

2021-2022

WORKING TOGETHER FOR Healthier Waterways



Partnering to improve the values
of our catchments and Reef



An aerial photograph of a coastal region, likely in the Dry Tropics. The image shows a large body of water with several islands and a coastal city. The water is a deep blue, and the land is a mix of brown and green, indicating a semi-arid environment. The city is visible in the lower half of the image, with a grid of streets and buildings. The overall scene is a mix of natural and urban landscapes.

Welcome to the —2021-2022— Management Response Report

The Dry Tropics Partnership for Healthy Waters (DTPHW) is a collaboration between community groups, industry, science organisations and government. The Partnership reports on waterway health with the goal of stimulating management actions.

This report showcases the activities and efforts of our partners to improve the health of waterways in our region over the past year.



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Social surveys reveal what people think about our waterways

Author: Dry Tropics Partnership for Healthy Waters

A total of 1,877 residents were surveyed across the five regional report card regions, spanning the Great Barrier Reef catchments between Gladstone and Cooktown, collecting information about the uses, benefits and values of waterways, as well as perceptions of threats, stewardship and governance.

Results from the surveys revealed some interesting results about the social values of our waterways.

Dr Matt Curnock from the CSIRO said the new data complements existing datasets from the Social and Economic Long-Term Monitoring Program (SELTMP) that largely focus on the Great Barrier Reef.

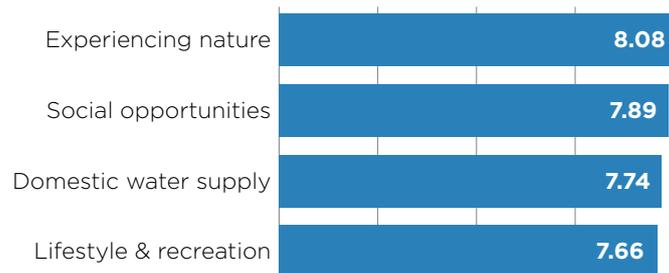
"This new information fills an important knowledge gap around how people use, value and perceive waterways in the Great Barrier Reef catchments," he says. "It also contributes directly to the objectives in the Reef 2050 Long-Term Sustainability Plan."



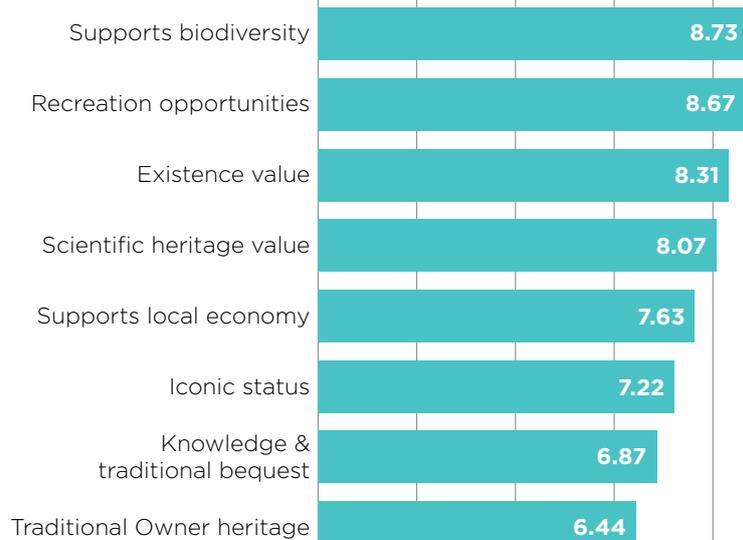
Healthy waterways are a key part of our lifestyles and livelihoods in Queensland. For the first time, CSIRO and the five Regional Report Card Partnerships teamed up to quantify the social, cultural and economic values of our waterways.

Results show that Townsville residents keenly recognise the value of waterways (Figure 1), despite more than 84% of respondents deriving no direct income from them.

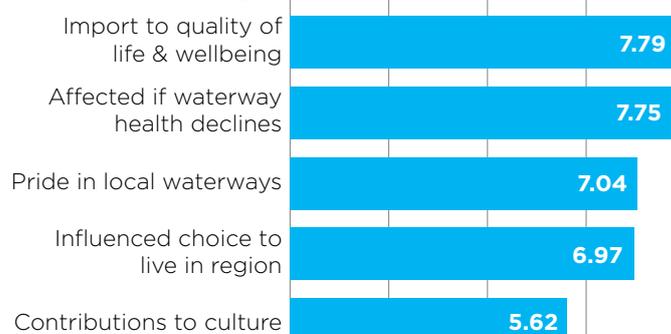
Relative importance of personal benefits



Relative importance of waterway economic & non-monetary values



Dependence on regional waterways



0 2 4 6 8 10
Mean of responses (1-10 agreement scale)

Check out the Regional social survey dashboard



Figure 1. Relative importance of personal benefits, importance of non-monetary value, and dependence on local waterways. Adapted from SELTMP data.

Townsville residents also experience a strong sense of responsibility towards local waterways, with the majority of respondents participating in multiple forms of stewardship and caretaker action.

95% of residents dispose of rubbish appropriately, 91% of residents fish responsibly, and more than 50% of residents undertake at least 4 additional stewardship actions. Townsville residents strongly agree that they feel a sense of responsibility, want to do more, and can make a difference to their local waterways (Figure 2).

