2023-24
Year in Review

Creating a better future for coral reefs

Great Barrier Reef Foundation

Acknowledgement of Country

The Great Barrier Reef Foundation extends its deepest respect and recognition to all Traditional Owners of the Great Barrier Reef and its Catchments, as First Nations Peoples holding the hopes, dreams, traditions and cultures of the Reef.

More than 70 Traditional Owner groups have deep and enduring connections spanning the length of the Reef along the Queensland coastline and beyond, from the Torres Strait Islands in the north to Bundaberg in the south.

Contents

'Great Barrier Reef' artwork by Melanie Hava, Mamu Aboriginal woman, Dugulbarra and Waribarra family groups, from the Johnstone River catchment of the Wet Tropics of Far North Queensland and the adjoining Great Barrier Reef Sea Country.

With crisis comes opportunity

This year we witnessed the worst summer on record for our Reef. The impact was devastating, but we also made huge advances towards solving scientific and engineering bottlenecks and implementing solutions at a scale and pace never before attempted.

In summer 2023/24, the Great Barrier Reef faced two destructive tropical cyclones, severe flooding that impacted the quality of water, and crown-of-thorns starfish outbreaks that ravaged healthy corals. This culminated in one of the most widespread and severe mass coral bleaching events ever recorded.

Off the back of months of record-breaking ocean temperatures caused by a warming climate and the El Nino weather pattern, a fourth global mass bleaching event saw widespread bleaching around the world.

While these events have been devastating, it's not too late. Our window to act is closing, but there's still time to restore and protect coral reefs from the impact of climate change if we pick up the pace. It's more critical than ever to come together, pool our expertise and resources, and take swift action to restore and protect our planet's coral reefs.

This year was the sixth year of the Reef Trust Partnership (RTP), and the majority of work concluded as scheduled, save for a small number of extensions. Not only did the partnership achieve significant improvement in the health of the Reef, it delivered an unprecedented level of coordination, collaboration, and prioritised and outcomes-focused effort. It also delivered sustained participation and investment from a range of organisations, community groups and volunteers in protection, management and restoration activities.

Alongside the RTP, the Foundation's innovative conservation portfolio sits within three overarching pillars: Coral reef restoration, coastal habitat restoration and global partnerships.

This year we've tested and refined the innovative Coral IVF technique and boosted successful coral fertilisation rates by 100-times – raising the chances of fertilisation from one-in-a-million in natural settings to one-in-10,000.

To further accelerate our reef restoration efforts, we launched a ground-breaking partnership with McLaren Racing to leverage the team's elite engineering skills to help us scale up this work at unprecedented rates.

We also built the world's largest purpose-built seagrass nursery in Gladstone, allowing us to significantly scale up restoration of seagrass meadows to repair this critical ecosystem and unlock the Reef's potential to mitigate the impacts of climate change.

In New Caledonia, we worked with local communities, reef managers and local government to co-design a resilience strategy to help the archipelago's coral reefs and ecosystems – including its incredible marine life – overcome the threats they're facing.

We wouldn't be able to do this without our dedicated staff, partners, First Nations Peoples, frontline communities and supporters. They are at the heart of our collective success and their expertise, passion and commitment propel us forward every day.

Now is the time for bold ambition. The Reef needs all hands on deck to survive the decades ahead. We are pioneering innovative solutions for some of the most complex environmental challenges of our time. Thank you for playing your part in 2023-24. Together we can create a better future for the world's coral reefs.

David Thodey AO, Co-chair

Dr Martin Parkinson AC PSM, Co-chair

Anna Marsden, Managing Director

Our impact

Coral health

Up to 1,000-times increase in coral production through world-first semi-automated and robotic methods to mass produce corals.

Protected hundreds of thousands of hectares of coral reef each year, including 160,000 hectares (an area the size of London) in 2023-2024 alone.

346 kilo tonnes of **fine sediment**, 469 tonnes of **dissolved inorganic nitrogen** and 8.5 million risk units of **pesticides** kept off the Reef every year.

Biodiversity and habitat improvements

2 seagrass nurseries established to scale seagrass restoration, including the largest purpose-build facility in the world.

194,470 seeds collected to restore more than 2,500 hectares of seagrass meadows.

Restored 17.2 hectares of critical seabird nesting habitat on Lady Elliot Island.

Global and local collaborations

Engaged with more than 3,000 local beneficiaries across four UNESCO World Heritage coral reef sites in the Pacific and Caribbean.

6,038 Traditional Owners involved in the delivery of 102 protection projects on the Great Barrier Reef, led by 65 Traditional Owner groups.

62,749 Great Barrier Reef community members engaged, with half participating in activities for the first time.

Innovation

22 scalable water quality innovation projects to reduce pollutants, develop new technologies and better planning tools, and create novel financing mechanisms.

24 research projects pioneering innovative techniques like eDNA and robotics that directly improve COTS prediction, detection and response to outbreaks.

Largest best-in-class co-designed Traditional Owner-led reef protection program in the world.

These figures are cumulative totals to 30 June 2024

Reef Trust Partnership

In 2018, the Australian Government's Reef Trust and the Great Barrier Reef Foundation formed the largest collaborative reef protection effort of its kind in the world. The Reef Trust Partnership (RTP) is dedicated to achieving significant, measurable improvement in the health of the Great Barrier Reef.

The following demonstrates the RTP's power as a convenor, funder and innovator, with 639 delivery partners working across 462 projects to achieve the scale and pace needed to safeguard the greatest coral reef on the planet.

Much of this unique program, which delivered and built upon the Reef 2050 Plan, wrapped up on 30 June 2024, however an extension was granted for some activities. This report highlights the on-ground and in-water efforts over the past six years that have delivered measurable and sustainable benefits for the Reef and its communities.

Key to the RTP's success:

Acceleration

Recognising the Reef could not wait and the task was urgent, we scaled what we knew and was proven; developed or adapted solutions where none existed; and took big, bold steps.

Collaboration

Understanding that no single group could tackle this alone, we embedded partnerships as a founding ethos and doubled the $443m in public funds, created local ownership of projects through co-design and co-delivery, and brought in new ideas and fresh perspectives.

Legacy

Giving the Reef outcomes that live beyond the end of the partnership, we grew and strengthened local capacity, drove long-term behavioural change, implemented sustainable financing solutions and created new business and delivery models.

The RTP Final Report, due at the end of the funding agreement in 2026, will provide an independent evaluation of all aspects of the grant, quantifying outcomes, assessing performance against targets, the quality of governance and other lessons that might have broader applicability.

Water Quality

Declining water quality associated with run-off from catchments adjacent to the Great Barrier Reef is a major cause of the poor state of many of the Reef's coastal and marine ecosystems. Improving water quality plays a significant role in improving ecosystem resilience, so almost half of the Reef Trust Partnership funding was allocated to efforts aimed at addressing water quality issues.

