbean. He's never looked back, working in tourism at dive sites all over the world, studying marine biology and now managing a crown-of-thorns starfish control program for the Reef and Rainforest Research Centre. He's clocked up over 7000 dives – 3000 of them on the Great Barrier Reef – and says the wonder never stops.

DO YOU REMEMBER YOUR FIRST DIVE ON THE GREAT BARRIER REEF?

Yes, we went down and saw a pack of devil rays and lots of turtles. The sheer volume of coral cover, and how vibrant it was... it just hit you.

WHAT IS YOUR BEST EXPERIENCE UNDER WATER?

I've had a surreal one at Ribbon Reef No.2, taking photos in about seven metres of water. I heard a loud noise, like a train coming. It was a big school of giant trevallies. They made a tube around me and there were so many eyes on me. They did a couple of circles and then disappeared into thin air. Last November was another one. As far as the eye could see, the biggest humphead parrot fish were coming towards me. They can be over a metre long and they stand really high in the water. They're listed as vulnerable but you'll get big pockets of them sometimes.

WHAT CHANGES HAVE YOU SEEN OVER THE YEARS?

After Cyclone Yasi, there was a lot of damaged coral at some reefs, down to about 25 metres. Gullies were scraped bare, there wasn't even algae. And after Cyclone Larry, at places outside Myrmidon pinnacle you could see the wave pattern in the coral cover down to 20 metres. It comes back though. A year or two afterwards we saw new coral growth. Regrowth has been quite impressive.

HOW IS MANAGING CROWN-OF-THORN STARFISH (COTS) HELPING THE REEF?

Trained COTS divers inject COTS with a single shot of bile salts or vinegar. The control program operates the length of the Reef. In the Cairns region, we focus on tourist reefs and high diversity reefs. Crews from tourist boats, control program partners and COTS divers are doing an amazing job.

WHY SHOULD WE CARE ABOUT CORALS?

The Great Barrier Reef has one of the highest diversities of coral on the planet. In some areas you'll see meadows of soft coral, in others mountains of hard coral. If you think about how long they've been there... they're like big old trees in the forest. Larger, older coral supports other coral species and the diversity creates amazing habitat for fish and many other species. Corals can bounce back quite quickly from adversity but with crown of thorns outbreaks, more marine heatwaves, coral bleaching events and more severe cyclones, there is less time for corals to recover.

WHAT KEEPS YOU COMING BACK FOR MORE?

The Great Barrier Reef is one of the most beautiful habitats on Earth. It's mind-blowing. Every time you go out you find something to enjoy. The diversity is my passion. I'm always amazed by it.

The Reef and Rainforest Research Centre and INLOC Group are managing COTS on selected reefs from Townsville to Lizard Island north of Cooktown on the Great Barrier Reef.

50 YEARS OF reef protection

When you think of the Great Barrier Reef, do you think of **drilling for oil and gas?** Back in the 1960s they did. We've come a long way with reef protection since then...

A small public notice in an Innisfail newspaper ignited the 'Save the Reef' campaign in the late 1960s. It was an application to mine coral for agricultural lime at Ellison Reef off Mission Beach, where the reef's coral was "dead", following a cyclone.

At Mission Beach, artist John Busst saw the notice. He convinced marine scientists from the University of Queensland to come and dive the reef in "two tiny homemade boats that were unsafe at any speed". (Those are the words of one of the divers!)

After five days on the ocean, they recorded more than 90 coral species and over 200 fish species, describing Ellison as a "perfectly normal coral reef". Their data helped to win a court case opposing the application, led by John Busst and members of the Queensland Littoral Society and the newly formed Wildlife Preservation Society of Queensland.

Seeing this as a test case for widespread mining, they together launched a campaign for the Great Barrier Reef to become a marine park. It happened, but not overnight. In the years that followed, the entire Queensland coastline opened up to oil exploration, there was a joint enquiry by the Queensland and Australian governments into oil drilling on the reef, which was upgraded to a Royal Commission, the Australian Government leadership changed and there was a whole lot of campaigning.

The Great Barrier Reef Marine Park Act was passed in 1975, establishing a Marine Park Authority to manage the newly created Great Barrier Reef Marine Park in partnership with the Queensland Government.

The first sections of park were declared several years later, and the reef became a World Heritage listed area in 1981, recognising its "outstanding universal value".

The Great Barrier Reef Marine Park Authority still has a big role to play – from monitoring reef health and running the Crown-of-thorns Starfish Control Program to making sure people are following zoning rules and doing the right thing while out enjoying the reef.

It's a team effort – the Authority works closely with lots of partners including Traditional Owner groups, the tourism industry, councils and schools. In another milestone, it has been 20 years since the first agreement was made between a Traditional Owner group, the Great Barrier Reef Marine Park Authority and the Queensland Government. And 22 years since the Reef Guardian Schools program began. There are now 100 Wet Tropics schools involved in it. A Reef Guardian Councils program was also set up and all the Wet Tropics councils - Cairns, Cassowary Coast, Douglas, Hinchinbrook, Mareeba, Tablelands, Wujal Wujal and Yarrabah – are on board.

Mulgrave Landcare

REEF Assist

PLANTING SEEDS & OPPORTUNITIES

Across the Wet Tropics, local groups are restoring landscapes, creating jobs and improving water quality through **Reef Assist** projects – one tree at a time.

Why link the Reef with trees? Forests, particularly along rivers and creeks, help filter out sediment and pollutants before they reach the ocean. In regions like the Wet Tropics, where rainfall is intense and waterways are short and steep, stabilising the land is crucial for reducing runoff that can damage coral reefs.

That's why the Queensland Government's $33.5 million Reef Assist program is funding projects that restore wetlands, plant native vegetation and strengthen riverbanks. These efforts are improving catchment health and also creating 'green jobs' and training opportunities.

Following on from the successful Reef Assist 1.0 program which began in 2020, Reef Assist 2.0 projects have been underway since 2022.

GREENING THE MULGRAVE RIVER

One of the current Reef Assist 2.0 projects is revegetation work along the Mulgrave River near Gordonvale. It's being delivered by the Madjaybana Rangers in partnership with Mulgrave Landcare and its diverse network of volunteers, and Greening Australia. Together, they're planting native trees along a section of river where cane paddocks meet mangroves, close to the river's mouth.

The seedlings are growing on the edge of a cane paddock. Mulgrave Landcare's Rachel Platte says it's marginal farming land, with soils that are becoming increasingly salty.

"We work with farmers on creating buffers between waterways and cane land to stabilise riverbanks and regenerate the landscape," she says.

"This is a brackish area in an old cane paddock, a little section in a loop behind mangroves that would have been covered in mangroves and rainforest many years ago.

"Madjaybana Rangers have planted thousands of trees, and we've also had public tree-planting days where we can all connect as one community."

Mulgrave Landcare volunteers collect native seeds and grow seedlings in their volunteer-run nursery. Their latest Reef Assist project builds on a 10,000-tree plant-out on the same landholder's property, where other types of erosion control work have also been happening. These projects add to more than 30 years of Mulgrave Landcare tree-planting initiatives.

"We love working with landholders. Growing green areas between waterways and farmland helps farmers, the land and our waterways, including the ocean."

The Mulgrave project is one of six in the Wet Tropics and Cape York regions as part of the Reef Assist 2.0 program.

Johnstone Landcare

REEF ASSIST 2.0 – Achievements in the Wet Tropics

INVESTMENT $8.9M

In-kind Contributions $0.5M

6 Delivery Partners: Greening Australia, Jaragun Ecoservices, Wet Tropics Management Authority, Johnstone Regional Landcare Group, Cape York NRM, Jabalbina Yalanji Aboriginal Corporation

70 JOBS

50% FIRST NATIONS, 31% YOUTH, 33% WOMEN

Training/upskilling in heavy machinery operation, erosion control, chainsaw and tree felling skills, fire management, first aid training, plant identification and natural revegetation logistics.