However, residents also indicated a perception that overall waterway management is average and could be improved. Resident satisfaction with management sectors was mediocre, and they perceive they have little influence or input. Despite this, residents agree that they trust the science about waterways, and the information provided by management institutions (Figure 3).

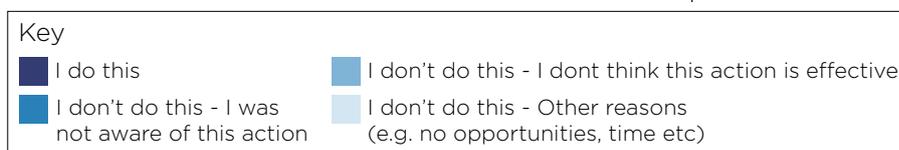
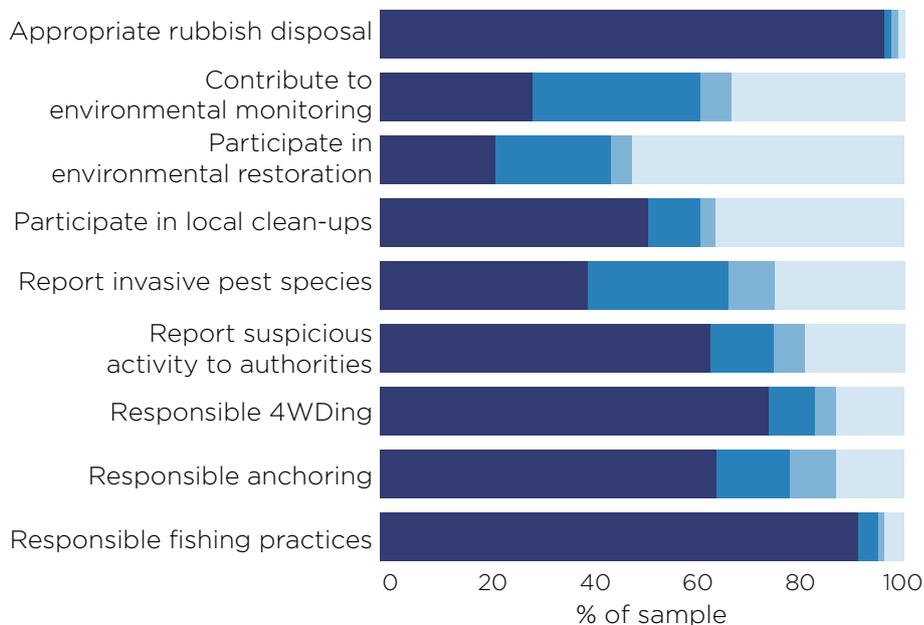


Figure 2. Self-reporting of waterway stewardship action. Captured from SELTMP website.

For more information, visit the CSIRO SELTMP website

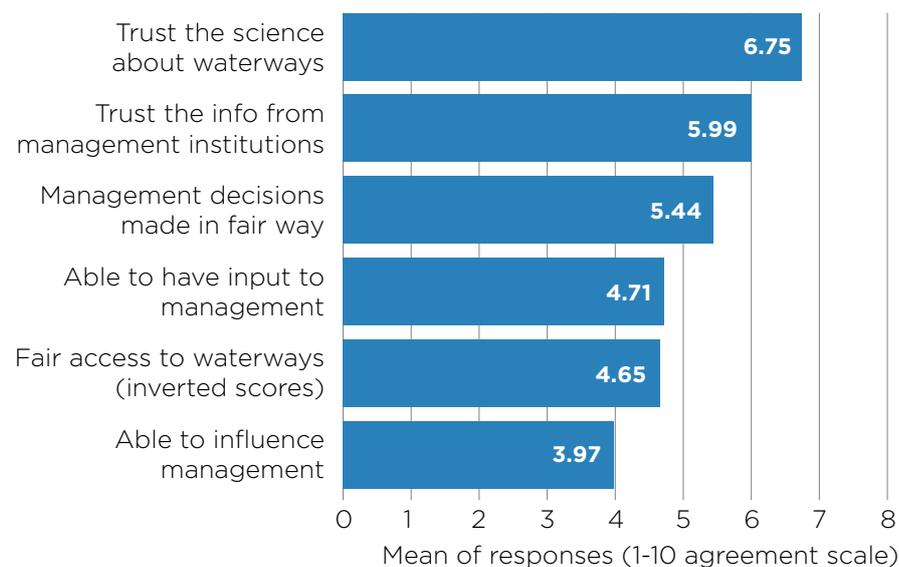



Figure 3. Participation, perceived fairness, and trust in waterway governance. Captured from Regional social survey dashboards.

Funding acknowledgement

This project is funded by the partnership between the Australian Government's Reef Trust and the Great Barrier Reef Foundation, and is being delivered in partnership with CSIRO, the Great Barrier Reef Marine Park Authority, and the Queensland Government's Reef Water Quality Program. This module of work was made possible with in-kind support and co-investment from the Queensland Government, and the five Regional Report Card Partnerships in the Great Barrier Reef catchment region: Dry Tropics Partnership for Healthy Waters, the Wet Tropics Healthy Waterways Partnership, Mackay-Whitsunday-Isaac Healthy Rivers to Reef Partnership, Fitzroy Partnership for River Health, and Gladstone Healthy Harbour Partnership.