With this investment we successfully designed and delivered a large-scale program across 150 partners and more than 130 water quality projects, implementing a best-practice framework that lays the foundation for future water quality programs to build upon. We prioritised activities to maximise water quality outcomes and created opportunities for new players and Traditional Owners to be involved in decision-making and on-ground actions. We adopted governance frameworks to avoid conflicts of interest and provided transparency and accountability, setting and achieving water quality targets at a program and project level.

Impact

346 kilo tonnes of fine sediment, **469 tonnes** of dissolved inorganic nitrogen and **8.5 million** risk units of pesticides kept off the Reef every year

2,000 landholders improved land management across 1.24m hectares of farmland, roughly the size of Sydney

55 gullies and **17 streambanks** restored across **26 properties** to prevent erosion

179 Traditional Owners from 24 Traditional Owner groups engaged

22 scalable innovation projects to reduce pollutants, develop new technologies and better planning tools, and create novel financing mechanisms

More than 11,600 landholders attended training and events on best-practice land management and Reef conservation

Case Studies

Mary River riverbank before rehabilitation (top) and after rehabilitation (above)
Image: Alluvium Consulting

Mary Water Quality Program

The Mary River, the largest river in the Burnett Mary region, flows through a diverse catchment of 9,595 km², from Maleny to River Heads near Hervey Bay. This area includes the Ramsar-listed Great Sandy Strait, home to dugongs, migrating whales and birds. Predominantly used for grazing, the river contributes significantly to sediment entering the southern Great Barrier Reef.

The Mary Water Quality Program aimed to reduce erosion and improve riparian habitat at 11 sites by installing fencing, stabilising steep banks, planting native vegetation and controlling environmental weeds.

Across the sites, over 5km of degraded streambank was rehabilitated, and 20 hectares of riverbank was revegetated with 100,000 native species. These efforts now prevent 26 kilotonnes of sediment from entering the Reef annually.

The biggest site in the program belongs to landholder Terry Schiefelbein. Terry and his wife are third-generation graziers at Munna Creek, Miva, who restored 3 hectares of eroding riverbank. This large-scale project used 661 wooden piles and over 23,000 native plants. The vegetation established around the timber piles will act as a long-term erosion control measure, stabilising the bank as these piles eventually break down.

More than 326 landholders participated in field days, property inspections, workshops and training events to increase their knowledge of sustainable grazing and improve management practices into the future.

A world-first Nitrogen Risk Insurance Product

The partnership pioneered a world-first insurance product – prototype nitrogen insurance – to test how a new product could help catalyse behaviour change and have a positive, lasting impact for the Reef.

The production of sugarcane in Australia relies on the application of large amounts of nitrogen fertiliser. However excess application, which is a common approach by farmers looking to maximise their growth and yield, causes dissolved inorganic nitrogen (DIN) run-off, which poses a major threat to coastal ecosystems and the Reef.

Nitrogen Risk Insurance was designed to enable sugarcane farmers to reduce the amount of nitrogen fertiliser they applied to crops, by helping them manage the potential risk of reduced yields. A commercial insurance product is now available to sugarcane farmers in specified sugarcane growing regions in North Queensland, from Babinda to Herbert, as well as in Mackay.

So far 22 policies have been purchased by farmers covering a total area of 250 hectares. On average, they have reduced their use of nitrogen fertiliser by 20 kg/ha over this area. That's nearly 5 tonnes of nitrogen kept off cane lands, and 991kg of DIN prevented from entering Reef ecosystems. Wide uptake could result in a DIN discharge reduction of around 900 tonnes per year – a 19% reduction of the total DIN discharged to the Reef.

Crown-of-Thorns Starfish Control

Outbreaks of coral-eating crown-of-thorns starfish (COTS) pose a major threat to the long-term health of the Great Barrier Reef. During an outbreak, COTS can strip a healthy reef of 90% of its corals. Controlling COTS is one of the most scalable and feasible direct management interventions available today to enhance the Reef's resilience in the face of climate change.

Over the past five years, the Reef Trust Partnership has invested in on-ground action to protect coral through the COTS Control Program, while also investing in a major research and innovation program to accelerate and scale up our control capabilities.

The COTS Control Program is the largest in-water intervention program on the Great Barrier Reef aimed at directly protecting coral, with dedicated vessels and professional divers out on the Reef every day surveying and culling COTS. The adult breeding corals saved from COTS predation are critical to boost the resilience of the Reef, spreading their larvae far and wide during the Reef's annual mass spawning event to repopulate damaged areas.

The COTS Control Innovation Program (CCIP) is a research program aimed at boosting capacity to predict, detect and respond to COTS outbreaks. Over 90 multi-disciplinary experts from across Australia have delivered a portfolio of 24 research projects with real-world impact.

Impact

Delivered the largest coral protection program in the world, with five dedicated vessels and **more than 100 divers** out on the Reef every day controlling coral-eating starfish

Managed over 90% of sites to sustainable levels so coral growth and recovery outpaces the impact of COTS feeding

Protected hundreds of thousands of hectares of coral reef each year, including 160,000 hectares (an area the size of London) in 2023-2024 alone

Brought together **over 90 multi-disciplinary experts from 11 institutions** to collaborate on solutions to the COTS threat

Delivered 24 research projects that directly improve the prediction, detection and response to outbreaks

Produced more than 100 research outputs that are translated to improve COTS management, including new knowledge, models, software, and technologies

Image: Rick Abom, RRRC

Delivering innovative new tools for COTS detection

Effective and efficient pest management relies on early detection and timely action. Like many pests, COTS are highly cryptic, often hiding in reef crevices during daylight hours. They are also patchily distributed, making it challenging to monitor for their presence across the entire scale of the Great Barrier Reef. Current methods to monitor their distribution and detect developing outbreaks suffer from low accuracy, especially when numbers are still low and most amenable to efficient management action.

The CCIP Detection sub-program has focused on developing new methods for COTS surveillance and monitoring, including eDNA techniques and smart robotics technology that scans the Reef and detects starfish using real-time artificial intelligence.

In 2022-2023, a major field effort involving seven organisations and 24 people was undertaken to trial the new technologies alongside existing methods.

The team visited seven different reefs, collecting 240 eDNA samples and 80,000 images that were analysed using novel machine learning models.

These new tools for COTS detection are being integrated into the COTS Control Program's field operations, and the new datasets they produce are being used to guide COTS management.

Collaboration enables rapid response to early warning signs of next major outbreak

There have been four recorded waves of COTS outbreaks on the Great Barrier Reef since the 1960's. These outbreaks generally start in the north and spread south over a period of 15 years, leaving infested reefs heavily damaged in their wake. The last major outbreak wave started in 2010 and is still spreading down the Reef.

