



Australian Government



Queensland
Government

Report to the Prime Minister and the Premier of Queensland

Reef Water Quality Protection Plan

Implementation of the
Reef Water Quality Protection Plan
Progress to date, challenges and
future directions.

2005

Protecting our reef

Implementation of the Reef Water Quality Protection Plan

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Progress to date, challenges and future directions



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1. Executive summary

The Great Barrier Reef (the Reef) is a nationally and internationally significant area with outstanding natural, social and economic values. Extensive modification within the Reef catchment since the beginning of European settlement has led to significant increases in pollutants (sediments, nutrients and chemicals) in waterways entering the Reef lagoon. While the vast majority of the 2900 reefs that make up the Reef are in good condition, this pollution threatens inshore reefs and ecosystems.

Single issue-based actions or policies by individual organisations are no longer an effective way to protect the Reef from this threat. The challenge is to change the behaviour of those whose actions impact on the Reef water quality.

In response to this challenge, the Australian and Queensland Governments, in partnership with a wide range of industry and community groups, developed the Reef Water Quality Protection Plan (the Reef Plan). The Reef Plan was launched in December 2003 and has now been in operation for 18 months. The Reef Plan focuses on actions to address pollutants from diffuse agricultural land use sources through an integrated natural resource management approach.

This is the first of two major progress reports and identifies the status of implementation, challenges and future directions for the Reef Plan. The second progress report is due in 2010. The report is based on:

- the experience of the Queensland and Australian Governments in managing Reef Plan implementation
- the independent audit (the Audit) of the Reef Plan's implementation
- targeted community consultation on progress with implementing the Reef Plan
- Reef Plan annual reports.

The implementation of the Reef Plan has been characterised by the delivery of a large number of activities that underpin the actions listed in the Reef Plan. The Audit found the rate of progress with implementing the Reef Plan consistent with the expected profile for such a complex engagement-focused initiative; however, this implementation has not been communicated effectively with stakeholders or the wider community.

The Reef Plan has primarily tapped into existing projects and programs for its delivery, rather than initiating a new set of 'single issue' activities. Where programs do not currently exist to meet particular actions, new work has been initiated. In the 18 months since the Reef Plan was launched, significant work has been undertaken to develop partnerships and align resources to ensure the Reef Plan is successfully implemented on a long-term basis.

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Key activities have focused on:

- establishing organisational structures
- aligning major joint Government initiatives, such as the Natural Heritage Trust and the National Action Plan for Salinity and Water Quality, to Reef Plan objectives
- establishing key partnerships between the Australian and Queensland Governments and with industry and regional NRM bodies.

Implementation of the Reef Plan to date has provided a strong foundation of policy coordination that supports the delivery of on-ground actions into the future.

Highlights from actions undertaken since the Reef Plan was initiated include:

- the development of industry-led best management practice and farm management systems
- the accreditation of regional NRM body plans and investment strategies that deliver on Reef Plan objectives
- the introduction of new vegetation management legislation in Queensland to improve land management in Reef catchments.

Experience over the past 18 months has shown that the Reef Plan actions will need to adapt as new knowledge and scientific information become available. Updating actions and milestones based on the experience gained since the launch of the Reef Plan will improve transparency, accountability and result in more effective outcomes. A review of milestones and prioritising actions is also supported by the Audit.

The impact of improved land use practices on water quality may not be obvious in the short term. In addition, due to the natural effects of pulse events, such as floods that significantly alter water quality in the immediate to short term, water quality in the Reef lagoon may decline before it improves to a sustained level. This should not be seen as a failure of the Reef Plan in achieving its objectives. A recommitment to the ten-year timeframe, recognising that long-term actions are required and that improvements in water quality will not be immediately obvious, will ensure the momentum of the Reef Plan gained over the past 18 months is maintained.

There is a strong emphasis on measuring water quality in the rivers and the lagoon, and this will continue. The implementation of the Stream and Estuary Assessment program in December 2005 is important in this respect; however, in the short term, a greater focus on monitoring trends in land condition and the uptake of improved farm practices will be required to provide crucial information to determine the progress of the Reef Plan objectives. Further work is required to ensure that monitoring changes in land use, land condition and uptake of best management practice complements the coordinated monitoring and reporting of the water quality of rivers, estuaries and marine areas.

Governments, regional NRM bodies and a number of industry groups are relied on to implement Reef Plan actions; however, non-government stakeholders and the wider community have a poor understanding of Reef Plan implementation processes, the level of resources invested, and the existing governance arrangements. In addition, the timeframes that are necessary to see on-ground changes in water quality are not well understood.

A comprehensive and detailed communication strategy and more effective engagement with non-government stakeholders and the wider community are needed to improve public confidence in the implementation of the Reef Plan. The Audit and community consultation strongly support this conclusion.

2. Recommendations

The three main points to note are:

- Positive partnership arrangements between Australian and Queensland Governments and with industry and regional NRM bodies have been developed.
- While not all Reef Plan actions with 1 July 2005 milestones have been achieved, the independent auditors found progress is consistent with their expectations for such a complex engagement-focused initiative.
- With stakeholders generally not perceiving that governments are committed to implementing the Reef Plan there is need to provide ongoing high level political support for the Reef Plan.

Given this, it is recommended that the Governments:

1. recommit to the ten-year timeframe for the Reef Plan, recognising that long-term actions are required and that improvements in water quality will not be immediately obvious
2. improve consultation and communication with key stakeholders and the wider community about the objectives, achievements and implementation processes of the Reef Plan
3. develop more effective partnerships with industry sectors, regional NRM bodies and the wider community in the implementation of the Reef Plan
4. identify in partnership with stakeholders those actions that are the key drivers to success of the Reef Plan and give priority to those actions for investment and reporting
5. update actions and milestones to incorporate new knowledge and scientific information and to reflect developments in policy
6. improve monitoring of land condition and the uptake of sustainable land use practices
7. publicly launch the updated Reef Plan.

3. Introduction

3.1. Background

The Great Barrier Reef (the Reef) is a nationally and internationally significant area with outstanding natural, social and economic values. Over the past 150 years, the catchment areas adjacent to the Reef have been extensively modified for urban infrastructure, agricultural production, tourism and mining. This has led to significant increases in pollutants in rivers entering the Reef.

The major source of pollutants (sediments, nutrients and chemicals) entering the Reef now result from land use activities in the Reef catchment. This trend is consistent with the findings of the United Nations' Global Program of Action for the Protection of the Marine Environment from Land-based Activities, which estimates 80 per cent of marine pollution results from land-based sources.

This pollution threatens inshore reefs and ecosystems. While the vast majority of the 2900 reefs that make up the Reef are in good condition, some of the 450 inshore reefs are showing impacts consistent with a decline in water quality from increased pollutants. The long-term health of the Reef has implications not only in terms of biodiversity conservation, but also for the future of significant industries such as tourism and fisheries.

No single solution will control pollution of the Reef. Single issue-based actions or approaches by individual organisations are no longer effective to halt and reverse the decline in water quality. The challenge is to change the behaviour of those whose actions impact on the Reef water quality.

In response to this challenge, the Australian and Queensland Governments, in partnership with a wide range of industry and community groups, developed the Reef Water Quality Protection Reef Plan (the Reef Plan). The Reef Plan was launched in December 2003 and has now been in operation for 18 months.

The Reef Plan is aimed at improving water quality by addressing diffuse pollution from broadscale land use. Climate change, shipping accidents, tourism, urban development, fishing and point sources of pollution, such as sewage, also impact on Reef water quality. The Reef Plan does not deal with these issues; they are covered by separate regulatory and planning processes.

3.2. Goal and objectives of the Reef Plan

The Reef Plan proposes a range of actions by all levels of government, industry and community groups to halt and reverse the decline in water quality entering the Reef within ten years. To achieve this goal, the Reef Plan has two objectives:

- to reduce the load of pollutants from diffuse sources in the water entering the Reef
- to rehabilitate and conserve areas of the Reef catchment that have a role in removing water-borne pollutants.

In particular, the Reef Plan:

- relies on a cooperative, partnership approach and commitment by industry and government to align their resources to achieve the Reef Plan's objectives
- identifies the most at-risk catchments so efforts can target the areas of most need
- provides a broad range of strategies and actions to achieve the Reef Plan's objectives
- allocates milestones to each action and identifies the government agencies, industry and community groups who will implement the action
- identifies the monitoring and evaluation activity needed to measure the impact of the Reef Plan.

The principles underpinning the Reef Plan are:

- **Sustainable land use is the means**

The major source of pollutants (sediments, nutrients and chemicals) entering the Reef result from land use activities in the Reef catchment areas. The Reef Plan therefore focuses on implementing sustainable land use management practices to reduce levels of diffuse pollutants entering the Reef lagoon; however, the impact of changes in land use practices on water quality may not be immediately obvious. During the ten-year life of the Reef Plan, there may be short-term declines in water quality because drought-breaking floods may flush significant quantities of sediment into the Reef. Adopting sustainable production systems is expected to provide long-term water quality improvements.

- **Partnerships are the key to long-term success**

A complex, wide-ranging network of landholders, government, industry, community groups and research organisations are involved in implementing the Reef Plan. Ongoing productive partnerships across this network are essential for the Reef Plan's long-term success.

- **Regional approaches to regional challenges**

No single action or state-wide solution will control pollution entering the Reef. Solutions to local challenges are best built by combining local knowledge and the best available science.

To this extent, the regional NRM bodies established under the National Action Plan for Salinity and Water Quality and the Natural Heritage Trust program have an important role to play.

- **Act now but adapt as needed**

Around the world, the relationship between land use activities in catchment areas adjacent to reef ecosystems, declines in reef water quality and subsequent impacts on reef health has been demonstrated. To prevent this occurring in the Reef, it is necessary to act now and adapt responses as new information becomes available.

3.3. Focus of this report

The Reef Plan requires two progress reports for the Prime Minister and the Premier of Queensland: one in 2005 and one in 2010. This first report focuses on:

- whether satisfactory progress has been made towards the objectives of the Reef Plan
- the processes through which these objectives are being achieved
- whether amendments to the Reef Plan are required to achieve the objectives
- interim progress made towards halting the decline in water quality entering the Reef.

This report is based on the findings of four sources:

- the experience of the Queensland and Australian Governments in managing Reef Plan implementation
- annual reports covering 2003–04 and 2004–05 provided to Ministers on progress towards the Reef Plan’s goal and objectives
- an independent audit of the Reef Plan’s implementation
- targeted community consultation on progress with implementing the Reef Plan.

Reef Plan annual reports

Annual reports provide a summary of progress made against each of the nine Reef Plan strategies. The 2004–05 report includes a report by industry on their actions in support of the Reef Plan.

Independent audit

Three independent audits on implementation are required over the life of the Reef Plan. The first of these independent audits (the Audit) was conducted in May–June 2005 by Howard Partners Pty Ltd. The Audit focused on government and non-government organisations involved in implementing the Reef Plan. The Audit's objectives were:

- to provide an independent assessment of progress in implementing the Reef Plan
- to identify barriers to, and drivers for, successful implementation.

The Audit report is attached (Appendix 2).

Targeted community consultation

As required by the Reef Plan, community consultation was undertaken in May–June 2005 to inform this report. A range of people representing various interests in the Reef region were consulted via a telephone survey. Interest areas included tourism, agriculture (grazing, sugar and horticulture), commercial and recreational fishing, traditional owners, conservation and science. People consulted were identified through their involvement in various Great Barrier Reef Marine Park Authority committees.

Outcomes of this consultation have been reported to Ministers and taken into account in producing this report.

4. Progress towards objectives

The Reef Plan identifies nine strategies to achieve the objectives of the Reef Plan. The first five strategies describe the main approaches required for achieving the objectives. These are:

- self-management approaches
- education and extension
- economic incentives
- planning for natural resource management and land use
- regulatory frameworks.

The remaining four strategies are necessary to target, inform and support the first five approaches. These are:

- research and information sharing
- partnerships
- priorities and targets
- monitoring and evaluation.

Sixty-five actions outlined in the Reef Plan support these nine strategies. Government and non-government organisations are undertaking a large number of activities to deliver these actions.

4.1. Performance against strategies and actions

Eighteen months into the ten-year timeframe, satisfactory progress has been made in many of the actions due on or before July 2005 and a strong foundation of policy coordination has been established which will support the delivery of on-ground actions in the future. Milestones have galvanised activity and generated momentum in engagement within government and between government and the wider community.

Significant work in developing partnerships and aligning resources to ensure the Reef Plan is successfully implemented on a long-term basis has been undertaken. Key activities have focused on:

- establishing organisational structures
- aligning major joint Government initiatives, such as the Natural Heritage Trust and the National Action Plan for Salinity and Water Quality, to Reef Plan objectives
- establishing key partnerships between the Australian and Queensland Governments and with industry and regional NRM bodies.

The Audit found:

- progress is consistent with the expected profile for a complex engagement-focused initiative such as the Reef Plan
- for actions with a milestone on or before July 2005, 43 per cent of activities were completed and 48 per cent were being implemented.

The development of the 2004–05 Annual Report highlighted a number of additional milestones that have been met since the Audit was completed. These include:

- undertaking the independent Audit
- receiving the report from industry required under actions A3 and I9
- completing this report to the Prime Minister and the Premier of Queensland.

4.2. Action highlights

The Reef Plan has primarily tapped into existing projects and programs for its delivery, rather than initiating a new set of ‘single issue’ activities. Where programs do not currently exist to meet particular actions, new work has been initiated.

Highlight actions undertaken since the Reef Plan was launched include:

- the development of industry-led best management practice and farm management systems
- the accreditation of regional NRM body plans and investment strategies that deliver on Reef Plan objectives
- the introduction of new vegetation management legislation in Queensland to improve land management in Reef catchments.

Brief highlights demonstrating the range of actions that are being implemented under the Reef Plan are outlined below. A summary of activities being undertaken to implement the Reef Plan is provided in the 2004–05 Annual Report (Appendix 1).

4.2.1. Queensland Wetlands Program

The Australian and Queensland Governments have accelerated efforts to implement the Queensland Wetlands Program, a significant program contributing to key wetland-related actions in the Reef Plan. The program comprises two sub-components:

- the Great Barrier Reef Coastal Wetlands Protection Program (Coastal Wetlands Program)
- the Natural Heritage Trust Wetlands Program.

Under this program, funding has been provided for:

- the development of a Wetland Prioritisation Decision Support System
- the investigation and adoption of programs and incentives relevant to wetlands conservation
- a pilot program for on-ground delivery of wetlands conservation

- mapping and classifying Queensland's wetlands and providing a wetland inventory database
- the preparation of wetland management profiles
- the Understanding Queensland Wetlands: An Information Review and Gap Analysis project.

Conservation Volunteers Australia has been contracted to lead a consortium to implement the \$2 million pilot program for on-ground delivery of wetlands conservation. This pilot program will use a number of mechanisms, such as voluntary conservation agreements and incentive packages, to identify and protect significant wetlands. The program will involve partnerships between government, community and individual landowners

4.2.2. Conservation agreements and land purchase

The Queensland Government, through its Environmental Protection Agency, is supporting landholders to place land under conservation agreements. Since October 2003, an additional 32 nature refuges have been formalised in the Reef catchment, protecting 123 144 hectares of land and bringing the total area of protected land in the Reef catchment to 178 615 hectares.

The Queensland Trust for Nature has been established and is now investigating potential land purchases that have an important wetland value. The Environmental Protection Agency has identified properties within the Reef catchment areas potentially suitable for the Trust for Nature to acquire. These properties are now being evaluated and assessed. The Australian Government through the Department of the Environment and Heritage has provided funds to promote philanthropic contributions to the Trust.

4.2.3. Supporting sustainable practices

The Agricultural State Level Investment Projects under the National Action Plan for Salinity and Water Quality led by the Queensland Department of Primary Industries and Fisheries help primary producers and regional NRM bodies to improve the uptake of sustainable practices. The 18 projects are grouped into four themes: landscape management, grazing lands management, industry capacity building for natural resource management, and coordination and progress support.

Particular highlights include the development and delivery of grazing lands management education packages in the Burdekin, Fitzroy and Burnett Mary catchments.

4.2.4. Best management practices

AgForce is an industry organisation which represents Queensland's broadacre industries of cattle, grain, sheep and wool. The Queensland Government has provided AgForce with \$8 million to deliver the AgForward program to help landholders to improve their land management practices. AgForward is funded from the Queensland Government's \$150 million financial assistance package established to help landholders to move forward with new vegetation management laws.

Phase one of AgForward will be a series of foundation workshops throughout Queensland which will analyse the 'big picture', including future markets and their expectations. The workshops will discuss property planning and linkages to other training programs for various industries and provide an overview of the regional planning processes.

Phase two of AgForward will deliver tools and information to landholders at a scale that is useable and effective. There will be a strong initial focus on comprehensive property plans that are useful in the ongoing management of properties.

4.2.5. Farm management systems

In 2004–05, a memorandum of understanding was signed between the Queensland Farmers' Federation and the Queensland Government to progress the development and implementation of industry-led farm management systems. The farm management systems concept is a voluntary, property and business level management process producers use to identify and manage risks, particularly environmental risk, that may occur as a result of their farming operation. The aim is to achieve continuous improvement by implementing recommended management practices and reviewing progress made against targets.

Queensland Farmers' Federation member organisations are developing farm management systems in their individual industries using the Queensland Farmers' Federation Farm Management Systems Framework. Industry's development and implementation of farm management systems is considered an important voluntary mechanism for achieving profitable and sustainable intensive rural industries and healthy and productive landscapes.

4.2.6. Trial extension activity under Fertcare program

Fertcare is a national training, quality assurance and certification program that focuses on managing food safety and environmental risks associated with fertiliser use. Everybody who is associated with fertiliser decisions or uses fertiliser can benefit from undertaking an appropriate level of Fertcare training, as follows:

- Level A focuses on best practice handling, transport, storage and spreading of fertilisers for those involved in the logistics side of the industry.
- Level B provides basic knowledge of nutrient issues relating to environment and food safety, and caters for people involved in fertiliser sales.
- Level C is designed for crop and pasture nutrition advisers who provide detailed plant nutrition advice based on soil and plant testing. The course includes detailed and complex knowledge of environmental issues, product stewardship and food safety issues. It also assesses the competency of the adviser in providing nutrient recommendations.

During 2004–05, a trial of Level C was undertaken for nutrition advisers working in the catchments of the Great Barrier Reef. The Fertcare initiative also includes the AccuSpread testing program to ensure fertiliser spreading machines apply nutrients in an even and efficient way.

4.2.7. Phase out of broadscale clearing

The Queensland Government has introduced legislation to phase out broadscale clearing of remnant vegetation by December 2006. It has provided a \$150 million financial assistance package, including \$12 million for incentives to retain high value non-remnant vegetation, \$8 million for best management practice delivered through Agforce's Agforward program, and \$120 million for structural adjustment for those significantly impacted by the new legislation.

4.2.8. Regional natural resource management plans

Regional natural resource management plans and regional investment strategies for all regional NRM bodies in the Reef catchment, with the exception of Cape York, have been accredited or recommended for accreditation. These plans identify aspirational, resource condition and management action targets for managing water quality in their regions and have been accepted by the Australian and Queensland Governments as a first step in addressing the decline of Reef and Reef catchment water quality.

The regional NRM bodies are now moving into an implementation phase.

4.2.9. Improved coordination of water quality monitoring

During 2004–05, the Australian and Queensland Governments focused their water quality monitoring programs to track the long-term trends of water quality entering the Reef and Reef Lagoon. A \$5 million investment from the Queensland Government Smart State Building Fund will go towards the implementation of the state's Stream and Estuary Assessment program. The funds provide a state-wide investment of \$1.6 million for water quantity monitoring, as well as \$3.4 million for water quality monitoring. An annual operating budget of \$1.2 million for three years will also be provided.

In 2004–05 the Great Barrier Reef Marine Park Authority developed and implemented an integrated marine monitoring program. The program allocates \$2 million in its first year to benchmarking the main environmental and ecosystem variables and establishing the monitoring program to measure changing trends in the water quality and ecosystem health of the Reef. This includes monitoring any changes in the social and economic values of industries in the Reef.

Both governments are also working with the regional NRM bodies to coordinate water quality monitoring programs from the catchment to the Reef.

4.2.10. Water quality improvement plans

Water quality improvement plans and associated interim projects will deliver on agricultural best management practices, protection and restoration of priority riparian areas and water quality benchmarking and monitoring.

The nearly completed Douglas Shire water quality improvement plan and interim water quality projects are informing water quality improvement plans elsewhere in Queensland (particularly in the Wet Tropics) and providing management practices to reduce nutrient and sediment export to the Reef lagoon.

The development of water quality improvement plans has commenced in the following catchments:

- Tully and Barron (Far North Queensland Natural Resource Management Board)
- Burdekin (Burdekin Dry Tropics Board)
- Proserpine, O'Connell, Pioneer and Plane (Mackay Whitsunday Natural Resource Management Group)
- Burnett (Burnett Mary Regional NRM Group).

4.2.11. Research information sharing

The Consortium for Integrated Resource Management has collated information on research relevant to improving and monitoring water quality and sustainable landscape practices in the Reef catchment. A gap analysis identifying research priorities has been undertaken to support the Reef Plan.

The Consortium for Integrated Resource Management provides an overall coordinating mechanism for research and development activities and comprises Queensland Government agencies (including the Department of Primary Industries and Fisheries, the Environmental Protection Agency, and the Department of Natural Resources and Mines), four universities (University of Queensland, Central Queensland University, Griffith University and James Cook University) and the Commonwealth Scientific and Industrial Research Organisation.

4.2.12. Indigenous cultural indicators of water quality

The Australian Government Department of the Environment and Heritage, the Queensland Environmental Protection Agency and the Barkanu Cape York Development Corporation (Cape York Region) are working together to develop a set of generic cultural indicators relevant to water quality and management. This tool will allow Indigenous knowledge to be integrated with traditional scientific resource monitoring and will have the potential to be used by all Traditional Owner groups in the Reef catchment.

5. Process for achieving objectives

No single solution will control diffuse pollution entering the Reef lagoon. Achieving the goal and objectives of the Reef Plan requires an integrated natural resource management approach. The Reef Plan therefore focuses on:

- partnerships between landholders, government, industry, regional communities and researchers
- investment and program coordination.

5.1. Partnerships

Landholders, government, industry, community groups and research organisations are all responsible for implementing the Reef Plan. Building productive, ongoing partnerships across this complex and wide-ranging network is essential for the Reef Plan's long-term success.

5.1.1. Engagement between governments

To date, the Reef Plan has successfully developed whole-of-government approaches within and between the Australian and Queensland Governments for protecting the Reef from declining water quality. Current aspects of the Reef Plan critical to driving this whole-of-government approach include:

- a single goal that is applicable across a range of government industry and community activities
- the Reef Plan's endorsement at the highest level of government (the Prime Minister and the Premier of Queensland)
- continued collaboration between government agencies that are responsible for delivering particular Reef Plan actions
- the role of formal bodies established to support the Reef Plan's implementation, including the Reef Plan Secretariat and the Interdepartmental Operational Committee.

Implementation of joint programs, such as the Natural Heritage Trust and the National Action Plan for Salinity and Water Quality, has been critical in achieving Reef Plan objectives. The Queensland and Australian Governments provide direction to regional natural resource management actions funded by the National Action Plan for Salinity and Water Quality and the Natural Heritage Trust through the Joint Steering Committee. The Joint Steering Committee's role is to make decisions regarding regional NRM bodies' proposals and forward any recommendations to Queensland and Australian Government ministers for support and approval.

The Reef Plan provides for an Interdepartmental Steering Committee (comprising relevant Australian and Queensland Government agency heads) supported by a working party of senior government officers (the Intergovernmental Operational Committee) and a small secretariat.

The Intergovernmental Operational Committee meets regularly and considers progress of government-led actions. Where delays in projects are occurring, the Intergovernmental Operational Committee considers the management actions that are being taken to ensure the work is completed in a timely and efficient manner. The Intergovernmental Operational Committee reports to the Interdepartmental Steering Committee as required.

Local government has not been engaged to the same extent as the Australian and Queensland Governments. Local government involvement is needed to implement Reef Plan actions concerned with planning instruments related to land use. Local government's ability to affect on-ground changes is through local planning schemes, rather than changing existing land uses.

Planning schemes are designed to reflect the state's interests regarding water quality and land use planning objectives. As these objectives are refined at the state level, local governments are expected to contribute more effectively to the goal and objectives of the Reef Plan.

5.1.2. Engagement with industry and regional NRM bodies

Engagement has commenced on a broad level with the establishment of a forum between senior Australian and Queensland Government representatives and key non-government organisations (including Agforce, the Queensland Farmers' Federation, regional NRM bodies, the Fertiliser Industry Federation of Australia, and the Local Government Association of Queensland). This forum provides an opportunity to discuss progress, implementation issues and ways government and non-government organisations can work more effectively together.

Industry

Peak industry bodies are responsible for implementing a number of actions under the Reef Plan. They play a critical role in the on-ground delivery of self-management approaches, such as best management practice and farm management systems.

While it is clear from their report on implementation that industry peak bodies are very willing to participate in the Reef Plan and actions are being progressed, there is not yet strong engagement or understanding of the Reef Plan implementation processes. The Audit and community consultation both found that industry is interested in the use of incentives to promote environmentally acceptable farming practices that lead to improved economic returns and improved water quality.

Regional NRM bodies

Regional NRM bodies within the Reef catchment are also responsible for a number of actions under the Reef Plan. These bodies implement Reef Plan actions through their regional natural resource management plans and associated regional investment

strategies. As part of the Australian and Queensland Governments' accreditation process, regional natural resource management plans must identify how their actions support Reef Plan objectives.

All regional NRM bodies within the Reef catchment, with the exception of Cape York, have had their regional natural resource management plans and investment strategies accredited, indicating alignment with the Reef Plan.

5.1.3. Engagement with wider community

There are many groups who, while not seen as directly responsible for implementing Reef Plan actions, are strongly committed to the Reef Plan's goal and objectives. These include fishers (commercial and recreational), tourism and conservation groups and regional communities.

These groups could become more involved in communication about Reef Plan actions and could be very effective champions for the Reef Plan. For example, recreational fishing groups could be instrumental in promoting the understanding of the relationships between impacts of land-based activities, such as excessive chemical use on crops, and fish numbers; however, engagement with these groups has been limited to date.

Participants in the community consultation felt they had a high level of awareness about the Reef Plan through being involved in various Great Barrier Reef Marine Park Authority committees; however, their responses to survey questions revealed a poor understanding of Reef Plan processes.

5.1.4. Engagement with researchers

Scientific input was critical to developing the Reef Plan. Many government and non-government research institutions are undertaking ongoing research important to the Reef. While there is agreement on the need to 'act now' to meet the challenge of declining water quality, it is important to know when to adapt the Reef Plan to new scientific knowledge.

The Reef Plan operates in a complex research environment. The sharing of research results with the wider community is an ongoing challenge, but necessary for improving land management activities.

The Consortium for Integrated Resource Management has work underway to identify the research and development needs and priorities for the Reef catchment. This will provide a solid foundation for improved engagement with the research community.

5.1.5. Challenges and recommendations regarding partnerships in achieving objectives

The Reef Plan is an innovative approach to managing a critical environmental problem. The innovation is partly based on the level of engagement government seeks with non-government organisations, businesses, and the wider community. Some stakeholders believe the Governments should take a greater role in project management of the actions under the Reef Plan. This has led to agencies outside of government having limited engagement in the implementation of Reef Plan actions.

For example, the Audit found that although actions of the regional NRM bodies are aligned with the Reef Plan, a number of the regional NRM bodies are not closely engaged with the Reef Plan. While some of the regional NRM bodies support the Reef Plan, others do not believe the Reef Plan is effective for delivering the intended policy outcomes.

The Audit supports the current governance practices that provide engagement between partners rather than the more traditional ‘command and control’ approach and finds that improved communication with all stakeholders will improve engagement.

The strong linkages between the Australian and Queensland Governments have not been effectively communicated to the wider public. In addition, the intergovernmental engagement has not yet included local government. The Audit and the community consultation support this.

Strengthened engagement and communication with governance bodies associated with the regional NRM bodies, such as the Joint Steering Committee, is also desirable to ensure coordination between the Natural Heritage Trust, the National Action Plan for Salinity and Water Quality and Reef Plan activities.

The Audit suggested there be greater emphasis on highlighting the financial benefits for farmers that result from improved environmental practices. This was also reflected in the community consultation. The Reef Plan provides for this through best management practice, farm management systems and actions under Strategy C (economic incentives) which are designed to deliver improved sustainable management and to provide positive economic outcomes for landholders and long-term environmental benefits. Improved communication about these actions is required to improve public understanding of and confidence in the Reef Plan.

A key challenge is to facilitate better engagement, communication and partnerships with industry, regional NRM bodies and the wider community. A concerted communications effort is needed, including the badging and identification of Reef Plan implementation activities, to inform community bodies of Reef Plan developments on an ongoing basis.

The Audit and the community consultation reinforce this finding, with the Audit strongly recommending that communicating the key role government has played to date will enhance public confidence in the Reef Plan.

5.2. Coordinating resources and programs

The Reef Plan focuses on using existing programs and mechanisms for its implementation. Key programs and associated funding sources for Reef Plan actions include:

- the National Action Plan for Salinity and Water Quality and the Natural Heritage Trust
- government programs at Australian, Queensland and local government levels.

While the Reef Plan was not an initial driver for these programs, the alignment process has linked these programs and the Reef Plan. In this way, common objectives, such as those of the National Action Plan for Salinity and Water Quality, the Natural Heritage Trust and the Reef Plan, can be achieved. Further details of the relationship of these programs to the Reef Plan strategies are in the 2004–05 Annual Report (Appendix 1).

Because the Reef Plan strongly relies on funding through existing programs, actual investment in the Reef Plan is difficult to monitor. Better coordination of reporting processes can improve this.

In the 18 months since the Reef Plan's launch in December 2003, significant progress has been made in establishing the organisational structures, building capacity and establishing key partnerships to ensure the Reef Plan is successfully implemented. Many of the Reef Plan's implementers, particularly government and regional NRM bodies, have aligned their strategic planning with the goal and objectives of the Reef Plan.

The Audit raised concerns that alignment of resources from low risk to high risk catchments may inadvertently result in declining water quality in low risk catchments. This is unlikely to occur because there are processes in place, such as vegetation management legislation, the Queensland Government's the wild rivers policy and environmental impact statement requirements preventing significant activities likely to lead to decreased water quality in low risk catchments.

5.2.1. Challenges and recommendations regarding coordinating resources and programs

The Reef Plan's structure and implementation through aligning programs and funding has thus far been a successful framework to deliver its objectives; however, changing behavior to reduce risks to the ecological health of the Reef is a widespread responsibility, not simply the Governments' responsibility. The message is that many non-government stakeholders are either unaware of the significance of more innovative engagement-based approaches to policy delivery or prefer more traditional modes of regulation and subsidy-based policy delivery. For example, industry views the threat of regulation as a key driver for changing farming practices.

As far as funding of the Reef Plan is concerned, industry does not view the Reef Plan as being effective in coordinating or targeting investment. Industry's perception is that government is not doing enough financially and further funding is required to accelerate the adoption of better farm management practices. The participants in the community consultation process also believed there were insufficient financial resources from government for the Reef Plan initiatives.

To increase public confidence in the Reef Plan and to address the issues the industry raised, improved communication about the investment and alignment of programs that has occurred is necessary.

6. Progress towards halting decline in water quality

There is now abundant evidence, primarily from international case studies, that the overall health of coral reef and seagrass ecosystems is affected by the quality of water in which they live. Poor water quality for particular ecosystems is a driver of ecological changes leading to the loss of dominant species, reductions or change in coral or seagrass cover, loss of ecosystem amenity value and, in extreme cases, destruction of the physical structure of the ecosystem. These studies establish a clear relationship between poor water quality and the health of coral reefs or seagrasses where large inputs of sediment or nutrients to relatively small areas occur.

These extreme situations have not yet occurred within the Reef; however, the same processes and pressures causing these large changes elsewhere are evident in the Reef and its catchment.

Monitoring improvement in water quality is a key action of the Reef Plan. The Reef Plan through its processes for coordination and partnerships provides an opportunity for monitoring and data collection networks to be complementary. The data and interpretations of water quality trends will be readily integrated across these programs to allow for a more holistic understanding of the health of the catchment and the Reef to be communicated to all stakeholders.

6.1. Monitoring networks

Water quality monitoring occurs across Queensland and the Reef for a range of purposes, including research, legislative requirements and community natural resource management. Different research organisations, government agencies, industry and community groups undertake water quality monitoring.

Implementation of the Reef Plan has prompted the Australian and Queensland Governments to better coordinate existing water quality monitoring systems. Complementary water quality monitoring and reporting systems are now being developed which will better track the long-term trends of water quality in the catchment and entering the Reef lagoon.

Queensland's new Stream and Estuary Assessment program focuses on monitoring the Reef catchment upstream of the tidal limit and assesses the key drivers (land use change, land management practices, land cover) and vectors (stream flow, loads of sediment, nutrients, and other contaminants). This program is expected to be implemented by December 2005.

Queensland's program is complemented by the Marine Monitoring Program conducted by the Great Barrier Reef Marine Park Authority and by the monitoring activities of regional NRM bodies. The Marine Monitoring Program, implemented in June 2005, aims to assess the long-term effectiveness of on-ground actions by measuring the trends in nutrient, sediment and pesticide loads entering the Reef lagoon and associated changes in the health of key Reef ecosystem variables.

The Marine Monitoring Program has four basic components: river mouth water quality monitoring, near shore marine water quality monitoring, marine biological monitoring and pollutant bioaccumulation monitoring.

Community groups, industries and the investment programs of regional NRM bodies provide further monitoring of actions to improve the management of land use and to reduce impacts on water quality.

6.2. Condition assessment

The condition assessment of the Reef draws information from several event-based monitoring programs conducted in specific catchments during 2004, and from a broader framework of ambient river monitoring within the Reef catchment conducted during 2003–04. Data analysis and interpretations for the ambient monitoring in 2004–05 are currently underway.

It is estimated that runoff from catchments carries 11–14 million tonnes of fine sediment, 40 000–64 000 tonnes of nitrogen and 7 000–14 000 tonnes of phosphorus on average annually into the Reef. Although activities such as green cane harvesting, trash blanketing and zero tillage have reduced sediment loss in specific industries, sediment and nutrients entering the Reef lagoon are estimated to be two to six times greater than average annual inputs prior to European settlement.

Much of the nitrogen (40–80 per cent) and most of the phosphorus (70–80 per cent) transported by waterways are attached to fine eroded soil particles. Loads of sediment, nitrogen and phosphorus carried by the large rivers of the dry tropics (Burdekin and Fitzroy) during floods are two to four times those carried in wet tropics rivers; however, the wet tropics rivers have higher losses on a per area basis due to their steeper topographies and higher rain-driven erosion rates.

River sampling programs in a number of catchments show that nutrient concentrations increase as river waters cross floodplains with intensification of agricultural land use. Significant increases (4–6 per cent a year) in nitrate, particulate nitrogen and phosphate concentrations were observed in the lower Tully River (wet tropics) over a ten-year period (1990–2000), which corresponded with increased fertiliser use in the catchment.

Available data on water quality in the Reef lagoon indicate that nutrient, suspended particulate matter and chlorophyll (a proxy for nutrient availability) concentrations in Reef waters are generally low. High concentrations of nutrients and sediments occur episodically in plumes of flooding rivers and over marine regions disturbed by tropical cyclones. Flood plumes may occur between one and several times a year on a regular basis in the wet tropics, but less frequently—every several years to several decades—in the dry tropics.

Observed changes in near shore benthic (sea floor) communities, including variations in cover, composition and relative abundance of macroalgae, encrusting algae, hard corals and soft corals, reflect increases in nutrient levels from catchment runoff closer to the coast. Differences are also observed between regions with differing levels of influence from agricultural runoff (Princess Charlotte Bay, Wet Tropics). The largely

one-off nature of these surveys, however, precludes determination of whether the spatial extent of terrestrial runoff influence is stable or changing.

Regional-scale chlorophyll monitoring has been carried out in coastal and Reef lagoon waters since 1992. Trends indicate an increase in average chlorophyll concentrations at the coast associated with increases in nutrient levels from runoff from catchments; however, no significant net changes in chlorophyll concentration have been observed regionally.

Seagrass monitoring indicates most intertidal seagrass meadows have been relatively stable over the past decade, although meadows in the Whitsunday region are declining.

6.3. Catchment perspective

Rainfall heavily influences water quality. Higher sediment and nutrient loads are associated with floods. For this reason, water quality information needs to be considered in the context of rainfall and associated runoff in relevant catchments.

This section provides an overview of surface water for three out of four of the aquatic ecosystem provinces in the Reef catchment for 2003–04. Data for 2004–05 are still being analysed; however, 2004–05 information about flood event monitoring in the Burdekin and Mackay–Whitsunday regions is available and is included.

6.3.1. The Cape to the Wet Tropics

Rainfall in 2003–04 was mostly average in the south and extremely high north of Tully, especially near Cairns and Cooktown. Runoff was below average or very low until the end of January, then close to average for the rest of the year.

Overall, just under half (48 per cent) of all sites monitored were rated as ecologically healthy or slightly impacted. Forty-three per cent of sites were considered to be slightly to moderately impacted with some signs of ill health, and 10 per cent of sites were classified as moderately to heavily impacted.

6.3.2. The Burdekin, Mackay–Whitsunday and the Fitzroy

Rainfall in 2003–04 was extremely low to below average for most of the province, with extremely low falls in the Shoalwater, Styx, Pioneer, Bowen and Cape Catchments and in the Burdekin Catchment near Charters Towers. Runoff was also generally below average.

Water quality generally complied with electrical conductivity and turbidity guidelines but total phosphorus levels were high. Overall, water quality results indicated that half of the sites were moderately to heavily impacted, 25 per cent were rated as slightly to moderately impacted with some signs of ill health, and 25 per cent were considered to be ecologically healthy or slightly impacted.

During the 2004–05 wet season, a flood event monitoring program was undertaken in the Burdekin River and rivers in the Mackay–Whitsunday region. This program integrated organisations involved in water quality monitoring in these regions.

In the Mackay–Whitsunday region, flood event sampling was undertaken in late January 2005 for suspended sediments, nutrients and pesticides in 18 rivers and streams. Sampling was also undertaken for chlorophyll, nutrients, suspended sediments, salinity and herbicides in river plumes in the Reef lagoon from off Sarina in the south to Repulse Bay in the north and out as far as the inner-shelf reefs near Lindeman, Brampton and Keswick Islands.

6.3.3. Burnett Mary

Long-term average annual rainfall varies from 640 mm to 1520 mm a year within the province. Rainfall for the 2003–04 reporting period was mostly average. Runoff was below average for most of the year.

Under the Queensland Ambient Surface Water Quality Monitoring Program, the Burnett–Mary region is included in the South East Queensland analysis. Therefore, water quality information relating solely to the Reef catchment in the Burnett–Mary province is not available.

However, sites in the west of the Mary catchment are thought to have high electrical conductivity due to landscape characteristics or past land clearing activities. High nutrient concentrations at a site downstream of Gympie were likely to be due to a major sewage plant discharge, rather than land use. Poor nutrient ratings for six sites in the south of the Burnett catchment were possibly due to impacts from cropping, dairy or grazing in the catchment. High nutrient concentrations were recorded at around 40 per cent of the monitored sites, generally reflecting diffuse source inputs from catchment land uses.

7. Future directions

7.1. Improvements to the Reef Plan

The implementation of the Reef Plan to date has provided a strong foundation of policy coordination. The Reef Plan has sought to tap into existing projects and programs for its delivery, rather than initiating a new set of 'single issue' activities. While this has provided an effective and efficient means of implementation, experience over the past 18 months has shown that the matrix of strategies and actions and the overlapping nature of many of the projects are very complex.

Difficulties in identifying which projects contribute to which strategies and actions highlight the need to clarify the actions and to review the reporting processes. In addition, because the Reef Plan is implemented through a diverse range of programs, matching the reporting timeframe of those programs with those of the Reef Plan will avoid duplication.

Updating the actions, milestones and reporting mechanisms based on the experiences gained since launching the Reef Plan will improve transparency and accountability and result in improved outcomes. The Audit supports a review of milestones and prioritisation of actions. A framework that enables the actions and activities to adapt when new knowledge and scientific information become available will provide a 'continuous improvement' model that will ensure the Reef Plan stays relevant into the future.

The Audit recommended that the existing ten-year timeframe should be reviewed, believing it is not a realistic timeframe for delivering the Reef Plan's goal and objectives. While it should be recognised that actions to reverse the decline of water quality entering the Reef need to be long-term, the land management changes critical to the Reef Plan's objectives can be met in this timeframe. Also, changing the ten-year timeframe may give the message that government is not serious about taking action to improve the health of the Reef. Targets need to be challenging to ensure all parties are convinced of commitment to the task. A recommitment to the ten-year timeframe, recognising that long-term actions are required and that improvements in water quality will not be immediately obvious, will ensure the momentum of the Reef Plan gained over the past 18 months is maintained.

7.2. Communication

Poor understanding of the processes used to implement the Reef Plan, the level of resources currently invested, the governance currently in place and the timeframes that are necessary to see on-ground changes in water quality is apparent. This lack of understanding is evident in both non-government implementers and the wider community.

One of the strongest messages from the Audit and the community consultation process is the lack of understanding among non-government stakeholders and the wider community of the progress made in implementing Reef Plan. A comprehensive and detailed communication strategy and stronger engagement with the non-government implementers and the wider community are needed to improve public confidence in the implementation of the Reef Plan.

7.3. Water quality monitoring

The impacts of improved land management practices are unlikely to be reflected in improved water quality in the short term. Due to the natural effects of pulse events such as floods that significantly alter water quality in the immediate to short term, water quality in the Reef lagoon may decline before it improves to a sustained level. This should not be seen as a failure of the Reef Plan.

There is a strong emphasis on measuring water quality in the rivers and the lagoon and this will continue; however, in the short term, a focus on monitoring trends in land condition and the uptake of improved farm practices will also be required to provide crucial information to determine the progress of the Reef Plan objectives. The implementation of the Stream and Estuary Assessment program in December 2005 will address this issue to a certain extent.

Further work is required to ensure that monitoring changes in land use and land condition complements the coordinated monitoring and reporting of the water quality of rivers, estuaries and marine areas.

8. Appendixes

A Reef Water Quality Protection Plan Annual Report 2004-05

Annex 1 – Report against strategies as at 1 July 2005

Annex 2 – A report on agricultural industry initiatives July 2005

B Reef Water Quality Protection Plan Audit Report 2005

Annex 1 – List of organisations consulted

Annex 2 – Workshop outline and audit instrument

Annex 3 – Tables analysing implementation progress

Reef Water Quality Protection Plan
Annual Report 2004–05



Australian Government



Queensland
Government

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List of acronyms

ABARE	Australian Bureau of Agricultural and Resource Economics
ACTFR	Australian Centre for Tropical Freshwater Research
AgSIP	Agricultural State-level Investment Projects
AIMS	Australian Institute of Marine Science
ANZECC	Australian New Zealand Environment and Conservation Council
APFA	Australian Prawn Farmers Association
APVMA	Australian Pesticides and Veterinary Medicines Authority
BDTB	Burdekin Dry Tropics Board
BMRG	Burnett Mary Regional Group
CCI	Coastal Catchments Initiative
CIRM	Consortium for Integrated Resource Management
CNC	Community Nature Conservation Program
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DAFF	Department of Agriculture, Fisheries and Forestry (Australian Government)
DEH	Department of Environment and Heritage (Australian Government)
DLGPSR	Department of Local Government and Planning, Sport and Recreation (Queensland Government)
DPC	Department of Premier and Cabinet (Queensland Government)
DPI&F	Department of Primary Industries and Fisheries (Queensland Government)
DSDTI	Department of State Development Trade and Innovation (Queensland Government)
EPA	Environmental Protection Agency (Queensland Government)
FBA	Fitzroy Basin Association
FIFA	Fertilizer Industry Federation of Australia
FMS	Farm Management Systems
FNQ NRM Ltd	Far North Queensland Natural Resource Management Ltd
GBRMPA	Great Barrier Reef Marine Park Authority (Australian Government)
LGAQ	Local Government Association of Queensland
LWMP	land and water management plan(s)

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MWNRM	Mackay-Whitsunday NRM
NAPSWQ	National Action Plan for Salinity and Water Quality
NAP	National Action Plan
NAP SIP	National Action Plan State Investment Program
NHT	Natural Heritage Trust Program
NRM	natural resource management
NR&M	Department of Natural Resources and Mines (Queensland Government)
QFF	Queensland Farmers' Federation
QMERRWG	Queensland Monitoring, Evaluation and Reporting
QPWS	Queensland Parks and Wildlife Service
QRIS	Queensland Regional Information Service
RWUEI II	Rural Water Use Efficiency Initiative
SCAS	Sustainable Coastal Agricultural Systems
SIP	State Investment Project(s)
SRLLS	State Rural Leasehold Land Strategy
VIP	Vegetation Incentive Program
WQCG	Water Quality Coordination Group
WQRAC	Water Quality Reef Advisory Committee
WQSIP	Water Quality State Investment Project

1.0 Executive summary

The Great Barrier Reef (the Reef) is a nationally and internationally significant area with outstanding natural, social and economic values. Extensive modification within the Reef catchment since the beginning of European settlement has led to significant increases in pollutants (sediments, nutrients and chemicals) in waterways entering the Reef. While the vast majority of the 2900 reefs that make up the Reef are in good condition, this pollution threatens inshore reefs and ecosystems.

Single issue-based actions or policies by individual organisations are no longer an effective way to protect the Reef from this threat. The challenge now is to change behaviour in order to reduce risks to the Reef's ecological health. Changing behavior is a widespread responsibility, not simply governments' responsibility.

In response to this challenge, the Australian and Queensland Governments, in partnership with a wide range of industry and community groups, developed the Reef Water Quality Protection Reef Plan (the Reef Plan). The Reef Plan was launched in December 2003 with a focus on actions to address pollutants from diffuse sources through an integrated natural resource management approach.

The Reef Plan requires agencies to provide annual reports on progress towards the goal and objectives of the Reef Plan to their respective Ministers. This report is the second report of this kind for the Reef Plan. It notes the progress and major investments made during 2004–05 against four focus areas and details the achievements against each of the nine strategies that support the focus areas.

Key highlights from the 2004–05 report include:

- implementation of the Great Barrier Reef Marine Park Authority's integrated **Reef Marine Monitoring Program**. During 2004–05 \$2 million was spent benchmarking the main environmental and ecosystem variables and establishing the monitoring program to measure changing trends in water quality and ecosystem health of the Reef
- accreditation of **regional natural resource management plans** and **regional investment strategies** within the catchments opposite the Great Barrier Reef. These plans identify targets for the regions' natural resource management and detail catchment-wide activity in land and water management, biodiversity and agricultural practices
- approval of funding under the Australian Government Coastal Catchments Initiative for the development and implementation of **water quality improvement plans** in the following catchments:
 - Tully and Barron (Far North Queensland Natural Resource Management Board)
 - Burdekin (Burdekin Dry Tropics Board)
 - Proserpine, O'Connell, Pioneer and Plane (MWNRM)
 - Burnett (Burnett Mary Regional NRM Group)
- investment of \$1.3 million in the National Action Plan for Salinity and Water Quality **State-wide Investment Program**. This program is lead by the NR&M and supports the development of tools and information products to assist the management of salinity and water quality in NAP regions through five key areas: agriculture, salinity, capacity building, water quality, and social and economic

- roll-out of **Farm Management Systems** by the Queensland Farmers' Federation. The Farm Management Systems concept is a voluntary, property and business level management process producers use to identify and manage risks, particularly environmental risk, that may occur as a result of their farming operation
- development of the **AgForward** program by AgForce. The Queensland Government has provided AgForce with \$8 million to deliver AgForward, which will assist land holders within the broadacre industries of cattle, grain, sheep and wool to improve their land management practices
- continued support from the Australian Government for the **Fertcare** program. During 2004–05, a trial training program was conducted within the catchments of the Reef, which provided participants with a detailed and complex knowledge of environmental issues, product stewardship and food safety issues. It also assessed the competency of the adviser in providing nutrient recommendations
- roll-out of the **Queensland Wetlands Programme**, including funding for the following projects:
 - developing a wetland prioritisation decision support system
 - investigating the adoption of programs and incentives relevant to wetlands conservation
 - mapping and classifying Queensland's wetlands and providing a wetland inventory database
 - preparing wetland management profiles
 - establishing the Understanding Queensland Wetlands: An Information Review and Gap Analysis project
- funding by the Australian Government for a consortium lead by the Conservation Volunteers Australia to deliver a pilot program for **on-ground delivery of wetland conservation** using a number of mechanisms, such as voluntary conservation agreements and incentive packages.

2.0 Introduction

The Great Barrier Reef (the Reef) is a nationally and internationally significant area with outstanding natural, social and economic values. Over the past 150 years, the land catchment areas adjacent to the Reef have undergone extensive modification for urban infrastructure, agricultural production, tourism and mining. This modification has led to significant increases in pollutant loads in the rivers since the beginning of European settlement, such that now the major source of pollutants (sediments, nutrients and chemicals) entering the Reef is land use activities in the catchment areas. This trend is consistent with the findings of the United Nations' Global Programme of Action for the Protection of the Marine Environment from Land-based Activities, which estimates that 80 per cent of marine pollution is the result of land-based sources.

This pollution threatens inshore reefs and ecosystems. While the vast majority of the 2900 reefs that make up the Reef are in good condition, some of the 450 inshore reefs are showing impacts consistent with a decline in water quality.

No single solution will control diffuse pollution entering the Reef. Single issues-based actions or policies by individual organisations are no longer an effective way to halt and reverse the decline in water quality. The challenge is to change the behaviour of those whose actions can impact on Reef water quality.

In response, the Australian and Queensland Governments, in partnership with industry and the community, developed the Reef Water Quality Protection Plan (the Reef Plan). The Reef Plan was launched in December 2003 with a goal of halting and reducing the decline in water quality entering the Reef within ten years.

To achieve this goal, the Reef Plan has two objectives:

- to reduce the load of pollutants from diffuse sources in the water entering the Reef
- to rehabilitate and conserve areas of the Reef catchment that have a role in removing water-borne pollutants.

To achieve these goals and objectives, the Reef Plan:

- relies on a cooperative, partnership approach by all levels of government, industry and community groups for implementation and a commitment to align resources to the Reef Plan's objectives
- identifies the most at-risk catchments so efforts can target the areas of most need
- provides a broad range of strategies and actions needed to achieve the Reef Plan's objectives
- allocates milestones to each action and identifies the government agencies, industry and community groups who will implement the action
- identifies the monitoring and evaluation activities needed to measure the impact of the Reef Plan.

Diffuse sources of water quality pollution, such as sediments, nutrients and chemical, are primarily derived from broadscale land use activities, such as agriculture, vegetation clearing, wetland drainage and grazing. Other impacts on water quality, such as runoff from urban development, sewage, aquaculture, climate change, tourism and fishing, are not part of the Reef Plan because they are dealt with in alternative policies and legislation.

2.1 Implementation processes

The Reef Plan is a complex array of nine strategies and 65 actions that contribute to delivering on the goal and objectives. The Reef Plan has primarily tapped into existing projects and programs for its delivery, rather than initiating a new set of 'single issue' activities. These programs are being delivered through government, industry and the regional natural resource management (NRM) bodies. Where programs do not currently exist to meet particular actions, new work has been initiated.

Funding for the Reef Plan is also delivered through existing government programs, such as:

- the National Action Plan for Salinity and Water Quality (the NAP)
- the Natural Heritage Trust (NHT).

An Interdepartmental Steering Committee comprising heads of agencies from the Australian Government's Department of Agriculture, Fisheries and Forestry (DAFF), Department of the Environment and Heritage (DEH), and Great Barrier Reef Marine Park Authority (GBRMPA), and the Queensland Government's Department of Natural Resources and Mines (NR&M), Department of Premier and Cabinet (DPC), Department of Primary Industries and Fisheries (DPI&F), and Environmental Protection Agency (EPA) oversees the implementation, reporting and evaluation of the Reef Plan's strategies and actions. The Intergovernmental Operational Committee and the Reef Plan Secretariat, which is based in the Queensland Government's Department of Premier and Cabinet, support this committee.

To date, implementation of the Reef Plan has focused on activities that develop partnerships, align resources, and provide a strong foundation of policy coordination that supports the delivery of on-ground actions into the future. Future years will continue to build on these partnerships and closely engage all relevant stakeholders in delivery of the Reef Plan. Better communication and more effective engagement with the non-government stakeholders and the wider community will be developed to improve public confidence in the Reef Plan's implementation.

Results from monitoring the water quality of rivers, estuaries and marine areas, complemented by monitoring changes in land use, land condition and uptake of best management practice, will determine progress towards the goal of the Reef Plan.

2.2 Scope of the annual report

Government agencies are required to report annually to their respective Ministers on progress towards the goal and objectives of the Reef Plan. As described in Section 3 of this report, currently the ability to measure a halt and reduction in the decline in water quality entering the Reef relies on the development of integrated monitoring and reporting systems. These systems are still in the process of design and early implementation. Therefore, while the report provides a summary of the most up-to-date information about water quality entering the Reef since the release of the Reef Plan, its main aim is to report on the progress made against the four focus areas outlined in the Reef Plan, which are:

- improved decision-making in land use planning
- adoption of sustainable production systems
- rehabilitation of damaged wetlands and riparian areas
- conservation of existing wetland and riparian areas.

The annual report also:

- notes the major investments
- highlights the challenges and opportunities for the next year
- reports in detail against each of the nine strategies that support the focus areas (see Annex 1).

3.0 Reef water quality

Water quality monitoring occurs across Queensland and the Reef for a range of purposes, including research, legislative requirements and community natural resource management. Different research organisations, government agencies, industry and community groups undertake water quality monitoring.

Implementation of the Reef Plan has prompted the Australian and Queensland Governments to better coordinate existing water quality monitoring systems. Complementary water quality monitoring and reporting systems are now being developed which will better track the long-term trends of water quality in the catchment and entering the Reef lagoon.

During 2004–05, the Queensland Government developed the Stream and Estuary Assessment program, which is due to be implemented by December 2005. Queensland's program focuses on monitoring the Reef catchment upstream of the tidal limit and assesses the key drivers (land use change, land management practices, land cover) and vectors (stream flow, loads of sediment, nutrients, and other contaminants).

The Australian Government through the GBRMPA has now implemented the Reef Marine Monitoring Program. This program focuses on water entering the Reef ecosystem. It has four basic components: river mouth water quality, marine inshore water quality, inshore marine biological change (status and trend in coral communities and intertidal seagrass communities), and bioaccumulation of contaminants within inshore crab populations.

Regional NRM bodies are also actively involved in water quality monitoring programs as part of their accredited regional NRM plans. For example, the Burdekin Dry Tropics and Mackay–Whitsunday NRM bodies collaborated with other agencies in 2005 on flood event and plume monitoring programs in their regions.