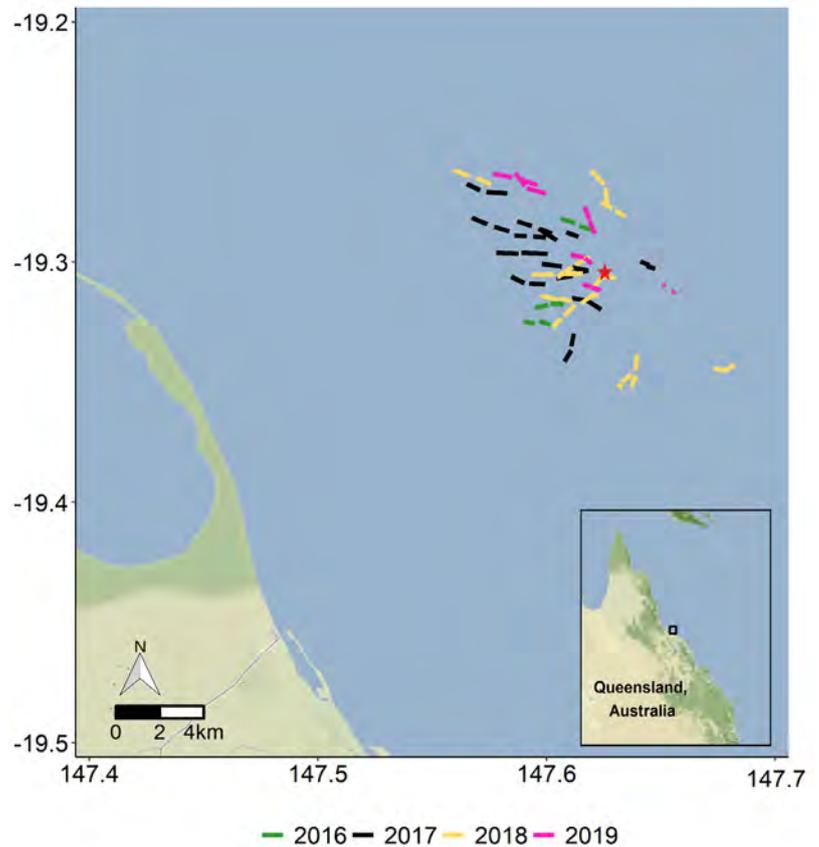
Microplastics prevalent in the Great Barrier Reef

Author: Dr Cherie Motti, Australian Institute of Marine Science

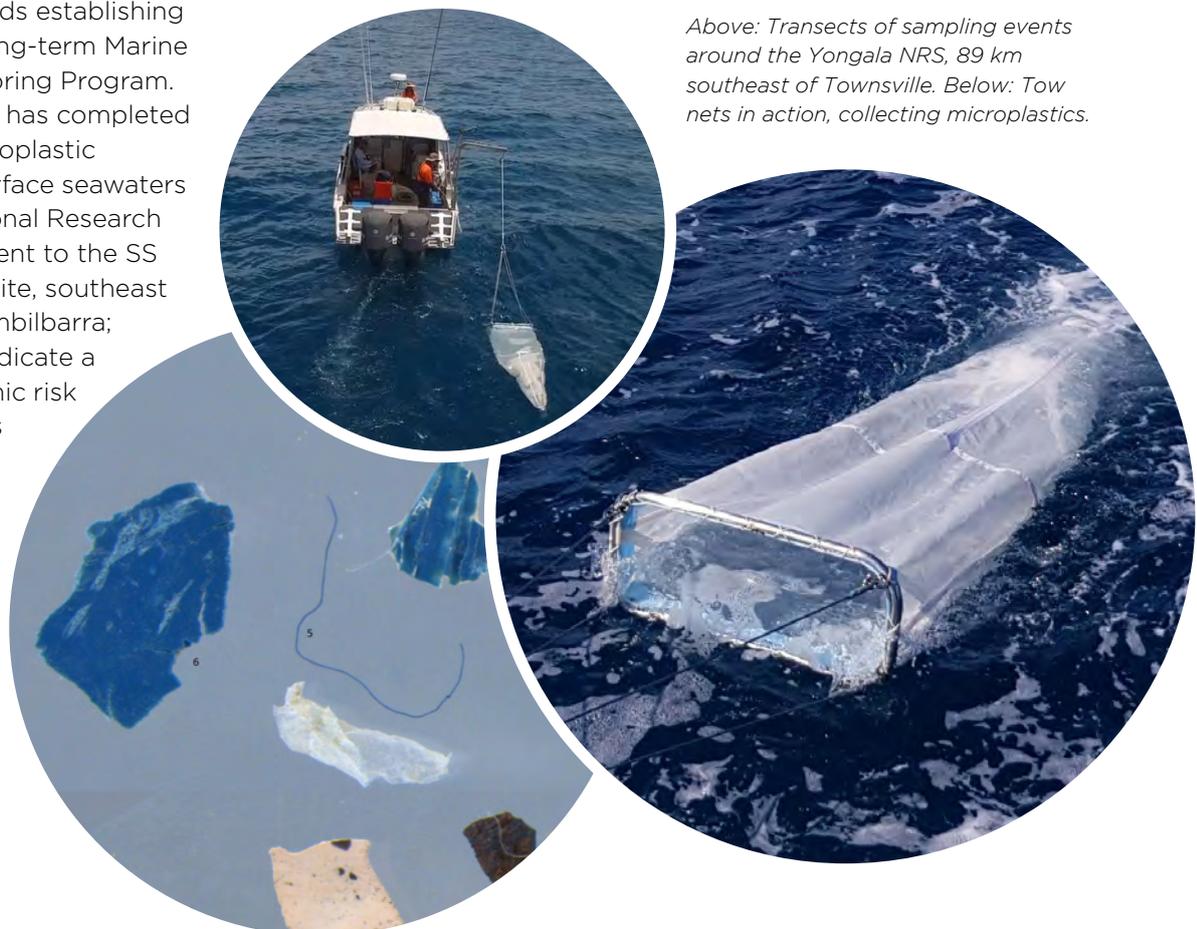
By 2030 it is estimated there will be a yearly global input of up to 53 million metric tonnes of plastic into aquatic ecosystems, posing significant risk to marine life and industries such as fisheries and tourism.

