

# Reef Water Quality Protection Plan 2009

For the Great Barrier Reef World Heritage Area and adjacent catchments







### **Foreword**

The Great Barrier Reef World Heritage Area (the Reef) is internationally recognised as a superlative natural phenomenon with outstanding natural, social and economic values. It is priceless to the people of Queensland and Australia.

Unfortunately, the quality of water flowing into the Reef lagoon from the land has deteriorated dramatically over the past 150 years. This has contributed to coral bleaching, algal blooms and pesticide pollution and made the reef less resilient to other pressures such as climate change.

The Reef Water Quality Protection Plan (Reef Plan), first introduced in 2003, contained a list of 65 actions that built on existing government policies and industry and community initiatives to achieve a sustainable future for the Reef and the industries in the Reef's catchments.

As we have now passed the halfway mark of this 10-year program, it is appropriate to renew Reef Plan in a contemporary context.

In reviewing our progress and moving forward, it is important that we acknowledge the positive outcomes that have been achieved since 2003. We would like to commend those people who have worked tirelessly over the last five years to help improve water quality in Reef catchments, including Natural Resource Management groups, landholders, industry groups, community monitoring groups, government officers, environmental education officers, scientists and extension officers.

Collectively, we recognise that reef water quality is not a short-term problem with a simple solution. It will take many years to improve water quality throughout the catchments adjacent to the Reef and in the Reef lagoon itself.

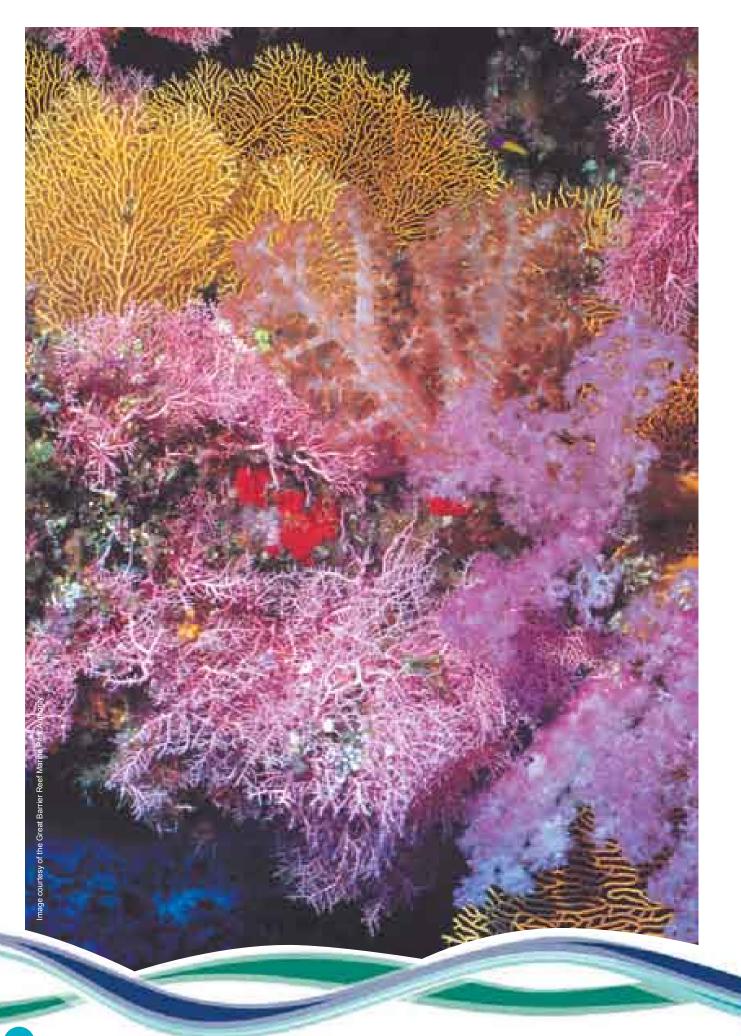
This has been confirmed by leading scientists who have agreed that water discharged from rivers into the Reef continues to be of poor quality and that current management actions are not addressing the problem effectively.

This updated Reef Plan helps redirect our focus to ensure that reef water quality is improved and that the Reef has the resilience to cope with the stresses of a changing climate. It includes the continuation and expansion of incentive schemes and extension work but also incorporates a regulatory safety net to accelerate uptake of better management practice. It also establishes an integrated monitoring and evaluation strategy so that we can measure our progress more effectively.

By working together, we can protect the Reef for future generations.

Hon Peter Garrett AM MP Minister for the Environment, Heritage and the Arts.

Hon Anna Bligh MP : Premier of Queensland



### Summary

Over the last 150 years, the land catchment areas adjacent to the Great Barrier Reef World Heritage Area (the Reef) have undergone extensive modification for urban and transport infrastructure, agricultural production, tourism and mining. This modification has led to significant pollutant loads entering the Reef, the largest contribution being from agricultural land use activities in the catchment areas.

To address this issue, the Reef Water Quality Protection Plan (Reef Plan) was endorsed by the Prime Minister and Premier in October 2003. It primarily built on existing government programs and community initiatives to encourage a more coordinated and cooperative approach to improving water quality.

Action undertaken through Reef Plan to date has not been effective in solving the issue of declining water quality in the Reef. Latest available evidence indicates that water discharged from rivers to the Reef continues to be of poor quality in many locations and current management interventions are not working. Land derived contaminants, including suspended sediments, nutrients and pesticides are still present in the Reef at concentrations likely to

cause environmental harm. In 2007, an estimated 6.6 million tonnes of sediment, 16,600 tonnes of nitrogen and 4180 tonnes of phosphorous reached the waters of the Reef lagoon due to loss from the catchments.

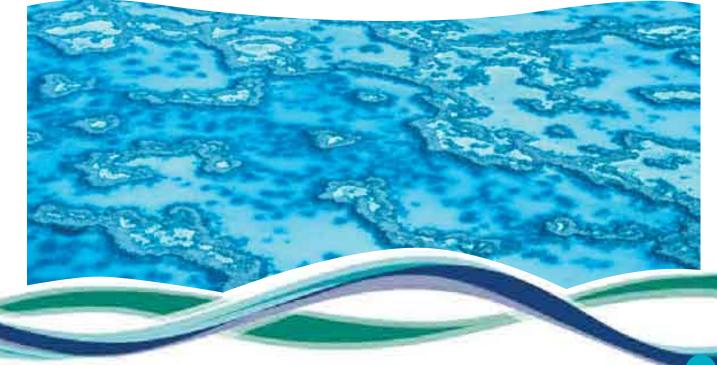
The impending threat of climate change to the Reef has been recognised as far more serious since the commencement of Reef Plan in 2003 and escalated the urgency of taking remedial action. Without taking this action the future livelihood of Queensland's industries and the lifestyle that Queenslander's enjoy could be under threat. Consequently, this plan has been reinvigorated to promote a more assertive approach to resolving the issue. Ambitious but achievable targets have been provided and both the Australian and Queensland Governments have committed significant resources to ensure they are met.