114,000 PLANTS established

209,000 plants propagated from native seeds

13.2ha wetlands restored or revegetated

60ha WEED control

53ha flood debris REMOVAL

FARMING FOR the future

Banana farming is continuing to change in the Wet Tropics and it's a win-win situation. It's helping farmers and the land. In the longer-term, it's also helping the Great Barrier Reef. We speak to Steve Morice from ABC Bananas.

Removing rows of bananas is never something a grower wants to do. But the toughest decisions often lead to the best results - and that's proven to be the case for ABC Bananas when it comes to its mosaic of farms in the Innisfail district.

Steve Morice, who is the general manager, says erosion was worsening on some of the headlands and in paddocks.

WET SEASON EROSION

"In the wet season, water was running over the top of a hill so fast it was eating away the headland that we were driving along below, and causing issues at the steep ends of the banana rows," he says.

"We went to a workshop on soils with the Australian Banana Growers Council and they were offering to help farmers with paddock layout issues and nutrient management plans.

"I was a bit hesitant at first because I knew we'd probably need to knock out some bananas to solve the problem. But we gained so much from the changes that we made."

HELP AT HAND

Steve and farm manager Stephen Prior received financial help from the Banana BMP's Best Practice Fund, which supports projects reducing nutrient, pesticide and sediment runoff.

The headland was moved to a higher point, the rows were shortened by taking bananas out of the steep sections, and the old road became a drain.

SPOON DRAINS TO SLOW WATER

On another farm, an in-paddock spoon drain was built to slow water and avoid washouts, and a concrete structure was added to stabilise a headland and prevent more erosion.

"It was a win for everything," Steve says. "We lost about three acres of bananas but we've gained in efficiencies - tractors not getting bogged anymore and bunches not falling off trailers.

"And the soil isn't washing away like it was. There is grass all through the spoon drain now.

"We're looking at more spoon drains. Vegetation is holding the land together."

The two Steves also worked with a Banana BMP extension officer on a nutrient management plan for their farms.

The free planning covers everything from farm mapping and record-keeping to setting targets for nutrient application that are specific to each farm and its needs. It includes soil and leaf-testing with farmers.

UNLOCKING PHOSPHORUS

"Now we are looking at ways to unlock the phosphorus which is naturally high in our soils, so that we don't need to add as much, and at reducing nitrogen application at certain times of year.

"It's rewarding to see benefits. You could bury your head in the sand and keep doing what you've always done, or you can move forward."

The Banana BMP and the Best Management Practice Fund is funded through the Queensland Government's Queensland Reef Water Quality Program and delivered by the Australian Banana Growers Council. Development of nutrient management plans has been funded by the partnership between the Australian Government's Reef Trust and the Great Barrier Reef Foundation through the Cassowary Coast Reef Smart Farming Project.

TREE PLANTING is a TREAT

Thousands of trees are going into the ground along waterways in the Russell River catchment thanks to volunteers from **TREAT** - Trees for the Evelyn and Atherton Tablelands.

Every Friday a group of tree lovers meets at a nursery beside Lake Eacham and makes magic happen in the world of forest restoration. Washing pots, planting seeds, pruning seedlings – they lay the groundwork for the green corridors that are steadily growing bigger and wider on the banks of creeks and rivers in the Atherton Tablelands region.

Volunteers from Trees for the Evelyn and Atherton Tablelands, or TREAT, have planted thousands of trees this year at sites including Lake Eacham, Butchers Creek, Millaa Millaa and Topaz. It's improving vegetation along waterways, stabilising creek and river banks and keeping topsoil on the land and, ultimately, out of the Great Barrier Reef.

TREAT project officer Irene Gorman says the latest project is on private property with a creek that connects to the Russell River.

"We've planted trees in a creek gully where there is already a lovely patch of biodiverse remnant riparian forest bordering a national park," she says.

"It's a 1.4km stretch of creek and the project includes fencing on both sides to keep out cattle and allow revegetation to happen on the other side as well.

"The vegetation that's already in the gully has a biodiversity status 'of concern' and it includes what's classified as 'reef regrowth watercourse vegetation'. It's quite the wildlife corridor with cassowaries and a range of frogs and bats including spectacled flying foxes and waterfall frogs, both of them endangered species."

TREAT has been growing and planting native rainforest trees for 40 years now. The group started by planting over 2700 trees, grown by members at their homes. With more than 400 members now, they grow about 45,000 trees a year for revegetation projects in collaboration with Queensland Parks and Wildlife Service's Lake Eacham Nursery staff.

Irene says one secret to their longevity and success is the close relationship with Queensland Parks and Wildlife Service. Another is planting in the rain: "We may come in looking like drowned rats but the wet season gives the trees a good start in establishing themselves".

A mix of local trees are used in the revegetation projects, with 'pioneer' species a staple because they grow quickly and establish habitat for seed spreading. They also protect the smaller remnant plants from weather, and shade out weeds. As the older remnants establish, the pioneer trees, which have a shorter lifespan, diminish.

"They create a bit of a nursery for the remnant riparian vegetation," Irene says. "They're really good at speeding things along in the regeneration of riparian habitats."

The Russell River tree-planting project is proudly funded through the Queensland Government's Community Sustainability Action Grants program.

MANAGING urban runoff

Water run-off from urban areas can have a big impact on local waterways if it's not managed effectively...

In the Wet Tropics, heavy rainfall is a fact of life – and where that water goes matters. In urban areas, stormwater doesn't just soak into the ground. It runs off roofs, roads, industrial zones and construction sites, carrying pollutants with it that can end up in our local waterways and, ultimately, the Great Barrier Reef lagoon.

While urban areas make up just one per cent of land in the Reef's vast catchment, they contribute a disproportionate share of pollution – up to seven per cent of the dissolved inorganic nitrogen (nutrient pollution) and nearly two per cent of sediment that flows into the Reef. These pollutants can damage fragile marine ecosystems.

To address this, local councils and industry are stepping up. One initiative is the Urban Water Stewardship Framework, co-funded by the Queensland and Australian Governments, which helps councils to evaluate and improve how they manage urban water, benchmark their practices against best-practice standards, and report on their progress.

TOWARDS BEST PRACTICE

Every two years, councils across the Wet Tropics region take part in workshops delivered by Wet Tropics Waterways to evaluate their urban water management strategies.

James Donaldson, Executive Officer of Wet Tropics Waterways, says the results so far show that water quality is generally being well managed during construction and as part of sewage treatment. But there is room for improvement in established urban areas.

"Older suburbs tend to have infrastructure that needs updating in order to bring them up to best practice standards," James says.

After the assessment workshops, an independent report is produced to grade each council's performance.

"The stewardship framework enables councils to identify where they can improve and where to allocate resources for the most impact," he says. "It also provides leverage when applying for funding to upgrade infrastructure and implement better management practices.

"An example is Douglas Shire Council using the program to successfully apply for funding for an erosion, sediment control and stormwater education and compliance program. They now have a training program for their civil construction, environment and planning teams. Staff have been trained in best practice requirements for environmental risks during construction work, and workshops will be held with builders and other stakeholders."

The Queensland Government has created a new webpage, or portal, with data on sewage treatment plants, aquaculture farms and wastewater management practices in reef catchments. Users can access reports on activities, pollution loads and best management practices, and explore each region through an interactive database.

Find out more at: *https://point-source-information-portal-qgsp.hub.arcgis.com/*

SENSATIONAL **sawfish**

Nature is pretty amazing and the sawfish is living proof. What a snout! We talk to scientist Dr Barbara Wueringer about what it'll take to save this endangered ray - and the exciting discoveries in Wet Tropics waters.

Dr Barbara Wueringer gets a thrill every time she sees a sawfish or learns about a new sighting. For the last 18 years she has been on the hunt for the four species remaining in Australian waters. It has taken her many places – from sawfish tagging in the ocean to regional pubs where 'saws', some of them up to 100 years old, are hanging on the walls.