Microplastics are plastics less than 5 mm in size. They are pervasive and persistent in the marine environment. Their (often unintentional) ingestion by marine species and subsequent transfer up the food chain has been linked to poor health outcomes.

The Australian Institute of Marine Science (AIMS) Microplastics Group in collaboration with the Integrated Marine Observing System (IMOS) have developed field and laboratory methods and protocols towards establishing an Australia-wide long-term Marine Microplastics Monitoring Program. As a first step, AIMS has completed a pilot study of microplastic contamination in surface seawaters at the Yongala National Research Station (NRS) adjacent to the SS Yongala shipwreck site, southeast of Townsville (Gurumbilbarra; see map). Results indicate a continued and chronic risk to marine organisms from microplastic exposure.



Above: Transects of sampling events around the Yongala NRS, 89 km southeast of Townsville. Below: Tow nets in action, collecting microplastics.



Analysis of 66 surface seawater tows (shown right), collected monthly between September 2016 and September 2019, found 533 microplastics, with only one tow having none.

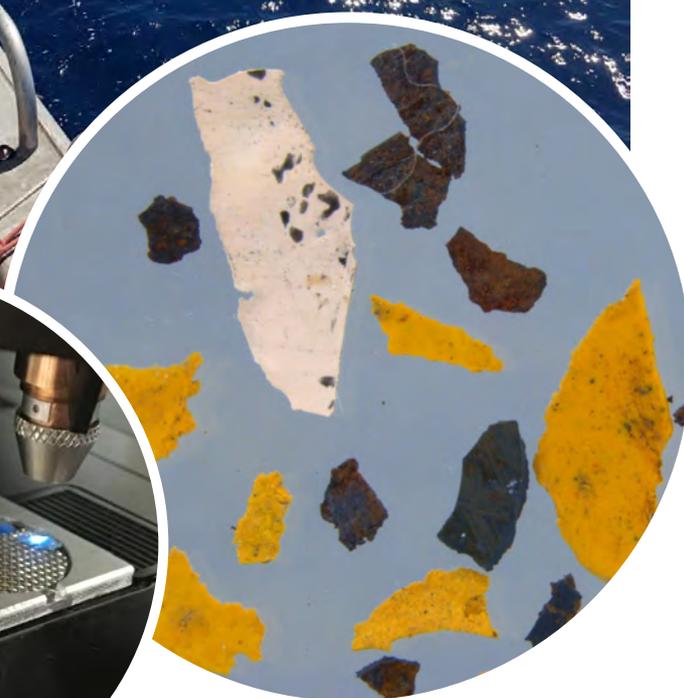
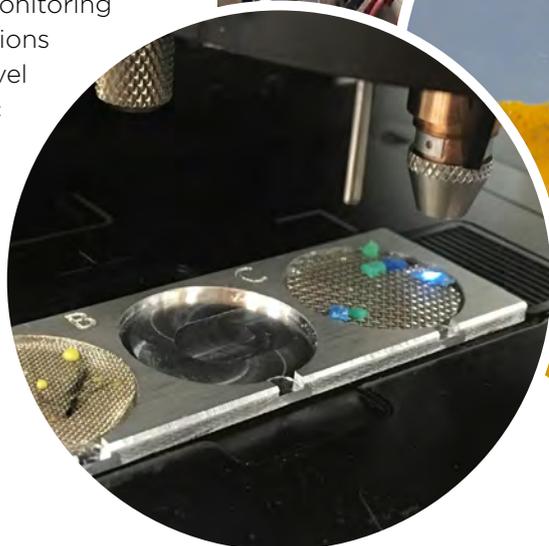
The microplastics were identified as microfibrils of textile origin, likely derived from clothing and furnishings. These findings reflect those previously reported in both GBR waters and coral reef fishes.

Interrogation of the data found extreme weather events and associated increases in river discharges have significant influences on surface seawater microplastic concentrations at the Yongala NRS. Outflows of plastic debris from local rivers during the February 2019 Townsville flood and extreme wind speeds from Severe Tropical Cyclone Debbie in March 2017 caused large spikes in microplastic concentrations.