This updated Reef Plan builds on the 2003 Plan by targeting priority outcomes, integrating industry and community initiatives and incorporating new policy and regulatory frameworks. Reef Plan is now underpinned by clear and measurable targets, improved accountability and more comprehensive and coordinated monitoring and evaluation.

Reef Plan has two primary goals. The immediate goal is to halt and reverse the decline in water quality entering the Reef by 2013. The long-term goal is to ensure that by 2020 the quality of water entering the Reef from adjacent catchments has no detrimental impact on the health and resilience of the Reef. Achievement of these goals will be assessed against quantitative targets established for land management and water quality outcomes.

To help achieve the Reef Plan goals and objectives, three priority work areas (Focusing the Activity, Responding to the Challenge, Measuring Success) have been identified and specific actions and deliverables outlined for completion between now and 2013.

Reef Plan will be reviewed again in 2013 to ensure that it is delivering the intended outcomes. Throughout the course of Reef Plan there will also be regular reviews and improvements to the Plan to ensure its currency and effectiveness.



# Reef Plan history

2001	The Great Barrier Reef Ministerial Council accepted the Great Barrier Reef Marine Park Authority's report on the decline in water quality in the Great Barrier Reef and the importance and urgency in addressing the issue.
2002	An independent panel of experts was commissioned to review the scientific evidence linking land use, water quality and reef degradation. The Panel prepared A Report on the Study of Land Sourced Pollutants and their impacts on Water Quality in and adjacent to the Great Barrier Reef.
2002	The Productivity Commission reported on the importance of different industries in the Reef catchments and examined and evaluated a number of policy options to address declining water quality entering the Reef.
2003	The Reef Water Quality Protection Plan was released for public consultation. Following consideration of the public comment, a revised plan was developed and endorsed by the Great Barrier Reef Ministerial Council.
2005	An Audit of the Reef Water Quality Protection Plan was conducted by Howard Partners Pty Ltd. This audit report formed the basis of the Report to the Prime Minister and the Premier of Queensland—Progress to Date, Challenges and Future Directions.
2007	The Reef Water Quality Partnership was established involving five regional Natural Resources Management (NRM) bodies and the Australian and Queensland Governments to enable coordinated, scientifically robust and collaborative target setting, monitoring and reporting arrangements.
2008	A Task Force of scientists reviewed the 2002 report and advised what scientific advances had been made in our understanding of reef water quality. The outcome was the Scientific Consensus Statement on Water Quality in the Great Barrier Reef.
2008	The Reefocus Summit was held to seek stakeholder views on an updated Reef Plan.
2009	The updated Reef Water Quality Protection Plan was endorsed by the Queensland and Australian Governments.

### Introduction

The Great Barrier Reef is a World Heritage Area, internationally recognised for its unique values. The long-term conservation of the Reef for future generations of Australians and visitors from overseas requires collective action from government and non-government stakeholders. The Australian and Queensland Governments have a responsibility to take action and in particular to work with key stakeholders – including industry, catchment and conservation groups, and landholders – in order to protect the values of the Reef.

Governments agree that there is an overwhelming case for halting and reversing the decline in the quality of water entering the Reef. Most of the nutrient, sediment and pesticide pollutants affecting water quality in waterways entering the Reef come from non-point sources arising from agricultural land use activities in Reef catchments.

Improved land management practices have been developed by the agricultural industry over the last five years, including new strategies that minimise the flow of nutrients, sediments and chemicals into the waterways. This Plan acknowledges the work undertaken cooperatively by government and industry; however, leading scientists agree that there has not been sufficient improvement and further urgent action is required to improve water quality.

Land-based farming activities and the Reef can comfortably coexist in the future. Both contribute significantly to Queensland's social and economic profile.

The Reef contributes \$5.4 billion¹ to the Australian economy and supports significant regional employment through tourism, fishing and other industries. The beef, cane and horticulture industries in Reef catchments contribute approximately \$3.7 billion a year in gross value of production² and also support significant regional employment.

Reef Plan is a joint commitment of the Queensland and Australian Governments. It identifies actions that will help minimise the risk to the Reef from a decline in the quality of water entering the Reef from the adjacent catchments. The Plan is a significant part of the overall strategy of both governments to protect and preserve the Reef. It incorporates and supports the actions of government, industry and community groups that impact on Reef health and has links with a number of other legislative and planning initiatives.

<sup>1 2006–07</sup> data based on Access Economics 2008 *Economic contribution of the GBRMP, 2006–07*, prepared for the Great Barrier Reef Marine Park Authority. Note this includes both direct and indirect contributions from tourism, commercial fishing and recreational use (including fishing).

<sup>2</sup> Based on Australian Bureau of Statistics (ABS) data for 2007–2008 and an estimate of the contribution Reef catchments make to each of the industries based on the Productivity Commission. This does not include value adding such as processing.

# Scope

### Reef Plan's scope is to address non-point source pollution from broad-scale land use.

#### Non-point source pollution is pollution that comes from a wide range of different sources and cannot be

sources and cannot be directly attributed to one point of dispersal, such as a pipe or waste outlet.

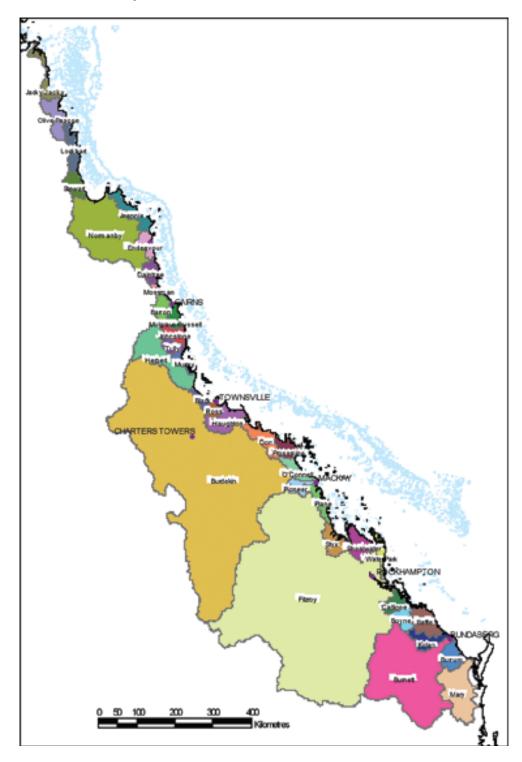
Broad-scale land use includes agriculture (such as grazing, cropping, horticulture and forestry) and other tenures of public land (e.g. national parks and reserves). It does not include urban land uses.

Reef Plan outlines actions to minimise non-point source pollution from broad-scale land use and reduce the entry of those pollutants to the Reef. It specifically targets nutrients, pesticides and sediment that wash into wetlands and waterways, leach into groundwater or flow overland across floodplains and ultimately enter the Reef lagoon because of agricultural activities in Reef catchments.

