Reef Recovery 2030



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

The Great Barrier Reef. Photo credit: Gary Cranitch – Queensland Museum



Reef Recovery 2030 Turning the tide on coral reef decline

The window to solve this challenge is rapidly closing. The solutions and enabling conditions sit with our generation and our time.

Reef Recovery 2030 is a landmark campaign dedicated to saving the Great Barrier Reef and supporting global coral reef conservation.

Led by the Great Barrier Reef Foundation. in partnership with the world's leading coral reef scientists, Australian Government,

The Great Barrier Ree Photo credit: Gary Cranitch - Que A guarter of all ocean life and a billion of the world's people depend on coral reefs. Yet our reefs are under imminent threat from climate change and local impacts. Even if global warming is limited to 1.5°C, current approaches are just not enough to protect the world's coral reefs.

reef managers, First Nations people and local communities, Reef Recovery 2030 will boost the resilience of these unique reef ecosystems and the people that rely on them.

This is a ten-year, one billion-dollar collective effort to turn the tide on coral reef decline.

The enormity of this task calls for an end to working as individuals. We invite you to join with us today so that together we can succeed in this urgent quest. Please consider the critical role you might play, where your investment can make the biggest impact, and where you can help us to connect with other supporters.

Git's surely our responsibility to do everything within our power to create a planet that provides a home not just for us, but for all life on Earth. >>

– Sir David Attenborough

• With every drop of water you drink, every breath you take, you're connected to the sea. No matter where on Earth you live. "

- Sylvia Earle, Marine Biologist

Oceans and the life they sustain depend on coral reefs for their very existence. And without living oceans, humanity cannot survive.

Oceans are not only crucial for global food security and human health, over three billion people directly rely on them for their livelihoods.

While coral reefs cover less than 0.1% of ocean area, they support 30% of all marine life on the planet. Coral reefs also provide a financial benefit of \$29.8 billion to local economies globally, supporting over a billion people.

The magnificent Great Barrier Reef is the world's largest reef. It is made up of 3000 coral reefs and is home to over 1700 species of fish and other marine life. It is a global asset and one of the seven natural wonders of the world.

Beyond its unparalleled beauty and biodiversity, the Great Barrier Reef is intrinsically linked to people. The connection of Traditional Owners to the Great Barrier Reef spans more than 60.000 years and is deeply embedded in Indigenous culture, spirituality and lore.

The Reef holds a special place in the hearts of all Australians, and we are proud to be responsible for its care. With the best reef scientists in the world. Australia has an opportunity to save the Great Barrier Reef, as well as lead the global effort to save coral reefs everywhere.

Coral reefs Too important to lose

Statement from the **UN Secretary-General's Special Envoy for** the Ocean



Climate change and ocean change are the two great challenges of our time. There can be no healthy planetary ecosystem without a healthy ocean.

Coral reefs are home to 30% of the Ocean's biodiversity. What their loss could do to the Ocean's health cannot be said with certainty at this stage, but it clearly won't be good. We have urgent work to do, and like it or not, no one is exempt. Here I repeat the mantra: no healthy planet without a healthy Ocean.

Reef Recovery 2030 provides critical innovation and practical solutions to save coral reefs, and scale up Ocean action for the implementation of Sustainable Development Goal 14 - Life Below Water. This comprehensive global plan for reversing the decline of coral reefs provides a beacon of hope and a unifying cause.

I ask everyone to heed the IPCC's warning that when we go past a 2°C global temperature rise, we will lose the planet's coral reefs. The great predicament we face is that on our current trajectory, we are headed by the end of this century to well above 2° warming to somewhere between 3° and 4°.

Only with bold initiatives, such as Reef Recovery 2030, can we deliver the Ocean we want. Reef Recovery 2030 is part of a suite of science-based innovative Ocean actions that are being developed through the UN Decade of Ocean Science (2021-2030). Indeed, such work is fundamental to meeting the socio-economic needs of the billions of people who depend on the sustainable resources of the Ocean.

I encourage you to support Reef Recovery 2030, to help the Great Barrier Reef Foundation and its partners implement this global vision with resolve and urgency.



