

reef water quality

Protection Plan:

For catchments adjacent to the
Great Barrier Reef World Heritage Area

October 2003



Australian Government



Queensland the Smart State

Further information is available from:

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Australian Government



Queensland the Smart State

Foreword

The Great Barrier Reef World Heritage Area has outstanding natural, social and economic values.

It is priceless to the people of Queensland and Australia.

Unfortunately the quality of water flowing into the Reef lagoon from the land has dramatically deteriorated over the past 150 years. This has occurred as the land has been modified to make way for urban infrastructure, agriculture, grazing and mining.

Science has established that unsustainable land-based activities are the main source of pollutants entering the Reef.

Land-based activities and the Reef can comfortably coexist in the future.

We need a cooperative and precautionary approach to protect the Reef from land-based pollutants. That is why the Australian and Queensland Governments are working with each other, and with local governments, industry groups, landholders, communities and other stakeholders.

The Reef Water Quality Protection Plan contains new actions, and proposals for building on existing government policies and industry and community initiatives to achieve a sustainable future for the Reef and the industries in the Reef's catchments. The overall aim is to halt and reverse the decline in the quality of water entering the Reef, within 10 years.

Together, we can protect the Great Barrier Reef for future generations.



Peter Beattie MP
*Premier of Queensland
and Minister for Trade*



John Howard
*Prime Minister
of Australia*



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Summary

The Great Barrier Reef World Heritage Area is a nationally and internationally significant area with outstanding natural, social and economic values. Over the last 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 entering the Reef are the result of land use activities in the catchment areas.

The balance of evidence is that sediment and nutrients from land-based sources are impacting the inner reefs and seagrass areas of the Reef. The vast majority of the 2900 reefs that make up the Great Barrier Reef are in good condition but some of the 450 inshore reefs are showing impacts consistent with a decline in water quality.

A cooperative and precautionary approach to Reef protection, involving all levels of government and stakeholders, is required. The Reef Water Quality Protection Plan (RWQPP) identifies actions, mechanisms and partnerships to build on existing Government policies and industry and community initiatives to assist in halting and reversing the decline in the quality of water entering the Reef. The focus of actions in the RWQPP is relatively low cost measures to encourage good planning and to assist landholders in adopting best management practices that are both profitable and environmentally sustainable. The Plan is aimed at long-term solutions.

It is intended that implementation of many of the strategies and actions in this Plan will be carried out under the auspices of the National Action Plan for Salinity and Water Quality (NAP) and the Natural Heritage Trust Program (NHT).

The Scope of the Plan

The Reef Water Quality Protection Plan is aimed at addressing diffuse pollution from broadscale land use. The strategies in the Plan provide for actions to minimise pollutants from diffuse sources and reduce the entry of those pollutants to the Reef. Diffuse sources of pollution are those that enter the waterways through a wide range of different sources and which cannot be directly attributed to one point of dispersal, such as a pipe or waste outlet. This includes nutrients, chemicals and sediment which wash into waterways and ultimately flow into the Reef lagoon.

Urban diffuse sources and point sources of pollution such as sewage, waste from ore processing as part of mining and aquaculture are dealt with separately under a range of legislation, regulations and strategies and are not dealt with in this Plan.

Global warming and climate change may also affect the health of the Great Barrier Reef. The effects of shipping accidents, tourism, fishing and natural threats such as infestation by the Crown of Thorns starfish are other areas of concern for the Reef. These issues are covered under separate regulatory and planning processes managed by the State and Commonwealth Governments and this Plan does not address them.

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

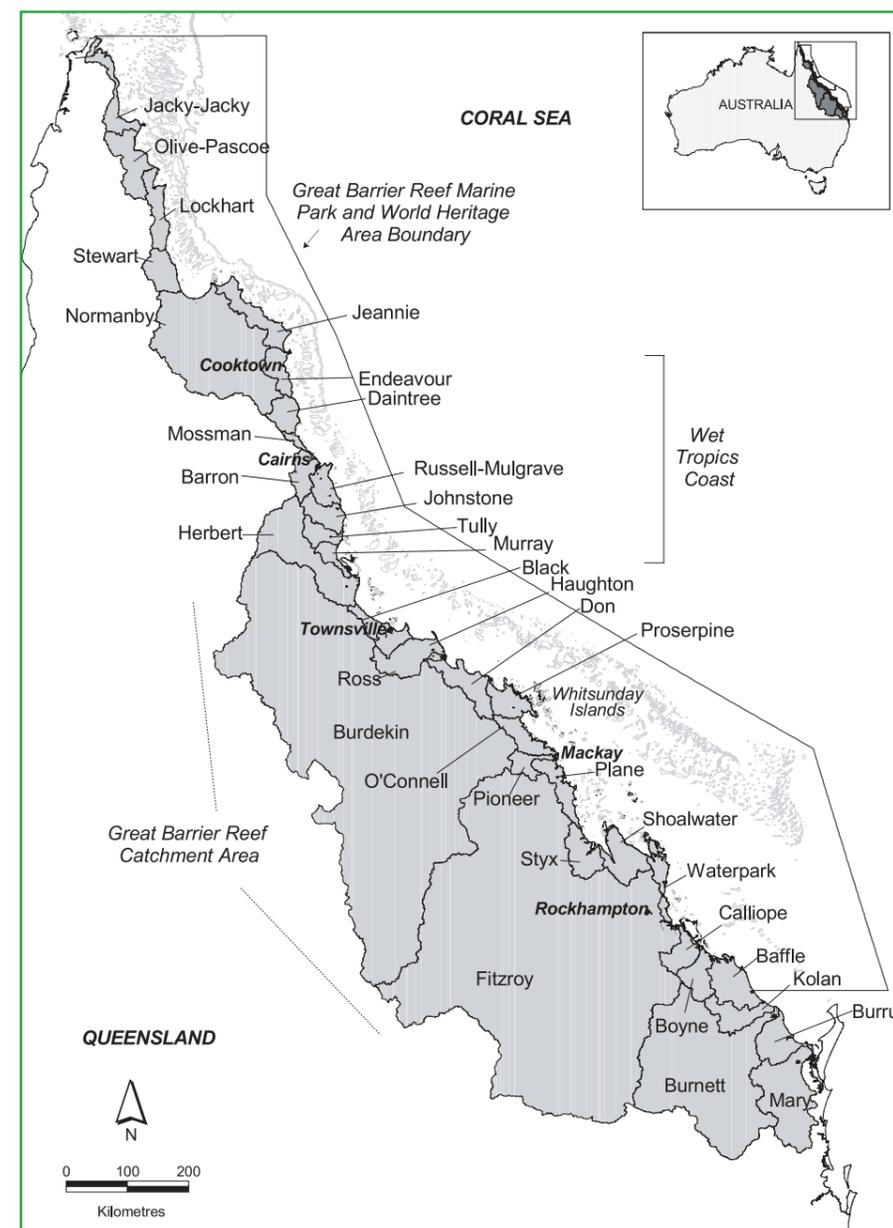


Figure 1: Map of the Great Barrier Reef World Heritage Area and catchments.

Introduction

The Great Barrier Reef is a World Heritage Area. The Governments of Australia have a responsibility to protect the Great Barrier Reef and to ensure the long term conservation of the Reef for the enjoyment of future generations of Australians and visitors from overseas.

The Reef Water Quality Protection Plan is a joint initiative of the Queensland and Australian Governments. Through this Plan the Governments will act on the potential risk to the Great Barrier Reef from the progressive decline in water quality in the waterways entering the Reef. In particular, the Plan addresses diffuse sources of pollutants entering waterways in the Reef Catchment area.

This Plan is one part of the government planning aimed at protecting and preserving the Reef. It incorporates and supports the actions of all levels of government, industry and community groups which benefit Reef health and has links with a number of other planning initiatives.

The Plan builds upon the existing participation and support of stakeholders in identifying and implementing solutions to the challenge. It will facilitate sustainable natural resource management and the long-term security of industries reliant on the resources of the Reef and its catchment. The Plan also recognises the desire of Indigenous people to protect and heal country and culture for future generations.

In 2002, the Queensland Government commissioned an independent panel of experts, to review the scientific evidence linking land use, water quality and Reef degradation. In their report, *A Report on the Study of Land Sourced Pollutants and their impacts on Water Quality in and adjacent to the Great Barrier Reef*, the Science Panel found the following:

- There are clear indications that major land use practices in the Reef catchment have led to accelerated erosion and greatly increased the delivery of sediment and nutrients over pre-1850 levels.
- Causes of this increase include grazing practices in the drier catchments and overgrazing in general, urban development, agricultural production, water use practices, extensive vegetation clearing, wetland drainage on coastal plains, and development on acid sulfate soils.
- There is clear evidence of adverse impacts on some rivers, estuaries and inshore areas.
- Coral reefs at a number of inshore locations along the coast (i.e. up to 20 km from shore) have been disturbed and have remained in a disturbed state.

- Impacts on offshore areas of the Reef are not well understood, but the health of offshore regions is linked to that of inshore areas, estuaries and rivers.
- Overseas experience shows that by the time widespread effects are obvious, the system would be almost irreparably damaged.

Also in 2002 the Australian Government asked the Productivity Commission to undertake a study and report on the importance of different industries in the GBR catchment and examine and evaluate a number of policy options to address declining water quality entering the Reef. The Productivity Commission's research report *"Industries, Land Use and Water Quality in the Great Barrier Reef Catchment"* reported that in terms of 1999-2000 data, gross value of production and employment for key industries in the Great Barrier Reef catchment were as follows:

- Mining – \$7052 million; 10380 employed.
- Tourism – \$4269 million; 47660 employed.
- Mineral processing – \$1392 million; 3918 employed.
- Beef – \$1017 million; 8728 employed.
- Sugar cane – \$803 million; 8736 employed.
- Horticulture – \$708 million; 9006 employed.
- Recreational fishing – \$ 240 million.
- Commercial fishing – \$119 million; 641 employed.
- Aquaculture – \$38 million; 378 employed.

The reports of the Independent Science Panel and the Productivity Commission are valuable contributions to the Governments' development of this Plan. They will continue to inform policy development and implementation as we respond to the challenge of protecting the Reef and facilitating a sustainable future for the industries reliant on the Reef and its catchments.

The Governments agree that there is an overwhelming case for halting and reversing the decline in water quality in the waterways entering the Reef. The value of the Reef and the sustainable development of its catchment are of sufficient importance that early action is justified to reduce these risks.