Based on the patterns of previous outbreaks, experts predicted that the next outbreak wave would begin soon. Working together across research and management agencies, we brought together the resources, capability and expertise to enable early detection and response to a new outbreak for the first time. Field intelligence coming from multiple sources provided an early warning that an outbreak was beginning to form. In response, the COTS Control Program boosted its coral defending fleet with two additional vessels that began suppressing the early stages of the outbreak.

Such swift and proactive intervention at the earliest stages of outbreak development has the potential to deliver benefits at scale by mitigating the spread of the outbreak across the Reef over the next 15 years.

A specially-trained diver culling a COTS.
Image: Rick Abom, RRRC

Reef Restoration and Adaptation Science

The Reef Restoration and Adaptation Program (RRAP) is a research and development program to design and test novel solutions to protect coral reefs and help them adapt to the impacts of climate change in the decades ahead.

Recognising emissions reductions are essential but no longer enough to safeguard coral reefs from rising ocean temperatures, new management options are needed to prepare for a warmer future, alongside management activities that support reef resilience and recovery, such as actions to improve water quality, prevent overfishing and contain coral predator outbreaks.

RRAP is a diverse consortium of more than 300 experts including biologists, data scientists, ecologists, engineers, geographers, mathematicians, social scientists, Traditional Owners and passionate Reef community members. Together we have achieved scientific and engineering breakthroughs that are paving the way for a new toolkit of solutions for reef restoration and adaptation science to be scaled up like never before. This includes propagating corals with enhanced heat tolerance, as well as cooling and shading technologies that could protect priority reefs during marine heatwaves.

Impact

World's largest research and development program to help an ecosystem survive climate change, made up of more than **300 scientists** across more than **27 organisations**

More than **100m coral babies** delivered to the Reef during annual spawning events

Up to **1,000-times increase in coral production** through world-first semi-automated and robotic methods to mass produce corals

More than 2,000 coral colonies tested for thermal tolerance and proof-of-concept developed for first generation of corals with higher heat tolerance

1 trillion coral sperm from 33 species cryopreserved for future restoration efforts, and new larvae cryopreservation technique demonstrated

More than 9,500 coral cradles used to deploy coral babies and help them survive in the critical first year of life

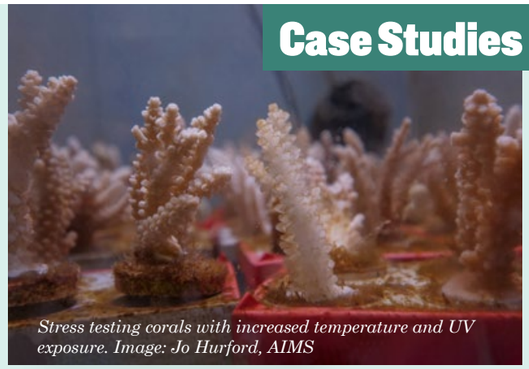
Image: Johnny Gaskell

A Reef-wide map of heat tolerance

Understanding how and where corals on the Great Barrier Reef might be able to resist warming temperatures is critical for our future restoration and adaptation efforts. Across the Reef, we're mapping bleaching and heat tolerance, as well as other important traits, that corals pass from generation to generation.

Tiny fragments of healthy corals are collected and stress tested using special mobile aquarium tanks where higher water temperatures or increased amounts of light can be applied. To date, we have successfully sampled thousands of individual corals, and identified several genetic markers associated with heat resistance and bleaching tolerance.

Testing has revealed that corals have a large variation in tolerance across species, population and habitat.



Stress testing corals with increased temperature and UV exposure. Image: Jo Hurford, AIMS

From this data, coral biologists and mathematicians have designed new models and tools to identify and map reefs containing high numbers of heat tolerant corals, which can help with the selection of species for restoration efforts.

Cryopreservation technology supports coral restoration efforts

Corals reproduce for just a few days each year – an extraordinarily narrow window for reef research and restoration efforts. Through RRAP, we're building on coral larvae cryopreservation methods that allow for new restoration options outside of spawning.

The RRAP Cryopreservation team has collected millions of cells from a wide variety of Great Barrier Reef coral species, which have been added to the world's largest frozen repository of living coral at Taronga's CryoDiversity Bank. The aim of freezing these coral cells is so they can be reanimated in the future to allow for reproduction outside of the spawning window, further accelerating our capacity for restoration throughout the year.

One challenge has been cryopreserving fertilised coral larvae, or baby corals. They are difficult to preserve due to their size and structure, but we overcame this barrier with an innovative prototype. The lightweight and cheap-to-manufacture 'Cryomesh' has been used to successfully freeze and then re-animate coral larvae, without the need for sophisticated cryopreservation equipment like laser warming.

Our dedicated coral cryopreservation teams are focused on not only ensuring a diverse representation of coral species is bio-banked, but that cryopreserved material is available for future restoration efforts.

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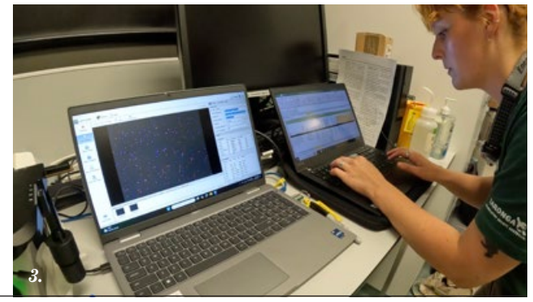

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1. *Collecting corals for breeding. Image: AIMS*
2. *Biobanking coral sperm samples in liquid nitrogen. Image: Taronga Conservation Society*
3. *Measuring motility after thawing. Image: Taronga Conservation Society*

Traditional Owner Reef Protection

For more than 30 years, Traditional Owners from across the Reef have called for a collective approach to achieving their rights and aspirations for ownership, access to, and involvement in the formal governance and management of their land and sea Country.

The Traditional Owner Reef Protection component has built the foundational pillars needed to deliver these aspirations, creating stronger Indigenous-led processes and the step-change needed for sustaining inclusive governance and management of the Reef, while recognising cultural values and diversity.

Through the RTP, we secured the largest single investment in Traditional Owner Reef Protection to date. On top of the $12m initially earmarked for Indigenous Reef Protection in the Grant Agreement, the Foundation allocated additional funding from the other Reef Trust Partnership programs to co-designed, Traditional Owner-led Reef protection, increasing the total investment to $51.8m. This program built on and scaled up the work already being done by Traditional Owners along the Reef and its catchments.

Impact

Largest best-in-class co-designed Traditional Owner-led reef protection program in the world

6,038 Traditional Owners involved in the delivery of **102 Reef protection projects**, led by **65 Traditional Owner groups**

More than 20 governance positions created on advisory and technical working groups

337 female Traditional Owner participants in women's communication and leadership programs

Traditional Owner voices elevated through storytelling on national and global platforms

More than 2,800 Traditional Owner youth participated in innovation projects and leadership programs

Water quality monitoring. Image: Mamu Aboriginal Corporation RNTBC

Case Studies

On-Country training. Image: Mamu Aboriginal Corporation RNTBC

Strong partnerships key to overcoming barriers in water quality improvement

In 2021, Mamu Aboriginal Corporation, based in Innisfail on Queensland's Cassowary Coast, set out to establish formal waterway monitoring and management based on holistic, culturally informed knowledge and approaches. Through three consecutive RTP grant rounds, Mamu Traditional Owners worked in close partnership with Terrain Natural Resource Management (NRM) and planning consultant Melanie Dulfer-Hyams to develop and implement their strategy.