Peter Thomson UN Secretary-General's Special Envoy for the Ocean



Coral Reefs are under threat on too many fronts

While the Great Barrier Reef is a vibrant and naturally resilient ecosystem, the Reef's condition has already deteriorated due to these combined effects.

Since 1985 the Great Barrier Reef has lost almost half its coral cover, with major coral bleaching events occurring in 2016, 2017 and again in 2020.

With no other pressures and under favorable conditions, coral reefs can naturally recover from a bleaching event. But this can take over 10 years.

Coral reefs cannot, however, recover, adapt and evolve fast enough to withstand the ever-growing combination of climate change and local impacts. We must address climate change urgently if coral reefs are to survive into the future.

We must also rapidly develop and scale up interventions to protect, restore and adapt coral reefs. rebuild coastal habitats and improve water quality.

Taking bold action to save coral reefs has never been more urgent. This is why we invite you to be part of Reef Recovery 2030.

•• We are facing the very real prospect that, within a generation and without urgent action to reduce carbon emissions and help drive reef adaptation and faster recovery from damage, the Great Barrier Reef as we have known it will cease to exist. ??

– Dr Paul Hardisty, CEO, Australian Institute of Marine Science Reef Restoration and Adaptation Program Investment Case 2019



Oceans are warming, and coral is bleaching.



Cyclones

More frequent and intense cyclones are causing damage to reef structures and increasing polluted runoff.



Habitat loss

50% of island and coastal wetlands, mangroves and seagrasses have gone.



Polluted water

Sediment from erosion and fertilizer runoff is choking fish, reducing light and smothering coral.



Ocean acidification

Carbon dioxide in the atmosphere is dissolving into the ocean, weakening coral skeletons.



Crown-of-thorns starfish

Numbers of this coral-eating threat are exploding.



Established in 1999, the Great Barrier Reef Foundation has evolved from a startup charity raising funds for reef research to become the lead science-based charity driving the immediate change needed for the Reef's very survival.



W The science is clearly telling us what needs to be done if we are to secure this magnificent underwater world. Doing nothing is unthinkable and falling short is not an option. That's why we need your help. ??

– Anna Marsden, Managing Director Great Barrier Reef Foundation

The Great Barrier Reef Foundation brings the world's brightest minds and advanced technologies together to solve the challenges facing coral reefs. This is what we do best.

The Reef Restoration and Adaptation Program is central to our vision, bringing together leading experts to ensure that the Great Barrier Reef and coral reefs globally can resist, adapt to, and recover from the impacts of climate change.





Alongside global action on climate change, we must urgently develop and scale up the technologies required to save coral reefs. From early intervention to protect coral ahead of bleaching events, to restoring reefs using climate hardy corals and to adapting species using enhanced breeding, we have the capability, the science and the commitment to deliver the world's largest and most ambitious project to save coral reefs. Above all, we have the hope and ambition to succeed.

Our Reef Restoration and Adaptation Program science partners include:

'l'he solution Reef Recovery 2030

Reef Recovery 2030 will not only provide hope for the future of coral reefs and the millions of people that rely on them, it will create the step change that is urgently needed.

The practical actions to be delivered by Reef Recovery 2030 span interconnected pillars of work, each feeding into the core focus of the campaign: healthy reefs and the wellbeing of reef communities. $m g_{estore\ reef\ islands} \, \& _{co_{a_{St_S}}}$ Restore critical habitat & coastal ecosystems



Resilient reefs, resilient people

We want to work with good people with good hearts that will partner with us to create positive change. We support partners like the Great Barrier Reef Foundation who have listened to us and demonstrated to us that they are genuine and caring. This is what matters. If we have good people by 99 our side, we can do anything.

> – Great Barrier Reef Traditional Owners, Cape Cleveland Statement, Townsville, May 2019

Traditional Owner rangers record the nesting data of an endangered green turtle on Raine Photo credit: Gary Cranitch – Queensland Museu

Your investment in Reef Recovery 2030 will create new jobs, strengthen local economies and build the capacity and resilience of reef communities.