By improving water quality, governments along with rural industry groups and landholders can help the Reef become more resilient and better able to withstand the impacts of climate change. Just as healthy humans are more able to resist and recover from diseases and injuries, healthy ecosystems can recover from acute disturbances or adapt to chronic stressors such as climate change.

There are a number of other threats to the Reef such as shipping accidents, tourism, coastal development and fishing that are not within the scope of Reef Plan. Urban non-point and point sources of pollution such as sewage and waste from ore processing or mining operations are also beyond the scope of the Plan. These issues are specifically dealt with under a range of regulatory and planning processes managed by both the Queensland and Australian Governments.

Figure 1: Map of the Great Barrier Reef World Heritage Area and catchments.



# Revising Reef Plan 2003

An independent audit and report to the Prime Minister and Premier on the implementation of the Reef Water Quality Protection Plan was undertaken in 2005. This report provided an evaluation of progress to date and identified challenges and potential future directions. While satisfactory progress had been achieved, the 2005 report to the Prime Minister and Premier made the following recommendations to both governments to ensure it met its goals:

- · recommit to Reef Plan
- improve consultation and communication with key stakeholders
- develop more effective partnerships with stakeholders
- update and publicly launch the refreshed Reef Plan
- · improve monitoring of land condition.

In 2008, Reef Plan passed the halfway mark of the original 10-year plan.

Therefore, it was considered timely to review progress and reflect advances in knowledge that support implementation of Reef Plan and other initiatives of governments, industry and the community.

This updated Reef Plan has been informed by the substantial work undertaken in the first five years, particularly that done by the Reef Water Quality Partnership (RWQP), Regional Implementation Group (RIG) and the Scientific Advisory Panel (SAP). In addition to the 2005 report to the Prime Minister and Premier, the following reports were integral to updating the plan:

- Reef Water Quality Protection Plan Annual Report 2006–07
- Scientific Consensus Statement on Water Quality in the Great Barrier Reef
- · Outcomes from the Reefocus Summit
- Reef Water Quality Partnership Strategic Plan 2007–2013
- Research and Information Priorities for Great Barrier Reef Water Quality Management—Workshop Outcomes.

#### Achievements to date

The 2006–07 Annual Report noted that 41 of the 65 actions within Reef Plan had met their original milestone, 18 had not but were progressing well, while six actions showed unsatisfactory progress. This report also highlighted that while significant progress was made in some areas, one of the challenges was the need to improve the speed of uptake of best management practice and its measurement.

The following are some of the key achievements of the first five years:

- The Reef Water Quality Partnership
  was established to enable coordinated
  and integrated water quality target
  setting, monitoring and reporting.
  This was a collaborative arrangement
  between the five regional natural
  resource management bodies in Reef
  catchments and the Australian and
  Queensland Governments.
- Broad-scale clearing of remnant vegetation was phased out in 2006.
- The Delbessie Agreement (rural leasehold strategy) commenced implementation in 2008, providing extended leases to those landholders that improved land condition.
- Water Quality Improvement Plans (WQIPs) have been completed for key catchments and identify regional targets for improvement and key management changes to be made to reach those targets.
- Nutrient Management Zones have been identified that will help focus work in 'hot spot' locations.
- Hot spots for sediment loss have been identified.

- A number of collaborative education and extension projects involving regional NRM bodies, industry and the Queensland Government have been completed that promote and support uptake of sustainable agriculture, such as: the Reef Extension program; Farm Management Systems; Mackay Whitsundays Sustainable Landscapes program; Rural Water Use Efficiency (RWUE) initiative; community-based water quality monitoring through 'Waterwatch'; the fertiliser industry's 'Fertcare' program and others.
- Industry-led changes to land management practices have taken place in the agricultural industry through the development of Farm Management Systems and codes of practice. The broad principles for effective management of pollutants are also well known for most industries. These principles are starting to be incorporated into management practices being implemented across the Reef catchments by industry through initiatives such as the 'Six Easy Steps' for nutrient management in sugarcane and the AgForward program within the grazing industry.
- The five-year Queensland Wetland Program, established in 2003, has delivered more than 38 projects including a range of mapping, information and decision-making tools to enable land managers and regional bodies to protect and manage wetlands.
- Significant community monitoring, education and extension has occurred through regional NRM bodies.

#### Scientific consensus

The establishment of Reef Plan in 2003 was supported by a body of scientific evidence showing a decline in water quality of the Reef. Since that time, there have been significant advances in knowledge to support implementation of the Plan. Significant research through major research initiatives such as the Cooperative Research (Reef and Rainforest) Centre Catchment to Reef program (2002-2007), the CSIRO Water for a Healthy Country Great Barrier Reef node (2004-present) and more recently, the Marine and Tropical Science Research Facility research program (2006-present), has further confirmed the changes to water quality in the Reef. These initiatives have significantly improved our understanding of the sources and fates of pollutants and the impacts of declining water quality in both the catchments and the marine ecosystems of the Reef.

In 2008, a taskforce of scientists was established to prepare a synthesis paper that reviewed the 2003 summary statement of evidence and where appropriate, updated that statement based on the results of more recently published and peer-reviewed articles. This synthesis was released in October 2008 as the Scientific Consensus Statement on Water Quality in the Great Barrier Reef. It is available on the Reef Plan website (www.reefplan.qld.gov.au).

Based on analysis of the latest available evidence, the taskforce concluded that:

- Water discharged from rivers to the Reef continues to be poor in many locations.
- Land-derived contaminants, including suspended sediments, nutrients and pesticides are present in the Reef at concentrations likely to cause environmental harm.

- There is strengthened evidence of the causal relationship between water quality and the coastal and marine ecosystem health.
- The health of freshwater ecosystems is impaired by agricultural land use, hydrological change, riparian degradation and weed infestation.
- Current management interventions are not effectively solving the problem.
- Climate change and major land use change will have confounding influences on Reef health.
- Effective science coordination to collate, synthesise and integrate disparate knowledge across disciplines is urgently needed.

Scientists also agree that improving water quality improves the resilience of the Reef to the pressures from climate change by reducing recovery time after catastrophic events such as coral bleaching, increasing resistance to effects such as raised sea temperatures and increasing the tolerance of species to these relatively rapid fluctuations.

#### Reefocus Summit

The Reefocus Summit was held on 24 October 2008 to bring together governments and key stakeholder groups, including representatives from agricultural peak bodies, natural resource management bodies, researchers and the conservation sector, to collectively review progress in halting and reversing the decline in water quality and to discuss the need for a renewed and reinvigorated Reef Plan.

The Summit recognised that significant work has been done by industry and natural resource management bodies to address water quality issues, but that changes have not been adopted at a scale necessary to achieve the objectives of Reef Plan.

The Summit acknowledged the most recent scientific evidence, which suggests that water quality continues to be poor and agreed that the goals of Reef Plan are not being met.

It was acknowledged that the Reef is under increasing pressure from declining water quality. Excessive nutrient, pesticide and sediment run-off entering the rivers flowing into the Reef are impacting on its resilience in the face of climate change.