While the focus of this Plan is on the decline in water quality entering the Reef, there is a range of other risks faced by the Reef, including climate change, shipping accidents, tourism impacts, urban development and fishing. Separate processes are underway to address these issues and as such they are not included in the scope of this Plan. However, the degree to which multiple

Funding

This Plan includes a range of actions that require material support to communities and industries facing the challenge of halting and reversing the decline in water quality entering the Reef. Substantial funding by the Australian and Queensland Governments will be sourced from the Natural Heritage Trust (NHT) and the National Action Plan on Salinity and Water Quality (NAP). Protection of the Great Barrier Reef is a continuing high priority for both the Australian and Queensland Governments. As the Plan is further developed and implemented funding for actions will need to be maintained.

It is likely that Reef protection will be a high priority for government and society into the future therefore funding beyond the agreed timetables for the NHT and NAP will be settled by the Governments through future Budget processes.

In addition to NAP and NHT, actions will be funded from a number of other sources. Resources have been allocated to fund the Great Barrier Reef Coastal Wetlands Protection Program, to the development of the water monitoring tools and methodologies by the CRC Reef and CRC Rainforest and to the CSIRO Healthy Country Flagship Program. In addition, state government agencies have funding to continue with the development of programs such as Coastal Management Plans, with Vegetation Planning and the implementation of the Rural Leasehold Land Strategy. All of these programs and plans directly relate to achieving the goal and objectives of the RWQPP.

risks may interact to create an even greater challenge should not be underestimated. The decline in water quality entering the Reef may negatively interact with other stressors such as coral bleaching or outbreaks of Crown of Thorns starfish.

The majority of chemical, sediment and nutrient pollutants affecting water quality in the waterways entering the Reef come from diffuse sources arising through land use activities in the Reef catchments. The Plan focuses on decreasing pollutants from these sources, and on rehabilitating and conserving areas of the reef catchment that have a role in removing water borne pollutants.

There are also risks to the Reef from point sources of pollution, including urban sewage and storm-water, ports, manufacturing and processing industries, and aquaculture. These sources of pollution are not covered by this Plan as point sources of pollution are regulated through a variety of legislation. For example sewage and aquaculture discharges are regulated under the *Environmental Protection Act 1994*. The adequacy of such regulatory measures for point source pollution will be assessed separately from the Plan. This Plan only covers diffuse sources from broad scale land use.

Significant changes to land management practices have been occurring in the agricultural industry. Landholders continue to develop new strategies to minimise the flow of nutrients, chemicals and sediment into the waterways. This Plan acknowledges the work undertaken by them cooperatively with Government and Industry and builds on the strategies and plans already in progress. More details on the many initiatives underway can be found at Appendix 1.

This is a long-term Plan. Actions undertaken in the RWQPP will be initially implemented over a 10 year period. Further strategies will be considered after the review in 2010. The results of these actions will be seen over a much longer period, with improvements in water quality continuing to be measured and further actions taken past this time frame. Ongoing evaluation of the Plan will ensure that the Plan continues to reflect progress in land management practices, new developments in science and the changing structure of natural resource management. Lack of progress in implementing actions which will result in the reversing of the decline of water quality will result in a reassessment of the Plan and the development of new strategies where required.

The Consultation Process

The Reef Water Quality Protection Plan has been developed in consultation with industry and the public.

A Reef Protection Steering Committee was established in 2002 to facilitate this process. The Steering Committee is comprised of senior officers of the following agencies: Department of Agriculture, Fisheries & Forestry (DAFF), Department of Natural Resources and Mines (NR&M), Department of the Premier and Cabinet (DPC), Department of Primary Industries (DPI), Environmental Protection Agency (EPA), Department of the Environment and Heritage (DEH) and the Great Barrier Reef Marine Park Authority (GBRMPA).

In consultation with a wide range of stakeholders a draft Plan was prepared in late 2002. This initial Plan was circulated to State and Commonwealth Government agencies, industry, conservation, local government and community groups for comment and a draft Plan was written as a result of these consultations. The draft Plan also took into consideration the findings of the Science Panel Report and the Productivity Commission study released in February 2003.

A Draft RWQPP was circulated for comment and consideration by all stakeholder groups and the public in May 2003. Advertisements were placed in regional and national newspapers requesting submissions from the public and interested groups. Meetings were also held with key stakeholder groups in regional locations in Reef catchment areas and in Brisbane during June and July 2003. These sessions provided an opportunity to discuss the content of the Plan, clarify issues of concern and to obtain initial stakeholder feedback. Over 100 submissions were received and the comments in those submissions have been taken into consideration in the development of this Plan.

The Goal of the Reef Water Quality Protection Plan

The goal of the RWQPP is:

Halting and reversing the decline in water quality entering the Reef within 10 years.

The Objectives of the Reef Water Quality Protection Plan

The two objectives of the RWQPP which will support the achievement of the goal are:

Objective 1

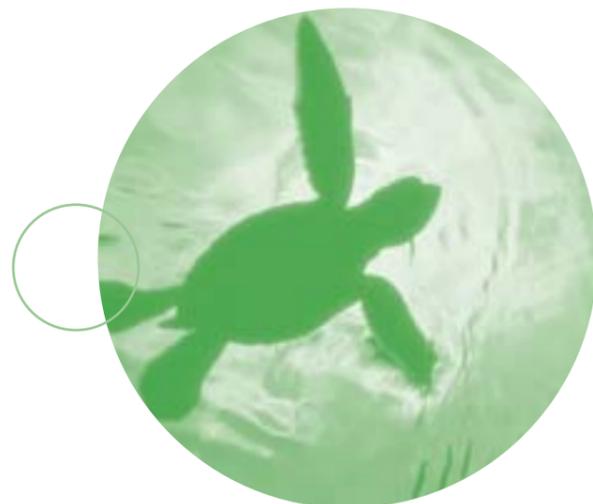
Reduce the load of pollutants from diffuse sources in the water entering the Reef.

Objective 2

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

The quality of the water entering the Reef is determined by a number of factors. This Plan covers the impact of pollutants entering rivers and streams; the capacity of the areas in the Reef catchment to filter the water (such as riparian areas and wetlands) and therefore reduce the levels of pollutants; and managing other actions such as land clearing, the intensification of agriculture and development of wetlands, which result in increased sediment or chemicals flowing into the river system. The focus of the RWQPP is to address these factors through:

- Improving decision making in landuse planning.
- Adopting sustainable production systems.
- Rehabilitating damaged wetlands and riparian areas.
- Conserving existing wetland and riparian areas.

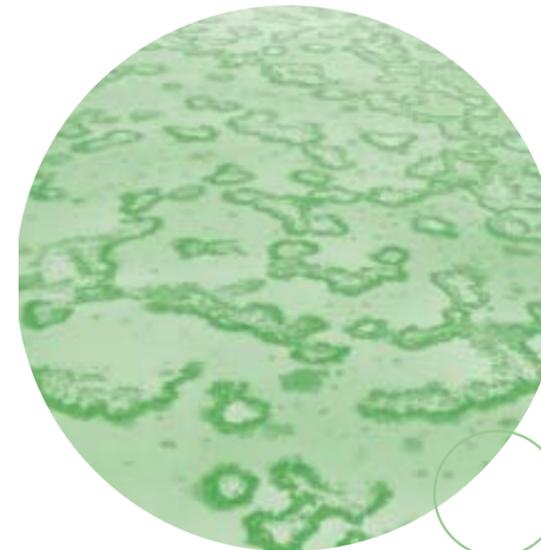


Strategies

The Plan contains nine key strategies. Each of these strategies is supported by actions or activities that support the objectives of the Plan and ultimately the goal. The first five strategies describe the five main approaches to achieving the objectives of the Plan, while the last four are underpinning strategies necessary to effectively target, inform and support the first five approaches (see Figure 2). The RWQPP outlines the actions, with the details of the implementation stage to be developed in consultation with key stakeholders. The strategies are:

- Self Management Approaches.
- Education and Extension.
- Economic Incentives.
- Planning for Natural Resource Management and Land Use.
- Regulatory Frameworks.
- Research and Information Sharing.
- Partnerships.
- Priorities and Targets.
- Monitoring and Evaluation.

Figure 2



Who Will Use The Plan?

This Plan is a working document. It will be used collaboratively to develop regional plans, support existing and new initiatives and to monitor progress, by:

- Landholders,
- Industry groups,
- Government agencies,
- Local government,
- Community groups,
- Indigenous people, and
- Regional Natural Resource Management (NRM) Bodies.

The Regional NRM Bodies will be key users. They are responsible for developing regional NRM plans as part of the regional planning process currently being undertaken to guide investment under the National Action Plan for Salinity and Water Quality (NAP), being proposed under the Natural Heritage Trust (NHT) and by other investors. More information on the Regional NRM Bodies and NAP and NHT can be found at Appendix 2. Where no Regional NRM Body exists, such as in Cape York Peninsula, other institutional arrangements will be utilised to implement the actions in the Plan.

Overview

Achieving the goal and objectives of the RWQPP requires an integrated natural resource management approach that will harness the co-operative activity of all levels of government, industry, landholders, the community and Indigenous people.

The RWQPP is based on developing partnerships and building on planning already underway in coastal and catchment areas. The initial focus of the actions in the RWQPP is to encourage good planning and to support landholders in the adoption and continued development of best management practices, rather than to seek large scale changes to land use or end-of-pipe solutions. Progress towards the goal of the Plan will be evaluated and improvements to the Plan made during implementation. The effectiveness and cost effectiveness of alternative strategies in addressing the decline in water quality entering the Reef has been an important consideration in the development of actions for inclusion in the RWQPP.

There is widespread consensus across government, industry sectors and community groups in the Reef catchment regions that single issues based policy and action responses have failed to deliver the desired outcomes of Reef protection and sustainable land use. There is a strong demand for a whole of systems approach in many aspects of natural resource management and the design of sustainable farming systems and land management practices.

This Plan aims to progress an integrated approach to natural resource management planning by building on the existing partnerships between the different levels of government, industry groups, the community and research providers within the Reef catchments, principally through partnerships with the Regional NRM Bodies. Sharing and dissemination of data and information between partners in a timely and efficient manner is essential to build on and operationalise these partnerships.

The regional planning process currently being undertaken by the Regional NRM bodies will be particularly important in implementing the RWQPP. There is an on-going need to support the regional bodies in both developing their plans and implementing actions that assist in meeting the goal of the RWQPP.

The RWQPP incorporates a risk management approach to identify and target high priority Reef catchments. The process to identify these catchments and the catchments considered to be high risk catchments is outlined in Appendix 3. The cost effectiveness of potential strategies which includes the costs, benefits and impacts of an action, to governments, to landholders and to communities has been considered and will continue to be reviewed. As the RWQPP and other related regional Natural Resource Management plans are put into effect and are evaluated, there will be a need to revise the RWQPP and to implement new strategies. This process will continue past the initial 10 year time frame of the current Plan.