The Cairns-based scientist and the rest of her team are using a mixture of science and detective work to learn more about sawfish populations. Once seen as far south as the Sydney Harbour, sawfish are rarely spotted outside the Gulf of Carpentaria, Northern Territory and the Kimberley region now. And that's why it's so exciting to hear they've been seen in Wet Tropics waters…

"We've received sightings from the Cairns area, Port Douglas and Hinchinbrook in recent years," Barbara says.

"One confirmed sighting, from a recreational fisher, was a baby narrow sawfish that was caught and released on Cairns's northern beaches a few years ago. It was in an area we'd always thought they might be. They don't necessarily go for crystal clear waters - they like murky areas.

"We've also had a few submissions of sharks or guitarfish or sawfish along the Cairns Esplanade. But so far we haven't been able to identify the species, so we're keen to see more video footage or photos."

She credits a highly successful citizen science project for most of the sightings. Back in 2017, Sharks and Rays Australia, or SARA, which is a not-for-profit organisation that was founded by Barbara, called for people to submit possible encounters with sawfish.

Since then, they've had 1650 responses about either current or historical sawfish. Sixty-eight are from the Wet Tropics region and while some can't be identified, quite a few were recent sawfish sightings.

Environmental DNA water samples have backed this up. SARA has been working with the Jabalbina Indigenous Rangers to test waters off Cairns and results indicate there are green sawfish at Port Douglas and narrow sawfish in the Cairns region. More eDNA testing will be happening later this year, this time with the Girringun Rangers in the Cardwell region.

"It seems like the narrow sawfish may be doing quite well in this region," Barbara says. "They mature at about three years, grow to four metres and can come into shallow water."

Sawfish used to also be larger animals. Sadly, their saw-like rostrum made them 'trophy' species the world over, and they also fell prey to fishing nets and habitat loss. Now all five sawfish species are listed as either critically endangered or endangered. And Australia's northern waters are one of the last remaining strongholds for four of the species – the green, dwarf, freshwater and narrow sawfish.

"We have an image from a newspaper in the 1960s of a 2.8 metre dwarf sawfish hung up at the Cairns Sugar Terminal, and one of a six-metre freshwater sawfish caught at the mouth of the Mulgrave River back in 1922.

"By looking at library records across Queensland (thanks to PhD student Nikki Biskis from the University of the Sunshine Coast who is also handling the sightings), we can see there were multiple stages of population decline.

"And now we are taking DNA samples from sawfish on the walls of pubs and roadhouses. We can match DNA in a larger dataset and look at population structure and decline over the decades.

"Back then I think people thought nature had no bounds. The silver lining is that trophy taking from the past has created a scientific treasure trove.

"It is giving us much needed baseline data about the genetic diversity of sawfish before they became endangered, and this helps us to better understand genetic health in today's populations."

TO SUBMIT A SAWFISH SIGHTING, go to **www.cytags.com**

Sharks And Rays Australia's sawfish project is funded by the partnership between the Australian Government's Reef Trust and the Great Barrier Reef Foundation. It was previously funded through a Citizen Science Grant and an Engaging Science Grant from the Queensland Government Department of Environment, Tourism, Science and Innovation, and a Small Grant from the Save Our Seas Foundation.

BEING SAWFISH SAVVY

- Sawfish are rays. They have gills underneath their bodies.
- Their rostrum, which looks like a large saw, is filled with sensory organs and detects tiny electrical signals given off by other animals, helping them to hunt.
- They live in shallow coastal waters including rivers and estuaries.
- Some species don't reach sexual maturity for nine years, so population recovery could take decades.

SMALL LIDS big impact

Plastic bottle tops can't go in our kerbside recycling bins – and that's why a Cairns organisation has stepped in with a great new initiative. So far, they've recycled more than three tonnes of plastic…

Piles of red, blue, yellow and white plastic bottle tops surround a team of people at the Precious Plastic FNQ workshop in Cairns.

It's bottle top sorting time, before shredding and then 'cooking' using moulds to create products ranging from plant pots and hair combs to blocks for Jenga game sets.

"The future is hopefully raw materials like bricks, boards and plastic beams for park benches," Bailey Stevenson says. He's the Service Coordinator for Precious Plastic FNQ, a disability support service recovering plastics that would otherwise end up as landfill or litter.

The organisation has been building up over five years and now has a collection point for businesses and individuals and a team of about 15 people whose roles range from washing and drying bottle tops and sorting them into plastic types and colours to operating the machines, running an online shop and selling products at community events.

"We are loving filling a gap in the market," Bailey says. "This is recycling that no one else is doing in northern Australia. It's work that benefits our clients – they're learning new skills, problem-solving and teamwork and in 18 months four clients have already been employed outside our organisation. What makes it even better is it's also work that benefits the environment."

Precious Plastic FNQ client Telena Wraith has been making and selling products for two and-a-half years and she's also a mentor for newcomers.

"I've learnt about how much plastic is wasted every day and how important it is to recycle," she says. "We don't want to see plastic going into our waterways and killing fish and turtles."

Bailey says both he and the clients are loving working in the environment sector.

"It's a great fit. Living in Cairns, we are three steps away from natural wonders in almost any direction. Plastic waste is a threat and it's up to all of us to help.

"This time the disability community is leading the conversation. We are showing people how to recycle better… and it's great to hear our guys at the markets talking about things like the importance of recycling right and re-using items, the dangers of microplastics and the ways we can help our oceans."

PLASTICS - FAST FACTS

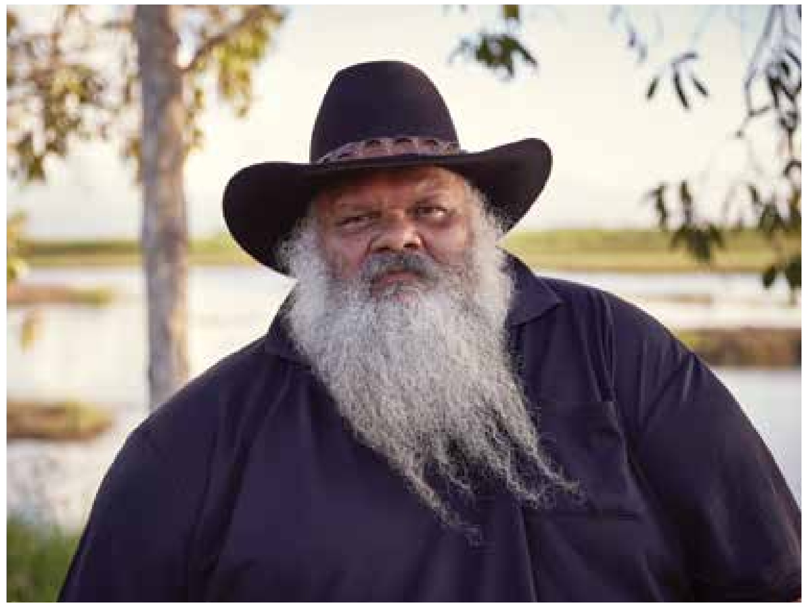
- Globally, more than 30 per cent of plastic packaging escapes collection systems and ends up in the environment where it impacts marine life and ocean health. In Australia, plastics account for at least 85 per cent of our total marine waste. And over 75 per cent of rubbish removed from Australian beaches is plastic.
- Scientists first noticed plastic pollution in the ocean in the 1960s and by the 1980s its impacts were obvious. Large amounts of plastic debris were building up in the oceans and the Great Pacific Garbage Patch - a massive area of floating plastic waste in the Pacific Ocean – was discovered.
- More than 100 years since the first fully synthetic plastic was invented, Australia has recently joined 96 other nations supporting the introduction of an ambitious plastics treaty – a binding global action to address pollution across the entire lifecycle of plastics.