The Summit agreed that the Reef Plan needed to be revisited and strengthened. A refreshed Reef Plan would provide a framework for accelerating and expanding efforts made to date, helping to achieve the goals of Reef Plan.

Attendees at the Summit discussed a more strategic approach to Reef Plan that focused on priority areas, better monitoring to measure progress against quantitative targets, and greater accountability to achieve defined actions. The Summit also discussed new initiatives that may be needed to ensure that goals can be met, including the use of regulation.

#### Stakeholder involvement

The updated Plan is based upon engagement and partnerships with key stakeholders to ensure it achieves its goals. It has been prepared through close consultation with key stakeholders. A stakeholder working group was formed involving regional natural resource management body, industry and conservation group representatives to work closely with the Australian and Queensland Governments in updating Reef Plan goals, objectives, actions, deliverables and accountabilities. This partnership approach will continue during the implementation of the updated Plan as outlined in the revised institutional arrangements.

### Reef Plan in 2009

The updated Reef Plan is focused on priority areas for action. It ensures that government and stakeholders are accountable for delivering on the actions.

The Plan moves away from a long list of actions (65 in the original to 11 in 2009), to a much more strategic and adaptive plan. It is focused on outcomes, incorporates and recognises industry and community initiatives and takes into account new policy and regulatory frameworks. Reef Plan is underpinned by clear and measurable targets, improved accountability and comprehensive and coordinated

monitoring, evaluation and reporting in order to measure progress.

To help achieve the Reef Plan goals and objectives, three priority work areas are identified and specific actions and deliverables outlined for completion between now and 2013. Work is focused in the most critical areas and there are clear accountabilities for delivering on the actions.

Two independent reviews of Reef Plan are scheduled, one in 2010 and another in 2013, to ensure that adequate progress is being made in implementing actions and achieving the Plan's goals and objectives. Ongoing evaluation of the Plan will ensure that it continues to reflect progress in land management practices, new knowledge in science and continuous improvement in natural resource management.

### Reef Plan structure

In 2003, Reef Plan outlined 65 actions across nine strategies. Milestones for each action were outlined, as well as the agencies responsible for contributing to the action.

The updated Plan is more strategically focused and identifies the priority work areas (Figure 2) and the actions that will be undertaken to achieve the 2013 goals and objectives. Within the priority work areas there are 11 actions, with clearly identified deliverables and accountabilities.

Another new component of Reef Plan's structure is a set of quantitative targets that will be the critical measures of whether the actions are helping achieve the goals and objectives.

Figure 2: Priority work areas and actions to be undertaken to achieve 2013 goals and objectives.



#### Objective 1

Reduce the load of pollutants from non-point sources in the water entering the Reef

#### Goals

**2013:** Halt and reverse the decline in water quality entering the Reef by 2013.

**2020:** To ensure that by 2020 the quality of water entering the Reef from adjacent catchments has no detrimental impact on the health and resilience of the Great Barrier Reef.



#### Objective 2

Rehabilitate and conserve areas of the Reef catchment that have a role in removing water-borne pollutants



#### **Priority Work Area 1**

Focusing the activity

#### **Priority Work Area 2**

Responding to the challenge

#### **Priority Work Area 3**

Measuring success

Actions

### Goals

#### Immediate goal

To halt and reverse the decline in water quality entering the Reef by 2013.

- Halt the decline means that there is no further decrease in the quality of water entering the Reef attributable to human actions (e.g. there is no measurable increase in nutrients, pesticides and/or sediments) from 2003 levels.
- Reverse the decline
   means that there is a
   measurable improvement in
   the quality of water entering
   the Reef attributable to
   human actions (e.g. there
   is a measurable
   decrease in the amount
   of nutrients, pesticides
   and/or sediments) from
   2003 levels.
- Entering the Reef includes water from all landbased non-point sources (e.g. river/estuarine flows, groundwater and overland flow).

#### Long-term goal

To ensure that by 2020 the quality of water entering the Reef from adjacent catchments has no detrimental impact on the health and resilience of the Great Barrier Reef.

- Adjacent catchments
   means those catchments
   that border and/or have
   flows into the Great Barrier
   Reef World Heritage Area.
- Detrimental impact means something that causes harm or injury to organisms and/or their habitat either individually or collectively.
- Health is the state of wellbeing of organisms both individual and holistic.
- Resilience means the capacity of an ecosystem to resist or recover from disturbances or damage, without changes in state, so as to maintain key functions and processes.

Water quality parameters, like most others in the natural world, are a dynamic feature of the environment and this is particularly relevant for Reef catchments. For many parameters (e.g. sediment) significant variations occur over time even under natural conditions.

The Plan's goals are aimed at reducing human impacts to levels where they will be having no detrimental impact on Reef health. This relies on our ability to:

- clearly define what 'healthy' water quality is for the Reef
- demonstrate the achievement of the identified water quality parameters for all waters entering the Reef.

### **Objectives**

The Reef Plan has two key objectives. The first aims to reduce the amount of pollutants entering the waterways and the Reef, while the second promotes protection and improvement of natural filters that capture these pollutants prior to entering the Reef.

#### Objective 1

Reduce the pollutant load from non-point sources in the water entering the Reef.

- Pollutants are contaminants at concentrations known to cause environmental harm.
- Contaminants are any material that can be detected in water at above 'natural' concentrations.
- · Non-point sources of pollution are those that enter the Reef lagoon from a wide range of different sources and that cannot be directly attributed to one point of dispersal, such as a pipe or waste outlet. Such pollution includes nutrient. chemicals and sediment that wash into waterways. leach into groundwater or flow overland through the floodplains and ultimately enter the Reef lagoon.

The main pollutants are:

- total suspended solids (i.e. soil that has run off the land and is suspended in water)
- nutrients such as nitrogen and phosphorus (in dissolved or particulate form)
- pesticides such as ametryn, atrazine, diuron, hexazinone and tebuthiuron.

Suspended solids can smother inshore reefs, limit light availability and therefore reduce productivity of reefs. Increased nutrients encourage algal growth, which inhibits growth of coral. It can also result in weakened coral skeletons, making them more susceptible to storm damage. High concentrations of pesticides can cause fish kills and can have long-term impacts on ecosystem function that are difficult to see.

Historically, flushing of sediments has occurred as a natural result of flood events. The ecosystem, when healthy, is somewhat resilient to these events. Reef ecosystems, when damaged by events such as cyclones, are highly susceptible to the effects of poor water quality. Therefore, increases in sediment loads beyond natural levels, which have occurred as a result of land clearing and soil disturbance, need to be addressed.

#### Objective 2

Rehabilitate and conserve areas of the Reef catchment that have a role in removing waterborne pollutants.

 Reef catchments are those catchments adjacent to the Great Barrier Reef, from Cape York in the north, to the Burnett-Mary in the south.