Related Initiatives

The RWQPP will influence existing planning systems at a State, regional and local level. They will be increasingly focused to deliver a number of the strategies and actions identified in the RWQPP. The RWQPP will seek linkages to these planning systems by:

- Providing a policy direction and framework for incorporation with other planning systems by reinforcing the need for these plans to deliver water quality objectives.
- Influencing planning for new development in the catchments adjacent to the Reef, to improve delivery of water quality objectives through local and regional planning processes.
- Broadly identifying the major source areas of pollutants, the major areas at risk and recommending priorities for action.
- Promoting property-level planning for agriculture that delivers improved natural resource management and environmental protection outcomes at farm and landscape levels and supports Reef water quality objectives.

As well as planning systems, a number of other programs and activities are also in place which support or are incorporated in the RWQPP. Many activities already occur which support the goal and objectives of the plan. They include:

- Industry initiatives which will play a vital role in delivering the objectives of the Plan such as best management practice programs and the Rural Water Use Efficiency Program.
- Implementation of improved agricultural practices by individual landholders.
- Government initiatives such as Coastal Management Plans, Water Recycling Strategies, NAP, NHT (including the Coastal Catchments Initiative) as well as the provisions of existing legislation such as the *Land Act 1994*, the *Water Act 2000*, the *Vegetation Management Act 1999* and the *Environmental Protection Act 1994*.
- Community groups, including Waterwatch, Catchment Management, Landcare and Coastcare groups, which play a significant role in raising community awareness and implementing actions.
- Statutory Authorities such as River Improvement Trusts and the Wet Tropics Management Authority.
- Negotiation of land use agreements (ILUAs) with Indigenous people.

- Regional NRM Bodies which play a key role in implementing actions.
- Local governments which have a strong role in water quality improvement and ecosystem protection.

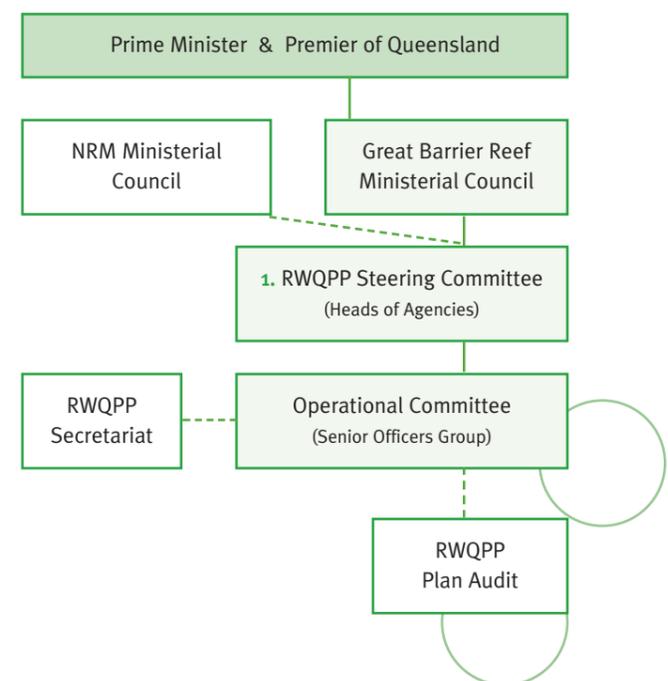
Full details of initiatives and actions underway which will support the implementation of the RWQPP can be found at Appendix 1.

Implementation and Evaluation

The RWQPP has been approved by both the Queensland and Australian Governments. An Interdepartmental Steering Committee comprising Heads of Agencies from the Department of Agriculture, Fisheries & Forestry (DAFF), Department of Natural Resources and Mines (NR&M), Department of the Premier and Cabinet (DPC), Department of Primary Industries (DPI), Environmental Protection Agency (EPA), Department of the Environment and Heritage (DEH) and the Great Barrier Reef Marine Park Authority (GBRMPA) will be established to oversee the implementation of the RWQPP. This will be supported by a small secretariat and a working party of senior officers.

Figure 3

RWQPP Administrative Arrangements



Each of the government agencies involved in the RWQPP will incorporate the goal and objectives of the RWQPP into their Strategic Plans and are required to work together to develop Implementation Plans which will outline how they will deliver on their responsibilities as outlined in the RWQPP. Heads of Agencies will provide annual reports on progress towards the goal and objectives of the Plan to their respective Ministers.

Two formal evaluation reports on the progress of the RWQPP will be provided by the Steering Committee to the Great Barrier Reef (GBR) Ministerial Council. The first will be completed by 1 July 2005 and the second by 1 July 2010. The GBR Ministerial Council will provide the reports with recommendations to the Prime Minister and Premier for their consideration. The reports will also be forwarded to the Natural Resources Management Ministerial Council for information.

The first report to the Prime Minister and Premier will focus on whether satisfactory progress has been made toward the objectives of the RWQPP, and will detail the process through which these objectives are being achieved. The report will discuss whether amendments to the RWQPP are required to facilitate achieving the objectives. The report will also review interim progress towards halting the decline in water quality entering the Reef. Dependent on the findings of this review, consideration may be given to a stronger approach in the development of further actions.

The process of developing and implementing many of the strategies and actions identified in the RWQPP will involve setting out responsibilities and timeframes for the identified actions. Since many of these actions will be contained within other planning processes, an important aspect of auditing the RWQPP will involve critically examining whether these other plans are effective in delivering Reef water quality protection outcomes.

The second report will also detail whether the objectives, strategies and actions in the revised Plan have been adequate to achieve sufficient progress towards the goal of halting and reversing the decline in water quality entering the Reef and will propose future actions beyond the life of this Plan.

Actions undertaken through the planning processes at the State and local level, including the Regional NRM plans, will each need to contribute to the objectives of the RWQPP in order to achieve its goal. Therefore, it is appropriate that auditing of these plans includes not only whether they are meeting their own goals, but also an evaluation of whether they are meeting the goal and objectives of the RWQPP. For this reason, reporting and auditing arrangements are to be linked to regional and statewide environmental reporting schemes, e.g. State of the Environment Reporting, State of the Reef Report and the monitoring and evaluation framework for NAP and NHT.

Strategy A: Self-management approaches

Actions to implement the strategy are:	Responsibility	Milestones
1. Promote existing and develop new guidelines and templates for preparing property resource management plans (PRMPs) that will assist in: <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. 	NR&M , Peak Industry Bodies, DPI, EPA	Finalisation of Property Resource Management Planning Guidelines for leasehold land December 2003 Report on progress of other guidelines completed by 1 July 2005
2. 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.	NR&M, EPA , Peak Industry Bodies, DPI	Completed 1 January 2005
3. Support industry-led development of best management practice for land, natural resources and chemical use practices for the sugar, fruit and vegetable, broad-acre cropping, dairy and grazing industries in high risk Reef catchments. In the short term this will involve: <ul style="list-style-type: none"> Continued rollout of COMPASS (Combining Profitability and Sustainability in Sugar). Support for further development of best management practice programs for broad-acre cropping. Continued support for implementing environmental management systems in agriculture. 	Peak Industry Bodies, DPI, NR&M, EPA, DAFF, DEH, BSES	Review of uptake of best management practices 1 July 2005
4. Promote adoption of sustainable land management and best management practices in high risk Reef catchments through programs such as: <ul style="list-style-type: none"> Best Management Practice (BMP). Property Resource Management Planning (PRMP). Environmental Management Systems (EMS) in agriculture. 	Peak Industry Bodies, DPI, NR&M , Regional Natural Resource Management (NRM) Bodies, Landholders, EPA, GBRMPA	Success in high risk catchments reviewed 1 July 2005 1 July 2010
5. 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 MAGIC (Managing Agricultural Chemicals in Communities).	DPI , Peak Industry Bodies, Regional NRM Bodies	Report on program achievements 1 July 2005
6. 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

Strategy A: Self-management approaches cont.

Ongoing improvement in land use management practices at a property and landscape level is dependent on landholders understanding their duty of care to the land and the environment and the impact of their activities. There is a need to improve the way sediment, nutrient and pesticide runoff is controlled and how wetlands and riparian habitats are protected and restored in the Reef catchment.

Adoption of best management practices provides the most cost-effective means of delivering sustainable primary production. For agricultural industries there is a variety of on-farm best management practice programs already being implemented that encourage sustainable primary production practices through the adoption of an environmental management systems approach based on the Assess-Plan-Do-Check-Review cycle. Governments are supportive of comprehensive programs, such as Cotton BMP, COMPASS and environmental management systems for agriculture, that result in best management practices being adopted by landholders. Governments are interested in the outcomes of these approaches rather than seeking to specify what approach a particular industry should adopt. Such programs help land holders identify and manage areas and aspects of the property that carry risks to the environment through a process of self-assessment with a commitment to progressive improvement e.g. COMPASS program for sugar cane growing and the Best Management Program for cotton growing. The national Environmental Management Systems in Agriculture program, Codes of Practice and best practice environmental management guidelines, can assist these industry-driven programs. Guidelines are also required on minimising sediment and nutrient runoff and protecting and rehabilitating wetlands and riparian habitat to assist landholders undertake property resource management planning.

The delivery of the Plan is heavily dependent on significant uptake of best management practices in high-risk catchments. Governments will promote the increased take up of best management practice in these areas through the regional natural resource management planning and investment process and in partnership with industry bodies, and will review and assess take up levels and performance at critical milestone dates.

The initiatives outlined in this section will build upon current industry initiatives and be implemented in partnership between Industry, Community and the Government sectors.

Governments are committed to managing the threats to water quality on public land.

Strategy B: Education and Extension

Actions to implement the strategy are:	Responsibility	Milestones
<p>1. 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.</p> <p>These programs will:</p> <ul style="list-style-type: none"> • Aim to use local knowledge and insights. • Recognise the drivers for voluntary uptake. (e.g. 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 with the Cotton BMP. • 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, 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 July 2004</p>
<p>2. Improve the integration and coordination of research information systems and relevant extension services to support regional Natural Resource Management (NRM), catchment and property resource management planning in the Reef catchment.</p>	<p>JSC, NR&M, DPI, EPA, DAFF/DEH, Peak Industry Bodies, Conservation Groups, Research Bodies, Regional NRM Bodies, Indigenous Bodies</p>	<p>Report on improvements 1 July 2005</p>
<p>3. Facilitate exchange of information between Indigenous groups, Government agencies, Industry and landholders on natural resource management approaches with positive Reef water quality outcomes.</p>	<p>EPA, GBRMPA, DAFF, DEH, Indigenous Bodies, DPI, NR&M Regional NRM bodies, Research Bodies</p>	<p>Report on progress by 1 July 2005</p>
<p>4. 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.</p>	<p>EPA, NR&M, Regional NRM Bodies, Research Bodies, Peak Industry Bodies</p>	<p>Completed 1 July 2005</p>
<p>5. 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.</p>	<p>NR&M, DPI, EPA, Peak Industry Bodies, DAFF, DEH, Regional NRM Bodies, Research Bodies, Local Governments</p>	<p>Success in high risk catchments reviewed 1 July 2005 1 July 2010</p>

Strategy B: Education and Extension cont.