In future, the combination of the Australian and Queensland Governments' programs and the regional NRM bodies' water quality monitoring activities should provide good long-term trend information on water quality in the catchment and entering the Reef and the quality of water in the Reef lagoon (actions I4 and I5 of the Reef Plan).

For this annual report, the most up-to-date water quality information is used wherever possible; however, information for 2004–05 is limited because the new programs are still being expanded and implemented. Another issue is that while sampling has occurred for 2004–05 under these programs, the results will not be available until late 2005.

This report uses baseline information sourced from:

- the GBRMPA's *Great Barrier Reef Water Quality Protection Plan first annual marine monitoring program report July 2005* (available at <http://www.gbrmpa.gov.au>)
- *Ambient surface water quality in Queensland – summary report 2003–04* (published in 2005 by S. Grinter and H. Hunter of the NR&M)
- results from flood event and plume monitoring programs conducted during 2004–05 by the Australian Centre for Tropical Freshwater Research (ACTFR) in association with the Burdekin Dry Tropics Board (BDTB), the Mackay–Whitsunday NRM Board (MWNRM), the GBRMPA, the NR&M, the DPI&F and CSIRO (Land and Water).

3.1 Reef lagoon to river mouth water quality

It is estimated that runoff from the catchment carries on average 11–14 million tonnes of fine sediment, 40 000–64 000 tonnes of nitrogen and 7 000–14 000 tonnes of phosphorus annually into the Reef. Although activities such as green cane harvesting, trash blanketing and zero tillage have reduced sediment loss in specific industries, sediment and nutrients entering the Reef lagoon are estimated to be two to six times greater than average annual inputs prior to European settlement.

Much of the nitrogen (40–80 per cent) and most of the phosphorus (70–80 per cent) transported by waterways are attached to fine eroded soil particles. Loads of sediment, nitrogen and phosphorus carried by the large rivers of the dry tropics (Burdekin and Fitzroy) during floods are two to four times those carried in wet tropics rivers; however, the wet tropics rivers have higher losses on a per area basis due to their steeper topographies and higher rain-driven erosion rates.

River sampling programs in a number of catchments show that nutrient concentrations increase as river waters cross floodplains with intensification of agricultural land use. Significant increases (4–6 per cent a year) in nitrate, particulate nitrogen and phosphate concentrations were observed in the lower Tully River (wet tropics) over a ten-year period (1990–2000), which corresponded to a similar increase in fertiliser tonnage use in the catchment.¹

Available data on water quality in the Reef lagoon indicate that nutrient, suspended particulate matter and chlorophyll (a proxy for nutrient availability) concentrations in Reef waters are generally low. High concentrations of nutrients and sediments occur episodically in plumes of flooding rivers and over marine regions disturbed by tropical cyclones. Flood plumes may occur between one to several times a year on a regular basis in the wet tropics, but less frequently—every several years to several decades—in the dry tropics.

Observed changes in near shore benthic (sea floor) communities, including variations in cover, composition and relative abundance of macroalgae, encrusting algae, hard corals and soft corals, reflect increases in nutrient levels from catchment runoff closer to the coast. Differences are also observed between regions with differing levels of influence from agricultural runoff (Princess Charlotte Bay, Wet Tropics); however, the largely one-off nature of these surveys precludes determination of whether the spatial extent of terrestrial runoff influence is stable or changing.

Regional-scale chlorophyll monitoring has been carried out in coastal and Reef lagoon waters since 1992. Trends indicate an increase in average chlorophyll concentrations at the coast associated with increases in nutrient levels from catchment runoff; however, no significant net changes in chlorophyll concentration have been observed regionally.

Seagrass monitoring indicates most intertidal seagrass meadows have been relatively stable over the past decade, although meadows in the Whitsunday region are declining.

¹ Furnas, M 2003, *Catchment to Corals – Terrestrial Runoff to the Great Barrier Reef*, Australian Institute of Marine Science, Townsville, p. 188.

3.2 The catchment – a regional perspective

Rainfall heavily influences water quality. Higher sediment and nutrient loads are associated with floods. For this reason, water quality information needs to be considered in the context of rainfall and associated runoff in the relevant catchment.

This section provides an overview of surface water for three of the four aquatic ecosystem provinces in the Reef catchment for 2003–04. Data for 2004–05 are still being analysed; however, 2004–05 information from flood event monitoring in the Burdekin and Mackay–Whitsunday regions is available and included.

The Cape to the Wet Tropics

Rainfall for the 2003–04 reporting period was mostly average in the south and extremely high north of Tully, especially near Cairns and Cooktown. Runoff was below average or very low until the end of January, then close to average for the rest of the reporting period.

Overall, just under half (48 per cent) of all sites monitored were rated as ecologically healthy or slightly impacted. Forty-three per cent of sites were considered to be slightly to moderately impacted with some signs of ill health, with 10 per cent² of sites classified as moderately to heavily impacted.

The Burdekin, Mackay–Whitsunday and the Fitzroy

Rainfall for the 2003–04 reporting period was extremely low to below average for most of the province, with extremely low falls in the Shoalwater, Styx, Pioneer, Bowen and Cape Catchments and in the Burdekin Catchment near Charters Towers. Runoff was generally below average.

Most river monitoring sites had water quality that generally complied with electrical conductivity and turbidity guidelines, but usually did not comply with total phosphorus guidelines. Overall, results indicated that half of the sites were moderately to heavily impacted, with 25 per cent rated as slightly to moderately impacted with some signs of ill health, and 25 per cent considered to be ecologically healthy or slightly impacted.

During the 2004–05 wet season, a flood event monitoring program was undertaken focusing on the Burdekin River and rivers in the Mackay–Whitsunday region. This program integrated the work of organisations involved in water quality monitoring in the Burdekin and Mackay–Whitsunday regions.

Flood event sampling was undertaken in late January 2005 for suspended sediments, nutrients and pesticides in 18 rivers and streams in the Mackay–Whitsunday region as part of the Mackay–Whitsunday Integrated Monitoring Program.

Sampling was also undertaken for chlorophyll, nutrients, suspended sediments, salinity and herbicides in river plumes in the Mackay–Whitsunday region. This sampling was carried out in the Reef lagoon from off Sarina in the south to Repulse Bay in the north and out as far as the inner-shelf reefs near Lindeman, Brampton and Keswick Islands.

The interim results of the BDTB 2005 flood event monitoring program for the Burdekin catchment can be found at <http://burdekindrytropics.org.au/> and <http://www.wqonline.info/>.

² Note: Figures used in this section are rounded up and therefore do not add up to 100 per cent.

Burnett Mary

Long-term average annual rainfall varies from 640 mm to 1520 mm a year within the province. Rainfall for the 2003–04 reporting period was mostly average to below average in a few areas. Runoff was below average for most of the year.

Under the Queensland Ambient Surface Water Quality Monitoring Program, the Burnett Mary region is included in the South East Queensland analysis, and therefore water quality information relating solely to Reef catchment in the Burnett Mary province is not available. However, sites in the west of the Mary catchment are thought to have high electrical conductivity due to landscape characteristics or past land clearing activities. High nutrient concentrations at a site downstream of Gympie were likely to be the result of a major sewage plant discharge, rather than land use³. Poor nutrient ratings for six sites in the south of the Burnett catchment were possibly due to impacts from cropping, dairy or grazing in the catchment. High nutrient concentrations were recorded at around 40 per cent of the monitored sites, generally reflecting diffuse source inputs from catchment land uses.

³ Water quality in Queensland coastal catchments: condition and trend assessment. Environmental protection Agency, Brisbane

4.0 Progress towards the objectives of the Reef Plan

4.1 Focus area 1: Improving decision-making in land use planning

The aim of this focus area is to:

- make better use of existing planning mechanisms to improve land use and development control decisions, with resulting improvements in the quality of water flowing into the Reef
- make sure the best available information (economic, environmental, social, and cultural) supports these decisions.

Some good progress has been made in this area, particularly in regional natural resource management planning, coastal management planning and water quality improvement planning by local government. There has also been successful collaboration among research institutes to develop modelling tools and decision support systems; however, the coordination of planning and the implementation of on-ground actions within the Reef catchment is an ongoing challenge.

Highlights from 2004–05 include:

Accreditation of regional natural resource management plans

Action G1 promotes partnerships with regional NRM bodies to determine water quality environmental values and to develop resource condition and management action targets for a region that reflect the goal of the Reef Plan. Regional NRM plans are the tool for building these partnerships. These plans identify targets for the region's natural resource management and detail catchment-wide activities in land and water management, biodiversity and agricultural practices.

The regional NRM bodies develop the plans and associated investment strategies for implementing them and the Queensland and Australian Governments accredit the plans and strategies. During 2004–05, the regional NRM plans and investment strategies were approved for all Reef catchment regional NRM bodies, with the exception of Cape York.

Developing these plans builds a strong coordinated approach to achieving the Reef Plan's objectives and they have the potential to make a significant contribution to improved water quality.

Completion of coastal management plans in high-risk catchments

Action D1 requires the completion of regional coastal management plans for high-risk catchment areas. Regional coastal management plans describe how the coastal zone is to be managed, guide coastal zone related decision-making, and identify the coastal management districts in particular regions. They identify important coastal wetlands and riparian vegetation important to water quality that require protection and rehabilitation.

Good progress has been made in this action, with plans completed or underway for six of the 11 coastal regions. Four of these six are in Reef Plan high-risk catchment areas.

Regional coastal management plans have been completed for the Wet Tropics, Cardwell–Hinchinbrook and Curtis Coast and are under development for the Mackay–Whitsunday, Dry Tropics and Wide Bay areas. Of these, the Wet Tropics, Cardwell–Hinchinbrook, Mackay–Whitsunday and Wide Bay areas are in high-risk catchment areas.

Benchmark established for local government water quality improvement plans

Action D4 requires the promotion of water quality improvement plans to local governments and regional NRM bodies. Water quality improvement plans help local governments and regional NRM bodies to determine environmental values and water quality objectives for waters in their catchment and to develop a longer-term strategy for achieving Reef water quality targets. Once developed, water quality improvement plans will be incorporated into regional NRM plans.

The nearly completed Douglas Shire Water Quality Improvement Plan and interim water quality projects are informing water quality improvement plans elsewhere in Queensland (particularly in the Wet Tropics) and providing management practices to reduce nutrient and sediment export to the Reef lagoon. Interim water quality projects include agricultural best management practices, protection and restoration of priority riparian areas, and water quality benchmarking and monitoring.

The following water quality improvement plans are planned for 2005–06:

- Tully and Barron (Far North Queensland Natural Resource Management Board (FNQ NRM))
- Burdekin (BDTB)
- Proserpine, O’Connell, Pioneer and Plane (MWNRM)
- Burnett (Burnett Mary Regional NRM Group (BMRG)).

National Action Plan for Salinity and Water Quality State-wide Investment Program

The NR&M leads the NAP State-wide Investment Program (SIP), which is developing tools and information products to support decision-making on issues of salinity management and water quality in NAP regions. There are five key program areas: agriculture, salinity, capacity building, water quality, and social and economic. Each of these key areas are further broken down into key projects that will deliver not only information to improve land use decision-making, but also information on resource condition and trends and social and economic aspects of natural resource management. For further information, see http://www.regionalnrm.qld.gov.au/planning/state_wide/nap/nap_sip.html.

Improvements in water quality monitoring

During 2004–05, the Queensland and Australian Governments focused their water quality monitoring programs on tracking the long-term trends of water quality entering the Reef and Reef lagoon. The GBRMPA now has a \$2 million annual water quality monitoring program in place and the Queensland Government has designed the Stream and Estuary Assessment program, which is due for implementation by December 2005. Both governments are also working with the regional NRM bodies to coordinate water quality monitoring programs.

4.2 Focus area 2: Adopting sustainable production systems

The aim of this focus area is to increase the adoption of improved agricultural practices to reduce the load of pollutants from diffuse sources entering the Reef and to protect other high-value environments, including wetlands.

The 2004–05 reporting period saw industry take significant steps to develop programs to help landholders adopt sustainable production systems. These programs provide information directly to landholders and monitor the uptake of sustainable management practices.

Highlights from 2004–05 include:

Roll-out of Farm Management System programs by the Queensland Farmers' Federation

In March 2005 the Queensland Farmers' Federation (QFF) and the Queensland Government signed a memorandum of understanding to progress the development and delivery of the QFF's Farm Management Systems (FMS) concept.

The FMS concept is a voluntary, property and business level management process producers use to identify and manage risks, particularly environmental risk, that may occur as a result of their farming operation. The aim is to achieve continuous improvement by implementing recommended management practices and reviewing progress made against targets.

QFF member organisations are developing FMS in their individual industries using the FMS framework. Industry's development and implementation of FMS is considered an important voluntary mechanism for achieving profitable and sustainable intensive rural industries and healthy and productive landscapes.

For further information visit <http://www.dpi.qld.gov.au/businessservices/17313.html> or the QFF web site www.qff.org.au.

Development of the industry program AgForward

AgForce is an industry organisation which represents Queensland's broadacre industries of cattle, grain and sheep and wool. The Queensland Government and AgForce initiated the AgForward program during 2004–05. This program will run over the next four years to help landholders improve their land management practices.

Phase one of AgForward will be a series of foundation workshops throughout Queensland which will analyse the 'big picture', including future markets and their expectations. The workshops will discuss property planning and linkages to other training programs for various industries and provide an overview of the regional planning processes.

Phase two of AgForward will deliver tools and information to landholders at a scale that is usable and effective. There will be a strong initial focus on the development of comprehensive property plans, which are useful in the ongoing management of properties.

Fertcare

Fertcare is a national training, quality assurance and certification program that focuses on managing food safety and environmental risks associated with fertiliser use. Everybody who is associated with fertiliser decisions or use can benefit from undertaking an appropriate level of Fertcare training:

- Level A focuses on best practice handling, transport, storage and spreading of fertilisers for those involved in the logistics side of the industry.
- Level B provides basic knowledge of nutrient issues relating to environment and food safety and caters for people involved in fertiliser sales.

- Level C is designed for crop and pasture nutrition advisers who provide detailed plant nutrition advice based on soil and plant testing.

During 2004–05 a trial of Level C was undertaken for nutrition advisers working in the Great Barrier Reef catchment. The Level C course provides a detailed and complex knowledge of environmental issues, product stewardship and food safety issues. It also assesses the competency of the adviser in providing nutrient recommendations.

The Fertcare initiative also includes the AccuSpread testing program to ensure fertiliser spreading machines apply nutrients in an even and efficient way.

Progress in Agricultural State-level Investment Projects

There are 18 Agricultural State-level Investment Projects (AgSIP) funded to help primary producers and regional NRM bodies improve the uptake of sustainable practices. The 18 AgSIP projects, funded until 2007, come under four themes:

- grazing lands management: developing best practice grazing management guidelines with stakeholders and supporting landholders in the transition to more sustainable grazing practice
- industry natural resource management: developing industries' (horticulture, cotton, grain and cane) capacity to engage with and be involved in the regional natural resource management process
- landscape management: developing innovative ways to support communities in monitoring and actioning natural resource management issues
- coordination and process support: economic, biophysical and social work to develop new decision support tools and processes.

Particular highlights from 2004–05 are:

- the development and delivery of grazing lands management education packages in the Burdekin, Fitzroy and Burnett Mary catchments
- the development of the Integrated Area Wide Management process to empower industry sectors to actively monitor and address off-site movement of potential pollutants.

Pilot extension service delivery program in high priority Great Barrier Reef catchment

In 2004–05, a pilot comprehensive extension service delivery program was implemented in high priority Great Barrier Reef catchment. The DPI&F, in partnership with the FNQ NRM Ltd and the BDTB, led the trial.

4.3 Focus areas 3 and 4: Rehabilitating, conserving and managing wetland and riparian areas

These focus areas target actions that help improve the capacity of wetland and riparian areas to filter pollutants from the water entering the Reef.

Highlights from 2004–05 include:

The Queensland Wetlands Programme

The Australian and Queensland Governments jointly contribute to the Queensland Wetlands Programme, which is an important driver for success in this focus area.

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The program comprises two sub-components:

- the Great Barrier Reef (GBR) Coastal Wetlands Protection Programme (Coastal Wetlands Programme)
- the NHT Wetlands Programme.

In 2004–05, funding was provided for:

- the development of a wetland prioritisation decision support system
- a pilot program for on-ground delivery of wetlands conservation
- wetland acquisitions
- mapping and classifying Queensland's wetlands and providing a wetland inventory database
- the preparation of wetland management profiles
- education materials and exhibit
- the Understanding Queensland Wetlands: An Information Review and Gap Analysis project.

During 2004–05 the Coastal Cooperative Research Centre, was funded under the GBR component of the programme to investigate the adoption of programs and incentives relevant to wetland conservation with a particular focus on the Reef catchment. The final report for the project found 'there is no universally applicable programme for increasing sustainable land management practices and conservation of wetlands on private land. However, programmes that take an integrated approach by incorporating education and extension, financial incentives and legislation, seem to have greater success in gaining participation and meeting environmental outcomes'.

Further information on the Queensland Wetlands Programme can be obtained from <http://www.deh.gov.au/coasts/pollution/qldwetlands/gbrwetlands.html>.

Funding for a pilot program for on-ground delivery of wetlands conservation

In 2004–05, Conservation Volunteers Australia was contracted to lead a consortium in implementing the \$2 million pilot program for on-ground delivery of wetlands conservation. This pilot program will use a number of mechanisms, such as voluntary conservation agreements and incentive packages, to identify and protect significant wetlands. The program will involve partnerships between government, community and individual landowners.

Increase in land placed under conservation agreements

The Queensland Government, through its EPA, is supporting landholders to place land under conservation agreements, as part of the Community Nature Conservation Program (CNC). Since October 2003, an additional 32 nature refuges have been formalised in the Reef catchment, protecting 123 144 hectares of land, and bringing the total area of protected land in the Reef catchment to 178 615 hectares.

The Queensland Trust for Nature has been established and is now investigating buying land with important wetland value. The Australian Government, through the DEH, has provided funds to employ a philanthropic officer for 12 months who will seek philanthropic contributions to the Trust.

5.0 Investment

The Reef Plan is not a traditional government funding program. It relies on the alignment of a range of government strategies and activities, as well as self-management and voluntary partnerships between a wide range of implementers. Because of this, it is difficult to determine the total investment in the Reef Plan, as existing programs, such as the NAP, the NHT, and other state and local government programs, provide the core funding for Reef Plan actions.

Major spending initiatives during 2004–05 are reported under four areas:

- water quality monitoring
- focus area 1: Improving decision-making in land use planning
- focus area 2: Adopting sustainable production systems
- focus areas 3 and 4: Rehabilitating, conserving and managing wetland and riparian areas.

Water quality monitoring

In 2004–05 the Queensland Government invested \$5 million from the Smart State Building Fund in the implementation of the state's Stream and Estuary Assessment program. The funds provide a state-wide investment of \$5 million for water quality monitoring and infrastructure. An annual operating budget of \$1.2 million for three years will also be provided (Reef Plan Action I5).

In 2004–05 the GBRMPA developed and implemented an integrated marine monitoring program. The program allocates \$2 million in its first year to benchmarking the main environmental and ecosystem variables and establishing the monitoring program to measure changing trends in the water quality and ecosystem health of the Reef. This includes monitoring any changes in the social and economic values of industries in the Reef (Reef Plan Action I4).

The Integrated Water Quality Monitoring Program received \$390 000 from the NHT. This program will aid Reef regional NRM bodies to manage water quality and meet obligations under the Reef Plan by improving the coordination of the many activities and projects currently in place to monitor, assess and report water quality. Further information can be found under action I6 in Annex 1.

The Catchment to Reef program receives approximately \$1.2 million a year to develop new protocols and tools to identify, monitor and mitigate water quality problems and to assess the health of aquatic ecosystems in the Wet Tropics and Great Barrier Reef World Heritage Areas. This program is due to finish in 2006 (Reef Plan Action I7).

The NAP Water Quality Work Plan received a total of \$2 043 035 to develop tools and products for regional NRM bodies to measure and monitor water quality.

Focus area 1: Improving decision-making in land use planning

In 2004–05, regional NRM bodies in the Reef catchment received over \$2 million from the NHT to participate in the Coastal Catchments Initiative (CCI). The CCI implements the Reef Plan through:

- the development of water quality improvement plans in high-risk catchments (Reef Plan action D4)
- the sharing of experiences between catchments where those plans are being developed (Reef Plan action F8)

- the implementation, monitoring and review of their effectiveness and integration in relevant planning processes (Reef Plan action I8).

An investment of \$1.3 million was made through the NAP SIP Salinity Activity lead by the NR&M. This investment supported the development of tools and information products to support decision-making on issues of salinity management in the NAP regions.

Focus area 2: Adoption of sustainable production systems

The AgSIP program has received \$7.8 million to deliver capacity building outcomes to primary producers and regional NRM bodies to improve the uptake of sustainable practices.

The Capacity Building SIP (CB SIP) now comprises seven separate projects funded under the NAP and the NHT programs, which total \$3.64 million. As a suite, these projects aim to strengthen the human, social and institutional capacities necessary to implement activities that help achieve natural resource management targets, as defined in regional NRM plans.

The NAP Social and Economic SIP led by the NR&M consists of a suite of five social and economic projects with a total investment of \$4.5 million. These projects will contribute to the Reef Plan by demonstrating the use of market-based mechanisms to change land use practice and will improve land use decision-making through increased understanding of social and economic consideration in natural resource management.

The State Government has provided AgForce with \$8 million to deliver the AgForward program to help landholders improve their land management practices. AgForward is funded from the State Government's \$150 million financial assistance package established to help landholders move forward with new vegetation management laws.

NHT funding of \$1.3 million supported a pilot comprehensive extension service delivery program in high priority Great Barrier Reef catchment led by the DPI&F in partnership with FNQ NRM Ltd and the BDTB.

There are a number of industry packages funded by government and industry that target the uptake of best management practices in the Reef catchment. These include \$800 000 to the sugar industry through its Change Management Program linked to the Rural Water Use Efficiency Initiative (RWUEI II), which aims to improve sugarcane farm sustainability and productivity through increased levels of farm management. The RWUEI II is a larger program of around \$7.5 million across Queensland which focuses on the industries of cane, cotton, dairy, and fruit and vegetables. There were also significant funds provided through programs such as the DAFF's Pathways to Industry Environmental Management Systems and associated programs, such as the development of FMS and the roll-out of the Combining Profitability and Sustainability in Sugar (COMPASS) program.

The investments made by agricultural industry organisations are outlined in their public report on progress towards supporting improved water quality management practices in rural industries (see Attachment 2).

The six NRM regions in the Reef catchment have received funding to improve land use activities through the National Landcare Program. All regions were funded between \$238 000 (Cape York) and \$360 000 (the Wet Tropics NRM region) for a range of natural resource management activities. Projects range from improved information management and capacity building through to practical demonstration of equipment in the paddock.

A number of interim funding agreements were approved in the Reef catchment regions in 2004–05. Significant projects include funding of \$250 000 to the Fitzroy Basin Association (FBA) for implementing the Central Queensland Sustainability Strategy 2, including the uptake of farm planning and best management practices through its Neighbourhood Catchments program, and \$758 500 in the Mackay–Whitsunday region for its cross-regional program on the implementation of sustainable agricultural systems and a further \$210 000 for its Reef Coastal Freshwater Fish Habitat Strategy. Cape York received over \$1 million for property planning and the delivery of weed and feral pest control programs. The Burnett Mary region received \$270 000 for the integrated management of terrestrial and aquatic weeds of national, state and regional significance. The Burdekin Dry Tropics received the combined total of approximately \$150 000 for the development of property level rangelands grazing targets and the protection and restoration of wetlands in the catchment.

Focus areas 3 and 4: Rehabilitating, conserving and managing wetland and riparian areas

In 2004–05, the Australian Government invested over \$3 million, with matching in-kind support from the Queensland Government, in the protection and improvement of wetlands in Queensland, including the Great Barrier Reef catchment, through the Queensland Wetlands Program.

Annexes

Annex 1 – Report against strategies

Annex 2 – A report on agricultural industry initiatives

Annex 1 – Report against strategies

Strategy A: Self-management approaches

<p>A1. Promote existing and develop new guidelines and templates for preparing property resource management plans that will assist in:</p> <ul style="list-style-type: none"> identifying issues relating to Reef water quality implementing management strategies and actions to conserve and rehabilitate areas such as riparian zones and wetlands. 	<p>NR&M, peak industry bodies, DPI&F, EPA</p>	<p>Finalisation of property resource management planning guidelines for leasehold land December 2003</p> <p>Report on progress of other guidelines completed by 1 July 2005</p>
<p>A2. Develop guidelines and templates to assist government agencies and landholders to establish and enter statutory covenants and agreements for nature conservation, natural resource management and other matters.</p>	<p>NR&M, EPA, peak industry bodies, DPI&F</p>	<p>Completed 1 January 2005</p>
<p>A3. Support industry-led development of best management practice for land, natural resources and chemical use practices for the sugar, fruit and vegetable, broadacre cropping, dairy and grazing industries in high-risk Reef catchment. In the short term this will involve:</p> <ul style="list-style-type: none"> continued roll-out of COMPASS program support for further development of best management practice programs for broadacre cropping continued support for implementing environmental management systems in agriculture. 	<p>Peak industry bodies, DPI&F, NR&M, EPA, DAFF, DEH, BSES</p>	<p>Review of uptake of best management practices 1 July 2005</p>
<p>A4. Promote adoption of sustainable land management and best management practices in high-risk Reef catchment through programs such as:</p> <ul style="list-style-type: none"> best management practice property resource management planning environmental management systems in agriculture. 	<p>Peak industry bodies, DPI&F, NR&M, NRM bodies, landholders, EPA, GBRMPA</p>	<p>Success in high-risk catchments reviewed 1 July 2005 and 1 July 2010</p>

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A5. Facilitate industry-supported quality assurance schemes for AgVet chemicals that promote risk reduction processes for off-farm movement of pesticides/chemicals. Expand involvement with community groups looking to find local solutions through projects such as Managing Agricultural Chemicals in Communities (MAGIC) .	DPI&F , peak industry bodies, regional NRM bodies	Report on program achievements 1 July 2005
A6. Develop management strategies and actions on relevant public lands to conserve, rehabilitate and protect areas such as riparian zones and wetlands.	Defence, DEH, NR&M, EPA, WTMA, local governments	Success in high-risk catchments reviewed 1 July 2005

Overall progress and key strategic issues

This is a key strategy in realising the Reef Plan's goal and objectives. It focuses on actions that collaboratively develop and support agricultural industries and regional NRM bodies to improve land management. The strategy is underpinned by the philosophy that governments should be outcomes-focused and support flexible approaches, recognising that this is more likely to assist with the continuing adoption and long-term retention of sustainable land management practices.

Key achievements for the 2004–05 reporting year include:

- continued development and implementation of the FMS framework by the QFF and its member organisations. This program provides mechanisms to improve land use decision-making at the farm scale for the intensive agricultural industry sector
- launch of the AgForward program, which aims to promote and support good land management practices within the grain and grazing industries
- completion of regional NRM plans and regional investment strategies for all Reef catchments, with the exception of Cape York, which include programs to help landholders implement best management practices on their land
- the Australian and Queensland Governments' continued support for the above programs through the delivery of funds, research, information and the development of guidelines and templates.

While the above examples demonstrate there has been good progress made towards building a solid foundation for this strategy, further work is required to establish a coordinated monitoring program to better report and measure the uptake of self-management approaches.

Eight milestones are noted for this strategy in the Reef Plan. Seven of these milestones were due on or before 1 July 2005 and only one milestone is due by 1 July 2010. The majority of the milestones due on or before 1 July 2005 have been met and links to final reports, relevant guidelines, templates and project information can be found in the summaries below.

Actions that have not met the full intention of the articulated milestones are A3, A4 and A5. It is important to note there is a significant amount of work that is contributing to these actions and the delay is due to the current ability to effectively monitor the uptake of the various best management practice and other related programs. Further, while a milestone may indicate that an action is complete, there is usually further work that is ongoing after this date. For example, guidelines and templates are completed for action A2; however, these will be further reviewed, modified and adapted as required. In light of this, work that occurred during the 2004–05 reporting period that is in addition to what the milestone states is also reported in the following summaries.

A1 Promote existing and develop new Property Resource Management Guidelines

Related actions: B5

A draft property resource management planning manual and proforma have been completed to support regional implementation of property resource management planning and the statewide guidelines. The manual and proforma were provided to regional NRM bodies and industry for comment and use in March 2005. Finalisation of these documents is ongoing.

In addition, land and water management plan guidelines were released during this year. The land and water management plan guidelines are designed to help landholders develop plans to improve water efficiency, to manage natural resource issues, to plan and review an irrigation enterprise, and to identify hazards and risks associated with irrigation practices. Specific guidelines were released for the State and Fitzroy Basin in May 2005, and guidelines for Burnett–Mary Basin will be issued in June 2005. A draft version of the guidelines for the Burdekin Basin has also been prepared.

The FBA has also invested in a process to deliver a common and agreed framework for property management plans with industry, government and other regional bodies. The FBA is in the process of developing education and awareness packages for the delivery of property management plans.

A2 Develop guidelines and templates for statutory covenants and nature conservation agreements

Related actions: B5, C6

The Queensland Government has developed guidelines and templates to assist government agencies and landholders establish and enter into statutory covenant (NR&M) and conservation agreements (EPA).

Statutory covenants guidelines have been prepared to support nature conservation agreements. These guidelines are now available for use in Queensland and can be accessed at http://www.nrm.qld.gov.au/land/management/statutory_covenants.html. Information on conservation agreements and nature refuges can be found at http://www.epa.qld.gov.au/nature_conservation/nature_refuges/.

An example of the application of statutory covenants is the protection of non-remnant vegetation through the Vegetation Incentive Program (VIP), which uses the covenant as a mechanism to implement a management plan over the areas protected. This program will disperse \$12 million of incentives to landholders across the state as part of Queensland's \$150 million financial assistance package for landholders affected by recent amendments to vegetation management laws.

The EPA is implementing the CNC in high priority Reef catchments. The program promotes and assists landholders to enter into and manage voluntary conservation agreements. The standard conservation agreement template has been completed and communication and information materials have been published. Further information on the EPA's CNC can be found at http://www.epa.qld.gov.au/nature_conservation/community_role/landholders/community_nature_conservation/.

A3 Support industry-led development of best management practices

Related actions: A3, A4, C5, I9

Government, industry and regional NRM bodies have identified this action as being of significant importance to meeting the goal and objectives of the Reef Plan. All parties have a strong commitment to work together to identify opportunities for supporting industry-led approaches.

The work by rural industries in the area of best practice programs—the QFF and member organisations with their FMS work and AgForce with the AgForward program—is captured through *A report on agricultural industry initiatives seeking to improve natural resource management and minimise environmental impacts in the Great Barrier Reef catchments* in Annex 2. This report was prepared to satisfy Reef Plan reporting requirements for action I9; however, the report is also relevant to this action, A3. Information outlined in the report includes a summary on a commodity-by-commodity basis for the cotton, dairy, horticulture, grains, grazing and sugar industries with a focus on the key initiatives of each of the industries and future directions. In the coming years government and industry will be looking into establishing a comprehensive monitoring and evaluation program for measuring the uptake of best management practice.

The Australian Government has provided significant funds to support the development and implementation of the Fertcare program. Fertcare aims to train and accredit all eligible people in the fertiliser industry in order to ensure best practice supply, advice and use. During the year, a trial of Level C was undertaken for nutrition advisers working in the Great Barrier Reef catchment.

Reef regional NRM bodies also have programs in place that support this action. The following are some examples:

- The FBA has trials in progress to improve water use efficiency in the Dawson Valley Irrigation Area and landholders adopting improved practices through neighborhood catchment action plans in conjunction with sub-regional groups. The aim is to coordinate workshops to produce 15 neighborhood action plans for adoption of improved practices across 8 per cent of the region.

- The BMRG has supported the adoption of sustainable land management and property management planning in both the Sustainable Use and Biodiversity Conservation Action programs. Best management practice is a focus of the Grazing Land Management and Farming Management Systems programs with both planned to be used to promote best management practice. The BMRG is also targeting priority cultivated landscapes and critical components of farming systems specifically for Reef Plan outcomes by 2005 and supports development and implementation of whole-of-property plans for land managers in identified areas to be followed by an incremental roll-out across the region from 2006 to achieve more than 59 per cent by 2011.
- The BDTB's Soils, Land and Agriculture package will deliver program investments at both property and landscape scales, including land and soil health assessments, benchmarking and monitoring, and implementing property planning and sustainable land practices.
- The FNQ NRM Ltd's Productive and Sustainable Use Package is designed to assist the region's agricultural sectors achieve sustainability through the implementation of best management practices. One of these projects is the sustainable farming and grazing systems for the Wet Tropics, which uses participatory action learning methods to involve industry in the delivery of systems that are economically and environmentally sustainable and which address issues of sediment, nutrients and chemicals.
- Under the Cape York Peninsula draft RIS the Applied Resource Management Program recognises the Reef Plan as one of the drivers for investment in natural resource management within the region. Some of the key elements of this program to support the Reef objectives are property planning for pilot properties to achieve biodiversity conservation while improving productive capacity of pastoral properties.

Other key initiatives and activities that aim to support industry and regional NRM bodies in the development and implementation of best management practices on the ground include:

Sustainable Coastal Agricultural Systems

Sustainable Coastal Agricultural Systems (SCAS) is a cross-regional NHT Stage 2 (NHT2) funded project which aims to analyse natural resource management implementation frameworks, improve efficiency of on-ground implementation, and establish a communication process between regional NRM bodies to increase the sharing of learning and the speed of implementation. Participants in the project include MWNRM (lead), FNQ NRM Ltd, the BDTB, the FBA, the BMRG, the QFF, AgForce and the DPI&F.

Solid progress was made during 2004–05, including achievement of the following milestones:

- collaborative design of relevant on-ground activities to support natural resource management implementation processes
- finalisation of agreements and contracts for deployment of SCAS resources (a total of six-and-a-half full-time equivalent positions to be involved in cane, grazing, horticulture, and farm forestry industries)
- initial development of a communication network for sharing of information about implementation process and overall experiences in trying to attain Reef targets.

AgSIP program

The DPI&F leads this program, within which are a number of projects that directly support the development of best management practice, including for example:

- integrated area-wide management projects in intensive irrigation (AG01, AG12)
- grazing best practice for the Burdekin (AG02) and Fitzroy (AG04)
- benchmarking nutrient and sediment in new cane and horticultural systems (AG05)
- monitoring (AG09) and modelling (AG10) support for the Grazing Lands Management Education Package
- capacity building and natural resource management support for the cotton (AG15), horticulture (AG16) and cane (AG17) industries.

More information is available from

http://www.regionalnrm.qld.gov.au/planning/state_wide/nap/ag.html.

The state's sugar package

Following the release of the Sugar Industry Amendment Bill 2004 relating to major reforms for Queensland's sugar industry, the state's sugar package was made available. The sugar package has three focus areas:

- Sugar Industry Change Management Program (\$13 million).
- Sugar Industry Innovation Fund (\$10 million)
- Farm Consolidation Loan Scheme (\$10 million).

Implementation of the package relies on partnerships between the DPI&F, industry, the Queensland Department of State Development Trade and Innovation (DSDTI), and Bureau of Sugar Experiment Stations Ltd.

Under the Change Management Program, the Reef Plan objectives will be delivered on through a range of programs and activities:

- The DPI&F contribution to the Sugar Industry Change Management Program is **FutureCane**, which was designed to promote a sustainable and competitive cane growing sector. As part of FutureCane, officers work with cane farmers to improve adoption of sustainable sugarcane farming systems practices, including the use of suitable rotation crops to ensure the long-term viability of the industry and to minimise adverse impacts on the environment. FutureCane is delivered in three main areas in the Reef catchment: Far North Queensland (including the Herbert), the Burdekin and central Queensland.
- The EPA will provide a range of services that will include building on the Code of Practice for Sustainable Sugar Production (Sugar CoP) under the *Environmental Protection Act 1994* (Qld), the development of sustainable property management plans, the Sustainable Sugar Catchment Projects/Partnerships that focus primarily on the protection and rehabilitation of high conservation value areas (such as coastal management plans, vegetation plans, Reef protection plans and Shire planning documents), and the Change Management Indicator Identification reporting that will focus on profitability, key practices and eco-efficiency of sugar industry processes (on-farm, harvesting, transport and mills), and industry and stakeholder culture and values. This information will then be used for the training needs of the regional sugar industry.

- The NR&M will engage in water use efficiency through the industry's COMPASS program. Building on the successful RWUEI II, Bureau of Sugar Experiment Stations Ltd will be engaged to drive the implementation of water use efficiency initiatives consistent with COMPASS and sustainable production benefits, such as high density planting. The NR&M will also work closely with the EPA, the DPI&F and the DSDTI through the sugar resource officers to deliver integrated natural resource management outcomes on-farm.

More information is available from <http://www.dpi.qld.gov.au/sugar/15157.html>.

Sustainable Farming Systems project

This project is funded by the Grains Research and Development Corporation and brings together major stakeholders in central Queensland with an interest in sustainable and profitable dryland grain farming systems. The project targets the problems of declining soil fertility and soil erosion. Participatory learning approaches are used, with farmer groups, agribusiness and scientists working together to develop and integrate best technology into useful farming systems. These improved farming systems are being developed with growers on-farm, across central Queensland.

The DPI&F leads a multidisciplinary project team involving agronomists, economists and water use specialists from its own department, the NR&M, CSIRO and Central Queensland University. Spackman Mackay Consulting (agricultural consultants) are also involved. The project is established and six farmer groups are participating. These groups are involved in numerous development sites widely distributed across central Queensland, and provide input into relevant farming solutions for most districts.

Improved practices are sought for crop and for grain/cattle production, with integration of best technology and best management practices into farming systems. Particular technologies that have been integrated into farming systems include controlled traffic farming, minimum or zero tillage, opportunity cropping, better water management, nitrogen management, legumes and integrated weed management.

More information is available from <http://www.dpi.qld.gov.au/cropresearch/13282.html>.

Other activities

The DPI&F is currently undertaking a review of the available data sources and data gaps relating to measuring the uptake of sustainable practices.

Preliminary findings indicate the current data available on best management practice uptake are not of sufficient quality and quantity to provide a clear picture at the catchment scale as required for Reef Plan purposes. Datasets have been collected for reasons other than the Reef Plan and as such do not align well with Reef Plan monitoring and reporting requirements. The report considers a number of options to fill the gaps in knowledge using a coordinated approach involving government, industry and regional NRM bodies.

A4 Promote the adoption of sustainable land and best management practice

Related actions: A3, A1, C1, C4

Action A4 is closely related to A3 and therefore once a monitoring program is developed and implemented to assess the uptake of best management practices there may be a capacity to assess the success of these programs in high-risk catchments. Please refer to activities reported under A3 for the progress against this action.

A5 Facilitate industry-supported quality assurance schemes for AgVet chemicals

The **Managing Agricultural Chemicals in Communities (MAGIC)** project was completed in 2003–04. A report on program achievements is available from the DPI&F central region. Limited work is still continuing, including regular consultation with local governments and banana growers regarding appropriate chemical use, alternative registered chemicals and assistance with obtaining off-label permits.

A highlight for 2004–05 was determining the best chemical to use to control Hymenachne in waterways in the Cardwell Shire. This determination was undertaken in conjunction with the DPI&F Fisheries Service because there was potential for impact on native fish populations and downstream barramundi farms. The result was the issue of an off-label permit for the use of Verdict 520 Herbicide, which was the safest option.

The DPI&F is also in the process of completing a desktop review drawing on previous work. Detailed web-based information on the responsible use of AgVet chemicals has been upgraded on www.dpi.qld.gov.au.

Other significant work includes:

- ongoing Endosulphin monitoring
- three annual updates of *Infopest*, a CD that contains all the label information and material safety datasheets in an easily searchable format, designed to encourage responsible chemical use
- monitoring of chemical use in Queensland by the Chemical Residue Laboratory. Results of random surveys of a variety of Queensland produce have shown that more than 99 per cent of produce tested does not have residues of chemicals or contaminants above the legal level (Maximum Residue Limit). Testing for the pesticide Endosulphan (often used on cotton crops) indicates that despite significant use of Endosulphan by cotton growers and small crop farmers last summer (2004–05), no residues of the chemical were detected in samples taken from cattle known or suspected to have grazed pastures adjacent to treated crops.

The DPI&F Biosecurity Business Group works closely with the Australian Pesticide and Veterinary Management Authority (APVMA) and provides input to new registration applications and minor use applications (refer to action F5 for related activities).

The BMRG has committed to extend AGSIP05 in the region, which is benchmarking pesticides and nutrients in horticulture and new sugarcane farming systems. In addition, the BMRG aims to reduce the exports of nutrients, sediment and agrochemicals in runoff through devolved grants to minimise environmental impacts through techniques such as bioremediation, water recycling and reuse, and biological effluent treatment.

A6 Develop management strategies and actions on relevant public lands to conserve, rehabilitate and protect areas such as riparian zones and wetlands.

A comprehensive review of the success of management strategies and actions of relevant public lands has not been completed; however, the Australian and Queensland Governments have implemented the following strategies and actions over the past year:

- The NR&M has been developing and implementing reserve management plan guidelines and regional guidelines for fire management and pest management on state and other lands. These guidelines are available at www.nrm.qld.gov.au/land/state/pdf/land_land_planning_kit.pdf.
 - A large number of unallocated state lands containing wetlands or other priority values for protecting the Reef have been identified. Action is currently underway to prioritise these areas. Action has commenced to secure the highest priority aggregation of unallocated state lands in Northern Region in protected area tenure. Action plans for Queensland Parks and Wildlife Service (QPWS) estates, which contribute to healthy landscape condition of protected areas and state forests, have been developed and implemented.
 - The Australian Government Department of Defence has environmental management strategies and plans in place for most Commonwealth Defence lands.
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Strategy B: Education and extension

<p>B1. In collaboration with regional NRM bodies and peak agricultural industry bodies, develop and implement education and extension programs and undertake the trialing of practices to increase the voluntary uptake by producers of sustainable agricultural practices, tailored to particular land uses, locations and pollutants. These programs will:</p> <ul style="list-style-type: none"> • aim to use local knowledge and insights • recognise the drivers for voluntary uptake (for example, practices need to be profitable, compatible with existing practices, easily observed and understood, and tried and tested) • build on and enhance progress by industry bodies, such as that of the Cotton BMP program • focus extension services on high-risk Reef catchments and on changing those practices that can have detrimental impacts on water quality. In the short term this will include implementing a pilot comprehensive extension service delivery program in high-priority Reef catchments • increase landholder awareness of the value of wetlands and riparian habitat in maintaining water quality and the threats to these wetlands • target, as a priority, sediment, nutrient and chemical contributions from cattle grazing and cropping activities in priority catchments • seek measurable increases in uptake of sustainable land management and best management practices. 	<p>DPI&F, NR&M, EPA, DAFF, DEH, peak industry bodies, regional NRM bodies, landholders, research bodies, Indigenous bodies</p>	<p>Completed 1 July 2005</p> <p>Trial programs in place by 1 July 2004</p>
<p>B2. Improve the integration and coordination of research information systems and relevant extension services to support regional natural resource management, catchment and property resource management planning in the Reef catchment.</p>	<p>JSC, NR&M, DPI&F, EPA, DAFF/DEH, peak industry bodies, conservation groups, research bodies, regional NRM bodies, Indigenous groups</p>	<p>Report on improvements 1 July 2005</p>

B3. Facilitate exchange of information between Indigenous groups, government agencies, industry and landholders on natural resource management approaches with positive Reef water quality outcomes.	EPA, GBRMPA, DAFF, DEH, Indigenous groups, DPI&F, NR&M, regional NRM bodies, research bodies	Report on progress by 1 July 2005
B4. Develop and implement a community awareness raising campaign, such as the Healthy Waterways model, to achieve wide recognition and acceptance of the importance of Reef water quality and the need to protect and rehabilitate wetlands and riparian habitats within the Reef catchment.	EPA , NR&M, regional NRM bodies, research bodies, peak industry bodies	Completed 1 July 2005
B5. Promote the benefits of management plans, conservation agreements and covenants for the protection of riparian areas and wetlands and management of vegetation cover over the land to landholders.	NR&M , DPI&F, EPA, peak industry bodies, DAFF, DEH, regional NRM bodies, research bodies, local government	Success in high-risk catchments reviewed 1 July 2005 Success in high-risk catchments reviewed 1 July 2010

Overall progress and key strategic issues:

This strategy focuses on coordinating government, non-government and community education and extension services within the Reef catchment to:

1. provide information and technical support to landholders to accelerate the adoption of best management practices aimed at improving the quality of water flowing to the Reef
2. raise community awareness of the importance of Reef water quality and the need to protect and rehabilitate wetlands and riparian habitats within the Reef catchment.

Education and extension services form critical components of the regional NRM plans and regional investment strategies for the Reef catchment and key industry programs such as FMS and AgForward. Continued support for these extension services and programs is occurring through the SIPs and various other government initiatives. Further information about specific programs and projects can be found in the action summaries that follow.

During 2004–05 work continued on developing and progressing key community awareness raising programs, such as:

- Townsville and Thuringowa Councils' 'Creek to Coral'
- Central Queensland Healthy Waterways Program
- Mackay Whitsunday Healthy Waterways Program.

Many of the regional NRM plans and investment strategies also include community awareness raising programs.

While significant progress has been made towards this strategy, the key challenges for the future will be to better coordinate extension and education programs to minimise duplication, and to continue to raise community awareness of the issues being targeted through the Reef Plan.

Seven milestones are noted in the Reef Plan under this strategy. Six of these are due on or before 1 July 2005. The following section outlines the progress that has occurred against each of these actions during 2004–05. While the milestones for actions B1 and B4 suggest the actions should be completed by 1 July 2005 it is worth noting that these actions will have activities that are ongoing and will continue to be reported on after this date. With regards to B5 a substantial amount of work has occurred towards the promotion of management plans and conservation agreements; however, the ability to measure the success of the promotional activities requires more work.

B1 Implement education and extension programs to increase voluntary uptake of sustainable practices

Related actions: A1, 2, 3, 4, 5

The following list of activities shows the amount of work that is currently contributing to this action. The challenge will be to continue to develop, implement and refine the current education and extension packages and to limit the amount of duplication between programs.

Key activities include:

- delivery of the Cotton BMP program, and the Dairying Better n Better Program, and development of the cane and fruit and the vegetable industry FMS programs by their respective industry organisations
- delivery of the RWUEI II by the NR&M in partnership with industry organisations, Canegrowers, Cotton Australia, Growcom, the Queensland Dairy Organisation
- implementation of a pilot comprehensive extension service delivery program in high priority Reef catchments. The DPI&F leads this project. Project officers were appointed during the 2004–05 reporting period and engagement with regional NRM bodies and industry representatives is continuing
- customisation of the Grazing Land Management Program by the DPI&F and regional NRM bodies to assist in reducing sedimentation. This project will include follow-up extension and evaluation of impacts through case studies with a focus on priority Reef catchments
- delivery of education and extension packages across all programs in FBA's regional investment strategy. Examples of the targets set under these packages include:
 - Property management plans and neighbourhood catchment action plans: 15 training workshops for property management plans and adoption of improved practices by 200 landholders in priority neighbourhood catchments

- salinity: education and awareness packages developed for best practice guidelines and workshops, extension and incentives for landholders for remediation of 50 hectares and protection of 1500 hectares, and work undertaken as part of priority neighbourhood catchment action planning and implementation
- biodiversity: an education package to promote protection and enhancement of high-value biodiversity assets. The package is to include biodiversity assets of neighbourhood catchments, monitoring design and a series of fact sheets for FBA and network staff
- continued implementation of extension trails under the BMRG priority action plans. Several trials have been implemented across the region and are being communicated across the region and to the wider community. As more pilots come online under the regional investment strategy these will be communicated through a number of different media, including (but not limited to), the BMRG web site www.burnettmarynrm.org.au and newsletter *NRM Watch*, television, radio, and industry and NRM journals and magazines in the print media.

B2 Integrate research and extension services to support regional NRM planning

Ongoing support for regional NRM bodies is being delivered by the Australian and Queensland Governments through the Joint Steering Committee, the State Co-ordination Group, regional coordination groups, the Regional NRM Taskforce, state-wide activities (for example, SIP) and through the GBRMPA's advisory committees.

The NR&M is developing through the NAP SIP IM01 project Regional Information Services Framework a web mapping and information services portal. This enables regional NRM bodies to view, use and download government-owned spatial data over the Internet. The NAP Salinity SIP Projects on Landscape Attributes (Sa03) and Information Management (Sa05) are also contributing information products through the Regional Information Services Framework portal to improve decision-making. The portal is complete and delivering data and information to NAP regional bodies. Capacity building is continuing.

The NAP SIP SE02 project Coordination of Social and Economic Information for the Development of a Queensland Regional Information Service (QRIS) has developed a system to integrate and deliver social and economic information from a wide range of sources, accessed through a common web browser. The QRIS information service is operational to regional bodies and provides current details of social and economic data for each region.

B3 Facilitate information exchange between Indigenous groups, government agencies, industry and landholders on natural resource management approaches with positive water quality outcomes

Related actions: G2

Two facilitators have been engaged to ensure Indigenous communities are involved in the development and implementation of actions/activities under the Reef Water Quality Protection Plan, the Great Barrier Reef Wetlands Programme and water quality management action targets identified in regional NRM plans. These facilitators will be hosted by FNQ NRM Ltd and the FBA, but will also support the MWNRM, BDTB and BMRG.

The facilitators will:

- provide support to traditional owners and Indigenous communities to access and participate in water quality initiatives, policies and programs
- facilitate the participation of traditional owners and Indigenous communities in the implementation of water quality projects funded through regional investment strategies where appropriate
- support regional monitoring partnerships between community networks and other stakeholders in freshwater, estuarine and marine systems
- work collaboratively with other NRM stakeholders, including regional NRM bodies and state agencies, to support traditional owners and Indigenous communities' participation in water quality issues.

Refer to action G2 for other activities related to this action.

B4 Implement a community awareness raising campaign to achieve wide recognition and acceptance of Reef water quality and the need to protect and rehabilitate wetland and riparian areas

Community awareness raising campaigns will need to be ongoing throughout the life of the Reef Plan. To date there are many awareness raising communication activities being undertaken by government agencies, regional NRM bodies and industry (as noted below). The challenge in the future for this action will be to ensure that all activities are well coordinated, duplication is minimised, and all key stakeholders are being reached through these programs.

A summary of some of the activities that have occurred over the 2004–05 reporting period follows:

Creek to Coral

Over the past year the joint EPA and Townsville and Thuringowa Councils' Creek to Coral project, which is modelled on the Healthy Waterways program, was developed. To date the Creek to Coral business plan has been completed, all major stakeholders (private, government, and community) have confirmed their participation and support for the program, a coordinator has been appointed (appointed in late 2004 until mid 2008), various funding grants have been obtained, a working group has been established, and community functions have been held sponsored by Creek to Coral. For further information on the Creek to Coral program visit <http://www.soe-townsville.org/creektocoral/index.html>.

Central Queensland Healthy Waterways Program

The Coastal Cooperative Research Centre has developed a healthy waterways program, which is an integrated program of research, training and extension activities to improve the condition of the region's coastal ecosystems. Projects use a participatory approach with local stakeholder and interest groups. An innovative communication and community participation approach has raised awareness and support to improve the condition of waterways in the region.

Messages for 2004–05 were developed through a local planning team formed with representatives from the Coastal Cooperative Research Centre, Sunfish, the NR&M, Rockhampton City Council, Central Queensland University, the Fitzroy Basin Elders Committee, the DPI&F, the Cooperative Research Centre for Catchment Hydrology, the FBA, the GBRMPA and WIN Television. The program is a public awareness campaign achieved through a number of short television segments to show how science, management and community action are addressing catchment and waterway issues in central Queensland.

Mackay Whitsunday Healthy Waterways Program

The Queensland Government is providing support and technical advice to the MWNRM. to help it develop its Mackay Whitsunday Healthy Waterways Program. The program objectives are to improve wetland and riparian management, to improve land management and sediment and nutrient control, and to improve urban stormwater management. It also aims to improve awareness of the Mackay Whitsunday Regional Coastal Management Plan and how it can contribute to managing these areas. The program is targeted at the community, land managers, and local government.

Regional NRM body programs

The FBA Healthy Waterways, Rivers and Wetlands improved community awareness and capacity to address water quality, river and wetland health through 20 monitoring workshops, development of a monitoring manual and education package (including Healthy Waterways television advertisements), and brochures and guidelines for protection and rehabilitation of 1500 kilometres of riparian areas and 2000 hectares of wetland in identified priority neighbourhood catchments.

The FBA Coral and Coasts is a series of information fact sheets, brochures and guidelines focusing on inshore water quality, coastal development, migratory birds and other species of high conservation value. Community workshops are being developed.

Education, extension and communication are an intrinsic component of the BMRG Country to Coast program. The BMRG has also specifically committed to socioeconomic outcomes, such as increased engagement, training, education, and communication under the Community Capacity and Partnerships action program.

The BDTB Engagement and Knowledge package will provide investments that will develop cohesive structures, effective multi-stakeholder working arrangements, a shared regional vision and increased awareness of natural resource management outcomes underpinned by appropriate levels of information and knowledge.

Capacity building

The EPA is contributing to various community engagement activities, including the development of quality assurance type products to enhance community groups' capacity to undertake water quality monitoring, and having the ANZECC Water Quality Guidelines put onto a CD in a searchable format to make it easier for the community and regional NRM bodies to use them.

Community engagement has been an integral part of the Douglas Shire Council Water Quality Improvement Program and of determining water quality objectives and environmental values for Douglas Shire Council and the Mary River area.

The DPI&F has given support to community-based groups monitoring the changes in seagrasses at various locations. For further information on Seagrass-Watch visit <http://www.seagrasswatch.org/AUSTRALIA>

The GBRMPA, in partnership with the DEH and the EPA, is developing a number of wetland education products. These include materials for use in schools (a wetland curriculum unit and wetland Reef Beat posters) and access to wetland information for students and interested members of the public via the worldwide web using a wetland web quest on Reef Ed web site: <http://www.reefed.edu.au/>. This further links to the GBRMPA's Reef Guardian Program, particularly the Reef Guardian Schools component of this program, which has more than 180 schools and more than 50 000 children involved in action-based learning programs about water quality. The GBRMPA is also developing a new wetland display at its Reef HQ aquarium in Townsville to demonstrate to its 100 000 or more annual visitors the connectivity between the catchment and the Reef.

B5 Promote management plans, conservation agreements and covenants

Related actions: A1, A2, A3, A4, C6

As has been reported under actions A1, A2, A3 and A4, there has been a significant amount of activity in developing, promoting and supporting property management plans, conservation agreements and covenants for the protection of vegetation, riparian and wetland areas. The ability to measure the success of these promotional activities in high-risk catchments will depend on the ability to monitor the uptake of best management practice (actions A3 and A4) and compile agency data on the uptake of conservation agreements and covenants at this scale.