Actions such as land clearing, the intensification of agriculture and disturbance and/or destruction of wetlands can result in increased sediment and/or nutrients and pesticides flowing into river systems. Water quality can, however, improve as it moves through natural filters such as floodplains, riparian areas and wetlands. Therefore, a key objective of Reef Plan must be to encourage rehabilitation of damaged wetlands and riparian areas and conservation of remaining wetland and riparian areas.

# **Targets**

There are two types of targets in this Plan:

- · water quality targets
- · management practice targets.

The two are closely linked, in that improvements in management practice will result in improvements in water quality. Together these targets highlight the outcomes that are to be achieved, and, as the basis of the monitoring and reporting system, will help measure our success in meeting the Reef Plan's goals and objectives.

These targets are designed to:

- ensure there is appropriate commitment from partners in delivering Reef Plan actions
- ensure we can appropriately monitor and measure our progress in meeting Reef Plan's goals and objectives
- inform the development of new regulation
- · promote continuous improvement.

To ensure that the targets accurately reflect the success of the updated Reef Plan, they are based on comparisons with 2009 baseline levels (e.g. a reduction in nutrients from 2009 levels).

#### Water quality targets

These reef-wide water quality targets quantify the amount of improvement to be achieved in water quality parameters including nutrient, pesticide and sediment loads. They build upon work done by NRM groups in developing Water Quality Improvement Plans and will be supported by continued work at the regional level to achieve these reef-wide and other catchment-specific targets.

Measurement of these water quality targets will need to take into account episodic events in catchments in order to accurately portray trends in water quality. The targets will be measured via trend analysis and modelling, rather than by using absolute measures. This is in recognition of the natural fluctuations observed in discharges over short periods, particularly for sediment in large dry catchments.

#### By 2013 there will be:

- a minimum 50 per cent reduction in nitrogen and phosphorus loads at the end of catchments
- a minimum 50 per cent reduction in pesticides at the end of catchments
- a minimum of 50 per cent late dry season groundcover on dry tropical grazing land.

#### By 2020 there will be:

 a minimum 20 per cent reduction in sediment load at the end of catchments.

#### Management practice targets

These targets relate to changes in land management, which contribute to improved water quality. Changes in management practice are expected to be more evident than improvements in water quality in the short term. As catchment models are continuously updated, improvements in land practices can be used to determine likely improvements in water quality.

#### By 2013:

- 80 per cent of landholders in agricultural enterprises (sugarcane, horticulture, dairy, cotton and grains) will have adopted improved soil, nutrient and chemical management practices
- 50 per cent of landholders in the grazing sector will have adopted improved pasture and riparian management practices
- there will have been no net loss or degradation of natural wetlands
- the condition and extent of riparian areas will have improved.

#### Measuring targets

There are a suite of monitoring programs already in place collecting data on water quality and ecosystem health. These programs are undertaken by various state and Australian government agencies as well as by community groups and other stakeholders. Data is collected at the catchment and subcatchment level, as well as in marine areas. There are also a range of monitoring and mapping technologies available, such as remote sensing, that provide valuable information on land condition (e.g. riparian and wetland extent, groundcover etc).

Many of the targets will be measured through these existing monitoring programs. However, to report effectively on progress towards the Reef Plan targets, these programs will be enhanced and coordinated through the development and implementation of the Reef Plan Integrated Monitoring and Reporting Program. This program will use existing data as well as modelling tools to generate information from the paddock to the reef. New information will also need to be collected, including data about adoption rates of improved management practices. The integration of existing information and the filling of information gaps is considered a high priority for Reef Plan, to ensure progress towards targets can be measured effectively in both the short and long term.

Further details of how the targets are to be measured will be outlined in the Monitoring and Evaluation Strategy.

# Priority work areas

To help organise activities and prioritise actions, three priority work areas have been established as follows:

- Focusing the activity resources are focused at the most critical areas using the most cost-effective measures.
- Responding to the challenge landholders adopt land management practices that maximise reef water quality improvements.
- Measuring success to gauge the efficiency and effectiveness of Reef Plan in achieving its goals and objectives through monitoring and evaluation.

There are 11 key actions grouped according to these priority work areas. The actions are relatively broad and may encompass a number of deliverables. This provides flexibility and adaptability

to ensure that other activities can be undertaken that contribute to achieving the targets.

A single entity is accountable for coordinating implementation and reporting progress against each action to help ensure that actions are completed and milestones met.

# Priority area 1: Focusing the activity

#### **Desired outcome:**

Resources are focused at the most critical areas using the most cost-effective measures.

To achieve this, issues need to be clearly defined at the appropriate scales and actions prioritised through a risk assessment process that takes into consideration current initiatives

and new information, while identifying opportunities for research, development and innovation.

Action	Deliverables	Accountability	Supporters
Develop, implement and maintain a Research,     Development and Innovation (R,D&I)     Strategy for agreed reef water quality priorities.	<ul> <li>A three-year R,D&amp;I Strategy for agreed reef water quality priorities by September 2009.</li> <li>An updated R,D&amp;I Plan by July each year.</li> </ul>	DPC	DERM, GBRMPA, AGLC, DEEDI, R&D organisations, Science Panel, WWF
<ol><li>Coordinate and integrate agreed R&amp;D priorities into programs of work.</li></ol>	<ul> <li>An evaluation report outlining the extent of uptake of R&amp;D priorities by research providers by July each year.</li> </ul>	DPC	R&D organisations, Science Panel
3. Prioritise and align investments for reef water quality based on catchment scale and reef-wide risk assessments of key pollutants and source areas.  3. Prioritise and align investments for reef water quality based on catchment scale and reef-wide risk assessments of key pollutants and source areas.	Reef Rescue investment for 2009–2010 and onwards is delivered based on a multi-criteria analysis.	AGLC	DEWHA, DERM, DPC, GBRMPA, DEEDI, industry groups, NRM bodies, R&D organisations, WWF
	<ul> <li>The Queensland Integrated Waterway Monitoring Risk Assessment is used to inform cooperative agreements and other water quality monitoring activities for 2009–2010.</li> </ul>	DERM	DPC, DEEDI, AGLC, GBRMPA, industry groups, NRM bodies, R&D organisations, WWF
	<ul> <li>A prioritisation process to guide investment in future water quality initiatives (other than Caring for our Country) is agreed by September 2009 for funding 2009–2010 and beyond.</li> </ul>	DERM	DPC, DEEDI, AGLC, GBRMPA, industry groups, NRM bodies, R&D organisations, WWF
	A Reef Plan Investment Strategy is developed and implemented by September 2009 to coordinate investments across programs, while acknowledging the different objectives of the various programs.	DPC	DEWHA, AGLC, relevant Queensland agencies, WWF

#### Priority area 2: Responding to the challenge

#### **Desired outcome:**

Landholders adopt land management practices that maximise reef water quality improvements.

To achieve this, programs that proactively engage landholders need to be developed, implemented, adopted and continuously improved and policy tools

including incentives, regulation and extension services need to be delivered.