HOW CAN YOU HELP

- Don't put bottle tops in kerbside recycling bins. They're made of different plastics and are too small to be accurately sorted at most recycling facilities. They contaminate loads and jam sorting machinery.
- Bring clean, label-free plastic bottle tops to 3/127 Anderson St, Manunda from 9am-4pm on weekdays.
- Volunteer to wash, dry and sort bottle tops.
- Learn more at: ***preciousplastic.gslservices.com.au***

HEALING THE Herbert

A stone's throw from the ocean, owners of a cattle and eco-tourism property are **bringing a wetland back** to its former glory. They say working together is the key to improving the Wet Tropics region's biggest river catchment.



Jacob Cassady looks out over a wetland full of fish and birdlife. There's a proud look in his eyes because he remembers a time when only tilapia, an introduced fish, was managing to live amongst the tangle of weeds.

"Now we have lots of fish species and bird watchers come here from all over the world, especially when the migratory birds arrive each year," he says.

The 880-hectare cattle station, beside Halifax Bay Wetlands National Park and just one kilometre from the ocean, has diversified into eco-tourism since the wetlands were restored. Work began when Mungalla Station was handed back to traditional owners in the late 1990s and it accelerated when a bund wall, built to create more grazing land in the 1940s, was partially taken down.

"Seawater could flow back through the wetland," Jacob, who is a Nywaigi Traditional Owner and Mungalla Aboriginal Corporation for Business Director, says. "It killed the noxious weeds. We'd been doing ground spraying, aerial spraying and cultural burning but breaching the earth wall was the best option.

"A year later we had little to no weed. The following year bulkuru sedge was growing there.

"We still have much more to do. With the recent big floods, sediment flushed through the catchment and parts of the wetland closed up again. There has also been an explosion of hymenachne weed.

"But to see the wetlands coming back to life, and fish species returning like barramundi, is really rewarding. We sit beside the Great Barrier Reef Marine Park lagoon and Halifax Bay, so it's critical that the water going out there is clean – and that doesn't happen unless the wetlands are functioning and creeks are flowing without sediment build-up and invasive weeds."

BLUE CARBON INITIATIVE

The Nywaigi people's goal now is to open the bund wall permanently and register a blue carbon project for the 230-hectare wetland.

"We'll lose some pasture ground for our cattle but I'm optimistic about the environmental benefits and the economic benefits, hopefully through carbon credits," Jacob says.

'Blue carbon' is carbon stored by oceans and coastal ecosystems including mangroves, wetlands, saltmarshes and seagrass beds. It's captured within the plants and in the sediments below and, given its storage capabilities, it's an important part of nature-based solutions to climate change.

The Nywaigi people have worked with CSIRO, James Cook University's Centre for Tropical Water and Aquatic Ecosystem Research (TropWATER), Greening Australia and Birdlife Australia.

NEW PROJECT LOOKING AT ALL OF THE HERBERT CATCHMENT

Jacob is also working with Terrain NRM on the Herbert Integrated Project – a new initiative that's taking a whole-of-catchment approach to improving the quality of water flowing off the land and, ultimately, to the Reef.

The project's leader, Fiona Barron, says farmers, industry bodies and other community representatives are working together on its co-design to identify the highest priority projects in the catchment.

"A lot of great work has already happened. Farmers have modified machinery and changed crop management to reduce fertiliser and pesticide use and they've changed grazing practices to reduce erosion.

"Erosion solutions like rock chutes have been combined with revegetation work along waterways, and wetland restoration has also been happening.

"Now we need to move beyond isolated fixes, look at the catchment as a whole and involve everyone with a stake in it to develop solutions that benefit the whole environment and the community too. This project seeks to further extend benefits though natural capital opportunities and other circular economy initiatives."

The Herbert Integrated Project is funded through the Queensland Government's Queensland Reef Water Quality Program. Mungalla Station projects have been funded through the Australian Government, Virgin Australia, the Ian Potter Foundation and other donations.

HERBERT: FAST FACTS

- The Herbert River is 288 kilometres long.
- The catchment covers nearly 10,000 square kilometres.
- It's made up of cattle country, cane land and national park land.
- One of Queensland's biggest contributors of nutrients and fine sediment to the Great Barrier Reef.
- More than 15 years of projects are making a difference.

FIGHTING frogbit

It can double its mass in less than a week, create impenetrable 30-50cm layers over waterways and produce up to 100 seeds in a pod…

Amazon frogbit, a noxious weed, has been making its way through creeks on the Tablelands and has also been spreading to the lower Barron catchment.

But the Barron River, which is considered a concerning hotspot, has been helped by, of all things, ex-tropical cyclone Jasper.

"Jasper flushed out the main Barron River flow, and an area immediately adjacent to our infrastructure at the Kuranda Weir," Patrick Curtis says. He's the environmental specialist at Cleanco, which manages the Barron River hydro-electric station.

"The sheer amount of water which flowed through the Barron River during the flooding in December 2023 left little to no sign of the weed."

Cleanco has been part of a local taskforce which includes Djabugay Rangers, Yungaburra Landcare, Kuranda Riverboat, FNQRoC, the Tablelands and Mareeba councils, Cairns and Far North Environment Centre (CAFNEC) and the Queensland Parks and Wildlife Service. It monitors and removes Amazon frogbit found across Wet Tropics waterways.

Patrick says Cleanco is continuing to regularly monitor the river despite the all-clear.

"We are keeping an eye out in and around our infrastructure," he says. "Other frogbit groups including Yungaburra Landcare and Tablelands Regional Council are monitoring it in the upper catchments and have seen some resurgence of frogbit but are doing an excellent job of controlling it."

Amazon frogbit is a decorative aquarium plant that's native to Central and South America. Declared a pest regionally, it can't be bought or sold in the Far North. The problem is it can still be bought online.

It enters waterways when people illegally dump aquarium contents into drains, where it spreads, reproduces and chokes waterways, and threatens native species. It can even attach to birds or watercraft, quickening the spread.

For the Djabugay Rangers, Amazon frogbit also diminishes the cultural values of creeks and rivers that are important Bulurru (Storywaters).

"The creeks may involve a story from the sacred time of creation and include laws or totems, but the Elders are telling us that these cultural values can easily be eroded by Amazon frogbit," Djabugay Bulmba Ranger Coordinator Darryl Hunter says.

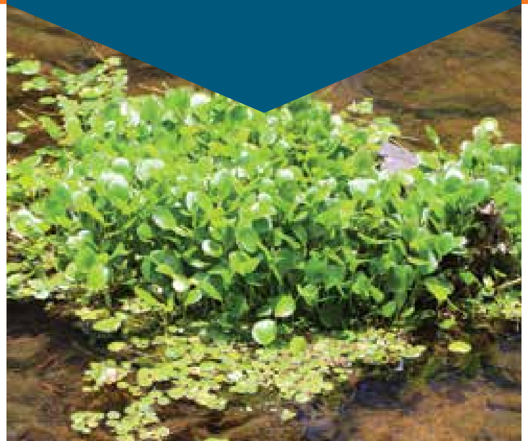
"It is quick to take hold and spread, and very difficult to get rid of, so we continue to monitor for signs of its return. This takes coordinated community action and ongoing funding."

AMAZON FROGBIT – HOW YOU CAN HELP

- Don't buy it for your aquariums. (It's promoted as an aquarium feature plant.)
- Don't dump aquarium contents into drains or waterways. Illegal dumping is the main cause of its spread. Seeds last up to three years.
- Report sightings to **Biosecurity Queensland** on 13 25 23.

BIOSECURITY RISKS OF THE **WET TROPICS**

REPORT Amazon Frogbit



Amazon Frogbit

What is it

Amazon Frogbit *(Limnobium laevigatum)* is a floating aquatic plant native to Central and South America. It was introduced for use in aquariums and ponds but has become highly invasive in many regions, including parts of Queensland.

