

WETLANDS

IN THE GREAT BARRIER REEF CATCHMENTS

Management Strategy

2016–21

Prepared by: Wetlands Team, Department of Environment and Heritage Protection

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Minister's foreword

The Queensland Government is committed to ensuring that the Great Barrier Reef is conserved for future generations. While the corals that build reefs are among the most visible natural value in the reef ecosystem, the broader reef ecosystem and the catchments that connect to it are as important for maintaining the health and resilience of the reef. This broader reef ecosystem includes mangroves, seagrasses and inshore coral reefs, as well as adjacent freshwater wetlands.

The Reef 2050 Long Term Sustainability Plan recognises the value of wetlands in contributing to reef resilience and ecosystem health, and highlights that there has been a decline in ecosystem processes that are important for maintaining water quality. The quality of water entering the Great Barrier Reef from adjacent catchments remains a major management issue. In response to ongoing concerns regarding water quality, the government has set ambitious targets to reduce land-based runoff of pollutants. It has also committed to targets aimed at no net loss of natural wetlands and an improvement in the ecological processes and environmental values of wetlands in recognition of the important role they can play in catchment and reef health.

The Queensland Government established the Office of the Great Barrier Reef to coordinate and implement reef management strategies and programs. Additionally, the government convened the Great Barrier Reef Water Science Taskforce to provide independent advice to ensure that clean water flows from the rivers to the sea to protect the reef. There is increasing recognition that previous initiatives are not sufficient to meet the water quality targets for the Great Barrier Reef. The Great Barrier Reef Water Science Taskforce also recognised that the health of the catchments and wetlands of the Great Barrier Reef are critical to its resilience. Their recommendations included improving the protection and health of wetlands and coastal ecosystems and rehabilitating wetlands and coastal ecosystems.

The Wetlands of the Great Barrier Reef Catchments Management Strategy 2016-2021 sets out a framework for the improved management of the wetlands of the Great Barrier Reef catchments. It builds on the achievements of the Queensland Wetlands Program and recognises wetlands as vital to the health of the Great Barrier Reef ecosystem and its catchments.

This strategy includes five themes: improved information; planning; on-ground management; communication and education; and evaluation, review and improvement. Wetlands, catchments and the Reef are interconnected and a healthy reef is dependent on effective management and wise use of wetlands and their catchments.



Dr Steven Miles MP
Minister for Environment and Heritage Protection
and Minister for National Parks and the Great Barrier Reef

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Key messages

- This strategy promotes an integrated approach to catchment management that considers the multiple values of wetlands in a whole-of-catchment context.
- Wetlands play numerous roles across the land and seascape including connecting many species to the Reef and also filtering catchment runoff. Wetlands provide protection from wave action and storms, reduce the impacts of floods, as well as provide habitat.
- Not all wetlands deliver all values and services. For example, some wetlands play a crucial role in improving water quality, while other wetlands are important for their biodiversity values. A range of factors influence what values and services a wetland provides including its location, size, type and its state. There are legislative and policy drivers that affect what values are considered important from a societal perspective. The challenge for management decisions regarding wetlands is to achieve a balance between competing interests.
- Threats to wetlands are numerous and can be located some distance from the wetland itself. Many wetlands have been extensively modified or lost over the last 100 years and their rehabilitation in strategic locations will contribute to water quality improvement and the provision of other wetland values and services.
- A large amount of information and tools are available to assist with managing wetlands. Wetlands occur on public and private land and looking after them is a collaborative effort across all levels of government and non-government stakeholders. This strategy establishes the actions needed for wetlands to contribute to the targets of the Reef 2050 Long Term Sustainability Plan and the Reef Water Quality Protection Plan 2013.

Introduction

Wetlands and coastal ecosystems in the catchments of the reef provide a vital role in protecting shores from wave action and storms, reducing the impacts of floods, retaining sediment, absorbing and transforming pollutants and providing nurseries for fish and other freshwater and marine species. Swamps, rivers, billabongs, lakes, mudflats, mangroves, farm dams and groundwater systems are all examples of wetlands. In fact, not all wetlands are wet all the time, for example paperbark woodlands can dry out completely. Wetlands are made up of many parts that interact with the surrounding environment to create functioning ecosystems. These, in turn, provide important ecosystem services that are valued by the community. Without active planning and management, changes to these habitats will continue to result in the loss of many of their values.