Actions	Deliverables	Accountability	Supporters
Identify improved land management practices to maximise reef water quality improvements.	<ul> <li>Improved land management practices for high-risk catchments are identified based on best available knowledge by September 2009.</li> </ul>	DEEDI	R&D organisations, industry groups, NRM bodies, DERM, AGLC
	<ul> <li>Improved land management practices are revised based on new information and made available to all land managers by June 2010.</li> </ul>		
	<ul> <li>Evaluate the actual costs and benefits of adopting improved land practices that have been identified and promoted to landholders by June 2011 and June 2013.</li> </ul>		
5. Implement improved land management practices that maximise reef water quality improvements as part of property level management systems.	Landholders implement improved land management practices.	QFF, Canegrowers, Growcom, Agforce	NRM bodies, DEEDI, DERM, DEWHA, AGLC
	<ul> <li>Report annually by industry sector on uptake of improved land management practices as part of industry-led property level management systems.</li> </ul>	QFF, Canegrowers, Growcom, Agforce	NRM bodies, DEEDI, DERM, DEWHA, AGLC
	Develop and implement a strategy to coordinate improvement of water quality management on public land in Reef catchments by December 2009.	DERM	Local governments, DEEDI, DEWHA, Department of Defence

Actions	Deliverables	Accountability	Supporters
6. Provide coordinated education and extension services to landholders to assist with uptake of land management practices that maximise reef water quality improvement.	<ul> <li>Undertake education and extension services targeting water quality improvement on an ongoing basis.</li> <li>Review extension and education services with recommendations for improvement and resourcing by December 2009.</li> <li>Review recommendations and implement appropriate changes to the extension and education program by June 2010.</li> </ul>	DEEDI	NRM bodies, industry groups, DERM and local governments
	<ul> <li>Develop an education and extension strategy for coordination of activities across different programs and agencies by December 2009.</li> </ul>	DEEDI	AGLC, DPC, DERM, DEWHA, GBRMPA, NRM bodies, industry groups, WWF
7. Review existing, and develop and implement new regulations and policies for improving reef water quality and the conservation and protection of wetland and riparian areas with emphasis on property level planning and action.	<ul> <li>Implement the following new or amended regulations:</li> <li>Reef regulatory package to be developed by mid-2009 and implemented by 2010.</li> <li>Wetlands regulation implemented in priority areas by December 2009.</li> </ul>	DERM	DEEDI, DPC, industry groups, NRM bodies, WWF
	Implementation of Land Management Agreements commences by September 2009 in high priority Reef catchments where leases trigger the Delbessie Agreement requirements.	DERM	DEEDI
	<ul> <li>Annually report on the implementation of conservation agreements and covenants in high priority Reef catchments.</li> </ul>	DERM	
	<ul> <li>Reef Plan objectives incorporated into existing statutory regional plans, planning policies and Coastal and Water Resource Management Plans by June 2010 and into new plans as they are developed.</li> </ul>	DIP	DERM, DEEDI, DPC, LGAQ, GBRMPA
8. Develop, review and implement non-regulatory policies and incentives for improving reef water quality and the conservation and protection of wetland and riparian areas.	<ul> <li>Reef Rescue investment strategies are updated annually.</li> <li>Reef Rescue outcomes and targets met by June 2013 with annual reporting on progress.</li> </ul>	AGLC	Industry groups, NRM bodies, IOC, JSIP, WWF
	<ul> <li>New cooperative agreement and NRM program for 2009–2013 agreed by September 2009.</li> </ul>	Joint Strategic Investment Panel	DEWHA/DAFF, industry groups, Queensland Government, WWF

### Priority area 3: Measuring success

#### **Desired outcome:**

To be able to gauge the efficiency and effectiveness of Reef Plan in achieving its goals and objectives through monitoring and evaluation.

Actions	Deliverables	Accountability	Supporters
9. Develop and implement a Reef Plan Monitoring and Evaluation Strategy to measure the efficiency and effectiveness of the Reef Plan.	<ul> <li>A Reef Plan Monitoring and Evaluation Strategy is endorsed by September 2009.</li> <li>Reef Plan targets are monitored, reported and reviewed annually.</li> <li>Reef Water Quality Report prepared to report annually on implementation of Reef Plan and water quality and associated ecosystem health.</li> <li>Independent audit and evaluation report undertaken by June 2010.</li> <li>Undertake further independent audits prior to June 2013 as necessary.</li> </ul>	DPC	GBRMPA, DERM, DEEDI, DEWHA, DAFF, AGLC, NRM bodies, industry groups, Great Barrier Reef Foundation, WWF
10. Develop and implement an integrated and coordinated paddock to Reef monitoring (modelling) and reporting	<ul> <li>Integrated paddock to reef monitoring and reporting Program designed and implemented by September 2009 including the following components:</li> </ul>	DPC	GBRMPA, DERM, DEEDI, DEWHA, AGLC, NRM bodies, research organisations, industry groups
program as part of the Reef Plan Monitoring and Evaluation Strategy.	<ul> <li>Monitoring of uptake of improved management practices.</li> <li>Paddock scale water quality monitoring and modelling to measure effectiveness of management practices.</li> </ul>	NRM bodies	DERM, DEEDI, industry groups
	<ul> <li>Catchment and sub-catchment water quality and land condition monitoring and modelling program.</li> </ul>	DERM	DEEDI, NRM bodies, industry groups
	Wetland mapping.	DERM	
	<ul> <li>Marine water quality and ecosystem health monitoring and modelling.</li> </ul>	GBRMPA	DERM
11. Improve data and information management to support data sharing, assessment and reporting.	<ul> <li>A scoping document on information management needs and a review of existing systems by September 2009.</li> <li>Improved information management system implemented by December 2009.</li> </ul>	DERM	DEEDI, GBRMPA, industry groups, NRM bodies, R&D organisations, Independent Science Panel

# Key strategies

As part of the actions and deliverables, there is a requirement to deliver a number of key strategies, namely:

- Monitoring and Evaluation (M&E) Strategy.
- 2. Research, Development and Innovation Strategy.
- 3. Investment Strategy.
- 4. Extension and Education Strategy.
- 5. Communications Strategy.

These strategies will ensure a more strategic and coordinated approach to more complex issues. They are primarily related to initiatives where there are multiple agencies or programs that contribute to the overall outcome. They are designed to ensure a consistent, complementary approach to these issues. The strategies will be developed in close consultation with stakeholders and government agencies to ensure appropriate linkages across various programs and initiatives undertaken by government and non-government organisations.

The Monitoring and Evaluation Strategy will enable evaluation of the efficiency and effectiveness of Reef Plan implementation and facilitate reporting on progress towards the Reef Plan goals

and objectives and inform adaptation and improvement of Reef Plan. Development of the Monitoring and Evaluation Strategy will be coordinated by the Department of the Premier and Cabinet (DPC) and will identify gaps in information and establish a process for more integrated 'paddock to reef' monitoring, modelling, data sharing and annual reporting.