The FBA is promoting biodiversity conservation agreements for high priority areas with landholders throughout the Basin and associated coastal catchments. It is also promoting management plans conducted through all regional investment strategy programs (for example, management plans through the Neighbourhood Catchment action process and activities to be undertaken through the Biodiversity and Vegetation and Coral and Coasts programs).

Strategy C: Economic incentives

C1. Promote the adoption of existing incentive schemes that have the potential to encourage landholders to implement sustainable management practices and property level planning.	DPI&F , NR&M, EPA, DEH, DAFF, peak industry bodies, regional NRM bodies	Report on update of schemes 1 July 2005
C2. Identify, prioritise and recommend changes to policies, incentives and subsidy schemes that may have a detrimental impact on the water quality of the Reef.	DEH, NR&M , DPI&F, EPA, DAFF, DLGP, peak industry bodies	Report to Ministers 1 July 2004
C3. Identify, prioritise and recommend policies and incentives (of a regulatory and non-regulatory nature) that governments could consider, through an analysis of their public and private benefits and costs, which will encourage the uptake of best management practices that lead to improvements in the water quality of the Reef.	DEH, NR&M, DAFF (ABARE) , DPI&F, EPA, research bodies, peak industry bodies	Report to Ministers 1 January 2005
C4. Use mechanisms outlined in the Queensland Draft State Rural Leasehold Strategy to enhance and improve environmental management through offering lease incentives such as increased security of tenure under the <i>Land Act 1994</i> . Seek accelerated uptake in priority Reef catchments on a voluntary basis.	NR&M	Finalisation of the State Rural Leasehold Land Strategy July 2004 Report on implementation of key actions from the State Rural Leasehold Land Strategy 1 July 2005
C5. Investigate the potential for planning systems to be linked to preferential access to: <ul style="list-style-type: none"> • government financial support programs • enhanced leasehold arrangements • funding from regional NRM bodies • water allocation • other identified incentive options. 	NR&M , DPI&F, EPA, DAFF, DEH, regional NRM bodies	Report completed 1 July 2005
C6. Implement programs to establish conservation agreements and covenants to ensure protection and management of remnant bushland, riparian vegetation and wetlands that can produce water quality improvement outcomes for the Reef.	EPA , DEH, DAFF, NR&M, regional NRM bodies, local governments, WTMA	Report on uptake of agreements 1 July 2005

Reef Water Quality Protection Plan
2005 Report to the Prime Minister and the Premier of Queensland

C7. Create mechanisms for trading natural resource products such as timber and carbon and other products and investigate market mechanisms for other ecosystem services.	NR&M , EPA, DEH, DAFF	Completed 1 July 2005
C8. Implement a pilot auction program that targets the conservation of wetland, riparian and other remnant vegetation that has a direct relationship with water quality improvements in high-risk Reef catchments.	EPA , industry, NR&M, DAFF, DEH, regional NRM bodies	Completed 1 July 2005
C9. Seek philanthropic investment as a source of finance for the protection and rehabilitation of important wetlands, riparian and other remnant vegetation that has a direct relationship with water quality improvements in high-risk Reef catchments (for example, the newly formed Queensland Trust for Nature).	EPA , DAFF, DEH, NR&M, regional NRM bodies	Progress report 1 July 2005

Overall progress and key strategic issues:

This strategy supports the use of economic instruments, policies and programs to encourage cost-effective natural resource management outcomes and the removal of perverse incentives that reward poor land management practices. It is underpinned by the philosophy that effective use of these instruments can produce better environmental outcomes and superior economic performance.

Progress towards delivering on this strategy has occurred through:

- inclusion of economic and market-based incentives for improved land management and conservation outcomes in a number of NAP and NHT programs, such as the Great Barrier Reef Coastal Wetlands Program and the NAP National Market Based Instruments Program
- development of a Queensland biodiversity tender model to secure nature refuge agreements with landholders for the protection and sustainable management of biological resources of high conservation significance
- proposed acquisition of strategic properties by the Queensland Trust for Nature.

These programs (and others listed below) will continue to be rolled out over the next couple of years.

A key challenge for this strategy is the ability to establish integrated monitoring programs across all key agencies and industry to enable reporting on the uptake of economic incentives. Further work is also required to design a suite of tools to ensure potential negative impacts on water quality are minimised.

Nine milestones are noted under this strategy, all of which are due on or before 1 July 2005. Significant work has occurred under each of these actions and the current activities are reported below. Despite this, there have been delays in meeting milestones due to, for example, the machinery of government (C4) and the process of engaging consultants (C2 and C3). Management actions are in place for ensuring these actions maintain momentum.

C1 Promote adoption of existing incentive schemes that encourage landholders to implement sustainable management practices and property level planning

Related actions: A1, A3, A4

A report on the uptake of existing incentive schemes is not available; however, the following are programs and activities the Australian and Queensland Governments have set up to promote the adoption of existing incentive schemes:

- The Queensland Government established and invested \$32 000 in the Green Rewards program to reimburse transfer duty and/or land tax where a landholder enters into a perpetual conservation agreement.
 - Through the implementation of the NAP SIP SE05, regional bodies are provided with ongoing support to implement and strengthen their planning frameworks through identifying, developing and applying a range of social, economic and market-based incentives for improved land management practices to achieve salinity and water quality outcomes. Over the 2004–05 reporting period a database on incentive programs was developed to assist regional bodies and a technical support workshop is currently being planned.
 - Through the AgSIP (AG13) Resource economic support for accelerated land use change project, a team of natural resource management economists from Central Queensland University is looking at case studies and on-farm costs, community values and the best use of incentives for remedial actions.
 - The FBA is promoting adoption of existing incentive schemes to encourage landholders to implement sustainable management processes and property level planning through the identification, development and implementation of neighbourhood catchment action plans in partnership with sub-regional groups. Specific examples include incentives for 25 000 hectares fenced for ground cover increase, 50 hectares remediation in salt affected areas, and improved community awareness and capacity for water quality.
 - BDTB Targeted Landscape Enhancement is an implementation package that works in partnership with industry, community and government to improve ecological integrity and economic performance of landscapes in the Wet Tropics.
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C2 and C3 Identify, prioritise and recommend changes to policies and programs with detrimental (C2) and positive (C3) impacts on Reef water quality *(C2 milestone: 1 July 2004; C3 milestone: 1 January 2005. Due to the complementary nature of these actions they have now been packaged as one project with the expected delivery date of by June 2005.)*

Following an open tender process led by the DEH, the Australian Bureau of Agricultural and Resource Economics (ABARE) was selected to undertake a consultancy addressing actions C2 and C3. A steering committee with representatives from the Australian Government's DAFF and DEH, and the Queensland Government's NR&M, is overseeing the consultancy.

A desktop review and discussions with key stakeholders have identified policies with unintended potential negative impacts on water quality and potential options for making changes to improve water quality. The consultant is in the process of drafting this part of the report based on the information collected. The selection of three case study catchments, agricultural industries and relevant management practices has been finalised following consultation with key stakeholders. The full report of this consultancy will be available during 2005–06.

C4 Use mechanisms under the State Rural Leasehold Land Strategy to enhance and improve environmental management

The Queensland Government is having further discussions with key stakeholders to finalise the agreed format for the implementation of the State Rural Leasehold Land Strategy. This is an important mechanism and approach to improve leasehold agreements for property level management and support the objectives of the Reef Plan. An analysis of lease conditions showed that the highest proportion of leasehold land in the Reef catchment occurs in the Burdekin and Normandy catchments.

Complementary to the Rural Leasehold Land Strategy is the development of the OnePlan framework. OnePlan aims to integrate and coordinate those property-level planning processes that are required by government under regulation or incentive arrangements for natural resource and environmental management purposes. This approach will also address regulatory performance monitoring and verification requirements that follow initial approval of plans as part of the property's established management system. The approach is reflected in a recent memorandum of understanding between the Queensland Government and the QFF relating to FMS. Through this arrangement, the Queensland Government will establish a policy and planning framework to define a consistent and coordinated set of guidelines and standards for property management plans that support existing regulatory and financial programs of state agencies and avoid duplication in administration.

C5 Investigate the potential for linking planning systems to preferential access to government financial support programs, leasehold arrangements, regional NRM funding, water allocations and other identified incentive options

The Queensland Government has set up working groups to investigate opportunities for preferential access to financial support as part of the development of the OnePlan framework for property management planning.

The NR&M, the DPI&F and the EPA are working with industry towards accreditation of FMS as an alternative means for farmers to meet a range of regulatory property planning requirements. A working group has prepared a framework for accreditation of FMS programs.

The BMRG, through its regional NRM plan and investment strategy, will be supporting the linkage of devolved grants for Rivercare and biodiversity outcomes (for example) to the completion of property management plans and uptake of best management practice.

C6 Implement programs to establish conservation agreements and covenants to protect and manage remnant and riparian vegetation and wetlands

Related actions: A2, B5

Through the CNC in the Reef catchment, the EPA provides support to landholders to assist them with placing land under conservation agreements. Since the Reef Plan was launched in October 2003, the CNC has formalised an additional 32 nature refuges in the Reef catchment, protecting 123,144 hectares of land. This has brought the total area of protected land in the Reef catchment up to 178,615 hectares. There are currently 102 nature refuges in the Reef catchment.

The VIP (\$12 million) has been established to support landholders who maintain and manage native vegetation, including high-value regrowth, as part of their operations in catchments critical to the maintenance of water quality for the Reef. Expert panels will evaluate bids for VIP funds taking these issues into consideration. Management plans for these areas will facilitate good landscape management practices, which will contribute to improving water quality within a catchment. To date, 80 expressions of interest have been submitted, with the majority of these coming from within the Barron and Johnstone Basins.

Other key programs include:

- the State Rural Leasehold Land Strategy, which, once finalised, will provide another mechanism to deliver incentive and covenant arrangements to protect and manage remnant vegetation and other areas of significant environmental value
- a pilot project established under the Great Barrier Reef Coastal Wetlands Programme to implement conservation agreements and incentive packages for wetlands that contribute to water quality in the Reef and have significant habitat values
- the FBA's plans to promote (through the Healthy Waterways media campaign) incentives for protection of riparian and wetland areas through riparian fencing and off-stream watering points
- the BMRG's support, through the Biodiversity Conservation and Coastal and Marine Management Action Programs, for the use of management agreements, reserve dedications, and covenants, creation of buffer zones and the use of compensatory habitat for cleared vegetation.

C7 Create mechanisms for trading natural resource products, such as timber and carbon, and investigate market mechanisms for other ecosystem services

Support for trading of timber, carbon and other natural resource products, and development of plantations on leasehold land, are being considered through the State Rural Leasehold Land Strategy.

C8 Implement a pilot auction program that targets the conservation of wetland, riparian and other remnant vegetation that has a direct relationship with water quality improvements in high-risk Reef catchments

The Queensland Government has developed and tested the Queensland Biodiversity Tender model to secure nature refuge agreements with landholders for the protection and sustainable management of biological resources of high conservation significance. The auction model, implemented by the EPA, has built on the Sustainable Sugar Partnership Pilot Project in the Mackay region and the Douglas Shire.

The first pilot auction of funding has been completed in the Mackay region with local cane growers. Outputs of this pilot auction included 1494 trees planted, 1500 hectares of land registered under Land for Wildlife, four tailings dams/sediment traps constructed, and the trial at one farm of the use of recycled effluent for irrigation. Tenders have been received from cane growers for the second auction of funds in the Mackay region. These applications are currently being assessed.

The Douglas Riparian and Wetlands Tender offered \$70 000 in incentives to encourage sugarcane farmers to adopt best management practices and enhance riparian and wetland vegetation on their property to improve water quality in the adjacent waterways of the Douglas Shire. Successful bidders were required to enter a deed of agreement and, where relevant, a river improvement trust notice. Contributions to improving water quality were achieved by securing deeds of agreement with sugarcane farmers to implement activities, including restoration and expansion of a natural spring, bank stabilisation, revegetation and establishment of silt traps.

The Queensland Government is currently undertaking a review of the effectiveness of the auction model in the Saltwater Creek area.

The NR&M is also participating in a NAP National Market Based Instruments Program which supports pilot research projects to develop and trial market-based or economic instruments to support water quality and natural resource management outcomes. The program has two projects in Queensland, including establishing the potential for offset trading in the lower Fitzroy River.

C9 Seek philanthropic investment to finance the protection and rehabilitation of wetlands in high-risk catchments (for example, through the Queensland Trust for Nature)

The Queensland Trust for Nature has been established and is now investigating potential land purchases. The EPA has identified properties within the Reef catchment that are potentially suitable for acquisition by the Trust for Nature. These properties are being evaluated and assessed to determine their suitability under the Trust for Nature.

The EPA has received funding from the DEH to employ a philanthropic officer during the 2005–06 reporting period. The principal role of the philanthropic officer will be to facilitate philanthropic contributions to the Trust for Nature.

The DEH, in conjunction with the Victorian Trust for Nature, has developed a booklet that outlines for landholders donation options for nature conservation. This booklet is relevant to all Australian jurisdictions and includes a decision-making tree for landowners wishing to assess their options for ongoing donations.

The BMRG is committed to the development of alternative partnerships, including philanthropic investment to extend current activities under the NRM plan. This is primarily articulated through the Community Capacity and Partnerships action program.

Strategy D: Planning for natural resource management and land use

D1. Ensure Commonwealth, state and local government planning processes in the Reef catchment are consistent with the goal and objectives of the Reef Plan.	NR&M , JSC, DLGP, DAFF, DEH, DPI&F, EPA, Local governments, WTMA	Completed 1 July 2004
D2. Finalise the regional coastal management plans in high-risk Reef catchments, which include a focus on protecting and rehabilitating coastal wetlands as well as riparian and other vegetation important to water quality.	EPA	Completed 1 July 2010
D3. Ensure vegetation management arrangements are in place across all tenures to provide adequate protection of wetlands, riparian zones and native vegetation important to maintain and improve water quality. The arrangements should apply at the regional and property level and promote ecologically sustainable land use, protect land prone to degradation and provide appropriate buffers to watercourses and tributaries.	NR&M , EPA	Report on progress on protection 1 July 2005
D4. Promote development of local water quality improvement plans to local governments and regional NRM bodies in high-risk high-priority catchments and give priority to their development and implementation where catchment communities have an interest and capacity to develop plans of a suitable standard. <ul style="list-style-type: none"> Commence the preparation of water quality improvement plans consistent with the Framework for Marine and Estuarine Water Quality Protection, and where accredited, implement those plans consistent with program requirements of the Australian Government's Coastal Catchments Initiative. Pursue interim water quality projects where water quality improvement plans are being developed. Prepare and support the implementation of a water quality improvement plan and interim projects for the waterways in the Douglas Shire. 	DEH , DPI&F, NR&M, EPA, DAFF, regional NRM bodies, local governments Douglas Shire Council , regional NRM body, DPI&F, NR&M, EPA, DAFF, DEH	Report on progress 1 July 2005 Completed 1 July 2004

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Annex 1 – Report against strategies

D5. Develop an agricultural planning policy as part of the Agriculture Planning System (APS). The policy will be based on identifying the suitability of land for new or intensified agricultural uses having regard to the potential for adverse side effects on the environment, including water quality.	DPI&F , NR&M, EPA, DLGP, peak industry bodies	Policy completed by 1 July 2004 Applied to high-risk areas by 1 July 2005
D6. As part of the Agricultural Planning System (APS) review the effectiveness and feasibility of regulatory and non-regulatory mechanisms (including voluntary, market-based and statutory options) for managing agricultural activities known to be impacting on Reef water quality. This review will include options to manage: <ul style="list-style-type: none"> the application of fertilisers that increase nutrient levels in waterways the application of pesticides and herbicides that affect aquatic ecosystems. The review would also include investigating the feasibility of options recommended by the Productivity Commission and the Science Panel.	DPI&F , DLGP, NR&M, EPA, peak industry bodies	Review completed by 1 January 2004
D7. Review current planning instruments and develop new planning or statutory instruments as appropriate to ensure agricultural activities that may have a significant adverse impact on Reef water quality (including construction of drains and levee banks that may damage coastal wetland hydrology, structure and functioning) are assessable.	DPI&F , DLGP, EPA, NR&M, peak industry bodies, Local government	Review completed and timetable for implementation developed by 1 January 2004
D8. Identify and establish nutrient-sensitive zones within which extension services, property resource management planning (PRMP) and natural resource management funding will be focused to minimise impact of nutrients on the Reef. <ul style="list-style-type: none"> Investigate further land use planning and regulatory, market and voluntary mechanisms that could be applied in these zones. 	DEH, DPI&F, NR&M, GBRMPA , EPA, regional NRM bodies, industry bodies	Completed 1 July 2004

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D9. Support the implementation of the State Planning Policy involving acid sulfate soils by identifying areas of acid sulfate soil risk for planning schemes and the provision of quality technical advice for development assessment.	NR&M , EPA, local government	Completed mapping priority areas 1 July 2007 Develop additional chapters of technical manual on acid sulfate soil 1 July 2006
D10. Investigate implementation of an offsets policy based on achieving a net gain of riparian and wetland areas of state and regional significance to water quality in high-risk areas of the Reef catchment.	EPA , NR&M, DPI&F	Completed 1 July 2004
D11. Negotiate Indigenous Land Use Agreements (ILUAs), which recognise the linkages between land, waterways and the marine environment, in areas of particular significance to Indigenous peoples, and implement strategies for maintaining water quality and ecosystem integrity. <ul style="list-style-type: none"> • Provide mechanisms for Indigenous people to be involved in the management of areas under ILUA. 	Indigenous bodies , EPA , NR&M , regional NRM bodies	Report to Ministers on progress 1 July 2005

Overall progress and key strategic issues:

This strategy aims to better focus and coordinate existing planning processes to meet Reef Plan objectives. It recognises the role of a wide range of natural resource and land use planning processes as important tools in managing diffuse source impacts. It also includes several strategies that review current approaches in order to see if alternative or strengthened policy approaches are needed.

Key highlights for 2004–05 include:

- the requirement for regional NRM plans to consider the Reef Plan objectives and for the plans to identify actions that relate to the Reef Plan (Reef Plan Module I9)
- the development (through the NAP SIP projects CBO1 and CBO2) of tools and processes to ensure natural resource management planning processes are being incorporated into local government planning processes
- the finalisation at present of the Douglas Shire Water Quality Improvement Plan and associated interim projects. Lessons learnt from this process will be used to develop plans in the following Reef catchments: Tully, Barron, Burdekin, Proserpine, O'Connell, Pioneer, Plane and Burnett
- the development of regional coastal management plans for the high-risk Reef catchments of the Dry Tropical Coast, Mackay–Whitsunday, Capricorn Coast, and Wide Bay. The Curtis Coast, Cardwell–Hinchinbrook, and Wet Tropics plans are complete.

There are 14 milestones, 11 of which are due on or before 1 July 2005. The activities that have occurred under each of the actions over the 2004–05 reporting are noted below. Some delays have occurred in meeting milestones and management actions are in place to ensure each of the actions is working towards completion of the milestone.

D1 Ensure planning processes are consistent with the Reef Plan

Related actions: G6

An approach has been agreed to for how to assess whether planning processes are consistent with the goal and objectives of Reef Plan. This approach will be further explored in 2005–06. Other related activities underway which will continue to improve the consistency of planning processes are as follows:

- The NR&M is continuing its review of the suitability of corporate governance, institutional frameworks, management and approval of riverine works and other arrangements applying under the *River Improvement Act 1940* (refer to G7).
 - Through the NAP SIP projects CBO1 and CBO2, tools and processes are being developed to ensure natural resource management planning processes are being incorporated into local government planning requirements. In particular, under CBO2 a discussion paper has been developed on the integration of relevant elements of NRM plans into local government planning schemes. The document covers background on planning systems in Queensland under the *Integrated Planning Act 1997* and the *Local Government Act 1993*, identification of a generic range of NRM plan elements that may be relevant to local governments for purposes of implementation, and a discussion of options to integrate these into planning schemes.
 - The *Addressing the Reef Plan in regional NRM planning* document (a module of the *Guidelines for developing a regional natural resource management plan and regional investment strategy*) has been developed and circulated to regional NRM bodies. It provides guidance on how regional NRM bodies can meet the commitments and expectations of the Reef Plan through their regional NRM plans (also see actions H1 and I3).
 - The FBA has the Water Allocation and Management Program, which supports the finalisation and implementation of the water operations plans for the Fitzroy and the Boyne/Calliope River systems.
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D2 Finalise regional coastal management plans in high-risk Reef catchments

Regional coastal management plans are being developed for the high-risk Reef catchments of the Dry Tropical Coast, Mackay–Whitsunday, Capricorn Coast, and Wide Bay.

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The Curtis Coast, Cardwell–Hinchinbrook, and Wet Tropics plans are complete and published statutory documents. They can be found on the EPA web site http://www.epa.qld.gov.au/environmental_management/coast_and_oceans/coastal_management/regional_coastal_management_plans/. Stakeholders in the regions have been consulted on the plans and have undertaken training in the content of the plans and their implications.

The Wide Bay plan, Mackay–Whitsunday plan, and Capricorn Coast plan are expected to be completed in 2006, 2007, and 2010 respectively.

These plans describe how the coastal zone is to be managed, guide coastal zone related decision-making, and identify the coastal management districts in particular regions. Regional coastal management plans will implement the State Coastal Management Plan's policy framework at the regional level and identify key coastal sites requiring special management within the region.

D3 Ensure vegetation management arrangements provide adequate protection of wetlands, riparian zones and native vegetation

Related actions: E2

The NR&M is continuing to administer the *Vegetation Management Act 1999* (Qld) and supporting policies, including assessment and approval of limited broadscale and ongoing clearing applications, ballot administration and management of appeals. Broadscale clearing of remnant vegetation will cease by December 2006.

All vegetation clearing applications are assessed against requirements to maintain ecological processes associated with wetlands, lakes and springs and to protect watercourse vegetation and adjacent habitat.

The Queensland Government is revising and updating the Vegetation Management Act codes. A host of products and decision-making tools are being developed to assist with implementing the Act's codes.

Through the review of the Rural Leasehold Land Strategy, the Queensland Government will address environmental interests, including the protection of wetlands and riparian areas.

D4 Promote development of water quality improvement plans

Related actions: F3

The Douglas Shire Water Quality Improvement Plan is due for completion at the end August 2005; however, significant work remains to be done to finalise the plan. There are five interim projects due for completion in the near future, at which time final reports are expected.

Water quality improvement plans and associated interim projects funded under the Coastal Catchment Initiative will now be developed in the Reef catchments of Tully, Barron, Burdekin, Proserpine, O'Connell, Pioneer, Plane and Burnett. Interim projects will include best management practice, priority riparian restoration and water quality monitoring and benchmarking.

The EPA is undertaking a process to establish environmental values and water quality objectives in the Douglas Shire (as part of the WQIP) and Mary River Basin/Great Sandy Region. The environmental values and water quality objectives will support the planning and management of waterways in these regions.

The second round of consultation, which will focus on the social and economic impacts of the draft environmental values and water quality objectives, is about to commence. This project will result in environmental values and water quality objectives for Douglas Shire Council and Mary River Basin/Great Sandy Region included in Schedule 1 of the Environmental Protection (Water) Policy.

The BMRG has committed to the development and implementation of environmental values, water quality objectives and water quality improvement plans for all catchments throughout the region by 2015. This resource condition target has been provided with additional Australian Government funding under the CCI. The development of local water quality networks or alliances of local government, industry and community partners is currently underway.

D5 Develop an agricultural planning policy as part of the Agricultural Performance Framework

The DPI&F has engaged a consultant to examine the range of options that is available to deliver an agricultural planning policy. The implications of the consultant's recommendations will be defined prior to wider consultation.

D6 Review the feasibility of regulatory and non-regulatory options for managing agricultural activities (the Agricultural Performance Framework project; previously the Agricultural Performance System)

Related actions: D5, D8

A review of regulatory and non-regulatory options for managing the water quality impacts associated with agricultural activities has been completed. The DPI&F led a cross-agency working group to develop the project in consultation with peak industry bodies and regional NRM bodies. The review included a broad framework and directions for implementation.

Implementation of action D6 sub-projects is continuing. A review of options to manage the application of pesticides and herbicides that affect aquatic ecosystems is likely to be finalised by December 2005. The review of application of fertilisers that increase nutrient levels in waterways is being undertaken in conjunction with action D8.

D7 Review current instruments and develop new instruments to ensure agricultural activities that may have a significant adverse impact on Reef water quality are assessable

Through a cross-agency working group, the DPI&F is leading the review of management mechanisms to minimise the adverse environmental impacts of agricultural activities that could potentially impact on wetlands. The implications of each of these options are being defined prior to wider consultation.

D8 Identify and establish nutrient-sensitive zones. Investigate mechanisms that could be applied in these zones

Related actions: H4

This action is essentially two complementary activities:

1. identify and establish nutrient-sensitive zones within which extension services, property resource management planning and natural resource management funding will be focused to minimise impacts of nutrients on the Reef
2. investigate further land use planning and regulatory, market and voluntary mechanisms that could be applied in these zones.

The DEH and the GBRMPA are leading the first activity in identifying and establishing nutrient-sensitive zones. A methodology is currently being developed and refined prior to wider consultation on the zones.

The DPI&F and the NR&M are leading a review of potential nutrient management mechanisms to apply in these zones prior to consultation with external stakeholders.

D9 Support the implementation of the State Planning Policy involving acid sulfate soils

The NR&M continues to support acid sulfate soil management, including implementation of the Acid Sulfate Soil State Planning Policy through ongoing technical support, soil analyses and education activities.

During 2004–05, a new legislation guideline was produced to add to the technical manual and there is an NHT and NR&M project underway to map key acid sulfate soil areas in central Queensland catchments.

Acid sulfate soil management is continuing and being supported, particularly in the high priority acid sulfate soil areas in urban and sugar lands from the Burdekin to Cooktown.

The FBA is managing an NR&M acid sulfate soil project. A contract was signed and work on mapping and bore drilling is underway for Mackay–Whitsunday and Fitzroy.

D10 Investigate the implementation of an offsets policy based on achieving a net gain of riparian and wetland areas

The Queensland Government has conducted a thorough investigation into the use and implementation of offsets policy. The investigation reviewed and analysed Australian and international case studies and the development and implementation of offsets by the Queensland and Australian Governments.

While no whole-of-government offsets policy for Queensland exists, the EPA has made the decision to further investigate offsets policy on an issue-by-issue basis and will support offsets where the principles of net environmental gain are realised.

D11 Negotiate Indigenous land use agreements

Related actions: B3, G2

In 2004–05 the NR&M, through Native Titles and Indigenous Land Services, was involved in negotiating a number of Indigenous land use agreements over river catchment areas adjacent to the Great Barrier Reef World Heritage Area. The Indigenous land use agreements are generally undertaken as part of the resolution of native title claims and provide for, among other things, Indigenous involvement in the management of protected areas.

Indigenous land use agreements involving the following native title claimant groups and relevant river catchments were in progress during 2004–05:

- Yalanji – Daintree River
 - Djabugay – Barron River (completed)
 - Mandinglbay Yidinyi; Gunggandji – Russell and Mulgrave Rivers
 - Mamu; Djiru – Johnstone River
 - Djiru – Tully River
 - Girramay – Murray River.
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Strategy E: Regulatory frameworks

E1. Investigate the potential to make declarations and undertake actions under the <i>Water Act 2000</i> for appropriate high-risk sub-catchments within the Reef catchment with the aim of preserving and improving water quality and regulating inappropriate land use.	NR&M	Complete 1 July 2004
E2. Identify potential areas within high-risk areas of the Reef catchment where declarations under the <i>Vegetation Management 1999</i> (Qld) might be made to secure protection of vegetation as a measure against land degradation.	NR&M, regional NRM bodies, DAFF, DEH	Completed 1 July 2004
E3. Develop, in cooperation with industry, guidelines to clarify the general environmental duty under the <i>Environmental Protection Act 1994</i> and the duty of care under the <i>Land Act 1994</i> which will assist land holders to determine practical measures to minimise or prevent water pollution in the Reef catchment.	EPA, NR&M, peak industry bodies	Completed 1 July 2004
E4. Ensure compliance programs and mechanisms for the <i>Environmental Protection Act 1994</i> and the <i>Land Act 1994</i> take into account the goal and objectives of the Reef Plan, including an increased emphasis on application of the general environmental duty and duty of care for the land respectively in relation to diffuse sources of water pollution.	EPA, NR&M, local governments	Completed 1 July 2004

Overall progress and key strategic issues:

This strategy explores the use of a range of existing regulatory powers to complement and support self-management and cooperative partnership approaches in order to achieve the goal and objectives of the Reef Plan.

Key highlights for 2004–05 include:

- the completion of a review of Queensland legislation dealing with water, vegetation and land to identify mechanisms that will assist in achieving Reef Plan objectives (E1)
- the finalisation of guidelines to clarify duty of care requirements under relevant legislation (E3)

- the upgrade of administrative procedures and compliance programs and mechanisms for the *Environmental Protection Act 1994* and the *Land Act 1994* to take account of the Reef Plan and to prioritise investigation of non-compliances in the Reef catchment (E4).

Further work is required to identify potential areas within high-risk catchments where declarations under the *Vegetation Management Act 1999* (Qld) might be made to prevent land degradation.

Four milestones are articulated in the Reef Plan against each of the actions under this strategy. Of these, only one has not been met (E2). Further work may be required for each of the actions.

E1 Investigate the potential to make declarations and undertake other actions under the *Water Act 2000*

An investigation of the existing powers of the *Water Act 2000* and their potential to assist in meeting the Reef Plan objectives concluded that Declared Catchments Areas are not an effective way to protect Reef water quality because they only address select developments in small areas abutting dams. As such, they do not control diffuse sources of pollution or apply at a catchment (or sub-catchment) scale.

Other powers under the Act can be used to manage particular activities and can thus assist in improving water quality. These include, for example, declared drainage and embankment areas, water use plans, land and water management plans, and riverine protection permits; however, aside from water use plans, these powers do not target the key source of (diffuse source) pollutants in the Reef catchment.

The current NR&M water planning activities are focused on the development of water resource plans, resource operations plans and water supply strategies; however, Water Act provisions which control earthworks and other activities that impact on watercourses and wetlands are being reviewed to improve their effectiveness. This review will also include water quality outcomes.

E2 Identify potential areas within high-risk catchments where declarations under the *Vegetation Management Act 1999* (Qld) might be made to prevent land degradation

This action will be further considered in the 2005–06 reporting period.

E3 Develop guidelines to clarify duty of care under the *Environmental Protection Act 1994* and the *Land Act 1994*

Related actions: D3

The EPA has completed codes of practice for agriculture under the *Environmental Protection Act 1994* which were produced via a process of industry review. The NR&M has provided guidance to clarify the duty of care under the *Land Act 1994* through the draft State Rural Leasehold Land Strategy and an information sheet.

The EPA is collaborating with other agencies and the QFF and member industries under the auspices of the FMS memorandum of understanding to explore ways to provide guidance in meeting statutory stewardship obligations within industry FMS and One Plan projects. A review of the *Land Act 1994* currently being conducted by the NR&M is expected to further clarify the duty of care obligations.

E4 Ensure compliance programs and mechanisms under the *Environmental Protection Act 1994* and the *Land Act 1994* take into account the goal and objectives of the Reef Plan

Related actions: E3

The EPA's Strategic Compliance Program deals with point and non-point water pollution loads. Recent amendments to administrative support systems for the *Environmental Protection Act 1994* enable the goal and objectives of the Reef Plan to be taken into account when regulating environmentally relevant activities.

The NR&M compliance program includes mechanism under the *Land Act 1994* to enforce duty of care obligations. The draft State Rural Leasehold Land Strategy includes tenure arrangements and incentives linked to achievement of sustainable production, among other things.

A review of the EPA's Strategic Compliance Enforcement Program will be based on the outcomes of independent performance audits of Reef Plan implementation in 2005, 2010 and 2013.

Further work is required to improve cost-effective techniques to monitor land use management practices (for example, remote sensing to improve the speed of detection and scale of identification of practices or events that result in high loads of sediment and nutrient entering waterways).

Strategy F: Research and information sharing

F1. Provide technical information and methods from research and monitoring on water quality entering the Reef to regional NRM bodies, landholders, industry peak bodies and the public.	NR&M, DPI&F, EPA, CSIRO, DEH, research bodies, NLWRA	Review uptake of information 1 July 2005
F2. Provide technical resource information to landholders to assist in the preparation of property resource management plans.	DPI&F, EPA, NR&M	Report on availability of information 1 July 2005
F3. Investigate the ability to better coordinate future resource condition monitoring to meet the needs of a wide range of stakeholders, including regional NRM bodies, local and state governments, industry, landholders and the community.	NR&M, regional NRM bodies, DPI&F, EPA, DAFF, DEH, research bodies, NLWRA	1 July 2004
F4. Undertake coordinated research and development programs that will assist in delivering Reef Plan objectives. These may include: <ul style="list-style-type: none"> identifying and prioritising best practice land management chemical use practices production systems pilot field studies to investigate innovative approaches to water quality improvement low impact agricultural production. 	DPI&F, NR&M, EPA, DAFF, research bodies, regional NRM bodies, peak industry bodies	Report on research undertaken 1 July 2005
F5. Undertake a review of the herbicide, Diuron.	APVMA, DEH	1 July 2004
F6. Implement a 'fertiliser sales by catchment' reporting system jointly developed by the fertiliser industry and government agencies.	DEH, peak industry bodies	Commences 1 January 2004
F7. Investigate the need for, and cost-benefit of, a herbicide and pesticide reporting system.	DEH	Report completed 1 July 2004
F8. Facilitate exchange of information and experience between catchments where water quality improvement plans have been developed and other areas.	DEH, regional NRM bodies, local governments	Report to Ministers 1 July 2005
F9. Provide information on the market and non-market values of the Reef, and risks arising in catchments from socioeconomic conditions, to regional NRM bodies, landholders, industry peak bodies and the public.	DEH, GBRMPA, NR&M, DPI&F, DPC	Report to Ministers 1 July 2005

Overall progress and key strategic issues:

This strategy focuses on the development and dissemination of information from new and existing research, which supports and/or contributes to improving the quality of the water entering the Reef and is critical to the success of the Reef Plan.

Key highlights for the 2004–05 reporting period include:

- completion a draft report on a review undertaken by the Australian Pesticides and Veterinary Medicines Authority (APVMA) considering the impacts of Diuron on the environment of the Great Barrier
- better coordination of research and information sharing as a result of the establishment of the Consortium for Integrated Resource Management (CIRM) Reef Catchment Working Group and the Water Quality Coordination Group (WQCG) to manage the Reef catchment Integrated Water Quality Monitoring Programme
- staging of the 'Catchment to Reef' conference in Cairns in November 2004, which updated regional NRM bodies, industry, government departments and non-government agencies on the outcomes of the Catchment to Reef program research activities.

As reported below under each of the actions, there is a significant amount of available technical information and methods from research and monitoring undertaken by regional NRM bodies, landholders, industry peak bodies. The key challenge for this strategy is to be able to review these interest groups' uptake of this information in order to better target the information to the selected audiences (F1).

There are nine milestones under this strategy with a due date on or before 1 July 2005. Approximately half of these have been met and summaries of the activities that have occurred under each of actions follow, including links to final reports and where research information can be found. It is important to note that while there are no milestones due after 1 July 2005, activity will continue under each of the actions and this activity will be reported in subsequent annual reports. Those milestones outstanding at present have management actions in place to ensure momentum.

F1: Provide technical information and methods from research and monitoring on water quality entering the Reef to regional NRM bodies, landholders, industry peak bodies and the public

Related actions: I4, I5

There is no review on the uptake of technical information and methods from research and monitoring by regional NRM bodies, landholders and industry peak bodies; however, there is a significant amount of technical information available to these interest groups. In particular, the following initiatives were specifically set up to deliver this information:

- In November 2004 a conference was held in Cairns to update regional NRM bodies, industry, government departments and non-government agencies on the outcomes of the Catchment to Reef program research activities. This program includes seven tasks to develop new protocols and tools to identify, monitor and mitigate water quality problems and to assess the health of aquatic ecosystems in the Wet Tropics and Great Barrier Reef World Heritage Areas.

The tasks relate to:

1. riparian zone performance: tools and protocols for assessment and monitoring, and development of guidelines for improvement
 2. monitoring tools for water quality assessment against benchmarks
 3. river health assessment tools
 4. frameworks for integrated catchment management
 5. advanced technologies for monitoring water quality in the Reef
 6. new tools for assessing health, status and trends in nearshore marine ecosystems
 7. achieving outcomes: adoption of tools through training of the current and new generation of practitioners.
- NAP SIP are specifically designed to provide regional NRM bodies with information products and decision tools to support the management actions and implementation of the resource plans. Further information on these projects can be found at <http://www.regionalnrm.qld.gov.au/>.
 - The EPA is leading projects that will develop tools and products (primarily) for regional NRM bodies to measure and monitor water quality. Queensland Water Quality On-line will give regional bodies access to the following tools and software: regional metadata (a query tool for accessing information), decision support tools for interpreting water quality data and making decisions, tools for community monitoring guidance and capacity, and reporting tools for regional integrated water quality condition assessments.
 - The EPA is currently in discussions with regional bodies and other governmental agencies about environmental management and sustainability indicators to be reported against for the *State of the environment* report.

F2 Provide technical resource information for property resource management planning to landholders

The EPA provides a range of technical information to the public that could be considered in a property resource management planning process. This includes:

- biodiversity planning assessments relevant to the Reef, which are completed and available for Brigalow Belt and Central Queensland Coast. Biodiversity planning assessments are available from the EPA and include GIS data, expert panel reports, and methodology on CD-ROM. See http://www.epa.qld.gov.au/nature_conservation/biodiversity/planning_assessments/
- Draft Queensland Water Quality Guidelines, which are available and undergoing consultation with stakeholders. They are part of a report available in hard copy or electronic version on the EPA web site http://www.epa.qld.gov.au/environmental_management/water/water_quality_guidelines/
- the Queensland's Wetlands Programme, Wetland Mapping and Classification Product, will comprise of a set of final wetland maps. Maps for the Reef coast are due for completion by March 2006. GIS layers will be made available on request and will be available electronically

- mapping of coastal resources as part of regional coastal management plans, which are completed for Wet Tropical Coast, Cardwell–Hinchinbrook Coast, and Curtis Coast. Plans are underway for Dry Tropical Coast, Mackay–Whitsunday Coast and Wide Bay Coast. Statutory coastal plans with pdf maps are available in hard copy or electronic form from the EPA web site. GIS layers are available from the EPA. See http://www.epa.qld.gov.au/environmental_management/coast_and_oceans/coastal_management/regional_coastal_management_plans/.

The NR&M is:

- developing a range of landscape decision support tools to assist in the integrated management of land, water and vegetation resources (<http://www.nrm.qld.gov.au/planning/index/>), including fact sheets (<http://nrm.dnr.qld.gov.au/factsheets/index.php>), manuals, modules, guides, market analysis, web sites (<http://www.regionalnrm.qld.gov.au/funding/incentives/index.html>), databases (<http://www.oesr.qld.gov.au/qrbis/>) and computer programs, through the Land Mangers' Monitoring Guide project.
- continuing the development and delivery of seasonal climate forecasts and decision support tools (state-wide), including Rainman, Droughtplan, and Streamflow. Decision support packages on seasonal forecasts continue to be promoted to rural industries
- developing a web mapping and information services portal through the NAP SIP IM01 project, Regional Information Services Framework. This enables regional NRM bodies to view, use and download government-owned spatial data over the Internet. The NAP regional information services portal is complete and delivering data and information to NAP regional bodies. See http://www.nrm.qld.gov.au/salinity/projects/regional_information/index.html.

The FBA is currently conducting a salinity risk assessment project to produce risk maps for each major sub-catchment and a supporting information package on suitable land practices is in development.

F3 Investigate the ability to better coordinate future resource condition monitoring

Related actions: F1

There are several processes underway that are investigating the ability to better coordinate resource condition monitoring. The challenge will be to ensure the different groups share the information and learnings.

The 2004–05 reporting period saw the formation of the Great Barrier Reef Water WQCG. The WQCG has members from bodies such as regional NRM bodies, the GBRMPA, the NR&M, CSIRO, and the Australian Government. This group meets regularly and is focused on exchanging information and coordinating and aligning projects and programs with a particular focus on water quality monitoring.

The Queensland Government continues to work with regional NRM bodies to better coordinate resource condition, performance and program monitoring and evaluation.

The FBA is conducting a project in conjunction with Central Queensland University to monitor remnant vegetation condition at 100 sites across the Fitzroy Basin and associated coastal catchments.

The BMRG has been participating in several concurrent processes committed to better integration and the development of a state water quality monitoring framework. This is an ongoing commitment and includes discussions, meetings and workshops with state agencies (principally the EPA and the NR&M), the GBRMPA (and its monitoring partner, the Australian Institute of Marine Science (AIMS)) and other regional bodies (through the Water Quality and Coastal Development Reef Advisory Committee, Water Quality Technical Working Groups and Reef Monitoring Framework Project).

F4 Undertake coordinated research and development programs that will

The CIRM Reef Catchment Working Group finalised a review of current research and development activities in the Great Barrier Reef in March 2005. The report highlights the current research and development activities being undertaken in the Reef catchment, including detailed information on the project and mapping of these activities across the Reef Plan strategies and actions. More than 90 different research projects, delivered through research organisations, universities and government agencies, have been listed in this report as contributing to action F4. The report can be found at <http://www.cirm.org.au/workinggroups/reefcatch/reefpubs.htm>.

F5 Undertake a review of the herbicide, Diuron

Diuron is a broad-spectrum residual herbicide registered for pre-and post-emergent control of both broadleaf and grass weeds in a number of broadacre and fruit and vegetable crops. Products containing Diuron are also registered for use in aquatic weed control, and cotton defoliants, as marine antifouling paints, and for control of algae in home aquaria and fishponds.

Concerns have been raised over the levels of Diuron in runoff from farms using this chemical, and the potential impacts this herbicide/algicide may have on ecosystems in the Reef lagoon, especially coral, seagrass and mangrove communities. The APVMA has undertaken a review of the use of Diuron and a draft report is available for public comment at <http://www.apvma.gov.au/chemrev/diuron.shtml>.

A range of scientists and government departments, including the DPI&F, has given the APVMA considerable technical input into the draft report via letters and meetings. This has raised some important issues, which should allow the final report to be a robust and defensible document.

F6 Implement a 'fertiliser sales by catchment' reporting system

Obtaining information on fertiliser sales by catchment is a complex task and at this stage there is no simple or sure method to collect accurate data. It may be possible to obtain only indicative levels of fertiliser sales because fertiliser companies do not keep sales records based on river catchment boundaries. There are also barriers to obtaining information directly from individual companies as a result of the market competition sensitivities involved. The DEH and the Fertilizer Industry Federation of Australia (FIFA) are exploring options for obtaining the data to fulfil this action.

In any event, issues, such as the differing stability of the various nitrogen/phosphorus/potassium (NPK) compounds used and the ability of different soils to bind NPK to a greater or lesser degree, make estimating the relative impact of the different fertiliser types difficult.

F7 Investigate the need for, and cost–benefit of, a herbicide and pesticide reporting system

The DEH plans to conduct a consultancy in 2005–06 to investigate the need for and to suggest options for a pesticide/herbicide reporting scheme in the Reef catchment using a cost–benefit analysis approach.

F8 Facilitate exchange of information and experience between catchments where water quality improvement plans have been developed

Related actions: D4

As noted in action D4, a significant amount of work has gone into developing water quality improvement plans and associated interim projects in the Douglas Shire. Other plans will follow shortly in the Tully, Barron, Burdekin, Proserpine, O'Connell, Pioneer, Plane and Burnett catchments. Interim projects will include best management practices, priority riparian restoration and water quality monitoring and benchmarking.

Due to the fact these plans require the involvement of all levels of government, industry, regional bodies and community, information exchange has occurred and lessons learnt will be passed on when developing the new water quality improvement plans.

As part of this information exchange, BMRG staff participated in a field trip to the Douglas Shire and were able to speak to participants about their experiences, successes and challenges in developing and implementing their water quality improvement plan. The relationship will certainly be further explored in developing similar local alliances and water quality improvement plans across Burnett Mary.

F9 Provide information on the market and non-market values of the Reef, and risks arising from the socioeconomic conditions, to regional bodies, landholders, industry peak bodies and the public

The GBRMPA has contracted Access Economics to conduct a study on the market values of the Reef and catchment industries building on past studies, such as the 2003 Productivity Commission report.

The DEH is seeking tenders for a consultancy to conduct a project on identifying the non-market values of the Reef and risks arising from socioeconomic conditions in the Reef catchment.

Strategy G: Partnerships

G1. Work in partnership with regional NRM bodies to determine water quality environmental values and objectives and to develop aspirational and short-term resource condition and management action targets that reflect the goal of the Reef Plan.	JSC, regional NRM bodies, NR&M, DAFF, EPA, DEH, DPI&F, GBRMPA	Completed 1 July 2005
G2. Ensure Indigenous people are involved in ongoing consultation and support Indigenous peoples' desire to be involved in the protection and healing of country and culture for future generations.	GBRMPA, EPA, DEH, DPI&F, NR&M, DAFF, regional NRM bodies, Indigenous bodies	Ongoing
G3. Create a research and development program in partnership with research institutions and regional NRM bodies to develop effective modelling tools to support regional target setting processes through the NAP Statewide Water Quality Work Plan.	NR&M, EPA, DEH, DPI, DAFF, regional NRM bodies, research bodies, WTMA	Completed 1 July 2005
G4. Work in partnership with research organisations to develop innovative sustainable production systems aimed at encouraging improvements in water quality entering the Reef, such as: <ul style="list-style-type: none"> • CSIRO (Healthy Country Program-Reef Region) • AIMS • cooperative research centres • universities • industry research bodies. 	NR&M, regional NRM bodies, DAFF, DEH, DPI&F, research bodies	Report on outcomes 1 July 2005
G5. Build on existing partnership with industry to ensure implementation of the Reef Plan. <ul style="list-style-type: none"> • As a component of this process, develop eco-efficiency agreements that improve water quality and enhance industry competitiveness, including an eco-efficiency agreement with the fertiliser industry which promotes the responsible use of fertiliser, and an agreement with CANEGROWERS on the promotion of COMPASS and best management practices in the sugar cane industry. 	DEH, DAFF, NR&M, DPI&F, EPA, peak industry bodies	Report to Ministers 1 July 2005 Eco-efficiency agreements in place mid-2003

Reef Water Quality Protection Plan
2005 Report to the Prime Minister and the Premier of Queensland

G6. Work with local government to ensure the successful implementation of the Reef Plan. <ul style="list-style-type: none">Support the LGAQ project on building the capacity of local governments to effectively participate in sustainable natural resource management planning arrangements in the local and regional contexts, particularly in relation to water quality improvement processes.	Local governments, LGAQ, DLGP, NR&M, DPI&F	Report on outcomes 1 July 2005
G7. Encourage regional NRM bodies and river improvement trusts to develop closer links to ensure compatible and coordinated planning, actions and work programs.	NR&M, regional NRM bodies, river improvement trusts	Report on progress 1 July 2005

Overall progress and key strategic issues:

This strategy is critical to the delivery of the Reef Plan goal and objectives. Without effective partnerships between government, industry, regional NRM bodies and the community, key activities occur in isolation, information is not shared and the likelihood of duplication is higher. In particular, the partnerships that government forms with regional NRM bodies and industry are important because they are the link to the landholders and the wider community.

Key achievements for 2004–05 in building partnerships include the:

- signing of the memorandum of understanding between the QFF and the Queensland Government to progress the development and implementation of industry-led FMS in March 2005
- signing of new eco-efficiency agreements between the Australian Government, Growcom and the Australian Prawn Farmers Association (APFA). These agreements are due for completion in June 2006
- completion of a discussion paper on the integration of relevant elements from NRM plans into local government planning schemes
- completion of a discussion paper, *Review of the River Improvement Trust Act 1940*, released by the NR&M in February 2005
- establishment of environmental values and water quality objectives through wider community consultation in the Douglas Shire and Mary River Basins/Great Sandy Region to support the planning and management of waterways in this region.

Enhanced communication between all Reef Plan stakeholders and the articulation of roles and responsibilities for monitoring and reporting will remain a key challenge for this strategy.

Summary progress reports for each of the actions are below. Although actions G1 and G3 are noted as being completed by 1 July 2005, all actions under this strategy will involve a process of continual improvement and activities will occur after this date.

G1 Work in partnership with regional NRM bodies to determine water quality environmental values and objectives

Related actions: H1, F8, D4, F1, I4, I5

The Queensland EPA, in collaboration with regional bodies and the wider community, is undertaking a process to establish environmental values and water quality objectives in the Douglas Shire and Mary River Basin/Great Sandy Region. The environmental values and water quality objectives will support the planning and management of waterways in these regions. The second round of consultation, which is focused on the social and economic impacts of the draft environmental values and water quality objectives, is about to commence. The project will result in environmental values and water quality objectives for Douglas Shire Council and Mary River/Great Sandy Region being included in Schedule 1 of the Environmental Protection (Water) Policy.

The Australian and Queensland Governments are providing support for regional NRM bodies' planning and implementation processes through the State Co-ordination Group, regional coordination groups, the Regional NRM Taskforce, and administration of state-wide activities (for example, SIP coordination and support for SIP projects) and other processes. The majority of SIP projects, including the Water Quality SIP, are on track and delivering to regional NRM bodies (for more information visit http://www.regionalnrm.qld.gov.au/planning/state_wide/nap/nap_sip.html). Administrative, communication and coordination support will continue for the life of SIP projects.

A series of water quality workshops have been funded through the National Landcare Program to provide advice and training to regional communities on planning, monitoring and reporting on actions to address water quality issues in the catchment to the sub-catchment level. Workshops within the Reef catchments have been held in Mackay, Townsville and Tully and have provided useful information for regional groups that are soon to introduce local water quality improvement plans in areas adjacent to the Great Barrier Reef.

G2 Ensure Indigenous people are involved in ongoing consultation and support Indigenous people's desire to be involved in the protection and healing of country and culture for future generations

Related actions: B3

During 2004–05 guidelines were completed for involving Aboriginal and Torres Strait Islander peoples in the establishment of regional NRM bodies and the development of regional NRM plans and investment strategies (May 2005). The guidelines are available at www.regionalnrm.qld.gov.au. Examples of where regional NRM bodies have incorporated Indigenous involvement into their regional NRM plans and investment strategies are:

- the FBA and sub-regional groups' strong working relationship with Fitzroy Basin elders and the Fitzroy Basin Elders Committee staff. Examples include staff involvement in a cultural tour to Ka Ka Mundi led by an elder, and FBEC staff involvement in meetings of the FBA board, stakeholders and staff, and training

- the BMRG's development, through PAP 1.3, of protocols for Indigenous engagement and representation and the identification of issues/management actions to be included in the BMRG NRM plan. Extensive provision has also been made for ongoing consultation to achieve resource condition target CHI1.1, which the Indigenous community is participating in at all levels of management and planning for country by 2015.

Other activities that support this action include:

- the GBRMPA working in partnership with the Indigenous communities of the Reef catchment by developing traditional use of marine resources agreements with traditional owners
- the DEH continuing to provide financial and technical support to Indigenous communities to sustainably manage their land through the Indigenous Protected Areas program
- implementation of the Indigenous State-wide Network (NHT2 state-wide funded project) to support the formation and operation of the emerging Indigenous State-wide Network, which commenced in October 2004. The network involves leadership and support for regional Aboriginal Land Management Facilities.

G3 Create a research and development program in partnership with research institutions and regional NRM bodies to develop effective modelling tools to support regional target setting processes through the NAP Statewide Water Quality Work Plan

Related actions: G1, H4

The Queensland Government, as a part of the NAP research and development program, is developing modelling tools. An example is the Modelling Landscape Process and the Management Impacts and Catchment Loads project which will use spatial and temporal models to provide regions with user-friendly outputs related to landscape processes and the impacts of management practices on water quality.

G4 Work in partnership with research organisations to develop innovative sustainable production systems

Through the NAP SE04 project, Integrated Research, Development and Extension for Regional NRM, led by the NR&M, mechanisms are being explored for establishing higher order research partnerships to address complex sustainability issues in the Reef catchment. The project provides support and research for brokering regional partnerships and common approaches for delivering integrated research, development and extension. A compilation of technical paper reviews was conducted on behalf of the BMRG.

The Catchment to Reef project led by the Rainforest and Reef Cooperative Research Centres is producing informative scientific information about indicators for water quality and ecosystem health in the Reef catchment and receiving marine ecosystems. For more details see action F1 or visit <http://www.rainforest-crc.jcu.edu.au/research/Program10CtoR.htm>.

The CIRM Reef Catchment Working Groups report listed 17 different research and development projects as contributing to this action. This includes the 'Catchment to Reef' program as well as other research and development programs from CSIRO, Bureau Sugar Experiment Stations, AIMS, the University of Queensland and James Cook University, all with a focus on sustainable production systems. This report can be found at <http://www.cirm.org.au/workinggroups/reefcatch/reefpubs.htm>.

G5 Build on existing partnerships with industry to ensure implementation of the Reef Plan

Related actions: A3, A4, I9

As already reported in the introduction of this report, the Queensland and Australian Government's and industry have committed to working together by establishing the QFF's FMS and Agforce's AgForward programs. These programs, as well as those listed below, continue to show the commitment from both government and industry to working together on programs that make a direct contribution to delivering on the overall goal of the Reef Plan.

Eco-efficiency agreements

In addition to public environmental reporting, the FIFA agreement included extensive work on the Fertcare 'product stewardship' program. FIFA has completed all of the original grant activities and, with additional government and industry funding, has further accelerated the development and delivery of Fertcare, with a focus on the catchments of the Great Barrier Reef.

Further information and key reports can be found at http://www.fifa.asn.au/default.asp?V_DOC_ID=789.

CANEGROWERS is due to complete the final activity in June 2005. Further information on the suite of projects undertaken by CANEGROWERS can be found at <http://www.canegrowers.com.au/Default.asp?page=145>). Growcom and the APFA have also signed up to agreements, which are due for completion in June 2006.

Rural Water Use Efficiency Initiative

The RWUEI II is a partnership between industry and government that has been set up to improve the use and management of available irrigation water. Stage 2 of the initiative (2004–06) has been broadened to include not only a focus on improving on-farm water use efficiency and farm productivity, but also the off-farm environmental impacts of irrigation. The programs are managed by rural industry organisations CANEGROWERS, Cotton Australia, Queensland Dairy Farmers Organisation, and Growcom. Final industry milestone reports are due in May 2006.

G6 Work with local government to ensure the successful implementation of the Reef Plan

Complementary projects under the project run by the LGAQ (NAP SIP CBO) and the Department of Local Government and Planning, Sport and Recreation (DLGPSR) (NAP SIP CBO2) look at integrating natural resource management planning into local government planning schemes in order to ensure relevant issues identified in regional NRM plans are reflected in statutory local government planning schemes.