Amazon Frogbit forms dense mats on water surfaces, smothering native aquatic plants and reducing oxygen levels in the water. This disrupts ecosystems, harms aquatic life, and can block waterways, impacting recreational activities and water management infrastructure.

What to do about it

Avoid trading or introducing Amazon Frogbit to ponds or aquariums. Report all infestations to local biosecurity authorities. Dispose of aquarium contents responsibly.

BIOSECURITY OBLIGATIONS AND LEGAL REQUIREMENTS:

Amazon frogbit is a locally declared pest plant under Local Laws in Mareeba, Tablelands, Cairns, and Cassowary Coast. It is an offence under Local Law to distribute or propagate. Penalties apply.

FNQROC
FNQ Regional Organisation of Councils

TERRAIN
NATURAL RESOURCE MANAGEMENT

THE BIG **picture**

10 YEARS OF WATERWAY HEALTH CHECKS

From fish barriers to invasive aquatic weeds – the **Wet Tropics Waterway Health Report Card** has been bringing issues to the surface for our rivers, creeks and ocean for 10 years now. And by doing this, it's also helping to protect them.

Every year, Dr Richard Hunt, an aquatic ecologist and redclaw crayfish farmer, spends countless hours pooling data from over ten different government departments, research organisations and councils to build a comprehensive picture of how well our waterways are doing.

What began in 2015 has become a bit of a breakthrough. Many programs were monitoring things like water, coral, fish, mangroves, seagrass and riverbanks but they weren't being linked up to see the big picture for the Wet Tropics region, from its river basins to ocean waters.

For Richard this means months of data analysis – including number-crunching to calculate grades (from A to E) across the freshwater, estuary and marine environments. He says there are many good reasons to do it.

"Waterways are the lifeblood of ecosystems, but they are vulnerable and require careful monitoring across various aspects — water quality, hydrology, habitats and biota. Many of us choose to live in the Wet Tropics because we enjoy activities like swimming in waterholes, fishing, boating or snorkeling, so keeping our favorite spots in good condition is essential. Beyond recreation, healthy waterways are vital for food and water supply, biodiversity, and cultural values. The report card has become an important tool for tracking their health and identifying emerging issues."

When the first report card was produced by the Wet Tropics Waterways partnership, Richard says it became obvious that there were lots of gaps in monitoring.

"There were many organisations collecting monitoring data for their own purposes, but it was not often integrated across programs to inform at a wider level. The great thing about Wet Tropics Waterways is that it has brought people together, to work out how to fill those gaps and discuss issues.

"Over 10 years we've slowly built up a consistent reporting system to track broad changes over time. We've filled knowledge gaps, and we've added new ways of measuring the health of aquatic ecosystems."

A good example of how the report card has made a difference is the data on freshwater fish populations.

"It has allowed us to identify hotspot areas for pest fish, and shown that fish biodiversity in the Wet Tropics is still generally good," Richard says.

"It has also put fish barriers under the spotlight, raising awareness of the many barriers between our estuary and freshwater habitats that can impede fish movement and disrupt their life cycles. We've gathered data that has highlighted where the worst fish barriers are that are a high priority for us to fix.

"Another example is the invasive weed Amazon frogbit. The report card has helped to identify this as an emerging issue with serious implications for the health of the Barron River."

Richard says it has been rewarding to be part of a project that's helping to connect organisations and start collaborations that benefit waterway health across the region.

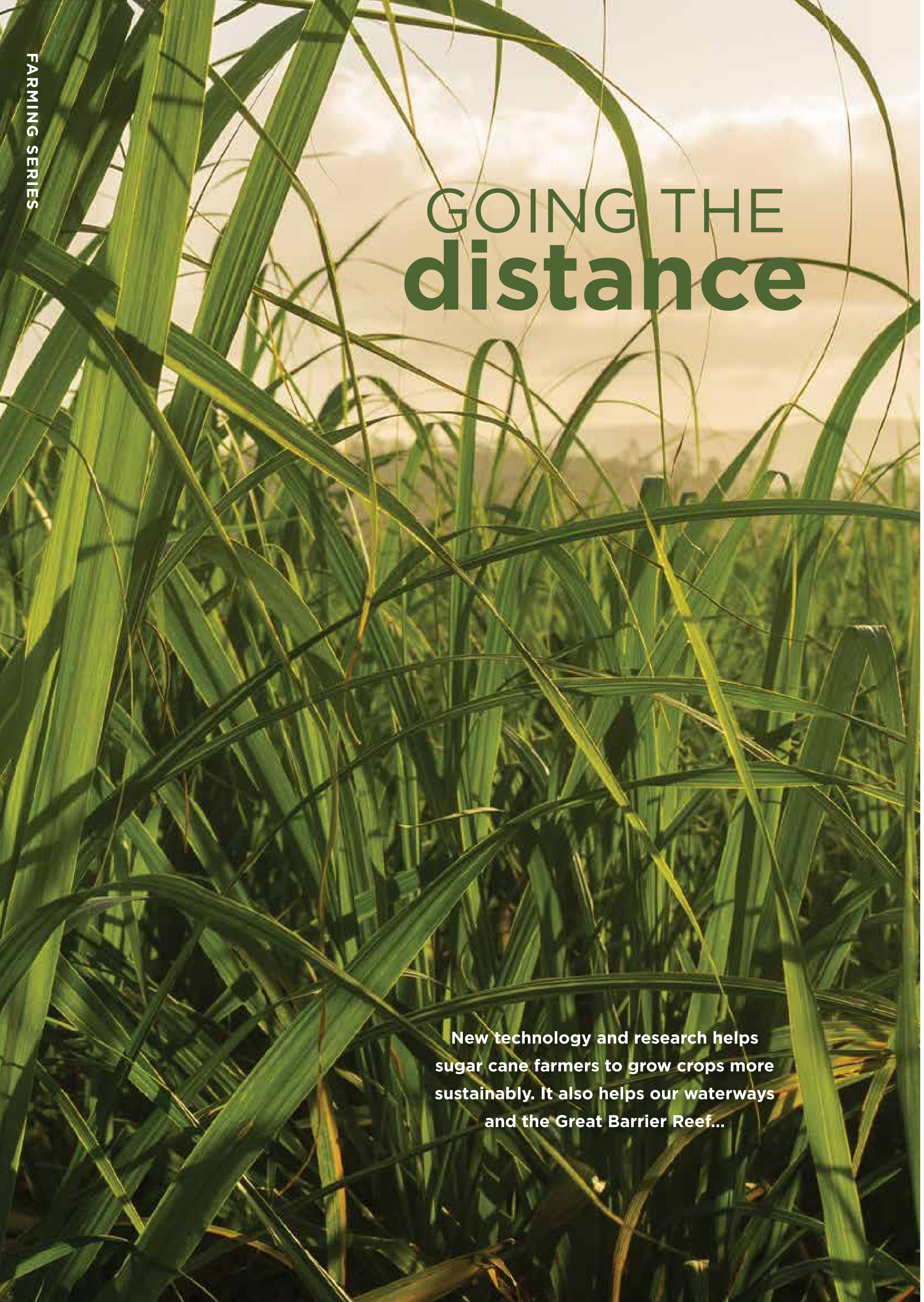
"Wet Tropics Waterways has grown into a strong, supportive and diverse partnership. Some of the partnership's most important achievements are raising awareness of seagrass and mangrove condition, highlighting issues and supporting partners to take action. The report card gives partners solid data for making waterway management decisions and applying for grants to help improve our waterways."

While a lot of progress has been made over the past 10 years, Richard says the report card and the Wet Tropics Waterways partnership are still developing.

"The report card is a valuable tool for capturing the broader picture and identifying key patterns and changes in our waterways. With this year marking the release of our tenth report card, we now have a robust long-term dataset that allows us to analyse trends. In the future it would be great if we can build on this by exploring specific issues in greater depth such as investigating what's driving low dissolved oxygen levels in Trinity Inlet, recent increases in chlorophyll-*a* concentrations (algae) across several estuaries, and the spread of pest fish in creeks and rivers."

