Great Barrier Reef Second Report Card 2010

Reef Water Quality Protection Plan







Australian Government

Progress towards targets 2009–2010

Management practice results

By setting ambitious targets, Reef Plan aims to significantly improve land management practices and reduce pollution runoff to the Great Barrier Reef by 2013. Progress towards these output targets for grazing, horticulture and sugarcane up to June 2010 is shown below.

The 2008-2009 baseline for management practice information in the First Report Card was based on limited data and, therefore, was of low confidence. As part of the Paddock to Reef program, new information has been collected through rigorous industry surveys, validated on ground. This has provided refined baseline data for 2008–2009 which is far more accurate and useful at the local scale. This Second Report Card uses the refined baseline and compares it against data collected in 2009–2010 using the same method.

Land management practices have been improving over time. Progress since the 2008–2009 baseline is presented below. Progress for the grains industry is presented in the Fitzroy summary. Information for the cotton and dairy industries is not currently available.

Grazing

Horticulture

Target: 80 per cent of landholders in agricultural enterprises will have adopted improved soil, nutrient and/or chemical management practices by 2013.

Sugarcane

Target: 80 per cent of landholders in agricultural enterprises will have adopted improved soil, nutrient and/or chemical management practices by 2013.



By June 2010, 11 per cent of graziers had adopted improved land management practices. The greatest adoption of improved practices was in the Cape York region (23 per cent).

Target: 50 per cent of landholders in the grazing

sector will have adopted improved pasture and

riparian management practices by 2013.

By June 2010, 18 per cent of horticulture producers had adopted improved land management practices. The adoption rate varied across regions and ranged from moderate to very good.

By June 2010, 20 per cent of sugarcane growers had adopted improved land management practices. The greatest adoption of improved practices was in the

Burnett Mary region (25 per cent).

Management practice systems

It is important to note that not all improved management practices result in a change in management practice system (rated from A to D for reporting purposes*). This means that the number of landholders estimated to have improved management practices will typically be greater than the number estimated to have improved management systems. The status in terms of management practice systems for grazing, horticulture and sugarcane is shown below.



By June 2010, 59 percent of graziers were using (A or B) management practice systems that are likely to maintain land in good to very good condition or improve land in lesser condition.

grazing is presented using the ABCD framework:

land in lesser condition



By June 2010, cutting-edge (A) or best management (B) practice systems were used by 50 per cent of horticulture producers for nutrients, 77 per cent for herbicides and 66 per cent for soil.





By June 2010, cutting-edge (A) or best management (B) practice systems were used by 40 per cent of sugarcane growers for nutrients, 23 per cent for herbicides and 15 percent for soil.

*The adoption of an improved management practice system for sugarcane and horticulture is presented using the ABCD framework: A – Cutting-edge practices

A - Cutting-euge

- B Best practices
- C Common or code of practice
- D Practices considered unacceptable by industry or community standards.
- C Practices that may maintain land in fair condition or gradually improve land in poor condition

* The adoption of an improved management practice system for

A - Practices likely to maintain land in very good condition or improve

B – Practices likely to maintain land in good condition or improve land

D – Practices likely to degrade land to poor condition.

© The State of Queensland 2013. Published by the Reef Water Quality Protection Plan Secretariat, April 2013. Copyright protects this publication. Excerpts may be reproduced with acknowledgement to the State of Queensland. Image credits front cover: From top; view from the Hummock, Bundaberg, photo by Peter Lik, courtesy of Tourism Queensland; cattle in Mackay Whitsunday, photo by J. Graftdyk, courtesy of Reef Catchments; farmhouse near Ingham, photo by Peter Lik, courtesy of Tourism Queensland; cortesy of Tourism Queensland; cattle in Mackay Whitsunday, photo by J. Graftdyk, courtesy of Reef Catchments; farmhouse near Ingham, photo by Peter Lik, courtesy of Tourism Queensland; Great Barrier Reef near Whitsunday Island, photo by Gary Bell, courtesy of Tourism Queensland.

Catchment results

Reef Plan's catchment targets aim to minimise the loss of wetlands, improve the condition of riparian areas, maintain groundcover on grazing land above acceptable levels to minimise soil erosion and reduce the pollutant load leaving catchments. Progress towards these outcome targets up to June 2010 is shown below.