Adopting best management practices to improve the quality of water flowing to the Reef will require better information to be provided to the community to promote an understanding of the threats to the Reef. Direct technical support to landholders from industry and government extension services is needed to facilitate remedial action and needs to be focused in high risk catchments. Technical guidelines for preparing and implementing property resource management plans and conservation agreements will assist property managers. Factors that need to be considered in designing education and extension programs include the interests and socio-economic characteristics of landholders.

The various government and non-government extension and community education services need to be better coordinated and integrated to deliver efficient and effective messages to the community on the threats to the Reef. These services also need to provide technical assistance for landholders on possible remedial actions. Generating broad community awareness by developing an education and information program about the need to protect the Reef is fundamental to creating change in our land-use and natural resource management practices.

The results of a range of water quality projects under NAP will also be relevant to regional NRM bodies in other catchments. Knowledge gained from a NAP catchment exercise (for example, modelling landscape processes, catchment loads and impact of management actions) is likely to have relevance in adjoining catchments. Providing opportunities for information exchange and dissemination can be achieved via such means as cross regional technical workshops, NAP/NHT websites and extension service delivery.

Strategy C: Economic Incentives

Actions to implement the strategy are:	Responsibility	Milestones
1. Promote the adoption of existing incentive schemes that have the potential to encourage landholders to implement sustainable management practices and property level planning.	DPI, NR&M, EPA, DEH, DAFF, Peak Industry Bodies, Regional NRM Bodies	Report on uptake of schemes 1 July 2005
2. 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, EPA, DAFF, DLGP, Peak Industry Bodies	Report to Ministers 1 July 2004
3. 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, that 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, EPA, Research Bodies, Peak Industry Bodies	Report to Ministers 1 January 2005
4. 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
5. 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, EPA, DAFF, DEH, Regional NRM Bodies	Report Completed 1 July 2005
6. 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
7. 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

Strategy C: Economic Incentives cont.

Actions to implement the strategy are:	Responsibility	Milestones
8. 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
9. 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 e.g. the newly formed Queensland Trust for Nature.	EPA , DAFF, DEH, NR&M, Regional NRM Bodies	Report on progress by 1 July 2005

The use of economic instruments can achieve cost effective natural resource management outcomes. The promotion of conservation covenants on riparian vegetation, coastal wetlands, floodplains and remnant native vegetation in lowland areas in high-risk and medium to high-risk catchments could deliver significant improvements for water quality within the catchments of the Reef. The promotion of best management practices on grazing and cropping lands in the same areas could also have significant impact.

Some policies and incentive programs inadvertently create perverse outcomes that encourage and reward land management practices that reduce water quality entering the Great Barrier Reef. There are situations where landholders are required to maintain stock numbers in extended dry periods persisting into drought in order to qualify for transport assistance whereas a system that encouraged land users to progressively turn off non-breeding stock as the dry periods progressed could reduce the incidence of erosion at the end of droughts. As evidence has suggested that considerable erosion and large sediment plumes occur with drought breaking rains, the reduction of erosion at that time is a high priority.

Effective use of economic instruments can produce a double dividend; both better environmental outcomes as well as superior economic performance. There are many instances where landholders are implementing best practice profitably, e.g. cell grazing can increase a landholder's return while reducing erosion. Incentive measures can encourage these practices to be implemented more widely. Identifying those land uses where significant change in management approach is required would assist landholders in seeking assistance.

As there is both a private and a public benefit to these practices it is appropriate to gain an understanding of a fair split in the costs of implementation.

Creating market value for the conservation and restoration of riparian and wetland habitats can be a powerful driver for change. The creation of statutory market mechanisms, resource management and trading agreements on freehold and leasehold land may provide economic incentives to improve land management practices.

An auction system can be an effective method of undertaking works that protect important wetland and riparian areas. It enables Governments and landholders to both work from their strengths, with Governments having better information about hazard areas and landholders being better informed on management costs. The auction system enables the Governments to outline what it wants to achieve and for landholders to bid to undertake those works. Property resource management planning can be directly cost effective through enhanced productivity and profitability as well as indirectly through preferential access to funding, natural resources, security of tenure and markets.

Strategy D: Planning for Natural Resource Management and Land Use

Actions to implement the strategy are:	Responsibility	Milestones
1. Ensure Commonwealth, State and Local Government planning processes in Reef catchments are consistent with the goal and objectives of the RWQPP.	NR&M , JSC, DLGP, DAFF, DEH, DPI, EPA, Local governments, WTMA	Completed 1 July 2004
2. 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
3. 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
4. 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 (WQIPs) 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 WQIPs are being developed. Prepare and support the implementation of a Water Quality Improvement Plan for the waterways in the Douglas Shire. Implement interim water quality projects. 	DEH , DPI, NR&M, EPA, DAFF, Regional NRM Bodies, Local governments Douglas Shire Council , Regional NRM Body, DPI, NR&M, EPA, DAFF, DEH	Report on progress 1 July 2005 Completed 1 July 2004
5. Develop an agricultural planning policy as part of an 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 , NR&M, EPA, DLGP, Peak Industry Bodies	Policy Completed by 1 July 2004 Applied to high risk areas by 1 July 2005

Strategy D: Planning for Natural Resource Management and Land Use cont.

Actions to implement the strategy are:	Responsibility	Milestones
6. 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, DLGP, NR&M, EPA, Peak Industry Bodies	Review completed by 1 January 2004
7. Review current planning instruments and develop new planning or statutory instruments as appropriate to ensure that 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, DLGP, EPA, NR&M, Peak Industry Bodies, Local governments	Review completed and timetable for implementation developed by 1 January 2004
8. Identify and establish nutrient sensitive zones within which extension services, property resource management planning and NRM funding will be focused to minimise impact of nutrients on the Reef. <ul style="list-style-type: none"> • Investigate further land use planning, regulatory, market and voluntary mechanisms that could be applied in these zones. 	DEH, DPI, NR&M, GBRMPA, EPA, Regional NRM bodies, Industry bodies	Completed 1 July 2004
9. 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	Complete mapping of priority areas 1 July 2007 Develop additional chapters of Technical Manual on ASS 1 July 2006
10. 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	Completed 1 July 2005
11. Negotiate Indigenous Land Use Agreements (ILUAs) in areas of particular significance to Indigenous peoples that recognise the linkages between land, waterways and the marine environment 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 ILUAs. 	Indigenous Bodies, EPA, NR&M, Regional NRM Bodies	Report to Ministers on progress 1 July 2005

Strategy D: Planning for Natural Resource Management and Land Use cont.

There is a need to coordinate and focus the various planning processes to deliver the goal of the RWQPP. Planning systems are powerful tools for informing and engaging the community about future directions in the management of our land and natural resources. Better use of existing planning mechanisms can achieve improvements in land-use and development control decisions that contribute to maintaining and improving the water quality and ecological health of the waterways flowing to the Reef.

Regional NRM plans can set out environmental values, aspirational management and resource condition targets, and measures to progressively improve the quality of waters flowing to the Reef. Coastal Management Plans and associated guidelines can assist local governments to undertake appropriate strategic planning and development assessment.

The *Integrated Planning Act 1997* (IPA) enables the Queensland Government and local government to regulate certain development through various planning mechanisms including the Act itself, State Planning Policies and local government planning schemes. The IPA provides the process by which a development is assessed and its impacts managed. The IPA also provides a mechanism for the heads of power in other legislation dealing with the forms of development covered by the IPA to be integrated and exercised. The relevant planning and development legislation and mechanisms could all give statutory effect to planning and development assessment requirements that manage the effects of agriculture on water quality entering the Reef. There is a need to review the planning and development assessment arrangements with a particular emphasis on assessing development activities that have a significant impact on the hydrology, structure and function of wetlands to deliver Reef water quality protection.

Development for new or intensified agricultural activities that may have a significant adverse impact will require assessment to manage the effects on water quality of the Reef.

An offset approach to the unavoidable loss of wetlands or riparian areas, based on achieving an improvement in water quality, would be beneficial provided risks associated with time-lags in restored areas being effective were taken into account in determining the offset trade.

By developing a strategy through the Agricultural Planning System project that involves (i) identifying areas that are best suited to, (or alternatively most constrained for), different types of agricultural activities; and (ii) the risks associated with undertaking such activities; new and intensified agricultural activities can be more appropriately sited and managed. Relevant constraints will include aspects of significance to the maintenance of water quality entering the Reef, including effective management of wetlands, riparian zones, remnant vegetation and maintenance of stream integrity.

The agricultural planning system will provide a risk-management approach that:

- Is based on identifying land that is inappropriate or 'constrained' for new agricultural development and, conversely, land that is more suitable or preferred;
- Has appropriate levels of assessment commensurate with the risk of impacts from types of activities within each of the levels of land constraints; and
- Provides environmental management appropriate to the activity and the constraints; including development conditions that achieve and/or exceed minimum management standards.

There is a need to complement regional NRM planning and land use planning by targeting on-the-ground actions, particularly at the property level. Sustainable production systems that minimise off-farm impacts on water quality and protect wetlands need to be developed and their adoption promoted in Reef catchments. A regional focus is necessary to ensure better land management practices and to leverage the planning and investment activities of the regional NRM bodies. For widespread adoption of sustainable production systems, these practices need to be both practical and profitable. This strategy therefore links to strategies A and C that itemise work on property resource management planning and other incentives.

Strategy D: Planning for Natural Resource Management and Land Use cont.

A program to assist the Douglas Shire Council to prepare and implement a Water Quality Improvement Plan (WQIP) will provide a benchmark for other local councils in Reef catchment areas in developing local plans. These plans will be developed to be consistent with the *Framework for Marine and Estuarine Water Quality Protection*, in cooperation with relevant Regional NRM Bodies. The framework provides a comprehensive approach to achieving and maintaining water quality and riverflow objectives. It is expected that WQIPs, where developed, will be incorporated into Regional NRM Plans. The WQIPs will be developed so as to be consistent with the goals and objectives of the Regional NRM plans. Interim projects are to ensure adequate water quality monitoring activities are in place, develop decision-support tools to guide sustainable development and address high priority water quality issues.