In particular, under CBO2 a discussion paper has been developed on the integration of relevant elements from NRM plans into local government planning schemes. The document covers background on planning systems in Queensland under the *Integrated Planning Act 1997* and the *Local Government Act 1993*, identification of a generic range of NRM plan elements that may be relevant to local governments for purposes of implementation, and a discussion of options to integrate these into planning schemes. The estimated completion date for this project is June 2007.

The MWNRM, through the Land, Water and Waterways program, will support local government to integrate natural resource management issues into planning schemes and to have government works include the management of rural subdivisions, conservation of good quality agricultural land, and sediment and nutrient management.

G7 Encourage regional NRM bodies and river improvement trusts to develop closer links to ensure compatible and coordinated planning, actions and work programs

The NR&M released a discussion paper, *Review of the River Improvement Trust Act 1940*, in February 2005. The aim of the discussion paper is to outline the preferred options for better aligning the objectives and provisions of the Act, and the River Improvement Trust Regulation 1998, with current policy directions and legislation.

The aim of the *River Improvement Trust Act 1940* is flood prevention and mitigation by protecting, repairing and improving the beds and banks of rivers and adjacent flood-prone land. There are now 17 river improvement trusts functioning as statutory bodies under the Act. These trusts operate on several river systems on the north-east tropical coast and in the south-east corner of Queensland.

The discussion paper considers the major issues surrounding the current Act and presents the advantages and disadvantages of several potential models for a future framework to protect riverbeds and riverbanks and to mitigate floods. The issues discussed in the paper include:

- the potential for improved integration of trusts with local government, in terms of their responsibilities for flood mitigation and their role in funding of local works
- the opportunity for improved integration of trusts with community-based regional natural resource management planning activities
- the potential to improve linkages between the Act and the integrated development approval system inherent in the *Integrated Planning Act 1997*
- the potential for integration with the *Water Act 2000* and its current-day approach to water planning and management
- the new accountabilities required of statutory bodies and the new approaches to their operation.

Submissions on the discussion paper were called for in April 2005. Government is considering the results of the consultation.

Strategy H: Priorities and targets

H1. Develop water quality targets for the Reef catchment waterways with a major focus on: <ul style="list-style-type: none"> improving water quality investing in remedial action that ensures adequate protection and rehabilitation of wetlands, riparian and other vegetation important to water quality. 	Regional NRM bodies, NR&M, DAFF, DEH, GBRMPA, EPA, research bodies, WTMA	Completed 1 July 2005
H2. Incorporate the water quality targets established by the regional NRM bodies into the evaluation process of the Reef Plan	Regional NRM bodies, DPI&F, NR&M, EPA, DAFF, DEH, GBRMPA, research bodies, WTMA	Completed 1 July 2005
H3. Identify waterways, riparian areas and wetlands that are in good condition and should be preserved to protect water quality.	NR&M, EPA, regional NRM bodies, DPI&F, DEH, DAFF, GBRMPA, WTMA	Completed 1 July 2005
H4. In partnership with regional NRM bodies, identify sub-catchment hotspots responsible for delivering disproportionate quantities of sediment, nutrient and pesticides to the Reef.	NR&M, EPA, DAFF, GBRMPA, DPI&F, DEH, regional NRM bodies, WTMA	Completed 1 July 2005
H5. In partnership with regional NRM bodies, make wetland and riparian rehabilitation a high priority in high-risk Reef catchment areas.	NR&M, DAFF, EPA, GBRMPA, DPI&F, DEH, WTMA	Completed 1 July 2005

Overall progress and key strategic issues:

This strategy emphasises the risk-based approach used in the Reef Plan. That is, efforts are directed to those areas identified as having a high potential risk of further impact on the Reef. It also ensures that efforts are concentrated on protecting healthy waterways and identifying riparian areas that have a positive effect on water quality entering the Reef.

The actions contained in this strategy are highly interrelated and rely on the provision of good scientific information to inform the priority and target setting for water quality and wetland and riparian protection. Targets for water quality will be reviewed on an annual basis to incorporate new scientific information. Key achievements that have occurred over 2004–05 include:

- delivery of a short-term modelling project managed by the NR&M to assist regional NRM bodies in assessing and setting interim water quality targets
- setting of 'interim' water quality targets by regional NRM bodies. These targets are articulated in the regional NRM plans and investment strategies

- putting in place programs for identifying key waterways and riparian and wetland areas for rehabilitation and protection through regional NRM plans and investment strategies
- development of a decision support system under the Wetlands Programme to aid wetland prioritisation.

The key challenge for this strategy is to ensure that government, research institutions and regional NRM bodies continue to work together and that the most up-to-date information is available for setting targets and priorities.

There are five milestones under this strategy that are due on 1 July 2005. Three of these have been met and the other two are in the process of being implemented (H3 and H4); however, it is important to note that all actions in this strategy will be continually reviewed and updated as new information becomes available.

H1 Develop water quality targets for the Reef catchment

Related actions: G1, G3, H4

Regional NRM bodies have provided 'interim' water quality targets in regional NRM plans and investment strategies, acknowledging that these are the first steps in a process of continual improvement of resource condition targets.

The Reef Catchments Short-term Modelling Project has aided regional NRM bodies in assessing and setting 'interim' water quality targets. The NR&M leads the project in collaboration with the EPA, CSIRO, and the Cooperative Research Centre for Catchment Hydrology, and uses the catchment model SedNet and five interlocking tasks to develop and communicate information about the impact of land use practices on the long-term sediment and nutrient loads to the Reef lagoon. The SedNet model has been constructed for all the Reef catchment. The model uses new information to improve the accuracy and understanding of long-term annual sediment loads discharged from the major river catchments to the Reef. The modelling approach has been presented to regional NRM body stakeholders and preferred scenarios for possible catchment management actions have been identified. Future work will incorporate the improved annex module to calculate nutrient losses from the catchments.

A good example of where this information has been applied is the BDTB's Surface Water and Wetlands Package. The three programs within this package are water quality, water resource planning, environmental flows and efficiency, and wetland and riparian management. Some specific management actions include refining interim water quality targets and ensuring the targets are aligned with the Reef Plan; developing an integrated and coordinated multi-stakeholder monitoring program to include monitoring and assessment of water quality, wetland and riparian condition; and evaluating sub-catchment contaminant contributions. Other regional NRM bodies within the Reef catchment have applied a similar approach.

The NR&M is also currently undertaking riverine habitat condition assessments and reviewing management guidelines (NAP SIP WQ04 project). A draft document has been prepared for review by the science review panel within the NAP SIP activities.

H2 Incorporate the water quality targets established by the regional NRM bodies into the evaluation process of the Reef Plan

Related actions: H1

The NR&M has led the development of the Addressing the Reef Plan in regional NRM planning document (a module of the Guidelines for developing a regional natural resource management plan and regional investment strategy). It provides guidance on how regional NRM bodies can meet the commitments and expectations of the Reef Plan through their regional NRM plans. The module has been circulated to regional NRM bodies.

Further, the Reef Plan's Monitoring Evaluation and Reporting Strategy acknowledges that once the regional NRM bodies in the Reef catchment have set the water quality resource condition targets in respective regions these targets will need to be integrated into the evaluation process for the Reef Plan. These targets, together with information provided by monitoring and data collection programs associated with implementation of the Reef Plan, such as the Stream and Estuary Assessment program and the Queensland Wetlands Programme, may provide the basis for developing more specific targets for the Reef Plan overall (for example, reduce the load of pollutants by a given percentage).

H3 Identify waterways, riparian areas and wetlands that are in good condition

Related actions: D2, D4

A number of programs directly contribute to this action. These include:

Wetlands Programme

The Wetlands Programme will see wetlands in the Great Barrier Reef catchment mapped and classified. This mapping and classification will help the EPA identify which types of wetlands contribute to water quality in the Reef. Under this program, the DEH has contracted HLA Envirosciences to develop a decision support system. The decision support system will be used to achieve greater accountability in wetland prioritisation and will use biophysical, socioeconomic, community capacity and threat data. The system will be completed during the 2005–06 reporting period.

Regional coastal management plans

The development of regional coastal management plans will help fill the knowledge gap on how wetlands and riparian areas in these regions contribute to water quality. Plans have been developed for the Wet Tropics, Cardwell–Hinchinbrook, and Curtis Coast. Plans are currently being developed for the Dry Tropics, Mackay–Whitsunday and the Wide Bay areas. These plans describe how the coastal zone is to be managed, guide coastal zone related decision-making, and identify the coastal management districts in particular regions. Regional coastal management plans will implement the State Coastal Management Plan's policy framework at the regional level.

Regional NRM body plans, programs and investments

There are a number of programs undertaken by regional NRM bodies that are aimed at identifying healthy wetland and riparian areas, including the Priority Action Proposal in the Burdekin Dry Tropics region, the River Reach Assessment program in the Burnett Mary region, and the Fish Habitat Assessment Program in the Mackay–Whitsunday region. The FBA is in the process of identifying high priority coastal areas for delivery of on-ground actions.

The BDTB's Surface Water and Wetlands Package will implement waterway and wetland rehabilitation and conservation programs for priority systems by 2006, and will finalise and implement the Water Resource Plan and Resource Operations Plan for the Burdekin and Haughton River Basins by 2007.

H4 Identify sub-catchment hotspots responsible for delivering disproportionate loads of sediment, nutrient and pesticide to the Reef

Related actions: D8, H1

The Australian and Queensland Governments are jointly funding the development of an appropriate modelling, monitoring and target setting program for predicting nutrient concentration/load 'hotspots' and quantifying actions proposed to address these issues. Once available, outputs from this model will assist regional NRM bodies in identifying their water quality resource condition targets based on their management action targets.

A 'hotspot' modelling project is also being undertaken in conjunction with the FBA and the Cooperative Research Centre for Catchment Hydrology development project for the catchments within the Fitzroy Basin using experience and existing data. The results were used to develop an approach to describe the sediment delivery between plot and small catchment scale. Data were also used to build the Environmental Management Support System and SedNet models to predict whole-of-catchment sediment and nutrient (total nitrogen, total phosphorus) movement from its source.

This project has provided a focus on using spatial and temporal models to provide user-friendly outputs related to landscape processes and their impacts on water quality, the effect of management practices and estimates and predictions of catchment loads.

Through the NAP Water Quality Work Plan, the EPA is leading projects that will develop tools and products for regional NRM bodies to measure and monitor water quality. Queensland Water Quality on-line will give regional bodies access to the following tools and software: regional metadata (a query tool for accessing information), decision support tools for interpreting water quality data and making decisions, tools for community monitoring guidance and capacity, and reporting tools for regional integrated water quality condition assessments.

The DEH has extended the funding of Queensland natural resource management land use mapping of high priority catchments to include the Burdekin and Johnston catchments. This activity contributes generally to strategies D and H by providing the underlying data necessary for effective land use planning and target setting.

H5 In partnership with regional NRM bodies, make wetland and riparian rehabilitation a high priority in high-risk Reef catchments

Related actions: H1, H3

As noted under actions H1 and H3, the Australian and Queensland Governments are working with regional NRM bodies to make wetland and riparian rehabilitation a high priority through, for example, the development of supporting guidelines for regional plans (for example, wetland target setting identified in Reef Plan module 19) and the projects under the Wetlands Programme, such as the decision support system.

Strategy I: Monitoring and evaluation

I1. Report through the Great Barrier Reef Ministerial Council to the Prime Minister and the Premier of Queensland on the implementation of the Reef Water Quality Protection Plan.	Great Barrier Reef Ministerial Council, relevant Ministers	Report completed 1 July 2005 Report completed 1 July 2010
I2. Ensure that implementation of the actions in the Reef Plan are regularly and independently audited.	Reef Water Quality Protection Plan Steering Committee	Audit undertaken 1 July 2005 Audit undertaken 1 July 2010 Audit undertaken 1 July 2013
I3. Incorporate the goal of the RWQPP into the State and Commonwealth Governments' evaluation process for regional natural resource management planning.	NR&M, DAFF , local governments, DPI&F, EPA, DEH, GBRMPA, peak industry bodies, regional NRM bodies	Completed 1 January 2004
I4. Implement a water quality and ecosystem health long-term monitoring program in the Great Barrier Reef lagoon to track the effectiveness of the Reef Plan. Funding for this action will be settled as part of future Budget considerations.	GBRMPA	Implementation 1 July 2005
I5. Implement a coordinated water quality monitoring program in high-risk catchments to track long-term trends in water quality entering the Great Barrier Reef lagoon. Funding for this action will be settled as part of future Budget considerations.	NR&M , local governments, EPA, GBRMPA, peak industry bodies, regional NRM bodies	Program implemented December 2005
I6. As part of the coordinated water quality monitoring program, support and improve community- and industry-based water quality information collection programs in high-risk Reef catchments. Actions would include expanding the Waterwatch network to cover high-risk sub-catchments.	Regional NRM bodies, NR&M , DAFF DEH, DPI&F, EPA, Waterwatch groups, research bodies, peak industry bodies, Indigenous bodies	High risk catchments programs in place 1 July 2005
I7. Develop improved indicators for long-term water quality monitoring in Reef catchments in conjunction with the Cooperative Research Centre Reef and the Cooperative Research Centre Rainforest.	Research bodies , DPI&F, NR&M, EPA, DAFF, GBRMPA, DEH	Commenced 1 July 2003 Completed 1 July 2006
I8. Ensure the monitoring and implementing of local water quality improvement plans and	DEH, EPA, DLGP , GBRMPA, NR&M, regional NRM bodies	Report to Ministers on implementation 1 July 2005

environmental flow objectives are reviewed and addressed in other planning processes.		
I9. Evaluate and report on the environmental impacts of agricultural industries in relation to water quality entering the Reef and the management practices being implemented and developed by industries to address the issue.	Peak industry bodies	Report by 1 July 2005

Overall progress and key strategic issues:

This strategy focuses on the reporting and auditing process for the Reef Plan, including establishing water quality monitoring programs in the Reef lagoon and catchment as essential steps for reviewing the effectiveness of Reef Plan implementation. The strategy recognises the importance of the national funding programs and NRM plans in achieving the goal of the Reef Plan. It also identifies requirements for coordinating community monitoring and information, developing improved indicators, reviewing water quality improvement plans and public reporting on industry initiatives to address water quality impacts.

Key highlights from this year include:

- the finalisation and approval of all regional NRM plans and associated regional investment strategies. A condition of their approval was incorporation of Reef Plan objectives
- the development and implementation of the GBRMPA integrated marine monitoring program, which is assessing the status and trends of water quality and ecosystem health in the Reef lagoon. Outcomes from the monitoring program will be reported to governments and the community as an indication of the long-term effectiveness of the Reef Plan
- finalisation at present of a review of the Ambient Water Quality Program. The revised program—the Stream and Estuary Assessment program—will meet the requirements of the Reef Plan as well as the water quality information needs of Queensland's legislation and intergovernmental agreements
- an industry report on the agricultural industry initiatives seeking to improve natural resource management and minimise environmental impacts in the Great Barrier Reef catchment (see Annex 2)
- completion of the first independent audit of the Reef Plan, completed by 1 July 2005.

The key challenge that remains under this strategy is developing the ability to better coordinate, integrate and report on the results of the various monitoring programs to enable more comprehensive Reef Plan annual reports.

Thirteen milestones are recorded against this strategy, of which seven are due on or before 1 July 2005. Of these, all have been met and summaries of the activities that have occurred under each are reported below. Two milestones were 'to be advised': the GBRMPA's integrated marine monitoring program has been implemented and the state's Stream and Estuary Assessment program is currently on track to meet its implementation date of December 2005, as reported in last year's annual report.

I1 Report through the Great Barrier Reef Ministerial Council to the Prime Minister and Premier of Queensland on the implementation of the Reef Plan

Related actions: I2

Early in the 2005–06 reporting period the Reef Plan Secretariat will complete the report to the Prime Minister and the Queensland Premier, incorporating information from the 2004–05 annual report on implementation. The report will include present water quality trends and conditions of the Reef and its catchments, and findings from the first independent report on Reef Plan implementation and from a targeted community consultation process undertaken in May–June 2005.

I2 Ensure implementation of the actions of the Reef Plan are regularly and independently audited

Related actions: all

The first independent audit of the implementation of Reef Plan actions was undertaken within the 1 July 2005 deadline. The objectives of the audit were to independently assess progress made in implementing the Reef Plan and to identify barriers to, and drivers for, successful implementation. The performance of all key bodies (government and non-government) responsible for implementing Reef Plan actions was assessed.

I3 Incorporate the goal of the Reef Plan into the state and Australian Governments' evaluation process for regional NRM planning

Australian and Queensland officers developed a Reef Plan module (no. 19) to clarify for regional NRM bodies government expectations for delivering their responsibilities under the Reef Plan. Regional NRM bodies, through the WQCG, have developed an addendum to module 19 to further clarify matters to do with the use of the outcomes of the water quality modelling, monitoring and target setting program. All regional NRM bodies adjacent to the Reef have incorporated the goal and objectives of Reef Plan into their regional NRM plans and regional investment strategies.

I4 Implement a water quality and ecosystem health long-term monitoring

The GBRMPA is managing an integrated marine monitoring program, which is assessing the status and trends of water quality and ecosystem health in the Reef lagoon. Outcomes from the monitoring program will be reported to governments and the community as an indication of the long-term effectiveness of the Reef Plan. The marine monitoring program focuses on four basic components: river mouth water quality, marine inshore water quality, inshore marine biological change, and changes in bioaccumulation within inshore crab populations.

A consortium, guided by the Reef Cooperative Research Centre, is undertaking the marine monitoring program and includes researchers from the Australian Institute of Marine Science, James Cook University, the University of Queensland, CSIRO, the NR&M and the DPI&F. The GBRMPA is also encouraging community participation in the marine monitoring program by identifying opportunities for hands-on monitoring by local community and coastal industry groups, and by coordinating their efforts.

The BDTB's Marine and Coast package also provides investment funding to protect and improve the condition of estuaries, coastal and marine assets, to regularly monitor and review coastal and marine condition, and to restore connectivity between freshwater and marine ecosystems.

I5: Implement a coordinated water quality monitoring program in high-risk catchments to track long-term trends in water quality entering the Great Barrier Reef lagoon

As noted in the introduction to this report, the NR&M and the EPA are reviewing the Queensland's Surface Water Ambient Network Program to meet the requirements of the Reef Plan as well as the water quality information needs of Queensland's legislation and intergovernmental agreements. The Stream and Estuary Assessment program will monitor and assess the key drivers (land use change, land management practices, and land cover) and vectors (stream flow, loads of sediment, nutrients, and other contaminants) within the Reef catchment.

The proposed new monitoring program is expected to be implemented by December 2005; however, the monitoring results from this program are not likely to be available for 18 months after the initial implementation of the program.

I6 Support and improve community and industry-based water quality collection programs in high-risk Reef catchments

A number of key projects and programs are contributing to this action. These include:

Integrated Great Barrier Reef Catchments Water Quality Monitoring Program

The NHT Interim Funding Agreement (IFA) 08 project, Integrated Great Barrier Reef Catchments Water Quality Monitoring Program, is a 12-month project to develop a framework and implementation strategy for the provision of water quality data and information to enable Reef regional NRM bodies to manage water quality impacting on the Reef lagoon and to meet their obligations under the Reef Plan. The project will examine data collection, data management, analysis and interpretation and information provision issues and negotiate strategies for the improved delivery of water quality data and information.

The project coordinator was appointed in December 2004 and commenced duties in February 2005. The initial focus was on the development of a preliminary information framework. The reports, *A review of regional body water quality information needs for reef outcomes* and *A monitoring and information framework to support regional body resource management for reef outcomes – a discussion paper*, were presented to the WQCG in April 2005. These two documents can be downloaded from http://www.eberhardconsulting.com.au/Reef_reports.html.

The review identified priority activities for consideration as part of the consultancy deliverables within the project. These will address assessment methods and information products, information management and delivery systems, and data collection activities. The terms of reference for these activities are being finalised and will necessitate detailed discussions with existing Queensland and Australian Government service providers before the parties can commit to them. A two-day workshop was held in Brisbane in June 2005 with representatives of each of the Reef regional bodies to further develop the priority information needs and products.

The MWNRM, in partnership with the Integrated Reef Catchments Water Quality Monitoring Program, will support community- and industry-based water quality monitoring programs, including the expansion of networks to cover high-risk sub-catchments. The monitoring will also determine the effectiveness of the on-ground actions and the success of achieving water quality targets.

Waterwatch

The DEH provided funds in 2004–05 to support the employment of Waterwatch facilitators in the Wet Tropics and Mackay–Whitsunday regions. These officers will directly support the Mackay–Whitsunday NRM body and the Far North Queensland NRM regional bodies and will work collaboratively with other cross-regional stakeholders, including NAP regional water quality officers and NAP SIP WQ05 project officers.

The project will:

- provide training and technical support to address community monitoring needs and gaps in high-risk non-NAP Reef catchments (standardised with NAP activities where appropriate)
- implement technical and data confidence tools for community waterway monitoring that ensure comparability of data between community-based, state-wide and regional monitoring programs
- support regional monitoring partnerships between community networks and other stakeholders in freshwater, estuarine and marine systems
- work collaboratively with other NRM stakeholders, including regional NRM bodies, state agencies, technical advisory groups and staff, to establish and implement regional data confidence programs.

This will ensure that community monitoring activities complement state-wide and cross-regional monitoring programs and priorities and provide valuable information at an appropriate scale on the effectiveness of management actions in achieving resource condition targets. Further information on Waterwatch can be found at <http://www.waterwatch.org.au/>.

Other activities

The following programs are also providing support to community and industry-based water quality information collection programs:

- The DPI&F continues to provide ongoing support for community-based monitoring of change in seagrasses (Seagrass-Watch) at various locations along the Reef. Further information can be found at <http://www.seagrasswatch.org/Australia.html#AUSTRALIA>.
- The DEH has provided funds to employ two facilitators to support regional bodies in engaging Indigenous communities in meeting the regional management action targets for water quality. This engagement will foster cross-cultural awareness and enhance the capacity of community monitoring networks to implement on-ground actions. Engagement through the project will also promote key components of regional plans, including capacity building, on-ground works, and monitoring and evaluation.
- The EPA is providing technical assistance to community groups through NAP SIP program to develop quality assurance products that help community groups to monitor water quality.

- FNQ NRM Ltd's Participatory, Planning, Monitoring and Evaluation Package includes a number of projects that will contribute to Reef Plan objectives. In particular, it will support community water quality monitoring (including monitoring programs to cater for (i) end of river, (ii) sub-catchment nutrient and sediment loads, and (iii) property-scale), and the integrated Reef catchments water quality monitoring program.

I7 Develop improved indicators for long-term water quality monitoring in Reef catchments in conjunction with the Reef and Rainforest Cooperative Research Centres

The Australian Government has supported the joint Catchment to Reef program of the Reef and Rainforest Cooperative Research Centres through to 2006 with more than \$2 million to develop new protocols and tools to identify, monitor and mitigate water quality problems and to assess the health of aquatic ecosystems in the Wet Tropics and Great Barrier Reef World Heritage Areas. This is a three-year program which will be completed in 2006. It will provide the tools landholders, industry and other stakeholders need to monitor the effects of land use changes and restoration on water quality.

Three projects have been undertaken under this action:

1. riparian performance: tools and protocols for assessment, monitoring and development of guidelines for improvement. Through this project, the ability of the riparian zone to trap sediments and nutrients is being investigated, as are other benefits of riparian vegetation. Outcomes of this project will assist with facilitating riparian zone buffer management
2. monitoring tools for water quality assessment against benchmarks. The primary output of this project is a manual containing comprehensive guidelines for water quality monitoring in the Wet Tropics. The project is also investigating the deficiencies in existing water quality and management practices and developing a discussion paper outlining frameworks for the development and implementation of risk-based water quality strategies
3. achieving outcomes: adoption of tools through training of the current and new generation of practitioners.

The project is communicating the results of current research to stakeholders through regular communication products and manuals on monitoring, analysis and interpretation. Training in the application of the monitoring guidelines and protocols will be provided to relevant agency personnel and other interested individuals from July 2005 onwards.

I8 Ensure the monitoring and implementation of local water quality improvement plans and environmental flow objectives are reviewed and addressed in other planning processes

Four regional NRM bodies adjacent to the Great Barrier Reef will develop water quality improvement plans: Wet Tropics, Burdekin, Mackay–Whitsunday and Burnett Mary. Regional NRM bodies will be entering into partnerships for delivering water quality improvement plans and projects. Implementation, monitoring and review will be incorporated as part of the development of each water quality improvement plan.

As well as the formation of water quality monitoring networks/alliances to undertake water quality monitoring and to oversee the development and implementation of water quality improvement plans, the BMRG has also committed to:

- promoting the engagement of the community in water management decision-making and management processes
- assisting the communication efforts to enhance common understanding of 'shared resource' concepts and engagement in establishing and reviewing performance measures of key Water Resource Plan outcomes (for example, environmental flow objectives).

I9: Evaluate and report publicly on the environmental impacts of agricultural industries in relation to water quality entering the Reef and the management practices being implemented and developed by industries to address the issue

Related actions: A3, A4

As noted in action A3, peak industry bodies, the QFF and Agforce, have prepared a report to meet their 1 July 2005 commitments under actions A3 and I9. This report details the development and implementation of a range of agriculture industry initiatives that seek to improve natural resource management and minimise environmental impacts in the Great Barrier Reef catchments. This report is attached at Annex 2. Government and industry will negotiate future reporting arrangements for reviewing the uptake of best management practices.

**A report
on agricultural industry initiatives seeking to improve
natural resource management and minimise environmental
impacts in the Great Barrier Reef catchments**

July 2005



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1 Introduction

1.1 Rationale

This report has been prepared by Queensland's agricultural industry to assist government meet its reporting requirements for the Reef Water Quality Protection Plan (Reef Plan) 2004/2005 Annual Report. Information presented in this report will help inform the Annual Report, particularly *Focus Area 2 – Adopting Sustainable Production Systems*.

Action 9 of the Reef Plan, under *Strategy I, Monitoring and Evaluation* states peak industry bodies are to evaluate and report publicly on the management practices being implemented and developed by industries to address the environmental impacts of agricultural industries on water quality entering the Reef.

Action 3 and 4, under *Strategy A - Self Management Approaches* can be summarised as supporting industry led development of best management practices for agricultural land. A significant component of this action is a review of uptake of best management practices in agricultural industries in the Great Barrier Reef catchments. Under Action A3, the Department of Primary Industries and Fisheries (DPI&F) was given lead responsibility to conduct this review in consultation with industry. A separate report titled *A Review of sources of data indicating uptake of Best Management Practice (BMP) by rural landholders in the Great Barrier Reef catchments*, prepared by the Department, details the results of this review.

1.2 Scope of Report

This report includes information relating to the cotton, dairy, horticulture, grains, grazing and sugar industries. Due to the Reef Plan's focus on diffuse sources of pollutants, a conscious decision was made not to include in the report the intensive animal industries such as poultry and pork as well as prawn farming and aquaculture. The Intergovernmental Organisational Committee has endorsed the scope of the report.

Taking into account the rationale as outlined above, this report emphasises the development and delivery by industry organisations of initiatives that support the adoption of environmental management practices, rather than reporting on actual implementation. However, where available, implementation data is presented.

Information is presented on a commodity-by-commodity basis. It should be noted that information presented is applicable beyond the Reef catchments, as the industries are not found solely in the reef catchments. Data presented is not reef catchment specific unless otherwise indicated.

Each industry has reported, where able to, on the following:

- **Background:** - General introduction to the industry in the Reef catchments, including regions where the industry is located, estimations of the number of growers/producers involved, area under production and the economic value of the industry.

- **Industry Initiatives** – Information on each industry-led initiative that seeks to minimise impacts on the environment arising from farming and/or promote improved natural resource management. Initiatives include things such as codes of practice, farm management systems, and /or training and extension programmes. Information reported where able to includes:
 - **Recommended Best Practice:** - the way in which best practice is used, types of best practice recommended, the research and development of practices.
 - **Current Implementation Levels:** - data on participation and implementation of initiatives where available.
 - **Initiative Evaluations/Industry Environmental Audits:** - details of past evaluations/audits as well as any planned for the future.
 - **Investment:** - costs of industry investment in the initiative.
 - **Strengths, Weaknesses and Gaps:** - brief assessment of the initiatives strengths, weaknesses and gaps.
- **Future Directions:** - a brief account of the industry's desired next steps in the area of environmental and natural resource management.

1.3 Report Authorship & Compilation

This report has been prepared jointly by staff from AgForce and the Queensland Farmers' Federation (QFF), including contributions from QFF member organisations, CANEGROWERS, Cotton Australia, Growcom, and Queensland Dairyfarmers' Organisation.

AgForce represents Queensland's broadacre industries of cattle, grain and sheep and wool. The Queensland Farmers' Federation is a collective of intensive rural industry organisations representing the cotton, sugar, horticulture, dairy, meat chicken, prawn farming, nursery, aquaculture plus a number of smaller industries.

Information and data presented in this report has been compiled by drawing upon a number of internal and public industry publications and studies, commissioned government and industry studies by consultants as well as anecdote and qualitative data from the industry organisations.

2 Broadacre Industries - Grazing and Grain

2.1 Grazing and Grain growing in the Great Barrier Reef catchments

AgForce is a peak organisation representing Queensland's rural producers, which strives to ensure the long term growth, viability, competitiveness and profitability of broadacre industries of cattle, grain, sheep and wool in Queensland.

Grazing and grain production is widespread throughout the reef catchments. Grazing occurs extensively throughout all of the reef catchments and is valued at well over \$1 billion at the farm gate per annum. In the Fitzroy Basin for example grazing occupies approximately 85% of the catchment and is the largest agricultural contribution with an estimated farm gate value of \$850 million annually.

Grain production in the reef catchments is concentrated in the Central Queensland Cropping areas, which occurs in the Fitzroy and Burdekin catchments. Grain production in the Fitzroy alone is valued at over \$230 million annually.

Grazing occurs in a range of highly diverse environments in the reef catchments. This ranges from the Wet Tropics in the North to the grazing savannas in the Fitzroy and Burdekin. As a result, prescriptive practices for grazing management are not appropriate. Unlike more intensive industries, where production systems may be relatively homogenous, the extreme diversity of environments that graziers operate in render prescriptive practices invalid.

2.2 Industry Environmental Initiatives

Since the final publication of the Reef Water Quality Protection Plan AgForce has come a long way in meetings its requirements under the Reef Plan. Although these are mostly incorporated around Actions A3, A4 and I9, AgForce has been involved in a large number of ongoing processes that will effect the on farm management environment. AgForce was highly involved in the Vegetation Management Legislation that was passed in 2004 and is in current discussions with the State Rural Leasehold Land Strategy. Not one of these processes can be viewed in isolation, as they all affect the ability of producers to effectively and optimally manage the resources on which they farm.

AgForce is also involved in a range of programs looking at broader issues in rural Queensland. The *Blueprint for the Bush* is a joint partnership between AgForce and the Queensland Government. It is a proactive attempt to develop a ten year plan focusing on rural community renewal and development. The blueprint will identify ways of improving economic, social, environmental and cultural development in rural communities.

One early issue that is arising from *Blueprint* discussions is the lack of producer trust towards the Government. Increased regulation has changed the nature of government services and presence in many areas and commonly Departmental roles have been changed from extension to compliance.

The Reef Plan and AgForce's response to it is a genuine indication that AgForce is keen to pursue win-win outcomes for its members and the broader community. AgForce values

sustainable production that optimises production and environmental outcomes. AgForce is proud of the achievements regarding Reef Policy thus far, but notes that this is just the beginning. With this in mind AgForce looks forward to moving its industries forward into the 21st Century.

2.2.1 Grazing

The grazing industry has invested heavily in natural resource management in its production systems with a view to improving the knowledge base of the diverse grazing production systems. Knowledge generation assists in the development of tools that can assist producers improve their on farm management practices. Meat and Livestock Australia (MLA) is a levy funded body and has completed significant research in the Reef catchments.

The EDGENetwork is owned by MLA and boasts a range of practical workshop sessions and learning opportunities that help primary producers gain knowledge and develop skills to improve their livestock enterprises.

The EDGENetwork in conjunction with the DPI &F has developed Grazing Land Management (GLM), which delivers strategies to increase both profitability and sustainability. GLM is a regional package that assists producers to become more effective managers. The workshop consists of 7 modules, that is:

1. Understanding the grazing ecosystem,
2. Managing grazing,
3. Managing fire,
4. Managing sown pastures,
5. Balancing trees and grass,
6. Managing weeds, and
7. Developing a grazing management plan.

The workshop uses an interactive style, building on the participants' knowledge. A locally relevant case study property is used to look at different management options.

AgForce believes that GLM has the ability to assist many producers to become better producers, through increasing production and reducing their environmental risk. AgForce is using the strong leadership it has shown through AgForward (see section 2.3.3) to encourage producers to attend GLM workshops.

Other programs that MLA is currently working on include:

- **Sustainable Grazing for a Healthy Burdekin Catchment** – the objectives of this project are:
 - Validate and further develop sustainable grazing management practices for the Burdekin catchment,
 - Develop tools for evaluating and documenting the effects of a range of resource management practices,
 - Refine computer models so that they can predict sediment and nutrient transport into waterways and throughout catchments,

- Provide quantitative measures of the short-term effectiveness of recommended sustainable grazing management practices, (for example: Ecograz) and their impacts on forage production, cover, and runoff of water, sediment and nutrients for reducing sediment and nutrient export from grazed lands,
 - Refine and validate tools for setting realistic and measurable targets for reductions in sediment and nutrient loads in rivers based on robust and reliable modelling tools, and
 - Inform and make more knowledgeable 50% of beef producers in the Burdekin about implementing best-practice management guidelines and their impacts on forage production, water use efficiency, and runoff.
- **Keeping it in place: Controlling sediment loss on grazing properties in the Burdekin River catchment – a discussion paper**
 - **Sustainable Grazing for Tropical Savannas – Wambiana Grazing Trial**, – the objectives of this project are:
 - Quantify the medium-term (8 years) effect of different utilisation rates and grazing strategies on resource condition, animal production and economic return,
 - Identify key management principles for the sustainable management of tropical savannas,
 - Develop practical management guidelines that allow graziers to manage their natural resources in a sustainable and viable manner,
 - Develop practical decision tools that producers can use in pasture condition assessment and forage budgeting, using climate forecasts to adjust stock numbers and adjusting animal numbers in relation to feed supply,
 - Develop empirical relationships that relate pasture production, animal production and soil loss to utilisation rate, and
 - Make at least 60% of producers in the Burdekin and Flinders catchments aware of these principles, guidelines and decision tools.
 - **Quantifying and predicting patch selection by cattle under different management strategies** - the objectives of this project are:
 - The impact of utilisation rate on patch and landscape selection by cattle at Wambiana will have been quantified,
 - The major biophysical determinants driving patch and land type selection at the Wambiana field site will have been identified,
 - Robust empirical relations that relate patch and land type selection by grazing cattle to soil and vegetation characteristics will have been constructed for the Wambiana site and these relations tested in a large, commercial paddock, and
 - Preliminary management guidelines to enable graziers to manage large, spatially heterogenous paddocks in a sustainable and productive manner will have been developed.
 - **Neighbourhood Catchments - Minimising the Impacts of Grazing in the Fitzroy Catchment** – the objectives of this project are
 - Quantify runoff, soil erosion and pollutant transport at a paddock to neighbourhood catchment scale,

- Understand the causes and processes that lead to a decline in water quality at a paddock, property and neighbourhood catchment scale, and relate responses to catchment condition,
- Increase the adoption of sustainable grazing and resource management systems at a property, neighbourhood, sub-catchment and basin scale within the Zamia Creek catchment at Bauhinia Downs, west of Moura, central Queensland,
- **Evaluation of MODIS for groundcover and biomass/feed availability estimates in tropical savanna systems** – the objectives of this project are:
 - Establish relationships for ground cover and pasture biomass/feed availability between field measurements and MODIS indices,
 - Write guidelines for the use of MODIS data in the estimation of groundcover and biomass/feed availability at a range of scales,
 - Provide participating producers with the tools and techniques for collecting field data for property/paddock based calibration in support of prototype MODIS estimates of ground cover and pasture biomass/feed availability, and
 - Develop a prototype framework for the automated delivery of prototype remote sensing products of groundcover and pasture biomass and report on the requirements for operational and near-real time delivery.

Rangelands Australia (RA), an initiative within the research organisation, is a strategic response to national reports on education and training in order to support sustainable management of Australia's pastoral industries. It addresses the need for curricula/programs in rangeland management, based on courses that are more aligned with stakeholder needs, encompass practical as well as theoretical aspects of management, and better integrate production and environmental issues. The outcomes will be:

- a new generation of cattle and beef producers, more qualified in rangeland management and with strong business and environmental credentials, and
- a larger pool of skilled, qualified rangeland professionals to better support further development and change in the cattle and beef industries.

The abovementioned projects do not represent a complete list of projects involving grazing in Reef catchments but demonstrates the very real investment that the Grazing industry has and will continue to make towards improving on ground land management practices.

2.2.2 Grain

The grains industry has in the past been involved in numerous environmental programs that occur in the Reef catchments such as the DPI&F's Central Queensland Sustainable Farming Systems whilst at the regional scale, regional Natural Resource Management (NRM) groups are integrating the existing management into their catchment and sub catchment planning processes.

AgForce Grains has appointed a specific taskforce to pursue the development of a training package similar to GLM to enhance the ability of Queensland graingrowers to deliver sustainable production. Initially the taskforce is investigating those packages that currently exist for grain production. Already, the Grains and Research Development Corporation (GRDC), the DPI&F and some universities have developed grain packages. AgForce does not intend to reinvent the wheel but rather, harness the good work that has been completed to deliver a package that achieves an optimal outcome for growers and the environment.

The grains industry has invested heavily in investigating the management practise that grain producers implement.

The Central Queensland Sustainable Farming Systems Project began in 1997. A major aim of the project was for the quick adoption of emerging technology to make farming in central Queensland more profitable and sustainable. Ten farmer groups were established, Kilcummin, Capella, Dysart, Gindie/Fernlees, Gindie/Orion, Bauhinia, Theodore, Baralaba, Jambin and Wowan. Each group had at least one development site to investigate issues important to the farmers in that group. Most groups also had 'spin-off' sites to enable 'a short term look' at an issue important to the group. During phase one of the project a number of issues and technologies were identified by the farmer groups that they considered important to improving profitable and sustainable farming in the area. These included:

- Zero or minimum till,
- Controlled traffic,
- Opportunity cropping,
- Improving water and nitrogen use efficiencies,
- Increasing the use of legumes in farming (grain, annual and perennial), and
- Weed management.

The project played an important role in encouraging farmers in the uptake of this technology. When reviewed by GRDC in 2001, the project was given a very positive report by farmers within groups and in the wider community. Funding by GRDC for another five years was granted. To ensure that we are still working on the important issues and that farmer dollars are hitting the mark, GRDC has decided that a mid term review (August–September 2005) is appropriate.

In the last couple of years, drought in most farming districts in central Queensland forced more trials to be conducted at either the Emerald or Biloela Research Station which meant fewer trials done on-farm. Farmers have valued the larger scale on farm development sites, frequently on similar soil types to their own. Recently many farmers have also seen the benefits of small, more complex replicated trials at research stations.

Another GRDC funded project was titled 'minimising the impacts of grain cropping at a paddock to neighbourhood catchment scale.' The project quantified soil erosion rates and water quality (particularly nitrogen and atrazine) between downslope and across slope farming at the paddock scale, and the impacts of catchment condition on water quality. Current adoption rates of improved practices have been spatially documented, and the impacts of these improved practices on sediment loads to streams have been modelled. Outputs have been delivered to grower groups, conferences, NRM groups, etc.

A telephone survey of 99 grain growers showed that 75% of properties had installed contour banks, 33% had adopted zero tillage with a further 50% undertaking reduced tillage. Controlled Traffic Farming, a relatively new technology, was adopted by 36% of growers. These results show that the grains industry has adopted technologies and practices that reduce sediment loads to the river network, thereby potentially reducing the impacts on aquatic environments (river, estuary and inshore).

Results from this project (water quality monitoring, adoption data and modelling) have shown the need to manage natural resources at a neighbourhood catchment scale. Stream water quality is related to catchment condition, and reductions in sediment loads have been made due to the adoption of improved management practices in the grains industry. To realise the full benefit of the reductions that are possible, all landholders (grazing, cropping, etc.) need to be involved in improving the resource condition of their property to maximise off-farm benefits.

Regional NRM Groups such as the Fitzroy Basin Association are also working closely with growers across the State and are developing a range of programs that fit in line with their regional planning processes. AgForce will strive for cohesion so that growers have a simple choice when approaching land management packages.

2.2.3 AgForward

AgForce is the deliverer of AgForward on behalf of the major rural industries of Queensland. AgForward is a program that has been funded by the Queensland Government for 4 years and was formally launched on May 19 2005. It is focussed on training and moving rural industry forward. Its aim is to help producers fine tune their operations by using modern technology and information so producers can base their decisions on the latest information.

Importantly, AgForce as the program deliverer will lead by promoting good land management and the supporting decision making tools. AgForward alone will not deliver all of the solutions and hence must link in to complementary programs and other planning processes such as the regional NRM groups.

Phase one of AgForward will be the delivery of the foundation workshops throughout Queensland. At these initial workshops, there will be an analysis of the 'big picture' including future markets and their expectations. To assist producers fine tune their operations, a detailed overview of the States vegetation mapping including the Regional Ecosystem (RE) maps and Property Maps of Assessable Vegetation (PMAVs) will be essential.

Property planning will also be discussed, including the drivers for planning and methods for property plan development. At this stage strong linkages will be made to other training programs that exist for various industries. Also, an overview of the regional planning processes will be made to ensure that regional linkages are strong. For grazing there will be encouragement for producers to attend GLM workshops, highlighting the positive production and environmental outcomes that GLM offers.

Phase two of AgForward is still in development and will further deliver tools and information to landholders at a scale that is usable and effective. It will further build on the relationships developed in phase one particularly those with regional groups, Landcare, and other grower groups. There will be a strong initial focus on comprehensive property plans that are useful in the ongoing management of properties.

In summary, AgForward represents an exciting opportunity for rural industry to show genuine leadership by developing and extending tools and information that will drive Queensland's primary production into the 21st century. AgForward is a dynamic and flexible program that

will lift industry standards to meet future expectations from markets, Government and the wider community. AgForce is committed to the delivery and success of AgForward.

2.3 Future Directions

AgForce intends to significantly progress a number of issues and programs into the future. The sustainable use of Queensland resources is intrinsic to the sustainability of the broad acre industries in Queensland. These programs include the pursuit of a broadacre environmental audit, the roll out of AgForward, the delivery of GLM, and the development of a comprehensive grains package that will become integral to AgForward.

Broadacre Environmental Audit

AgForce is interested in investigating the development and implementation of an independent environmental audit/survey of members/landholders to demonstrate environmental credentials to the community.

The audit/survey would be a state of the environment style report from a broadacre agricultural perspective including grazing cattle, sheep, goats and grain growing.

The intent is to benchmark industry wide performance of landholders response to increasing environment requirements on balance with production of food and fibre.

The end aim is delivery of an industry wide reporting mechanism would give governments and the community the confidence that landholders were looking after the environment, progress to date and future improvement. The report could be done across regions and state levels as well as industry level.

AgForce is seeking funding through the NHT to get independent consultants to undertake the report. It is estimated that it would cost between \$300 000 - \$500 000.

The TORs would include:

- Conduct a comprehensive environmental audit of Queensland's broad acre industries, including conducting a stock take of management practices across different farms,
- Priorities for enhanced environmental management being identified in different bioregional areas,
- Outstanding examples of voluntary farmer actions would be highlighted as a basis for learning and the development of improved environmental management,
- Assessing stakeholder engagement in regional NRM planning and highlight reasons for any barriers to engagement, and
- Consideration of the requirements of Government in regard to environmental improvements relating to Reef Plan, regional targets, and Government priorities.

AgForce believes that this project would be extremely beneficial to Queensland's broadacre industries and Government policy makers.

AgForward Roll out

Over the next four years AgForce will continue to roll out the AgForward program. Importantly phase two of the program will require more linkages to be made with regional NRM groups and other associated organisation.

AgForward will need to streamline its program to suit other rural industries and there will be a real need to review workshops to ensure quality maintained.

AgForce is committed to growing and lifting AgForward and is proud of this proactive step to address any community concerns.

GLM development and workshops

The development of GLM is near completion for the reef catchments. Moving forward the delivery of the workshops will require careful planning. AgForce will be encouraging members to attend the workshops, importantly, by highlighting the positive attributes of the cause. That is the ability to deliver win-win outcome for production and for the environment.

AgForward is expected to generate a fair deal of interest in GLM and DPI&F, regional Groups and AgForce need to be able to manage the demand. Furthermore, demonstrable outcomes of the GLM implementation will need to be monitored, the environmental audit is a key component of this demonstration.

AgForce will continue to develop a comprehensive grains package that will become integral to AgForward.

AgForce grains will continue to pursue the development of a grains land management package that offers real value to growers. This process will not result in duplication but rather lever off the good work that has already been completed by the industry and associated groups.

3 Cotton Industry

3.1 Growing Cotton in the Great Barrier Reef Catchments

The only commercial cotton growing undertaken in Great Barrier Reef catchments occurs in the Fitzroy Basin. Area planted to cotton under normal growing conditions is typically 20,000 – 22,000 hectares in the Emerald region and approximately 7,000 in the Theodore district. The region has experienced a small decline in area planted over the last few years due to the drought (7,000 hectares across the two areas). There are approximately 50 landholders who grow cotton in the Emerald region and 25 in Theodore / Biloela.

3.2 Industry Environmental Initiatives

The cotton industry has undertaken a range of initiatives to improve the industry's natural resource management and environmental performance. The primary initiative is the Australian Cotton Industry Best Management Practice (BMP) Program, which is a grower-driven, cotton industry initiative that combines sound science with proven practical management recommendations to benefit the community and the environment.

A brief history of activity and initiatives includes:

- The first industry-wide environmental audit. Undertaken by the Australian Cotton Foundation (now Cotton Australia), this audit examined activities across all industry sectors and made 75 recommendations (see section 3.2.2 for more information.)
- A 1991 study looking at the impact of pesticides on the riverine environment. This study was a joint initiative of the Land and Water Research and Development Corporation, Murray Darling Basin Commission, and the Cotton Research and Development Corporation (CRDC). The study showed that whilst there was no impact at that time, there was a risk to the environment, and recommended the industry implement some strategies to manage this risk.
- The Australian Cotton Industry BMP Program's first BMP Manual was released in 1997, after 6 years of program development; in response to the 1991 study recommending industry take a proactive approach to dealing with the issue of risk. Programs and initiatives from around the world were analysed in the development of the BMP Program. The BMP Manual contained four modules: Application of Pesticides, Storage and Handling of Pesticides, Integrated Pest Management (IPM) and Farm Design and Management. See Section 2.2.1 for more information).
- In 1999 the cotton industry began the Cotton and Grains Rural Water Use Efficiency Initiative (RWUEI) program in partnership with the Department of Natural Resources and Mines. This program benchmarked existing water use efficiency practices and provided technical extension to growers to improve their water use. (See section 2.3)
- The second edition of the BMP Manual was released in 2000. The content of the manual was updated and a new module on Farm Hygiene added.
- A Petrochemical Storage and Handling module was released in 2002.

- In 2003, the industry (through CRDC) commissioned a second industry environmental audit. This audit revisited the recommendations from the first audit and found the industry had made significant advances over the last 12 years. This audit also made a new series of recommendations for industry to progress, which the industry has embraced. (See Section 2.2.2).
- In 2003 the cotton industry (through Cotton Australia and CRDC) was chosen as one of fifteen national pilot projects to participate in the Department of Agriculture, Fisheries and Forestry (DAFF) EMS National Pilots Program. Through this project the cotton industry undertook to develop the Cotton BMP Program into a comprehensive Environmental Management System (EMS) through the development of a Land and Water module.
- In 2003 the industry embarked on a RWUE Stage 2 program again with the Department of Natural Resources and Mines. This program was to build on the success of the first RWUEI.
- In 2004 the industry conducted an evaluation of the effectiveness of the Cotton BMP Program. This evaluation also demonstrated the effectiveness of the BMP Program in changing growers' practices over the last five years.
- In 2004, the industry (through CRDC) initiated a project with DAFF through their Pathways to EMS Program to investigate the linkages between environmental performance and quality to end users.
- The industry (through the Cotton CRC) released Guidelines for the Management of Riparian Areas in 2004.
- The BMP Land and Water Management Module was released to the industry in January 2005. This module is the industry's commitment to natural resource management.

3.2.1 Australian Cotton Industry BMP Program

The Australian cotton industry's commitment to reducing the impacts of cotton farming on the natural environment, neighbours, workers and the community is best seen by the way the industry has developed and implemented its Best Practice Management (BMP) Program. Implementation of the Program is one of the biggest undertakings of the cotton industry and is often seen as setting an example for the rest of the rural sector.

The BMP Program is a voluntary environmental management program that seeks to ensure the potential environmental impacts of cotton production are minimised. Adoption of BMP involves the commitment to a process of continuous improvement. Growers develop flexible, practical plans for improving their farm management and environmental performance, and progress is assessed by an independent audit.

The goals of BMP are to see the development of a cotton industry:

- whose participants are committed to improving farm management practices;
- whose participants have developed and follow policies and farm management plans that minimise the risk of any adverse impacts on the environment or human health; and

- which can credibly demonstrate to the community stewardship in the management of natural resources and farming operations.

BMP is a risk assessment process that contains the core elements of a simple environmental management system. It is based around the same *plan-do-check-act* adaptive management cycle that a formal EMS is. Growers involved in the BMP Program therefore already have in place many of the components of an environmental management system.

Industry Commitment

The cotton BMP importantly has the support of the key industry bodies, including Cotton Australia (responsible for implementation and policy advocacy), the Cotton Research and Development Corporation (development) the Australian Cotton Grower's Research Association (support) and the Australian Cotton CRC (soon to be Cotton Catchments Community CRC at 1 July 2005) (research that underpins the best practice guidelines). The Australian Cotton Industry Council (ACIC) has endorsed BMP as a core program.

Elements of the BMP Program

The BMP Program is designed to help growers improve their farm management practices. The key tool for growers to undertake BMP is the BMP Manual. The BMP Program involves:

- Growers reading through the information booklets contained in the BMP Manual and working through the self-assessment worksheets to assess their farm operation,
- Growers then writing and implementing action plans to address issues identified through self-assessment. These action plans require growers to commit to timeframes, and
- An independent audit is then arranged to assess the implementation of BMP. This provides the grower with recognition for the work done, as well as advice on areas that can be improved. The audit teams are appropriately skilled to conduct the audit and assist growers with any problems they may have with their planning and implementation. Auditing is undertaken against industry agreed certification standards. Growers are then certified to the Program on demonstration of having met or exceeded these standards and on demonstration of the continuous improvement philosophy,

Five modules currently make up the core of the BMP Program. These include: *Application of Pesticides*, *Chemical Storage and Handling*, *Integrated Pest Management*, *Farm Design and Management* and *Farm Hygiene*. Two other modules: *Storage and Handling of Petrochemicals* and *Land and Water Management* are also available and are being implemented by growers. These two modules will become a core component of the Program in 2007. At present they are voluntary in order to allow growers time to adopt the Program without being overburdened with the content.

In addition to the modules with an environmental focus, the industry also has an Occupational Health and Safety course/module, *Managing Cotton Farm Safety*, which sits beside the BMP Program to address on-farm health and safety issues.

On-farm activities of the BMP Program

The self-assessment sheets and workbooks in the BMP manual identify for growers 'best practice' activities that are designed to negate or minimise potential impacts of day-to-day farming activities. The best practice guidelines are underpinned on science. Below is an outline of the objectives contained in each module and best practice actions to achieve the objectives.

Farm Design and Management Module

The design and management of a cotton farm plays an important role in minimising the risk of pesticide being transported off the farm. The design and management of the farm can determine:

- how and how much water is transported around a farm, and how much soil is moved by the water;
- how much water can be retained on the farm; and
- where water leaving the farm ends up.

This section highlights practices that can help minimise the off-farm movement of pesticides in irrigation water and stormwater run-off.

Objectives and best practice actions:-

- Minimise erosion and control water on-farm:
 - Water containment on-farm,
 - In-field erosion minimal – furrow lengths designed (where possible) to suit conditions, and
 - Laser levelling of low spots.
- Minimise the impact of storms:
 - Written plan for managing storms is in place,
 - Run-off from most severe storms contained on-farm, and
 - First flush of run-off from a treated (chemically) area is retained on-farm.
- Erosion and run-off control:
 - Groundcover is maintained where possible,
 - Strip cropping used in floodplain areas,
 - Opportunity cropping used where possible, and
 - Slope lengths reduced where possible.
- Control and clean-up run-off on farm:
 - Run-off diverted away from sensitive areas where possible,
 - Drains or natural drainage lines used for filtration and sedimentation, and
 - Buffer zones utilised between cropping and sensitive areas.
- Use of buffer zones:
 - Vegetative buffer zones used, and
 - Other methods of controlling pesticide drift utilised.

Application of Pesticides Module

When using pesticides the safety of people and the environment is the first consideration. If it is not possible to apply a pesticide safely then the application must be delayed until it is. It is an

offence to let a pesticide contaminate another person, their property, or the environment. All parties – growers, applicators and consultants – must act responsibly when making decisions about pesticide applications.

The core best management practice for safe and responsible pesticide use is to develop a Pesticide Application Management Plan (PAMP) for pesticide use on farm.

A PAMP will help ensure that everyone involved in pesticide application has a clear understanding of their responsibilities. It also helps identify the risks associated with pesticide applications so that controls to minimise those risks can be put in place.

Objectives and best practice actions:-

- To develop a Pesticide Application Management Plan (PAMP):
 - Plan developed to cover all pesticides used.
- Establish good pre-season communication:
 - Detailed farm map is developed that includes – on-farm and neighbouring buildings, buffer zones, on-farm and neighbouring sensitive areas, neighbouring farming activities, rail and stock routes, aircraft hazards, windsocks,
 - All neighbours contacted pre-season to discuss above map and planned season activities,
 - Pre-season meetings held with anyone involved in the farming operation eg. consultant, aerial/ground sprayer to determine operating parameters for season, and
 - All workers aware of operating parameters for season and details on farm map.
- Establish good in-season communication:
 - Agreed communication arrangements are followed during the season,
 - Application activities are monitored and recorded, and
 - Crop re-entry protocol is followed.
- Apply pesticides during appropriate weather conditions:
 - Pesticide application occurs in appropriate weather conditions for the application method being used,
 - Weather prediction tools utilised prior to applications,
 - Appropriate conditions and limitations for each area to be treated determined by growers prior to application,
 - Wind direction and buffer zones considered and used where required, and
 - Weather conditions monitored pre and during applications.
- Appropriate product selection and use:
 - Product selections take into account potential for off-target damage,
 - All people involved are trained and certified in chemical use,
 - All products used are registered for use on the crop,
 - Products applied as per label, and
 - Material Safety Data Sheets available for all products used.
- Equipment selection and maintenance:
 - Low drift equipment used where possible, and
 - Calibration of equipment occurs frequently.
- Record Keeping:

- Comprehensive record keeping of all activities.