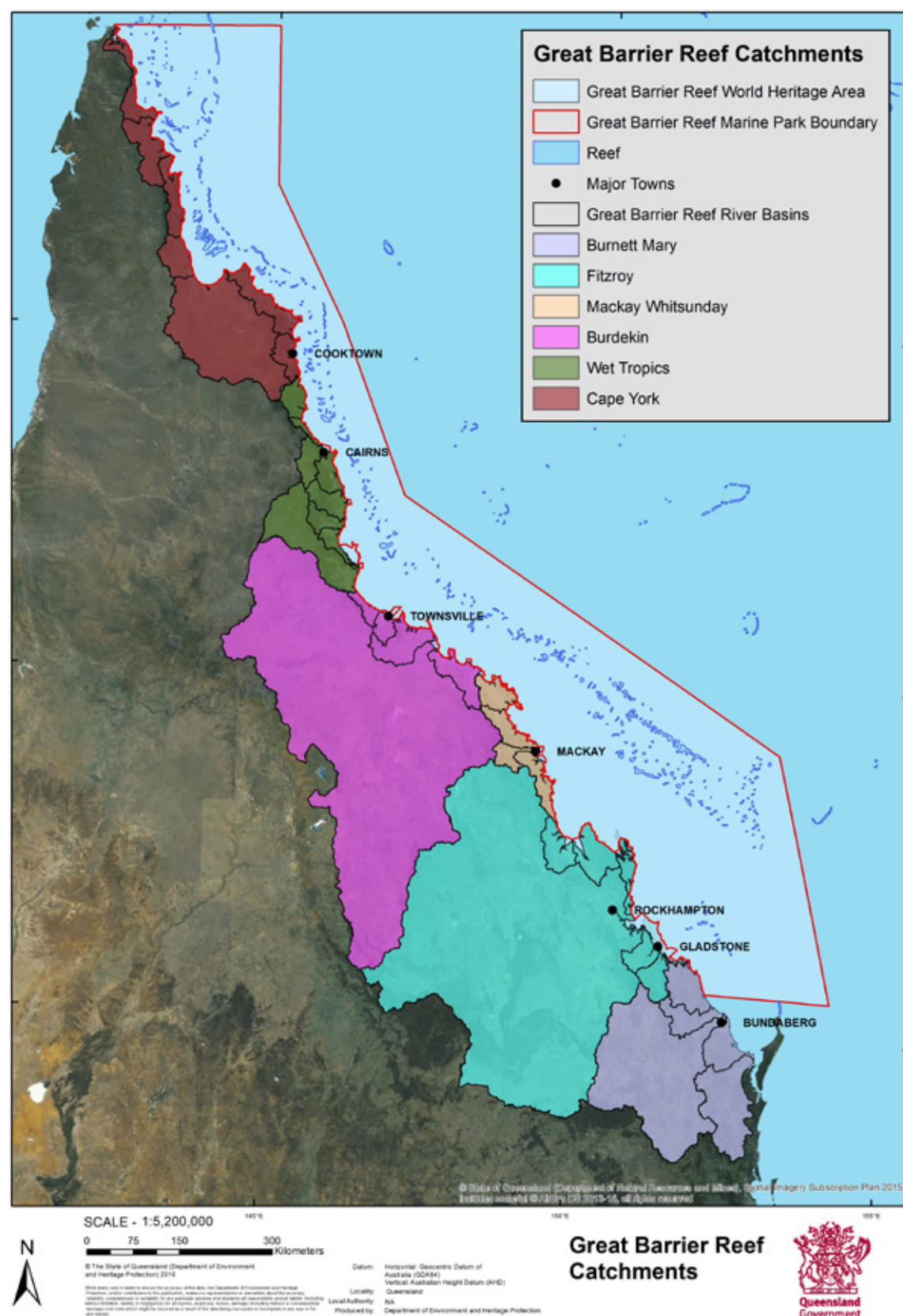
While there are over 15,000km² of wetlands remaining in the catchments of the Great Barrier Reef, many wetlands and coastal ecosystems have been extensively modified or lost over the last 100 years. Their restoration and rehabilitation in strategic locations will contribute to water quality improvement and the enhancement of other wetland values.

Grazing is the major land use covering 74% of the catchments of the reef, while intensive agriculture (predominantly sugarcane farming) occurs in lower coastal floodplains comprising 5% of the total catchment area. These land uses have resulted in extensive loss of freshwater wetland and forested floodplain ecosystems in some locations. Intensification and expansion in the agricultural sector has the potential to lead to further decline in wetlands extent and health.

The Great Barrier Reef catchments area includes the river basins that flow eastwards into the Coral Sea from the Great Dividing Range and incorporates six broad management areas—Cape York, Wet Tropics, Burdekin Dry Tropics, Mackay-Whitsunday, Fitzroy and Burnett-Mary (Figure 1). Within these management areas there are 35 river basins (smaller catchments) covering an area of approximately 423,000km².

The inter-dependencies between catchments, wetlands and the broader reef ecosystem underpin this strategy's whole-of-system catchment management approach for the improved management of wetlands. The strategy provides the strategic approach needed to achieve the goal of no net loss of natural wetlands and that wetland values and ecological processes are enhanced, thereby contributing to the health and resilience of the Great Barrier Reef. This strategy presents the policy drivers that inform action, the values and pressures on these wetlands and coastal ecosystems, and outlines management actions within five themes.

Figure 1 Great Barrier Reef regional Natural Resource Management (NRM) area boundaries—Cape York, Wet Tropics, Burdekin Dry Tropics, Mackay Whitsunday, Fitzroy and Burnett Mary



Vision

Wetland extent, values and ecological processes are enhanced and contribute to the health and resilience of the Great Barrier Reef ecosystem.

Purpose

The purpose of this Strategy is to provide a range of objectives and activities to improve wetlands management that aligns with Australian and Queensland government initiatives, including targets in the Reef 2050 Long Term Sustainability Plan.

Context

The Queensland Office of the Great Barrier Reef has been established to coordinate and implement reef management strategies and programs in conjunction with the Australian Government. As part of this role the office supported the Great Barrier Reef Water Science Taskforce (the Taskforce) to provide scientific advice on the best approach to meeting water quality targets. The final report by the Taskforce includes several recommendations that relate to wetlands, including extending regulations to protect natural wetlands and riparian areas.

The report also recommends an increased focus on innovation, including the use of treatment systems to remediate sediment and nutrient runoff. Wetland and riparian restoration, and stream bank management were identified as important elements in protecting water quality. The Taskforce suggests that incentives, such as stewardship payments, be used to deliver ecosystem restoration and repair of wetlands. Further, the Taskforce proposes that a water quality offset framework be established for new or expanded development.

The Reef 2050 Long Term Reef Sustainability Plan (Reef 2050) is linked to the protection and improvement of the Outstanding Universal Value of the Great Barrier Reef World Heritage Area. Reef 2050 recognises that ecologically significant areas such as wetlands are critical to maintaining these Outstanding Universal Values and contributing to reef health, connectivity and resilience. Natural wetlands are specifically addressed under the water quality and ecosystem health themes in the plan. An example of the relationship between wetlands and the Outstanding Universal Value of the Reef is the important breeding habitats for the lifecycle movements of reef fish that freshwater and estuarine wetlands provide.

Reef 2050 states that there has been a significant decline in many inshore habitats and species, especially in the southern part of the region. It also highlights that there has been a decline in ecosystem processes that are important for maintaining water quality. The Reef 2050 includes a target for no net loss, and a net improvement in the condition of natural wetlands and riparian vegetation. Achieving this target will contribute to reef resilience and ecosystem health.

This strategy identifies the key initiatives to help meet the Reef 2050 targets, including wetland and catchment management activities, better access to information, enhanced planning and regulation, and productive collaborations with partners, such as regional natural resource management groups and other non-government organisations.

The Reef Water Quality Protection Plan 2013 (Reef Plan) is a joint commitment of the Australian and Queensland governments to improve the quality of water entering the Great Barrier Reef by addressing diffuse source pollution from agriculture—which is the main source of excess nutrients, fine sediments and pesticides.