That's why we partner with First Nations people. collaborate with the best reef scientists, tap into local knowledge, and build the capacity of people who can take practical action to save coral reefs.

We have also created an independent Futures Fund, led by Traditional Owner aspirations. This fund supports the safeguarding of rights, responsibilities and obligations, cultural knowledge and customary lores. The Futures Fund will invest in Traditional Owner businesses to help create local jobs and healthy reefs.

Through the leadership of Great Barrier Reef Traditional Owners, we will bring together Traditional and western knowledge to support people and Country to prosper, to restore coral reefs using cutting-edge technologies and interventions, while embracing local knowledge.

Additionally, Reef Recovery 2030 will support reef leaders across the globe by sharing tools and strategies. As most coral reefs are in countries that are especially vulnerable to climate change, we will work with local communities to innovate together, support local economies, and strengthen reef management.

The solution to a thriving, resilient reef has people at its heart.

For thousands of years. Aboriginal and Torres Strait Islanders in Australia managed reef ecosystems. Today, a Traditional Owner Reef Protection Program is being co-designed with the reef's First Nations people.

We will activate the broader community through targeted actions and volunteering opportunities to protect our reefs. We will also challenge, inspire and support people to take direct action on climate change at home, in their workplace and in their local communities.

How you can invest

- Support First Nations people and international sites to pilot Reef Restoration and Adaptation Program innovations
- Make a meaningful donation or legacy gift to the Traditional Owner Futures Fund
- Help us employ local Chief Resilience Officers in Small Island Developing States to transform local governance and decision making

What your impact will be

5,000,000

people actively partnering on projects

Traditional Owner Groups leading projects

International Reef Community partnerships Climate Change is the biggest threat facing coral reefs today, and time is running out. With a predicted minimum 2°C rise in global temperatures, the world's coral reefs will decline. If we reach 3-4°C rise virtually all of the worlds coral reefs will be lost.

Reef Recovery 2030 will act on climate in two ways:

<u>Reduce</u> – we'll work with our partners, supporters and the community to develop, commit to and implement zero-net emissions strategies.

<u>Drawdown</u> – we'll restore ecosystems such as wetlands, mangroves and seagrasses in strategic locations that have potential for storing carbon (known as blue carbon).

Mangrove forests and seagrass meadows within the Great Barrier Reef catchments already hold a blue carbon store of over 111 million tonnes. By restoring lost wetlands and mangroves we aim to store an additional 5 million tonnes of CO_2 by 2030.

How you can invest

- Support carbon storage by restoring critical ecosystems on reef islands and coasts
- Support us to place an economic value on coral reef ecosystem services in addition to blue carbon
- Invest in innovative techniques to restore critical ecosystems and store carbon, returning an efficiency dividend
- Assist us to build capacity and develop our blue carbon offset program

What your impact will be

5,000,000

100% partners and supporters with zero net emission targets

Restoration of ecosystems to store blue carbon has not been done before at this scale, and your support will enable us to demonstrate that we can generate a market for blue carbon while recreating critical reef habitat.



Mangroves store more than double the carbon in a tropical rainforest, and provide habitat for reef species.



Act on climate

C Solutions to the climate crisis are within reach, but in order to capture them, we must take urgent action today across every level of society. **??**

> – Al Gore, Chairman and Founder The Climate Reality Project

The Reef Restoration and Adaptation Program is the world's largest and most ambitious effort to develop, test and deploy at-scale protection, restoration and adaptation interventions for coral reefs globally. It will inform and support reef managers to take action across coral reefs all around the world.

Researchers trial Coral IVF techniques to restore damaged reel Photo Credit: Biopixel

Reef **Restoration** & Adaptation Program

While global carbon emissions continue to rise, we are in a race against time to build the resilience of reefs against impacts that are happening right now.

Emissions reduction is not enough to guarantee survival of the Great Barrier Reef, or reefs worldwide.

A \$6 million feasibility study conducted with 150 experts from 20 international science organisations concluded that coral reef protection, restoration and adaptation is possible and-if we act now -we can double the likelihood of sustaining healthy coral reefs.