FAST FACTS

Wet Tropics Waterways is a partnership of 20+ organisations and a network of 50+ organisations involved in waterway health initiatives. It is an initiative of Australia's Reef 2050 Long-Term Sustainability Plan.



GOING THE distance

New technology and research helps sugar cane farmers to grow crops more sustainably. It also helps our waterways and the Great Barrier Reef...

You don't have to cane the land to grow cane. That's the message from farmers like Bruce Cotterill and his son Todd who are improving the land and the water flowing through it as part of their sugar cane operations.

Bruce is a third-generation cane farmer at Aloomba, south of Cairns, and he doesn't need to look any further than his own cane blocks to see major changes in the way the land is being managed these days.

"Back in my grandfather's time they'd put nine bags (of fertiliser) on and then one more for the Gods – just in case," he says. "They'd work the ground until the soil was so fine it'd blow away. That was the way people farmed at the time.

"We can't afford to farm like that anymore – economically with the costs of fertiliser and fuel, and also environmentally."

IMPROVING LAND & WATER

Bruce is one of the many growers across more than 150 farms in the Wet Tropics who are being supported through the Queensland Government's Sugarcane Practice Change Program to boost farm productivity and, in doing so, improve the quality of water in our catchments.

Through the 'Going the Distance' project run by Farmacist, he has been working with agronomist Dan Knowles to fine tune his nutrient management plan, improve the farm's drainage systems, and manage sedge, a non-native weed invading low-lying, poorly drained cane paddocks and natural ecosystems across the region.

"One of the things we've been doing is putting in grassed headlands where gullies have formed in the middle of cane blocks," he says. "We are doing this block by block, as they come out of (cane) rotation.

"With the new headlands, the water flows through grassland rather than cane land during heavy rain.

"To achieve this, we've lost about one and a half kilometres, collectively, from cane blocks. But these were low-performing areas, and there are benefits all round. The water flowing through is cleaner and the drainage changes are also helping with sedge control."

Bruce says working with an agronomist has given him access to aerial and soil mapping technology to accurately map the poorer-performing cane areas. That's helped with both the drainage changes and farm nutrient management planning – ensuring ameliorants like lime are used at the best time to maximise nutrient uptake and minimise runoff, and nutrients including zinc and magnesium are accurately applied to crops for well-rounded nutrition based on soil sample results.

BETTER SOIL HEALTH

He says the work has helped to reduce his fertiliser use.

"We've gradually cut back to close to 12 per cent below recommended rates. We are improving soil health through multi-legume fallow crops. Instead of just the traditional soybean or cow pea to put nitrogen back in the soil, we're also using sunn hemp and sunflower for a better all-round effect. The roots of sunn hemp are bigger and they loosen up the soil, and the nitrogen accumulated in the crop doesn't disappear immediately. It's more gradual, over a number of years.

"And with GPS (global positioning systems), these days we can map the farm, keep our vehicle use on the inter-row spaces and reduce soil compaction. It's a big advancement."

A LOVE FOR WATERWAYS

The 110-hectares of cane land farmed by Bruce borders Behana Creek, which flows into the Mulgrave River about 20 kilometres from where it meets the ocean at Russell Heads. With such a handy location, the Cotterill family has fished in the creek, river and ocean for many years.

"We love the waterways on and near the farm, and going out on the ocean. Living where we do, the way we see it we are stewards of what goes into the creeks, rivers and ocean and how it all looks."

The Going the Distance project is delivered by Farmacist as part of the $4.38 million Sugarcane Practice Change Program funded through the Queensland Government's Queensland Reef Water Quality Program.

hooked
WITH RAYMOND WHITE

He caught his first sooty grunter in the Tully River as a four-year-old. And by the time he was six or seven, he was at the Reef. He's never stopped fishing. We talk to **Raymond White** about sooties, barra and what keeps him in our waterways.

WHAT SUSTAINABLE FISHING PRACTICES DO YOU LIVE BY?

I mostly catch and release. It's more about trying to figure out what'll get different fish to bite and how to use the conditions. And the thrill of the chase.

WHAT IS IT THAT YOU LOVE ABOUT BARRA FISHING?

The bite and the fight. When you're casting lures, barra have the best strikes. The enjoyment for me is in working out what'll get them to bite. They can be hard to trick. Then there's the way they look at you and that stripe down their forehead...

BIGGEST BARRAMUNDI...

A 1.28m barra at Tinaroo. In the saltwater, it'd be a 1.19m barra in the Hinchinbrook Channel. And a 1.09m in the Hull River. They were all released.

TOP THREE TIPS FOR CATCHING BARRAMUNDI:

ONE: Fish on the neap tides in estuaries. There's less current so it's easier to fish the snags. Or go for the start of the making tides, which are five to seven days before the full moon and five to seven days before the new moon.

TWO: I like the challenge of using lures. You need the right lure for the conditions. If there is too much current in the rivers, it's hard to get the prawns to work. They tend to want to swim on their side. Top three lures: Soft plastic prawn imitations like a Zerek Live Shrimp or a Berkley Gulp Shrimp. Soft vibes like a Zerek Fish Trap, a Jackall Transam or a Samaki Vibelicious. Suspending deep-diving jerk baits like the Jackell Squirrel 79 or Samaki Redic DS80.

THREE: At Tinaroo Dam, fish the main shallow points a couple of hours before sunrise. The sunrise bite seems to be the most consistent.

WHAT KEEPS YOU GOING BACK FOR MORE?

The serenity! I'm often out there by myself. I love being on the water. It's the challenge of it too. You're always thinking about how to get your target fish on the bite, and when to go so that you'll be in the right place at the right time.

In the lead-up, you're checking the weather, the tides... It's pretty rewarding when you set out with a good plan and it comes through. Then again, if things aren't working out, you need to think about what to do next – shift locations, change your cast angles, reposition your boat?

MOST MEMORABLE MOMENT ON THE WATER

Years ago I drove up to Tinaroo after work one night and caught a 1.24m barra while trolling. But some of most memorable days are when I'm just walking the creeks in the Tully region chasing sooties and jungle perch, and catching and releasing. There is still the same enjoyment in that as there was back when we were kids.

TOP THREE BAITS FOR CATCHING SOOTY GRUNTER

ONE: The best bait is still worms.

TWO: Little surface poppers in the early morning or late afternoon or when you're casting under the shade of the trees.

THREE: The Zman Grubz soft plastic 2.5 inch lure in motor oil colour.

MARINE invaders

Ports North is using cutting-edge science to find marine pests hitching a ride into our waterways.

Hundreds of trade vessels, cruise ships and recreational boats pass through Great Barrier Reef waters to get to the Port of Cairns each year. They can bring unwelcome passengers – from non-native mussels and oysters to worms, sea squirts and algae – which have the potential to disrupt local ecosystems and fisheries by spreading through ballast water, marine equipment and the biofouling on hulls.

Adam Fletcher, Environment Manager at Ports North, says eDNA, or environmental DNA, is a new technology that is revolutionising biosecurity monitoring, particularly as new applications emerge.

"Environmental DNA detects traces of DNA that organisms naturally shed in the water," he says.

"This helps us to identify species with much greater speed and accuracy.

"It means we can detect the presence of invasive species before they become a major problem and put response measures in places much more rapidly."

The award-winning Q-SEAS Marine Pest Sampling program has been running since 2019 and is a joint effort by Ports North, the Queensland Ports Association, and Biosecurity Queensland.

As part of the program, Ports North collects bio-fouling – the layer of marine organisms, algae, slime and other debris that builds up on the underwater surfaces of a vessel – by placing plastic plates in the water for eight weeks twice a year.