This strategy aligns with the land and catchment management targets under the Reef Plan. These include no net loss of natural wetlands, an increase in the extent of riparian vegetation, and improvements in the ecological processes and values of wetlands. The Reef Plan also proposes monitoring of wetland values and ecological processes. To that end, this strategy promotes a consistent wetlands assessment methodology for reporting on these targets.

Queensland's wetlands management is guided by Australia's obligations under the Convention on Wetlands of International Importance especially as Waterfowl Habitat 1971 (the Ramsar Convention), which has three key concepts: the wise use of all wetlands; designation of internationally important sites; and international cooperation. The 4th Strategic Plan 2016-2024 of the Ramsar Convention states that to achieve its objectives it is essential that ecosystem functions and services are recognised, maintained, restored and wisely used. There are two Ramsar - listed wetlands within the Great Barrier Reef catchments—Bowling Green Bay, and Shoalwater and Corio Bays Area. The Great Sandy Strait Ramsar - listed wetland site is located just outside of the area covered by the Reef 2050; however a significant part of the catchment that affects this wetland is covered in the plan and is recognised as hydrologically connected to the Great Barrier Reef.



Bowling Green Bay Ramsar site

Wetland values and services

Wetlands provide many of the services that underpin the Outstanding Universal Value of the Great Barrier Reef. Wetlands provide important habitat and valuable refuge for fish, birds and other wildlife. Wetlands can play an important role in improving water quality by trapping and transforming pollutants such as nutrients, sediments and pesticides. Some wetlands help capture the first flush of pollutants after heavy rain. Wetlands can also slow the flow of water, reducing soil erosion and the sediment load flowing out to the Reef. Both natural and constructed wetlands assist in water quality improvement. However, excessive loading of wetlands with pollutants can result in loss of values.

Many wetlands have cultural values for Indigenous people, are important sources of water and have tourism and recreational values. Wetlands can provide a buffer to extreme weather events such as storms, cyclones and extreme high tides. Rising seas, carbon dioxide levels, and other climate change impacts can also be buffered by wetlands. The impacts of flooding can be reduced by wetlands.

Artificial wetlands and modified natural systems (for example dams, weirs and stormwater treatment wetlands) can provide substantial economic, social, cultural and ecological benefits for the community. With careful planning and management, many wetland functions can be successfully created and maintained in these systems.

Not all wetlands provide the same values or services. For example, a wetland may be primarily valued for its natural features, while another wetland might be considered more important for their productivity or tourism values. A range of factors influence what values and services a wetland provides including its location, size, type and condition. Most wetlands have multiple values and managing wetlands effectively involves balancing these values to achieve the best outcomes economically, socially and environmentally.

Wetland pressures

Pressures on wetlands can vary depending on a number of factors including type of wetland, intensity or frequency of the pressure, landscape setting and the management in place to mitigate the impacts. Further, pressures affecting a wetland may be located a long way from the wetland itself. For example, a dam at the top of a catchment may significantly alter the hydrology of a downstream wetland.

Threats to wetlands include weeds and invasive animals; land development including land clearing and irrigated agriculture leading to changes in salinity; drainage and water extraction; excessive land-based runoff of nutrients, pesticides and sediments leading to adverse impacts on habitats and ecosystem functions; altered fire regimes; climate change. Changing climate is a significant long-term threat to wetlands—potentially altering wetting and drying cycles, increasing fire frequency and intensity; and causing rising sea levels that lead to loss of freshwater wetlands.

It is important that wetlands are managed from a whole-of-catchment perspective to help ensure pressures are addressed at appropriate scales.



Managing wetlands

The Queensland Government has committed to improving the management of wetlands and coastal ecosystems in the Great Barrier Reef catchments. This strategy provides an approach to managing wetlands and catchments that draws on the strengths and previous investments of the Queensland Wetlands Program. Increased uptake of best management practice for wetlands and integration with existing management activities can help improve water quality in Great Barrier Reef catchments. To achieve the best outcomes, planning processes and policies will be reviewed to incorporate innovative approaches, new technologies and wetland management research.

Case study—Queensland Wetlands Program

The Queensland Wetlands Program was established by the Australian and Queensland governments in 2003 to support programs and projects that will result in long-term benefits for the sustainable use, management, conservation and protection of Queensland wetlands. The program, which is now run by the Queensland Government, is made up of multiple federal, state, local government and non-government partners and has helped raise awareness of wetlands and fostered an understanding of their importance. Increasing awareness encourages appreciation of the many values of wetlands.

The tools developed by the program help wetland landholders, managers and decision makers. Tools relevant to the Great Barrier Reef catchments include

Wetland management tools such as:

- wetland mapping and classification
- wetland conceptual models
- conservation assessments
- species lists and information
- links to assessment and monitoring programs
- rehabilitation and grazing guidelines
- fact sheets and case studies
- wetland projects search tool that lists on-ground wetland projects from a range of funding programs, stakeholder groups and land managers.

Education and communication tools:

- a range of videos
- school curriculum, brochures and posters.

A fact sheet of the program tools is available on the *WetlandInfo* web portal: <http://wetlandinfo.ehp.qld.gov.au>

A number of additional measures will enhance wetlands management, such as improved access and delivery of high quality information and education about on-ground wetland management projects. Improved access to information can build community understanding and promotes best practice management of wetlands. The Department of Environment and Heritage Protection hosts the *WetlandInfo* web portal (www.wetlandinfo.ehp.qld.gov.au), which is a key resource for providing information to the public on all aspects of wetlands management.

Partnering and collaboration are crucial to effective wetlands management. Wetlands occur on private and public lands, and the responsibility for managing wetlands is shared between all levels of government, land managers, Traditional Owners, industry, natural resource management and other organisations, as well as the wider community. The science community also has a key role to play in informing wetlands management. Citizen science initiatives provide information on wetland values that can assist with wetland management. A key component of this strategy is to effectively engage, consult and collaborate with stakeholders to identify and prioritise what management activities should occur for wetlands and where.