Based on the benefits, costs and scale, 43 interventions have been shortlisted for further development by the Reef Restoration and Adaptation Program Joint Venture partners.



These include:

Protect

• Cooling and shading — This intervention provides us with the greatest opportunity to minimise species loss and save on future restoration costs. We will target reefs likely to suffer heat stress ahead of predicted bleaching events, and use advanced techniques to reduce the exposure of coral reefs to heat and light stress.

Adapt

- Assisted natural adaptation To strengthen corals' tolerance to climate change, we will facilitate the sharing of the genetic diversity of corals, transferring desirable traits between coral species and populations, such as using coral larvae that is already adapted to warmer conditions.
- Enhanced coral breeding We will also use gene-editing approaches and synthetic biology to increase stress tolerance or other desirable traits. This is cutting edge science and innovation at the very early stages of its development.

Restore

- Stabilisation Healthy coral reefs have complex structures that support biodiversity and protect coastlines from erosion. These are weakened and damaged by ocean acidification and extreme weather events. By stabilising or adding new reef structures, we are able to help coral recover.
- Biocontrol Coral predators like Crown-of-thorns starfish survive by eating coral, and their numbers are out of control. To give the Reef a fighting chance of recovery after bleaching events, we will scale up the most effective ways to manage coral predators and competitors.
- Field treatments Like all animals, corals are inhabited by a microbial community. We will use probiotics, feeding, and medicines in both the breeding process and during bleaching events, to increase coral survival and health

We will target 100 reefs for implementation, located to maximise connection by ocean currents to the wider reef network with treatments replicated globally to ensure technology transfer, risk management, learning and impact.

How you can invest

- Assist with improving restoration of corals after storm damage
- Invest in solutions to tackle pests such as Crown-of-thorns starfish
- Support accelerating evolution with selective coral seeding, interbreeding, and gene-editing technologies
- · Invest in technology to scale up and deploy solutions



رلاطلال



 Support initiatives to prevent or limit coral bleaching through cooling and shading reefs What your impact will be

10,000,000

coral colonies produced per year

priority reefs protected with improved adaptation potential

coral species with improved resistance to thermal stress



Restore reefislands and coasts

Re-profiling beaches on Raine Island to raise nesting areas above a rising sea level will result in an additional 500,000 green sea turtle hatchlings each year. We will restore other high priority islands to ensure threatened species—such as the green sea turtle—can survive into the future.

Photo credit: Christian Miller

Interconnected reefs, islands and coastal ecosystems support some of the richest biodiversity on the planet. They provide shelter, feeding and breeding grounds for both marine and terrestrial species. They provide a climate refuge, and critical connectivity for species movement in a changing climate.

The Great Barrier Reef is home to six of the world's seven marine turtles, and islands provide critical habitat to complete key phases of their life-history, including nesting. In addition, islands support the biodiversity of bird species, with over 25% of Australian tropical seabirds nesting on the islands of the Great Barrier Reef.

Reef islands and coasts hold deep cultural significance to First Nations people. Not only are islands a source of food and sustenance. they support local economies through ecotourism.

Unfortunately, more than 50% of coastal ecosystems have been lost due to development, climate change and rising sea levels. While islands and coastal areas are highly soughtafter, healthy ecosystems and economic development are not mutually exclusive.

In partnership with local stakeholders, we will target 30 reef islands in a tailored program to restore ecosystems, reconnect coasts and reefs, reverse the decline of biodiversity and improve community governance.

How you can invest

· Fund the restoration of turtle nesting sites at strategic locations

• Invest in the science underpinning ecosystem restoration

 Support habitat restoration for specific animals such as migratory shorebirds

 Support restoration of mangroves and sea grasses that provide critical habitat and store carbon

What your impact will be

threatened species benefiting from habitat restoration

islands restored and under effective management



Every year, millions of tonnes of sediment, nutrients, sewerage and plastics pollute coral reefs.

For the Great Barrier Reef, past land management has led to sediment pollution and scarred land which erodes even further during rain. Rivers and erosion gullies need urgent repair.