Through the partnership, Mamu Aboriginal Corporation was supported to develop the Mamu Healthy Waterways Strategy 2022, based on Traditional Owner values, rights, interests, responsibilities, custodianship and concerns for waterways across their Country in the Tully and Johnstone River Catchments. The strategy identified priority actions for managing waterways on Mamu Country and informed the Mamu Waterway Healthy Monitoring Plan. It expanded the existing western science-based monitoring program to include culturally important sites and indicators based on cultural and traditional knowledge of waterway health. Mamu's subsequent projects focused on delivering the strategy and plan.

Terrain NRM played a key role in supporting Traditional Owner leadership by helping develop skills for holistic management of Country based on both cultural and western science approaches to waterway monitoring and management. This included the development of water quality testing training materials by Traditional Owners for Traditional Owners, and opportunities for Elders to share cultural knowledge relevant to looking after waterways through both formal training events and informal time on Country.

Indigenous women vital to Reef health

There is rapidly growing global recognition of the critical role that Indigenous women play as ancestral knowledge-holders and caretakers of Country. One of the many ways women care for Country is through taking on Indigenous ranger careers. Being a ranger provides an opportunity to use Indigenous knowledge to foster ongoing learning and connection to the environment alongside western science and management systems. In 2018 in Queensland however, less than 20% of Indigenous rangers were women, and very few held coordinator positions. Through the RTP, the Foundation supported a number of initiatives to increase the participation of Indigenous women in land and sea Country management roles and elevate and amplify their voices. One of our investment areas was with the Queensland Indigenous Women Rangers Network (QIWRN).

In 2018, Queensland's first female Ranger Coordinator, Larissa Hale, launched QIWRN. The network provides a forum for female rangers to share their experiences, ideas and information; provide support and advice; and enable connections in remote and isolated communities. It also provides training opportunities and offers a mentorship program for women looking to further their careers or talk through difficult work or cultural issues.

In 2022, QIWRN won the prestigious £1m Earthshot Prize in the Revive Our Oceans category. This investment helped drive Larissa's vision to scale the network and expand its offering to include female Indigenous rangers nationally and internationally.

Over the past five years, QIWRN has provided training and support to over 200 women from 48 Traditional Owner groups across Queensland and encouraged new conservation approaches by bringing together ancient knowledge with modern tools. Today, there are more leadership opportunities available, including training and employment in leadership positions.

In 2024, QIWRN launched the Indigenous Women Rangers Network Australia for female rangers around the country, as well as the Indigenous Women Rangers Network International – a global network to connect First National rangers working in land and sea management around the world. This world-first program is inspiring the next generation of female Indigenous rangers, who are vitally important for the health of our planet.

Female Indigenous rangers. Image: Heather Miller Photography

Community Reef Protection

This component built on and accelerated work already underway through committed groups and individuals across the Reef and its catchments. To meet the scale and urgency of the challenge, more had to be done to find new ways to work together for a healthier Reef.

Projects supported and enhanced capacity to deliver on-ground action that reduced Reef threats and increased Reef resilience. This was achieved by making it easier for people to get involved and stay involved in conservation of the Reef; improving sharing, connection and collaboration between individuals, community groups and Reef decision makers; and providing hope that inspires greater action by demonstrating that the collective efforts of many can and will make a difference.

Impact

97 community-centred projects, involving over **511 partners**

62,749 community members and **4,130 Indigenous people** engaged, with half participating in activities for the first time

89,598 volunteer hours contributed

293 on-ground conservation actions to protect local Reef habitats and wildlife

100 instances of community data used for Reef-wide planning, reporting and driving action, demonstrating increased community influence on Reef protection

1,443 community training, education and outreach initiatives to empower community participation and capacity

Releasing coral larvae. Image: Southern Cross University

Local communities influencing Reef planning, reporting and action

Local Reef communities have long held aspirations to have greater influence on decision-making and drive on-ground and in-water actions to care for the Reef. Community Reef Protection projects have been designed to support place-based collaborative planning that strengthens the connections between local and Reef-wide protection, and demonstrates the credibility of community generated data.

Through the RTP, community data has influenced wider Reef planning and actions in a number of ways. Some examples include:

- **Planning processes** – Community data was used in the development of the six Community Action Plans to drive place-based coordination of efforts. Fitzroy Basin Association's community litter data informed the development of the Queensland Government's Litter and Illegal Dumping Management Framework.
- **Formal reporting** – MangroveWatch community data was used to report on mangrove condition in the Wet Tropics for the first time and build a framework that can be applied in other regions.
- **Local actions** – OzFish citizen science fish data informed the design of a rock-ramp fishway to improve connectivity for fish in the region, which successfully provided passage for eight native fish species that would previously have been unable to migrate.

Case Studies

Preparing coral fragments for planting. Image: Coral Nurture Program

- **New ways of working with decision-makers** – The first community-led Eye on the Reef monitoring program was trialled on Yunbenun (Magnetic Island). Regular swimmers at Alma Bay received training on how to use the app and record their marine observations.
- **Government agencies** – The Coral Nurture Program tourism and science partnership has worked with the Joint Field Management Program to develop and embed new Standard Operating Procedures for using their Coralclip® as an intervention in areas of discrete coral damage.

Community-led coastal habitat protection

Coastal habitats like mangroves, saltmarshes and wetlands are natural guardians of the Great Barrier Reef. Their matrix of highly connected habitats helps protect shorelines, provides homes and nurseries for marine wildlife, filters water coming from catchments, offers places for local fishing and boating, and retains irreplaceable cultural values for First Nations Australians. They are also significant blue carbon stores, helping to combat climate change.

Like many ecosystems, these habitats have felt the impact of threats including coastal development, pollution and climate change. We partnered with a range of community organisations working on the ground with coastal communities to pilot and prove community-centred approaches to care for coastal habitats.

Earthwatch's MangroveWatch citizen science monitoring program was developed to activate local communities in mangrove and saltmarsh monitoring, education and conservation. Cairns and Far North Environment Centre (CAFNEC) and Earthwatch Australia scientists have worked with partners to grow a community network for tidal wetland monitoring and action in the Wet Tropics using the MangroveWatch citizen science methods.

This collaborative citizen science program has generated the first citizen science mangrove condition reporting for the region. Data has been integrated in the Wet Tropics Waterways report card to fill an identified data gap, highlighting the vital role of citizen science.