The Great Barrier Reef Marine Park Authority has been a long term partner in promoting the importance of coastal ecosystems to the health of the Reef. Equally, the Queensland Department of National Parks, Sport and Racing are important managers of coastal areas including national parks, the Great Barrier Reef Coast Marine Park and Fish Habitat Areas.

Whole-of-system catchment management framework

The whole-of-system catchment management framework is an initiative of the Queensland Wetlands Program. It provides an integrated approach to catchment management and the protection, maintenance and restoration of wetland systems. The framework proposes that information on natural and human components of a system can be integrated with an understanding of how catchments function. Threats can then be used to prioritise options for management intervention, based on the objectives associated with a management activity.

The framework provides the foundation for establishing a comprehensive approach to prioritising investment.

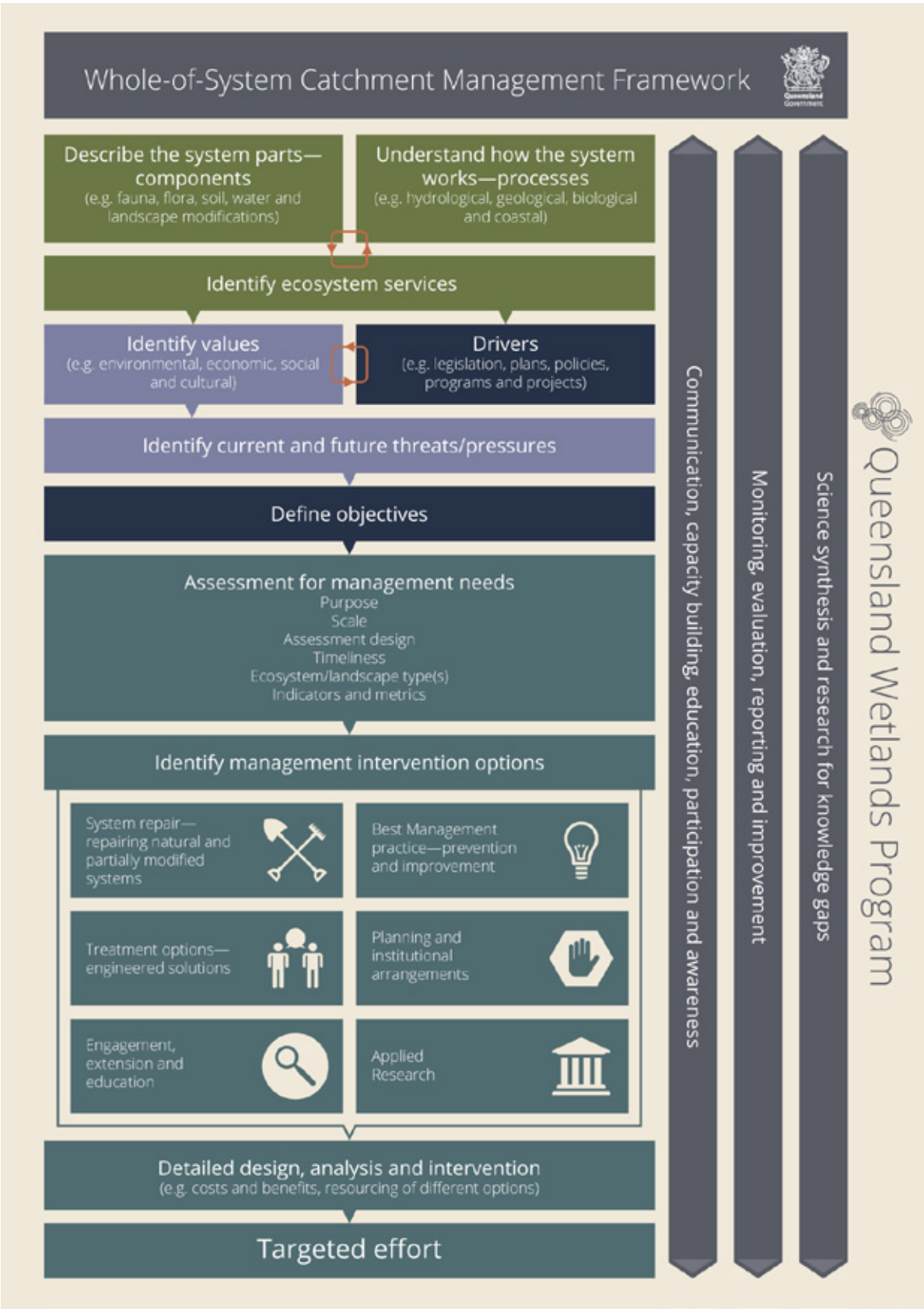
Understanding the parts of a catchment, how it works and the values and services it provides are critical to determining appropriate and integrated management activities. A whole-of-system approach encompasses consideration of both terrestrial and aquatic environments within broader catchment environmental processes.

It is intended that the framework will be used in day-to-day wetlands management decisions that will help deliver more effective and sustainable management of the catchment. Figure 2 illustrates the key steps of the framework.