High levels of nutrients from poor cropping practices also pollute coral reefs. This causes phytoplankton blooms—a food source driving Crown of Thorns starfish outbreaks, which in turn destroy coral.

Reef waters are also polluted by sewage runoff and plastics, two issues even more pronounced in the coral reefs of developing countries.

For coral reefs to have the best chance of withstanding the impacts of climate change, they need clean, clear water.

Reef Recovery 2030 will support land managers and communities to restore the land and rivers, transition to best-practice farming and build reef-friendly infrastructure.

How you can invest

- Support restoration of degraded rivers and gullies to reduce sediment pollution
- Invest in technological solutions to reduce sediment and nitrogen pollution on the reef
- Support landholders in changing their agricultural practices to reduce their impact on the reef
- Support local communities in Small Island Developing States to identify and solve the highest priority water quality issues

What your impact will be

500,000 tonnes sediment reduced each year

500

tonnes Dissolved Inorganic Nitrogen reduced each year

We will target the highest yielding pollution sites to ensure maximum benefit to the Great Barrier Reef, consistent with the Reef 2050 Water Quality Improvement Plan.



The Burdekin River in flood. Every year over 10 million tonnes of fine sediment pollutes the ► Great Barrier Reef carrying nutrients, smothering coral and suffocating fish.

Photo credit: Matt Curnock for TropWATER JCU, Marine Monitoring Program - Inshore Water Quality.



Improve water quality



29

Measuring impact

not overnight.

we will monitor:

Reef Recovery 2030 will act immediately, using the knowledge available. Cutting-edge science and monitoring techniques will enable us to learn and adapt as we go.

One of the challenges we face is that there are multiple organisations and programs monitoring the Great Barrier Reef's marine environment-and they're not integrated. What's more, direct results from the restoration of natural ecosystems appear over time,

To determine whether we're turning the tide on reef decline and investing capital wisely,

• the impact of restored mangrove ecosystems on carbon storage, and on the health and biodiversity of reef species

 the success of coral reef restoration and adaptation, also in relation to wider reef networks connected by ocean currents

- improved reef resilience, the impact of water quality and the impact of restored reef islands and coasts
- the impact on local communities and on the sustainability of effective reef management

How you can invest

• Support us to develop efficient high resolution technology for large scale use, to measure the impact of Reef Recovery 2030 solutions

What your impact will be

Integrated and efficient real-time monitoring of impacts on reef health and resilience

We will apply technologies such as artificial intelligence, big data analytics and remote sensing to monitor impact at Australian and international reef-wide scales. We'll do this in a timeframe that allows us to learn, respond and adapt quickly to improve collective impact.

Your opportunity to invest – Summary of budget, targets and actions

Program	Overview	Budget	What your impact will be	
Resilient reefs, resilient people	People focused solutions, ensuring healthy reefs and healthy communities	\$108m	50,000 People actively partnering on projects 70 Traditional Owner Groups leading projects 20 International Reef Community partnerships	- Support First Nations people and internati - Make a meaningful donation or legacy gift - Help us employ local Chief Resilience Offic
Act on climate	Reduce CO ₂ emissions and drawdown carbon concentrations in the atmosphere	\$100m	5,000,000 Tonnes of carbon stored 100% Partners and supporters with zero net emission targets	 Support carbon storage by restoring critic Support us to place an economic value or Invest in innovative techniques to restore Assist us to build capacity and develop or
Reef Restoration and Adaptation Program	Build the resilience of coral reefs to cope with and adapt to climate change	\$384m	10,000,000Coral colonies produced per year100Priority reefs protected with improvedadaptation potential25Coral species with improved resistanceto thermal stress	 Support initiatives to prevent or limit cora Assist with improving restoration of corals Invest in solutions to tackle pests such as Support accelerating evolution with select Invest in technology to scale up and deplot
Restore reef islands and coasts	Restore critical habitat and nursery grounds for threatened reef species	\$34m	20 Threatened species benefiting from habitat restoration 30 Islands restored and under effective management	 Fund the restoration of turtle nesting sites Invest in the science underpinning ecosys Support habitat restoration for specific ar Support restoration of mangroves and set
Improve water quality	Coral reefs need clean, clear water to survive	\$322m	500,000 Tonnes sediment reduced each year 500 Tonnes Dissolved Inorganic Nitrogen reduced each year	 Support restoration of degraded rivers an Invest in technological solutions to reduce Support landholders in changing their agr Support local communities in Small Island
Measuring impact	Cutting-edge science and monitoring to inform our decision making	\$52m	Integrated and efficient real-time monitoring of impacts on reef health and resilience	- Support superior reef monitoring, to mean threatened species recovery, and water q