Storage and Handling of Pesticides Module

Pesticides are an important component in cotton production. However, they must be stored, used, transported and disposed of safely to ensure that they do not create significant risks to the environment or human health.

Objectives and best practice actions:-

- To locate the storage facility in an appropriate place:
 - Facility located a safe distance from sensitive areas, watercourses, houses, property boundary, etc, and
 - Facility located on a site not prone to flooding, and level so any run-off does not reach sensitive areas.
- An appropriate building for the storage facility:
 - Facility is a separate building or room or enclosure,
 - Facility has access to running water and emergency shower type conveniences,
 - Facility is large enough for quantity of chemical it has to store, and
 - Facility is constructed of fire and chemical resistant material as far as possible.
- Spill containment:
 - Facility floor is impermeable, and
 - Facility floor is bunded to contain spills.
- Good ventilation:
 - Facility is vented or one or more sides open to the atmosphere.
- Good security:
 - Facility fitted with lockable doors or gates,
 - Facility is locked when not in use, and
 - Access to facility is controlled.
- Safe work procedures:
 - Up to date records exist for facility contents,
 - Pesticides stored in original, marked containers,
 - All people involved with chemicals are trained and certified in chemical use,
 - Appropriate (according to label) protective equipment available and used when handling chemicals, and
 - First aid kit readily accessible.
- Establish emergency procedures:
 - Basic emergency plan has been developed,
 - Emergency equipment is readily accessible eg. fire extinguisher, and
 - Clean up equipment/materials are readily accessible.
- Appropriate signs:
 - Facility has clearly visible warning signs, and
 - An evaporation or disposal pits have clearly visible warning signs.
- An appropriate mixing and loading site:

- Mixing and loading carried out away from watercourses, drains, property boundary, sensitive areas, and
- Closed transfer systems used wherever possible.
- Good mixing and loading systems and techniques:
 - Closed transfer systems used wherever possible,
 - All equipment calibrated and checked regularly, and
 - Backflow to water source is prevented.
- Worker safety during mixing, loading and application:
 - All people involved with chemicals are trained and certified in chemical use,
 - Appropriate clothing and protective equipment available and worn, and
 - First aid kit and supply of clean water available.
- Equipment maintenance and cleaning:
 - All equipment checked prior to use, and
 - All equipment cleaned after use.
- Minimise pesticide waste and dispose of waste properly:
 - Containers cleaned and returned as per label instructions,
 - Containers triple rinsed and rinsate is not dumped, and
 - Returnable or recyclable containers purchased whenever possible.
- Safe transport of pesticides:
 - Pesticides not transported in with people or foodstuffs,
 - Containers secured during transport, and
 - Personal protective equipment available when transporting pesticides.

Integrated Pest Management Module

Integrated Pest Management (IPM) integrates all means of managing pest populations with the aim of reducing pesticide use while maintaining profitability. The following are the philosophies behind IPM:

- the presence of pests does not automatically require the use of pesticides, as damage may not be significant;
- when pest control measures are necessary, non-chemical pest control methods should be considered before a decision is taken to use pesticides; and
- suitable pest control strategies should be used in an integrated manner and pesticides should be used appropriately.

Although IPM is more a philosophy of management than a set of rules, it contains the following essential components:

- the ability to identify pest and beneficial species;
- an understanding of the biology and ecology of the pests and beneficial insects in question;
- a reliable method of pest and beneficial insect population monitoring and crop damage assessment;
- knowledge of economic or action thresholds for each pest;
- a range of effective control methods from which to choose; and
- an IPM plan for the farm designed to ensure that there is not an over-reliance on any one control method, particularly pesticides.

Objectives and best practice actions:

- To manage the crop for early maturity:
 - Varieties matched to region and likely pests and diseases,
 - Fertilizer application is based on soil and/or petiole testing,
 - Final irrigation timed to ensure most plant available water is used by estimated defoliation,
 - Growth regulators used to control excessive growth, and
 - Planting occurs as early as practical for region.
- To regularly monitor fields for insects and damage:
 - Crops checked for pests and beneficial insects and crop damage approx. 3 times per week,
 - Sampling and monitoring results are kept,
 - Pest to predator ratios used as guide to determining whether to apply pesticides, and
 - Crop growth rates monitored to help determine crop's capacity for compensation.
- To preserve beneficial insects:
 - Records kept of beneficial insects in the crop,
 - Effect of insecticide application on beneficial population is considered,
 - Food sprays considered as an alternative where appropriate, and
 - Refuge and/or trap crops considered as part of pest management.
- To prevent the development of insect resistance:
 - Insect Resistance Management Strategy for region is followed,
 - Specific cultivation to eliminate overwintering pupae undertaken if required, and
 - Application failures not re-sprayed with insecticide from same chemical group.
- Host and trap crops:
 - Weeds well controlled on-farm, and
 - Ability of different crops to host pest and beneficials considered when setting crop rotation strategy.
- Area wide management:
 - Active participation in area wide management groups encouraged,
 - Decisions on use of broad spectrum insecticides made through consensus, and
 - Use of spring and summer trap crops considered and coordinated.

Farm Hygiene Module

Cotton is susceptible to the adverse effects of a number of diseases, weeds and pests. Once a disease, weed or pest becomes established in a crop, it can be difficult to manage. Preventing the problem is therefore better than attempting to cure full-blown symptoms. Good farm hygiene will help prevent the build-up and movement between farms of disease, weeds and pests.'

Objectives and best practice actions:-

- Early detection and notification:
 - All entries to property are made aware of existence of any crop disease and asked to take precautions to prevent its spread,

- Ginners and seed companies (where relevant) notified where possible of existence of disease affected cotton to be ginned,
- Crops regularly inspected for disease, weeds and pests, and
- Employees and contractors made aware of disease symptoms and requested to notify manager/owner of suspect plants or areas.
- Clean down all equipment and machinery:
 - All vehicles and machinery thoroughly cleaned of soil and crop debris before entering or leaving property, and
 - Vehicles and machinery thoroughly cleaned after working in affected areas.
- An integrated approach to managing disease, weeds and pests:
 - Tailwater and storm run-off are retained on-farm,
 - Disease resistant cotton grown where possible,
 - Crop rotation strategy used to help reduce crop diseases, and
 - Weeds well controlled in and around fields.
- Safe destruction of plants affected by Fusarium Wilt:
 - Affected plants of a small outbreak within 2 meter radius destroyed on-site,
 - Affected area not irrigated and storm water contained on-site if possible,
 - Trash collected in tail drains from affected fields and burnt on-site, and
 - Machinery traffic avoided in affected area where possible.

Storage and Handling of Petrochemicals Module

Efficient cotton production requires petrochemicals to be stored on-farm for use in machinery and farm vehicles. Petrochemicals commonly stored on-farm include fuels (petrol, diesel, and aviation fuel), engine oil and lubricants. Petrochemical storage includes storage in above-ground tanks, underground tanks, mobile tanks, and in drums or other containers. Petrochemicals need to be stored and handled safely to avoid soil or water contamination, fires or explosions.

Objectives and best practice actions:-

- Use an appropriate site for petrochemical storage tanks:
 - All tanks on property safe distance from watercourses, drains, houses, areas storing other chemicals, etc,
 - Tanks sited to allow safe access to all vehicles that need access, and
 - Tanks sited away from flood prone areas or are protected from floodwaters.
- Proper design and installation of petrochemical storage tanks:
 - Tanks are specifically designed and constructed to hold the liquid stored,
 - Tanks are properly installed by qualified or experienced persons, and
 - Tanks maintained in safe working order.
- Spill containment:
 - Appropriate bunding for large tanks containing greater than 5,000 L petrol, or 10,000 L diesel, or 10,000 L engine oil,
 - Spills can be safely drained from the bunded area, and
 - Smaller and mobile tanks utilise ground slope, diversion channels, low bunds or kerbing to control spills.

- Install appropriate signs:
 - All tanks have appropriate warning signs.
- Ensure safe working conditions:
 - All workers aware of proper safety precautions and hazards associated with petrochemicals,
 - Material Safety Data Sheets available for petrol,
 - Ignition sources kept away from fuel storage areas,
 - Tanks are free from fire hazards, rubbish and farm equipment,
 - Vehicle engines turned off whilst fuel storage tanks are in use, and
 - A register is kept for all fuels stored on farm (Qld).
- Establish emergency procedures:
 - Fire extinguishers are readily accessible and available,
 - An emergency plan has been established and documented,
 - All workers aware of emergency plan and actions.
- Dispose of waste safely:
 - Used engine oil is stored safely until it can be collected for recycling,
 - Used engine oil is recycled through licensed waste oil collectors, and
 - Recyclable or reusable drums used where possible.

Land and Water Management Module

Cotton production relies on the sustainable use of land and water. Soils, water and crops need to be managed so that the farm is profitable well into the future, and so that the risk of adverse environmental impacts is minimised. Sustainable management of land and water requires growers to be familiar with the resources on their farm, and to use those resources within their capacity.

Objectives and best practice actions:-

- Assess the farm's resources:
 - Develop a farm which highlights the property's natural features, soils, land use and infrastructure,
 - Record resource and property information,
 - Review catchment plans, and
 - Assess risk of landscape (catchment) scale issues.
- Good soil management and monitoring (structure, nutrition, salinity and sodicity and erosion):
 - Monitor soil structural condition,
 - Avoid traffic on wet soils where possible,
 - Use implements that don't cause smearing or compaction,
 - Use minimum tillage and controlled traffic, avoid bed shoulder compaction,
 - Increase soil organic matter,
 - Avoid sodic water,
 - Manage hard-setting soils,
 - Use crop rotations and deep tillage only as necessary,
 - Use soil conditioners as appropriate,
 - Undertake soil and leaf tests,

- Apply nutrients efficiently,
- Monitor and measure soil and water salinity,
- Use high quality water or adopt a conjunctive water use strategy,
- Apply water efficiently and uniformly,
- Maximise distribution and storage efficiency,
- Use good seedbed design and plant seeds to avoid saline areas,
- Minimise recharge and lower the water table where necessary,
- Identify areas of significant erosion risk and monitor high risk areas,
- Consider field design, furrow lengths and tail drain design,
- Laser level fields,
- Use controlled drops in culverts,
- Design tailwater drains to carry water at non-erosive velocities,
- Develop a stormwater management plan and retain first flush storm water on-farm,
- Maintain ground cover, including stubble or crop residues,
- Reduce run-off and reinforce high-risk areas with rock, gravel or logs,
- Use buffer zones, vegetation strips or silt traps,
- Use temporary ponding if required,
- Use opportunity cropping,
- Plant rows and cultivate along the contour,
- Use strip cropping,
- Maintain vegetation in natural drainage lines,
- Minimise cultivation during storm season,
- Locate and design earthworks and other farm infrastructure to minimise the impact of flood flows,
- Use low road formations, and
- Remove fences or limit the number of fences used.
- Efficient irrigation (storage & distribution and application):
 - Avoid constructing storages and channels on sites with highly permeable soils,
 - Proper design and constructive of the storage and distribution system,
 - Carry out regular inspection and maintenance of the storage and distribution system and fix any detected leaks or inefficiencies,
 - Reduce evaporation from farm storages,
 - Irrigate according to crop needs,
 - Use soil water monitoring tools, and
 - Monitor and measure water use, and calculate water use efficiency.
- Efficient furrow irrigation:
 - Aim for uniform applications,
 - Use appropriate rates,
 - Optimise the duration of irrigation, and
 - Use good field design.
- Efficient drip irrigation:
 - Plan the drip irrigation system,
 - Proper installation of the drip irrigation system, and
 - Proper operation of the drip irrigation system.
- Efficient centre pivot and lateral move irrigation:
 - Plan the system,

- Proper system design and installation, and
- Proper operation of the system.
- Good native vegetation management:
 - Obtain development consent if required,
 - Highlight areas of native vegetation on the farm map,
 - Describe and assess the condition of native vegetation,
 - Monitor the condition of native vegetation,
 - Protect native vegetation from weeds, pests, and other negative impacts,
 - Retain mature trees and other important habitat features,
 - Re-vegetate where practical,
 - Connect areas of native vegetation if possible,
 - Identify native animals on the farm, and
 - Avoid harming native animals.
- Good riparian land management (Riparian vegetation management, stock management and water quality and stream bank stability):
 - Retain and protect existing native riparian,
 - Leave dead and fallen trees, and trees with hollows alone,
 - Obtain specialist advice on appropriate plant species and planting locations,
 - Consider connecting areas of remnant vegetation,
 - Develop a weed management plan,
 - Develop a stock management plan for riparian areas,
 - Provide off-stream or purpose built in-stream watering points for stock,
 - Exclude or limit stock access to areas with steep or eroded banks, or with dispersible or highly erodable soils,
 - Exclude stock from areas being re-vegetated,
 - Maintain filter strips near major waterways, rivers and streams, and
 - Identify and manage areas of bank instability and erosion.

Auditing BMP

The BMP Program contains an external, independent auditing component. In 2003 the industry, at the request of growers, established certification standards for the BMP Program. Auditing prior to this was against process and continual improvement, as with a formal ISO 14001 EMS audit. Cotton growers adopting BMP are now audited against both process and performance, with certification granted only to those growers who can demonstrate they have met or exceeded the agreed standards.

Industry Uptake of BMP

The cotton industry has embraced the BMP Program. Industry figures indicate and external evaluations support that approximately 95% of the industry has changed its practices as a result of the program. Audit figures supplied by the BMP Audit Office demonstrate that 30% of the industry has voluntarily undertaken an audit and are certified under the BMP Program. This represents approximately 60% of the area grown to cotton in Australia.

In 2004 Cotton Australia made some changes to the audit program to encourage more growers through to the audit stage. This includes introducing a Pre-Certification Assessment (PCA) stage where trained (Environmental Systems Auditor training) Cotton Australia staff pre-assess

growers against the certification standards and assist them in prioritising action plans prior to an audit. By participating in a Pre-Certification Assessment, the grower then commits to a twelve-month maximum timeframe to move through to certification audit, thereby making a commitment to the Program. Cotton Australia is currently working to convert growers into this new system that encompasses performance standards.

In terms of adoption of BMP in the Fitzroy Basin, as at the beginning of June 2005, 40 growers have been audited at least once by an independent auditor, and a further 9 have undertaken a PCA and are in the BMP system working towards full compliance with the certification standards.

Industry Investment in the BMP Program

More than \$7 million has been invested into research in the development of the Best Management Practices (BMP) Program.

According to the Macarthur Agribusiness study (Macarthur Agribusiness, 2004) CRDC expenditure on the Program since 1993/94, and including commitments to 2006 total \$7.8 million. Within this, research accounts for fifty-two percent, development twenty-one percent and other twenty-seven percent. Table 1 details a breakdown CRDC expenditure over the life of the Program and committed expenditure till 2006.

Table 1: - CRDC expenditure over the life of the BMP Program and committed expenditure till 2006.

	1991 '000	1992 '000	1993 '000	1994 '000	1995 '000	1996 '000	1997 '000	1998 '000	1999 '000	2000 '000	2001 '000	2002 '000	2003 '000	2004 '000	2005 '000	2006 '000
Research	50	52	92	466	523	377	357	204	425	486	269	318	360	0	0	0
Devel't	0	0	0	0	0	0	0	180	311	345	293	335	171	69	69	
Other	0	0	0	0	0	0	0	35	180	515	469	248	383	126	135	8
TOTAL	99	104	184	932	1,046	754	863	688	1,833	2,691	2,062	1,802	1,826	390	408	15
GRAND TOTAL	\$7.8million															

Source: Macarthur Agribusiness (2004)

Macarthur Agribusiness (2004) also estimated the cost to Cotton Australia for its commitment to implementation of the Program is currently in the order of \$700,000 per annum. This equates to an approximate \$4.9 million since the organisation dedicated resources to drive BMP implementation in 1999.

BMP Program Strengths

Strengths of the BMP Program include:

- Industry driven and therefore a strong sense of ownership and commitment,
- A maintained core focus on on-farm activities and impacts,
- It is delivering results, and
- It's development around the risk assessment principle, to which other industry tools and issues can be aligned. An example of this is the Managing Cotton Farm Safety occupational health and safety program that sits alongside the BMP Program.

BMP Program Weaknesses

Weaknesses of the program include:

- It is reasonably expensive to resource, and
- Setting certification standards that comply with two State jurisdictions has been interesting and challenging at times.

BMP Program Gaps & Opportunities

An area of opportunity for the cotton industry is in benchmarking and trend reporting in the area of natural resource management. The industry has good data in the area of chemical use, but as the focus on natural resource management strengthens with the Land and Water Management module, work needs to be done to ensure adequate and complete benchmarking data sets to assess performance over time.

3.2.2 Cotton Industry Environmental Audits

In 1991 the cotton industry undertook its first industry wide environmental audit. With the commissioning of this audit, the Australian cotton industry became the first major agricultural industry to seek a comprehensive external examination of its environmental performance. While many individual farmers had sought to grow cotton in an environmentally responsible manner, the commissioning of this audit marked the first cotton industry-wide commitment to improved sustainability.

The first audit provided a framework and focus for subsequent research, development and extension activities that have seen significant changes in industry environmental practices. These have been achieved hand in hand with improved economic efficiency and the production of higher quality cotton and despite growing economic pressures on cotton farmers.

The improvements achieved since 1991 are well documented and scientifically validated: however, by 2003 the industry believed it was time to have its overall environmental performance tested externally once more to document changes arising from the first audit and identify further areas of environmental management that need attention.

The second audit in 2003 found the cotton industry's environmental management system, Best Management Practices, to be a major driver for improved environmental management on cotton farms and provides extensive evidence of this in the report. The industry takes pride in this program – not only for what BMP has achieved already but for the comprehensive environmental blueprint it will offer as it addresses future issues.

Despite the many environmental improvements made since the 1991 audit, the industry acknowledges the areas the 2003 audit has identified as needing further improvement. Its key recommendations cover BMP, water use and management, pesticides and non-pesticide chemicals, waste management and vegetation management. Already, the new Land and Water Management module, released in 2005, addresses a number of the key recommendations in the 2003 environmental audit. (*Taking Responsibility for our Future: The Australian Cotton Industry Action Response To The Second Australian Cotton Industry Environmental Audit 2003*)

2.3 Cotton Australia and CRDC evaluation of the BMP Program

In 2003 a comprehensive evaluation of the BMP Program was undertaken (Macarthur Agribusiness, 2004). Commissioned by Cotton Australia and the CRDC as part of the Cotton EMS National Pilots Project, the study aimed to, among other things, identify and describe the changes in practice on cotton farms from the start of the BMP program to the present.

The study consisted of a literature review, grower (greater or less than 10 years growing experience) and stakeholder survey and focus groups. A total of ten face-to-face grower interviews, 40 telephone interviews with growers and a further 25 with stakeholders and five focus groups were conducted along with cost/benefit analysis on three farms to inform another aim of the study - compile information on the costs to growers and industry groups to implement BMP procedures.

The study found beneficial changes in cotton grower behaviour and implementation of the Program's practices across all of the Program's modules – application of pesticides, storage and handling of pesticides, integrated pest management, farm design and management, farm hygiene and storage and handling of petrochemicals.

In the reef catchment area (Fitzroy Basin) both the Emerald and Theodore growing district were surveyed as a part of the study but the limited survey numbers meant a reef specific picture could not be obtained. Given the size of the industry located outside the reef catchment area the low number of interviews conducted in the Fitzroy Basin is not surprising.

3.2.3 Research & Development

The cotton industry, through the CRDC and the Australian Cotton CRC invest significant funds into research and development that benefits the industry, and to technical extension of this research to growers for adoption. The Cotton CRC is responsible for the important industry publications of technical packs that collate information in a useable form for growers. Current 'Paks' available to cotton growers include: SOILpak, MACHINEpak, SPRAYpak, ENTOpak, WEEDpak, NUTRIpak, DISEASEpak, and WATERpak, which was released in 2004 to address water use efficiency and related issues. The CRDC and Cotton CRC have also published *Integrated Pest Management Guidelines for Cotton Production Systems in Australia* (2nd Edition), designed to assist cotton growers implement integrated pest management strategies to suit their individual farming system. Another significant publication in 2004 was *Managing Riparian Lands in the Cotton Industry*, which consists of case study information and examples of best practice from across Qld and NSW of the management and use of riparian areas.

3.2.4 Rural Water Use Efficiency in the Cotton Industry

The RWUE Initiative is a partnership between industry and government to improve the use and management of available irrigation water, thereby improving the competitiveness, profitability, and environmental sustainability of Queensland's rural industries.

Adoption programs have been established to help farmers achieve best practice in irrigation water management on their properties. The cotton program involves Cotton Australia and the Australia Cotton Cooperative Research Centre (Cotton CRC). There have now been two RWUE program, RWUE 1 ran from 1999 – 2003, and RWUE 2 from 2003 – 2005.

Rural Water Use Efficiency 1 had a Financial Incentives Scheme component to the Initiative, which was designed to encourage and assist irrigated cotton and grain producers implement activities identified as improving on-farm water use efficiency. The Financial Incentives Scheme was exceedingly successful in initiating change for growers, as well as accelerating the rate of change across the industries.

The objective of RWUE 1 was to, by June 2003, increase irrigation efficiency in the cotton and grain industries by at least ten percent (10%) and have seventy percent (70%) of growers adopting best management practice guidelines for irrigation.

Program highlights (Goyne, 2003) for RWUE 1 include:

- The Program has dramatically improved irrigators' awareness of and access to new technologies to improve irrigation management and system performance. Grower awareness and participation in the RWUE Initiative exceeded 75% by August 2001, and was estimated to be greater than 85% in some regions at completion of RWUE 1.
- For the \$1.5 million invested to date through the Financial Incentives Scheme from Government, cotton and grain irrigators have invested between \$3.5 and \$3.6 million. This money has been used to help irrigators implement on-farm changes to their management necessary to achieve best practice irrigation.
- An increasing number of irrigators are now achieving irrigation efficiencies well in advance of the State benchmarks compiled at the commencement of the Program. Efficiency gains at the completion of the project were estimated to be in the order of over 11%, exceeding the objective of 10% set at the outset of the program.

RWUE 2 was designed to build on the success of the initial RWUE program. The industry once again is working in cotton and grain irrigated systems, and has a team of technical extension staff located in cotton growing regions in Queensland. RWUE 2 is aiming for a further 8% efficiency gain, to have participation of at least 75% and to build capacity of the growers and industry service personnel within all regions to offer water use efficiency advice after the completion of the program.

3.2.5 DrumMuster and ChemClear

DrumMuster – national chemical container collection and recycling scheme aimed at reducing the amount of plastic drums requiring on-farm disposal. Cotton Australia has been an active campaigner to encourage as many Shires throughout Qld and NSW to participate in the program. The BMP Program encourages growers to participate in such a collection program, or to use recyclable or returnable containers wherever possible.

ChemCollect – a free collection, storage and destruction scheme for unwanted agricultural and veterinary chemicals used in primary production. The Environmental Protection Agency is co-ordinating the scheme in Queensland. It is estimated there are 270 tonnes of unwanted and potentially hazardous pesticides on Queensland rural properties. The ChemCollect scheme is targeting organochlorine pesticides. This program is an effective tool to manage the risk of chemical use and storage on-farm, by providing a safe, off-farm method of removal and destruction of unwanted product.

3.3 Future Directions

The industry is continually reviewing the BMP tool for appropriateness, content and performance. This will continue, and will be strengthened with the greater focus on better data collection in the area of natural resource management.

The industry is working closely with catchment groups in cotton areas, to link on-farm activities and impacts with sub-catchment and catchment scale activities and impacts. The Integrated Area Wide Management program that operates in the Fitzroy area originally in Emerald and now extending down to Theodore is viewed by the rest of the industry as a key program and the link it creates with on-farm practices (BMP Program) to catchment scale targets and outcomes. This project has been supported by the Fitzroy Basin Association (FBA) and is now being trialled in the non-reef catchments of Condamine Alliance and Qld Murray Darling Basin and across into the Border Rivers-Gwydir Catchment Management Authority in NSW. In the Fitzroy Basin, the industry is working in with the FBA's Neighbourhood Catchments program.

4 Dairy Industry

4.1 Dairying in the Great Barriers Reef Catchments

There are three distinct dairy regions located within the GBR catchment area. These are:

Far north Queensland

This dairying region is based on the Atherton Tablelands and is centred around the towns of Atherton, Malanda, Millaa Millaa and Ravenshoe. There are currently 104 registered dairy farms milking approximately 140 cows year round. Each farm in the region produces approximately 840,000 litres per annum, which across the region for 2004-2005 equates to approximately 87 million litres of milk. In the region, the dairy industry employs approximately 352 people directly on farm, in the processing plants and cartage, with additional people involved as vendors, and also in sales and distribution. The industry is the largest employer between Townsville and Cape York and it is estimated it is worth approximately \$45 million to the local community, which multiplies to approximately \$200 million across the region. The industry also contributes to the aesthetic appeal of the Atherton Tablelands, with many tourists attracted to the region to view ecological and sustainable agriculture being implemented.

Central Queensland

This region is based around Rockhampton, with 62 producers spread between Mackay (Eungella) in the north to Bundaberg in the south and inland to Monto and Biggenden. The average size milking herd is 150 cows with production per farm averaging 710,000 litres in 2004 (40.4 million litres for the region). There are more than 250 families directly involved in the industry including 90 farming families, 50 Parmalat factory employees, 20 distributors plus others working in transport, raw milk contractoring, packaging, suppliers etc. It is estimated that the farm gate value of milk is approximately \$19 million with an accepted multiplier effect of three, gives a total value of dairying to the central Queensland region of approximately \$57 million.

Burnett - Mary

This region includes farmers surrounding the townships of Munduberra, Goomeri, Kingaroy, Nanango, Maleny, Gympie and Marybrough with farmers supplying Dairy Farmers, Parmalat-Australia and some smaller milk and cheese processors. This region has approximately 180 dairy producers who produce approximately 750,000 litres per farm per annum. These milk producers receive approximately \$50 million directly as farm income, which injects more than approximately \$150 million into the local and regional economy.

It also should be noted that the dairy industry in these regions has been, and still are, severely impacted by ongoing drought conditions. All of the regions have been classified as experiencing exceptional circumstances under the Federal Government's drought program.

4.2 Industry Environmental Initiatives

The dairy industry at a national and state level has undertaken a range of initiatives to improve the industry's natural resource management and environmental performance.

4.2.1 Queensland Dairy Farming Environmental Code of Practice

The Queensland Dairy Farming Environmental Code of Practice was approved under the *Queensland Environmental Protection Act (1994)* (EP Act) in February 2001. The code was compiled by representatives from the then Department of Primary Industries (DPI), Environmental Protection Agency (EPA), and the Queensland Dairyfarmers' Organisation (QDO).

The EP Act requires all Queenslanders to meet their “general environmental duty” which requires the use of all reasonable and practical measures to prevent or minimize environmental harm. The Queensland Dairy Farming Environmental Code of Practice is a voluntary code and contains the principles of sustainable farming practice and recommendations that promote a positive approach to responsible environmental management to ensure that farmers meet their general environmental duty as prescribed in the EP Act.

The code of practice includes an industry overview, environmental outcomes and suggested management (planning and operation) practices for a number of farming activities including farm planning and site selection, effluent collection, storage and utilization, feed pads, loafing pads and feed storage facilities, managing yards and laneways, on-farm carcass and rubbish disposal, community amenity, riparian land management, fertilizer management and soil protection.

It also acknowledges that every farm is different and that different farming systems are adapted depending on a variety of circumstances including local knowledge and experience, geography, local and state planning regulations and on-farm resources. This means that farmers implement on-farm management practices that address environmental outcomes in reasonable and practical ways and are therefore addressing the Queensland Dairy Farming Environmental Code of Practice.

A study conducted by the Institute of Sustainable Futures in 2003-2004 on behalf of the Environmental Protection Agency, to review the effectiveness of codes of practice under the EP Act, including the Queensland Dairy Farming Environmental Code of Practice found that 66% of dairy farmers who took part in the Queensland wide survey used the dairy code more than once per year (Institute of Sustainable Futures, 2004).

4.2.2 Dairying Better N Better for Tomorrow

Dairying Better N Better for Tomorrow was originally developed in 2001 (it was known then as Dairying Better N Better) as a set of tools to support farmers implement on-farm, better natural resource management activities. A central tool included in the newer version of the program is the *Dairy Self Assessment Tool* (DairySAT). This self-assessment tool helps farmers identify their on-farm natural resource management priorities. The tool also forms the basis of a three-part workshop series for farmers about information on better management of natural resources. DairySAT and the workshop content draw their information on improved practice from the Queensland Dairy Farming Environmental Code of Practice. DairySAT also includes a section on farmer's legal requirements.

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To support the adoption of improved practices the *Dairying Better N Better for Tomorrow* aspect of the program was added in 2003. This aspect of the program involves farmer workshops where implementation of priority actions is encouraged through the documentation of an “action plan”, supporting financial resources are allocated and an on-farm monitoring plan is developed to track progress.

Currently a third aspect of the program *Dairying Better N Better Plus* is under development. This aspect will enable farmers to develop a whole of farm approach to planning and management picking up areas such as quality assurance, financial management in addition to natural resource management.

Table 2 details the various aspects of the Dairy Better N Better program in a step-by-step fashion.

Table 2: - The various aspects of the Dairy Better N Better program.

Stage 1	DairySAT (dairy self assessment tool)	Outcome: <ul style="list-style-type: none">• NRM issues identified and prioritised on-farm• Identification of linkages with catchment and regional NRM issues and priorities• Direct association and links with the Queensland Dairy Farming Environmental Code of Practice
Stage 2	Dairying Better N Better for Tomorrow <ul style="list-style-type: none">• Local farmer group workshops with technical advice• action plans• Farm based and sub-catchment monitoring	Outcome: <ul style="list-style-type: none">• Technical advise and support. Development and implementation of actions to address on-farm NRM change.• Monitoring plan implemented via the action plan (farm management system)
Stage 3 (continuing option – under development)	Dairying Better N Better Plus	Outcome: <ul style="list-style-type: none">• Whole farm management

The implementation of the program is conducted on a sub-catchment basis with 10-15 enterprises participating in each group.

The Subtropical Dairy Program and the Queensland Dairyfarmer’s Organisation have adopted the Dairying Better N Better program as the Queensland industry’s approach to addressing natural resource management and demonstrating its commitment to sustainable dairying.

Current uptake

The Dairying Better N Better Program is relatively recent and as such the Queensland industry has only just started to roll out the program statewide. A staged approach to implementing the program has been adopted, as adequately resourcing activities is proving a significant challenge. The industry is making headway in this area though by increasingly working with Regional

NRM bodies, who are assisting by providing funding and on ground staff to support farmer activity.

Staged implementation is now underway in number of areas across the State. In the Great Barrier Reef catchment a sub-catchment group on the Atherton Tablelands involving ten enterprises has been established. Each of the enterprises in the group has conducted the Dairy Self Assessment Tool and collectively they have participated in the first of four technical workshops. The participants will attend the full series of workshops and develop an Action Plan. This action plan follows the requirements of an Environmental Management System and will help the farmers to implement actions to address their on-farm priority.

Further groups of dairy farmers in the Great Barrier Reef catchment have expressed an interest in participating in Dairying Better N Better program - which will be offered to all farmers throughout the region as resources become available.

4.2.3 Industry Environmental Performance Studies

“Sustaining our Natural Resources – Dairying for Tomorrow” was a joint project between the Dairy Research and Development Corporation and the National Land and Water Resources Audit conducted in 2001. A national survey of 1800 farms was conducted as part of this project, which assessed current on-farm management practices.

The survey found for those dairy farms in Reef catchment:

- 85% of respondents soil test at least every 2-3 years,
- 70% of respondents re-use their effluent either through irrigation, broadcasting or dry spread), and
- 64% of respondents have an effluent holding pond or sump and dispersal effluent management system and the remaining 36% apply effluent directly to paddock.

It is anticipated that this survey will be conducted again in late 2005-early 2006.

4.2.4 Other Industry Environmental Initiatives

Other initiatives involving the Queensland dairy industry to improve the industry’s natural resource management and environmental performance include:

Natural Resource Management positions

Two positions have been funded by the dairy industry specifically to develop and implement natural resource programs throughout the subtropical dairy region, including the dairy regions in reef catchment areas. These positions have come about due to the strong commitment the industry has in addressing on-farm natural resource management in a pro-active manner and through a partnership with the Commonwealth Government, which partly funds one of the positions. The two NRM positions coordinate NRM projects including the roll-out of Dairying Better N Better for Tomorrow, development and implementation of other NRM initiatives, supporting farmers to participate in regional NRM programs and providing support for farmers to access resources to support on-farm adoption of better natural resource management activities.

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Eco-Efficiency Program

Queensland Dairyfarmers' Organisation entered into an Eco-Efficiency agreement with the Environmental Protection Agency in 2001. This project undertook a number of activities to derive on-farm resource use efficiency outcomes while also delivering environmental benefits. Resource areas covered included a range of themes, for example feed conversion efficiency, soil and nutrient management and energy management.

Riparian management project

The project is being conducted by the Department of Primary Industries & Fisheries with financial support from Dairy Australia. The project will run from 2003-2006 and will identify the critical factors associated with riparian condition in the sub-tropical dairy region. The project will collect sufficient data on riparian zone condition, and attitudes to riparian zone management, to inform policy development and identify the research and extension requirements of the Queensland dairy industry with respect to riparian zone management. A further objective of the project will be to increase the understanding of agency staff involved in riparian management of the constraints farmers face, and concerns they have, in managing riparian zones.

North Queensland Sustainability Initiative - \$1.6 million "Advancing Grow Malanda"

This \$9.8 million project has been recently funded over two years with support from Dairy Farmers, Dairy Australia, the Queensland Department of Primary Industries and Fisheries and local milk suppliers represented by the Grow Malanda group. The aim of the project is to increase milk volumes in the region by 30 per cent to 130 million litres and lift milk protein levels by at least 0.1%. The project is firmly focused on working with milk suppliers in the region to help them achieve a target return of 10 per cent on farm assets through the increased milk protein output. The project will also maintain and gradually increase dairy farm numbers, create more than 80 new jobs across the region and generally enhance business and technical competencies in the Atherton Tablelands. The program has nine interdependent modules that centre around the farmers and the existing Dairy Farmers Malanda milk processing plant, which produces packaged milk, cheese and protein, working together to increase each other's long term viability and profitability.

Rural Water Use Efficiency Initiative

The Rural Water Use Efficiency Initiative was a partnership approach between the Department of Natural Resources and Mines, Queensland Dairyfarmers' Organisation and the Department of Primary Industries and Fisheries and was implemented between 2001-2004. A financial incentive package was attached to the program which supported 680 producers throughout the State, with farmers financial contribution being more than 3.4 times that of the program.

A second phase of the initiative was launch in 2004 called "Dairy Water Use for Profit" which aims to support the implementation of better management practices associated with irrigation and effluent management. This initiative has developed comprehensive manuals and a workshop for both irrigation and effluent management and a small financial assistance package is also offered to producers to assist with greater adoption.

Support for farmers to implement on-farm environmental works

Many farmers are supportive of on-farm works that have a dual benefit of supporting the implementation of their sustainable farming system and also the provision of an improvement to community assets including protecting biodiversity and improvements to water quality. Farmers in the reef catchments area have been able to successfully access more than \$150,000 from funding sources such as the FNQ-NRM regional NRM body as well as through the Commonwealth Government's Envirofund scheme. On-farm works have included fencing off remnant rainforest vegetation, fencing of riparian areas and providing for alternative water points for stock, planting locally native tree and shrub species and implementing more efficient and effective effluent management systems. Farmers have also contributed significantly to these programs with farmers contribution in excess of 370% of funds received.

Food Safety Quality Assurance

Management of food safety risks is paramount to the ongoing sustainability of the Australian Dairy Industry and the production of safe dairy food is regulated by Safe Food Queensland. All dairy farms are licensed through Food Safe Queensland and all processors have manufacturing and on-farm quality assurance schemes which are based on the application of Hazard Analysis and Critical Control Point (HACCP) systems. The on-farm QA systems are independently audited on an annual basis.

4.2.5 Investment in Industry Initiatives

Much of the investment in the natural resource management areas for the dairy industry is conducted at either a State or National level through organizations such as Dairy Australia (national research and development body), Subtropical Dairy Program (regional delivery arm for Dairy Australia), Queensland Dairyfarmers' Organisation (Queensland peak body) or through Queensland State Government agencies. The following provides a summary of key investment areas and the partners in the development and implementation of initiatives:

- Queensland Dairy Farming Environmental Code of Practice cost an estimated \$1 million including investments from farmers, Queensland Dairyfarmers' Organisation, QDPI and the Dairy Research and Development Corporation (now known as Dairy Australia).
- The original Dairying Better N Better program was the development of support tools as a precursor for Dairying Better N Better for Tomorrow. Total investment for Dairying Better N Better I is estimated at more than \$1.25 million with investment partners including Dairy Research and Development Corporation, Subtropical Dairy Program, Natural Heritage Trust, Australian Research Council, Queensland Dairyfarmers' Organisation, Queensland Government (DPI&F and DNR&M), NSW Agriculture and the University of Queensland.
- Dairying Better N Better for Tomorrow includes investment used for the development of the Dairy Self Assessment Tool. The total investment for the development of this project in the subtropical dairy region is estimated to be \$150,000 from Dairy Australia, Subtropical Dairy Program and QDPI. A further \$60,000 of investment, primarily from the Environmental Protection Agency has supported the implementation of the program on the Atherton tablelands.

- The Sustaining our Natural Resources: Dairying for Tomorrow survey conducted in 2001 recorded an investment of more than \$110,000, while the investment Dairy Australia contributes to NRM is approximately \$2.5 million per annum.
- The Rural Water Use Efficiency Initiative was an initial investment of more than \$3 million from project partners including Queensland Government (DNR&M and DPI&F) as well as Queensland Dairyfarmers Organisation and dairy farmers. The second phase of the Rural Water Use initiative is expected to leverage a further \$1.8 to 2.2 million from the aforementioned project partners.
- Other NRM initiatives and projects focusing on sustainability issues include the \$9.8 million Advancing Grow Malanda (refer to section 3.4), QDPI riparian management project (expected investment of more than \$500,000), NSW Agriculture climate management project on the Atherton Tablelands (estimated investment of \$100,000) and the Mudtapilly Farmlets sustainable farming systems project (estimated \$1.5 million).

4.3 Future Directions

The Queensland dairy industry is committed to ensuring that the industry remains profitable and sustainable in the long term. The industry makes a significant contribution to regional communities - economically, socially and environmentally. The industry is committed to further supporting sustainability initiatives including voluntary NRM initiatives such as Dairying Better N Better for Tomorrow.

Limited supply options: Farmers in the regions of the reef catchments have extremely limited options for markets of their product. Dairy farmers located in North Queensland can either supply Dairy Farmers Cooperative Ltd at Malanda or a limited number of farmers can supply Mungalli Biodynamic processors (as long as they are properly accredited). In central Queensland, the only viable processing option for farmers is through the Parmalat Australia factory based at Rockhampton. Although both of these company's support their suppliers strongly, only having a single processing option for many farmers is an enormous business risk.

NRM Coordination: Natural Resource Management continues to be key issue for the dairy industry and more investment in this area is expected in the future. Through the voluntary farm management system approach (Dairying Better N Better for Tomorrow) and collaborative approach with community-based NRM organizations and the Commonwealth and State Governments, investment in on-farm adoption and management of natural resources is expected to grow.

Food Safety: Food safety and hazard management is a major issue for all consumers and particularly the world trading environment. Through the development and implementation of quality assurance programs, industry and governments are able to ensure robust systems for traceability and recording are used throughout the whole supply chain.

Links with Regional NRM bodies: The dairy industry has been very pro-active in working together with key community based natural resource management organizations. Key groups that the industry are developing up a collaborative relationship with include FNQ-NRM, Burdekin Dry Tropics NRM Board, Fitzroy Basin Association and the Burnett Mary Regional Body.

4.4 Further Information and Contacts

For further information relating to information presented in this section or dairy industry activity in the environment area generally please contact the following representatives:

- Philip Chamberlain, Executive Officer, Subtropical Dairy Program.
- Adrian Peake, Executive Officer, Queensland Dairyfarmers' Organisation
- Bronwyn Fisher, NRM Coordinator, Subtropical Dairy Program and Queensland Dairyfarmers' Organisation.

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5 Horticulture

Horticultural industries make a major contribution to the economies and communities of the Reef Catchments.

Horticultural producers have a strong commitment to sound natural resource management and have been introducing many improvements to farm practices over many years to improve the environmental sustainability of the industry. The current standard of environmental management in the industry is high.

Growcom (formerly Queensland Fruit & Vegetable Growers) is the peak body for the fruit and vegetable industry in Queensland and currently delivers a range of projects and services that assist horticultural growers to continually advance on-farm management to achieve improved environmental performance.

Minimising the potential impacts of horticultural production activities on the Great Barrier Reef is strong driver for horticultural growers and Growcom. Growcom is pleased to have the opportunity to contribute to this report to highlight the progress being made in the fruit and vegetable industry towards addressing reef water quality. It is important to note that this report will focus on the activities coordinated by Growcom. Many growers and grower groups are active in a range of additional projects and initiatives that are also making significant contributions to the objectives of the Reef Water Quality Protection Plan.

A more comprehensive overview of the industry's achievements and progress towards improved environmental management will be available following the completion of a major assessment of industry sustainability planned for 2005-2006.

5.1 Horticulture in the Great Barrier Reef catchments

Horticultural industries in the reef region are diverse and highly valuable. Major horticultural crops grown include bananas, mangoes, fresh tomatoes, potatoes, tropical fruits (including lychees, avocados, pawpaws, pineapples), citrus and a broad range of vegetables.

Growcom commissioned a major study in 2004, "The economic contribution of horticulture to the Queensland economy" (CDI Pinnacle Management and Street Ryan & Associates, 2004). The following data is taken from this report.

Fruit and vegetable production in the catchments adjacent to the Great Barrier Reef had a farm gate value in 2001 of \$860.5 million. The Coastal Wet Tropics region alone generated \$342.3 million.

Banana production, primarily located in the Coastal Wet Tropics, was valued at \$345 million. Potatoes production, primarily located in the Atherton Tablelands, was valued at \$47 million. Mangoes, produced in the Atherton Tablelands, Burdekin and Burnett regions were valued at \$64 million. Fresh tomatoes, mainly in the Gumlu-Bowen-Whitsunday district, were valued at \$135 million and capsicums and chillies in the same district were valued at \$60million.

The fruit and vegetable industry in Queensland directly supports 27 880 full time equivalent jobs. Casual labour in the fruit and vegetable industry makes a major contribution to supporting tourism industries in the state.

The economic contribution report is available on the Growcom website on www.growcom.com.au.

It should be noted that drought conditions over recent years across wide areas of the state have had a significant impact on individual horticultural enterprises, severely limiting the financial capacity of many growers.

5.2 Industry Environmental Initiatives

The fruit and vegetable industry in Queensland has a strong commitment to environmental sustainability and growers aim to be responsible custodians of natural resources and rural environments.

Growcom is committed to providing leadership and support services to the fruit and vegetable industry to assist growers to achieve environmental sustainability.

Growcom and its members aim to work in partnership with governments, regional and catchment management bodies, research organisations, the community and other stakeholders to address natural resource and environmental management issues. Through a cooperative and holistic approach, we aim to deliver workable and balanced outcomes for the industry that also benefit the broader community.

The current set of highly complex regulatory, policy and planning systems make natural resource management a major challenge for growers. Growcom, therefore, is advocating for an overarching framework that encourages and coordinates efforts at local, regional, industry, state and national levels to achieve sustainable natural resource management in agriculture.

Growcom has worked closely with its members to prepare a natural resources and environmental management policy statement, which is available on our website www.growcom.com.au and is provided in an attachment to this report. (see Appendix 1)

This section outlines the initiatives under way in horticultural industries to support sustainable natural resource management and address environmental issues such as water quality in the Great Barrier Reef.

5.2.1 Farmcare Code of Practice for sustainable fruit and vegetable production

The Farmcare Code of Practice for Sustainable Fruit and Vegetable Production in Queensland (Qld Fruit and Vegetable Growers & Horticulture Australia 1998), (the Farmcare Code) was developed through a joint project by Growcom and Horticulture Australia.

The Farmcare Code was developed through extensive research, technical input and industry consultation. The intent was to define acceptable industry standards for on-farm environmental management and to provide industry members with guidance on how to meet their general

environmental duty. The Farmcare Code has been endorsed by the Queensland Government as an approved Code of Practice under Section 219 of the *Environmental Protection Act 1994*.

The code was launched in 1998 and distributed to all fruit and vegetable growers in Queensland.

The Farmcare Code provides growers with guidance on efficient and careful use of natural resources, particularly water and soils; minimising environmental impacts caused by horticultural land use, particularly run-off of sediments, fertilisers and pesticides into waterways; minimising waste and pollution from horticultural land use; careful use of pesticides; and minimising impacts on biodiversity.

The Farmcare Code includes sections on:

- land and soil management,
- water management,
- biodiversity management,
- air management,
- noise management,
- waste management, and
- integrated crop management.

The Farmcare Code has been heavily promoted in the industry and incorporated into property and business planning programs and industry environmental management training courses.

5.2.2 Growcom Land & Water Program

Since the early 1990's Growcom has maintained an environmental program on behalf of the industry.

The purpose of Growcom's current Land & Water program is to:

- deliver projects and services that help fruit and vegetable growers achieve sustainable management of natural resources and environmental protection, and
- contribute to the development of workable policy and legislative frameworks that support improved natural resource and environmental management in horticulture.

The Growcom Land & Water Program is multifaceted, in recognition that environmental sustainability in the industry will not occur simply through farm-scale management activities.

The program includes:

- policy analysis,
- strategic planning,
- advocacy services,

- industry projects and support services that address environmental sustainability issues at a range of scales, and
- the development of partnerships that support industry environmental sustainability and deliver incentives for enhancing on farm management practices.

The Growcom Land & Water Program is delivered by 10 full time staff.

The major projects under the Growcom Land & Water program are outlined below.

5.2.3 Farm Management Systems in Horticulture

The fruit and vegetable industry, along with other intensive agricultural industries, has embraced the concept of Farm Management Systems (FMS) (see section 7.1) as a means for growers to take a systematic and documented approach to on-farm environmental management within a broader business management framework.

A Farm Management System is a management tool a farm business can use to achieve efficient and integrated management of its natural resource, environmental, staff, financial and other business management needs.

The use of an FMS approach should help growers to:

- better plan their management processes,
- assess their management performance and effectiveness of management practices,
- identify opportunities for improvements or efficiencies, and
- demonstrate management practices and outcomes to external stakeholders.

Growcom believes the FMS initiative can provide the core mechanism for promoting, supporting and demonstrating uptake within the fruit and vegetable industry of good agricultural practices for environmental management.

In 2003, Growcom negotiated with the Department of Natural Resources and Mines to include the development of a Farm Management System process for the fruit and vegetable industry in the second stage of the Rural Water Use Efficiency Initiative.

In April 2004, Growcom commenced work on the Farm Management Systems project. The aim was to investigate options for an integrated management framework for horticultural enterprises and develop a suite of tools and support services that could be offered to growers to assist uptake of an FMS approach.

Because the majority of fruit and vegetable businesses already have third party certified food safety and quality assurance systems in place, the Growcom FMS process is being designed to use these systems as a base on which to build additional management elements.

Growcom will recommend that growers implement a management system that incorporates three key elements: a management process that drives adaptive management and continuous

improvement; management practices that are consistent with up to date industry and scientific standards; and a process for assessing and demonstrating management performance and outcomes.

While the Growcom FMS program will encourage growers to implement a holistic and integrated management system, the initial focus will be on supporting growers to address natural resource and environmental management priorities. In reef catchments, the key priority will be the implementation of management practices and processes that minimise sediment and nutrient movement off-farm.

To assist growers to implement an FMS, Growcom is developing an FMS support service, which will include:

- A recommended process for assessing current and future management priorities,
- An environmental risk assessment process,
- Up to date fact sheets on current industry recommended practices and minimum standards for environmental management drawn from the Farmcare Code and a range of other sources,
- Information on regional natural resource and environmental management priorities and suggested processes for accounting for catchment and landscape issues in farm scale risk assessment and management,
- Recommended planning and management components for an FMS for a sustainable horticultural enterprise,
- An integration framework that guides how to build a full FMS using the record keeping systems and management processes already operational in the business,
- Templates for FMS records and processes,
- Options for participating in or making use of catchment level environmental monitoring to inform farm scale management,
- Recommended processes for conducting an internal review or self-assessment of management performance,
- Guidance on how to address, and achieve recognition of, statutory property planning requirements such as Land and Water Management Plans through an FMS process, and
- Options for environmental assurance auditing and certification along with alternative means of achieving community or government recognition of good on-farm practices.

Growcom believes that independent auditing and certification of an FMS should not be a general requirement for horticultural businesses. Some horticultural businesses, however, are interested in achieving independent verification of environmental management. Accordingly, Growcom is investigating options for environmental assurance certification.

Preliminary discussions have been held with Freshcare, the industry owned food safety certification program. Freshcare is developing a new environmental and workplace health and

safety module as an additional certification option. This may provide growers with a means to seek independent assessment of the environmental management components of their FMS.

Growcom has also maintained active involvement in a national horticulture industry project, *Horticulture for Tomorrow*, which is coordinating the development of national guidelines for environmental assurance in Australian horticultural industries. The project will also develop a generic national auditing checklist for environmental assurance.

Delivering FMS support to industry members

Throughout 2004-2005, Growcom has been developing industry support for the FMS approach through regular briefings to growers meetings and commodity committees and through regular articles in the monthly industry journal, *Fruit and Vegetable News*.

Growcom intends to support widespread uptake of FMS in the fruit and vegetable industry through an FMS program incorporating FMS tools, information and support services.

Growcom is currently developing and trialing FMS tools and expects to have its FMS program and support services available to growers in late 2005.

The program will include grower access to a central FMS information service along with regionally based support staff who can assist growers to apply the Growcom FMS tools and implement an FMS in their business.

Where possible, Growcom will work in partnership with regional natural resource management organisations or catchment groups in delivering FMS services. These partnerships may facilitate the provision of group training and workshops that assist growers to analyse natural resource issues in a catchment or landscape context and design appropriate management strategies. They may also help broker access to financial support to growers for the implementation of farm management actions that contribute to regional resource condition targets.

While Growcom's FMS program and tools are still being developed, we have begun seeking funding for regionally based FMS implementation support staff.

Funds have been secured for an FMS project in Far North Queensland through an eco-efficiency agreement with the Australian Government Department of the Environment and Heritage. This project is expected to be operational in July 2005.

Priority areas for other regionally-based FMS support staff are Bundaberg / Inland Burnett and the Lockyer Valley.

5.2.4 Water for Profit

The Rural Water Use Efficiency Initiative is a Queensland Government – rural industry partnership that has been operating since 1999. The Department of Natural Resources and Mines has contracted Growcom to deliver the initiative within the fruit and vegetable industry.

While the primary focus of the Water for Profit program is to achieve water savings and productivity gains targets, the program also plays an important role in helping to deliver

improved natural resource management on fruit and vegetable farms, in particular, water quality management.

The focus of the Water for Profit Program is to optimise water use efficiency through improved irrigation management. While horticultural industries were already characterised by the use of advanced irrigation systems, the program has supported a process of ongoing improvement, particularly in the area of irrigation system improvements and upgrades and the use of sophisticated irrigation scheduling technologies.

The program has supported the uptake of precision irrigation systems such as trickle and micro-spray, which ensure that little or no irrigation water moves off site. The program also encourages and supports the uptake of fertigation systems that allow growers to exactly match water and fertiliser application to the crop's needs, significantly reducing the risk of nutrient movement off the farm.

Between 1999-2003, the program achieved:

- An awareness rate within industry of over 90%,
- Around 45% of horticultural growers participating in the program and implementing improvements to their irrigation system and practices,
- Over 6000 attendances at Water for Profit workshops and field days, and
- Over 1400 participating in the financial incentive scheme which operated until 2003.

The irrigation efficiencies facilitated through stage one of the Water for Profit program generated more than \$162 million in water savings and increased productivity. For every \$1 invested by the Queensland Government, the industry returned \$23 in efficiency gains.

Stage two of the program is currently being delivered, and the program has achieved an additional \$37 million in gains since 2003. The program target is \$50 million. The current grower participation rate is 30%.

5.2.5 Regional Natural Resource Networks

The Natural Resource Networks project, jointly funded by Growcom and Horticulture Australia, has been operating since June 2004.

The project aims to significantly enhance the participation of the fruit and vegetable industry in regional natural resource management (NRM) planning processes, in particular community-driven regional plans for NRM.

The objectives of the project are to:

- Support fruit and vegetable industry involvement in regional NRM processes and help identify priority NRM issues for the industry,
- Encourage communication and networking amongst growers regarding NRM issues, and

- Enhance regional investment into initiatives that improve NRM and sustainability in the fruit and vegetable industry.

The project has been successful in supporting improved grower involvement in and input to the regional NRM plans and investment strategies and raising the profile of the fruit and vegetable industry in regional NRM processes.

The project is now brokering targeted funding arrangements from regional NRM groups towards initiatives that support implementation of on-farm works or management practices in the fruit and vegetable industry that deliver farm and catchment level environmental outcomes. It is anticipated that improved water quality would be an outcome of most regional investments in horticultural projects.

5.2.6 Pest Management Strategies

Since 1999, Growcom has been delivering a Pest Management Strategies project with matching funds from Horticulture Australia. The project has been extremely successful in facilitating horticultural commodity groups in Queensland to take a more strategic approach to assessing and addressing pest management needs. Through the development of strategic plans for pest management for a large number of commodities, the project has:

- accelerated the uptake of Integrated Pest Management (IPM) approaches that help reduce the use of pesticides on farms,
- facilitated growers' access to pesticide products that are more targeted and less environmentally harmful, and
- coordinated industry investment into research and development of "softer chemicals" for pest management needs.

This project, along with major investments in improved pest management methods over the last 15 years by the banana, pawpaw, vegetable, tomato and citrus industries, has contributed to significantly reducing the amount of pesticides used in horticultural farms and helped minimise the risk of pesticides moving off farms.

5.2.7 Industry Development Officers

The role of Industry Development Officers (IDOs) is to provide communication, facilitation, technical and extension services for horticultural commodity groups. Currently, the banana, vegetable, pawpaw, melon, strawberry, apple and table grape industries have IDOs. Many IDOs have an increasing focus on natural resource and environmental management issues.