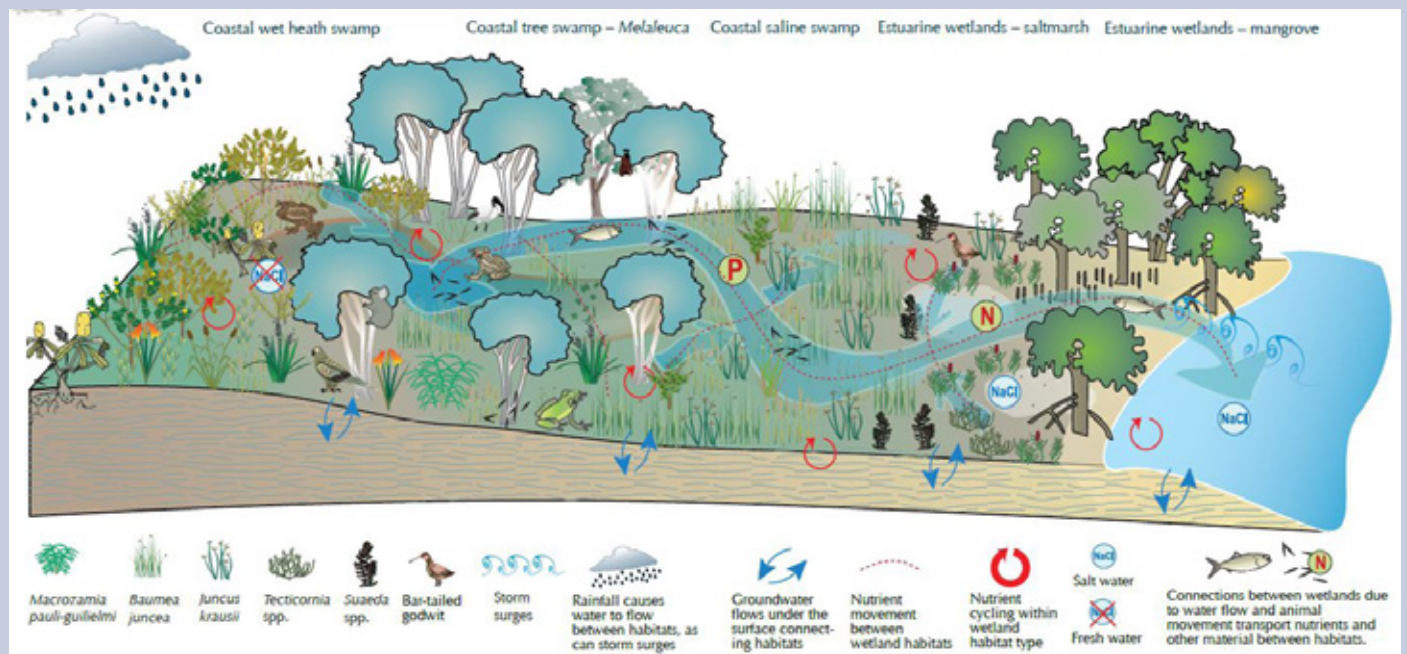
Lake Mary, Yeppoon

Figure 2 Whole-of-system catchment management framework



Case study—Walking the landscape to improve understanding

The Queensland Wetlands Program has established the walking the landscape process that encourages consideration of wetlands from a whole-of-landscape perspective to develop and demonstrate an understanding of how a catchment functions e.g. in terms of how water flows and how that flow is affected by geology, topography, vegetation and land use. It recognises that ecological processes and the long-term resilience of a landscape are interconnected and that management decisions can impact across land and water. The process integrates existing data with expert knowledge to develop a whole-of-system map linked to conceptual models showing how the catchment functions.



A conceptual model of coastal wetland connections.

An outline of the Walking the landscape process is available on the *WetlandInfo* web portal: <http://wetlandinfo.ehp.qld.gov.au>

Themes

Five themes are presented to protect wetlands and improve their management. Each theme has a corresponding table consisting of the goal, objectives and activities.

Theme 1: Improving wetlands information for decision making and action

Goal: Information is available for evidence-based decision making and action

Scientifically-robust information on wetlands is needed to effectively understand and manage all aspects of wetlands. Much of this information is consolidated into a knowledge base delivered through the *WetlandInfo* web portal. There is an ongoing need to improve understanding of the values and services of wetlands in Great Barrier Reef catchments to better inform decisions and actions into the future and address key knowledge gaps.

Knowing where wetlands are, the different types of wetlands, how they function and how they support different values is crucial to maintaining the health of the Great Barrier Reef. It is also important to integrate and consolidate information from research into management decision making.

Table 1. Improving wetlands information for decision making and action

Goal: Information is available for evidence-based decision making and action		
Objectives		Current and proposed activities
1.1	Information on the location, type and extent of wetlands (including groundwater requirements) is available and changes are monitored and reported.	Continue to map and report on changes in extent of wetlands. Extend Groundwater Dependent Ecosystem mapping to all Great Barrier Reef catchments. Improve the scale and key attributes of wetland mapping.
1.2	Improvements to ecological processes and environmental values of wetlands are known.	Monitor and report on ecological processes and environmental values of wetlands.
1.3	Wetlands and other coastal ecosystems are managed from a whole-of-catchment perspective.	Undertake the Whole-of-catchment management framework and Walking the Landscape processes. Update aquatic conservation assessments for all Great Barrier Reef catchments. Redevelop and encourage use of a decision support tool to improve management decisions and prioritisation.
1.4	Wetlands are managed to best practice standards.	Promote best practice wetlands management tools and guidelines.
1.5	Deliver value for money investments, encourage collaboration and avoid duplication in wetlands-related projects.	Maintain a system to report historic and new on-ground works for wetlands management.
1.6	Information on wetlands is publicly accessible to inform decision making and action.	Continue to deliver information through the <i>WetlandInfo</i> web portal.
1.7	Wetlands used by shorebirds and other waterbirds are managed with best available data and information.	Update information on migratory and other waterbirds to help inform decision making and management action. Continue to collaborate on the conservation of shorebirds and other waterbirds.
1.8	Applied research addresses wetland knowledge gaps and assists management.	Consolidate scientific data and information into easy to use formats. Form partnerships to address research needs including knowledge gaps. Investigate how pollutants move through groundwater and impact wetlands.
1.9	The role of natural and artificial wetlands in water quality improvement are understood and incorporated into relevant Reef initiatives.	Encourage research into the role of natural and artificial wetlands in water quality improvement. Incorporate best information on wetlands into Reef initiatives.
1.10	Barriers to fish passage are managed to improve ecosystem health.	Consolidate mapping of barriers to fish passage and guidance on best management.
1.11	The extent and type of intertidal and subtidal habitats are known.	Conduct and make available mapping of intertidal and subtidal habitats of high risk ecosystems.
1.12	The ecological character of Ramsar wetlands is maintained, and changes detected.	Promote research and monitoring to assist to identify the ecological character of Ramsar wetlands and detect change.
1.13	Tools are available to mitigate the impacts of climate change on wetlands.	Updated tools to integrate wetlands and climate change in the context of resource planning, management and ecosystem repair to enable effective site based wetland decisions.