Catchment indicators

Since pre-European times, 18 per cent of riparian forest and 17 per cent of wetlands have been lost. Reef Plan aims to halt this loss. Some areas are less impacted with Cape York still having 100 per cent of wetlands remaining.

The loss of wetlands and riparian forest was caused by a range of factors including modifications to hydrology and clearing of vegetation.

Wetland loss

Target: There will have been no net loss or degradation of natural wetlands.



Good progress

Loss of wetlands declined from 0.10 per cent (742 hectares) between 2001 and 2005 to 0.03 per cent (255 hectares) between 2005 and 2009. The Burnett Mary region had the highest proportional loss of wetlands for 2001 to 2005 (0.33 per cent) and 2005 to 2009 (0.23 per cent).

Wetland loss relates to agricultural and other land uses including urban.

Riparian loss

Target: Improved condition and extent of riparian areas.



Moderate progress

Loss of riparian forest decreased from 0.65 per cent (41,490 hectares) between 2001 and 2005 to 0.39 per cent (24,636 hectares) between 2005 and 2009. The greatest reduction in the rate of loss of riparian forest was in the Fitzroy region, down from 1.12 per cent (21,153 hectares) between 2001 and 2005 to 0.48 per cent (9069 hectares) between 2005 and 2009.

Riparian forest is the vegetation beside waterways which can help reduce pollutant losses to waterways.

Groundcover

Target: A minimum of 50 per cent late dry season groundcover on dry tropical grazing land by 2013.



Target met

The 2010 mean groundcover was high (94 per cent), well above the Reef Plan target of 50 per cent mostly due to high rainfall over recent years. The area below the 50 per cent target was only one per cent in 2010.

Improved land management helps maintain groundcover during dry periods when erosion risk is highest.

Catchment loads

The pollutant loads leaving catchments and entering the reef vary significantly from year to year, mainly due to differences in annual rainfall. Catchment modelling has been used to correct the annual pollutant loads for climate variability and estimate the long term annual load reductions due to the adoption of improved management practices. Progress towards load reduction targets is modelled using well documented methods and assumptions, and long term water quality monitoring is used to validate these modelled results. Progress is measured in terms of the reduction in loads due to agriculture (termed 'anthropogenic load' in this context).

The catchment loads targets are ambitious measures designed to be met in 2013 for nutrients and pesticides and 2020 for sediment. The bar indicators below show the one-year reduction in load as at June 2010. This period covers only the first year of Reef Plan implementation. More progress will be evident in the third and subsequent Report Cards. This result is a very good outcome as it demonstrates the program is arresting and reversing the loads into the reef.

The load reductions do not include all activities undertaken during the reporting period and are, therefore, considered an underestimate of total progress. For example, land management changes in the horticulture and dairy industries and parts of the grains industry have not been modelled at this time. Changes in riparian management also could not be modelled due to the lack of data.

2013 target

50%

Nitrogen

Target: A minimum 50 per cent reduction in nitrogen load at the end-of-catchments by 2013.



Moderate progress

The estimated annual average total nitrogen load leaving catchments reduced by four per cent (641 tonnes).

Phosphorus

Target: A minimum 50 per cent reduction in phosphorus load at the end-of-catchments by 2013.



Moderate progress

The estimated annual average total phosphorus load leaving catchments reduced by two per cent (83 tonnes).

Sediment

Target: A minimum 20 percent reduction in sediment load at the end-of-catchments by 2020.



Good progress

The estimated annual average suspended sediment load leaving catchments reduced by two per cent (105,000 tonnes).

Pesticides

Target: A minimum 50 per cent reduction in pesticide load at the end-of-catchments by 2013.



Good progress

The estimated annual average pesticide load leaving catchments reduced by eight per cent (1254 kilograms).

Marine condition

Marine results

Reef Plan aims to improve the quality of water entering the reef and maintain its health and resilience. Marine results for 2009–2010 are shown for water quality, seagrass and coral.

The overall marine condition has remained moderate since 2005–2006. There was some variability between regions, with the Burdekin and Burnett Mary in poor condition overall. Water quality and the condition of seagrass meadows and coral reefs also varied between regions.