Caring for mangroves. Image: Bendi Media

Beyond that, partners have worked together to translate community data into on-ground protection and restoration activities through local action plans that strengthen community leadership in driving solutions to protect coastal habitats.

The project built a replicable model and Earthwatch is now working with partners at Yunbenun-Magnetic Island, Townsville, and Mackay to expand the proven and successful program.

Integrated Monitoring and Reporting

The Integrated Monitoring and Reporting (IMR) program has been a proving ground for innovation to capture and process a wide range of Reef data more efficiently and effectively.

The Reef 2050 Integrated Monitoring and Reporting Program (RIMREP) was launched in 2014 to provide Reef managers with information to guide decisions, track progress against the Reef 2050 Plan, drive better alignment between existing monitoring programs and help fill monitoring and modelling knowledge gaps.

Stage one of RIMREP involved a stocktake of existing Reef monitoring programs, identifying monitoring needs and providing recommendations for establishing a Reef knowledge system. Completed in June 2019, this significant piece of work brought the scientific community together to reach consensus on overall Reef monitoring needs.

The Reef Trust Partnership Integrated Monitoring and Reporting component prioritised RIMREP stage one recommendations to invest in critical monitoring needs, as well as the early-stage development and prototyping of a Reef-wide decision-support system.

Impact

All critical monitoring gaps identified by RIMReP filled

First Reef-wide data management system developed to integrate Reef data and inform decision-making

7 monitoring tools developed and adopted to improve speed, coverage and cost of priority Reef monitoring activities

Raising the bar on Reef Traditional Owner engagement and participation, involving more than **100 Traditional Owners** in monitoring activities

106 technical experts guided IMR product design and delivery

Program data informing conservation and management decisions for dugongs, dolphins, sea cucumber fisheries and Reef fish

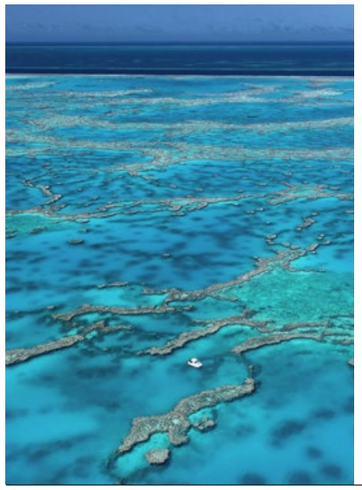
Image: Kristen McSpadden

World's largest Reef forecasting and modelling program

The Great Barrier Reef is the size of 17 million football fields, and its vast size makes it hard to monitor and predict a growing combination of threats, such as warmer water temperatures and poor water quality from sediment and nutrient run-off.

To better understand the likely future impact, we successfully seeded and scaled a $35m Reef forecasting and modelling system, eReefs, that tracks and predicts reef conditions including water quality and bleaching using satellite technology, powerful models and machine learning.

eReefs delivers Reef water quality information online in near real time, enabling anyone to track the effects of rising water temperatures, cyclones, floods and other impacts on the Reef. This tool is now embedded within and funded by the Australian government and is used to inform Reef-wide decision-making and policy, including where to deploy restoration interventions. eReefs is now also being used to produce more precise modelling of marine megafauna populations such as turtles and dugongs.



Dugong monitoring. Image: JCU TropWATER

Queensland-wide dugong surveys

The Reef supports one of the world's largest dugong populations, and their reliance on the Reef was one of the key reasons for its listing as a World Heritage Area. In recent years, dugong monitoring has been identified as a critical monitoring gap for the Great Barrier Reef.

Dugongs are subject to a range of human threats, including entanglement, collisions with boats and degradation of important habitats such as seagrass meadows. Since the 1980s, dugongs have been surveyed every five years along the Queensland coast using highly trained observers in light aircraft.

Through the RTP, we enabled the continuation of Queensland's dugong population survey data using proven aerial survey techniques but with the addition of cutting-edge technology, including aerial imagery experiments and machine-learning.

Results on dugong abundance and distribution have identified important conservation and management outcomes, highlighting areas where more targeted surveillance and conservation efforts are required. Key outcomes were published in the Reef Authority's GBR Outlook Report 2024, and the development and refinement of innovative camera systems and artificial intelligence algorithms have helped to streamline the analysis of large marine mammal datasets, improving detection capabilities for future large-scale dugong surveys.

Additional RTP investment is extending the project scope beyond the realms of scientific data collection for dugongs, enabling the establishment of meaningful and respectful dialogue and partnerships with Reef Traditional Owners. This work recognises that for holistic management and decision-making of this culturally important animal, both Indigenous and western scientific knowledge systems should influence and inform the processes for dugong management decisions, including planning and research. This project aims to create a space for both knowledge systems to be acknowledged with equity, and to have Traditional Owners contributing and assessing both forms of knowledge for species management that they see as a priority.

Coral Reef Restoration

Coral reefs are the most biodiverse ecosystems on the planet and essential for the health of our oceans. However they are on a rapid trajectory of decline, with 90% of coral reefs predicted to be lost by 2050 due to climate change impacts.

It is not too late to improve outcomes for coral reefs, but the window to act is rapidly closing. After decades of research and development, together with our partners we've achieved more advances in coral reef restoration science in the past five years than have been made in the past five decades. We're developing a toolkit of solutions which offer reef restoration outcomes at a scale never seen before.

Impact

Introduced leading Coral IVF and probiotic technology on the Reef, delivering a **100-fold improvement in successful fertilisation** during coral spawning

Founded cooperatives with **400+ researchers to accelerate research** in reef restoration and crown-of-thorns starfish control

Pioneered scientific and engineering breakthroughs to solve a range of restoration bottlenecks

Developed a portable micro-nursery concept that enables aquaculture facilities to be shipped to Pacific locations for local communities to grow and deploy heat-tolerant corals at scale

Awarded vital funding through The Audacious Project to deploy these restoration technologies across Australia and the Pacific

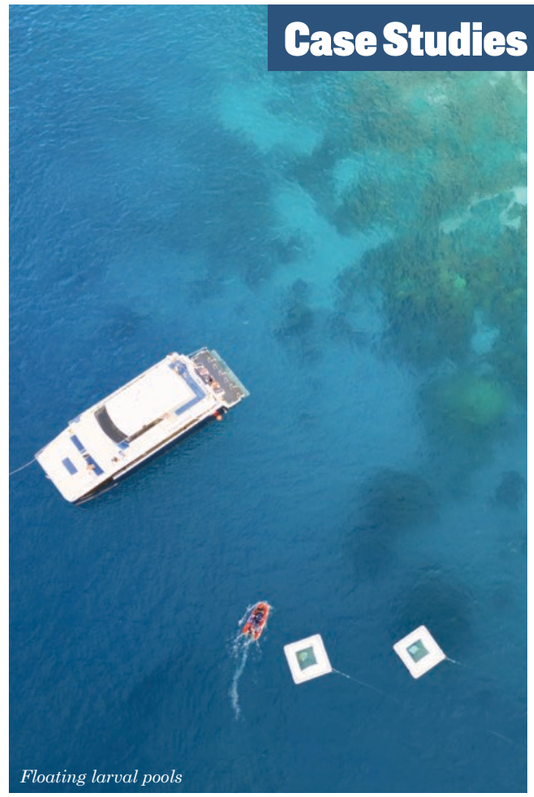
Began developing the underlying methods for a **future coral reef biodiversity credit** to attract private sector investment into critical restoration activities