In particular, the Banana IDO has recently completed a major survey of banana growers across Queensland to document and benchmark the environmental management practices and systems currently being used in the industry. Preliminary results show that the large majority of growers are implementing practices to minimise soil erosion and run-off from their properties and retaining or re-establishing vegetation along riparian areas.

The pawpaw industry has worked with their IDO to facilitate grower groups to investigate improved nutrient management strategies in pawpaw production systems.

Natural resource management issues have been included as a focus area of a newly established IDO for vegetable growers in the Bowen district.

5.2.8 GrowSmart

In 2004, Growcom entered into a partnership with eco-fertiliser company, NutriSmart. NutriSmart is designed to significantly reduce the amount of chemical fertilisers used in intensive cropping systems and minimise off-site movement of nutrients. Through the partnership, Growcom members receive a significant rebate on their purchase of NutriSmart fertilisers and Growcom receives a donation for its Sustainability Program for every tonne of product sold to participating Growcom members.

5.2.9 Industry Investment in Initiatives

The investment by Growcom, Horticulture Australia and horticultural commodity groups in staff and projects aimed at supporting improved natural resource and environmental management in the industry is significant.

At least 5 industry funded full time equivalent staff are either fully or partly focussed on activities that directly contribute to improved water quality management in horticultural industries in the reef catchments.

A significant number of industry research and development projects recently completed, under way or planned also have natural resource management outcomes.

5.2.10 Current uptake and involvement

The fruit and vegetable industry's high level of commitment to and involvement in natural resource management activities is evidenced by the participation rates in the Water for Profit program, the growing participation in regional NRM initiatives and the strong industry support for the Farmcare Code. It should also be noted that a significant proportion of banana growing enterprises in Far North Queensland have implemented environmental management systems certified to the international standard, ISO14001.

Feedback from growers regarding the Farm Management Systems concept has been strongly positive as well.

Many growers, however, have indicated that while they support the use of efficient systems that facilitate ongoing improvements in environmental management practices, the capacity within industry to take on additional documentation, record keeping and certification requirements for NRM issues is very limited.

5.2.11 Industry Environmental Performance Evaluation

While there are sound evaluation processes in place for many industry projects, Growcom has identified that there is limited capacity within the industry to assess and report on progress towards improved environmental sustainability at an industry scale.

To address this issue, Growcom aims to establish a process for collecting, collating and analysing data on industry NRM activities and achievements and broader efforts to enhance industry economic and environmental sustainability.

Growcom will seek support from the Queensland Government through the Environmental Protection Agency to implement an industry sustainability audit and reporting project in 2005-2006. The project would focus on:

- Collecting and collating objective data regarding the industry's environmental and economic performance and benchmark the level of grower involvement and industry investment in NRM activities,
- Identifying opportunities to improve, and
- Investigating options for on ongoing monitoring and report framework.

Growcom also aims to maintain strong links to other monitoring and evaluation processes operating or being established at regional, state and national scales, for example projects funded through state investments within the National Action Plan for Salinity and Water Quality.

5.3 Future Directions

Growcom and the fruit and vegetable industries in the catchments of the Great Barrier Reef and across Queensland have demonstrated a strong commitment to natural resource and environmental management practices and processes that contribute to industry sustainability and the objectives of the Reef Water Quality Protection Plan.

The key focus of future activities will be to:

- Support uptake within fruit and vegetable industries of Farm Management Systems as a means for growers to document and demonstrate their management activities and to drive ongoing farm management improvements.
- Maintain and enhance projects and support services through the Growcom Land & Water Program and other industry and regional structures that assist growers to address natural resource management issues.
- Seek financial support through regional NRM investment and other avenues for growers who are implementing farm management improvements that deliver reef water quality outcomes and achievement of regional resource condition targets.
- Implement a project to assess and report in further detail on the fruit and vegetable industry's progress towards economic and environmental sustainability and identify options for on-going monitoring and reporting arrangements.

To accelerate initiatives that drive improved natural resource and environmental management in the fruit and vegetable industry, Growcom recommends that:

- Governments provide direct funding to industry organisations to enhance and expand the delivery of projects and services that help growers and industries to address priority issues.

- The model of property and landscape scale monitoring of environmental indicators provided by the Integrated Area Wide Management project in the Central Highlands be extended to key reef catchments to provide growers with a more effective feedback loop between on-farm practices and catchment level responses.
- The capacity for and investment in research and development targeted at supporting on-farm natural resource management should be significantly enhanced.
- An overarching framework be developed that supports and coordinates industry, government and regional NRM group efforts to progress sustainability in agricultural industries.

6 Sugar Industry

6.1 Sugar Growing in the Great Barrier Reef catchments

Across Australia, sugarcane is grown in 18 geographically separate regions. Production within Queensland constitutes approximately ninety-five percent of the country's sugarcane production with the remaining within northern NSW and a small volume in WA's Ord region. The majority of sugar is grown the Great Barrier Reef catchments on land that was lowland forest or wetlands on the coastal plain

Family farms with number of farms totally approximately 4000 dominate the cane-growing sector. These farms supply cane to 30 sugar mills.

Along with this consolidation of existing farms, there has been a corresponding consolidation process for sugar mills. Over the last 70 years, only two new mills have been established both in new cane growing areas in the Ord River valley and on the Atherton Tablelands. In recent years a number have closed, the last being the Nambour Mill on the sunshine Coast in 2003. Eleven sugar regions have only one mill.

Australia wide the industry has over 5,000 growers who produce 30 to 40 million tonnes of sugarcane annually. From this cane 4-5 million tonnes of sugar is produced. The gross value of sugar produced in 2003 in Australia was in the order of 800 million Australian dollars down from its peak of 2 billion dollars in 1997. Tonnage has remained relatively constant during this time. The strengthening of the Australian dollar and the spectacular increase in export sugar from Brazil, one of the largest sugar producing countries in the world has reduced the price of Australian sugar by nearly 50 % during this time.

Within the Great Barrier Reef catchments there exists 28 Mills, 6 major grower regions, consisting of approximately 4500 business enterprises.

CANEGROWERS, the peak industry representative body for Australia's sugarcane growing industry supports Australia's sugarcane industry by representing and advancing the interests of the industry to governments, non-government organisations, the media and the community. In addition, BSES Ltd. and Productivity Boards provide technical assistance to farmers. The major millers are CSR, Bundabung Sugar and a number of co-operative milling companies.

6.2 Industry Environmental Initiatives

CANEGROWERS in conjunction with various other sugar industry bodies as well as other stakeholders including Government continue to roll out a number of initiatives aimed improving natural resource management in the sugar industry and minimising the impacts of sugar cane growing on the environment.

Replacement and fragmentation of the lowland forest and wetlands on the coastal plains in the Great Barrier Reef Catchments by agriculture including sugar cane growing as well as urban development has altered the properties of landscapes and the biophysical functioning of catchments. The industry is conscious of this modification of catchment hydrology and water quality by its activity and that this can have potentially detrimental impacts on the natural environment if adequate safeguards are not in place. With this in mind improvement in the

management of water runoff and on-farm improvement of soils, pesticide, herbicides and nutrients to deliver better environmental outcomes to receiving waters, including local rivers and estuaries and the Great Barrier Reef lagoon is a priority.

A number of the initiatives are briefly described below:

- **Accredited Nutrient Management Plans**
CANEGROWERS, in conjunction with BSES Ltd, has devised a two-day accredited program whereby farmers can develop nutrient management plans for their farms. These plans will be based upon soil types, water availability and trash management for individual farms. These programs will be delivered in the Wet Tropics, Mackay Whitsunday and Burdekin cane growing regions. The courses started in 2005 and grower numbers are still small.
- **Engagement with Regional Natural Resource Management Bodies**
CANEGROWERS has worked closely with Wet Tropics, Mackay Whitsunday, and Burdekin Dry Tropics; Mary Burnett and South East Queensland Natural Resource Management (NRM) bodies. CANEGROWERS, the community and the Wet Tropics NRM has worked together to agreed upon key management practices and adoption rate targets for priority best practice for cane growing. These targets are available in the NRM plans for the region, will be met over the next three years as part of canegrowers commitment to the NRM plan.
- **Land and Water Management Plans**
Up to 60% of canegrowers who irrigate their farms have already completed or will complete Land and Water Management Plans for their farm water resource needs. These plans developed in conjunction with DNRM encourage sustainable farming practices. These plans, which will allow farmers to trade water, are based upon water conservation, water recycling and best management farm practices.
- **Eco - efficiency Agreement with the Australian Government**
This agreement has supported the roll out of COMPASS. Also the industry's first Public Environmental Report has been completed and will be launched in July 2005.
- **The Code of Practice for Sustainable Cane Growing**
The Code of Practice for Sustainable Cane Growing was developed in 1998. It contains sections covering developing new land (including farm plans, vegetation and drainage), established farms (including farm plan, vegetation, soils, irrigation, drainage, fire, timing of operations, fuels and chemicals and waste), references, advice on fertilizer use, and advice on water use efficiencies. The code was intended to help growers meet their obligations of duty of care under the *Environmental Protection Act* 1994.
- **The Rural Water Use Efficiency Initiative - Stage 1 (1999 – 2003)**
The sugar industry in conjunction with cotton and grains, dairy and lucerne and horticulture industries have been strongly involved in and supportive of the Rural Water Use Efficiency Initiative (RWUEI). The Initiative is a partnership between the above industries and the State Government to improve the use and management of available irrigation water, thereby improving the competitiveness, profitability, and environmental sustainability of Queensland's intensive rural industries. Please see below for more detail on this program.

- **Combining Profitably and Sustainability in Sugar (COMPASS)**

COMPASS (COMbining Profitability And Sustainability in Sugar), is a program and a workbook which enables growers to identify financial, social and environmental improvements to their farming practices in a workshop setting. Please see below for more detail on this program.

- **The Rural Water Use Efficiency Initiative - Stage 2 (2004 – 2006)**

In 2004 Stage 2 of the Initiative was launched with the focus of the program broadened to also include a focus on the off-farm environmental impacts of irrigation. Please see below for more detail on this program.

- **SUGARCANE FMS**

To farm more sustainably, Australia's sugarcane industry has come together to develop a system, known as SUGARCANE FMS to assist cane growers improve their farming operations on an ongoing basis. Please see below for more detail on this program.

6.2.1 Code of Practice for Sustainable Cane Growing

The Code of Practice for Sustainable Cane Growing (CAENGROWERS) was developed in 1998 in response to the GHD Audit. It was developed by CANEGROWERS with input from individual cane growers, the then Department of Environment (now Environmental Protection Agency), BSES and the Cooperative Research Centre for Sustainable Sugar Production.

The code aims to establish management practices to enable growers to meet their General Environmental Duty of Care obligations under the *Environmental Protection Act 1994*.

The code contains sections covering developing new land (including farm plans, vegetation and drainage), established farms (including farm plan, vegetation, soils, irrigation, drainage, fire, timing of operations, fuels and chemicals and waste), advice on fertilizer use, and advice on water use efficiencies.

Together with the COMPASS initiative, which 'values adds' to the Code (the COMPASS workbook covers management practices in more detail and the workshops aim to stimulate grower adoption) have had some measure of success in encouraging farmers to adopt improved practices (C4ES, 2004). It is important to note that the Audit acknowledges that this improvement albeit sometimes difficult to pinpoint has not been reflected in a range of community reported environmental outcomes and/or community perceptions. This lack of community acknowledgement of industry effort to strive for improved practices is now translating into a drive by the industry to demonstrate environmental responsibility and stewardship. The Sugar FMS program represents this drive.

Compared to other industries with environmental codes of practice the ability to ascertain uptake of the sugar code is a little more robust. To date a number of studies have been undertaken that have involved examining the use and uptake of the Code.

In 2000, BSES conducted a study of best practice adoption in the sugar industry with particular reference to the code. (O'Grady & Christensen 2001). The study found 79% of Queensland cane growers were aware of the Code, with 62% possessing a copy, of which 75% had read it.

An unpublished study commissioned by the Environmental Protection Agency and conducted by the Institute of Sustainable Futures in 2003/2004 involved a survey of 323 cane growers to review the utility of the Code of Practice. The study found that 14% of respondents used the code at least once a month, 57% use the Code one to four times a year, 14% use it at least once a year and 6% of respondents indicating they have never used the Code. The small survey sample and limited response rate (44 growers equating to 14%) suggest though statistical analysis is somewhat unreliable.

The Industry Audit (C4ES) also considered uptake of the Code of Practice. It found of the growers surveyed (225) that 88% were aware of the Code, but with only 61% having read it. Of those who have read the Code 97% expressed support for the Code and believe that it helped them to minimise the risk of environmental harm.

6.2.2 Rural Water Use Efficiency Initiative - Stage 1 (1999 –2003)

The original Rural Water Use Efficiency water use was funded by the Department of Natural Resources and Mines (NR&M) for four years with \$41 million being allocated to the program. These funds were allocated to the program across four areas:

- \$23M to the Adoption Program (extension, development and research), and
- \$18M to Reducing Water Losses from Storages on Farm; Financial Incentives to achieve Best Management Practice; and Reducing Water Losses in Irrigation Water Supply and Distribution Systems.

The *Adoption Program* and the *Financial Incentive Scheme* programs were managed through the respective industries in partnership with the Department.

The major focus of Stage 1 was on improving the water use efficiency and productivity of the main rural irrigation industries in Queensland. The first stage of the Initiative included stocktakes of existing irrigation practices and identified cost-effective opportunities for improvements. These stocktakes were used to identify best management practices in each industry sector. The financial incentives component provided an avenue to directly assist growers adopt more efficient practices.

Along with the other industry Adoption Programs, the sugar program was found to be a great success and a pioneering partnership program between government and industry. Despite facing many barriers including record low sugar prices, disease and drought grower involvement and adoption of the program exceeded milestone targets and all expectations.

Over the entire 4 years of the program around 3100 growers or 93% of possible growers were involved. Secondly, 85% of growers substantially achieved irrigation BMP compared to a target of 70% for 2003. An estimated 210,000 ML of water saved has been attributed to the program and an extra \$135M in production generated by the sugar industry.

The Financial Incentive Scheme program also proved to be huge success with 1898 growers, or 63% of irrigated cane growers in project areas, obtaining funding under this scheme to make significant improvements to their irrigation efficiency. Of the State Government's investment of \$3.7M in incentives to the sugar industry as a part of the initiative, cane growers have spent

\$16M. That is, for each dollar that the Government invested, growers invested an additional \$3.30.

6.2.3 Combining Profitably and Sustainability in Sugar (COMPASS)

Following the development of the Code of Practice for Sustainable Sugar Growing the industry took the next step of stimulating grower involvement in and use of the code through a self-assessment workshop process. The industry developed COMPASS (**COM**bining **PRO**fitability **AND** **SUSTAINABILITY** in Sugar), a workbook which enabled growers to identify financial, social and environmental improvements to their farming practices.

Originally COMPASS was developed mainly as a tool to create awareness of best practice amongst growers, and to help them benchmark their performance against the code of practice. While inextricably linked to the Code of Practice it in itself is not a code and ideally both initiatives should be viewed together rather than in isolation.

COMPASS development was led by BSES together with support from CANEGROWERS, the Queensland Government and the SRDC. The workbook was launched in 2001 and workshops commenced in 2002.

The workbook and associated one day or two half day workshops involves growers ranking and assessing their on farm performance against practices contained within the workbook in ten key management areas. Practices are described from a farm management and practical perspective, e.g *I do exclude stock from riparian areas* - Section 6 p. 47.). COMPASS also contains a section for growers to plan any changes or improvements to their current practices in the form of an Action Plan.

As at 31 May 2005, 1173 COMPASS certificates had been issued to grower participants. This represented approximately 27% of sugarcane farms in Queensland. It is expected that managers responsible for over 50% of the total sugarcane area will have participated in a COMPASS workshop by the end 2006.

The industry will use COMPASS as a base for the ongoing development of the Cane Farm Management System.

6.2.4 Rural Water Use Efficiency Initiative - Stage 2 (2004 –2006)

Recognising that sugar regions in Queensland vary considerably simply as a result of geographical differences, the Stage 2 Adoption Program is seeking to identify and subsequently manage regional priority issues. Regional management committee have been established and have been tasked with establishing regional natural resource management priorities and targets. The overall focus of the industry's Stage 2 is improving environmental performance of the sugar industry.

This process has encouraged the committees to link production priorities with natural resource management priorities, seek the involvement of stakeholders such as regional natural resource management groups and the Great Barrier Reef Marine Park Authority, link with other regional projects and set work plans which are focussed and achievable. An additional benefit of this approach has been the potential to leverage other available funds (eg. through the natural resource management groups) to 'value add' to the adoption program.

All regions identified water-related issues as priority areas to target with management and extension activities. This includes irrigation water use efficiency, water quality leaving the farm, and water aquifer/table management. Table 3 overleaf outlines some of these activities.

Table 3: - Sugar Industry RWUE - stage 2 Activities

Region	Activity
North	<ul style="list-style-type: none"> • Nutrient management workshops • Shed meeting tours eg lagoons, sediment ponds, minimum tillage • Bus tour to other regions and industries eg minimum tillage • Chemical accreditation workshops • Tree planting via local catchment group
Burdekin	<ul style="list-style-type: none"> • Control traffic to minimise run-off and better utilise farm inputs such as irrigation and crop nutrient requirements • Rotation cropping discussed at shed meetings • Recycle pits discussed at shed meetings • Irrigation scheduling at discussion groups • Link with regional NRM and regional planning groups • LWMP workshop development
Central	<ul style="list-style-type: none"> • Link with regional NRM and regional planning groups eg <i>Healthy Waterways</i> • Minimum tillage at shed meetings • LWMP workshop development • Nutrient management workshop development
South	<ul style="list-style-type: none"> • Link between farm inputs, on-farm environment and off-farm environment eg nutrient management workshops, LWMP workshops, herbicide management workshops • Link with other industry to highlight importance of environmental issues eg for food grade soybeans (Grain in Cane, bus tour to areas, Target 100) • Highlight soil-water balance principals to best use rainfall and irrigation and to minimise off-site impacts. Also issues such as deep drainage, run-off

Stage 2 targets for the sugar industry include:

- Increase irrigation water use efficiency by 2%.
- 50% grower adoption of best management practice to address the regional priority issue.
- 90% grower awareness of management techniques which address the regional priority issue.

6.2.5 SUGARCANE FMS

The industry is developing a system known as SUGARCANE FMS to help growers build on the programs and initiatives they have already been a part of, and put in place a customised documented system to track their farm's individual profitability and progress.

SUGARCANE FMS (Farm Management Systems) is an option for growers who are searching for ways to become more productive and profitable. The FMS will incorporate Land and Water Management Plans, the Grower Positioning Program and other industry programs currently in place.

Whilst the SUGARCANE FMS is still in developmental stage, and planned to be rolled out in 2006, many growers continue to develop better farm practices to become more profitable and sustainable. Many in the farming community have been at the forefront of calls for improved farm management practices, joining initiatives such as Landcare or embracing new practices such as minimum-tillage farming, legume fallow and green cane trash blanketing.

6.2.6 C4ES Sugar Industry Environmental Audit

The Independent Environmental Audit, commissioned by the Sugar Industry Guidance Group in 2003, in general focused on the rate of adoption of Best Management Practice (BMP) within the sugar cane industry and downstream processing. The audit also reviewed the COMPASS program as well as the adoption and usefulness of the Code of Practice. In addition, a review of stakeholder interaction and natural resource management was undertaken.

A clear message from the audit is that substantial changes in farming practices have been adopted and are leading to improved environmental outcomes. A further message from the audit is that this progress has not been enunciated clearly to the government and wider general public.

Productivity on farm and environmental outcomes have been delivered by better control of water through improved irrigation practices, laser levelling and drainage works. The ongoing support of these change programs is likely to continue to deliver financial and environmental outcomes. Even so, there is a low use of higher technology in water management scheduling tools, indicating that the potential efficiency gains from utilising this kind of technology are still to be gained.

Other areas of potential improvement include:

- Greater uptake of soil and leaf testing,
- Sub surface application of fertiliser,
- Uptake of controlled traffic, minimum tillage and other advanced techniques, and
- Improved harvesting.

The following recommendations were made by the Audit:

- That there is a whole of industry environmental policy and adoption of BMP,
- That sustainable farming outcomes be driven by regional focus groups developing regional Environmental Risk Assessments and BMP Registers, and
- That the sugar industry develops a framework, which builds on and incorporates the current Code of Practice and subsequent industry BMP.

Many of these recommendations will be facilitated by the development and adoption of Farm Management Systems, an activity currently being undertaken in the industry.

6.3 Future Directions

The ongoing development of improved farming practices based upon controlled traffic; legume fallow and minimum tillage systems complement the changes already undertaken by the sugar cane industry to improved productivity on farm. These practices are disseminated via a huge

communication network in the sugar cane industry. This involves mills, BSES, government departments, CANEGROWERS and individual growers.

The ongoing programs of COMPASS, FMS and RWUE2 with the NRM incentive programs are assisting farmers in the improvement and documentation of their practices. This documentation will assist farmers in continuous improvement of on-farm performance in addition to benchmarking industry against best management practice.

7 Cross Industry Activity

7.1 Farm Management Systems

In mid 2003 the major members of QFF, CANEGROWERS, Cotton Australia, Growcom and Queensland Dairyfarmers' Organisation together with the Queensland Chicken Growers Association and Nursery & Garden Industry Qld commenced work on the Farm Management Systems initiative.

This work centres on value adding to the existing and developing programs of these industries namely:

- The Cotton Industry's BMP Program
- The Sugar Industry's FMS Program
- Growcom's FMS program
- Dairy Industry's Dairying Better N Better Program
- Meat Chicken Industry's National Environmental Management System, and
- Nursery Industry's Accreditation Scheme (NIASA)

It should be noted that the term Farm Management Systems is used mainly as a collective reference the above programs. Because these programs have developed or are developing to suit and match industry priorities, needs and circumstances they have their own individual identities.

A number of drivers prompted these industries under QFF to work together including recognition of shared design and delivery features, shared policy and implementation obstacles, the need to minimise potential duplication between programs when implemented on multi commodity farms, and the prospect of achieving efficiencies and savings through collaboration.

7.1.1 Work to Date

Work to date by QFF and member organisations on the Farm Management Systems initiative has been significant. A range of strategic and applied policy negotiations has commenced with the State Government to support the development and implementation in Queensland by industries of these programs.

The signing in March 2005 of a *Memorandum of Understanding between QFF and the Queensland Government relating to Farm Management Systems* sets out a strategic policy framework for action. This agreement comprises of commitments from the State Government, QFF and the major member organisations to the support the initiative.

In addition to this policy work under the banner of QFF, member organisations are progressing the development and implementation of their FMS programs as outlined in their relevant sections.

A draft *Farm Management Systems Framework* and draft *Guide to the Common Elements of FMS Programs* have been developed and are now out for consultation with stakeholders. Consultation on these documents will be wrapped up in June 2005 and it is expected that the final versions will be ready by the end of August 2005.

The FMS Framework sets out a number of guiding principles and objectives with the intent of providing a common framework for joint activity by industries. Activity under the framework is both policy and program implementation orientated and the framework also serves as an interface between key stakeholders and government.

The draft guide details the common design and delivery elements between the industry programs, namely:

- Recommended management process,
- Use of and focus of recommended management practice,
- On-farm performance verification,
- Delivery, review and evaluation mechanisms, and
- Support by industry.

Working with non-government stakeholders is equally important and QFF has also established a key partnership with Regional Natural Resource Management (NRM bodies, through the Queensland Regional NRM Groups Collective (the Collective), to help in the delivery of programs and explore and develop links between farm and regional orientated activity. The Farm Management Systems initiative is a significant area of focus under a Memorandum of Understanding signed in June 2004 between QFF and the Collective.

8 Conclusions

Within the cotton, dairy, grain, grazing, horticulture and sugar industries a number of initiatives aimed at improving industry natural resource management and minimising the impacts arising from farming on the environment are progressing. These initiatives are being pursued individually by industry, in partnership with fellow industries, and in partnership with government, regional NRM bodies and other industry stakeholders.

This work and activity represents significant investment by industries on behalf of their constituents, and demonstrates a strong commitment by industry to be proactive contributors to an environmentally responsible Queensland.

The Great Barrier Reef is recognised as one of the greatest natural wonders of the world and rural industry, who make up the predominant land use in the reef catchments, are committed to minimising impacts that may arise from farming activity on the health and resilience of the icon.

Many of the initiatives mentioned are in their early stages of development and implementation and time is needed for efforts to mature and improve. The breadth and depth of initiatives and associated activity is unprecedented.

Partnerships, mutual support, trust and confidence are highly regarded by industries as motivators to continue progressing these and perhaps more initiatives into the future.

As development of initiatives progresses, a stronger focus on facilitating uptake by farmers and improvement in farm practices will result. Direct investment by government in industry initiatives is essential if accelerated delivery is desired.

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10 Appendix 1

Growcom Natural Resource Management Policy Statement

The issues

Environmental protection and natural resource management are important issues for growers. Much of Queensland's fruit and vegetable industry is located close to sensitive environments such as the Great Barrier Reef.

The community, industry and government recognise the importance of maintaining a healthy environment. Across Australia there is a high level of concern about major environmental problems such as salinity, declining river health and the loss of natural ecosystems. Issues such as resource security in water and vegetation are the subjects of hot debate.

Fruit and vegetable growers in Queensland aim to be responsible custodians of natural resources and rural environments, however, highly complex regulatory, policy and planning systems make natural resource management a major challenge for growers.

Our position

Growcom supports the sustainable development of the horticulture industry in Queensland.

This requires horticultural enterprises to be profitable, socially viable and environmentally safe. Growcom and its members aim to work in partnership with government, research organisations, regional and catchment management bodies, the community and other stakeholders to address natural resource and environmental management issues.

Growcom believes an overarching framework is needed to encourage and coordinate sustainable natural resource management at local, regional, state and national levels.

Through a cooperative and holistic approach, we aim to deliver workable and balanced outcomes for the industry that also benefit the broader community.

Our commitment

The industry has made a commitment to the *Farmcare Code of Practice for Sustainable Fruit and Vegetable Production in Queensland*¹, which outlines good environmental management practices such as:

- Efficient and careful use of natural resources, particularly water and soils.
- Minimising environmental impacts caused by horticultural land use, particularly run-off of sediments, fertilisers and pesticides into waterways.
- Minimising waste and pollution from horticultural land use.
- Careful use of pesticides.

¹ The Farmcare Code has been endorsed by the Queensland Government as an approved Code of Practice under Section 219 of the *Environmental Protection Act 1994*. It constitutes an industry standard giving guidance to growers in meeting their 'General Environmental Duty' under the Act.

- Minimising impacts on biodiversity. Growcom maintains an environment program designed to assist its members to continually improve their environmental performance and achieve ecological sustainability. We believe a 'triple bottom line' approach would be an appropriate measure of the industry's performance.

Our expectations

Growcom seeks recognition and commitment from government and the community that the industry requires support to achieve its goal of ecological sustainability. In particular, the industry requires:

- The opportunity to apply self-regulation wherever possible to address environmental issues.
- Planning and management of natural resources to be based on sound science.
- If necessary, negotiated transition phases of an appropriate, planned, and agreed timeframe that allow industry members time to adapt or restructure to legislative or policy changes, implement changes to practices or develop solutions to problems.
- Financial and other support for growers when the public benefits of environmental management outweigh private benefits, and when the community's expectations of environmental management or biodiversity conservation restrict growers' farm management beyond current recommended practices.
- A range of financial and market-based incentives be explored and used as much as possible to encourage the adoption of improved environmental management practices.
- Institutional, economic and other barriers to the adoption of sustainable management practices be identified and addressed.

Our agenda items

Issues to be considered within this policy area include:

- A 10-year plan for natural resource management in Queensland and on-farm delivery programs.
- Regional and catchment planning and management within an overarching framework.
- Natural resource access, allocation and trading (eg water, carbon credits).
- Great Barrier Reef.
- Vegetation management and tree clearing.
- Water quality.
- Salinity.
- Greenhouse and climate change.
- Acid-sulphate soils.
- Biodiversity and wildlife management.
- Pest and weed management and chemical use.
- Biotechnology and genetically modified organisms.
- Organic food production.
- Competing land use eg urban development in rural areas.
- Local government land use planning.
- Property management planning.
- Farm Management Systems in agriculture.



**Australian Government
Queensland Government**

**Audit of the Reef Water Quality
Protection Plan**

Audit Report

1 July 2005

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Executive Summary

Key Findings

- This independent Audit views the Reef Plan to be an important and innovative approach to an issue of both national and international concern. The innovation lies in the emphasis placed upon fostering a whole-of-government approach based on improved investment coordination. The innovation also lies in the level of engagement with non-government organizations, business, civil society and the general community sought by government.
- This innovative aspect of the Reef Plan has yet to be fully recognised outside of government. This may reflect a lack of familiarity and understanding of the importance of adopting a whole-of-government approach, and of the long lead-time involved in building such a comprehensive solution. It also highlights the importance of moving to communicate what the Reef Plan is, and what it is not, far better in the future. Explaining the disadvantages of targeted funding in this engagement-based context is one key area that requires more attention. This communication will be critical to building public confidence in the Reef Plan.
- The manner in which the Reef Plan has been implemented to date is perceived both within government and in the wider community to constitute an initial launch phase (increasingly referred to as Phase One). Phase One has played an important role in galvanising a wide range of activities on the basis of adopting the precautionary principle.
- In line with this emphasis on generating momentum as quickly as possible the design of Phase One of the Reef Plan placed an emphasis on assigning responsibilities for implementation within government in such a way that the machinery of government has sought to meet its obligations to the Reef Plan. Strong political backing at the most senior level has served to facilitate the implementation of the Reef Plan. This political impetus has resulted in the definition of a set of Actions necessary to meet each Strategy and a subsequent delegation of responsibility for different Activities to each department, agency or organization involved.
- The Reef Plan set milestones for each Action that act as stimuli for galvanising activity in order to generate momentum. There is compelling evidence from this Audit that stakeholders fail to grasp that the Reef Plan aims to generate momentum in constructive engagement. The Reef Plan does not simply involve implementing a set of Actions and Activities all with clear milestones and due dates in a strict project management sense. **The ‘implementation’ of the Reef Plan is a process of implementing a sustainable process of constructive engagement *not* implementing a well-defined fixed term project plan. This aspect is not currently recognised outside of government.**

- Communicating this innovative aspect of the Reef Plan is now of critical importance, and constitutes the main conclusion from this Audit. Stakeholders, whether currently involved in Reef Plan Actions or not, need now to recognise that implementing the Reef Plan is all about implementing *constructive engagement* both within the two involved governments and between government, industry and civil society.
- Not only is the potential for constructive engagement a key advantage possessed by democracies, it is also critical to addressing environmental challenges. This Audit finds that whilst the government sector has sought to generate greater constructive engagement in order to save the Great Barrier Reef those elements in the wider community currently linked to the Reef Plan still hanker for a more traditional reliance on government to solve all such problems.
- As of 1 July 2005 the Intergovernmental Operating Committee (IOC) has accepted completion reports for three Actions and one partially completed Action (out of a total of 69 Actions, i.e. six percent of all Actions). These are (in abbreviated form):
 - E1: Investigate the potential to make declarations and undertake other actions under the Water Act 2000.
 - E3: Develop guidelines to clarify the general environmental duty under the Environmental Protection Act 1994 and the duty of care under the Land Act 1994.
 - E4: Ensure compliance programs and mechanisms for the Environmental Protection Act 1994 and the Land Act 1994.
 - D6 (Completed with some implementation still to be undertaken): Review the effectiveness and feasibility of mechanisms for managing agricultural activities impacting on the Reef Plan.
- The IOC has also accepted 18 Action of Concern Reports (covering 26 percent of all Actions).
- In an effort to both validate apparent progress in implementation, and to generate higher resolution data on the implementation process, the Audit investigated progress made in the Activities that sit behind Actions.
 - Of the 11 percent of Activities due on or before 1 July 2005, 43 percent have been completed, 48 percent are currently being implemented and 8 percent are still being planned.
 - Of the 39 percent of all Activities due after 1 July 2005, 3 percent are complete, 79 percent are being implemented 18 percent are still being planned.

- Of the remaining 50 percent of Activities with no due date specified, 12 percent are completed, 82 percent are being implemented and 9 percent have no known status.
- The 50 percent of Activities with no due date specified reflects the mix of ‘work in progress’ and the on-going nature of many of the Reef Plan’s Activities.
- Reef Plan milestones linked to Actions are the ‘way points’ in a longer-term journey – they do not, as some external observers assume, necessarily represent the end of that journey. One of the key findings of this Audit is that there is a lack of clarity over the purpose to be served by Action milestones
- These findings are consistent with the expected “S curve” profile for such a complex engagement-focussed initiative. They demonstrate that momentum in the implementation process has now built-up, and that this is clearest when one drills beneath the set of Actions that are the ‘currency’ adopted for the Reef Plan. This supports the view that the implementation of the Reef Plan is best understood as a process of implementing constructive engagement enabled by Actions but not restricted to these Actions.
- The Audit finds that maintaining momentum in the implementation of the Reef Plan will require an explicit focus on the design of Phase Two of the Reef Plan as long-term processes for building a constructive engagement based approach. Phase Two will therefore require changes in the design of Actions and Activities and a far clearer sequence of relevant long-term milestones and due dates – where this is appropriate. Now that momentum has been generated, the challenge must shift to maintaining momentum. This rests upon counter-acting prevalent misconceptions outside of government that implementing the Reef Plan is simply as issue of government delivering on objectives rather than the general community also delivering on their obligations and responsibilities towards the ecological health of the Great Barrier Reef.
- Phase Two of the Reef Plan will also provide an important opportunity to strengthen stakeholder and public confidence in the Reef Plan by re-visiting the ten year time frame initially specified. Whilst a sense of urgency has been important in catalysing an engagement-based approach it as also a hostage to fortune. The major role played by pulsed rainfall events in unpredictably flushing stocks of pollution out from the land and rivers systems into the lagoon must be recognised. A more realistic time frame and a greater recognition of the importance of monitoring and modelling behaviour and pollution emissions on-land are key issues for the future of the Reef Plan.

- One strength of the Reef Plan is that it has kick-started a highly complex array of Actions and Activities involving numerous partners. This has generated a richer set of inter-relationships within the machinery of government than may have existed otherwise. These lateral relationships now constitute an asset for future exploitation. That said, concerns have been raised that this asset will now start to depreciate unless Phase Two of the Reef Plan re-invigorates the implementation process by re-enforcing the importance of these relationships as a basis of communication and coordination.
- There is also a recognition that the scope for improving policy and investment coordination will tend to encounter decreasing returns as the implementation of the Reef Plan progresses. This is because it is far more difficult to reconcile the core objectives of fostering economic development and achieving environmental sustainability than to reduce the severity of a more general set of policy and investment alignment problems – many of which are caused simply by a lack of information and communication between departments and agencies.
- Public confidence in the Reef Plan would be enhanced if the common ground in the core objectives of fostering economic development and achieving environmental sustainability were given greater recognition in Phase Two of the Reef Plan.
- The Audit has identified opportunities for progressing in this area. These opportunities rest upon fostering a more comprehensive asset-value based approach that highlights the financial benefits for farmers and land developers that stem from reduced environmental impacts whilst also showing how these private benefits help to protect the Great Barrier Reef. A greater ‘carrot-based’ emphasis on ensuring that access to the range of subsidies and incentives for agriculture and land-development is conditional upon compliance with Reef Plan objectives would support this asset-value based approach.

Terms of Reference

The purpose of undertaking the audit is to enhance public confidence in the implementation of the Reef Water Quality Protection Plan (the Reef Plan). The audit will give effect to Action I2 of the Reef Plan to:

“Ensure that implementation of the actions in the Plan are regularly and independently audited.”

The objectives of the audit are to:

- (1) Provide an independent assessment of progress in implementing the Reef Plan; and
- (2) Identify barriers to, and drivers for, successful implementation.

To achieve these objectives, the audit will draw on three main sources of information:

- information and reports required through the Reef Plan Monitoring, Evaluation and Reporting Framework;
- other relevant reports produced as part of implementing Reef Plan actions; and
- structured interviews with implementers (those organisations identified by the Reef Plan as responsible for Reef Plan actions).

SCOPE

The audit will consider the collective performance of Reef Plan implementers in implementing the Reef Plan in the period December 2003 to June 2005. In achieving this, the audit will comment on the:

1. Implementation of Strategies and Actions;
2. Government and Non-Government Implementation Processes; and
3. Barriers to Implementation.

The audit will not address the issue of change in natural resource condition.

1. Implementation of Strategies and Actions

The audit will assess the overall progress in Reef Plan implementation. Specifically, the audit will assess and report on the extent to which:

- 1.1 Implementation of actions due on, or before, 1 July 2005 is complete;
- 1.2 Actions due after 1 July 2005 have commenced and are progressing towards delivery of their milestone;

1.3 Implementation of actions is achieving the intent of strategies;

1.4 Implementers have prioritised activities according to the high risk catchments identified in the Reef Plan.

To assess implementation of actions, the audit will assess the extent to which activities have contributed to fulfilling action requirements. In doing this, the audit:

- will review systems for collecting information on implementation; and
- may take into account other programmes and policies that are not actions in the Reef Plan, but may affect implementation of the Reef Plan. For example, developments in government policy and programme delivery arrangements.

In assessing the extent to which actions have been completed the audit will include, but not be limited to considering the extent to which the Reef Plan has been incorporated into the strategic, corporate or other planning of implementers and whether effective implementation plans are in place.

2. Government and Non-Government Implementation

Processes

Governance arrangements

The audit will assess the extent to which governance arrangements required by the Reef Plan are established and working effectively.

This assessment will include, but not be limited to, the extent to which:

- the Intergovernmental Steering Committee (ISC) effectively and efficiently oversee implementation of the Reef Plan;
- the Intergovernmental Operational Committee (IOC) effectively and efficiently supports the ISC and implements the Reef Plan;
- the Reef Plan Secretariat effectively and efficiently supports and implements directions from the ISC and IOC.

Implementation and reporting systems

The audit will assess the extent to which the systems described in the Monitoring, Evaluation and Reporting Strategy provide a basis for accurate and communicable reporting on the implementation and performance of the Reef Plan.

Stakeholder engagement processes

The audit will assess the extent to which those organisations identified by the Reef Plan as responsible for Reef Plan actions are engaged in Reef Plan implementation (implementers).

In determining the extent of engagement, the audit may examine, but is not limited to the effectiveness and efficiency of arrangements for implementers to participate in Reef Plan implementation.

3. Barriers to Implementation

Based on the outcomes of the above assessment, the audit will identify barriers to, and drivers for, successful implementation.

Introduction

This is a report on an independent Audit of the implementation of the Reef Water Quality Protection Plan (the Reef Plan). This is the first of a series of audits to be carried out, with subsequent audits taking place by 1 July 2010 and 1 July 2013. The Audit has been carried out by the research and consulting firm Howard Partners.

In providing an independent assessment, the intention of this Audit is to seek to enhance public confidence in the Reef Plan. Public confidence is critical because it is integral to the success of the Reef Plan. Consequently, the audit team placed a high priority on ensuring that the audit was conducted in an independent and transparent manner.

This independence was reflected in a decision to hold a workshop with well-informed representatives from the wider community despite the fact that such consultation lay outside of the Terms of Reference for the Audit. This workshop was arranged when it became apparent that many stakeholders had concerns over their exclusion from the audit process. Although a process of consultation with stakeholders was taking place in parallel with the audit, the perception of exclusion, even if unfounded, was viewed by Howard Partners as a critical issue and appropriate actions were taken to re-assure these stakeholders.

The independent nature of this Audit means that a robust and balanced assessment of the Reef Plan has been carried out. Whilst there are positive aspects of the Reef Plan implementation process, there are also some pressing challenges. This Audit draws attention to both positive and negative findings – striving wherever possible to identify practical solutions to the challenges we have identified. After all, the intent of the series of Audits is to provide an opportunity to take stock of progress and to suggest ways of improving progress in the future.

The tight time frame allowed for this Audit required that the validation of information on the status of the implementation was a substantial challenge. The approach adopted was to request information on the current status on the set of unpublished Activities that sit behind each of the Actions specified in the Reef Plan. This has provided richer and higher resolution data than is available if Actions are considered irrespective of the Activities via which they are implemented. Such information was readily available from government implementers and proved to be invaluable in assessing the progress made in implementation. The main caveat is that time did not allow the status of these unpublished Activities to be validated – this was taken on trust.

It is the considered view of the Auditors that this caveat to the findings does not constitute a significant limitation to this assessment of progress in implementing the Reef Plan. This is because the Reef Plan is not solely a firmly fixed plan for which the implementation process is simply that of completing agreed objectives over a fixed period. Whilst there is

a defined ten-year time frame, and a clear set of Objectives, Strategies and Actions these are intended to *launch* a whole-of-government and engagement-based process by providing impetus. Many of the Actions and supporting Activities are open ended and have an evolutionary and exploratory intent. This means that any in-depth validation process is a complex and time consuming exercise well beyond the scope of this Audit. For example, it would require that the impact of a number of reports commissioned to meet Actions were assessed.

Methodology adopted for the Reef Plan Audit

The approach adopted for this Audit is based on extensive consultation with government and non-government organizations tasked with implementing the Reef Plan. It is also based on reviewing a substantial amount of documentation generated by the process of implementing the Reef Plan.

Most of these consultations have been carried out in a workshop format. This has allowed front of mind issues and concerns to be captured in a relatively unstructured manner.

These views have then been summarised at the end of each workshop or meeting using a survey form. The survey form is designed to provide a quantitative summary of the view expressed in a standardised format. An attempt was made in each workshop to obtain consensus over these views. Where this was not possible individual responses were recorded and weighted in such a way that an average organisational response was obtained. The survey instrument can be found in Annex 2. The survey instrument also includes guidelines for conducting the workshops and meetings.

In addition, lead organisations within government were asked to complete an Activity Status data template. This provided key data for assessing the current state of the implementation of Strategies and Actions.

The policy context: fostering more joined-up public service delivery

The general community relies on governments to handle the uncertainties, risks and indirect consequences of individual and corporate actions that markets cannot cope with effectively. This key role for governments is particularly important with regard to threats that are complex in origin and take a long-time to deal with. The community therefore relies upon governments to play a stewardship role in looking after challenges that take a long time to manifest themselves, or, as in

the case of the Great Barrier Reef, require far-sighted solutions to be developed.

Governing a modern economy is a highly complex undertaking. Several government departments may need to coordinate their decision-making over legislation, incentives and funding programs. This requires efficient and effective communication at varying levels within public administration. Unintended consequences for policy and for how public services are delivered can arise out of this complexity.

These challenges for government can be particularly severe in the contemporary Australian and state system of government because of the way in which budgetary authority and accountability is handled within each Department – resulting in vertical silos with a tendency to restrict communication between Departments.

Similar information flow and coordination challenges arise from Australia's federal system where responsibilities are shared between governments in a wide range of areas. It is for these reasons that policy-makers stress the importance of adopting more whole-of-government approaches. The aim is to streamline and coordinate the machinery of government in order to make it more efficient and effective.

These efforts to foster whole-of-government approaches can require innovation within government. That is to say, developing and trialling new approaches to better coordination and new approaches to public service delivery. There is a growing recognition that good government involves:

- experimentation in policy and its delivery;
- assessment of what works and what does not work – and why this is the case, and;
- the selection and “mainstreaming” of these innovative new approaches.

This is the context within which the implementation of the Reef Plan has been assessed. The Reef Plan is an attempt to innovate in the coordination of policy and its delivery *both* within the Queensland and Australian Governments *and* between each sphere of Government and via engagement with the wider community. This is an ambitious undertaking that is subject to various risks.

Public servants operate within a relatively risk-averse environment. Coordinating efforts between portfolios and between State and Federal levels of government is risky. Priorities may not align well. Performance targets and incentives may conflict. Opportunities to demonstrate the superiority of one Department or Agency over another exist – and could be exploited.

Taking the risks necessary to produce more whole-of-government policy is, however, necessary in order to address the threats to the ecological

health, and economic value of the Great Barrier Reef. Therein lies the potential significance of the Reef Plan.

This tends to mean that risks taken in order to innovate in policy and service delivery need to be encouraged and sanctioned at the highest political level. In essence, such top-level endorsement of innovative risk taking imposes a more severe risk from not seeking to coordinate in risky areas. This drives more whole-of-government approaches because the consequences of a failure to attempt better coordination are more severe than the consequences of attempting to innovate in coordination - and of failing.

It is critical that this Audit recognise that, as far as the public sector is concerned, the Reef Plan implementation process involves taking risks in order to deliver more coordinated and whole-of-government policy towards factors that influence the ecological health of the Great Barrier Reef.

Consequently, this audit focuses on an assessment of progress in implementing the Reef Plan in terms of the barriers to, and drivers for, successful implementation that involves the taking risks in order to experiment with more joined-up approaches.

This point applies both within government and in evolving relationships between government and non-government implementers and other stakeholders in the wider community. In such an environment, a more permissive attitude towards the meeting of targets and milestones is appropriate. What matters is the overall progress made in ironing out clashes and inconsistencies in public policy and in its delivery via a process of “learning-by-doing”. The process of designing and delivering the Reef Plan is one of discovery and innovation – it is not simply the execution of unproblematic instructions.

Understanding the engagement sought by the Reef Plan

The Reef Plan is innovative because it seeks to develop a more effective whole-of-government approach to policy delivery through engagement with the general community, industry groups and civil society.

This engagement is characterised in the following two diagrams (Figures 1 and 2). Figure 1 introduces the general principle of how government, industry and advocacy groups and intermediary bodies can form a triangular partnership based upon their distinctive roles. Figure 2 then applies this conceptual scheme to the Reef Plan.

This conceptualisation was proposed as a hypothesis at the start of the Audit and then discussed and ‘tested’ during the consultations. There was a consensus that it is useful to frame the intent of the Reef Plan in this way because it helps to draw out what the Reef Plan *is*, and what it is *not*.

The widely held view amongst those involved in implementing the Reef Plan is that, in line with the intent of overall government policy, the Reef Plan represents one element in a triangular partnership linking government (in the authoritarian – compliance with process quadrant), industry/advocacy groups (in the organic organization – compliance with objectives quadrant) and (in the case of Queensland) Regional NRM bodies in the organic organization – compliance with process quadrant.

From this perspective, the Reef Plan is part of a wider partnership and system of engagement not the *sole* mechanism for engagement. In particular, the Regional NRM bodies have an more loosely coupled yet supporting role that positions them to interact with industry and advocacy groups and the general community at arms length from government. Consequently, the Reef Plan can be understood as part of a more general constructive engagement-based approach to a wide range of environmental challenges.

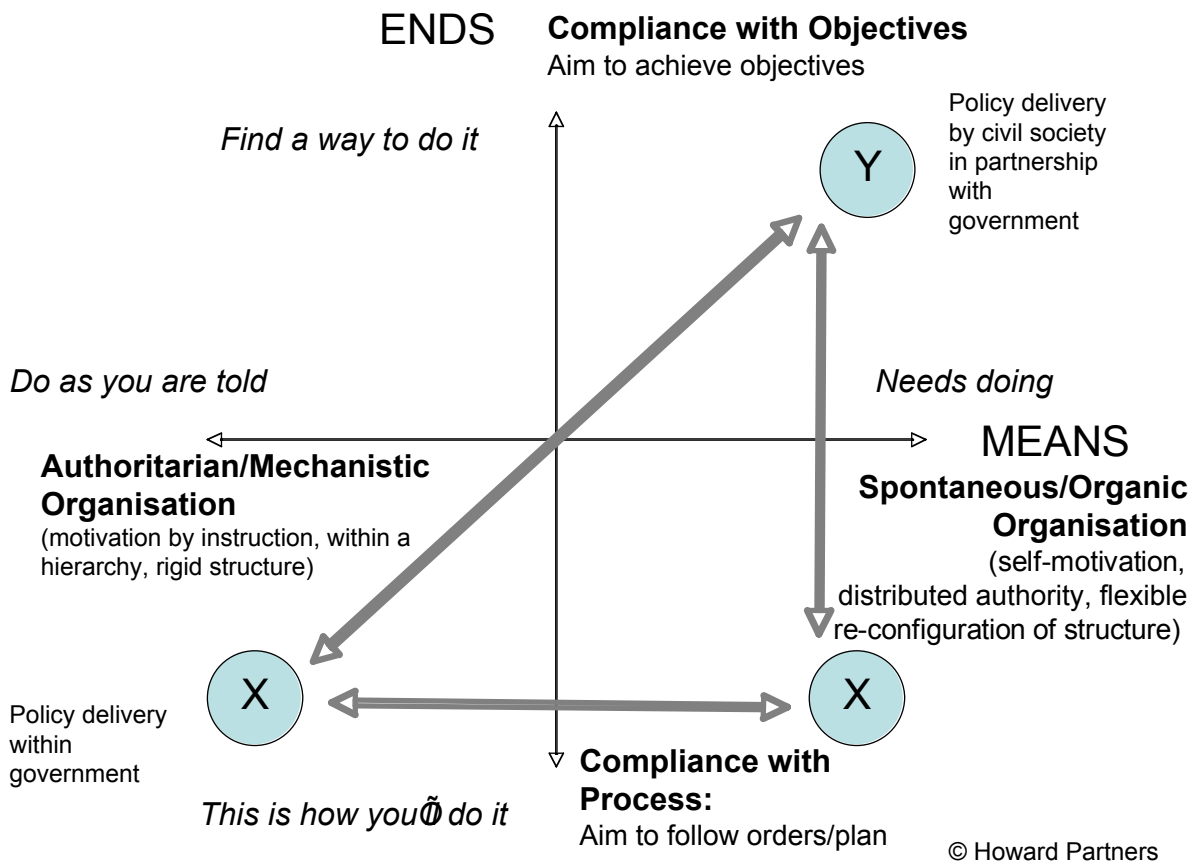


Figure 1: Diagrammatic Exposition of the Partnership Context in which the Reef Plan Operates

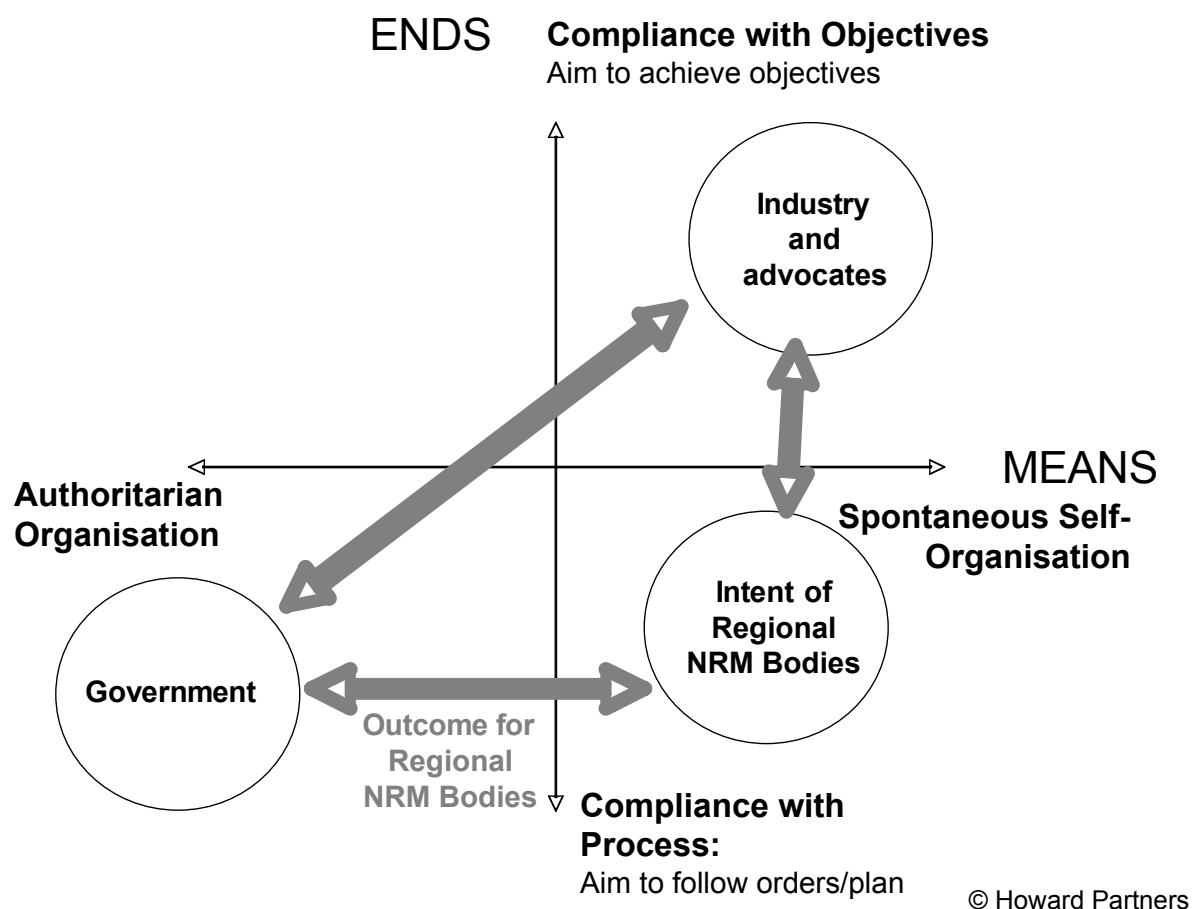


Figure 2: The Conceptual Scheme Applied to the Reef Plan

More traditional policy initiatives are often based upon the announcement of a specified amount of funding. This usually combines existing funds and some new funding together with a re-ordering of priorities. Attention then shifts to program design and delivery. The Reef Plan effectively reverses this sequence.

The Reef Plan has started by exploring the extent to which existing policy and funding can be better aligned. In this sense it is an investment coordination strategy. It recognises that there are inconsistencies in policy objectives that impact upon the Great Barrier Reef – and that it makes sense to seek to reduce the severity of these inconsistencies.

The Reef Plan's emphasis on policy coordination over new funding per se allows it to seek to deliver its objectives by fostering 'informal' innovation outside of government and closer engagement between government, industry and civil society.

The principle is that this engagement is facilitated by a greater emphasis on compliance with objectives than compliance with process, and by a greater emphasis on spontaneous self-organisation outside of government than with more traditional 'top down' authoritarian approaches.

Critics of the Reef Plan who view the absence of major targeted funding may not recognise this intention to the Reef Plan. Indeed, if there were substantial funding then the Reef Plan would be forced to operate in a far more traditional manner. This would involve compliance with process and a more authoritarian mode of conducting business. This is necessary in order to comply with financial accountability provisions inherent to the public sector.

This innovative aspect of the Reef Plan is aligned with Australian and Queensland Government policy to deliver environmental outcomes through partnerships with regional community organizations – notably Natural Resource Management bodies.