The Research, Development and Innovation (R,D&I) Strategy will identify priority areas for research that will improve knowledge about the impacts of poor water quality on the Reef. It will improve knowledge about the most effective ways of improving water quality. The R,D&I Strategy will be led by DPC in consultation with research providers, stakeholders and other Queensland and Australian government agencies.

The Investment Strategy will provide an overarching framework for coordinating and prioritising investments across relevant incentive programs that contribute to Reef Plan objectives (both Queensland and Australian Government investment). It will be developed by DPC in consultation with agencies responsible for administering relevant programs. The Strategy will recognise the objectives and approved business plans for the various incentive programs.

The Extension and Education Strategy will ensure a coordinated and focused approach to extension across various government agencies, regional bodies and industry groups. It will identify the range of current extension programs in place and establish strategies for better integrating and focusing those programs to achieve the best education and adoption outcomes. The Strategy will also establish a process for the review of existing programs (e.g. as per action 6).

In addition to the strategies outlined in the actions, a Communications Strategy will be developed by DPC to inform the public, as well as relevant stakeholders, about Reef Plan and the need to look after water quality in the catchments and the Reef lagoon to improve its resilience to deal with impacts such as those expected from climate change. This strategy will ensure the latest knowledge on water quality is communicated to stakeholders and the public and will help promote ownership of Reef Plan at a grass roots level.



# Implementing Reef Plan

Reducing the impacts of land use on reef water quality is not solely the responsibility of governments. Achieving the objectives of Reef Plan will rely on a partnership approach between all levels of government, industry, community groups and individual landholders.

The updated Reef Plan builds upon existing programs but will also help to establish new partnerships and initiatives to enable the achievement of the Reef Plan objectives.

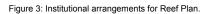
Governments will incorporate Reef Plan goals, objectives and actions into relevant planning processes (e.g. business and strategic plans) to make sure certain actions are achieved in appropriate timeframes. To ensure the timely implementation of actions, implementation plans will be developed for each priority work area and/or individual action by the accountable agency or group. This accountable entity is responsible for driving implementation of the action and working with the identified supporters to deliver outcomes.

Implementation plans will describe how the actions in Reef Plan are to be implemented, including tasks, timeframes and milestones; who is involved and their roles and responsibilities; programs and resources that will support delivery; and indicators for reporting on implementation outcomes. This will ensure appropriate planning occurs and will improve the likelihood of actions being achieved. Implementation plans will be developed in consultation with key supporters and stakeholders.

#### Overseeing implementation

Reef Plan establishes institutional arrangements that will ensure that actions are implemented in a timely way and properly coordinated across agencies and programs.

The key decision-making body will be the Great Barrier Reef Ministerial Council. The Council will consider various sources of information related to Reef Plan implementation, including scientific and government advice, and views of stakeholders. To ensure this information is provided to Ministerial Council in the most appropriate format, a number of committees have been established (Figure 3). The committees will help ensure a coordinated and cohesive approach to implementation, and appropriate commitment of resources to implement individual actions.





The Partnership Committee will be primarily made up of stakeholders such as industry groups, conservation organisations, NRM bodies and government officials and will be chaired by an independent person. The Partnership Committee will ensure a partnership approach to implementation of Reef Plan at the operational level. They will oversee and drive implementation of Reef Plan by contributing to the development of implementation plans and monitoring appropriate progress against actions. The Partnership Committee provides advice to the Intergovernmental Operations Committee (IOC) on the operational implementation of the Reef Plan. The independent chair will also provide an annual report to the Great Barrier Reef Ministerial Council on the operation of the committee, describing any emerging issues identified by stakeholders. This will ensure stakeholder feedback is fed through to the ministerial level in an independent context. The Terms of reference for the Partnership Committee are at Annexe 1.

The Intergovernmental Operational Committee (IOC) is responsible for overseeing the operational implementation of the Reef Plan and comprises nominated senior officers from the Queensland departments of Premier and Cabinet (DPC), **Environment and Resource Management** (DERM), Employment, Economic Development and Innovation (DEEDI) and Infrastructure and Planning (DIP), as well as the Australian Government departments of the Environment, Water, Heritage and the Arts (DEWHA), Agriculture, Fisheries and Forestry (DAFF) and the Great Barrier Reef Marine Park Authority (GBRMPA). It is the key decision- making body on operational matters and will take direction from and report to the Reef Plan Heads of Agencies group.

The IOC will also establish an **Independent Science Panel** to provide scientific advice as necessary. The Panel will be made up of approximately five members with relevant scientific expertise and will have an independent chair with a scientific background. The Panel will provide an advisory and review role on matters referred to it by the IOC.

IOC may also establish working groups to deal with emerging issues or specific tasks. This will ensure the appropriate agencies and stakeholders are involved in specific aspects of Reef Plan implementation.

The Reef Plan Heads of Agencies will oversee the implementation of Reef Plan at a strategic level. The committee comprises chief executives (or equivalent) from DAFF, DEWHA, GBRMPA, DERM, DEEDI and DPC.

These committees will continue to be supported by a secretariat based in the Queensland Department of the Premier and Cabinet.

#### Reporting progress

Agencies or organisations accountable for an action will be responsible for reporting progress against that action and the relevant implementation plan. Progress reports will be compiled annually and provided to the Partnership Committee and IOC to ensure that adequate progress is being made in completing the actions and deliverables. Progress reports will also be made publicly available through the Reef Water Quality Protection Plan annual report. These reports will be considered by the Reef Plan Heads of Agencies and the Great Barrier Reef Ministerial Council. Progress against the actions will also be carefully scrutinised as part of the independent audits in 2010 and 2013.

# Supporting initiatives

Protection of the Reef is a continuing high priority for both the Australian and Queensland Governments.

Reef Plan includes a range of actions that require funding support to communities and industries facing the challenge of halting and reversing the decline in water quality entering the Reef. The Plan also includes a number of actions that will require policy and legislative changes to promote accelerated uptake of improved land practices.

To achieve this, several existing and new initiatives will be developed and implemented during the life of the Plan.

### Australian Government's commitment to Reef Plan

The Australian Government has a number of programs and initiatives that will contribute to the realisation of Reef Plan goals and objectives. Chief among them is Caring for our Country, the Australian Government's \$2.25 billion initiative to restore the health of Australia's environment and improve land management practices. It represents a new, coordinated approach to environmental management in Australia that is built on transparent and consistent national targets.

Caring for our Country includes a number of components relevant to the Reef Plan, most notably the Reef Rescue package. Reef Rescue's objective is to improve the water quality of the Reef lagoon by increasing the adoption of land management practices that reduce the run-off of nutrients, pesticides and sediments from agricultural land.

Reef Rescue is made up of five integrated components that work together to achieve the above objective:

- Water Quality Grants (\$146 million over five years)
- Reef Partnerships (\$12 million over five years)
- Land and Sea Country Indigenous Partnerships (\$10 million over five years)
- Reef Water Quality Research and Development (\$10 million over five years)
- Water Quality Monitoring and Reporting, including the publication of an annual Great Barrier Reef Water Quality Report Card (\$22 million over five years).