Coral IVF technique key to reef restoration at scale

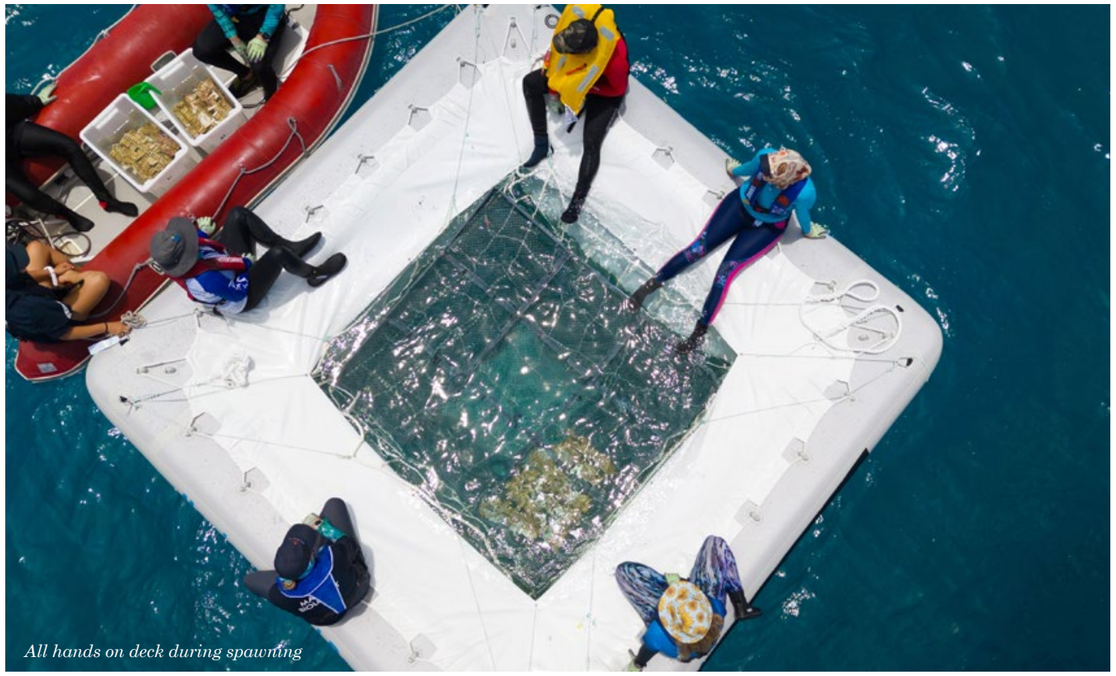
In 2016, we provided seed funding to bring the ground-breaking Coral IVF technology to the Great Barrier Reef. Coral IVF is used during the annual mass spawning event, when researchers capture excess coral eggs and sperm from healthy reefs and rear millions of baby corals in specially designed floating larval pools. These young corals are then deployed to help restore the Reef, including areas impacted by climate change.

We advocated for this innovative method to be used on the Great Barrier Reef, explored innovative approaches to improve the Coral IVF process including the now widely used larval pools, and have trained more than 100 tourism operators and Traditional Owners in this method. So far we've used the method to grow and settle millions of baby corals on the Reef, and scientists estimate that Coral IVF boosts successful coral fertilisation rates by 100-fold – raising the chances of fertilisation from one in a million in natural settings to one in 10,000 through this innovative technique.

Five years after this work began, the first tranche of Coral IVF babies on the Great Barrier Reef had matured, survived a bleaching event and reproduced – the first time a breeding population had been reestablished on the Reef. Coral IVF is now considered a key part of the coral restoration toolkit and is being used around the world.



Floating larval pools



All hands on deck during spawning

Case Studies

McLaren joins the r ace to restore the Great Barrier Reef

Launched this year, our partnership with McLaren Racing is a ground-breaking initiative to leverage the team's elite engineering skills to help accelerate coral reef restoration at a scale and speed never before attempted.

Through the Reef Restoration and Adaptation Program, we've already pioneered world-leading techniques that revolutionise reef restoration. Our next challenge is to solve significant science and engineering bottlenecks that will allow us to scale up this critical work in a closing window of opportunity.

Together with McLaren's Accelerator program, which takes the learnings and expertise from the fast-paced world of motorsport and applies them to real-world applications, the Great Barrier Reef Foundation and its partners aim to fast-track and scale up the deployment of heat-tolerant corals.

McLaren engineers with RRAP researchers at the National Sea Simulator

Coastal Habitat Restoration

The 1,050 islands and 2,300km of coastal wetland ecosystems along the Great Barrier Reef support some of the highest biodiversity on the planet and store carbon up to 50 times more efficiently than tropical rainforests.

Monitoring and supporting these habitats is a huge task. As they face the intensifying impacts of climate change, the challenge to protect and restore these refuges is growing.

We're working to identify the highest-priority habitats along the Reef and actively pioneering new conservation models to safeguard key ecosystems.

In partnership with Traditional Owners and local communities, we're restoring vitally important blue carbon ecosystems like seagrass meadows, mangroves and tidal marshes, restoring tidal flows to former wetlands along our vast coastline, and restoring habitats for over 40 threatened species including turtles, dugongs, whales and seabirds.

Impact

2 seagrass nurseries established to scale seagrass restoration, including the world's largest purpose-build facility

166,331 seeds collected to restore more than **2,500 hectares of seagrass meadows**

More than 140 community members contributed to seagrass restoration activities

17.2 hectares of critical seabird nesting habitat restored on Lady Elliot Island

Began developing the underlying methods for a **future coral reef biodiversity credit** to attract private sector investment into critical restoration activities

Supporting restoration and conservation actions at five Reef island locations.

Replacing weeds with native species.

Lady Elliot Island is a haven for nesting sea birds.

Restoring critical seabird and turtle habitats on Lady Elliot Island

One of four sites in our Reef Islands Initiative, Lady Elliot Island is part of the Capricorn-Bunker group of islands and is the southern-most coral cay in the Great Barrier Reef. It's an island ark for over 1,200 species of marine life, including whales, manta rays, turtles, dolphins and coral reef. The island also has the second highest diversity of breeding seabirds of any island on the Great Barrier Reef and is an important stop for migrating seabirds.