You cannot manage effectively what you cannot measure. Being able to identify where wetlands occur, their type and the area they cover is essential. Wetland mapping in Queensland helps planners, managers and landholders make well informed decisions about the protection and management of wetlands. The Queensland Wetlands Program has produced a consistent map of the state's swamps, lakes, rivers, estuarine and marine wetlands. Regular updates to the mapping managed by the Queensland Herbarium helps identify changes in wetland extent over time. A key initiative has been the expansion of the mapping and classification methods to Groundwater Dependent Ecosystems.



Theme 2: Wetland planning arrangements

Goal: **Funding, non-statutory and statutory planning arrangements in place to protect, manage and enhance wetlands**

Understanding the role of wetlands in the catchment and the multiple values they support will assist in planning for the protection, management and rehabilitation of wetlands. Providing strategic direction for funding programs on where to focus investment for the most effective outcome is essential. Regulation of activities impacting wetlands should be based on accurate and robust mapping, data and other information.

Updating and maintaining statutory and non-statutory planning and management information for Ramsar-listed sites is a key initiative in improving the management of these internationally recognised wetlands.

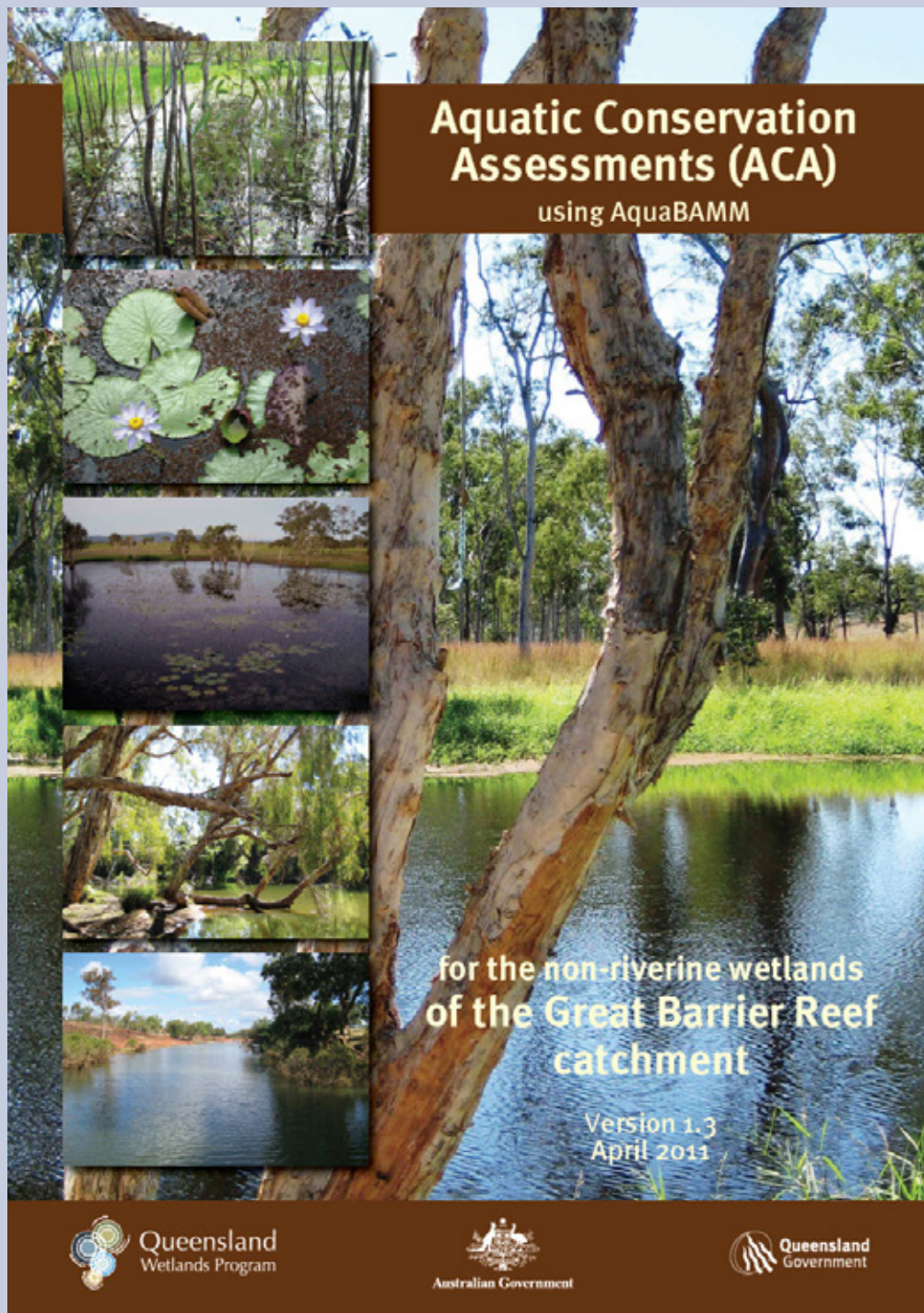
Table 2. Wetland planning arrangements

Goal: Funding, non-statutory and statutory planning arrangements in place to protect, manage and enhance wetlands		
	Objectives	Current and proposed activities
2.1	Water allocations consider and maintain wetland values and services.	Continue to identify wetland values in catchment-based water allocation and management planning processes.
2.2	Natural and near natural wetlands and riparian areas are consistently protected under legislation.	Extend legislation to protect natural and near natural wetlands and riparian areas in all Reef regions.
2.3	Wetlands and whole-of-catchment management are incorporated into strategic planning and funding initiatives.	Continue to include wetlands management in Natural Resource Management Plans and Water Quality Improvement Plans. Encourage other relevant plans and policies to include wetland management objectives.
2.4	Up-to-date information is available for listed Ramsar wetland sites.	Update and publish Ramsar Information Sheets for all listed sites.
2.5	Wetlands are protected through formal planning mechanisms.	Review the State Planning Policy, coastal planning and local government planning schemes to assess planning controls for Great Barrier Reef wetlands and amend as required.
2.6	Wetlands are recognised in protected area planning and management.	Continue to include wetlands management principles in protected area planning.
2.7	Incorporate wetlands into nature refuges and other voluntary conservation measures.	Continue to consider wetlands in nature refuges and other voluntary conservation arrangements.
2.8	Offset provisions are used to strengthen wetlands management.	Strengthen offset provisions for wetlands by expanding provisions to additional catchments. Consider options that include direct benefit management plans to guide offset investments.
2.9	Maintain and enhance connections to improve reef ecosystem health and resilience.	Include connections to improve reef ecosystem health and resilience in planning, legislative and policy initiatives.

