

# CYCLONE DEBBIE RECOVERY WORKS AT A GLANCE



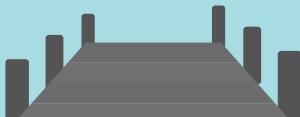
HEALTHY RIVERS TO  
REEF PARTNERSHIP  
MACKAY-WHITSUNDAY

## SPECIAL FEATURE

On 28 March 2017 Tropical Cyclone Debbie made landfall near Airlie Beach on the north Queensland coast at midday. The Category 4 storm system brought severe weather, with wind speeds reaching 263 km/h and extreme rainfall resulting in major flooding across the region. The system had significant impacts on local communities and ecosystems.

The Mackay-Whitsunday Healthy Rivers to Reef Partnership has developed this feature to provide an update on the state of some of our local ecosystems and the many recovery projects that have commenced, been completed, or are currently in planning in Mackay and the Whitsundays. These projects focus on the recovery of highly impacted ecosystems and habitats. Many in the region are still feeling the effects of Cyclone Debbie long after the storm has passed. Projects that have been commissioned are not only aiding the recovery of our natural systems, but also help severely affected communities and industry, including tourism and agriculture.

AN ADDITIONAL  
**60 PUBLIC MOORINGS**  
INSTALLED AT POPULAR  
BAYS IN THE INSHORE  
WHITSUNDAY REGION



NEW  
**WALKING TRACKS**  
AND  
**LOOKOUTS**  
AROUND THE  
WHITSUNDAY ISLANDS



**IMMEDIATE  
ON-GROUND**



ACTION POST CYCLONE  
TO CONDUCT DETAILED  
ASSESSMENT OF INSHORE  
FRINGING REEF SITES AROUND  
THE WHITSUNDAY ISLANDS

AN ADDITIONAL  
**45**  
**REEF PROTECTION  
MARKERS** INSTALLED  
TO PROTECT  
REMNANT CORAL



*REINSTATED*  
**CORAL  
'BOMMIES'**  
AT MANTARAY BAY  
TO ENCOURAGE  
CORAL GROWTH

**MANAGEMENT  
INTERVENTION**

GRANTED TO FLIP AND  
RE-RIGHT CORAL  
IN APRIL AND  
MAY 2017



**ALTERNATE  
DIVE AND SNORKEL  
SITES** ESTABLISHED



**1,700**



**HARD WOOD TIMBER**  
PILES DRIVEN INTO BANKS,  
FORMING PILE FIELDS TO  
HELP STABILISE RIVER BANKS  
IN CATCHMENT RIVER BASINS

**OVER  
25,000**



PLANTS PROPAGATED AND  
PLANTED TO HELP STABILISE  
DAMAGED RIVER BANKS AT  
OVER 20 RESTORATION SITES

**18,000 TONNES**

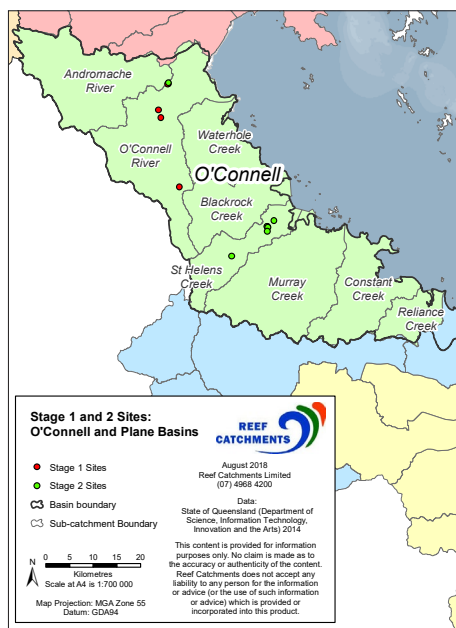
OF ROCK USED TO  
REINFORCE AND  
COMPLEMENT BANK  
REPROFILING THAT  
WAS DAMAGED IN  
CYCLONE



# SPOTLIGHT ON - REHABILITATION OF OUR REGION'S WATERWAYS

Severe Tropical Cyclone Debbie caused significant damage to our river systems resulting in loss to public and private assets, damage to the local agricultural industry, and large amounts of sediment and associated nutrients moving downstream towards the Great Barrier Reef Marine Park (GBRMP).

The Australian and Queensland Governments provided funding to Reef Catchments following the cyclone through the Natural Disaster Relief and Recovery Arrangements (NDRRA) to rehabilitate highly impacted areas and increase the resilience of the region's waterways. These disaster recovery projects have a long-term goal to help build a landscape more equipped to withstand and recover from natural disasters in the future, reducing sediment loss and ultimately improving reef water quality. Works on these projects will be completed by June 2019.