Lady Elliot has a history of mining that has dramatically altered the island's landscape. The Reef Islands Initiative is working to restore native vegetation across the island to rehabilitate seabird nesting habitat. To date, the program has:

- **Revegetated 17.2 hectares**, which is more than 60% of the total target area, increasing native biodiversity and improving bio-condition across multiple regional ecosystems.
- **Established the only nursery for coral cay species** on a Great Barrier Reef island. The nursery can propagate and stock 6,000 coral cay plants across 31 species to support the revegetation program.
- **Increased available turtle nesting habitat by 125%** and seen an increase in nesting seabird populations.
- **Established the Leaf2Reef research program**, which is delivering new knowledge on the island's marine and terrestrial ecosystems and their connection to revegetation. The research findings will be used to develop a model to assess the links between revegetation and the island's ecosystems.

Since 2018, the program has been a valuable proving ground for innovating and refining revegetation methods to restore native coral cay terrestrial ecosystems and critical seabird nesting habitats.

Image: Jeremy Somerville

World's largest seagrass nursery to supercharge restoration efforts

Home to the largest seagrass ecosystem in the world, the Reef's meadows provide nurseries and food sources for endangered species like turtles and dugongs, while acting as natural filters by removing pollutants such as fine sediment and excess nutrients from the water. But they also have another critical job – mitigating climate change by storing 400 million tonnes of carbon, which is the equivalent weight of eight Sydney Harbour bridges. This ecosystem is under threat from the impacts of climate change, and there are areas struggling to recover from increasingly severe and frequent storms, floods and cyclones.

To help boost seagrass restoration, this year we unveiled the world's largest purpose-built seagrass nursery in Gladstone with leading seagrass researchers from CQUniversity and Reef Traditional Owners.

The nursery will see restoration scaled up significantly using an innovative seed-based method pioneered at the facility, to help repair critical ecosystems, while unlocking the Great Barrier Reef's potential to mitigate the impacts of climate change.

In the seagrass nursery.

Collecting seagrass flowers to harvest seeds for restoration.

Global Partnerships

Climate change is affecting coral reefs around the world. The impacts of climate change, as well as other local threats to reef health, can devastate coastal communities that depend on reefs for food, income and protection from storms. We're working closely with reef communities in the Pacific and Caribbean to help them boost the resilience of their coral reefs and coastal ecosystems.

The Pacific region in particular contains 27% of the world's coral reefs, but has received less than 4% of coral restoration funding over the last decade. This is despite the fact that 94% of the Pacific's 12.7m people rely on reefs for their livelihoods.

Australia is home to the world's largest coral reef and the largest coral reef research community, which has given rise to an innovative toolkit of solutions. We are committed to democratising these solutions with our Pacific neighbours.

Impact

Pioneered the Resilient Reefs Initiative and partnered with World Heritage marine sites in New Caledonia, Belize, Palau and Australia (Ningaloo)

Developed best-in-class holistic reef resilience strategies for each site in close partnership with Indigenous communities, local organisations and governments

These sites represent **37 million hectares of coral reef** and collectively hold 37% of the blue carbon stored in all World Heritage marine sites.

Engaged 3,000+ local community members across the four sites in the development of strategies and the design of resilience actions that will reach **300,000+ beneficiaries**

Funded 30 diverse projects and built capacity for resilient project co-design

Trained more than 750 reef managers across 100 countries in a best-practice resilience-based management approach

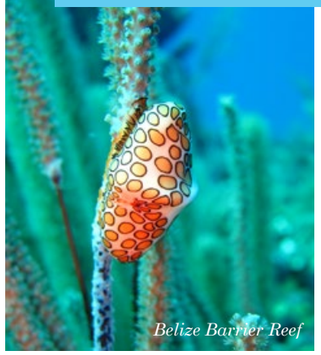
Global partnerships delivering collective impact

The Resilient Reefs Initiative has brought together local communities, businesses, scientists and reef managers to co-develop new solutions for adapting to climate change and other local threats. Engaging with more than 3,000 local beneficiaries across four UNESCO World Heritage coral reef sites in the Pacific and Caribbean, bespoke climate resilience plans have been designed and implemented for the first time.

In Palau, this has resulted in the first government-endorsed fisheries management plan, which also integrates Traditional Knowledge. In New Caledonia, it's led to new customary agreements with Traditional Owners for turtle management. And in Belize, new coastal development policies are improving protection of blue carbon ecosystems. These successes have catalysed an additional $15m for expansion to other Pacific sites.

Launch of New Caledonia's resilience strategy

Case Studies



Belize Barrier Reef

RRI chief resilience officers. Image: Joel Johnsson

Climate-smart adaptive management actions for Palau coral reefs

Palauan coral reefs demonstrate remarkable resilience to local stressors, however ocean warming over the coming decades is likely to overwhelm their inherent capacity to rebound from disturbances. Early intervention, equipping local communities and reef users with the right knowledge and mobilising political support are crucial to ensuring that Palau remains on the front foot to tackle the challenges ahead.

We are supporting the Palau International Coral Reef Center (PICRC) to develop and test an adaptive management framework that enhances local community capacity to implement actions to strengthen the resilience of Palauan reefs.

Following its launch in May 2024, the initiative quickly caught the attention of State Governors and expanded its engagement with local communities, culminating in the selection of a suitable reef to serve as a training site for Rangers and demonstration of coral out-planting techniques.

In the meantime, a wide variety of stakeholders have regularly convened to jointly develop a climate-smart adaptive management framework that is built from the ground-up around local conditions and capacities, but also informed by international expertise and best practice.

Over the coming year, the initiative will transition from an engagement and theoretical phase to one of practical demonstration, training and hands-on involvement by community members. The initiative highlights the importance of locally-led interventions and showcases the value of up-front engagement with political and community leaders.

Workshop in Palau. Image: PICRC

Thank you for your support

We are deeply grateful to our community of supporters in Australia and around the world, who have united for our Great Barrier Reef. Your unwavering passion and commitment played a vital role in our shared goal of reversing coral reef decline and protecting this invaluable natural treasure.

The remarkable progress we've made this year would not have been possible without the dedication of our project partners and supporters. Hundreds of individual donors joined our Plant a Coral initiative, while volunteers, school children, businesses and supporters from around the world raised funds and awareness through social media and at local events to help unlock much-needed critical funding for the Reef.

We received donations from our major donors in Australia, USA and Europe, who were crucial in enabling us to replant seagrass meadows, support Traditional Owner-led conservation on the Reef, and scale our cutting-edge reef restoration and adaptation technologies. This included generous support from Oceankind, ICONIQ Impact's Ocean Co-Lab, Norman Family Foundation, Auxilium Foundation, Ferris Family Foundation, Wollemi Capital Group, Paul M. Angell Family Foundation, Tiffany & Co Foundation, Builders Initiative, UBS Optimus Foundation and Kissick Family Foundation.