Plankton is also collected, along with water samples. The genetic materials of marine organisms are then sent to Curtin University, where they are analysed and compared to a library of over 100 marine pest DNA profiles.

Adam says no high priority or new invasive species have been detected in Cairns since the program began. However, already established pest species have been detected.

"In the last two decades there have been a number of incursions of Asian green mussel and Asian bag mussel from physical samples but luckily they haven't established themselves here. However, the black scar oyster, which was detected around five years ago, is now prevalent in Cairns and Port Douglas, competing with native oysters for habitat and resources."

Australia has some of the strictest biosecurity laws in the world. Ships must regularly maintain their hulls with anti-fouling coatings to prevent marine organisms from attaching, and vessels arriving from high-risk international locations are inspected.

"This eDNA program provides another layer of defence in protecting our marine environment," Adam says.

HELP STOP THE SPREAD OF PESTS

- Keep your boat and fishing gear clean and dry and undertake regular maintenance to prevent biofouling.
- Comply with Australian Ballast Water Management requirements on your vessel.
- Put unwanted fishing gear in the bin, not the water.
- Dispose of aquarium contents responsibly i.e. not in our waterways.
- Only import permitted species for your aquarium.
- Learn more about risks, species and how you can help in the great resources provided by marine biosecurity agencies.

PETERSON'S platypus

A new project at **Yungaburra's Peterson Creek** is shining a light on the platypus – and it could also be the next step in improving the water flowing past their burrows.

Most of us think of platypus when we think of Peterson Creek at Yungaburra. It's definitely a place to go if you want to spot these reclusive creatures (known as 'Ngunba' in the local Dulgubarra Yidinji language) whose populations are declining across much of eastern Australia.

The Yungaburra platypus crew lives in burrows on the edge of a creek that Landcare volunteers and the Dulgubarra Yidinji clan have spent years transforming from a weed-choked waterway into a wildlife haven.

Together they're now going one step further, working on a new project that's monitoring both platypus and the quality of water in Peterson Creek, a 9km waterway that passes through farmland and Yungaburra before flowing into Lake Tinaroo and, ultimately, the Barron River.

Volunteers are taking water samples every three weeks near the creek's rainforest source and at a platypus viewing spot near town. They are also using a motion-activated video camera to better understand platypus activities, and this will work in with a new James Cook University research project using environmental DNA, citizen science records and camera monitoring to learn more about the platypus population.

Yungaburra Landcare Group's Dermot Smyth says footage of a female platypus has been a highlight.

"We saw a mother climbing a five-metre embankment dragging wet vegetation with her tail and hind feet so she could line the burrow for youngsters.

"We've got nighttime footage of her coming and going throughout breeding season and the camera has also captured other species including tree kangaroos, possums, rakali, snakes, water dragons and birds.

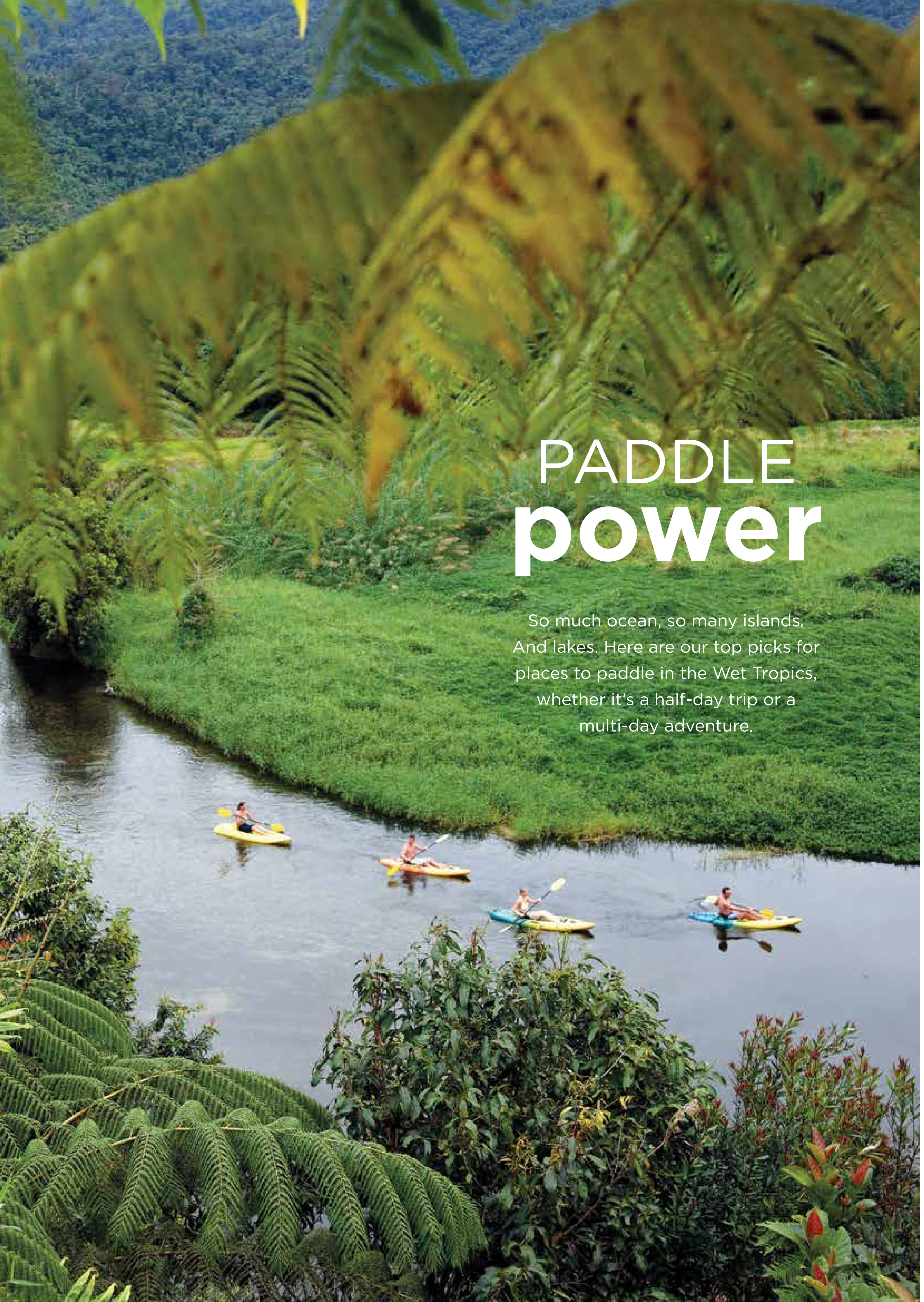
"It's nice to see to how vegetating even a narrow strip beside the creek has brought in so many native species."

The water testing part of the project is happening over a wet and dry season. Samples are analysed at the Cairns Regional Council laboratory for everything from bacteria, nutrients and suspended solids to electrical conductivity and pH levels.

"This is the first time the difference in water quality between the creek's source and further downstream is being measured. Early results show much higher sediment loads downstream.

"We will be sharing the final results along with a draft strategic plan for managing Peterson Creek, taking into account Traditional Owners, landowners, tourists, the council and other stakeholders. With more information we are hoping that we can all do better."

The wetland monitoring is a collaboration between Terrain NRM, James Cook University, Griffith University and Queensland Government agencies. It is funded by the partnership between the Australian Government's Reef Trust and the Great Barrier Reef Foundation.



PADDLE power

So much ocean, so many islands. And lakes. Here are our top picks for places to paddle in the Wet Tropics, whether it's a half-day trip or a multi-day adventure.

HINCHINBROOK ISLAND, CARDWELL AND LUCINDA

Pack your camping gear and get excited! Australia's largest island national park lures sea kayakers from all over the world, offering up secluded beaches and sunsets over jagged mountain ranges. There's a great six-day paddling route along the east coast between Cardwell and Lucinda. If you'd like to share the adventure with new friends, Coral Sea Kayaking runs catered trips.