One challenge for the Reef Plan is that it has adopted a complex set of Strategies, Actions and Activities that can be confused with a more traditional approach in the 'authoritarian-compliance with process' quadrant. These Strategies, Actions and Activities are intended to stimulate the partnerships that will generate more joined-up policy and its delivery – not to simply serve as just another set of deliverables to be ticked-off.

The extent that both government officials and non-government implementers may interpret this structured aspect of the Reef Plan as a *compliance* rather than an *engagement* challenge constitutes a major potential risk to the Reef Plan.

It is therefore important that this message about what makes the Reef Plan innovative is communicated effectively both outside of and within

government. A key finding from this Audit is that this task has yet to be completed effectively outside of the Australian and Queensland Governments.

Progress made to date in implementing the Reef Plan's Strategies and Actions

Implementation overview

This section of the Audit Report focuses on progress made to date in implementing the Reef Plan's Strategies, Actions and Activities.

The Reef Plan is currently in initial implementation or 'launch' mode. It is characteristic of launching complex initiatives of this type that an "S curve" is followed. It takes some time to build momentum, there is then a phase of relatively rapid implementation which then flattens out. This is represented in Figure 3 below.

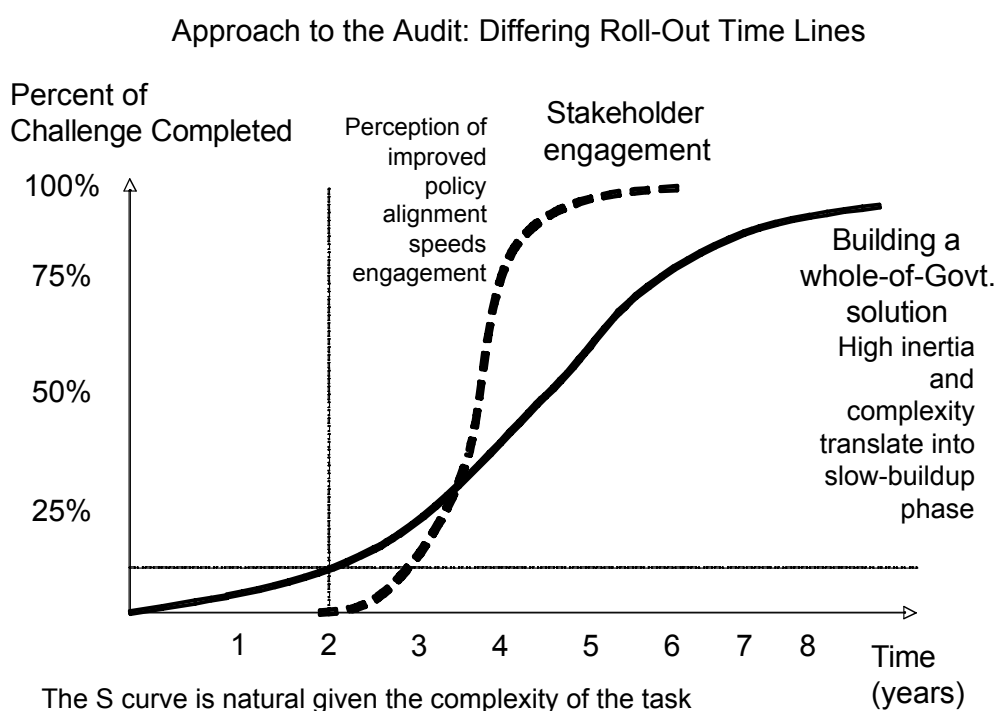


Figure 3: Representation of Reef Plan implementation phases

In the context of the Reef Plan, it is important to note that it is far more difficult to build momentum in generating a whole-of-government solution than to ramp up stakeholder engagement. Indeed, a perception by stakeholders that there is growing momentum in the whole-of-

government solution can be an enabler of public confidence in the initiative.

Audit approach

The Reef Plan is based upon Actions designed to deliver each Strategy. It identifies ‘milestones’ for each Action. However, there is not necessarily a clear relationship between the Activities undertaken and the specified milestones. The milestones were specified in the initial design of the Reef Plan and therefore represent the initial intent.

As the implementation process developed, work was allocated to each implementing organization in the form of Activities. Activities can relate to more than one Action. Whilst the ‘currency’ used in the Reef Plan are the Actions – these Actions are actually delivered by relevant Activities.

The approach adopted in this Audit has been to determine the current status of these more detailed Activities that deliver each Action. We have also sought information on whether each Activity is ‘critical’ or ‘contributory’ to a specific Action. This approach has allowed us to assess the Reef Plan as it has actually been implemented via Activities. This has the advantage that it is not always clear from the initially stated Action milestones whether or not a milestone has been met, or whether the Action has evolved via learning-by-doing, thereby outdating the original milestone.

Furthermore, many milestones are ambiguous as to their relationship to either the achievement of the Action or the delivery of particular elements of it. Some Action milestones specify a commencement date not a completion date. Some milestones are work to be undertaken not measures of achievement. Many milestones are progress reports on Actions with no validation of the intent of the Action. This makes it extremely difficult to assess progress made in implementation simply in relation to the milestones stated in the Reef Plan document.

Consequently, in the opinion of the Auditors simply examining implementation in relation to milestones does not give an accurate account of the implementation of the Reef Plan.

This re-enforces the need to look behind the Actions and examine the status relevant Activities. From an investment perspective an Action should be the sum of its critical Activities.

Implementation of Actions to date

Overview

As of 1 July 2005 the Intergovernmental Operational Committee (IOC) has accepted completion reports for three Actions and one partially completed Action (out of a total of 69 Actions, i.e. six percent of all Actions). These are (in abbreviated form):

- E1: Investigate the potential to make declarations and undertake other actions under the Water Act 2000.
- E3: Develop guidelines to clarify the general environmental duty under the Environmental Protection Act 1994 and the duty of care under the Land Act 1994.
- E4: Ensure compliance programs and mechanisms for the Environmental Protection Act 1994 and the Land Act 1994.
- D6: Review the effectiveness and feasibility of mechanisms for managing agricultural activities impacting on the Reef Plan.

The IOC has also accepted 18 Action of Concern Reports (covering 26 percent of all Actions).

The following data on Reef Plan implementation relate to Actions in which government departments are taking a lead. The Annex 3 contains tables that summarise implementation progress.

Progress in implementing Reef Plan Actions for which non-government organizations are taking the lead is discussed separately. This is because reporting on progress led by non-government organizations at this level of resolution is not currently possible.¹

Figure 6 contains a graph summarising the current status of Reef Plan Strategies based upon the status of the various Activities that deliver Reef Plan Actions. Figure 5 expresses the status of the Strategies on this basis in percentage terms. These two graphs provide a bird's eye view of the current state of play in implementing the Reef Plan. They highlight the findings that:

- a substantial amount of Reef Plan activity led by government departments is now in progress;
- a significant volume of activity led by government departments in Strategies G, H and I is still being planned – this is indicative of new work that may have been stimulated by the Reef Plan;

¹ As is discussed in the section on monitoring and reporting, the Reef Plan secretariat has prioritised the collection of data on implementation within government. It is therefore difficult, at present, to easily summarise progress made outside of government.

- implementation progress within government is particularly advanced for Strategies C and E (Economic Incentives and Regulatory Frameworks);
- the incidence of ‘unknown’ status for Reef Plan activities is low.

Figure 7 provides an Action-based perspective of the Reef Plan. It allows the status of each Reef Plan Action led by government departments to be grasped by indicating: the number of enabling Activities that have been completed; the number that are still in progress; and, the number that are still being planned.

The most significant point to grasp is that the three Actions (E1, E3, E4) for which completion reports have been accepted by the IOC are associated with Activities that are still being completed. This reflects the open-ended nature of the Reef Plan as a mechanism for generating momentum in investment coordination.

In this context, Reef Plan milestones linked to Actions are the ‘way points’ in a longer-term journey – they do not, as some external observers assume, necessarily represent the end of that journey. One of the key findings of this Audit is that there is a lack of clarity over the purpose to be served by Action milestones.

Indeed, the emphasis in the Terms of Reference for the Audit on Actions due on or before 1 July 2005 and those due after 1 July 2005 are indicative of this lack of clarity. Action milestones do not represent Action completions – they indicate that momentum has been established in a longer-term process.

Any expectation that Reef Plan Action milestones represent completed activity is likely to be problematic because it sets up expectations about the implementation process that cannot be met.

Reef Water Quality Protection Plan 2005 Report to the Prime Minister and the Premier of Queensland

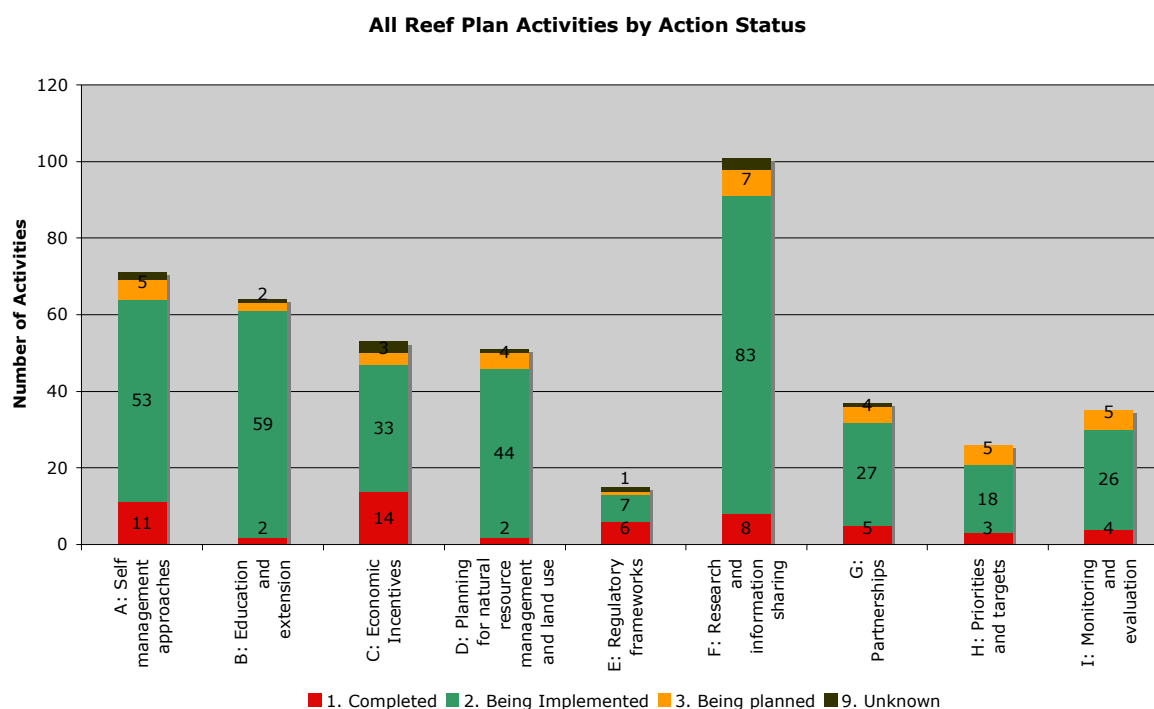


Figure 6: Graphical Summary of Status of Reef Plan Strategies based on the status of Activities (number view)

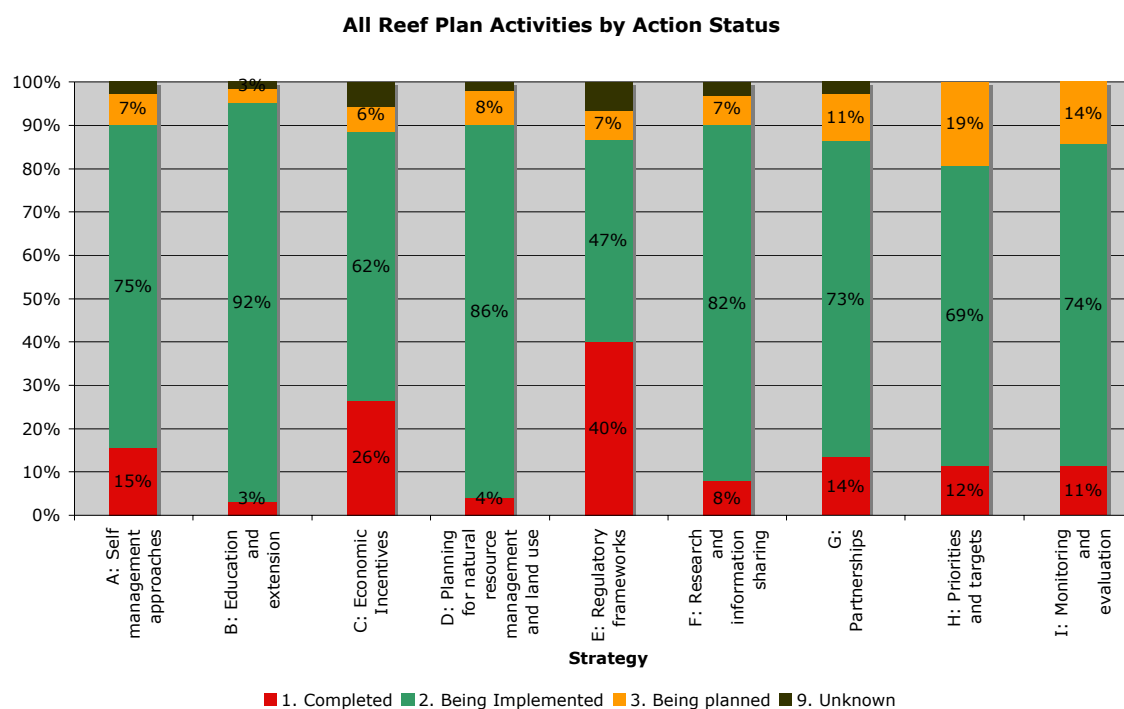


Figure 5: Graphical Summary of Status of Reef Plan Strategies based on the status of Activities (percentage view)

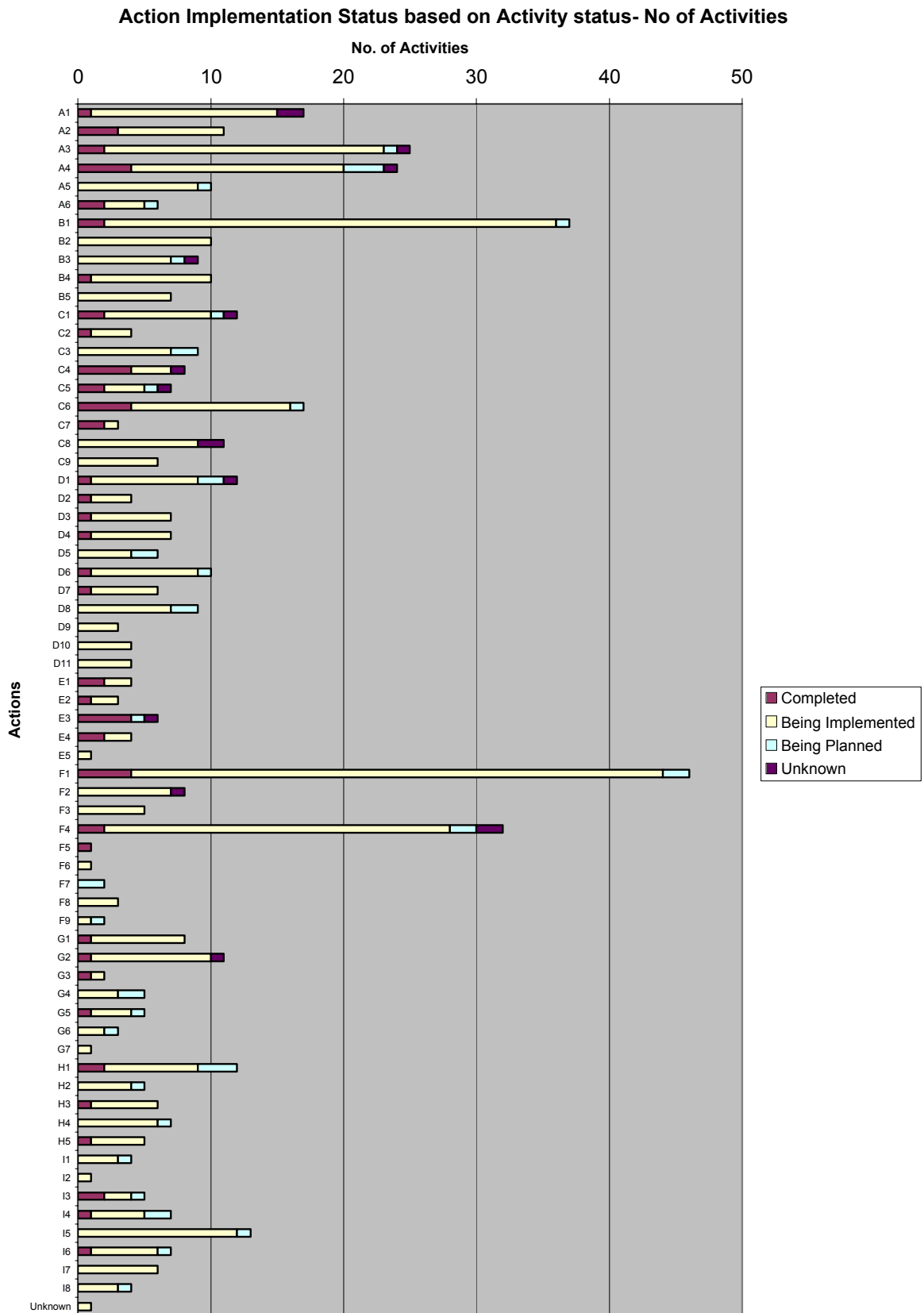


Figure 7: Overview of Action Implementation Status Based on the Status of Activities

Implementation of Activities due on, or before, 1 July 2005

Eleven percent of all Activities are due on or before 1 July 2005. Of these, 43 percent have been completed, 48 percent are currently being implemented and 8 percent are still being planned.²

Figure 8 summarises the status of these Actions. In interpreting these findings it is important to bear in mind the fact that many Actions are enabled by a mix of Activities that have a due date and those that do not.

The earlier point regarding the nature of the Reef Plan's milestones should always be born in mind. Given the nature of the Reef Plan, it is neither possible or advisable to seek to 'tick off' Action milestones due on or before 1 July 2005 because these are way-points in a more open ended process. What does matter from an Audit perspective is the finding that so much activity is now being implemented.

Much of the Reef Plan involves the improved coordination of existing Activities in order to deliver on Actions. It follows that delays to planning processes for new Activities should warrant particular scrutiny. It is these new Activities being planned that represent efforts stimulated by the existence of the Reef Plan. Only Actions A3, A4 and F4 still have Activities due on or before 1 July 2005 that are still being planned. This suggests that progress to date in implementing Activities due by 1 July has been satisfactory.

² This is an Action-based view of Activity status. Given that one Activity can belong to more than one Action, when Activities are related to Actions the sum of those Activities is 551. The eleven percent statistic for Activities due on or before 1 July 2005 refers to the 60 out of the 551 Activities that collectively relate to the range of Reef Plan Actions. When viewed at an Activity level only, there are a total of 292 activities. Of those 292 Activities, 24 (i.e. 8.2 percent) were due on or before 1 July 2005. Of these 24 Activities, 14 (58 percent) have been completed, 9 (37.5 percent) are currently being implemented, and 1 (4.2 percent) are being planned.

**Status of Implementation of Actions due
on or before 1 July 2005 based on Activity Status**

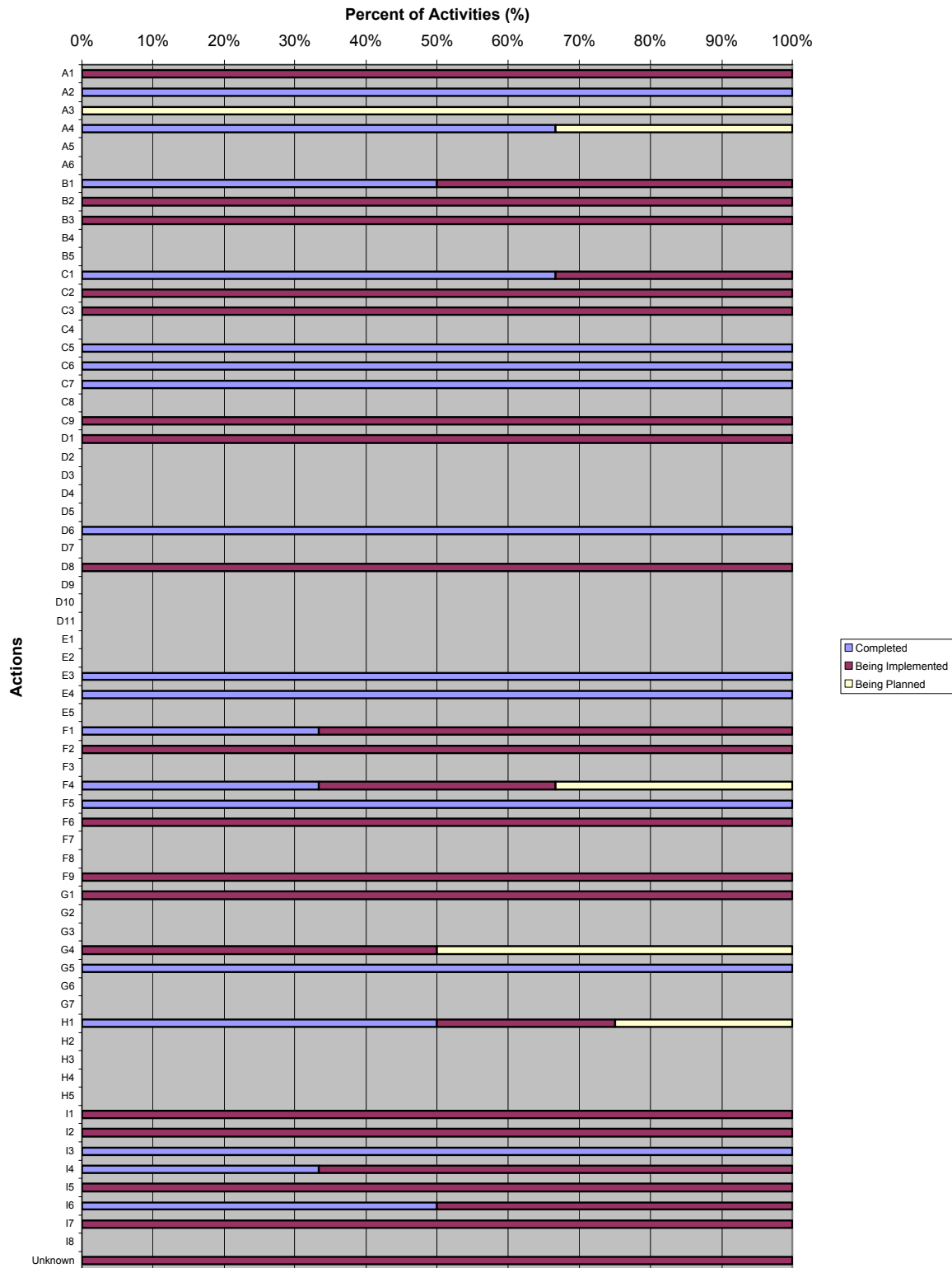


Figure 8: Status of Implementation of Actions Due on or Before 1 July 2005

Progress being made for Activities due after 1 July 2005

Of the 39 percent of all Activities due after 1 July 2005, 3 percent are complete, 79 percent are being implemented 18 percent are still being planned.

Of the remaining 50 percent of Activities with no due date specified, 12 percent are completed, 82 percent are being completed and 9 percent have no known status.

These findings are consistent with the expected “S curve” profile for such a complex initiative. The 50 percent of Activities with no due date specified reflects the mix of ‘work in progress’ and the on-going nature of many of the Reef Plan’s Activities.

Figure 9 summarises implementation status by Action based on Activity status for Activities due after 1 July 2005.

Figure 10 summarises implementation status by Action based on Activities status for which no due data has been set.

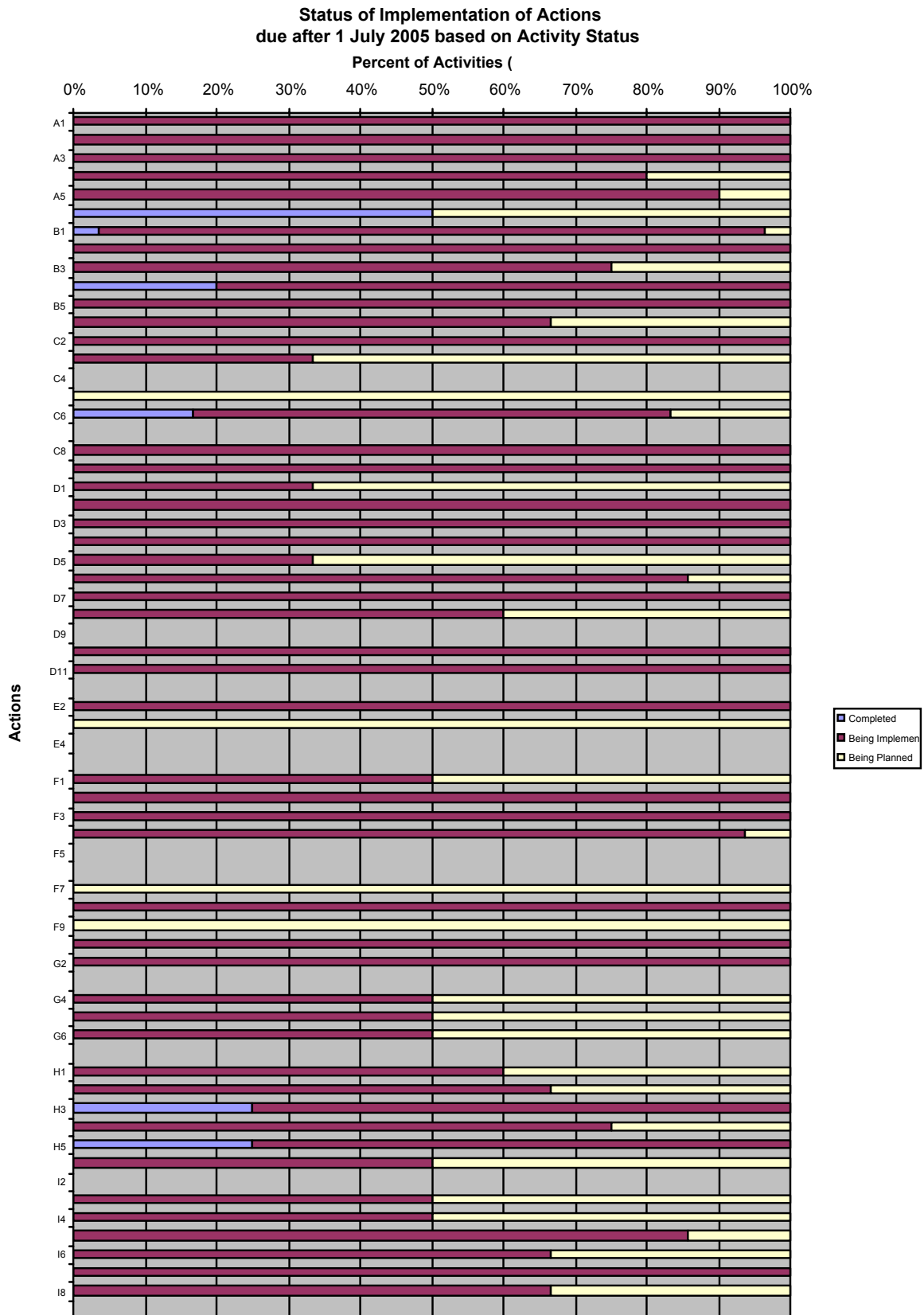
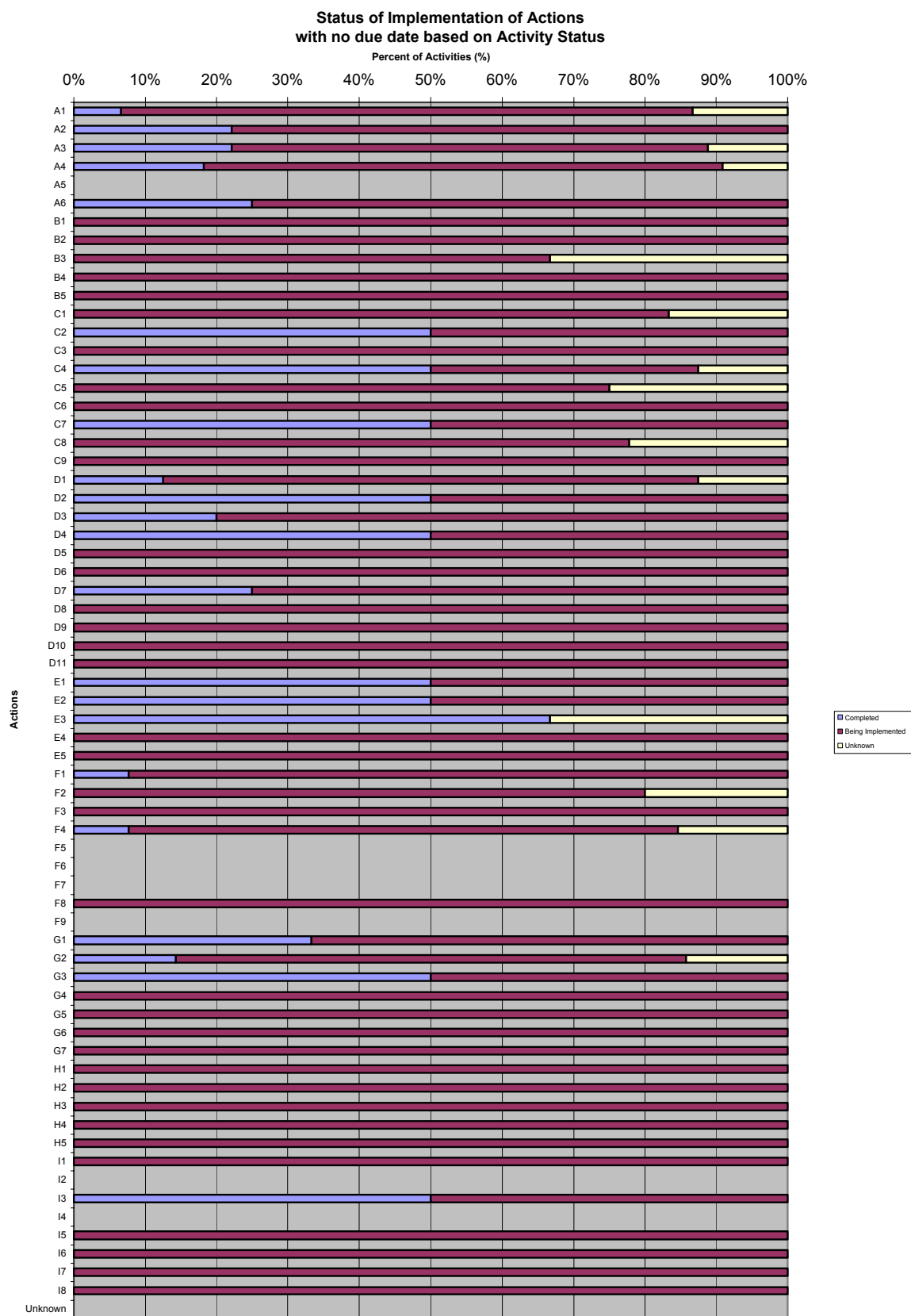


Figure 9: Status of Actions due after 1 July 2005

Reef Water Quality Protection Plan

2005 Report to the Prime Minister and the Premier of Queensland



The extent to which the implementation of Actions is achieving the intent of Strategies

The intent of the Reef Plan's Strategies is to quickly generate momentum in sustained changes to improved practices across a broad front. Constructive engagement between the Australian and the Queensland Governments, industry and the wider community is critical to this intent. From this perspective the Audit concludes that the implementation of Actions is, in very broad terms, achieving the intent of the Reef Plan's Strategies.

The main shortcoming in achieving the intent of the Strategies is that the wider community does not recognise what makes the Reef Plan different. Unless this misconception is corrected by a concerted communication strategy the intent of the Reef Plan's Strategies is unlikely to be met.

The prioritisation of the implementation of Actions in relation to the high risk catchments identified in the Reef Plan

The Reef Plan includes an assessment of various risks on a catchment-by-catchment basis. The risk factors used are:

- Biophysical risk;
- Risk related to a (lack of) capacity to change;
- Risk from development pressures;
- Risk to marine industries.

Fifty-six percent of Activities relating to regions are either 'all Reef regions' or 'Reef wide'. Twenty-nine percent of Activities relate to no regional at all. The current nature of many Actions and Activities does not lend itself to targeting catchment-specific risks.

The main challenge faced in this part of the Audit was that the classification of the regional breakdown of the Activities that support Actions does not easily align with the catchment risk areas specified in the Reef Plan. This shortcoming in systems of collating and reviewing Reef Plan progress is therefore significant. It made it very difficult to provide an answer to this part of the Terms of Reference in the time available.

On this context a concern has been raised that the current structure of the Reef Plan places an inadequate focus on facilitating strategies and investments aimed at maintaining acceptable levels of water quality. This is because of a perceived tendency for funding to be directed at current problem areas.

The perception outside of government is that the Reef Plan's prioritisation of resources towards high-risk catchment areas may have

had the unintended consequence of increasing theoretical risks of deteriorating water quality in low and medium risk catchment areas. This issue is not straight-forward because existing legislation is designed to address this issue. It will therefore be important to monitor this issue in the future.

It is also worth noting that some concerns have been raised over the currency of the catchment risk profiles used in Phase One of the Reef Plan. It might therefore be prudent to re-visit these risk assessments in the light of experience gained to date in implementing the Reef Plan.

One conclusion of the Audit is therefore that it would be prudent to ensure that Phase Two of the Reef Plan places a greater priority on maintaining acceptable water quality in low risk catchment areas.

Government and Non-Government Implementation Processes

Governance arrangements

The Audit has not found there to be any major concerns over governance arrangements. The Reef Plan operates via devolved responsibility with the two governments. In such a context, it is inherently difficult to do much more than monitor progress with a view to identifying areas of concern and appropriate responses.

There is a perception amongst industry and the Regional NRM bodies that the ISC and the IOC are not particularly effective in supporting the Reef Plan. However, this perception stems from a view that the Reef Plan is mainly concerned with a 'within government' focus rather than a focus on constructive engagement between government and the wider community.

As the conceptual framework put forward via this Audit stresses, governance arrangements cannot function effectively in a 'command and control' manner. Expectations in the wider community that there is insufficient command and control re-enforce the importance of developing an effective communication strategy for the Reef Plan.

Implementation and reporting systems

The Reef Plan's Monitoring, Evaluation and Reporting Strategy

The Reef Plan has a clearly articulated Monitoring, Evaluation and Reporting Strategy (MERS). This aims to:

- allow a transparent and consistent approach to reporting on progress in implementing the Reef Plan; and,

- help to assess the effectiveness of Actions and Activities in delivering the overall goal of the Reef Plan.

To this end, the objectives set for the MERS are to:

- define the process for determining whether the Reef Plan has stabilised and/or improved the quality of the water entering the Reef;
- identify monitoring and reporting responsibilities for each of the Reef Plan partners;
- provide the opportunity to review the Reef Plan and initiate improvements, including the development of new Actions if required;
- ensure consistency with the existing National and Queensland natural resource management monitoring and evaluation frameworks, data capture and reporting programs;
- identify linkages with reporting programs used by industry, conservation and community partners.

Audit Conclusions on the Monitoring, Evaluation and Reporting Strategy

This Audit judges the MERS system to be an effective approach in principle. The practical roll-out of the MERS system is however less straight forward. The major challenges faced are that:

- Non-government implementers of Reef Plan Actions have yet to be fully engaged in the reporting system aside from submitting material for inclusion in the Annual Report. At present, there is a major asymmetry between the level of detail available on the implementation of Actions and Activities led by government departments and those led outside of government.
- Regional NRM bodies do not view themselves to be engaged with the Reef Plan MERS system, not least because they take the view that they have not been contracted to provide such information.
- The major role played by pulsed rainfall events in unpredictably flushing stocks of pollution out from the land and rivers systems into the lagoon must be recognised. At present, there is a strong emphasis on measuring water quality in the rivers and the lagoon. Water quality here is heavily influenced by these pulsed rainfall events. A greater emphasis on trends in land condition and farm practices would help to counter-act this imbalance. After all, the it is land condition and farm practices that determine the extent to which pollutant loads are generated as an ‘inventory’ of pollution that is subsequently and more unpredictably flushed into the lagoon via sediment loads in river systems.

- It is difficult to relate the regional breakdown of the Activities that support Actions to catchment risk areas. This will need addressing.

The Reef Plan Database

The Secretariat database has been an ongoing development. The current version of the database, as updated for the 04/05 Annual Report represents a substantial upgrade from the previous year. It is expected that the latest round of data collection and update will result in a comprehensive dataset that is well suited to undertaking basic tasks such as annual reporting and activity tracking.

Efforts have been made to expand the database to include additional performance based elements such as resources. It is our opinion that these elements should not be pursued at this point in time as there is no standard format for the measurement, collection or reporting of these elements. It is also arguable that the introduction and collection of performance measures is outside of the boundaries of the Secretariat, in that the Secretariat has a support and reporting role. It is not responsible either directly or by proxy for the performance of the individual agencies who participate in the Reef Plan. Agencies should remain individually responsible for the allocation, reporting and performance of their activities. The Reef Plan operates via devolved responsibility.

Given that the recent updates and changes will give the Secretariat a reliable and comprehensive dataset, the next step should be to improve the reporting and dissemination of the information collected in the database.

We note that at this stage, while considerable effort has been made to collect information very little thought has been given as to how this information will be *used* (form and content) and *who* will use this information.

As a starting point, we would suggest that the Secretariat design and implement a Management Reporting Plan. The plan should be based on the needs of the key decision making bodies such as the IOC, JSC, working groups and the Secretariat itself. Secondary considerations should include looking at how the database can be used as a learning tool for Reef Plan participants (sharing information on activities and as a way of coordinating their actual and planned activities). We note that this may require the addition of extra fields in the database that identify the functional elements of activities (eg workshops, field days, publications and so on). A longer-term consideration would be to look at how the information may be accessed by the public. However, this should not be a major consideration at this point given the already comprehensive annual report.

General Improvements

At present, activity level monitoring and evaluation is the responsibility of the implementing organisation. This is entirely consistent with the Reef Plan delivery model and we see no reason to change this. That said, it is still important that the progress of the Reef Plan be properly mapped and that implementing organisations' delivery of performance be transparent.

We would therefore propose that for Phase 2 and for projects going beyond the 1 July 2005 deadline, implementing organisations identify key deliverables, achievements and waypoints that will demonstrate the progress of the work they are undertaking.

It is proposed that the current database be expanded to record these elements. In recording these elements they will need to be categorised as to their nature (eg report, agreement, workshop and such), their expected delivery date and some reference should be included that defines the quality of the element (eg 80% or NRMs attendance or Report Accepted by the Minister). When viewed as a whole, these elements should provide a logical sequence of key achievements showing how implementing organisations are progressing with the delivery of Activities and Actions.

Stakeholder engagement processes

Regional NRMs

In the conduct of this Audit a distinction has been made between stakeholders who have responsibility for implementing parts of the Reef Plan and stakeholders who do not under current arrangements. A parallel consultative process has been used to capture the views of stakeholders who are not currently involved in the implementation process.

As has already been discussed, Regional NRM bodies play an important role in implementing the Reef Plan. The six Regional NRM bodies involved in implementation are:

- Burdekin Dry Tropics Board;
- Burnett Mary Regional Group for Natural Resource Management;
- Cape York Interim Advisory Group;
- Far North Queensland Natural Resource Management Ltd;
- Fitzroy Basin Association;
- Mackay Whitsunday Natural Resource Management Group Inc.

These bodies were all consulted in the Audit. Each of these NRM bodies has been developing detailed plans following a process laid out by the Australian and Queensland governments. The Regional NRM bodies set their resource allocations according to regional priorities that include the Reef Plan but by no means are limited to the Reef Plan.

The overall picture obtained is that these NRM bodies are very well *aligned* with the intent of the Reef Plan but that they are not closely *engaged* with the Reef Plan. The close alignment stems from both the specific influence of the Reef Plan on what their own plans are intended to achieve and the more general aims and objectives of delivering environmental outcomes. These more general objectives would have still existed without the Reef Plan.

The Audit found significant diversity in opinion between different Regional NRM bodies. Some NRM bodies took the view that the Reef Plan is not an effective mechanism for delivering the intended policy outcomes. Other NRM bodies were more supportive of the Reef Plan and stressed that it was particularly useful as a means of stressing top-level political commitment during the process of drawing up regional NRM plans. This lends further support to the conclusion that the Reef Plan has served a useful purpose in helping to galvanise activity and to build-up momentum in addressing diffuse pollution source issues.

One shared view amongst the NRM bodies was that close alignment did not require close engagement. There is a marked contrast between the attitude of government implementers and the Regional NRM bodies to the level of engagement sought and actually achieved. Whereas government implementers have sought to actively demonstrate compliance in implementing the Reef Plan Actions the NRM Bodies focus on compliance with their own processes relating to the regional delivery of environmental outcomes. They place little priority on demonstrating compliance with implementing the Reef Plan aside from the fact that Reef Plan Actions are addressed in their own plans.

In short, the Regional NRM bodies demonstrate compliance of their own plans with the Reef Plan but see no need to demonstrate strong compliance with the *implementation* of the Reef Plan. Indeed, some NRM bodies stressed that, in their view, in the context of a very specific contractual arrangement they were not funded to specifically demonstrate compliance with Reef Plan implementation. They interpreted this contractual situation as re-enforcing their rather decoupled relationship with the Reef Plan.

One risk is that the nature of the Reef Plan may be misinterpreted by the Regional NRM bodies – with some viewing it as an ineffective mechanism because they fail to grasp that it aims to operate via constructive engagement with civil society and business and not by command and control. The critical role of an effective communication strategy in the future is to correct such misinterpretations.

Industry

Industry representative bodies and their constituents constitute another key stakeholder group involved in implementation.

The agricultural industries are fairly sceptical about the utility of the Reef Plan and view the threat of regulation of farm activities linked to the Reef Plan as a key driver for changing farming practices. They do not view the Reef Plan to be either a particularly effective strategy for coordinating relevant investments or effective in integrating with existing non-government programs.

Rather like the Regional NRM bodies, many but by no means all, agriculture industry representative bodies do perceive their own missions to be aligned with the Reef Plan's Goal and Objectives. They are however very willing to participate in Reef Plan implementation. That said, their degree of current engagement is not particularly high – although it is significant in relation to some specific Actions.

The positive message is that industry is very willing to become more engaged in the Reef Plan in the future. One reason for this is a recognition of way in which efforts to reduce the impact of farming practices on the Reef will also help to enhance and sustain the market values of farms. Environmentally acceptable farming practices also help to produce a healthy balance sheet for the farm as a business. Poor farming practices not only bankrupt the land, they also bankrupt the farm as a sustainable business. There is consequently interest in the farming industry in approaches that link environmental compliance to subsidies and incentives. The Reef Plan, particularly as regards Phase 2, is viewed as a potential facilitator of such an incentive-based approach.

Not unexpectedly, industry perceives there to have been insufficient resources allocated by government to assist agriculture to adopt better farm management practices. The agricultural industry's main concern is that more needs to be done by government.

Conclusions on stakeholder engagement in implementation

The consultations with the stakeholders involved in implementing the Reef Plan indicate that the term 'implementation' may itself be a source of confusion that leads to misinterpretations of the Reef Plan. The Reef Plan involves implementing Actions linked to milestones with diffuse responsibility. This is intended as a means of generating *momentum* in constructive engagement both within government and between government and civil society and business.

There is compelling evidence from this Audit, including some soundings taken with the wider community, that the non-govt stakeholders fail to grasp that the Reef Plan aims to generate momentum in constructive engagement. It does not simply involve implementing a set of Actions and Activities all with clear milestones and due dates in a strict project management sense. **The 'implementation' of the Reef Plan is a process of implementing a sustainable process of constructive**

engagement *not* implementing a well-defined fixed term project plan.

Part of the confusion may be due to the fact that the designers of the Reef Plan sought to use something akin to the project management structure as a mechanism to galvanise activity. This is natural within the command and control system upon which government business relies. Part of the problem also lies in the setting of a ten-year time frame for meeting the Reef Plan's goal. However, both the semblance of a program structure and setting a ten-year goal are critical to galvanising the necessary activity to build momentum in constructive engagement.

The implication is that Phase Two of the Reef Plan, and the communication strategy in particular, could usefully emphasise the point that what is being implemented is a process of constructive engagement *enabled* by Strategies and Actions. Progress in implementation is not simply an issue of mechanically implementing Actions and underlying Activities. Mechanistic approaches are unlikely to actually generate constructive engagement.

In the explicit context of the Terms of Reference for this Audit, the extent to which the implementation of Actions is achieving the intent of Strategies rests upon the extent to which momentum in constructive engagement has been generated. As our analysis of the Activities that are designed to deliver Actions has highlighted, momentum is growing in this sense. The challenge for the future is to place a far greater emphasis on *communicating* the idea that the implementation of the Reef Plan is about generating and sustaining momentum in constructive engagement.

Barriers to, and drivers for, successful implementation

This Audit's approach to the barriers to, and drivers for, successful implementation rests upon a recognition that the implementation of the Reef Plan is a process of generating constructive engagement. The implementation of the Reef Plan is not simply about government meeting its obligations and targets – not least because whether or not the Reef Plan's Goal and Objectives can be met is not fully controlled by government.

The general conclusion is that the greatest barrier to the implementation of the Reef Plan is the misconception that the Reef Plan is something that government is doing rather than something that a far wider range of organizations and individuals *should* be doing.

The consultations outside of government revealed a consistent complaint that the governments were not doing enough - particularly on the ground. Yet, changing behaviour in order to reduce risks to the ecological health of the Reef is a wide-spread responsibility – not simply a responsibility for government. The implicit message is that many stakeholders are either unaware of the significance of more innovative engagement-based approaches to policy delivery, or prefer more traditional modes of regulation and subsidy-based policy delivery.

Given the core intent of the Reef Plan, the key driver for success is the rectification of misconceptions about how the Reef Plan will try to deliver its goal and objectives. If successful implementation rests upon achieving constructive engagement then stakeholders must understand that this is in fact the intention of the Reef Plan.

Conclusions

The main conclusions from the Audit are as follows:

There is a prevailing view amongst government implementers that the Reef Plan is nearing the end of an initial launch phase (“Phase One”). Phase One has started the process of building more joined-up approaches within and between the two governments involved. It has also launched the process of engagement with non-government implementers – particularly the Regional NRM bodies.

Experience gained from this launch process is now highlighting the need to maintain momentum in the implementation of the Reef Plan by an explicit emphasis on “Phase Two”. The view is that Phase Two should involve:

- re-invigorating the Reef Plan by renewed top-level political commitment;
- defining a series of longer-term milestones and targets where these are relevant;
- selecting and prioritising Actions and Activities within the Phase One Reef Plan architecture on the basis of new understanding of the barriers to implementation and the drivers of success in implementation;
- Establishing a more realistic time-line for delivering the Reef Plan’s Goal and Objectives

Stakeholders may not appreciate that the Reef Plan needed to prioritise the building of more joined-up approaches by the two governments involved because this is both critical to coordinating a wide range of investments and policies and takes several years to achieve. Whilst stakeholder involvement can be ramped up relatively quickly, achieving more joined-up policy and its delivery must address complex challenges that are not solved over-night. Furthermore, public confidence in the Reef Plan is enhanced if these efforts to generate more joined-up approaches are recognised.

Developing an effective communication strategy should be a critical component of Phase Two of the Reef Plan. This strategy would need to explain what a whole-of-government approach is, and why it is so important.

Public confidence in the Reef Plan would be enhanced if the common ground in the core objectives of fostering economic development and achieving environmental sustainability were given greater recognition in Phase Two of the Reef Plan.

The Audit has identified opportunities for progressing in this area. These opportunities rest upon fostering a more comprehensive asset-

value based approach that highlights the financial benefits for farmers and land developers that stem from reduced environmental impacts whilst also showing how these private benefits help to protect the Great Barrier Reef. A greater ‘carrot-based’ emphasis on ensuring that access to the range of subsidies and incentives for agriculture and land-development is conditional upon compliance with Reef Plan objectives would support this asset-value based approach.

A move in this direction would significantly enhance industry and public confidence in the Reef Plan because it would open up a path for more on-the-ground activity on farms via the positive impact of incentives. This carrot-based approach would, in turn, support further constructive engagement with the Reef Plan.

Annexes

Annex 1 List of organisations consulted

Annex 2 Workshop outline and audit instrument

Annex 3 Tables analysing implementation progress

Annex 1 – List of organisations consulted

Government implementers

Australian Government – Department of Agriculture, Fisheries and Forestry

Australian Government – Department of Environment and Heritage

Australian Government - Great Barrier Reef Marine Park Authority

Queensland Government – Department of Local Government, Planning, Sport and Recreation

Queensland Government – Department of Natural Resources and Mines

Queensland Government – Department of Premier and Cabinet

Queensland Government – Environmental Protection Agency

Queensland Government – Department of Primary Industries and Fisheries

Non-government implementers

Regional Natural Resource Management Bodies

Burdekin Dry Tropics Board

Burnett Mary Regional Group for Natural Resource Management

Cape York Interim Advisory Group

Far North Queensland Natural Resource Management Ltd

Fitzroy Basin Association

Mackay Whitsunday Natural Resource Management Group Inc.

Peak and Advocate Bodies

Agforce

Canegrowers

Growcom

Queensland Conservation Council

Queensland Farmer's Federation

World Wildlife Fund

Annex 2

Workshop outline and audit instrument

Introduction

The purpose of undertaking the audit is to enhance public confidence in the implementation of the Reef Water Quality Protection Plan (the Reef Plan). The audit will give effect to Action I2 of the Reef Plan to:

“Ensure that implementation of the actions in the Plan are regularly and independently audited.”

The objectives of the audit are to:

1. Provide an independent assessment of progress in implementing the Reef Plan; and
2. Identify barriers to, and drivers for, successful implementation.

The Audit is seen as an important mechanism for assessing progress to date, as a way of identifying any barriers to the implementation of the Reef Plan and as providing the opportunity to learn what elements of the Plan are successful and why this is the case. This is not a financial compliance/accountability Audit.

Howard Partners Pty Ltd was selected to undertake the Audit in May 2005. A final report suitable for communication to the Prime Minister and the Premier is due by 1 July 2005.

Guidelines

The following Audit Instrument is intended for use in meetings and workshops with implementing organisations in both the government and non-government sectors. Where appropriate it will be used to capture input to the Audit for organisations and individuals who it will not be possible to meet face-to-face.

The Instrument is being circulated prior to meetings and workshops in order to allow those participating to have a clear idea of the structure, purpose and output of these events.

The meeting/workshop will have three key elements. Section 1 is the confirmation of the involvement of the organisation and an assessment of the current status of activities already implemented, and being implemented, by the organisation. This will be followed by an open forum discussion addressing the discussion points outlined in Section 2 of this document. These discussion points directly address the Terms of Reference and will be a critical part of the Audit findings. The final phase of the session will involve using the tables contained in Section 3 to provide quantification of the opinions and views expressed in Section 2.

While it will be important that people feel free to express their opinions and raise issues regarding the Reef Plan, it is important that participants be aware of the fact that the Audit has a very specific terms of reference and a short delivery time and that workshop coordinators will seek to limit discussion to the Terms of Reference.

If you have any questions regarding the Instrument or the Audit itself, please feel free to contact Mark Matthews at Howard Partners on 0403 583602 or via email mark.matthews@howardpartners.com.au.

Reef Water Quality Protection Plan – Workshop Outline and Audit Instrument

Respondent Profile

Organisation:

Contact person:

Contact tel:

E-mail:

1 Status of Strategic Actions

1.1 Confirmation of involvement in Strategic Actions

Note: to be covered at the start of the meeting/workshop

1.2 Assessment of the status of current Reef Plan Actions

Note: this information should already have been provided by Government implementers but will need to be collected for non-government implementers

Points to be covered:

- What has been completed?
- What is overdue?
- Actions due after 1 July 2005
- Activities not yet planned but important to delivering Actions

2 Discussion Points

2.1 What is the overall progress made in Reef Plan implementation?

- How important is the Reef Plan to your organisation?
- What priority has your organisation assigned to the Reef Plan?
- What has been the impact of the Reef Plan on your organisation (strategic planning through to service delivery)?

2.2 Implementation processes

- To what extent has the Reef Plan facilitated access to resources made available to implementers of actions by the Australian and Queensland Governments?
- To what extent has the Reef Plan resulted in the reallocation of resources?
- Which factors have been critical to success in implementing the Reef Plan?
- Which factors have been constraints to implementing the Reef Plan?

2.3 Implementer engagement processes

- What factors have affected implementer engagement?

2.4 Maintaining momentum in implementation

- Looking ahead, what are the most important issues to address to maintain momentum in implementation?
- How far into the future do clear definitions of your organisation's roles and responsibilities extend?

3 Quantified summary of views

Note: if consensus is not reached in a workshop then indicate the number of discussants holding a particular view. Attempt to achieve consensus if possible.