Through Reef Rescue, the Australian Government has committed to delivery of the following five-year outcomes:

- Reduce the discharge of dissolved nutrients and chemicals from agricultural lands to the Great Barrier Reef lagoon by 25 per cent.
- Reduce the discharge of sediment and nutrients from agricultural lands to the Great Barrier Reef lagoon by 10 per cent.
- In Reef catchments, increase the adoption of improved land management practices by at least 30 per cent of agricultural land managers.

### Queensland Government's commitment to Reef Plan

Since the commencement of Reef Plan in 2003, the Queensland Government has invested approximately \$25 million annually on natural resource management in Reef catchments, including reef water quality related projects. This is an investment in the health of the entire

catchment that ultimately supports a healthy reef ecosystem. The Queensland Government is committed to continuing its contribution and has identified that the total Queensland investment in saving the Reef over the next five years will be increased by an additional \$50 million to support the reef regulatory package, bringing the total investment to \$175 million over the next five years.

#### Policy and legislative initiatives

One of the new directions for the updated Reef Plan is the implementation of new regulatory measures to ensure the adoption of minimum standards of land management that will improve water quality across the catchments and into the Reef. This is designed to be a 'safety net' to ensure clarity and fairness so that the good efforts of many are not undermined by the poorer practices of a few.

The package of regulatory measures is a new initiative that aims to:

- phase out clearly unacceptable farm management practices from Reef catchments within a reasonable timeframe
- increase the number of primary producers in priority Reef catchments who have implemented accredited property management plans that will ensure measurable water quality benefits are achieved.

The new measures will accelerate primary producers' adoption of improved land management practices and complement the Reef Rescue and other Caring for our Country grants programs. New regulations will be developed in 2009 in close consultation with industry and other relevant stakeholders and will be led by the Queensland Environmental Protection Agency.

#### Industry and communitybased initiatives

Industry and the community play a vital role in delivering the objectives of the Plan. A number of existing initiatives are already being implemented, including the Rural Water Use Efficiency Program and Blueprint for the Bush, which is a 10-year partnership plan between the Queensland Government, AgForce and the Local Government Association of Queensland to foster and support sustainable, liveable and prosperous rural communities in Queensland.

Other industry and community-based initiatives include:

- implementation of improved agricultural practices by individual landholders
- community groups, including Waterwatch, Catchment Management, Landcare and Coastcare groups, that play a significant role in raising community awareness and implementing actions
- work of Statutory Authorities such as River Improvement Trusts and the Wet Tropics Management Authority

- indigenous groups that have developed land use agreements (ILUAs) or management agreements (e.g. TUMRAs)
- regional NRM Bodies that play a key role in implementing actions at the regional level
- local governments that have a strong role in water quality improvement, land management and ecosystem protection.

Reef Plan strongly supports continued partnerships between government and industry to develop innovative new ways to manage our land and improve water quality.

# Acronyms

ABS	Australian Bureau of Statistics
AGLC	Australian Government, Lands and Coasts
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DAFF	Australian Government, Department of Agriculture, Fisheries and Forestry
DEEDI	Queensland Government, Department of Employment, Economic Development and Innovation (includes the former Department of Primary Industries and Fisheries)
DERM	Queensland Government, Department of Environment and Resource Management (includes the former Department of Natural Resources and Water and the Environmental Protection Agency)
DEWHA	Australian Government, Department of Environment, Water, Heritage and the Arts
DIP	Queensland Government, Department of Infrastructure and Planning (includes the local government section of the former Department of Local Government, Sport and Recreation)
DPC	Queensland Government, Department of the Premier and Cabinet
GBRMPA	Great Barrier Reef Marine Park Authority
GBRWHA	Great Barrier Reef World Heritage Area
IOC	Intergovernmental Operational Committee
Joint AG NRM Team	Joint Australian Government Natural Resource Management Team
JSIP	Joint Strategic Investment Panel
LGAQ	Local Government Association of Queensland
NRM bodies	Natural Resource Management bodies
QFF	Queensland Farmers Federation
R&D	Research and Development
RIG	Regional Implementation Group
RWQP	Reef Water Quality Partnership
SAP	Scientific Advisory Panel
TUMRA	Traditional Use of Marine Resources Agreement
WQIP	Water Quality Improvement Plan
WWF	World Wildlife Fund Australia

### Annexe 1

#### Terms of reference for the Partnership Committee

#### Background

A key component of Reef Plan to date has been the Reef Water Quality Partnership (RWQP). This Partnership was formed to ensure ongoing collaboration between Australian and Queensland government agencies and regional natural resource management (NRM) bodies of the Great Barrier Reef Catchments. The RWQP had a Management Committee, Regional Implementation Group and Science Advisory Panel, which collectively facilitated and oversaw the implementation of work plans to deliver coordinated reef water quality monitoring and reporting activities.

The review of Reef Plan in 2005 highlighted the need to develop more effective partnerships with industry sectors, regional NRM bodies and the wider community.

The RWQP Management Committee is reconstituted as the Partnership Committee (the Committee) in the updated Reef Plan. Membership of the Committee is expanded to include representatives of the agricultural industry and conservation groups with an independent chair. The terms of reference for the Committee are set out below.

#### Independent Chair

An independent person appointed by the Great Barrier Reef Ministerial Council will chair the Committee.

The Chair will provide an annual report to the Great Barrier Reef Ministerial Council on the operation of the committee. The report should:

- describe the number of meetings held and summarise the issues considered
- comment on stakeholders contributions to the Committee
- provide a summary of stakeholders views on Reef Plan progress
- identify any key issues raised by stakeholders that influence timely implementation of Reef Plan
- recommend any changes to the function of the Committee or additional actions that need to be taken to ensure adequate progress in implementing Reef Plan.

#### **Members**

Membership of the Committee comprises two nominated senior representatives (with identified alternatives) from each of the following:

- · State Government of Queensland
- · Australian Government
- · the agricultural industry
- Natural Resource Management regional bodies
- · conservation organisations.

The Reef Plan Secretariat, based in the Queensland Department of the Premier and Cabinet, provides Secretariat support.

#### Role

The Partnership Committee promotes a partnership approach to implementation of Reef Plan. It is responsible for providing advice directly to the Intergovernmental Operational Committee (IOC) on the operational implementation of the Reef Plan. Its role is to:

- consider and provide advice to the IOC on Reef Plan actions, strategies and implementation plans developed by action managers
- consider and provide advice to the IOC on the reporting by action managers against implementation plans
- consider and provide advice to the IOC on annual reports on Reef Plan implementation
- propose to the IOC possible areas of work to continuously improve the implementation of the Reef Plan
- as requested by the IOC, provide advice on membership and terms of reference for working groups and other committees that may be established by the IOC
- other tasks as requested by the IOC.