## Stage 1 funding

Stage one funding saw \$1.67M directed to emergency remediation works at priority sites.

### O'Connell River

- Four sites secured with rock reinforcement
- Large woody debris embedded within the bank at one site
- Extensive revegetation undertaken

### Bakers Creek

- Additional rock protection at outlet of constructed wetland to protect wetland from draining
- Fish ladder reinstated

### Oaky Creek

- Eight priority sites using rock reinforcement and/or large woody debris
- Community consultation, spatial analysis and hydrological modelling conducted to create restoration plan that addresses community concerns whilst also stabilising the waterway
- Extensive revegetation program providing a biodiverse riparian buffer zone and long-term stability

## Stage 2 funding

Stage two funding has committed \$3.8M to the region which includes twelve sites spread over five priority creeks. These works look to stabilise and/or train watercourses, dampen future flow velocities, provide in-stream 'roughness' to facilitate sediment accumulation and provide habitat.

### Sites include:

- Cherry Tree Creek
- Marion Creek
- St. Helens Creek
- West Hill Creek
- O'Connell River

### Techniques include:

- Rock reinforcement
- Log jams and pile fields
- Revegetation and site maintenance

Mackay and Whitsunday Regional Councils, and the Whitsunday Rivers Improvement Trust also received funding for projects under the NDRRA. Works will be conducted at sites on the Proserpine River, Campbell Creek in the Whitsundays and Little McCreadys Creek, Mackay.



For more information visit -

[www.reefcatchments.com.au/water/disaster-recovery](http://www.reefcatchments.com.au/water/disaster-recovery)



THE WHITSUNDAY REGION, ALSO KNOWN AS THE *HEART OF THE REEF*, IS ICONIC FOR ITS CONTINENTAL ISLANDS AND STUNNING FRINGING REEFS.

The local Airlie Beach community has a large tourism focus and relies heavily on local reefs to showcase to visitors the wonders of the Great Barrier Reef. The Whitsundays is fortunate to have many islands in close proximity which offer sheltered bays, coves and beaches. Cyclone Debbie was a very slow-moving system, with high velocity winds and torrential rain which damaged ecosystems and urban infrastructure across the islands.

On some fringing reefs around the Whitsunday Islands (North and East orientated) considerable damage was caused; between 50-100% of hard coral was lost. At more sheltered sites however, reefs remain largely unscathed and are popular with snorkelling and diving operators.

Post Cyclone Debbie, in addition to continuing in-water tourism attractions, new walking trails on Langford and Border Islands are already proving popular with visitors. Tourism operators are very excited about the new walk on South Whitehaven Beach which is set to deliver a spectacular scenic vista taking in Hamilton Island to the left, and the saddle of Whitsunday Island and Whitehaven Beach to the right.

Cyclone Debbie has highlighted the environmental and socio-economic value of the Whitsunday Plan of Management area. Work on the Reef BluePrint (2017), by multiple reef stakeholders, including the Whitsunday tourism industry, has led to recognition that management approaches in the Whitsundays need to be agile for management response to occur in a timely manner after major disturbance events like cyclones and coral bleaching.

1 <http://elibrary.gbrmpa.gov.au/jspui/bitstream/11017/3287/1/GBRMPA%20Blueprint%20for%20Resilience%20-%20Low%20Res.pdf>