Nutrient Sensitive Zones are areas of land that contribute significant quantities of nutrients to waterways entering the Reef and that can influence sensitive marine ecosystems. The identification of nutrient sensitive zones will provide a focus for the fertiliser industry in working with local users on improving fertiliser use as part of the fertiliser industry eco-efficiency agreement and will include consideration of the uptake of slow release fertilisers.

Strategy E: Regulatory Frameworks

Actions to implement the strategy are:	Responsibility	Milestones
1. Investigate the potential to make declarations and undertake other 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	Completed 1 July 2004
2. Identify potential areas within high-risk areas of the Reef catchment where declarations under the <i>Vegetation Management Act 1999</i> 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
3. Develop, in co-operation 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> that will assist land holders to determine reasonable and practical measures to minimise or prevent water pollution in the Reef catchment.	EPA, NR&M, Peak Industry Bodies	Completed 1 July 2004
4. 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 RWQPP, 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

Appropriate use of the wide range of existing regulatory powers is essential to complement and support self-management and co-operative partnership approaches. Regulation is an efficient and effective way of affirming the minimum acceptable performance, providing certainty to all stakeholders and ensuring that the efforts and competitiveness of good performers are not undermined by those who do not initiate action themselves. Some regulatory actions should be implemented immediately. Others should be implemented at a later date where there is a risk that voluntary approaches will fail to deliver significant water quality improvements.

The *Environmental Protection Act 1994* and the *Land Act 1994* oblige landholders to meet their general environmental duty or duty of care to the land respectively. Landholders understanding and meeting their legal and moral obligations to care for the environment within and beyond their properties, is important to achieve improvements in water quality in the Great Barrier Reef lagoon.

Reduction of nutrient input to coastal rivers and the Reef will require innovative techniques and concerted effort over many years. There is potential benefit in establishing nutrient sensitive zones in coastal catchments to manage use of commercial quantities of fertiliser. However there is a need to conduct a thorough policy analysis of the most effective and cost efficient means of managing fertiliser inputs, either through nutrient management plans or other instruments.

Strategy F: Research and Information Sharing

Actions to implement the strategy are:	Responsibility	Milestones
1. 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, EPA, CSIRO, DEH, Research Bodies, NLWRA	Review uptake of information 1 July 2005
2. Provide technical resource information to landholders to assist in the preparation of property resource management plans.	DPI, EPA, NR&M	Report on availability of information 1 July 2005
3. 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, EPA, DAFF, DEH, Research Bodies, NLWRA	1 July 2004
4. Undertake coordinated research and development programs that will assist in delivering RWQPP 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, NR&M, EPA, DAFF, Research Bodies, Regional NRM Bodies, Peak Industry Bodies	Report on research undertaken 1 July 2005
5. Undertake a review of the herbicide Diuron.	Australian Pesticides and Veterinary Medicines Authority, DEH	1 July 2004
6. 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
7. Investigate the need for, and cost benefit of, a herbicide and pesticide reporting system.	DEH	Report completed 1 July 2004
8. 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
9. Provide information on the market and non-market values of the Reef, and risks arising in catchments from socio-economic conditions to Regional NRM bodies, landholders, industry peak bodies and the public.	DEH, GBRMPA, NR&M, DPI, DPC	Report to Ministers 1 July 2005

Strategy F: Research and Information Sharing cont.

To make the RWQPP a success there will need to be ongoing access to the best available scientific data and other information. This information will be used to make improvements to current actions and to develop new initiatives. There needs to be a mechanism(s) for pooling the current scientific information, interpreting it and expressing it in a clear and unambiguous manner. This information will be used by policy makers and stakeholders.

An understanding of fertiliser sales by catchments when combined with other information will assist Governments and industry identify areas that may benefit from increased education and extension and incentive measures. The need for a similar system reporting on herbicides and pesticides will also be investigated to determine if this too would have benefits.

The market and non-market values of the Reef and the socio-economic circumstances of the communities in the catchments and their ability and willingness to adopt best management practice land management are also important in making investment decisions. The information will enable the economic evaluation of policy and management trade-offs to be made at the Reef catchment scale.



Strategy G: Partnerships

Actions to implement the strategy are:	Responsibility	Milestones
1. 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 RWQPP.	JSC, Regional NRM Bodies, NR&M, DAFF, EPA, DEH, DPI, GBRMPA	Completed by 1 July 2005
2. 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, NR&M, DAFF, Regional NRM Bodies, Indigenous Bodies	Ongoing
3. 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 by 1 July 2005
4. 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. • CRC. • Universities. • Industry Research Bodies. 	NR&M, Regional NRM Bodies, DAFF, DEH, DPI, Research Bodies	Report on outcomes 1 July 2005
5. Build on existing partnership with industry to ensure implementation of the 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 that 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, EPA, Peak Industry Bodies	Report to Ministers 1 July 2005 Eco-efficiency agreements in place mid 2003
6. Work with Local Government to ensure the successful implementation of the Plan. <ul style="list-style-type: none"> • Support the LGAQ project on building the capacity of local governments to effectively participate in sustainable NRM planning arrangements at the local and regional context, particularly in relation to water quality improvement processes. 	Local governments, LGAQ, DLGP, NR&M, EPA, DPI	Report on outcomes 1 July 2005
7. Encourage Regional NRM Bodies and River Improvement Trusts to develop closer links to ensure compatible and co-ordinated planning, actions and work programs.	NR&M, Regional NRM Bodies, River Improvement Trusts	Report on progress 1 July 2005

Strategy G: Partnerships cont.

Government, Industry and Community partnership programs that can contribute to improving the quality of water entering the Reef are critical to successful implementation of the RWQPP.

Regional NRM Bodies are one of the most critical partnerships to the delivery of the RWQPP as they represent all stakeholders within their region. The Regional NRM Bodies and their technical advisory panels may require additional expertise and assistance to develop appropriate water quality targets for their plans. Assistance will be provided on a case-by-case basis to individual Regional NRM Bodies, with extra assistance provided to high-risk high priority catchments.

River Improvement Trusts are in a unique position to assist in implementation of the Plan given their own statutory powers, their close relationship with local and state governments and their knowledge about individual catchments. To maximise their effectiveness Trusts will need to continue to build on their partnerships with regional NRM bodies to ensure that activities they undertake are compatible with NRM plans. In many instances Trusts have the ability not only to assist in plan development but also to play a key role in implementation.



Strategy H: Priorities and targets

Actions to implement the strategy are:	Responsibility	Milestones
1. 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
2. Incorporate the water quality targets established by the Regional NRM Bodies into the evaluation process of the RWQPP.	Regional NRM Bodies, DPI, NR&M, EPA, DAFF, DEH, GBRMPA, Research Bodies, WTMA	Completed 1 July 2005
3. 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, DEH, DAFF, GBRMPA, WTMA	Completed 1 July 2005
4. 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, DEH, Regional NRM Bodies, WTMA	Completed 1 July 2005
5. 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, DEH, WTMA	Completed 1 July 2005

It is important that efforts are concentrated on protecting healthy waterways and identifying riparian areas that have a positive effect on water quality entering the Reef so that they can be considered in the development of Regional NRM plans.

A risk-based approach is required to identify priority areas within catchments for immediate action. The timing and scale of actions in these catchments should be directly related to the further risk to the Reef.

The Workshops on "Prioritising Catchments and Sub-catchments", were held to refine what attributes should be used to identify areas of high risk to the Reef and the risks from these attributes. This will assist Regional NRM Bodies to prioritise high-risk catchments and sub-catchments. Quantifying the relative risk of the major rivers discharging to the Reef involved an ecosystem risk analysis based on the flow characteristics (such as discharge volume, flow frequency and spatial flow dispersion), pollutant load and the sensitivity of the receiving ecosystems, together with information on social risk, development pressure risk and the importance of marine industries in the region. The results of this risk classification have been incorporated into the Plan and will serve as a basis for further investment decisions. In the short term the top 10

high-risk catchments have been identified from the work done to date. Further information on the high-risk catchments and the process for identifying risk can be found at Appendix 3.

The best understanding of sediment and nutrient loads and our ability to reduce these with future management will come from a combined approach that integrates all available information. River monitoring provides information on current loads for some catchments and vital information on the sources and form of those loads. The modelling allows this information to be extrapolated into catchments and sub-catchments that have not been monitored, and allows the prediction of where remedial measures will have the greatest ability to reduce future loads.

Strategy I: Monitoring and Evaluation

Actions to implement the strategy are:	Responsibility	Milestones
1. 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	Reports completed 1 July 2005 1 July 2010
2. Ensure that implementation of the actions in the Plan are regularly and independently audited.	Reef Water Quality Protection Plan Steering Committee	Audits undertaken 1 July 2005 1 July 2010 1 July 2013
3. 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, EPA, DEH, GBRMPA, Peak Industry Bodies, Regional NRM Bodies	Completed 1 January 2004
4. Implement a water quality and ecosystem health long-term monitoring program in the Great Barrier Reef lagoon to track the effectiveness of the Reef Water Quality Protection Plan. Funding for this action will be settled as part of future Budget considerations.	GBRMPA	To be advised
5. 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	To be advised
6. 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 subcatchments.	Regional NRM Bodies, NR&M, DAFF, DEH, DPI, EPA, Waterwatch groups, Research Bodies, Peak Industry Bodies, Indigenous Bodies	High risk catchments programs in place 1 July 2004
7. Develop improved indicators for long-term water quality monitoring in reef catchments in conjunction with the Co-operative Research Centre (CRC) Reef and CRC Rainforest.	Research bodies DPI, NR&M, EPA, DAFF, GBRMPA, DEH	Commenced 1 July 2003 Completed 1 July 2006
8. Ensure the monitoring and implementing of local water quality improvement plans and environmental flow objectives are reviewed and addressed in other planning processes.	DEH, EPA, DLGP, GBRMPA, NR&M, Regional NRM Bodies	Report to Ministers on implementation 1 July 2005
9. 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.	Peak Industry Bodies	Report by 1 July 2005

Strategy I: Monitoring and Evaluation cont.

Ongoing evaluation of the RWQPP will analyse the effectiveness of the actions that are implemented to stabilise and improve the quality of water entering the Reef and provide an opportunity to initiate improvements. Two reviews will be reported to the Prime Minister and the Premier of Queensland and will involve a process of community consultation.

Water quality monitoring, auditing and reporting is essential for the periodic assessment of the effectiveness of the RWQPP in achieving its goal and objectives with respect to the proposed timelines. Public confidence in the RWQPP will be enhanced through encouraging independent auditing of the Plan. The Australian and Queensland Governments will ensure jointly commissioned performance audits are undertaken on the implementation of the Plan. The monitoring and evaluation framework will also pick up the outcomes of the risk analysis and evaluate the success of the RWQPP against the targets established by the Regional NRM Bodies. This evaluation will be based on the guidelines established in the National Water Quality Management Strategy.