Case study—prioritising conservation values

High conservation value wetlands are identified using the Department of Environment and Heritage Protection's Aquatic Conservation Assessments (ACAs) and these areas are included as Matters of State Environmental Significance under Queensland's state planning provisions.

Aquatic Conservation Assessments are based on sound science and provide a comprehensive and transparent method for assessing the conservation values of wetlands. They can provide a source of baseline wetland conservation and ecological information to support regional planning, in assessing development applications for natural resource management and protected area management planning. An ACA can have an application in determining priorities for protection, regulation or rehabilitation of wetlands, as well as on-ground investment decisions.



Theme 3: On-ground activities to protect, manage and rehabilitate wetlands

Goal: Implementation of on-ground activities that improve the health of wetlands and enhance their contribution to Reef resilience through statutory and non-statutory mechanisms

Reducing risk to wetlands through the implementation of regulatory provisions and compliance, as well as adoption of best practice in wetlands management are critical components of this theme. Implementing on-ground management would be enhanced through new initiatives, such as consistent prioritising of wetland investment; greater funding for on-ground activities, including restoration of wetlands; and identifying incentives for wetland management on private land.

Table 3. On-ground activities to protect, manage and rehabilitate wetlands

Goal: Implementation of on-ground activities that improve the health of wetlands and enhance their contribution to Reef resilience through statutory and non-statutory mechanisms		
Objectives		Current and proposed activities
3.1	Wetlands compliance activities are enhanced.	Continue and enhance compliance activities that contribute to the protection and management of wetlands, including riparian areas.
3.2	Wetland values are enhanced through targeted, coordinated and effective rehabilitation/restoration initiatives.	Continue to collaborate with key stakeholders, including NRM groups to prioritise on-ground works. Encourage use of existing decision support tools and the Whole-of-system catchment management framework to target effort for wetland rehabilitation/restoration.
3.3	Land managers understand the connection between their actions and the health of wetlands, catchments and the Great Barrier Reef.	Continue to develop education and communication initiatives for land managers on the importance of wetlands.
3.4	Wetlands are connected for improved environmental outcomes and address barriers to fish passage.	Develop, fund and implement measures to enhance connections, including removal of barriers via restoration/rehabilitation for projects to improve wetland and broader reef ecosystem health and resilience.
3.5	Innovative approaches to wetland and coastal ecosystem repair are in place.	Long term funding of wetland and coastal ecosystem repair is achieved through application of innovative options, such as trialling innovative restoration techniques. Explore incentives, such as stewardship payments, to achieve ecosystem restoration and rehabilitation of wetlands.
3.6	Wetland values and services are enhanced through management of threats.	Develop, fund and implement management programs that address threats such as climate change, invasive species and land-based runoff. Actions are monitored and reported to inform future on-ground works.
3.7	Natural wetlands that significantly contribute to improved Reef water quality and/or wetland conservation are protected through acquisition.	Explore an acquisition fund to identify areas that significantly contribute to improved Reef water quality or conserve high priority wetlands and explore an acquisition fund, including consideration of management of these wetlands.
3.8	On-ground managers are skilled in best available wetland management techniques.	Undertake on-ground management training to build capacity and meet specific needs.
3.9	Wetlands in protected areas and/or Ramsar sites maintain their ecological character.	Implement wetland management planning that is in accordance with legislation and international conventions, agreements and partnerships.

Case study—managing wetlands

Understanding how a wetland functions and what is needed to protect values is important when effectively managing a wetland. The Queensland Wetlands Program has produced a comprehensive range of tools and guides to assist on-ground management of wetlands. This includes grazing, intensive agriculture and rehabilitation guidelines, templates for management plans, case studies, as well as models of how wetlands function.



Wetlands Field Workshop

Theme 4: Education, communication and capacity building

Goal: Improved stakeholder awareness of the value of wetlands and the management tools available

Education, communication and capacity building are key components of a program to encourage protection and best practice management of wetlands. The communication and education activities proposed will facilitate this by continuing to provide information on wetlands. There are many avenues for engagement including face-to-face meetings, distribution of information via brochures, newsletters, fact sheets, interactive websites and social media. Diverse approaches will be adopted, actively encouraging dialogue with stakeholders regarding wetlands management and incorporating research findings into messages.

Table 4. Education, communication and capacity building

Goal: Improved stakeholder awareness of the value of wetlands and the management tools available		
Objectives		Current and proposed activities
4.1	Wetland visitors, residents and industry appreciate wetlands and actions they can take to conserve wetlands.	Continue to prepare and promote educational material and activity programs for managers, schools, tertiary institutions, industry, community groups, and other relevant sectors. Publish a book promoting wonderful wetlands of Queensland.
4.2	Wetlands information is available online.	Continue to provide wetland information through the WetlandInfo web portal. Wetlands management information is available on other relevant websites including federal and local government, NRM groups, other non-government organisations and industry.
4.3	Wetlands education is available at strategically located sites.	Provide wetlands interpretation material and education centres with the best available information.
4.4	Innovative approaches are used to deliver key messages on wetlands.	Explore new message delivery mechanisms that assist wetland conservation including social media to broaden audience coverage.
4.5	Collaborative partnerships promote wetlands best practice management.	Continue the Great Barrier Reef Wetlands Network to build connections between wetland decision makers and managers. Continue regional and local wetlands networks to implement wetlands management activities. Establish stakeholder advisory groups for Ramsar listed sites to collaborate on management activities.
4.6	Traditional Owners' cultural and spiritual values and traditional uses of wetlands are incorporated into wetlands initiatives.	Engage with Traditional Owners to share information on indigenous use and values of wetlands. Consult with Traditional Owners on wetland-related initiatives.
4.7	Tourism and recreational use of wetlands is encouraged.	Explore opportunities for promoting public access to wetlands, including online information on wetlands to visit. Ensure access to and use of wetlands does not impact on wetland values.
4.8	Communities are aware of wetlands and their values through robust citizen science.	Promote citizen science initiatives that contribute to the protection, maintenance and enhancement of wetland values. Create a sense of community responsibility and ownership.
4.9	Build capacity amongst people delivering wetland management and information services.	Establish networks, training and education initiatives to improve the capacity of policy makers, environmental managers and others delivering information, wetland tools and extension activities.
4.10	Explore new partnerships to enhance collaborations that result in improved wetlands management.	Expand the Queensland Wetlands Program Governance Group to include other key partners not represented. Establish a high level multi-disciplinary technical reference group to provide direction and technical support for wetland management initiatives.