# SPOTLIGHT ON -

## WHITSUNDAY ISLANDS AND INSHORE RECOVERY

Actions	Assessing cyclone impacts and recovery	Strengthening protection	Improving access to Whitsunday Islands	Accelerating recovery	Providing alternative activities in the region
Immediate (under 3 months)	Whitsunday inshore fringing reef sites were assessed immediately after the cyclone in a <b>multi-agency response</b> from: <ul style="list-style-type: none"><li>Queensland Parks and Wildlife Services (QPWS)</li><li>Great Barrier Reef Marine Park Authority (GBRMPA)</li><li>Association of Marine Park Tourism Operators (AMPTO)</li><li>Order of Underwater Heroes (OUCH)</li><li>Eye on the Reef participants</li></ul>	<b>Reef Protection Markers</b> (no-anchoring areas) that were lost during the storm were reinstated by August 2017 to <b>ensure best protection to remnant coral cover</b> .	Immediate remediation to restore access to the Whitsunday Islands included: <ul style="list-style-type: none"><li>A <b>'beach scrape'</b> at the southern end of <b>Whitehaven Beach</b> to accelerate natural profiling of the beach and allow visitor access</li><li>Fallen trees and debris cleared from the beachfront of Whitehaven Beach adjoining the day use and camping areas</li><li><b>Reopening island visitor facilities such as picnic areas and walking tracks</b>. This included tree and debris removal. Access points were restored in time for Easter holidays 2017</li><li>Reinstating lost public moorings and ensuring operational integrity in April 2017</li></ul>	Authorisation was granted for management intervention to allow AMPTO to <b>flip and re-right coral at various bays</b> in the region in April and May 2017. These efforts <b>maximised the potential for recovery of coral colonies</b> and encourage re-establishment.	
Short term (3-6 months)	GBRMPA Tourism and Stewardship group used collected reef health data to develop <b>a comprehensive snapshot of reef health</b> in May 2017. This assisted in guiding management for the Whitsunday inshore region, including efforts to reduce further impacts on areas of remaining coral.	GBRMPA continued to promote the code of conduct for coral viewing and snorkelling, reinforcing <b>no fins</b> and <b>sustainable tender operations</b> like reducing prop strike and sustainable outboard engines.		<b>Reinstating coral bommies</b> at the devastated Mantaray Bay, Hook Island, was completed by QPWS in May 2017. The task, to return massive corals to the water, was completed with earthmoving machinery to encourage coral growth in the bay.	
Medium term (6-12 months)		An <b>additional 45 Reef Protection Markers</b> identifying no anchoring areas were installed in August 2017. This <b>strengthened the number of protected</b> fringing reef sites from <b>13 sites prior Cyclone Debbie, to 22 protected sites after Cyclone Debbie</b> .	<b>An additional 60 public moorings</b> were installed at popular bays. Work was completed in August and October 2017. These sites include Chalkies (Haslewood Island) and Cairn (Whitsunday Island) beaches which are both <b>popular snorkelling areas with remnant coral</b> .	Langford and Black Island beaches have currently had no intervention, with the beaches left for <b>natural re-profiling</b> .	Short walks to viewing points from popular bays at <b>Langford, Haslewood and Border Island</b> were established to aid <b>recovery of tourism</b> in the area under the Whitsunday Island Investment Package. <b>New lookouts</b> at South Whitehaven Beach as well as a <b>new walking track</b> to Whitsunday Craig, linking Hill Inlet to Southern Whitehaven. These projects are in various stages of planning and construction.
Long term (above 12 months)	Targeted <b>Reef Health and Impact Survey (RHIS)</b> assessments to determine rates of recovery are planned at damaged sites. Further <b>Eye on the Reef</b> training and workshops, most recently in May 2018, aim to rebuild a strong field of <b>tourism operator data collectors</b> in the region following Cyclone Debbie.		Options to <b>improve tidal access in Tongue Bay</b> , from which the popular Hill Inlet lookout is reached, are being reviewed. They aim to increase the tidal range at which access over the adjoining reef flat can occur, <b>improving visitor experience</b> and <b>reducing damage to the coral environment</b> .	Recovery fund project currently underway to scope the establishment of a <b>coral nursery</b> and replanting projects. The proposal also includes introducing hard sub-structures to aid coral growth, and the installation of <b>underwater sculptures</b> to offer an alternative dive/snorkel experience.	Development of new opportunities to <b>upgrade existing island products</b> . QPWS aims to improve visitor experience by <b>expanding lookout platforms and improving walking tracks</b> at Tongue Point, as well as developing and implementing a <b>Master Plan</b> for the southern Whitehaven Beach visitor precinct.

Project complete Project is in the planning stage Project underway



## HOW HEALTHY IS OUR CORAL POST CYCLONE DEBBIE?

Immediately after Severe Tropical Cyclone Debbie passed through the region, **spot check surveys were conducted on fringing reefs around the Whitsunday Islands to collect a snap shot of coral health directly after the cyclone**.

This was a multi-agency and community response including Queensland Parks and Wildlife Services (QPWS), Great Barrier Reef Marine Park Authority (GBRMPA), Association of Marine Park Tourism Operators (AMPTO), Order of Underwater Heroes (OUCH), Eye on the Reef participants and local tourism operators. Information from these surveys assisted in identifying and prioritising management actions, which helped to protect remnant coral areas and guide intervention response.

Whilst Cyclone Debbie caused severe damage to coral in the Whitsundays, this damage was patchy, with some areas of fringing reefs around the islands suffering little to no damage and other areas significantly damaged, recording sharp declines in coral cover. Blue Pearl Bay, a popular diving and snorkelling site (monitored by Reef Check since 2001), was one area that was severely

damaged. Prior to Cyclone Debbie, this area featured over 50% live coral cover and minimal algal cover. The event led to substantial coral damage and an increase in algal cover. High amounts of algae on coral reefs can lead to smothering of existing corals, further degrading coral reef habitats. Improving water quality around the Whitsunday Islands will be important to assist in coral recruitment and recovery in areas where coral was significantly damaged.