Despite these spikes however, the overall trend of microplastic contamination remained consistent over the study, suggesting continued and chronic risks of plastic exposure to marine organisms.

The findings and learnings from the pilot study are being used to develop a long-term Australia-wide monitoring program across seven locations to better understand the level and impacts of microplastic contamination in Australian waters. This dataset is publicly accessible via the [Australian Ocean Data Network \(AODN\)](#).

For more, see Miller, M.E., et al. *Environmental Pollution* 307 (2022).



Funding acknowledgement

The pilot study was supported by AIMS and a JCU scholarship to PhD Candidate Michaela Miller. The Marine Microplastics Monitoring Program is co-funded by AIMS and IMOS and is being delivered through partnership with IMOS field crews.



COMMUNITY ACTION PLAN PROGRAM

Turbo-charging community-led action on Yunbenun (Magnetic Island)

Author: Great Barrier Reef Foundation



Over the past several years, Magnetic Island Community Development Association (MICDA) has been working with a range of partners on the creation and implementation of the Yunbenun (Magnetic Island) Community Action Plan.

Now rebranded as Our World Heritage Island, the project empowers local groups and individuals to unite efforts to nurture, restore and protect the island. The community has long recognised the ecological importance of the island and growing pressures on this unique place from climate change and other threats like urban and coastal development and invasive species.

The initiative is part of the Great Barrier Reef Foundation and the Reef Trust-funded Community Action Plan (CAP) Program, which connects community aspirations with regional and reef-wide priorities to help design better ways to work together to deliver change.

Our World Heritage Island has brought together community groups, managers and scientists to develop and implement a plan as part of a whole-of-island coordinated approach to protect and restore the island's World Heritage values. Senior Traditional Owners were heavily involved in the development, forming the Wulgurukaba Working Group to ensure that Traditional knowledge and values were incorporated into the projects. There are many talented, passionate and knowledgeable people who live and visit Yunbenun.

Our World Heritage Island is harnessing this valuable resource to partner with the organisations carrying out a number of exciting initiatives. By providing a focal point, Our World Heritage Island is well placed to help groups work together for a greater impact.

MICDA President, Les Sampson said: "The process has catalysed our community, both adults and children, to future-proof the land and sea country of Yunbenun (Magnetic Island), and has helped create this leading sustainable island community."

CAP Leader Gemma Wickens said: "The GBRF funding has brought people together and is building momentum. Without the funding, without people able to dedicate their time and effort, all the good work dissipates without gaining any traction for change."

Our World Heritage Island consists of three highly interconnected community-led projects for coastal, estuarine, and marine citizen science and community on-ground action. Five part-time roles have been funded; a CAP Leader, a Community Partnerships Coordinator, two Traditional Owner Coordinators, as well as a World Heritage Values coordinator administered through Magnetic Island Nature Care (MINCA). The MICAP Steering Group provides strategic advice for the projects and continues to grow new partnerships, participation, and funding.



Protecting and restoring World Heritage values

The MINCA World Heritage Values Project will enable the island community to identify the natural values needing protection, and the best way to reduce any threats. As well as consolidating existing knowledge and concern, the project will provide direction for further activities and for targeted monitoring of impacts. A short film is in production to showcase the work.

Community partnerships for ecosystem monitoring

The project is harnessing the energy and knowledge of residents, Traditional Owners, and stakeholders to link and support them with citizen science organisations. The project aim is to systematically record, report on, and communicate the Island's marine and coastal ecosystem health. Some of the successes so far include:

- promoting collaboration between all partners and stakeholders through the Monitoring Maggie Workshop
- contracting Tony and Avril Ayling to work with locals to monitor coral reef sites building on 33 years of data
- partnering with Magnetic Island State School, OzFish and Townsville City Council to adopt a creek under CreekWatch
- partnering with AusMap, Queensland Parks and Wildlife Service and Tangaroa Blue for beach clean-ups such as Trek for Trash
- partnering with Sealink, local venues and experts to present the hugely popular Pub Talks
- partnering with Great Barrier Reef Marine Park Authority to pioneer community marine monitoring through Under Alma
- working with MangroveWatch to co-ordinate a group of passionate locals to monitor their mangroves as the MaggieMangroovers
- facilitating partners to work with Apex camp to design and deliver a program of environmentally conscious, fun activities to high school students.



Traditional Owner participation on land and sea country

Wulgurukaba people inhabited Yunbenun for thousands of years. This connection was disrupted by colonisation but there is a hunger for Traditional Owners to get back to looking after their Country. There has been constant effort in this regard, however people have lacked resources and training.

Our World Heritage Island Project has been funded to build capacity for Wulgurukaba to gain the knowledge and expertise that empowers them to take greater control of their Country. This includes support for Indigenous Rangers and training in skills such as cultural databases, scuba diving, monitoring, and drone use. There was a successful NAIDOC celebration at Magnetic Island State school, featuring Yunbenun Rangers and Wulgurukaba Walkabouts. Wulgurukaba artist Lee George worked with the children to produce art installations.

MICDA are working with the Dry Tropics Partnership for Healthy Waters to ensure that data collected can be included in its report cards on waterway conditions. The Dry Tropics Partnership for Healthy Waters is also working with Reef Ecologic to progress a Townsville region CAP project and is seeking input from the community.