The National Water Quality Management Strategy has developed guidelines for the design of water quality monitoring programs. The guidelines emphasise the need for a formal process in designing monitoring programs.

The results of the measurement and monitoring of the water quality entering the Reef lagoon will only be one indicator of the success of the RWQPP. Factors such as climate and weather, long term sediment build up and other external factors will be considered in the evaluation of water quality targets. Progress towards actions such as increased uptake of BMPs or EMS will be another measure. Further performance indicators, such as the implementation of sustainable land management practices, including ground cover in grazing areas, will be developed in collaboration with stakeholders as the actions in the RWQPP are implemented.

The goal of joint research by the Reef and Rainforest CRCs and partners is to develop new protocols and cost-effective 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 integrated catchment to Reef approach aims to minimise the downstream effects of agriculture and improve the ecosystem health of the Great Barrier Reef lagoon and its feeder catchments. This program will provide the tools needed by landholders, industry and other stakeholders to monitor the effects of land use changes and restoration on water quality.

Implementation of the RWQPP will significantly depend on the implementation of the NAP and NHT in Queensland. It is appropriate therefore that the goal of the Plan be incorporated as a key objective against which the success of actions under the NAP and the NHT are measured.

Appendix 1: Current Activities

The State and Commonwealth Governments are already involved in a series of initiatives and activities to improve water quality (and by default, water entering the Reef). These are outlined in the following table. There is a need to ensure that these programs are focused to deliver an improvement in Reef water quality.

Table 2: Government Programs

Agency	Program	Brief Description
CSIRO	CSIRO Healthy Country Flagship Program (HCFP)	HCFP facilitates and supports public and private partnerships in taking a systems approach to natural resource management in the GBR catchment to overcome past failures of single issues based responses.
CRC Rainforest and Reef	Catchment to Reef : New Tools for Mitigation and Monitoring of Water Quality and Ecosystem Health	This program includes the development of tools and methods to monitor water quality, the undertaking of monitoring activities within Reef waters and understanding the contribution of riparian and wetland systems to healthy catchment and Reef systems.
DLGP	<i>Integrated Planning Act 1997</i>	The IPA forms the foundation of Queensland planning and development assessment legislation. The purpose of the IPA is to balance community well-being, economic development and the protection of the natural environment by providing a framework for managing growth and change within the State.
DLGP	Local Government Services Funding Program	Funding for water-related and other services under the: <ul style="list-style-type: none"> • Local Governing Bodies' Capital Works Subsidy Scheme. • Advanced Wastewater Treatment Technologies Scheme. • Smaller Communities Assistance Program.
DPI	Research, development and extension programs	Grazing strategies to minimise downstream impacts: <ul style="list-style-type: none"> • Monitoring land condition. • Crop management systems to minimise downstream impacts. • Increased water use efficiency. • Reducing chemical use in production systems. • Capacity building for producers and rural communities.
DEH	Coastal Catchments Initiative	The Coastal Catchments Initiative (CCI) is a national component program of the Natural Heritage Trust, administered by the Department of the Environment and Heritage. The CCI, rolled out in collaboration with State environment protection agencies, seeks to achieve and maintain targeted reductions in pollution to coastal water quality hotspots. The CCI will achieve pollution reductions through development and implementation of Water Quality Improvement Plans (WQIPs), prepared in accordance with the Australian Government's Framework for Marine and Estuarine Water Quality Protection. WQIPs will identify the water quality and environmental flow objectives of coastal water and the works, institutional reforms and program arrangements required to achieve those objectives. WQIPs will be reviewed and renewed every seven years. During preparation of WQIPs the CCI will support interim projects designed to assist in development of the WQIP, that will build institutional capacity and tools to implement the findings of the WQIP or that support short term cost-effective measures to improve water quality.

Appendix 1: Current Activities cont.

Agency	Program	Brief Description
DEH	Eco-efficiency Program	<p>Promotes eco-efficiency through the development of voluntary Eco-Efficiency Agreements with industry associations. Eco-Efficiency Agreements are three-year co-funded agreements where DEH and industry associations agree to work together to improve both business and environmental performance. To date DEH has signed agreements with 26 industry associations representing most sectors of the Australian economy. Eco-efficiency Agreements have been developed with the Fertiliser Industry Federation of Australia (FIFA) and CANEGROWERS (not yet approved) to improve water quality entering the Reef.</p> <p>FIFA will address Reef water quality issues through a number of product stewardship activities aimed at improving the handling and use of fertilisers.</p> <p>CANEGROWERS also aims to improve water quality entering the Reef by increasing the proportion of its members who have undertaken the COMPASS (Combining Profitability And Sustainability in Sugar) farm self-assessment program.</p>
DEH	Great Barrier Reef Coastal Wetlands Protection Program	<p>The aim of the GBRCWPP is to enhance the water quality of the Reef lagoon through the protection of wetlands on adjacent catchment and coastal regions.</p> <p>The program will include an inventory of wetlands of significance to water quality in the Reef lagoon to identify priority areas for management and restoration.</p> <p>The program will involve development and implementation of a package of measures ranging from acquisition, the development of binding conservation agreements, incentives to protect and manage wetlands and the establishment of management regimes for wetlands conservation on private lands.</p>
EPA	State Coastal Management Plan	<p>The State Coastal Management Plan – SCMP (and its subsidiary Regional Coastal Management Plans) has been developed under the provisions of the Coastal Protection and Management Act 1995.</p> <p>The SCMP describes how the coastal zone and its resources should be managed. The policy direction of the SCMP is consistent with the objectives of the RWQPP. It provides policy direction to statutory instruments administered by State Agencies in their regulation of activities impacting on the values of the coastal zone. The SCMP is itself a statutory instrument and has a standing equivalent to a State Planning Policy, hence Local governments must have regard to it in the preparation and implementation of their Planning Schemes and their development assessment processes. The SCMP also provides direction to the regulatory provisions of the Coastal Protection and Management Act 1995 itself, in regard to development proposals within the Coastal Management District (up to the ‘erosion line’) along the Queensland coast.</p> <p>The SCMP provides policy direction on several topic areas including: coastal use and development, physical coastal processes, public access, cultural resources and water quality management, particularly in regard to the management of point sources of pollution from urban areas.</p>

Appendix 1: Current Activities cont.

Agency	Program	Brief Description
EPA	Regional Coastal Management Plans	<p>Regional Coastal Management Plans are currently under development. These plans:</p> <ul style="list-style-type: none"> • Provide direction and guidance for decision makers, including State and Local government, Regional NRM Bodies and landholders, within the coastal zone on significant coastal management issues. • Identify key coastal sites that require special management outcomes. • Include regional policies that address management of water resources and water quality. • Deliver improved water quality management in key areas of the Reef catchment.
EPA	Queensland Water Recycling Strategy	Encourages water recycling that is safe, environmentally sustainable and cost-effective. This initiative will develop the most effective ways to manage municipal, industrial and agricultural effluents and urban storm water as resources rather than as wastes.
EPA	<i>Environmental Protection (Water) Policy 1997</i>	<p>Provides for water quality management consistent with the National Water Quality Management Strategy, including the identification of environmental values. Requires local governments to develop environmental plans for:</p> <ul style="list-style-type: none"> • Urban storm water quality management; • Sewage management; • Trade waste management; • Water conservation.
EPA	<i>Environmental Protection Act 1994</i>	Under the Act, Environmentally relevant activities (ERAs) must be licensed and may require a licence to discharge wastewater to waterways. The Act ensures that point source discharges have specific discharge limits taking into account the waterway uses, the quantity, type, frequency and place of discharge.
NR&M DAFF DEH	National Action Plan for Salinity and Water Quality (NAP) and the Natural Heritage Trust (NHT)	In partnership with the Australian Government NR&M will provide support to Regional NRM Bodies to develop and implement Regional Natural Resource Management Plans.
NR&M	<i>Vegetation Management Act 1999 and Land Act 1994</i>	<p>Regional Vegetation Management Plans, declared areas and the statewide codes provide a blueprint for management of native vegetation at a regional, catchment, local and property level. These instruments:</p> <ul style="list-style-type: none"> • Include regional guidelines and codes for assessment of native vegetation clearing applications on both freehold and leasehold land in the region. • Help preserve water quality by ensuring approved clearing does not increase the risk of land degradation, and that it allows for ecologically sustainable land-use in the Reef catchment.

Appendix 1: Current Activities cont.

Agency	Program	Brief Description
NR&M	<i>Land Act 1994</i>	State Rural Leasehold Strategy promoting joint stewardship of State Land
WTMA	Wet Tropics Conservation Strategy	This conservation strategy is currently being developed. It outlines high priorities for conservation of Wet Tropics World Heritage values, both within and outside the World Heritage Area. It will be used to prioritise resource allocation in the region and will inform the Wet Tropics regional NRM plan.
NR&M	<i>Water Act 2000</i>	Plans include: <ul style="list-style-type: none"> • Water Resource Plans; • Resource Operations Plans; • Water Use Plans; • Land and Water Management Plans.
NR&M	Overseeing catchment and regional NRM planning	Conditions on leasehold land: <ul style="list-style-type: none"> • Property Resource Management Plans; • Vegetation Management Plans; • Queensland Rural Water Use Efficiency Strategy; • Statewide Landcover and Tree Study.

Local Government Activities

There are 21 local governments and over 100 urban centres (ranging from medium sized cities such as Townsville to small towns such as Lucinda) adjacent to the coast of the Reef. Local governments along the coast face the challenge of balancing the demands of economic development associated with urban expansion with protecting local coastal water quality and ecosystems.

Key areas of activity for local governments include sewage management (including upgrading sewage treatment plants in accordance with the State Coastal Management Plan), management and treatment of contaminated storm water (including authority delegated by the EPA to a number of local governments to manage certain sources of contamination), waste collection and disposal, acid sulfate soil management, and protection of critical habitats. Currently, seven local governments in the Reef catchment area have delegations from EPA under the EPP Water to manage deposit or release of rubbish etc (s31), or release of sediment etc (s32) into storm water.

Local governments have a strong role in supporting community actions relevant to water quality improvement and ecosystem protection. They also address co-operative planning and management of these and other regional issues in regional council groupings such as the Far North Queensland Regional Organisation of Councils (ROC), and the Central Queensland ROC, as well as broader Regional Planning Advisory Committees (RPACs) such as those for Far North Queensland, the Whitsunday Hinterland and Mackay region (WHAM). Regional Strategic Plans are generated by RPACs established under the *Integrated Planning Act 1997* and Regional Organisations of Councils. These plans guide decision-making related to growth, development and management of regions, over a defined time period.

Industry Activities

Following is a list of many of the initiatives that industries have been involved in that have links to the activities outlined in the Plan.