Obtaining information on coral health around the Whitsunday Islands fringing reefs is vital as it aids in identifying priorities and actions for recovery and resilience of coral reefs in the region.

Various methods and levels of coral monitoring exist for visitors, locals and tourism operators to participate in monitoring the health of the Reef. Examples include submitting sightings of iconic species using the free Eye on the Reef app or undertaking training to conduct in-water coral reef monitoring surveys. Citizen science is used in conjunction with other Great Barrier Reef monitoring programs.

For more ways you can get involved in monitoring programs around the Whitsunday Islands visit:

- Great Barrier Reef Marine Park Authority [www.gbrmpa.gov.au](http://www.gbrmpa.gov.au)
- Reef Check Australia [www.reefcheckaustralia.org](http://www.reefcheckaustralia.org)
- Order of Underwater Coral Heroes (OUCH) [www.ouchvolunteers.com](http://www.ouchvolunteers.com)



# SPOTLIGHT ON - SOLWAY LASS

## 1902 SHIP BRINGS NEW LIFE TO REEF RESEARCH

The Mackay-Whitsunday Healthy Rivers to Reef Partnership coordinated a research project between CSIRO and Tourism Whitsundays in response to poor water clarity in the Whitsunday region. This tourism and research partnership has allowed CSIRO to provide water quality expertise to the Whitsunday region and Great Barrier Reef, installing state of the art monitoring equipment on the Solway Lass (a two masted schooner built in 1902 that now operates in the Whitsundays as a tourist vessel). Solway Lass was used by the British navy during WWI and by Germany in WWII. Despite being 110 years old, the schooner is now one of the most technologically advanced vessels on the Great Barrier Reef.

The ship is equipped with water quality and atmospheric measuring tools. Data is collected in real time and fed straight back to CSIRO, where the research team can monitor changes as they happen. The Solway Lass is a pilot study using commercial ships to help validate Great Barrier Reef modelling that otherwise wouldn't be possible from moorings or conventional research voyages. Being able to capture accurate measurements of water quality and atmospheric parameters helps to redefine CSIRO modelling provided by satellite. The initiative is leading to an improved understanding of where attention and intervention should be focused in the region.

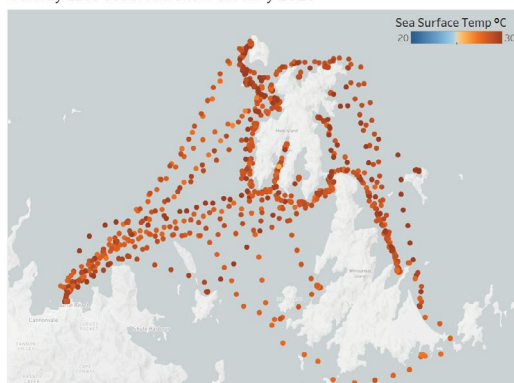
### Water quality parameters being collected:

- Salinity
- Temperature
- pH
- Dissolved Oxygen
- Turbidity
- Chlorophyll
- Blue green algae
- Colour dissolved organic matter (CDOM)
- Sea surface temperature

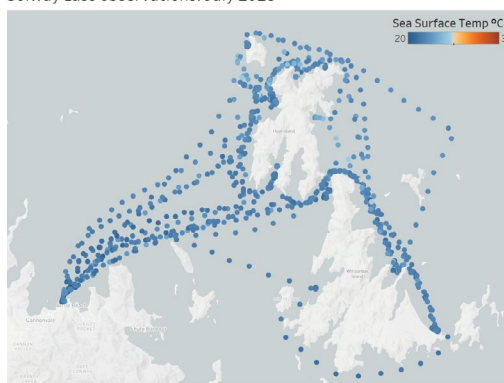
### Atmospheric parameters being collected:

- Wind speed direction
- Air temperature
- Relative humidity
- Barometric pressure

Solway Lass observations: February 2018



Solway Lass observations: July 2018



The next Mackay-Whitsunday Healthy Rivers to Reef waterway health report card (2017) will reveal the results of monitoring programs running immediately before and after Tropical Cyclone Debbie (2016/2017 data).

To see how the region's waterways and marine environments scored in the reporting **before** the cyclone (2015/16) you can view our 2016 report card at [www.healthyriverstoreef.org.au/report-card-results](http://www.healthyriverstoreef.org.au/report-card-results)

If you are interested in finding out more about the Partnership head to our website: [www.healthyriverstoreef.org.au](http://www.healthyriverstoreef.org.au)



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