The reef was affected by a range of extreme events in 2009–2010. Significant rainfall events led to comparatively high levels of freshwater entering the reef. Exposure to large volumes of low salinity flood waters for an extended period contributed to localised coral bleaching on shallow, inshore reefs. Tropical Cyclone Ului passed through the Mackay Whitsunday region in early 2010 causing damage to some parts of the reef.

Marine graphic descriptions

- Chlorophyll a indicates nutrient availability and productivity.
- Total suspended solids measures particulate matter in water.
- Seagrass abundance includes the cover and change in cover.
- Reproduction indicates the potential of seagrass meadows to recover from disturbances.
- Nutrient status measures the response of seagrass to nutrient conditions in surrounding waters.
- Coral cover is a measure of the percentage of coral on a reef and indicates the capacity of coral to persist under the current environmental conditions and its potential to recover.
- Coral change measures change in coral cover which indicates coral resilience to disturbance.
- Macroalgal cover high abundance indicates poor water quality and negatively affects the resilience of coral communities.
- **Coral juvenile** density measures the abundance of corals less than 10 centimetres in diameter which indicates the recovery potential from disturbances.

Water quality

Inshore water quality was moderate overall across all regions in 2009–2010. Concentrations of chlorophyll *a* and total suspended solids were also moderate overall. Overall inshore water quality has been relatively stable since 2005–2006.

Pesticides were detected at all monitored sites in 2009–2010, except for Cape York, with high variability between regions and seasons. Higher concentrations were generally detected in the wet season when flood plumes transport pesticides from adjacent catchments into the marine environment. Pesticides that inhibit photosynthesis, in particular diuron, were frequently detected in inshore waters of the reef. At times, these herbicides were found up to 15 kilometres from the shore at concentrations that when combined have potential to affect marine plants and corals.

Seagrass

Inshore seagrass was generally in poor condition overall in 2009–2010, and its condition has declined since 2005. The exception was Cape York, where limited monitoring indicated seagrass meadows were in good condition. Seagrass abundance and reproductive effort, although highly variable between regions, were poor overall. The nutrient status of seagrass was moderate in four of the six regions indicating excess nutrients in the water.

Corals

Inshore coral reefs were in moderate condition overall in 2009–2010, with some sites in the Burdekin and Fitzroy in poor condition. The condition of inshore reefs has remained relatively stable during the past three years. Coral cover at most inshore reefs was moderate and competing macroaglae cover was low (good), particularly at sites in the Wet Tropics. At some inshore reefs, the density of juvenile hard coral and the rate of change in coral cover were poor overall, indicating recovery potential from disturbances may be poor.



Pesticides at all sites monitored in the Great Barrier Reef in 2009–2010.

Second Report Card 2010

This Second Report Card measures progress from the 2009 baseline towards Reef Water Quality Protection Plan (Reef Plan) goals and targets. It assesses the combined results of all Reef Plan actions up to June 2010.

Key findings

- Overall, progress towards Reef Plan targets has been encouraging; however, it will take time for these achievements to translate into improved marine condition.
- There was significant discharge from rivers in 2009–2010 particularly in the Burnett Mary and Fitzroy regions and this subsequently affected reef health.
- The condition of the marine environment remained moderate overall in 2009–2010. This ranking comprises moderate scores for water quality and coral and a poor score for seagrass which has declined over the past four years.
- Major positive change has been observed in the catchments. Overall, across the Great Barrier Reef region, there has been good progress by land managers towards Reef Plan targets. Twenty per cent of sugarcane growers, 11 per cent of graziers and 18 per cent of horticulture producers have adopted improved management practices.
- As a result of this change, the estimated average annual pollutant loads entering the reef have reduced—nitrogen by four per cent, phosphorus by two per cent, sediment by two per cent and pesticides by eight per cent.
- The greatest proportional catchment load reduction leaving reef catchments was the pesticide load with an estimated 1254 kilograms (eight per cent) less.
- Loss of wetlands and riparian areas has also slowed in recent years. It is expected that the cessation of broad scale clearing under the *Vegetation Management Act 1999* at the end of 2006 and the protection of wetlands under the State Planning Policy in 2011 will lead to further reductions in loss when subsequent periods are reported on.
- There were moderate to poor results for wetlands and riparian indicators in the Burnett Mary region. This was mainly due to conversion of swamps for agriculture and some urban use.
- The significant progress has been driven primarily by the Australian Government's Reef Rescue program along with Queensland Government and industry-led initiatives.