Table 3: Current initiatives of Industries

Industry or Organisation	Description of Initiative
Agriculture Industry	<ul style="list-style-type: none"> • Environmental Code of Practice for Agriculture. • ChemCert; accredited training is required for the use of some chemicals. • <i>drumMUSTER</i>; recycling AgVet chemical containers and removing unwanted containers from farms. • Community Nature Conservation Programs; e.g. Nature Refuges, Land for Wildlife, NatureSearch.
Fruit and Vegetable Growers	<ul style="list-style-type: none"> • Code of Practice for Sustainable Fruit and Vegetable Production in Queensland (Farmcare). • Environmental Management Systems – case studies and training development, investigating appropriate certification options. • Water for Profit (Rural Water Use Efficiency Program). • <i>FutureProfit</i> property management planning program. • Research and development, grower awareness. • Pest Management Strategies Project. • Development of “Introduction to Environmental Management for Horticulture Enterprises” training program.
Cotton Industry	<ul style="list-style-type: none"> • Best Management Practice Program to minimise environmental risk of pesticide use. BMP Manual currently covers: <ul style="list-style-type: none"> - Farm Design and Management; - Integrated Pest Management; - Pesticide Storage and Handling; - Pesticide Application; - Farm Hygiene; - Petrochemical Storage and Handling. • <i>Fostering best management practices in natural resource management – towards an environmental management system in the cotton industry</i> – Report March 2001 (ACGRA, CRDC, MDBC). • DAFF EMS Pilot project investigating the <i>development and assessment of the Cotton BMP Program into a comprehensive EMS through the development of a Land and Water Module</i>. • Project funded by Murray Darling Basin Commission and cotton R&D Corporation assessing the costs and benefits of using a procedure-based EMS model. • Rural Water Use Efficiency Program. • Research and development, grower awareness.
Dairy Industry	<ul style="list-style-type: none"> • Queensland Dairy Farming Environmental Code of Practice. • Dairy traineeship program, natural resource management module. • <i>Subtropical Dairy Regional Action Plan – Sustaining our Natural Resources</i> October 2001. • <i>Sustaining our Natural Resources – Dairying for Tomorrow</i> Project Report 2001. • Eco-efficiency project. • National Farm Environmental Self Assessment Project. • Rural Water Use Efficiency Program. • Dairying Better and Better Programs I and II which are targeted at the adoption of NRM management practices on farm. • Research and other programs targeted at improving NRM performance. • ChemCert and AgVet training and accreditation of Producers.

Appendix 1: Current Activities cont.

Industry or Organisation	Description of Initiative
Fertiliser Industry	<ul style="list-style-type: none"> FIFA and AFSA Eco Efficiency Agreement with Department of Environment and Heritage FERTCARE © : A National Environmental Stewardship Program. Environment Manager appointed to co-ordinate environmental management initiatives. Cracking the Nutrient Code: Guide for land managers to identify environmental risks related to nutrients and to develop strategies to deal with them.
Grazing	<ul style="list-style-type: none"> National Best Management Practice Guidelines. Research and development, grower awareness. CattleCare: an audited quality assurance program which focuses on the use and storage of agricultural and veterinary chemicals. SmartTrain: A nationally accredited chemical user's course. Meat and Livestock Corporation currently investing in a range of projects related to grazing impacts on water quality in GBR catchments.
Irrigation	<ul style="list-style-type: none"> Rural Water Use Efficiency Program.
Pork	<ul style="list-style-type: none"> Environmental Code of Practice for Queensland Piggeries. National Environmental Strategy for the Pig Industry (draft). Environmental Management Training for Piggery Managers.
Sugarcane Industry	<ul style="list-style-type: none"> Code of Practice for Sustainable Cane Growing in Queensland. Fish Habitat Code of Practice; training and permit system to ensure compliance with requirements to protect habitats under the <i>Fisheries Act 1994</i>. Integrated Pest Management (grubs and rats). Combining Profitability and Sustainability in Sugar (COMPASS) Self Assessment Program. Rural Water Use Efficiency Program. Research, Development and Extension. Public Environment Report (Eco-efficiency Project). Land and Water Management Plans – training and resources.
Australian Prawn Farmers Association	<ul style="list-style-type: none"> Environmental Code of Practice for Australian Prawn Farmers.

Community Activities

Community groups improve water quality through their work in Waterwatch, Coastcare, Bushcare, Landcare and Rivercare projects etc. In addition, these groups play a significant role in raising community awareness of environmental issues and in lobbying government at all levels.

In the future, the Regional NRM Bodies will play a key role in improved natural resource management through the development and implementation of integrated regional natural resource management plans and investment strategies. The State and Commonwealth Governments are funding and supporting regional bodies in these activities.

Appendix 2: Role of Regional NRM Bodies

The regional model being developed in Queensland and other jurisdictions for delivery of NRM programs such as the National Action Plan for Salinity and Water Quality and the Natural Heritage Trust relies on regional bodies to identify and address the priority NRM issues in their region and confers a special responsibility on regional NRM bodies in Reef catchment areas which require them to take into account the agreed outcomes of the Reef Water Quality Protection Plan.

Regional NRM bodies are required to develop integrated regional NRM plans which are submitted to Commonwealth and State governments for accreditation. Regional NRM bodies will develop their plans through active participation of rural and regional communities working in partnership with all levels of government. It is expected that the regional NRM plans will assess social, economic and biophysical drivers for NRM issues, set short and long-term resource management objectives and identify implementation strategies to achieve those objectives.

The accreditation criteria reflect the expectation that actions proposed in the regional plan will not be inconsistent with other planning processes that have been collectively agreed by relevant jurisdictions, such as the Reef Water Quality Protection Plan, and enable them to be taken forward and implemented at the regional level.

Associated with the regional NRM plan will be an investment strategy which will provide a mechanism for Governments and others to invest in the implementation of accredited plans. Regional bodies are being encouraged to ensure their investment strategies include options for incentives that promote the uptake of improved land management practices through adoption of industry best practice. Such incentives might target, for example, grazing practices or the use of pesticides and fertilisers.

There is also the capacity for adjacent or groupings of coastal regions to develop a coordinated approach to improving the quality of catchment outflows.

In relation to GBR catchments, regional NRM bodies covering the Burnett, Mary, Fitzroy and Burdekin regions have been established under the National Action Plan following a bilateral agreement signed in March 2002. The signing of an Interim Financial Agreement for delivery of the Natural Heritage Trust extension in June 2003 also covers these regions and regional NRM bodies covering the Mackay Whitsunday, Wet Tropics, Cape York and Torres Strait regions.

Under the National Action Plan regional NRM bodies have put forward a suite of priority actions as interim measures which would either contribute to their planning process or address undisputed regional NRM imperatives. In addition to priority actions a suite of statewide projects have been developed. While these statewide projects will be delivered in all NAP priority regions, they have regional deliverables which will contribute to the implementation of the Reef Water Quality Protection Plan.

Appendix 3: Catchment Risk Assessment

The August 2002 Commonwealth-Queensland Memorandum of Understanding (MoU) on co-operation to protect the Great Barrier Reef (GBR) from land-sourced pollutants specified that the RWQPP would include... "Clear statements of risks and priorities that arise from risk assessment, noting that connectivity is of significance in reef environments in assessing risk" (MoU, s12a).

The RWQPP states that a number of actions will be focused on high risk catchments and that the success of other actions will be ascertained by the level of implementation of the action within high risk catchments. The RWQPP has identified high risk catchments where these commitments will be implemented. The risk assessment process is subject to on-going work, particularly as part of the development by Regional NRM Bodies of their Natural Resource Management plans. Participants at both of the workshops agree that further work needs to be undertaken to clarify and improve the risk assessment process. This work will inform the RWQPP on an on-going basis.

Each catchment was assessed against the following criteria:

Bio-physical risk, summarising the magnitude of (potential) land-based pollutants from the catchment or basin and their impact on coastal/marine ecosystems in the catchment impact area;

Social risk, encapsulating various factors of the capacity of a catchment community to change practices that (potentially) cause land-based pollution;

Development risk, providing an assessment of future development pressures, which may result in increased pollution from the catchment/basin to the Reef;

Risk to marine industries, assessing the economic impact of land-based pollution on industries, which operate within the catchment/basin impact area and rely on Reef integrity for income and profit.

Full details of the risk assessment for each catchment can be found in the table on page 38. This table was developed in two workshops involving technical experts, members of each Regional NRM Body within the Reef catchment and members of the RWQPP Steering Committee.

The top 10 high risk catchments identified from the calculations based on the criteria are (in alphabetical order):

- Burdekin Basin (especially the Bowen sub-catchment).
- Burnett Basin (especially the near coast parts).
- Fitzroy Basin (especially the near coast parts).
- Herbert Basin.
- Johnstone Basin.
- Mulgrave-Russell Basin.
- O'Connell Basin.
- Plane Basin.
- Proserpine Basin.
- Tully Basin.

The top 10 were determined by using a risk assessment process. Risk assessment at the catchment level provides a methodical approach to identify and estimate the current threat or risk posed by key factors. It works by identifying those attributes that are relevant to measuring the risk such as the proximity to sensitive marine environments and river flow characteristics. Each attribute was given an agreed relative ranking (in this case from 1 to 3, with 1 being of high importance and 3 of lesser importance) depending on its influence and importance to the overall risk. This ranking was then combined with available information on the attribute to calculate the risk.

Biophysical risk Attributes and rankings used to determine biophysical risk were:

Agreed Attribute	Workshop ranking
Increased riverine suspended solid load since 1850	1
Dissolved inorganic nitrogen	1
Mean river flow	1
River flood regime	2
Pesticide concentrations	3
Catchment connectivity	3
Catchment beef cattle numbers	3
Catchment aquatic ecosystem (riverine, floodplain and wetland) condition	2
Total reef circumference in catchment area of influence	1
Total area of seagrass in catchment area of influence	2
Development pressure	2

Social risk Attributes and rankings used to determine capacity to effect change risk were:

Agreed Attribute	Workshop ranking
Gross income of agricultural industries per catchment	1
NRM Infrastructure	2
Willingness to change	2

Development pressure was determined as a single consensus measure by the members of the Regional NRM Bodies and the technical experts at the workshops. The pressure was considered to be high, medium or low on each catchment.

Risk to marine industries Attributes and rankings used to determine the risk to marine industries were:

Agreed Attribute	Workshop ranking
Value of marine tourism	4
Value of fishing	1
Pollutant (from biophysical risk table)	1

The relative value of tourism and fishing reflect the relative financial contribution of the two industries to the economy of the Reef and its catchments.