Find out more:

Magnetic Island World Heritage Values: minca.org/world-heritage-values-of-magnetic-island or contact Gethin Morgan at president@minca.org

Community Partnerships: www.facebook.com/EcosystemsMI or Jo Marks at EcosystemsMI@outlook.com

Traditional Owner participation:
Lyle Johnson at lylej33@hotmail.com
Brian Johnson at bj2172649@gmail.com

iNaturalist citizen science in the Dry Tropics

Author: Reef Ecologic

Reef Ecologic has been very active in the citizen science space this year, particularly by championing the world's largest citizen science database, iNaturalist.

The iNaturalist tool allows anyone to make observations of wildlife by taking photographs, and with the help of AI and crowdsourcing, the app will identify the photographed species. Once two or more people agree on a species name, an observation is classed as "research grade" and can be used in research or to inform natural area managers. Reef Ecologic set up several projects to collate this data by region or by taxa, and trained people in the use of the app.



One highlight of these citizen science efforts was the ReefBlitz 2022 event, which collected and uploaded observations between 1-8 June in celebration of World Oceans Day. The entirety of the Great Barrier Reef World Heritage Area was included, with 33 observers making 1,538 observations of 433 species, and 142 people around the world helping to identify these creatures. The majority of observations (67%) and species recorded (70%) occurred in Dry Tropics catchments, highlighting just how biodiverse this area is, as well as how passionate the local citizen scientists are!

Several localities within the Dry Tropics Partnership for Healthy Waters (DTPHW) region have been the focus of iNaturalist projects started by Reef Ecologic. The Magnetic Island (Yunbenun) project has had significant engagement due to accessibility of both terrestrial and marine environments, as well as the increased tourism leading to over 5,700 observations. The most observed species overall is currently the Koala at 115 observations.

The Orpheus Island (Goolboodi) project has seen 850 species observations, with the Green Tree Frog being the most observed species at 17 observations. Lastly, the citizen science project at John Brewer Reef (all marine based) has 732 species observations with the most observed species, the Blackaxil Puller, having 12. The projects have identified a total of 12 threatened or endangered species in these categories altogether, with 9 on Magnetic Island, 1 at Orpheus Island and 2 at John Brewer Reef. These observations are some of the most significant in these projects, helping to determine threatened species abundance and distribution within the region.



Reef Ecologic also launched three taxa-specific projects to engage the local communities along the Queensland coast, which included Sharks and Rays, Seaweeds, and Fish. Currently, in the DTPHW region, there have been 246 observations for the Sharks and Rays project and over 3,800 observations for the Fish project with 40 different species of Shark and Ray, and 537 Fish identified. There are currently 205 Seaweed observations within the same region, and 35 species.

These projects shed light on the power of collaboration and individual initiative to contribute to projects they are passionate about. They also provide an opportunity for citizen scientists to collaborate with like-minded experts and citizens to develop an understanding of these interesting and threatened marine species' current distribution, abundance and richness, with a total of 82 identified species currently in the threatened category.

iNaturalist

www.inaturalist.org/signup

Citizen science at Magnetic (Yunbenun) Island

inaturalist.ala.org.au/projects/citizen-science-at-magnetic-yunbenun-island

Citizen science at Orpheus Island and Marine Park

inaturalist.ala.org.au/projects/citizen-science-at-orpheus-island-and-marine-park

Coral Greenhouse, John Brewer Reef

inaturalist.ala.org.au/projects/coral-greenhouse-john-brewer-reef

Reef Assist makes waves in first phase

Author: Townsville City Council



The Townsville City Council's (TCC) Reef Assist - Business Activity and Environmental Restoration project was funded through the initial stage of the Queensland Government's \$33.5 million Reef Assist program. It was proudly delivered by TCC, in collaboration with 5 business partners, including 3 First Nations and 2 not-for-profit local businesses.

During its first phase, spanning the whole of 2021, the project achieved a range of outcomes, including riparian vegetation restoration, foreshore restoration, bank stabilisation, flood debris removal, soil health remediation, weed removal and humification, and development of low-impact eco-trails.

The project also sought to enhance longer-term environmental outcomes for the region, building local skill and restoration capacity through employment, training, and creating opportunities for circular economy outcomes.

The engagement and upskilling of First Nations people as part of this project have provided the opportunity to connect to Country and deliver impactful management outcomes across key landscapes (see page 14). Training programs have amplified Townsville's natural resource management industry and built the region's capacity to undertake rehabilitation works into the future.

The project also provided a great opportunity to further develop the model for the reuse of weeds removed and harvested from riparian zones. Previously, weeds removed were trucked to Waste Recycling Facilities, where materials could end up landfill at a cost. Now, harvested weeds can be generated into a stable and beneficial product for enhancing on-site soils (see page 17).

The Reef Assist project has continued throughout 2022, delivering continued beneficial outcomes for local waterways, including the construction of leaky weirs and other sediment erosion control structures, and thousands more local native tree plantings.

"Reef Assist has been great for Ausfield Services to build our staff skills and capability in the delivery of environmental restoration projects," says Sharon from Ausfield Services. "Working collaboratively with the Townsville City Council sustainability team, community stakeholders, Indigenous groups and other small businesses has led to profitable relationships and made us a stronger company with knowledgeable crews."