3.1 Governance

Q1.	In your organisation's experience what is the overall progress made in Reef Plan implementation?	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree	Insufficient knowledge to Comment	Not Appropriate to Comment	Too Early to Comment
a	The current and planned set of Activities will deliver the Reef Plan Goal (Objectives 1 and 2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b	The Reef Plan is an effective strategy for coordinating relevant investments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c	The current systems for Monitoring, Evaluation and Reporting are appropriate (i.e. timely, relevant and reliable)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d	The Reef Plan integrates effectively with existing Government programs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e	The Reef Plan integrates effectively with existing non-government programs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f	The <i>Intergovernmental Steering Committee</i> (ISC) has effectively overseen the implementation of the Reef Plan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g	The <i>Intergovernmental Operational Committee</i> (IOC) effectively supports the implementation of the Reef Plan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h	The Reef Plan Secretariat effectively supports the implementation of the Reef Plan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q2.	Are there problems in achieving the intent of different Strategies caused by gaps and duplication in the implementation of Actions?	There are significant gaps in the Actions necessary to achieve the intent of this Strategy (check if in agreement)	There is significant duplication across Actions for this Strategy (check if in agreement)
a	Self management approaches	<input type="checkbox"/>	<input type="checkbox"/>
b	Education and extension	<input type="checkbox"/>	<input type="checkbox"/>
c	Economic incentives	<input type="checkbox"/>	<input type="checkbox"/>
d	Planning for natural resource management and land use	<input type="checkbox"/>	<input type="checkbox"/>
e	Regulatory frameworks	<input type="checkbox"/>	<input type="checkbox"/>
f	Research and information sharing	<input type="checkbox"/>	<input type="checkbox"/>
g	Partnerships	<input type="checkbox"/>	<input type="checkbox"/>
h	Priorities and targets	<input type="checkbox"/>	<input type="checkbox"/>
i	Monitoring and Evaluation	<input type="checkbox"/>	<input type="checkbox"/>

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Annex 2 - Workshop outline and audit instrument

Q3.	How important is the Reef Plan to your organisation?	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree	Insufficient knowledge to Comment	Not Appropriate to Comment	Too Early to Comment
a	The Reef Plan's Goal and Objectives are consistent with your organisation's mission	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b	The Reef Plan's Goal and Objectives are included in your organisation's mission	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c	The Reef Plan's Goal and Objectives are reflected in your organisation's business/strategic planning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d	The Reef Plan's Goal and Objectives are reflected in your organisation's performance targets and measures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e	The Reef Plan has had a significant affect on decisions made of relevance to reef water quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f	The Reef Plan's Goals and Objectives are included in relevant manager performance appraisals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3.2 Implementation processes

Q4.	Priority access to resources (funding from new and existing programs, people, information, knowledge and infrastructure)	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree	Insufficient knowledge to Comment	Not Appropriate to Comment	Too Early to Comment
a	The implementation of the Reef Plan has facilitated priority access to resources made available by the Queensland Government for the Reef Plan (other than NHT & NAP)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b	The implementation of the Reef Plan has facilitated priority access to resources made available by local Government for the Reef Plan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c	The implementation of the Reef Plan has facilitated priority access to resources made available by the Australian Government for the Reef Plan (other than NHT & NAP)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d	The implementation of the Reef Plan has facilitated priority access to resources made available by the NHT	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e	The implementation of the Reef Plan has facilitated priority access to resources made available by the NAP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f	The implementation of the Reef Plan has facilitated access to resources from non-government organisations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g	The implementation of the Reef Plan has facilitated access to resources from the private sector	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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Q5.	To what degree have the following factors either contributed to success or acted as a constraint?	Critical success factor	Contributory factor to success	Cannot be determined	Contributory factor to constraints	Critical constraint	Not able to Comment
a	Ministerial direction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b	Lobbying/media profile	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c	Access to funding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<i>Access to people:</i>						
d	- internal staff	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e	- partner organization staff (lead & support organizations)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f	- other people	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g	Use of milestones	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h	Access to information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i	Access to knowledge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j	Access to physical infrastructure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
k	Implementer engagement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
l	Extension activity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
m	The matching of state-wide Activities with catchment-specific challenges and risks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
n	Definitions of Actions that make it difficult to assess progress in implementation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
o	Reef Plan administrative arrangements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
p	Reef Plan governance arrangements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3.3 Implementer engagement processes

Q6.	To what extent have the following factors affected implementer engagement?	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree	Insufficient knowledge to Comment	Not Appropriate to Comment	Too Early to Comment
a	Implementers have been given the opportunity to participate in Reef Plan implementation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b	Implementers are willing to participate in Reef Plan implementation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c	There is effective communication between implementers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3.4 Maintaining momentum in implementation

Q7.	Looking ahead, what are the most important issues to address to maintain momentum in implementation?	Importance		Feasibility		Insufficient knowledge to Comment	Not Appropriate to Comment	Too Early to Comment
		High Priority	Low Priority	High	Low			
a	The need to define a series of long-term milestones and/or targets for Actions over the lifetime of the Reef Pan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b	The need to move beyond the identification of problems and towards the development of solutions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c	The need to develop a clearer understanding of how Actions and Activities inter-relate in order to facilitate investment coordination	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d	The need for closer engagement between government and non-government implementers and non-government stakeholders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q8.	How far into the future do clear definitions of your organisation's roles and responsibilities for the Reef Plan extend?	Not Clear at Present	1 to 2 Years	2 to 5 Years	5 + Years
a	Strategic objectives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b	Strategic planning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c	Actions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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Annex 3 – Tables analysing implementation progress

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Annex 3 – Tables analysing implementation progress

Table 1: Reef Plan Action status by critical Activities

Critical Activities by Action by Status				All Activities	Critical Activities by Action by Status as a % of All Activities				Action of Concern and Completion Report's Status				
Action Ref	Completed	Being Implemented	Being planned	Total	Completed	Being Implemented	Being planned	Total	Report Type Submitted	Milestone	Issue	Status	Completed/ Revised Completion Date
A1	1	13		14	17	6%	76%	0%	82%				
A2	3	8		11	11	27%	73%	0%	100%				
A3	1	13	1	15	25	4%	52%	4%	60%	Action of Concern	Review of uptake of best management practices (1 July 2005)	Noted by IOC 4/2/05	
A4	3	12	2	17	24	13%	50%	8%	71%				
A5		2	1	3	10	0%	20%	10%	30%	Action of Concern	Report on program achievements (1 July 2005)	Need to revise current activities	Noted by IOC 8/4/05
A6	2	3		5	6	33%	50%	0%	83%				
B1	1	12		13	37	3%	32%	0%	35%				
B2		6		6	10	0%	60%	0%	60%				
B3		4		4	9	0%	44%	0%	44%				
B4	1	6		7	10	10%	60%	0%	70%				
B5		6		6	7	0%	86%	0%	86%				
C1		4	1	5	12	0%	33%	8%	42%				
C2	1	1		2	4	25%	25%	0%	50%	Action of Concern	Report to Ministers (1 July 2004)	Late start and ability of consultant to deliver within timeframes	Noted by IOC 8/4/05
C3		5		5	9	0%	56%	0%	56%	Action of Concern	Report to Ministers (1 July 2005)	Late start and concern over the ability of consultant to deliver within timeframes	Noted by IOC 8/4/05
C4	4	3		7	8	50%	38%	0%	88%				
C5	2	3	1	6	7	29%	43%	14%	86%				
C6	3	11		14	17	18%	65%	0%	82%				
C7	1	1		2	3	33%	33%	0%	67%				
C8		9		9	11	0%	82%	0%	82%				
C9		3		3	6	0%	50%	0%	50%	Action of Concern	Report on progress by 1 July 2005	Time delays in establishing the Trust for Nature, Limited funding.	Noted by IOC 4/2/05
D1	1	7		8	12	8%	58%	0%	67%	Action of Concern	Completed 1 July 2004	Revised completion dates. Agreement on process 1 April 2005. Review of planning processes completed 1	Jul-05

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Critical Activities by Action by Status				All Activities	Critical Activities by Action by Status as a % of All Activities				Action of Concern and Completion Report's Status				
Action Ref	Completed	Being planned	Total	Total	Completed	Being Implemented	Being planned	Total	Report Type Submitted	Milestone	Issue	Status	Completed/ Revised/ Completion Date
											July 2005		
D2	1	2	3	4	25%	50%	0%	75%					
D3	1	6	7	7	14%	86%	0%	100%					
D4	1	5	6	7	14%	71%	0%	86%	Action of Concern	Completed 1 July 2004	Delay in WQIP. Expected interim projects to be finalised by 1 July 2005	Noted by IOC 8/4/05	WQIP Aug 2005, Interim projects 1 July 2005
D5		3	3	6	0%	50%	0%	50%	Action of Concern	Policy completed by 1 July 2004	Some stakeholders dispute the need for a statutory policy to achieve the desired outcome. Policy ready for consideration 1 July 2005.	Withdrawn 4/2/05 IOC. Noted by IOC 8/4/05	Jul-05
D6	1	7	8	10	10%	70%	0%	80%	Completion	Review completed by July 2004		Accepted by IOC 4/2/05 noting that sub projects to be implemented	Jul-04
D7	1	5	6	6	17%	83%	0%	100%	Action of Concern	Review completed and timetable for implementation developed by 1 July 2004	Delays created by slippage in dependent establishment projects	Noted by IOC 4/2/05	Early 2006
D8		5	5	9	0%	56%	0%	56%	Action of Concern	Completed 1 July 2004	Time delays	Noted by IOC 4/2/05. Updated with changes 8/4/05	Sep-05
D9		3	3	3	0%	100%	0%	100%					
D10		4	4	4	0%	100%	0%	100%					
D11		4	4	4	0%	100%	0%	100%					
E1	2	2	4	4	50%	50%	0%	100%	Completion	Completed 1 July 2004		Accepted by IOC 20/8/04	
E2	1	1	2	3	33%	33%	0%	67%					

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Critical Activities by Action by Status					All Activities		Critical Activities by Action by Status as a % of All Activities				Action of Concern and Completion Report's Status				
Action Ref	Completed	Being Implemented	Being planned	Total	Total	Completed	Being Implemented	Being planned	Total	Report Type Submitted	Milestone	Issue	Status	Completed/ Revised Completion Date	
E3	4			4	6	67%	0%	0%	67%	Completion	Completed 1 July 2004		Accepted by IOC 8/4/05		
E4	2	2		4	4	50%	50%	0%	100%	Completion	Completed 1 July 2004		Accepted by IOC 8/4/05		
E5		1		1	1	0%	100%	0%	100%						
F1	4	38	2	44	46	9%	83%	4%	96%						
F2		5		5	8	0%	63%	0%	63%						
F3		6		6	6	0%	100%	0%	100%	Action of Concern	Completed 1 July 2004		To go to June IOC	1-Jan-05	
F4	2	13	1	16	35	6%	37%	3%	46%						
F5	1			1	1	100%	0%	0%	100%	Action of Concern	Review due 1 July 2004	Delay awaiting stakeholder input			
F6					1	0%	0%	0%	0%						
F7					2	0%	0%	0%	0%	Action of Concern	Report completed 1 July 2004	Delayed due to late start in receipt of funding	Noted by IOC 8/4/05	1-Jan-06	
F8		3		3	3	0%	100%	0%	100%						
F9					2	0%	0%	0%	0%	Action of Concern	Report to Ministers 1 July 2005	Delayed due to late start in receipt of funding		1-Jan-06	
G1	1	5		6	9	11%	56%	0%	67%						
G2		6		6	12	0%	50%	0%	50%						
G3	1	1		2	2	50%	50%	0%	100%						
G4		1	1	2	5	0%	20%	20%	40%						
G5	1	3		4	5	20%	60%	0%	80%						
G6		2		2	3	0%	67%	0%	67%						
G7		1		1	1	0%	100%	0%	100%						
H1	1	6	2	9	12	8%	50%	17%	75%	Action of Concern	Completed 1 July 2005	Information required to deliver the Action are unlikely to be available in time to meet deadline	Noted by IOC 4/2/05	Interim water quality targets to be completed 1-Jul-05. Testing of scenarios to be ongoing	
H2		3	1	4	5	0%	60%	20%	80%						
H3	1	4		5	6	17%	67%	0%	83%						
H4		6		6	7	0%	86%	0%	86%						
H5	1	2		3	5	20%	40%	0%	60%						
I1		2	1	3	4	0%	50%	25%	75%						
I2		1		1	1	0%	100%	0%	100%						
I3	1	1	1	3	5	20%	20%	20%	60%						
I4	1	2	2	5	7	14%	29%	29%	71%						

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Critical Activities by Action by Status				All Activities	Critical Activities by Action by Status as a % of All Activities				Action of Concern and Completion Report's Status					
Action Ref	Completed	Being Implemented	Being planned	Total	Total	Completed	Being Implemented	Being planned	Total	Report Type Submitted	Milestone	Issue	Status	Completed/ Revised/ Completion Date
15		7	1	8	13	0%	54%	8%	62%	Action of Concern	Design completed 1 March 2005. Implementation to commence 1 December 2005	Delayed due to underestimation of impact of complexity of activities on integration and coordination	Noted by IOC 4/2/05	
16		3	1	4	7	0%	43%	14%	57%	Action of Concern	High risk catchments programs in place 1 July 2004	Delayed due to underestimation of impact of complexity of activities on integration and coordination	Noted by IOC 4/2/05	
17		4		4	6	0%	67%	0%	67%					
18		3		3	4	0%	75%	0%	75%					
19										Action of Concern	Report by 1 July 2005	Limited time, expertise and funds to deliver against full intent of Action. Industry only able to report on current management actions	Noted by IOC 4/2/05	
N/A					1	0%	0%	0%	0%					

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Table 2: Status of implementation of Actions due on or before 1 July 2005

Action	Total Activities (No.)	Total Activities (%)	Completed Activities (No.)	Completed Activities (%)	Activities Being Implemented (No)	Activities Being Implemented (%)	Activities Being planned (No.)	Activities Being planned (%)
Total	60	11%	26	43%	29	48%	5	8%
A1	1	6%			1	100%		
A2	1	9%	1	100%				
A3	1	4%					1	100%
A4	3	13%	2	67%			1	33%
A5								
A6								
B1	2	5%	1	50%	1	50%		
B2	2	20%			2	100%		
B3	2	22%			2	100%		
B4								
B5								
C1	3	25%	2	67%	1	33%		
C2	1	25%			1	100%		
C3	1	11%			1	100%		
C4								
C5	2	29%	2	100%				
C6	3	18%	3	100%				
C7	1	33%	1	100%				
C8								
C9	1	17%			1	100%		
D1	1	8%			1	100%		
D2								
D3								
D4								
D5								
D6	1	10%	1	100%				
D7								
D8	1	11%			1	100%		
D9								
D10								
D11								
E1								
E2								
E3	2	33%	2	100%				
E4	2	50%	2	100%				
E5								
F1	3	7%	1	33%	2	67%		
F2	1	13%			1	100%		
F3								
F4	3	9%	1	33%	1	33%	1	33%
F5	1	100%	1	100%				
F6	1	100%			1	100%		
F7								
F8								
F9	1	50%			1	100%		
G1	1	13%			1	100%		
G2								
G3								
G4	2	40%			1	50%	1	50%
G5	1	20%	1	100%				
G6								
G7								
H1	4	33%	2	50%	1	25%	1	25%
H2								
H3								
H4								
H5								
I1	1	25%			1	100%		

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Action	Total Activities (No.)	Total Activities (%)	Completed Activities (No.)	Completed Activities (%)	Activities Being Implemented (No)	Activities Being Implemented (%)	Activities Being planned (No.)	Activities Being planned (%)
Total	60	11%	26	43%	29	48%	5	8%
I2	1	100%			1	100%		
I3	1	20%	1	100%				
I4	3	43%	1	33%	2	67%		
I5	1	8%			1	100%		
I6	2	29%	1	50%	1	50%		
I7	1	17%			1	100%		
I8								
Unknown	1	100%			1	100%		

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Table 3: Status of implementation of Actions due after 1 July 2005

Action	Total Activities (No.)	Total Activities (%)	Completed Activities (No.)	Completed Activities (%)	Activities Being Implemented (No)	Activities Being Implemented (%)	Activities Being planned (No.)	Activities Being planned (%)
Total	219	39%	6	3%	174	79%	39	18%
A1	1	6%			1	100%		
A2	1	9%			1	100%		
A3	15	60%			15	100%		
A4	10	42%			8	80%	2	20%
A5	10	100%			9	90%	1	10%
A6	2	33%	1	50%			1	50%
B1	29	78%	1	3%	27	93%	1	3%
B2	2	20%			2	100%		
B3	4	44%			3	75%	1	25%
B4	5	50%	1	20%	4	80%		
B5	4	57%			4	100%		
C1	3	25%			2	67%	1	33%
C2	1	25%			1	100%		
C3	3	33%			1	33%	2	67%
C4								
C5	1	14%					1	100%
C6	6	35%	1	17%	4	67%	1	17%
C7								
C8	2	18%			2	100%		
C9	3	50%			3	100%		
D1	3	25%			1	33%	2	67%
D2	2	50%			2	100%		
D3	2	29%			2	100%		
D4	5	71%			5	100%		
D5	3	50%			1	33%	2	67%
D6	7	70%			6	86%	1	14%
D7	2	33%			2	100%		
D8	5	56%			3	60%	2	40%
D9								
D10	1	25%			1	100%		
D11	1	25%			1	100%		
E1								
E2	1	33%			1	100%		
E3	1	17%					1	100%
E4								
E5								
F1	4	9%			2	50%	2	50%
F2	2	25%			2	100%		
F3	1	20%			1	100%		
F4	16	50%			15	94%	1	6%
F5								
F6								
F7	2	100%					2	100%
F8	2	67%			2	100%		
F9	1	50%					1	100%
G1	4	50%			4	100%		
G2	4	36%			4	100%		
G3								
G4	2	40%			1	50%	1	50%
G5	2	40%			1	50%	1	50%
G6	2	67%			1	50%	1	50%
G7								
H1	5	42%			3	60%	2	40%
H2	3	60%			2	67%	1	33%
H3	4	67%	1	25%	3	75%		
H4	4	57%			3	75%	1	25%
H5	4	80%	1	25%	3	75%		
I1	2	50%			1	50%	1	50%

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Action	Total Activities (No.)	Total Activities (%)	Completed Activities (No.)	Completed Activities (%)	Activities Being Implemented (No)	Activities Being Implemented (%)	Activities Being planned (No.)	Activities Being planned (%)
Total	219	39%	6	3%	174	79%	39	18%
I2								
I3	2	40%			1	50%	1	50%
I4	4	57%			2	50%	2	50%
I5	7	54%			6	86%	1	14%
I6	3	43%			2	67%	1	33%
I7	1	17%			1	100%		
I8	3	75%			2	67%	1	33%
Unknown								

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Table 4: Status of implementation of Actions with no due date

Action	Total Activities (No.)	Total Activities (%)	Completed Activities (No.)	Completed Activities (%)	Activities Being Implemented (No)	Activities Being Implemented (%)	Activities Being planned (No.)	Activities Being planned (%)
Total	278	50%	34	12%	228	82%	16	6%
A1	15	88%	1	7%	12	80%	2	13%
A2	9	82%	2	22%	7	78%		
A3	9	36%	2	22%	6	67%	1	11%
A4	11	46%	2	18%	8	73%	1	9%
A5								
A6	4	67%	1	25%	3	75%		
B1	6	16%			6	100%		
B2	6	60%			6	100%		
B3	3	33%			2	67%	1	33%
B4	5	50%			5	100%		
B5	3	43%			3	100%		
C1	6	50%			5	83%	1	17%
C2	2	50%	1	50%	1	50%		
C3	5	56%			5	100%		
C4	8	100%	4	50%	3	38%	1	13%
C5	4	57%			3	75%	1	25%
C6	8	47%			8	100%		
C7	2	67%	1	50%	1	50%		
C8	9	82%			7	78%	2	22%
C9	2	33%			2	100%		
D1	8	67%	1	13%	6	75%	1	13%
D2	2	50%	1	50%	1	50%		
D3	5	71%	1	20%	4	80%		
D4	2	29%	1	50%	1	50%		
D5	3	50%			3	100%		
D6	2	20%			2	100%		
D7	4	67%	1	25%	3	75%		
D8	3	33%			3	100%		
D9	3	100%			3	100%		
D10	3	75%			3	100%		
D11	3	75%			3	100%		
E1	4	100%	2	50%	2	50%		
E2	2	67%	1	50%	1	50%		
E3	3	50%	2	67%			1	33%
E4	2	50%			2	100%		
E5	1	100%			1	100%		
F1	39	85%	3	8%	36	92%		
F2	5	63%			4	80%	1	20%
F3	4	80%			4	100%		
F4	13	41%	1	8%	10	77%	2	15%
F5								
F6								
F7								
F8	1	33%			1	100%		
F9								
G1	3	38%	1	33%	2	67%		
G2	7	64%	1	14%	5	71%	1	14%
G3	2	100%	1	50%	1	50%		
G4	1	20%			1	100%		
G5	2	40%			2	100%		
G6	1	33%			1	100%		
G7	1	100%			1	100%		
H1	3	25%			3	100%		
H2	2	40%			2	100%		
H3	2	33%			2	100%		
H4	3	43%			3	100%		
H5	1	20%			1	100%		
I1	1	25%			1	100%		

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Action	Total Activities (No.)	Total Activities (%)	Completed Activities (No.)	Completed Activities (%)	Activities Being Implemented (No)	Activities Being Implemented (%)	Activities Being planned (No.)	Activities Being planned (%)
Total	278	50%	34	12%	228	82%	16	6%
I2								
I3	2	40%	1	50%	1	50%		
I4								
I5	5	38%			5	100%		
I6	2	29%			2	100%		
I7	4	67%			4	100%		
I8	1	25%			1	100%		
Unknown								

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Table 5: Activity Status by Region

Region	Total	Completed	Being Implemented	Being planned	Unknown
All Reef Regions	133	20	105	7	1
Burdekin	4		4		
Burdekin Burnett-Mary	2		2		
Burdekin Burnett-Mary Fitzroy	2		2		
Burdekin Burnett-Mary Fitzroy Mackay-Whitsundays Wet Tropics	2		2		
Burdekin Burnett-Mary Fitzroy Wet Tropics	1		1		
Burdekin Far North	1			1	
Burdekin Fitzroy	4		4		
Burnett-Mary	2	1	1		
Burnett-Mary Fitzroy	2		2		
Burnett-Mary Fitzroy Mackay-Whitsunday Wet Tropics	1		1		
Burnett-Mary Fitzroy Wet Tropics	1		1		
Burnett-Mary Wet Tropics	2		2		
Fitzroy	4	2	2		
Mackay-Whitsunday	2	1	1		
Mackay-Whitsundays Wet Tropics	4		3	1	
Reefwide	29	4	19	5	1
Wet Tropics	8	1	7		
Wet Tropics Burdekin Mackay-Whitsundays Burnett-Mary	1		1		
Wet Tropics Burdekin Mackay-Whitsundays Burnett-Mary Fitzroy	2	1	1		
No Region	85	6	71	1	7
Total	292	36	232	15	9

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Table 6: In your organisation's experience what is the overall progress made in Reef Plan implementation (All Organisation Response)?

Question No.	Question	Total	1 Strongly Agree	2 Agree	3 Neither Agree or Disagree	4 Disagree	5 Strongly Disagree	6 Insufficient Knowledge	7 Not Appropriate	8 Too Early to Comment
1 a	The current and planned set of Activities will deliver the Reef Plan Goal (Objectives 1 and 2)	19.0		5.2	1.2	4.2	5.0	2.0		1.5
1 b	The Reef Plan is an effective strategy for coordinating relevant investments	19.0	1.2	6.3	2.0	7.5	1.0			1.0
1 c	The current systems for Monitoring, Evaluation and Reporting are appropriate (i.e. timely, relevant and reliable)	19.0		2.2	2.0	6.2	2.0	1.0		5.7
1 d	The Reef Plan integrates effectively with existing Government programs	19.0		6.5	4.0	5.5	3.0			
1 e	The Reef Plan integrates effectively with existing non-government programs	19.0		4.5	3.0	9.0	1.0	1.5		
1 f	The Intergovernmental Steering Committee (ISC) has effectively overseen the implementation of the Reef Plan	19.0	1.0	2.3	3.0	5.0	2.0	4.7	1.0	
1 g	The Intergovernmental Operational Committee (IOC) effectively supports the implementation of the Reef Plan	19.0	2.0	4.5	4.0	5.0	1.0	2.5		
1 h	The Reef Plan Secretariat effectively supports the implementation of the Reef Plan	19.0	1.0	6.0	2.0	4.0	2.0	1.2	1.0	1.8
Total		152.0	5.2	37.5	21.2	46.3	17.0	12.8	2.0	10.0

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Table 7: In your organisation's experience what is the overall progress made in Reef Plan implementation? (Government Organisation Response)

Question No.	Question	Total	1 Strongly Agree	2 Agree	3 Neither Agree or Disagree	4 Disagree	5 Strongly Disagree	6 Insufficient Knowledge to Comment	7 Not Appropriate to Comment	8 Too Early to Comment
1 a	The current and planned set of Activities will deliver the Reef Plan Goal (Objectives 1 and 2)	7.0		3.2	0.2	1.2		1.0		1.5
1 b	The Reef Plan is an effective strategy for coordinating relevant investments	7.0	1.2	3.8	1.0					1.0
1 c	The current systems for Monitoring, Evaluation and Reporting are appropriate (i.e. timely, relevant and reliable)	7.0		1.2		1.2		1.0		3.7
1 d	The Reef Plan integrates effectively with existing Government programs	7.0		5.0	2.0					
1 e	The Reef Plan integrates effectively with existing non-government programs	7.0		2.5	2.0	1.0		1.5		
1 f	The Intergovernmental Steering Committee (ISC) has effectively overseen the implementation of the Reef Plan	7.0	1.0	2.3	2.0			0.7	1.0	
1 g	The Intergovernmental Operational Committee (IOC) effectively supports the implementation of the Reef Plan	7.0	2.0	4.5				0.5		
1 h	The Reef Plan Secretariat effectively supports the implementation of the Reef Plan	7.0	1.0	2.0	1.0			0.2	1.0	1.8
	Total	56.0	5.2	24.5	8.2	3.3	0.0	4.8	2.0	8.0

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Table 8: In your organisation's experience what is the overall progress made in Reef Plan implementation? (Other Organisation Response)

Question No.	Question	Total	1 Strongly Agree	2 Agree	3 Neither Agree or Disagree	4 Disagree	5 Strongly Disagree	6 Insufficient Knowledge to Comment	7 Not Appropriate to Comment	8 Too Early to Comment
1 a	The current and planned set of Activities will deliver the Reef Plan Goal (Objectives 1 and 2)	8.0		2.0		1.0	4.0	1.0		
1 b	The Reef Plan is an effective strategy for coordinating relevant investments	8.0		0.5		7.5				
1 c	The current systems for Monitoring, Evaluation and Reporting are appropriate (i.e. timely, relevant and reliable)	8.0		1.0	1.0	3.0	1.0			2.0
1 d	The Reef Plan integrates effectively with existing Government programs	8.0		1.5	2.0	1.5	3.0			
1 e	The Reef Plan integrates effectively with existing non-government programs	8.0		1.0		6.0	1.0			
1 f	The Intergovernmental Steering Committee (ISC) has effectively overseen the implementation of the Reef Plan	8.0				2.0	2.0	4.0		
1 g	The Intergovernmental Operational Committee (IOC) effectively supports the implementation of the Reef Plan	8.0			2.0	3.0	1.0	2.0		
1 h	The Reef Plan Secretariat effectively supports the implementation of the Reef Plan	8.0		3.0		3.0	1.0	1.0		
	Total	64.0	0.0	9.0	5.0	27.0	13.0	8.0	0.0	2.0

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Table 9: In your organisation's experience what is the overall progress made in Reef Plan implementation? (NRM Response)

Question No.	Question	Total	1 Strongly Agree	2 Agree	3 Neither Agree or Disagree	4 Disagree	5 Strongly Disagree	6 Insufficient Knowledge to Comment	7 Not Appropriate to Comment	8 Too Early to Comment
1 a	The current and planned set of Activities will deliver the Reef Plan Goal (Objectives 1 and 2)	4.0			1.0	2.0	1.0			
1 b	The Reef Plan is an effective strategy for coordinating relevant investments	4.0		2.0	1.0		1.0			
1 c	The current systems for Monitoring, Evaluation and Reporting are appropriate (i.e. timely, relevant and reliable)	4.0			1.0	2.0	1.0			
1 d	The Reef Plan integrates effectively with existing Government programs	4.0				4.0				
1 e	The Reef Plan integrates effectively with existing non-government programs	4.0		1.0	1.0	2.0				
1 f	The Intergovernmental Steering Committee (ISC) has effectively overseen the implementation of the Reef Plan	4.0			1.0	3.0				
1 g	The Intergovernmental Operational Committee (IOC) effectively supports the implementation of the Reef Plan	4.0			2.0	2.0				
1 h	The Reef Plan Secretariat effectively supports the implementation of the Reef Plan	4.0		1.0	1.0	1.0	1.0			
	Total	32.0	0.0	4.0	8.0	16.0	4.0	0.0	0.0	0.0

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Table 10: How important is the Reef Plan to your organization? (All Organisation Response)

Question No,	Question	Total	1 Strongly Agree	2 Agree	3 Neither Agree or Disagree	4 Disagree	5 Strongly Disagree	6 Insufficient Knowledge to Comment	7 Not Appropriate to Comment	8 Too Early to Comment
3 a	The Reef Plan's Goal and Objectives are consistent with your organisation's mission	19.0	10.0	6.0	1.0	1.0			1.0	
3 b	The Reef Plan's Goal and Objectives are included in your organisation's mission	19.0	7.5	5.0		3.5	2.0		1.0	
3 c	The Reef Plan's Goal and Objectives are reflected in your organisation's business/strategic planning	19.0	11.5	6.0		0.5			1.0	
3 d	The Reef Plan's Goal and Objectives are reflected in your organisation's performance targets and measures	19.0	8.0	5.0	1.0	3.0			2.0	
3 e	The Reef Plan has had a significant affect on decisions made of relevance to reef water quality	19.0	5.0	6.0		4.0	1.0		3.0	
3 f	The Reef Plan's Goals and Objectives are included in relevant manager performance appraisals	19.0	5.0	3.0		6.0	1.0		4.0	
	Total	114.0	47.0	31.0	2.0	18.0	4.0	0.0	12.0	0.0

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Table 11: How important is the Reef Plan to your organization? (Government Organisation Response)

Question No.	Question	Total	1 Strongly Agree	2 Agree	3 Neither Agree or Disagree	4 Disagree	5 Strongly Disagree	6 Insufficient Knowledge to Comment	7 Not Appropriate to Comment	8 Too Early to Comment
3 a	The Reef Plan's Goal and Objectives are consistent with your organisation's mission	7.0	5.0	1.0					1.0	
3 b	The Reef Plan's Goal and Objectives are included in your organisation's mission	7.0	3.0	3.0					1.0	
3 c	The Reef Plan's Goal and Objectives are reflected in your organisation's business/strategic planning	7.0	6.0						1.0	
3 d	The Reef Plan's Goal and Objectives are reflected in your organisation's performance targets and measures	7.0	4.0	1.0					2.0	
3 e	The Reef Plan has had a significant affect on decisions made of relevance to reef water quality	7.0	1.0	3.0					3.0	
3 f	The Reef Plan's Goals and Objectives are included in relevant manager performance appraisals	7.0	5.0						2.0	
	Total	42.0	24.0	8.0	0.0	0.0	0.0	0.0	10.0	0.0

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Table 12: How important is the Reef Plan to your organization? (Other Organisation Response)

Question No.	Question	Total	1 Strongly Agree	2 Agree	3 Neither Agree or Disagree	4 Disagree	5 Strongly Disagree	6 Insufficient Knowledge to Comment	7 Not Appropriate to Comment	8 Too Early to Comment
3 a	The Reef Plan's Goal and Objectives are consistent with your organisation's mission	8.0	3.0	3.0	1.0	1.0				
3 b	The Reef Plan's Goal and Objectives are included in your organisation's mission	8.0	2.5	1.0		3.5	1.0			
3 c	The Reef Plan's Goal and Objectives are reflected in your organisation's business/strategic planning	8.0	3.5	4.0		0.5				
3 d	The Reef Plan's Goal and Objectives are reflected in your organisation's performance targets and measures	8.0	2.0	2.0	1.0	3.0				
3 e	The Reef Plan has had a significant affect on decisions made of relevance to reef water quality	8.0	2.0	3.0		3.0				
3 f	The Reef Plan's Goals and Objectives are included in relevant manager performance appraisals	8.0		2.0		4.0			2.0	
	Total	48.0	13.0	15.0	2.0	15.0	1.0	0.0	2.0	0.0

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Table 13: How important is the Reef Plan to your organization? (NRM Response)

Question No.	Question	Total	1 Strongly Agree	2 Agree	3 Neither Agree or Disagree	4 Disagree	5 Strongly Disagree	6 Insufficient Knowledge to Comment	7 Not Appropriate to Comment	8 Too Early to Comment
3 a	The Reef Plan's Goal and Objectives are consistent with your organisation's mission	4.0	2.0	2.0						
3 b	The Reef Plan's Goal and Objectives are included in your organisation's mission	4.0	2.0	1.0			1.0			
3 c	The Reef Plan's Goal and Objectives are reflected in your organisation's business/strategic planning	4.0	2.0	2.0						
3 d	The Reef Plan's Goal and Objectives are reflected in your organisation's performance targets and measures	4.0	2.0	2.0						
3 e	The Reef Plan has had a significant affect on decisions made of relevance to reef water quality	4.0	2.0			1.0	1.0			
3 f	The Reef Plan's Goals and Objectives are included in relevant manager performance appraisals	4.0		1.0		2.0	1.0			
	Total	24.0	10.0	8.0	0.0	3.0	3.0	0.0	0.0	0.0

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Table 14: Priority access to resources (funding from new and existing programs, people, information, knowledge and infrastructure) (All Organisation Response)

Question No.	Question	Total	1 Strongly Agree	2 Agree	3 Neither Agree or Disagree	4 Disagree	5 Strongly Disagree	6 Insufficient Knowledge to Comment	7 Not Appropriate to Comment	8 Too Early to Comment
4 a	The implementation of the Reef Plan has facilitated priority access to resources made available by the Queensland Government for the Reef Plan (other than NHT & NAP)	19.0	1.0	2.3	3.3	5.0	3.3	1.0	2.0	1.0
4 b	The implementation of the Reef Plan has facilitated priority access to resources made available by local Government for the Reef Plan	19.0			2.0	6.0	4.5	2.5	4.0	
4 c	The implementation of the Reef Plan has facilitated priority access to resources made available by the Australian Government for the Reef Plan (other than NHT & NAP)	19.0	1.0	8.8	2.3	3.7		1.2	2.0	
4 d	The implementation of the Reef Plan has facilitated priority access to resources made available by the NHT	19.0	4.0	7.0	0.5	5.0			2.5	
4 e	The implementation of the Reef Plan has facilitated priority access to resources made available by the NAP	19.0	1.0	5.8	0.3	6.3	1.0	1.0	2.5	1.0
4 f	The implementation of the Reef Plan has facilitated access to resources from non-government organisations	19.0		1.0	3.2	3.5	3.0	3.3	4.0	1.0
4 g	The implementation of the Reef Plan has facilitated access to resources from the private sector	19.0		2.5	1.2	8.2	1.0	3.2	2.0	1.0
	Total	133.0	7.0	27.5	12.8	37.7	12.8	12.2	19.0	4.0

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Table 15: Priority access to resources (funding from new and existing programs, people, information, knowledge and infrastructure) (Government Organisation Response)

Question No.	Question	Total	1 Strongly Agree	2 Agree	3 Neither Agree or Disagree	4 Disagree	5 Strongly Disagree	6 Insufficient Knowledge to Comment	7 Not Appropriate to Comment	8 Too Early to Comment
4 a	The implementation of the Reef Plan has facilitated priority access to resources made available by the Queensland Government for the Reef Plan (other than NHT & NAP)	7.0	1.0	1.3	1.3		0.3		2.0	1.0
4 b	The implementation of the Reef Plan has facilitated priority access to resources made available by local Government for the Reef Plan	7.0			1.0	1.0	0.5	1.5	3.0	
4 c	The implementation of the Reef Plan has facilitated priority access to resources made available by the Australian Government for the Reef Plan (other than NHT & NAP)	7.0	1.0	2.3	1.3	0.2		0.2	2.0	
4 d	The implementation of the Reef Plan has facilitated priority access to resources made available by the NHT	7.0	3.0	1.0		1.0			2.0	
4 e	The implementation of the Reef Plan has facilitated priority access to resources made available by the NAP	7.0	1.0	1.3	0.3	1.3			2.0	1.0
4 f	The implementation of the Reef Plan has facilitated access to resources from non-government organisations	7.0		0.5	1.2			2.3	3.0	
4 g	The implementation of the Reef Plan has facilitated access to resources from the private sector	7.0		0.5	0.2	0.2		3.2	2.0	1.0
	Total	49.0	6.0	7.0	5.3	3.7	0.8	7.2	16.0	3.0

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Table 16: Priority access to resources (funding from new and existing programs, people, information, knowledge and infrastructure) (Other Organisation Response)

Question No.	Question	Total	1 Strongly Agree	2 Agree	3 Neither Agree or Disagree	4 Disagree	5 Strongly Disagree	6 Insufficient Knowledge to Comment	7 Not Appropriate to Comment	8 Too Early to Comment
4 a	The implementation of the Reef Plan has facilitated priority access to resources made available by the Queensland Government for the Reef Plan (other than NHT & NAP)	8.0		1.0	1.0	3.0	2.0	1.0		
4 b	The implementation of the Reef Plan has facilitated priority access to resources made available by local Government for the Reef Plan	8.0				3.0	3.0	1.0	1.0	
4 c	The implementation of the Reef Plan has facilitated priority access to resources made available by the Australian Government for the Reef Plan (other than NHT & NAP)	8.0		4.5		2.5		1.0		
4 d	The implementation of the Reef Plan has facilitated priority access to resources made available by the NHT	8.0	1.0	2.0	0.5	4.0			0.5	
4 e	The implementation of the Reef Plan has facilitated priority access to resources made available by the NAP	8.0		2.5		4.0		1.0	0.5	
4 f	The implementation of the Reef Plan has facilitated access to resources from non-government organisations	8.0		0.5	2.0	0.5	3.0	1.0	1.0	
4 g	The implementation of the Reef Plan has facilitated access to resources from the private sector	8.0		2.0	1.0	5.0				
	Total	56.0	1.0	12.5	4.5	22.0	8.0	5.0	3.0	0.0

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Table 17: Priority access to resources (funding from new and existing programs, people, information, knowledge and infrastructure) (NRM Response)

Question No.	Question	Total	1 Strongly Agree	2 Agree	3 Neither Agree or Disagree	4 Disagree	5 Strongly Disagree	6 Insufficient Knowledge to Comment	7 Not Appropriate to Comment	8 Too Early to Comment
4 a	The implementation of the Reef Plan has facilitated priority access to resources made available by the Queensland Government for the Reef Plan (other than NHT & NAP)	4.0			1.0	2.0	1.0			
4 b	The implementation of the Reef Plan has facilitated priority access to resources made available by local Government for the Reef Plan	4.0			1.0	2.0	1.0			
4 c	The implementation of the Reef Plan has facilitated priority access to resources made available by the Australian Government for the Reef Plan (other than NHT & NAP)	4.0		2.0	1.0	1.0				
4 d	The implementation of the Reef Plan has facilitated priority access to resources made available by the NHT	4.0		4.0						
4 e	The implementation of the Reef Plan has facilitated priority access to resources made available by the NAP	4.0		2.0		1.0	1.0			
4 f	The implementation of the Reef Plan has facilitated access to resources from non-government organisations	4.0				3.0				1.0
4 g	The implementation of the Reef Plan has facilitated access to resources from the private sector	4.0				3.0	1.0			
	Total	28.0	0.0	8.0	3.0	12.0	4.0	0.0	0.0	1.0

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Table 18: To what degree have the following factors either contributed to success or acted as a constraint? (All Organisation Response)

Question No.	Question	Total	1 Critical success factor	2 Contributory factor to success	3 Cannot be determined	4 Contributory factor to constraints	5 Critical constraint	6 Not able to comment
5 a	Ministerial direction	19.0	6.0	5.0	2.0	2.0	2.0	2.0
5 b	Lobbying/media profile	19.0	2.0	7.0	3.0	4.0	2.0	1.0
5 c	Access to funding	19.0	2.5	5.0	1.0	7.0	2.5	1.0
5 d	Access to people - internal staff	19.0	4.0	7.0	2.0	2.0		4.0
5 e	Access to people - partner organisation staff (lead & support organisations)	19.0	4.0	8.0		3.0		4.0
5 f	Access to people - other people	19.0	2.0	4.0	7.0	1.0		5.0
5 g	Use of milestones	19.0	4.0	9.0	1.0	4.0		1.0
5 h	Access to information	19.0	5.0	3.5	2.5	6.0	1.0	1.0
5 i	Access to knowledge	19.0	6.0	5.5	1.5	4.0	1.0	1.0
5 j	Access to physical infrastructure	19.0		1.0	4.5	1.0		12.5
5 k	Implementer engagement	19.0	3.0	4.5	0.5	6.0	4.0	1.0
5 l	Extension activity	19.0	3.0	4.5	0.5	5.0	4.0	2.0
5 m	The matching of state-wide Activities with catchment-specific challenges and risks	19.0	2.0	2.5	1.0	5.0	5.5	3.0
5 n	Definitions of Actions that make it difficult to assess progress in implementation	19.0			1.0	13.5	2.5	2.0
5 o	Reef Plan administrative arrangements	19.0		6.0	1.0	5.5	4.0	2.5
5 p	Reef Plan governance arrangements	19.0	2.0	4.0	2.0	5.5	4.0	1.5
	Total	304.0	45.5	76.5	30.5	74.5	32.5	44.5

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Table 19: To what degree have the following factors either contributed to success or acted as a constraint? (Government Organisation Response)

Question No.	Question	Total	1 Critical success factor	2 Contributory factor to success	3 Cannot be determined	4 Contributory factor to constraints	5 Critical constraint	6 Not able to comment
5 a	Ministerial direction	7.0	4.0	1.0				2.0
5 b	Lobbying/media profile	7.0	1.0	2.0	1.0	2.0		1.0
5 c	Access to funding	7.0	1.0	2.0		1.0	2.0	1.0
5 d	Access to people - internal staff	7.0	4.0	1.0		1.0		1.0
5 e	Access to people - partner organisation staff (lead & support organisations)	7.0	4.0	1.0		1.0		1.0
5 f	Access to people - other people	7.0	2.0	1.0	3.0			1.0
5 g	Use of milestones	7.0	1.0	4.0		1.0		1.0
5 h	Access to information	7.0	2.0	2.0	1.0	1.0		1.0
5 i	Access to knowledge	7.0	3.0	2.0		1.0		1.0
5 j	Access to physical infrastructure	7.0		1.0	2.0			4.0
5 k	Implementer engagement	7.0	2.0	2.0		1.0	1.0	1.0
5 l	Extension activity	7.0	2.0	3.0			1.0	1.0
5 m	The matching of state-wide Activities with catchment-specific challenges and risks	7.0	1.0	1.0	1.0	1.0	1.0	2.0
5 n	Definitions of Actions that make it difficult to assess progress in implementation	7.0				5.0	1.0	1.0
5 o	Reef Plan administrative arrangements	7.0		6.0				1.0
5 p	Reef Plan governance arrangements	7.0	2.0	4.0				1.0
	Total	112.0	29.0	33.0	8.0	15.0	6.0	21.0

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Table 20: To what degree have the following factors either contributed to success or acted as a constraint? (Other Organisation Response)

Question No	Question	Total	1 Critical success factor	2 Contributory factor to success	3 Cannot be determined	4 Contributory factor to constraints	5 Critical constraint	6 Not able to comment
5 a	Ministerial direction	8.0	1.0	3.0	1.0	1.0	2.0	
5 b	Lobbying/media profile	8.0	1.0	2.0	1.0	2.0	2.0	
5 c	Access to funding	8.0	1.5	1.0		5.0	0.5	
5 d	Access to people - internal staff	8.0		4.0	2.0	1.0		1.0
5 e	Access to people - partner organisation staff (lead & support organisations)	8.0		6.0				2.0
5 f	Access to people - other people	8.0		3.0	3.0			2.0
5 g	Use of milestones	8.0	3.0	3.0		2.0		
5 h	Access to information	8.0	3.0	0.5	1.5	2.0	1.0	
5 i	Access to knowledge	8.0	3.0	2.5	1.5		1.0	
5 j	Access to physical infrastructure	8.0			0.5			7.5
5 k	Implementer engagement	8.0	1.0	1.5	0.5	2.0	3.0	
5 l	Extension activity	8.0	1.0	1.5	0.5	2.0	2.0	1.0
5 m	The matching of state-wide Activities with catchment-specific challenges and risks	8.0	1.0	0.5		1.0	4.5	1.0
5 n	Definitions of Actions that make it difficult to assess progress in implementation	8.0				5.5	1.5	1.0
5 o	Reef Plan administrative arrangements	8.0				2.5	4.0	1.5
5 p	Reef Plan governance arrangements	8.0			1.0	2.5	4.0	0.5
	Total	128.0	15.5	28.5	12.5	28.5	25.5	17.5

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Table 21: To what degree have the following factors either contributed to success or acted as a constraint? (NRM Response)

Question No	Question	Total	1 Critical success factor	2 Contributory factor to success	3 Cannot be determined	4 Contributory factor to constraints	5 Critical constraint	6 Not able to comment
5 a	Ministerial direction	4.0	1.0	1.0	1.0	1.0		
5 b	Lobbying/media profile	4.0		3.0	1.0			
5 c	Access to funding	4.0		2.0	1.0	1.0		
5 d	Access to people - internal staff	4.0		2.0				2.0
5 e	Access to people - partner organisation staff (lead & support organisations)	4.0		1.0		2.0		1.0
5 f	Access to people - other people	4.0			1.0	1.0		2.0
5 g	Use of milestones	4.0		2.0	1.0	1.0		
5 h	Access to information	4.0		1.0		3.0		
5 i	Access to knowledge	4.0		1.0		3.0		
5 j	Access to physical infrastructure	4.0			2.0	1.0		1.0
5 k	Implementer engagement	4.0		1.0		3.0		
5 l	Extension activity	4.0				3.0	1.0	
5 m	The matching of state-wide Activities with catchment-specific challenges and risks	4.0		1.0		3.0		
5 n	Definitions of Actions that make it difficult to assess progress in implementation	4.0			1.0	3.0		
5 o	Reef Plan administrative arrangements	4.0			1.0	3.0		
5 p	Reef Plan governance arrangements	4.0			1.0	3.0		
	Total	64.0	1.0	15.0	10.0	31.0	1.0	6.0

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**Table 22: To what extent have the following factors affected implementer engagement?
(All Organisation Response)**

Question No	Question	Total	1 Strongly Agree	2 Agree	3 Neither Agree or Disagree	4 Disagree	5 Strongly Disagree	6 Insufficient Knowledge to Comment	7 Not Appropriate to Comment	8 Too Early to Comment
6 a	Implementers have been given the opportunity to participate in Reef Plan implementation	19.0		11.5	1.0	3.0	2.0	0.5	1.0	
6 b	Implementers are willing to participate in Reef Plan implementation	19.0	4.0	9.5	3.0	1.0		0.5	1.0	
6 c	There is effective communication between implementers	19.0		6.0	3.5	8.0		0.5	1.0	
	Total	57.0	4.0	27.0	7.5	12.0	2.0	1.5	3.0	0.0

**Table 23: To what extent have the following factors affected implementer engagement?
(Government Organisation Response)**

Question No.	Question	Total	1 Strongly Agree	2 Agree	3 Neither Agree or Disagree	4 Disagree	5 Strongly Disagree	6 Insufficient Knowledge to Comment	7 Not Appropriate to Comment	8 Too Early to Comment
6 a	Implementers have been given the opportunity to participate in Reef Plan implementation	7.0		5.0	1.0				1.0	
6 b	Implementers are willing to participate in Reef Plan implementation	7.0		4.0	2.0				1.0	
6 c	There is effective communication between implementers	7.0		2.0	3.0	1.0			1.0	
	Total	21.0	0.0	11.0	6.0	1.0	0.0	0.0	3.0	0.0

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Table 24: To what extent have the following factors affected implementer engagement? (Other Organisation Response)

Question No.	Question	Total	1 Strongly Agree	2 Agree	3 Neither Agree or Disagree	4 Disagree	5 Strongly Disagree	6 Insufficient Knowledge to Comment	7 Not Appropriate to Comment	8 Too Early to Comment
6 a	Implementers have been given the opportunity to participate in Reef Plan implementation	8.0		4.5		1.0	2.0	0.5		
6 b	Implementers are willing to participate in Reef Plan implementation	8.0	4.0	2.5	1.0			0.5		
6 c	There is effective communication between implementers	8.0		2.0	0.5	5.0		0.5		
	Total	24.0	4.0	9.0	1.5	6.0	2.0	1.5	0.0	0.0

Table 25: To what extent have the following factors affected implementer engagement? (NRM Response)

Question No.	Question	Total	1 Strongly Agree	2 Agree	3 Neither Agree or Disagree	4 Disagree	5 Strongly Disagree	6 Insufficient Knowledge to Comment	7 Not Appropriate to Comment	8 Too Early to Comment
6 a	Implementers have been given the opportunity to participate in Reef Plan implementation	4.0		2.0		2.0				
6 b	Implementers are willing to participate in Reef Plan implementation	4.0		3.0		1.0				
6 c	There is effective communication between implementers	4.0		2.0		2.0				
	Total	12.0	0.0	7.0	0.0	5.0	0.0	0.0	0.0	0.0

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Table 26: Looking ahead, what are the most important issues to address to maintain momentum in implementation? (All Organisation Response)

Question No.	Question	Priority Total	1 Importance - High Priority	2 Importance - Low Priority	Feasibility Total	3 Feasibility - High Priority	4 Feasibility - Low Priority
7 a	The need to define a series of long-term milestones and/or targets for Actions over the lifetime of the Reef Plan	18.0	15.0	3.0	18.0	15.0	3.0
7 b	The need to move beyond the identification of problems and towards the development of solutions	19.0	17.0	2.0	19.0	17.0	2.0
7 c	The need to develop a clearer understanding of how Actions and Activities inter-relate in order to facilitate investment coordination	18.0	16.0	2.0	18.0	12.0	6.0
7 d	The need for closer engagement between government and non-government implementers and non-government stakeholders	19.0	17.0	2.0	19.0	15.0	4.0
Total		74.0	65.0	9.0	74.0	59.0	15.0

Table 27: Looking ahead, what are the most important issues to address to maintain momentum in implementation? (Government Organisation Response)

Question No	Question	Priority Total	1 Importance - High Priority	2 Importance - Low Priority	Feasibility Total	3 Feasibility - High Priority	4 Feasibility - Low Priority
7 a	The need to define a series of long-term milestones and/or targets for Actions over the lifetime of the Reef Plan	7.0	7.0		7.0	5.0	2.0
7 b	The need to move beyond the identification of problems and towards the development of solutions	7.0	6.0	1.0	7.0	7.0	
7 c	The need to develop a clearer understanding of how Actions and Activities inter-relate in order to facilitate investment coordination	7.0	5.0	2.0	7.0	5.0	2.0
7 d	The need for closer engagement between government and non-government implementers and non-government stakeholders	7.0	7.0		7.0	5.0	2.0
Total		28.0	25.0	3.0	28.0	22.0	6.0

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Table 28: Looking ahead, what are the most important issues to address to maintain momentum in implementation? (Other Organisation Response)

Question No.	Question	Priority Total	1 Importance - High Priority	2 Importance - Low Priority	Feasibility Total	3 Feasibility - High Priority	4 Feasibility - Low Priority
7 a	The need to define a series of long-term milestones and/or targets for Actions over the lifetime of the Reef Pan	8.0	5.0	3.0	8.0	8.0	
7 b	The need to move beyond the identification of problems and towards the development of solutions	8.0	8.0		8.0	8.0	
7 c	The need to develop a clearer understanding of how Actions and Activities inter-relate in order to facilitate investment coordination	8.0	8.0		8.0	5.0	3.0
7 d	The need for closer engagement between government and non-government implementers and non-government stakeholders	8.0	7.0	1.0	8.0	8.0	
	Total	32.0	28.0	4.0	32.0	29.0	3.0

Table 29: Looking ahead, what are the most important issues to address to maintain momentum in implementation? (NRM Response)

Question No	Question	Priority Total	1 Importance - High Priority	2 Importance - Low Priority	Feasibility Total	3 Feasibility - High Priority	4 Feasibility - Low Priority
7 a	The need to define a series of long-term milestones and/or targets for Actions over the lifetime of the Reef Plan	3.0	3.0		3.0	2.0	1.0
7 b	The need to move beyond the identification of problems and towards the development of solutions	4.0	3.0	1.0	4.0	2.0	2.0
7 c	The need to develop a clearer understanding of how Actions and Activities inter-relate in order to facilitate investment coordination	3.0	3.0		3.0	2.0	1.0
7 d	The need for closer engagement between government and non-government implementers and non-government stakeholders	4.0	3.0	1.0	4.0	2.0	2.0
Total		14.0	12.0	2.0	14.0	8.0	6.0

Table 30: How far into the future do clear definitions of your organisation's roles and responsibilities for the Reef Plan extend? (All Organisation Response)

Question No	Question	Total	1 to 2 years	2 to 5 years	5 + years	Not clear at present
8 a	Strategic objectives	19.0	2.0	1.0	12.0	4.0
8 b	Strategic planning	19.0	4.0	2.0	10.0	3.0
8 c	Actions	19.0	4.0	3.0	8.0	4.0
Total		57.0	10.0	6.0	30.0	11.0

Table 31: How far into the future do clear definitions of your organisation's roles and responsibilities for the Reef Plan extend? (Government Organisation Response)

Question No	Question	Total	1 to 2 years	2 to 5 years	5 + years	Not clear at present
8 a	Strategic objectives	7.0		1.0	5.0	1.0
8 b	Strategic planning	7.0	1.0	1.0	4.0	1.0
8 c	Actions	7.0	2.0	2.0	2.0	1.0
Total		21.0	3.0	4.0	11.0	3.0

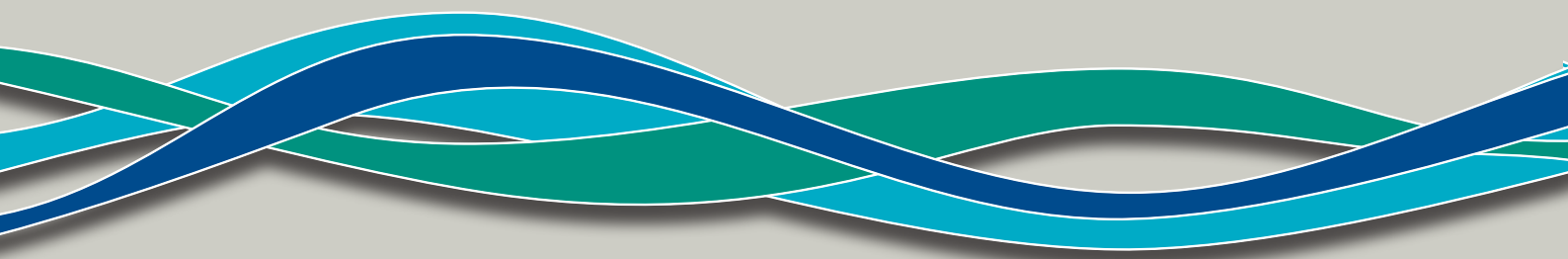
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Table 32: How far into the future do clear definitions of your organisation's roles and responsibilities for the Reef Plan extend? (Other Organisation Response)

Question No	Question	Total	1 to 2 years	2 to 5 years	5 + years	Not clear at present
8 a	Strategic objectives	8.0		6.0	2.0	
8 b	Strategic planning	8.0	1.0	5.0	2.0	
8 c	Actions	8.0		5.0	3.0	
	Total	24.0	1.0	16.0	7.0	0.0

Table 33: How far into the future do clear definitions of your organisation's roles and responsibilities for the Reef Plan extend? (NRM Response)

Question No	Question	Total	1 to 2 years	2 to 5 years	5 + years	Not clear at present
8 a	Strategic objectives	4.0	2.0		1.0	1.0
8 b	Strategic planning	4.0	2.0	1.0	1.0	
8 c	Actions	4.0	2.0	1.0	1.0	
	Total	12.0	6.0	2.0	3.0	1.0



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