How you can invest

- tional sites to pilot Reef Restoration and Adaptation Program innovations
- t to the Traditional Owner Futures Fund
- ficers in Small Island Developing States to transform local governance and decision making
- ical ecosystems on reef islands and coasts
- on coral reef ecosystem services in addition to blue carbon
- e critical ecosystems and store carbon, returning an efficiency dividend
- our blue carbon offset program
- al bleaching through cooling and shading reefs
- Is after storm damage
- s Crown-of-thorns starfish
- ctive coral seeding, interbreeding, and gene-editing technologies
- oy solutions
- es at strategic locations
- stem restoration
- nimals such as migratory shorebirds
- ea grasses that provide critical habitat and store carbon
- nd gullies to reduce sediment pollution
- e sediment and nitrogen pollution on the reef
- ricultural practices to reduce their impact on the reef
- d Developing States to identify and solve the highest priority water quality issues

asure the impact of our solutions on reef health, community wellbeing, reef island habitat, quality



Campaign Leadership

Governance

The Great Barrier Reef Foundation is an independent entity registered with and regulated by the Australian Charities and Not-for-profits-Commission and governed by a Board of Directors. Our Board comprises representatives of Australian business, science and philanthropy, reflecting the charter to bring all sectors together for the benefit of the Great Barrier Reef.

Board

Dr John M Schubert AO, Chairman Dr Paul Greenfield AO, Chairman, International Scientific Advisory Committee Anna Marsden, Managing Director Dr Russell Reichelt, International Scientific Advisory Committee

Steven Sargent, International Scientific Advisory Committee Olivia Wirth

John Gunn

Grant King

Phillip Strachan

Stephen Fitzgerald AO

Maureen Dougherty

Michael Cameron

Cindy Hook

Reef Recovery 2030 Campaign Committee

Reef Recovery 2030 is guided by our Campaign Committee, which works closely with the Foundation Board to monitor campaign progress and ensure that we successfully complete the campaign.



International Science Advisory Committee

The Foundation is directly advised by an International Scientific Advisory Committee (or ISAC) independently chaired by Dr Paul Greenfield AO. ISAC performs a critical role in the selection, development and implementation of our science-based projects.

Great Barrier Reef Foundation USA Inc.

Great Barrier Reef Foundation USA, Inc. is US registered non-profit entity exempt from federal income tax under IRC Section 501(c)(3), able to receive tax deductible gifts in the USA, to support the protection and enhancement of tropical reefs including the Great Barrier Reef.

Reef Restoration and Adaptation Program - Joint Venture Board

- Professor Rob Vertessy Independent Chair
- Dr Paul Hardisty, Chief Executive Officer, Australian Institute of Marine Science
- Anna Marsden, Managing Director. Great Barrier Reef Foundation
- Dr Peter Mayfield, Executive Director Environment, Energy and Resources CSIRO
- Professor Chris Cocklin, Provost and Deputy Vice Chancellor (Research and Innovation) James Cook University
- Professor Christopher Barner-Kowollik, Deputy Vice-Chancellor, Research and Innovation, and Vice-President Queensland University of Technology
- Professor Bronwyn Harch, Deputy Vice-Chancellor (Research) and Vice-President (Research) The University of Queensland
- Professor Mary Spongberg, Deputy Vice Chancellor of Research Southern Cross University





0

Great Barrier Reef Foundation

Contact

Jonathan Duddles Director of Development jduddles@barrierreef.org Phone +61 417 503 814