In 2021 Townsville City Council's Reef Assist project achieved the following within the Ross and Black River catchments:



850m
of stream bank
stabilised

260t
of weeds
removed

35
jobs
created

14,726 stems
seedlings planted

360kg
of flood debris
removed

34,475m²
of soil treated to
reduce runoff

8,750
local seeds collected
and propagated

“Working collaboratively has led to profitable relationships and made us a stronger company with knowledgeable crews.”

- Sharon, Ausfield Services



Reef Assist in focus: Healing Country

Author: NQ Dry Tropics



Three Big Rivers
garrbu yaralbarra

One initiative made possible through the Queensland Government's Reef Assist program is the Healing Country project — run in partnership by NQ Dry Tropics and Indigenous employment group, Three Big Rivers.

Healing Country has supported Indigenous jobs and training, helped protect the Great Barrier Reef, and boosted North Queensland's economic recovery after the pandemic.

Under the project, five members of an Aboriginal and Torres Strait Islander Environmental Team in their early 20s gained practical on-ground skills working on NQ Dry Tropics projects across North Queensland, while undertaking an accredited environmental training program.

The crew carried out activities including controlling invasive weeds, fixing eroded gullies to reduce sediment runoff from grazing properties, constructing fences on a grazing property to protect fragile land, and improving the condition of coastal ecosystems, including creeks and wetlands.

Work in the Black River Basin included weed control and marine debris collection at three locations featuring endangered beach scrub — Crystal Creek, Mystic Sands and Quindalup.

To complement the field work, the group undertook a Certificate III in Rural Operations and accredited training in First Aid and CPR, Agricultural Chemicals Distribution Control, and Chainsaw Operation. NQ Dry Tropics staff provided additional training in areas such as gully remediation, weed identification and control, and grass species identification.



“Being part of this team has boosted my confidence, and since starting this work, I feel much more connected to my Country.”

– Gary Kyle, Three Big Rivers crew member

Crew member Gary Kyle, from Townsville, said he hoped the experience gained through the project would lead to further opportunities to work in the natural resource management.

"This has been my first regular full-time job and I have learnt so much," Mr Kyle said. "With all the practical skills and training courses, my resume is looking jam-packed."

"Being part of this team has boosted my confidence, and since starting this work, I feel much more connected to my country."

"I want to learn about my land, and give back to my land."

Supervisor Darryl Chong said he took great pride in how the crew had developed personally and professionally.

"It has made me so happy to see these young men gain skills and grow in confidence," Mr Chong said.

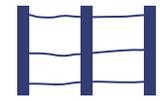
"I hope they will continue going down this path and the experience will help them achieve anything they want to."

"It's been a great journey and I feel very privileged to be part of it."

Three Big Rivers Director Thomas Holden said the project was a great example of what could be achieved through well-targeted investment.

"The Reef Assist program is supporting beneficial Indigenous economic and employment outcomes," Mr Holden said.

"The Three Big Rivers employees have been able to invest in themselves individually, and gain great cultural experiences while working on Country and improving the environment."



2.2km
of fencing
constructed
to support
improved grazing
management
practices



Snapshot of Townsville City Council initiatives

Author: Townsville City Council



Bohle Water Quality Offsets Project

The Bohle Water Quality Offsets Project has developed and tested the feasibility of using stormwater treatment solutions instead of traditional wastewater treatment upgrades to improve water quality in the Bohle River catchment, and ultimately, the Great Barrier Reef.

An offsets 'Road Map' has been developed to assist Townsville City Council in the future delivery of this project. This Road Map can also be used by other Councils and utilities as a guiding framework to deliver similar projects.



The approach means that benefits can be shared by community across the catchment instead of investing in expensive onsite upgrades to grey infrastructure at wastewater treatment plants.

An education package was developed to assist other local governments with developing a framework to support this approach to point source water quality offsets. Two pilot projects will be delivered to assess the approach in a dry tropics setting.

This project was funded by the Queensland Government as part of the Cleaner Wastewater Initiative project under the Queensland Reef Water Quality Program.

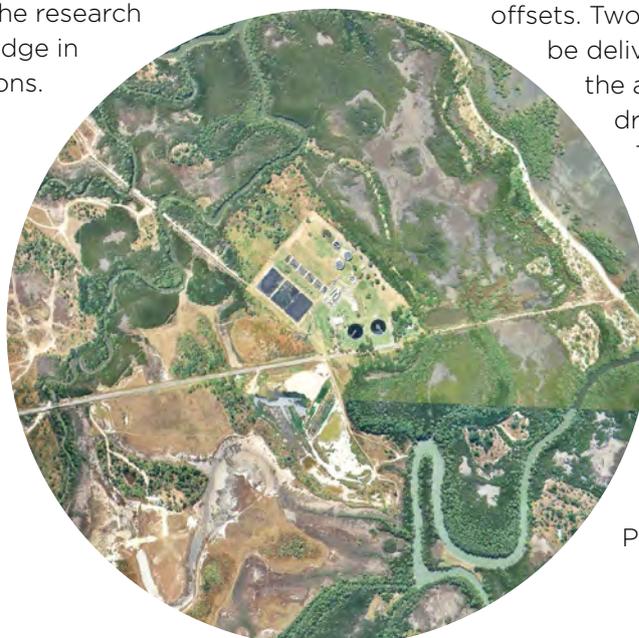
Wastewater research in emerging contaminants

Townsville City Council is playing a crucial role in research and development for the wastewater industry, and in guarding against potential impacts of contaminants of emerging concern on the Great Barrier Reef.