Our valued corporate partners, including Qantas, Coles, McLaren Racing, L'Oréal, Garnier, Lendlease, Airbnb, Life-Space, XXXX, oOh! Media, AECOM, and the BHP Foundation, have continued to support Reef protection through both financial investments and by leveraging their expertise to bolster on-ground and in-water conservation efforts. Additionally, these partners have played a key role in raising awareness among their employees and customers about the challenges facing the Reef and emphasised the role everyone can play in ensuring a sustainable future for coral reefs.

It's only through the collective impact of so many that we can succeed in this critical decade for coral reefs. Thank you for your vital contributions. Together, we can achieve even more for our Great Barrier Reef, and coral reefs around the world.

Case Studies

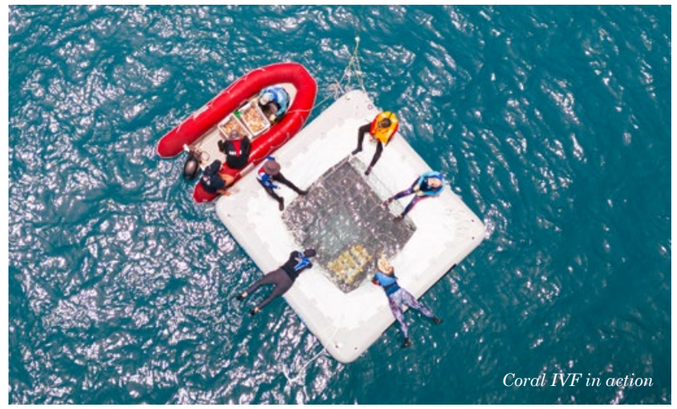
Qantas commits $10m to reef restoration

Building on a strong 15-year partnership with the Foundation, Qantas elevated its commitment to the Great Barrier Reef this year by investing $10m over 10 years into the Reef Restoration Fund. This significant contribution is dedicated to advancing coral restoration efforts and supporting groundbreaking research.

The Fund will help expand restorative work happening across the Reef, while also fostering innovation to restore corals on a larger scale in future. Over the first two years, Qantas's funding will support impactful projects including Boats4Corals, the Coral Nurture Program, RRAP and ReefSeed.

Additionally, Qantas's Green Tier Frequent Flyer program continues to make an impact, enabling customers to contribute their Qantas Points to various charities, including the Foundation. This program generates approximately $20,000 monthly for vital reef conservation.

Coral IVF in action



Coral IVF in action

Case Studies

Supporters rally following severe mass bleaching

In response to one of the worst mass coral bleaching events our Reef has ever experienced, we launched our first crisis fundraising appeal to rally support for much-needed conservation efforts.

The Reef Rescue Appeal gained strong community support and raised $330,355 from 918 donors from around the globe. Support from XXXX and media partners oOh! And Bishopp helped amplify the appeal.

The funds raised are essential for implementing recovery programs, including restoration efforts, heat-tolerant coral research, and emergency responses to protect vulnerable reef ecosystems.

Although the full extent of the damage is still being assessed, scientific advancements offer hope. The funds raised through the appeal will support research into coral adaptation strategies, particularly breeding corals with increased thermal tolerance. This innovative approach will help reefs better withstand rising ocean temperatures. The Reef Rescue Appeal reflects the collective determination to protect one of the world's most precious ecosystems, ensuring that it can recover and thrive despite the ongoing challenges posed by climate change.

Image: Marie Roman, AIMS

Ecoganic Bananas

Eco Bananas leading the way in sustainable farming for the Reef

Banana farmer Frank Sciacca's commitment to sustainable farming is a testament to how agriculture can coexist harmoniously with nature. Together with his wife Dianne, Frank created Ecoganic Bananas in 1998, a farming system that eliminates the use of chemical insecticides, significantly reduces synthetic fertilisers and reduces sediment run-off into the Great Barrier Reef. His innovative Ecoganic™ system emphasises the importance of protecting ecosystems while producing quality food.

Eco Banana growers have been long-term supporters of the Foundation, donating over $402,000 since 2003. By combining his passion for farming with his commitment to the environment, Frank has demonstrated how businesses can thrive while making a meaningful difference.

Statement of Financial Results for the Great Barrier Reef Foundation

For the year ended 30 June 2024

	FY24 ($)	FY23 ($)
Revenue		
Government grants	84,943,164	106,728,032
Grants	9,154,212	6,601,857
Philanthropy	2,590,781	1,963,292
Interest*	8,187,616	7,530,657
Other	616,244	660,035
Total	**105,492,017**	**123,483,872**
Expenses		
Programs investment	92,837,642	0
Fundraising	2,913,550	2,377,496
Administration & governance	3,103,517	2,849,557
Communications & engagements	1,195,269	0
Depreciation & amortisation	344,420	348,532
Total	**100,394,397**	**5,575,584**
Surplus for the year	**5,097,620**	**117,908,288**

FY24 Results

In FY24 the Foundation achieved an operating surplus of $5M. $4M of this surplus represents funds received during the year restricted for use on priority programs to be delivered in the coming years.

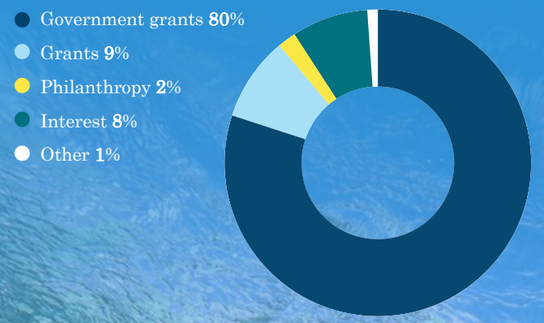
Government-funded initiatives such as RTP Program continued to constitute the primary focus of our program investment in FY24.

Our strong financial results, supported by strategic investments and targeted funding allocation, position us well to sustain and expand our impact in safeguarding and restoring the reef ecosystem.

This annual report underscores our dedication to transparency, responsible financial governance and environmental stewardship.

* The Foundation is required to generate interest from funds held in advance for the RTP to fund administration costs as outlined in RTP Grant. In its fifth year delivering the Reef Trust Partnership Program (RTP) Foundation accessed $7.6M of this restricted interest

FY24 Revenue



FY24 Expenses

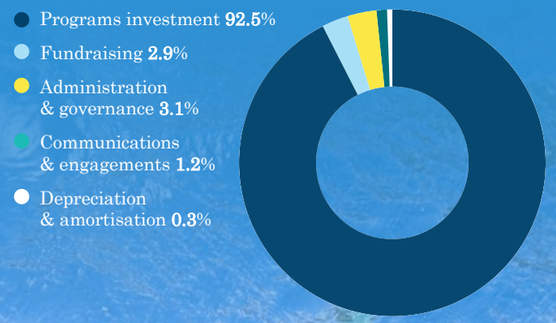


Image: MarkFitz

2023-24
Year in Review

Great Barrier
Reef Foundation