Great Barrier Reef

The Great Barrier Reef is the largest and best-known coral reef ecosystem in the world, spanning 2300 kilometres along the Oueensland coast. The coral reefs—almost 3000 in total represent about 10 per cent of all the coral reef areas in the world. The Great Barrier Reef receives runoff from 35 major catchments which drain 424,000 square kilometres of coastal Queensland. These catchments are spread from the Cape York region in the north to the Burnett Mary region in the south. Poor water quality from catchment runoff affects the health of the reef, causing degradation of inshore reefs and is thought to be contributing to crown-of-thorns starfish outbreaks. This decreases the Great Barrier Reef's ability to withstand and recover from other impacts caused by climate change, such as coral bleaching and damage from increased storm intensity. Climate and soil characteristics vary across the catchments. Grazing (77 per cent) is the dominant agricultural land use. Sugarcane (1.4 per cent) and horticultural crops (0.2 per cent) are more prevalent in areas with high rainfall and coastal irrigation. Grain crops and irrigated cotton are prevalent in the inland areas of the Fitzroy region.

Reef Plan

The Reef Water Quality Protection Plan is a joint commitment of the Australian and Queensland Governments to minimise the risk to the reef ecosystem from a decline in the quality of water entering the reef from adjacent catchments. It has been established to galvanise and target the collective actions of governments and the community for the protection of the reef. Reef Plan focuses on reducing the impacts of diffuse source agricultural pollution on the health and resilience of the reef.

Paddock to Reef program

The Paddock to Reef program, funded jointly by the Australian and Queensland Governments, is a highly innovative approach to integrating monitoring and modelling information on management practices, catchment indicators, catchment loads and the health of the reef. This program integrates the best available information, recognising that data confidence varies across the indicators and regions. The quality of data is continually improving; however it is expected that some data may be updated as new methodologies are applied and more information becomes available. Significant changes as a result of improved information will be clearly explained.



View from the Hummock, Bundaberg region, photo by Peter Lik, courtesy of Tourism Queensland.

Regional snapshot

The following table provides a Great Barrier Reef-wide and regional snapshot of progress and status against Reef Plan targets. More information can be found in the summaries for each region.

Progress and status								
Targets			Regions					
		Great Barrier Reef region	Cape York	Wet Tropics	Burdekin	Mackay Whitsunday	Fitzroy	Burnett Mary
% adoption improved practices	Grazing	11	23	8	13	17	10	10
	Horticulture	18	27	14	26	41	9	18
	Sugarcane	20	N/A	24	14	17	N/A	25
% loss	Wetlands	0.03	0	0.04	0.03	0.01	0.03	0.23
	Riparian	0.39	0.03	0.16	0.29	0.50	0.48	0.89
% groundcover		94	N/A	98	95	98	94	95
% load reduction	Nitrogen	4	2	2	6	4	0.4	6
	Phosphorus	2	2	2	3	1	1	3
	Sediment	2	1	1	2	3	1	1
	Pesticides	8	0	4	10	18	0	14
Overall marine condition								
Water quality								
Seagrass								
Corals			N/E					N/E



Poor
Very poor
No data available

Hatching indicates low confidence due to limited data availability or limited validation for seagrass and water quality in Cape York and the Burnett Mary regions. As such, this data was not used in overall Great Barrier Reef-wide assessments of marine condition.

N/A Not applicable

N/E Not evaluated

Partners

Implementation of the Paddock to Reef program is a collaborative effort involving the Queensland Government, Australian Government, AgForce Queensland, Canegrowers, Growcom, Bureau of Sugar Experiment Stations, Reef Catchments Natural Resource Management, Fitzroy Basin Association, Terrain Natural Resource Management, NQ Dry Tropics, Burnett Mary Regional Group, Cape York Natural Resource Management, CSIRO, Centre for Tropical Water and Aquatic Ecosystem Research (TropWATER), Australian Institute of Marine Science, the University of Queensland and the University of Maryland, United States of America.

More information

More information and results can be found on the Reef Plan website at www.reefplan.qld.gov.au.

DPC2795



Australian Government