PhD studies underway in collaboration with James Cook University, other councils, and leading wastewater industry bodies include the assessment of ecological risk of emerging contaminants of concern released from the Cleveland Bay sewage treatment plant, and the effects of antibiotic resistance genes (ARGs) from the wastewater treatment plant on the green sea turtle populations in Cleveland Bay.

A collaborative wastewater industry and academic approach has proven the best way to undertake this work because of the challenging and diverse nature of the research and the desire to have this new knowledge in published and peer-reviewed publications.

This is about taking a proactive approach in filling knowledge gaps about what emerging contaminants of concern make it into our wastewater and how effectively they are removed at the sewage treatment plant. This gives us a better understanding around how we can continue to meet our licence conditions for the operation of the plant, and allows us to meet the actions set out in the Reef 2050 Long-Term Sustainability Plan.



Aquatic weed management

Townsville City Council has used an innovative approach based on circular economy principles to manage the removal of aquatic weeds and other unwanted species from urban waterways. Fertilisers and grass clippings from stormwater run-off enter urban lakes. The excess nutrients from these sources encourage aquatic weed growth and declining water quality in the wetlands. Council staff remove aquatic weeds and treat them with naturally occurring microbes to reduce odours and minimise overgrowth of unhelpful bacteria. Stockpiled weeds are then dried and turned into mulch and soil, which is re-used in projects across the city, proving a net environmental benefit.



Aquatic weeds are harvested, dried, and turned into valuable mulch (inset)

Adopt-a-Creek

The Adopt-a-Creek program was launched at the end of 2021 by Townsville City Council and our Creekwatch program delivery partner, OzFish. Participants in the Adopt-a-Creek program receive training and Creekwatch waterway monitoring kits to conduct activities in their chosen creek at a time that suits them. Creekwatch gives recreational fishers, community members and local schools ongoing opportunities to be custodians of their waterways, with activities including fish and macroinvertebrate sampling, water quality monitoring, litter clean-ups, and ecosystem restoration.

The program empowers communities to get involved in water catchment management and monitoring and is a great way for residents to meet likeminded community members. The program launch saw 5 community and school groups adopt Mundy Creek, an unnamed waterway adjacent to Ryan Catholic College, Ross River in Aplins Weir, the Bohle Wetlands, and an unnamed waterway adjacent to St Benedict's Catholic School.

Clockwise from left: Brett Murphy from Belgian Gardens State School adopted Mundy Creek; Recording fish data for Adopt-a-Creek; Ngaire Trigg, left, from Junior Landcare adopted the Bohle Wetlands.



IMPROVING WATERWAYS

More action around Townsville

Author: Dry Tropics Partnership for Healthy Waters

PORT OF TOWNSVILLE AND COASTAL DRY TROPICS LANDCARE INC.

Planting for our future

The Port of Townsville has been working closely with Coastal Dry Tropics Landcare to help plant trees across the Townsville region. In 2022 1000 seedlings have been planted. These new trees are important for stabilising soil and helping restore ecosystems.



ST BENEDICT'S CATHOLIC SCHOOL

Pitch Your Project

Last year's DTPHW community Waterway Forum saw St Benedict's Catholic School win our inaugural 'Pitch Your Project' grant. The project is run by Ngaire Trigg from St Benedict's and is analysing soil permeability and leaching impacts of humus soil compared to fertiliser. Soil samples are being collected from 4 schools which include St Benedict's, St Joseph's, Southern Cross Catholic School, and Ryan Catholic College. The results from this study will help direct schools and sporting clubs on the most environmentally friendly ways to treat their sportsgrounds.



ST BENEDICT'S
CATHOLIC SCHOOL
God in All of Life

TANGAROA BLUE FOUNDATION

Look After Your Tackle

Tangaroa Blue Foundation has released an industry-wide recreational fishing recycling program to help improve our waterways. Rig Recycle bins can be found at a number of fishing stores across the state and allow anglers to dispose of their unwanted fishing gear. This initiative helps reduce debris in our waterways and waste sent to landfill.



Check out the Recycle Mate app at recyclemate.com.au for more locations



Litter baskets update

Our Partners and the Local Marine Advisory Committee are achieving success with their litter baskets in the Ross Freshwater Basin and Halifax Bay. Since project inception, the Port of Townsville has added a further 30 litter baskets bringing the total in the region to 103.

24,000 items removed
1,238kg of rubbish



Cigarette butts and filters are still the dominant source of pollution in our waterways.





dry tropics partnership
for healthy waters

About the Partnership

The Dry Tropics Partnership for Healthy Waters is a collaboration between community groups, industry, science organisations and government. The Partnership reports on waterway health with the goal of stimulating management actions.



Acknowledgement of Country

The Partnership acknowledges the Bindal, Wulgurukaba, Nywaigi and Manbarra people as the traditional custodians of land in the Townsville region.

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Or email us at info@drytropicshealthywaters.org

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