Case study—Wetland/Info promoting awareness, understanding and appreciation

The Wetland/Info website (www.wetlandinfo.ehp.qld.gov.au) is the premier website for wetland resources in Queensland. It links wetland planners, managers and landholders to the widest range of wetland management resources in Australia. It contains a range of material including wetland definitions, maps of wetlands, a central data collection point for scientific purposes, planning guidelines, and case studies.

Regularly updated, the website provides topical information on the wetlands of the Great Barrier Reef catchments. The website hosts a range of resources to assist with education including school curriculums, fact sheets, brochures, videos, posters and interactive learning. More than 500 people a day access the website.



Queensland's wonderful wetlands

Our wetlands are ...



...protecting us from floods



...supporting our primary industries



...rich habitats for wildlife

What makes our wetlands special?



...where we can relax and have fun



...keeping our waterways healthy

Find all your wetlands information on Wetland/Info
www.wetlandinfo.ehp.qld.gov.au



Australian Government



Queensland Government



Queensland Wetlands Program

#9506QWP-201015 (updated 2011 #30110)

Theme 5: Monitoring, evaluation, reporting and improvement

Goal: An adaptive management approach incorporating effective monitoring, evaluation, reporting and improvement is implemented to improve wetland management

This theme will assist with monitoring the targets of the Reef Water Quality Protection Plan 2013 and the Reef 2050 Long-Term Sustainability Plan.

A longer term evaluation of progress is essential to monitor change for those trends that take time to detect, as well as identifying emerging issues. Critical to this process is the identification of benchmarks from which to measure impacts and suitable indicators to track change.

Table 5. Monitoring, evaluation, reporting and improvement

Goal: An adaptive management approach incorporating effective monitoring, evaluation, reporting and improvement is implemented to improve wetland management		
Objectives		Current and proposed activities
5.1	Monitoring the effectiveness of management initiatives on wetlands.	Continue to monitor baseline data and indicators of wetlands to measure change resulting from management interventions.
5.2	Monitoring, reporting and evaluation of wetland targets.	Continue to monitor and report on wetland targets in the Reef 2050 Long Term Sustainability Plan. Report through Reef Water Quality Protection Plan report cards and State of the Environment Queensland. Investigate opportunities for more efficient and cost effective monitoring methods to report on the conditions of wetlands.
5.3	Obligations for reporting through international agreements, conventions and partnerships are fulfilled.	Continue to deliver state jurisdictional reporting as required under the Ramsar Convention and bilateral migratory bird agreements.
5.4	Meet objectives and milestones of wetlands projects.	Record and report on milestones and targets for wetlands projects.
5.5	Assess the effectiveness of the Wetlands in the Great Barrier Reef Catchments Management Strategy.	Undertake five yearly reviews of the Wetlands in the Great Barrier Reef Catchments Management Strategy, including consideration of relevant research findings and contemporary issues.

Case study—monitoring the extent of wetlands

Knowing the extent of wetlands and how this changes over time helps wetland managers target efforts to those areas most in need. Mapping of Queensland's wetlands is updated every four years and provides important information on changes in the extent of wetland types. This mapping is delivered across a range of scales including natural resource management regions, drainage basin and local government areas. The findings are reported through *WetlandInfo*, Reef report cards, and the Queensland State of the Environment report and regional report cards.

Great Barrier Reef contributing catchments wetland area by system 2013

System	Area (km ²)	% wetlands area	% total area
Artificial and highly modified	1,673	10.9%	0.4%
Estuarine	4,010	26.1%	0.9%
Lacustrine	224	1.5%	0.1%
Palustrine	2,811	18.3%	0.7%
Riverine	6,665	43.3%	1.6%
Total	15,383	100.0%	3.7%

Source: <http://wetlandinfo.ehp.qld.gov.au/>



Werribee Creek State Forest, Rockhampton

Governance

This strategy is a whole-of-government managed program within the Department of Environment and Heritage Protection. It has been produced by the Queensland Wetlands Program, which is formally overseen by a governance group. The group is composed of members from key stakeholder groups (see below). The objective of the governance group is to review the administration of projects under the Program, as well as support monitoring and reporting on the strategy. The group will also support the strategy by communication and engagement across sectors to raise awareness of the strategy and the efforts undertaken to improve wetland values in Great Barrier Reef catchments, with potential to expand to provide support to the implementation of the strategy.

The governance group is presently composed of ten members from:

- Queensland Regional Natural Resource Management Groups Collective
- Local Government Association of Queensland
- Department of Environment and Heritage Protection
- Great Barrier Reef Marine Park Authority
- Department of Natural Resources and Mines
- Department of National Parks, Sports and Racing
- Department of Agriculture and Fisheries
- Department of Science, Information Technology and Innovation.

Next steps

The implementation of this strategy will be achieved through the activities articulated under the five themes. Implementation planning will be undertaken in collaboration with stakeholders that will set specific, measurable, achievable, relevant and time-bound targets to deliver the actions for the period 2016-2021. Included in the implementation planning will be the allocation of actions to the relevant stakeholders and identification of resourcing.

Delivery of the actions in the strategy and achieving positive outcomes requires ownership, cooperation and coordinated action by stakeholders. Improved wetland and catchment management for reef health cannot be achieved by one organisation.

Protection and management of wetlands in Great Barrier Reef catchments is complex, involving numerous and diverse stakeholders. It requires a multi-disciplinary approach, with a strong focus on education, communication, working with communities and an ongoing commitment to improving the health of wetlands, their catchments and the Reef.

Note: A glossary of terms used in this strategy is available at www.wetlandinfo.ehp.qld.gov.au