DUNK ISLAND, MISSION BEACH

Paddling around Dunk is a 22km day trip (to and from Mission Beach) with some great stop-offs at palm-tree-lined beaches. There is also fringing reef to paddle over. BYO watercraft or hire one at Mission Beach.

BABINDA CREEK, BABINDA

This is a family favourite. Paddle/float down Babinda Creek for a few hours or half a day. BYO kayaks or hire them through Babinda Kayaks for a trip that's about 9km and includes transport back to your car.

LAKE BARRINE AND LAKE EACHAM, ATHERTON TABLELANDS

These two lakes, which are rain-filled craters, have beautiful rainforest surrounds (with walking tracks if you feel like stretching your legs after a paddle), and they're perfect for 3km or 4.5km circumference paddles. They're also great for swimming.

FITZROY ISLAND, CAIRNS

Paddling will get you to beaches and reefs off the beaten track at popular Fitzroy Island. Catch a boat to the island and enjoy a paddle along its shores, exploring reefs along the way. Hire kayaks and snorkelling gear from the Fitzroy Island Adventure Centre or book a three-hour tour in a glass-bottom sea kayak.

DOUBLE ISLAND, PALM COVE

Look out for green and hawksbill turtles, rays and shovelnose sharks as you paddle over reefs on your way to, and around, Double Island. It's a 1.5km paddle from Palm Cove. BYO watercraft or take advantage of a number of operators who have tours to the island.

SNAPPER ISLAND, WONGA BEACH

On a calm day you'll see colourful corals off Snapper Island. Part of the Hope Islands National Park, it's a 2km paddle from Wonga Beach. When you get there, you can stop off at small sandy beaches and enjoy the serenity.

BEING SAFE ON THE WATER

Don't let these put you off!

- Be croc-wise and avoid estuaries on your paddles.
- Stinger season is from November to May so wearing protective clothing is recommended.
- Safety gear is also recommended - from a life jacket and first aid kit to an emergency position-indicating radio beacon (EPIRB).
- And finally, let someone know your plans.

WATER filters

Wetlands are nature's water filters — they're remarkably effective at removing pollutants. With this natural ability, they're now helping to treat agricultural run-off and support Australia's Reef 2050 targets.

Farmers have been making significant progress in reducing the runoff of nutrients, pesticides and sediment into the Great Barrier Reef lagoon from their paddocks, but recent science shows that 'best management practices' alone won't be enough to meet Australia's Reef 2050 targets.

We need to go beyond farm-based changes. And that means scaling up broad landscape repair work, including restoring wetlands and installing engineered water treatment systems to intercept runoff before it reaches waterways.

WETLANDS AS POLLUTANT REMOVERS

Researchers have been monitoring several wetlands, including three constructed wetlands in the Wet Tropics – on cane, banana and cattle farms. The concentrations of nitrogen and sediment going into and out of the wetlands show they are working effectively to clean pollutants from runoff, and further data has been collected to estimate the quantities removed.

Tony Weber from Alluvium Consulting says the data collected from these wetlands is being used to test a model that predicts how wetlands will perform under different weather and landscape conditions. The model can calculate the overall water quality improvement if wetlands are repeated across the landscape, making it useful for planning and managing future wetlands to improve the quality of water flowing to the Reef.

"It takes time and a lot of data to understand how wetlands function," he says. "But what we've learned is clear – vegetation is everything. With the right amount of vegetation and proper maintenance, wetlands can effectively remove a lot of nutrients."

Water flow also matters. Tony says wetlands need to hold water long enough for pollutants to be removed and if water flows through too quickly, they don't work as effectively.

THE ROAD AHEAD

Wetlands are an important part of the broader Reef ecosystem. Evidence shows that the negative impacts of pollutants running off the land to the Reef can be reduced by installing treatment wetlands in addition to expanding the restoration of natural wetlands, particularly on land with low agricultural value.

James Donaldson, Executive Officer at Wet Tropics Waterways, says the goal is to reduce pollutants at the source through good farm practices, and then to use treatment wetlands as interceptors that clean up any runoff before it enters waterways. Natural wetlands can provide the final 'polish'.

"Wetlands are important to our aquatic landscapes – they protect our rivers, lakes and the Reef lagoon from pollutants and provide vital habitat for birds, fish, reptiles and amphibians. They also provide a buffer against storms and floods.

"We need to protect the wetlands we have and bring degraded ones back to life."

FAST FACTS

- Historic loss of wetlands from clearing and draining land has stabilised.
- Treatment wetlands are man-made systems designed to mimic the natural processes of wetlands in treating water.

The wetland monitoring is a collaboration between Terrain NRM, James Cook University, Griffith University and Queensland Government agencies. It is funded by the partnership between the Australian Government's Reef Trust and the Great Barrier Reef Foundation.

OYSTER REEFS 101

Once a vital part of Australia's coastal ecosystems, **oyster reefs** are now among the world's most endangered marine habitats. Fortunately, efforts are underway to restore them – reviving lost habitat, improving water quality and supporting marine biodiversity.

WHAT IS AN OYSTER REEF?

Oyster reefs are dense clusters of oysters that grow on hard surfaces like rocks, old shells, or even other oysters and whelks in shallow coastal waters. These reefs provide vital habitat for marine life.

WHY ARE THEY ENDANGERED?

Globally, over 85 per cent of oyster reefs have been lost due to destructive harvesting, dredging, pollution, disease and coastal development. In Australia, the loss is estimated at more than 95 per cent. A major driver of this decline was the widespread harvesting of oysters for their shells, which were burned to produce lime—a key ingredient in cement. While these figures mostly relate to southern temperate waters, oyster reefs are now being discovered across tropical Australia, although there is little evidence yet of how extensive they once were.

WHAT'S THE SITUATION IN QUEENSLAND?

A recent Griffith University study uncovered historic mentions in local newspapers of 23 oyster reefs across 14 locations between Townsville and Port Douglas – most of them long forgotten. Connecting with Traditional Owners may help to bridge the scientific knowledge gap. OzFish Unlimited has mapped and helped ground-truth many of these sites and has discovered numerous remnant reefs—but only in remote areas. Priority reefs are being selected for restoration.

WHAT DO WE KNOW ABOUT TROPICAL OYSTERS?

Tropical oysters show greater species diversity, grow more quickly and reproduce more often than their southern counterparts.

WHY RESTORE REEFS?

Oyster reefs provide powerful ecological benefits. They stabilise shorelines, filter and clean water, and create vital habitat for a rich community of invertebrates like crabs, worms, and prawns, which are important food sources for fish.

HOW MUCH WATER CAN THEY FILTER?

A single adult oyster can filter up to 180 litres of water per day. Multiply that by thousands or even millions of oysters, and you've got a natural water purification system that can dramatically improve water quality.

HOW ARE THEY BEING RESTORED?

Despite the scale of decline, oyster reef restoration is proving successful both overseas and around Australia. The process involves laying down hard surfaces like recycled oyster shell or limestone and allowing wild oyster larvae to settle – or adding hatchery-grown spat (young oysters) and protecting the site so the reef can grow.

HOW CAN YOU GET INVOLVED?

OzFish Unlimited is building a national database of the remaining tropical shellfish reefs. If you spot a reef or shellfish cluster, you can help by reporting it at: ***ozfish.org.au/projects/great-shellfish-hunt***

WORKING TOGETHER WITH WATER & LAND CARERS ACROSS QUEENSLAND

Supporting more than 50 community-based groups delivering sustainable agriculture, biodiversity conservation, environmental protection, advocacy and education, coastal rehabilitation, restoration and conservation across the Wet Tropics region.

QWaLC
QUEENSLAND WATER & LAND CARERS

www.qwalc.org.au

Landcare

Get involved: Volunteer for a sustainable future.

Find out more about the local groups in your area: *https://qwalc.org.au/groups/group-listing/wet-tropics/*