Catchment risk profiles: Summary of the Risk Rating of Catchments

(Catchments are listed in geographical order)

Basin name	Biophysical risk	Risk related to (lack of) capacity to change	Risk from development pressures	Risk to marine industries
Jacky Jacky Basin	L	MH	M	L
Olive-Pascoe Basin	M	MH	L	L
Lockhart Basin	L	M	L	L
Stewart Basin	L	MH	L	L
Normanby Basin	MH	H	L	L
Jeannie Basin	L	MH	L	L
Endeavour Basin	L	L	M	L
Daintree Basin	L	M	M	M
Mossman Basin	M	L	M	M
Barron Basin	M	L	M	H
Mulgrave-Russell Basin	MH	M	M	H
Johnstone Basin	H	M	M	MH
Tully Basin	MH	M	M	MH
Murray Basin	M	M	M	M
Herbert Basin	MH	MH	M	MH
Black Basin	L	H	M	M
Ross Basin	M	M	H	MH
Haughton Basin	M	H	L	M
Burdekin Basin	H	H	H	H
Don Basin	M	H	M	M
Proserpine Basin	MH	L	M	H
O'Connell Basin	MH	M	L	H
Pioneer Basin	MH	L	M	MH
Plane Basin	H	MH	M	M
Styx Basin	M	H	L	L
Shoalwater Basin	L	H	L	L
Water Park Basin	L	M	H	L
Fitzroy Basin	H	H	H	H
Calliope Basin	M	MH	H	M
Boyne Basin	M	MH	H	M
Baffle Basin	M	H	M	L
Kolan Basin	L	H	M	L
Burnett Basin	MH	H	M	MH
Burrum Basin	M	MH	H	L
Mary Basin	MH	L	H	MH

Glossary of Terms

ABARE:

Australian Bureau of Agricultural and Resource Economics.

AIMS:

Australian Institute of Marine Science.

AgVet:

Agricultural and veterinary chemicals.

Best management practice (BMP):

Current recommended best practices for sustainable productivity outcomes.

Best management practice programs:

A system to manage farm operations in order to minimise the environmental risks associated with various farming activities. It can identify and manage property areas that carry risk to the environment and human health through a process of self or second party assessment with a commitment to progressive improvement. The BMP program is founded on the Assess-Plan-Do-Check-Review cycle.

Best Practice Environmental Management:

The management of the activity to achieve an ongoing minimisation of the activity's environmental harm through cost-effective measures assessed against the measures currently used nationally and internationally for the activity.

BSES:

Bureau of Sugar Experiment Stations.

Code of Practice:

The *Environmental Protection Act 1994* makes provisions for a general environmental duty (GED) and the development of industry specific codes of practice that state ways of complying with the GED. There are six existing industry Codes which have been prepared by industry peak bodies and approved by the Minister for Environment. These Codes can apply to licensed and non-licensed activities and can provide a defence to a charge of causing unlawful environmental harm (to the extent the Code is relevant to the harm and the Code has been complied with).

The Codes provide guidance for voluntary self-management tools to control water pollution at the property level including environmental management systems, property resource management plans and best management practice programs.

COMPASS:

Combining Profitability and Sustainability in Sugar. COMPASS is a way for sugarcane growers to assess the economic and environmental sustainability of their farms. COMPASS uses a straightforward easy to use workbook and facilitated workshops have been designed to help growers identify more sustainable farming practices.

CRC:

Cooperative Research Centre (Australian Government).

CSIRO Healthy Country Flagship Program:

The goal of the CSIRO Healthy Country Flagship Program is to achieve a tenfold increase in benefits (environmental, social, economic) from water use by 2025, by forming public and private partnerships. In the context of reef protection, these partnerships will design, test and demonstrate the necessary landscape systems to help achieve the governments' objective of halting and reversing the decline of water quality entering the Reef. To measure whether there is progress towards achieving the above goal, it is proposed to develop a water benefits accounting framework (WBA). Water quality will be one of many key indicators underpinning this formal framework of assessing sustainability.

Current Recommended Practice:

Up-to-date practices that competent natural resource managers would adopt now to achieve sustainable natural resource management practices and to increase productivity.

DAFF:

Department of Agriculture, Fisheries and Forestry (Australian Government).

DEH:

Department of Environment and Heritage (Australian Government).

DPI:

Department of Primary Industries (Queensland Government).

DLGP:

Department of Local Government and Planning (Queensland Government).

Glossary of Terms cont.

Duty of Care:

The concept that is constantly evolving and is defined for a particular purpose at a particular time for a particular property, locality or legislation. The common law duty of care requires that each person takes all reasonable and practicable steps to avoid causing foreseeable harm to another person's land, or their use or enjoyment of that land. State legislation extends this responsibility, requiring everyone to exercise a duty of care and to take all reasonable and practicable steps to avoid and minimise harm to the environment in general, and to maintain the productive capacity of natural resources (land, water, native vegetation) on state land in particular. The duty of care to the land under the *Land Act 1994* and the general environmental duty under the *Environmental Protection Act 1994* apply to all persons who hold leases, licences and permits on state land.

Environmental Management System:

A systematic approach that can be used by a business or organisation to identify and manage its impacts on the environment. It provides a management framework that achieves continuous improvement through a 'plan, do, check, review' cycle, within which Best Management Practices can be integrated, and Codes of Practice upheld. An EMS can be externally audited and may be certified to the international standard, ISO 14001.

Environmental values:

Are: a) a quality or physical characteristic of the environment that is conducive to ecological health or public amenity or safety; or b) another quality of the environment identified and declared to be an environmental value under an environmental protection policy or regulation.

Extension:

A service provided by an organisation, relating to the expertise of that organisation, that is generally beyond the normal service of such organisations. Often used in relation to agriculture where organisations (government, private, and industry based) will provide expert assistance to landholders.

EPA:

Environmental Protection Agency (Queensland Government).

GBRMPA:

Great Barrier Reef Marine Park Authority (Australian Government).

General Environmental Duty:

A person must not carry out any activity that causes, or is likely to cause, environmental harm unless the person takes all reasonable and practicable measures to prevent or minimise the harm (*Environmental Protection Act 1994*).

IDC:

Interdepartmental committee.

ILUAs:

Indigenous Land Use Agreements.

Integrated Natural Resource Management Approach:

An 'integrated natural resource management approach' means adopting actions, mechanisms and partnerships at the property, catchment, local and regional level, which covers all natural resource management issues such as water, soil, biodiversity, vegetation, etc. The interdependence of natural, social and economic systems is recognised within this approach.

Integrated Planning Act 1997 (IPA):

Queensland State legislation that seeks to achieve ecological sustainability by –

- coordinating and integrating planning at the local, regional and State levels;
- managing the process by which development occurs; and
- managing the effects of development on the environment (including managing the use of premises).

JSC:

Joint Queensland/Commonwealth NAP Steering Committee.

Land and Water Management Plans:

Landholders presently develop Land and Water Management Plans for new irrigation water entitlements. These plans are intended to provide certainty that the water allocated by the government will not cause degradation of land or water resources and demonstrate that the irrigation farming practices are sustainable. These plans will contribute to achieving RWQPP objectives by specifying sustainable irrigation practices.

LGAQ:

Local Government Association of Queensland.

NAP (National Action Plan for Salinity and Water Quality):

Overall, the Action Plan's goal is to prevent, stabilise and reverse trends in dryland salinity affecting production sustainability, biological diversity conservation and the viability of our infrastructure. It's also aimed at improving

Glossary of Terms cont.

water quality and securing reliable allocations for human uses, industry and the environment.

National Water Quality Management Strategy:

Sets out the policy, principles and processes, agreed nationally, for water quality management in accordance with ecologically sustainable development.

NHT (Natural Heritage Trust):

The Natural Heritage Trust was established by the Australian Government in 1996 with the aim of investing \$1.5 billion in Australia's natural heritage over the six years to 30 June 2002. In the May 2001 the Australian Government extended the Natural Heritage Trust for a further five years to 2006-07, with more than \$1 billion in additional funding over that period to support the sustainable management of Australia's natural resources. The Trust's four main programs are: Landcare – reversing land degradation and promoting sustainable agriculture; Bushcare – conserving and restoring habitat for our unique native flora and fauna, which underpin the health of our landscapes; Rivercare – improving water quality and environmental condition in our river systems and wetlands; and Coastcare – protecting our coastal catchments, ecosystems and the marine environment.

NLWRA:

National Land and Water Resources Audit.

NR&M:

Department of Natural Resources and Mines (Queensland Government).

NRM:

Natural Resource Management.

Offset Arrangement:

A policy that allows a party to undertake an action that reduces ecosystem services if they also undertake (or purchase from another) a separate action that increases ecosystem services by at least the same amount.

Perverse incentives:

A perverse incentive is an incentive that rewards behaviour which is undesirable or contrary to a policy objective.

Philanthropic Investment:

Donations, usually financial in form, from the private sector made to a Trust, non-profit organisation or other body to support ethical investment in projects that produce positive outcomes for a particular cause, such as the environment or humanitarian purposes, e.g. the establishment of a Queensland Trust for Nature will be

eligible to receive philanthropic financial donations to establish a revolving fund using statutory covenants to secure regionally significant landscape values.

Productivity Commission:

The Productivity Commission was established in April 1998 and is the Australian Government's principal advisory body on all aspects of microeconomic policy and regulation. The Commission's work covers all sectors of the economy, including both the public and private sectors and areas of Commonwealth and State and Territory responsibility. The Commission conducts public inquiries and research into a broad range of economic and social issues affecting the welfare of Australians, including, competition policy, productivity, the environment, economic infrastructure, labour markets, trade and assistance, structural adjustment and microeconomic reform.

Property Management Planning:

The RWQPP aims to promote a broad range of property based activities that assist landholders in achieving sustainable production systems and so improve the quality of waters flowing from properties. Property Resource Management Plans allow the landholder to document actions to achieve sustainable production. Regional NRM Bodies may choose as part of their Regional NRM plans to facilitate, in conjunction with industry peak bodies, Property Resource Management Planning and the undertaking of performance evaluations by landholders.

Property Resource Management Plan (PRMP):

Refers to a part of a property management plan that deals with the management of natural resources, the conservation of nature and cultural heritage and protection of the environment. These matters are usually in the public interest and some are required by regulation. The other components of a property management plan may include people or human resources including estate planning and other family considerations; financial management; and production and marketing. These components are usually private and confidential.

Regional Coastal Management Plans:

Regional Coastal Management Plans implement statewide coastal management direction articulated in the State Coastal Management Plan – Queensland's Coastal Policy at the regional level. The *Coastal Protection and Management Act 1995* and the *Integrated Planning Act 1997* gives the State and regional coastal management plans the status of statutory instruments and the effect of a State planning policy respectively. This means that the Local and State Governments are required to consider

