Part 1: Planning process – Development of the Water Quality Improvement Plan

1.1 Introduction

Part 1 of this Water Quality Improvement Plan (WQIP) describes the key projects undertaken to inform the Plan and outlines each step involved in its establishment. Part 1 is a summary – for further information refer to the relevant appendices identified throughout.

1.2 Project background

The Coastal Catchments Initiative (CCI) is an Australian Government initiative that focuses on improving water quality in Australia's coastal waterways through partnerships with state and local governments in 'hot spot' areas. In 2005, Great Lakes Council received $2.09 million in funding from the Australian Government to implement the Great Lakes Coastal Catchments Initiative. The Great Lakes CCI project was the first of two CCI projects funded in New South Wales – the second is to be undertaken by a local government area. In addition to the partnerships established between federal, state, regional and local government, the Great Lakes CCI places equal emphasis on working with the community and industry groups to develop the WQIP.

1.3 Project area

The Great Lakes CCI project is located on the Mid North Coast of NSW, and includes the catchments and estuaries of three lakes: Wallis Lake, Smiths Lake and Myall Lakes (Boolambayte Lake, Bombah Broadwater and Myall Lake) (Figure 1.3.1).

The project area is predominantly within Great Lakes Council local government area (65%). However, the Wallis Catchment extends significantly into Greater Taree City Council local government area (30%) and also into Gloucester Shire Council local government area (5%) (Figure 1.3.1).

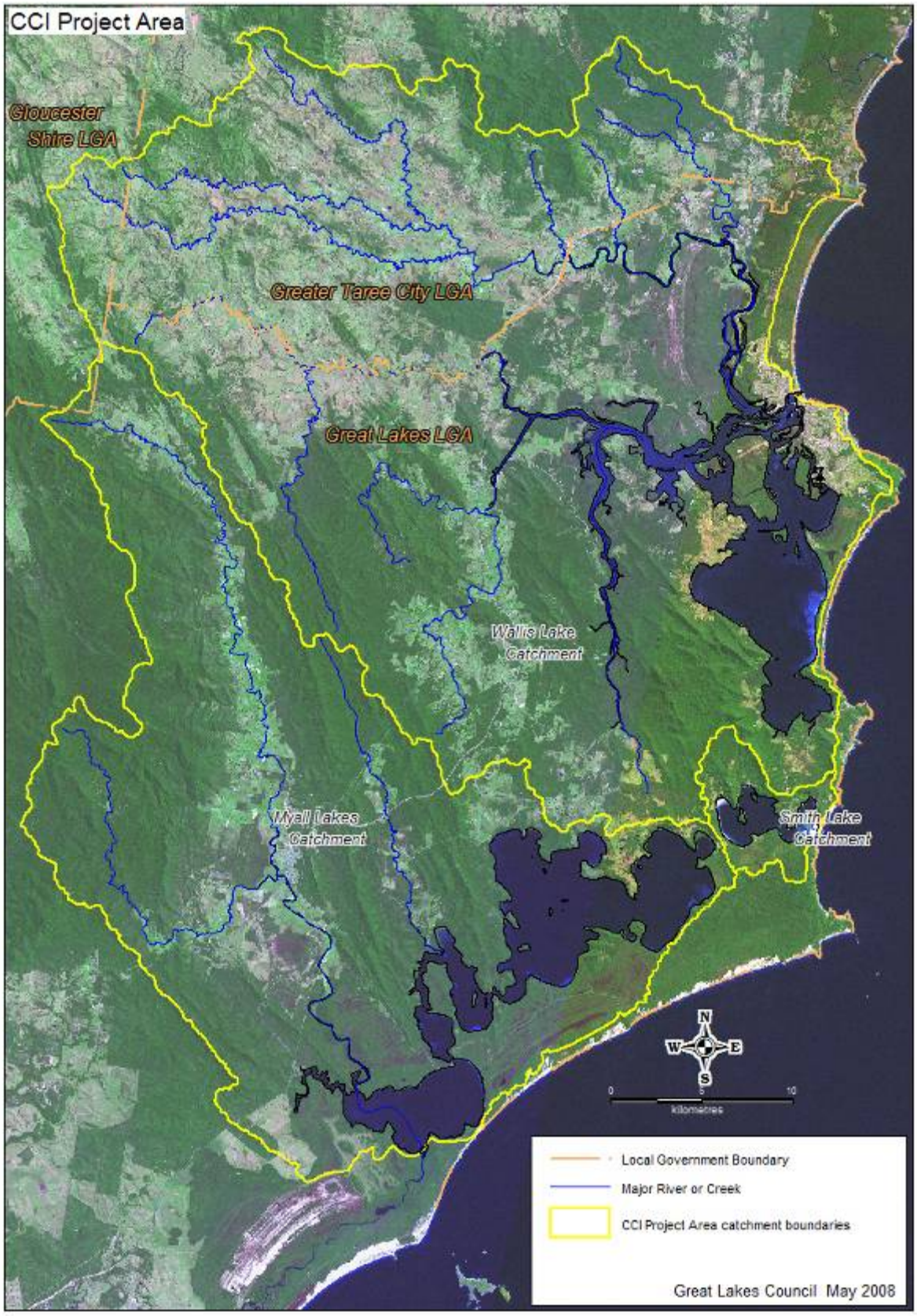

Figure 1.3.1. The Great Lakes Coastal Catchments Initiative project area, showing the Myall Lakes, Smiths Lake and Wallis Lake catchments, and local government area boundaries.

1.4 Project purpose

The focus of the CCI has been to identify ways to reduce the impact of sediments, nutrients and faecal coliforms on Wallis, Smiths and Myall lakes.

The primary sources of these pollutants in the Great Lakes catchments are from varying human activities in catchments – that is, they are non-point source pollutants. In this context, the project aimed to:

- identify the specific levels of nutrients and sediments that are required to support a healthy lake ecology (gauged in terms of the abundance of valuable plants such as seagrass versus the abundance of undesirable plants such as algae) and the environmental values desired by the community
- identify the best way to manage land-based activities to reduce the loads of sediments and nutrients entering the lakes
- review the pollution control and faecal coliform management systems.

The key product for the Great Lakes CCI project is the WQIP for Wallis, Smiths and Myall lakes. Although the water quality improvement strategies for each lake are outlined separately in Section 2 of the document, the strategies for each lake were developed in an integrated way using the same process. This Plan identifies the actions needed to improve or maintain the ecology of the three lakes (e.g. fencing off streams), as well as the tools (e.g. Water Sensitive Urban Design road design guidelines), planning systems (e.g. Local Environment Plan) and institutional arrangements (e.g. Statements of Joint Intent) needed to implement these actions. The WQIP combines new research, scientific modelling and input from the community, with existing knowledge about the lakes and their catchments gained from past research and current catchment management. The Plan establishes a comprehensive framework for water quality management that identifies the most cost-effective management measures to reduce pollutants in the Great Lakes system.

The WQIP recognises that behavioural change of individuals and appropriate government decision-making are central to improving water quality. It is for this reason that there has been equal emphasis on identifying technical solutions and engaging stakeholders.

A high level of engagement has occurred throughout the project. Individuals who will implement components of the WQIP, and people in urban and rural areas who will be affected by recommendations in the WQIP, have been involved in developing and reviewing the plans. Figure 1.4.1 shows the range of different groups and representatives that have been involved. It is hoped that involving people in plan development will

maximise the chances that the WQIP will be implemented. Details on who was engaged and how they were involved can be found in Appendix 1.

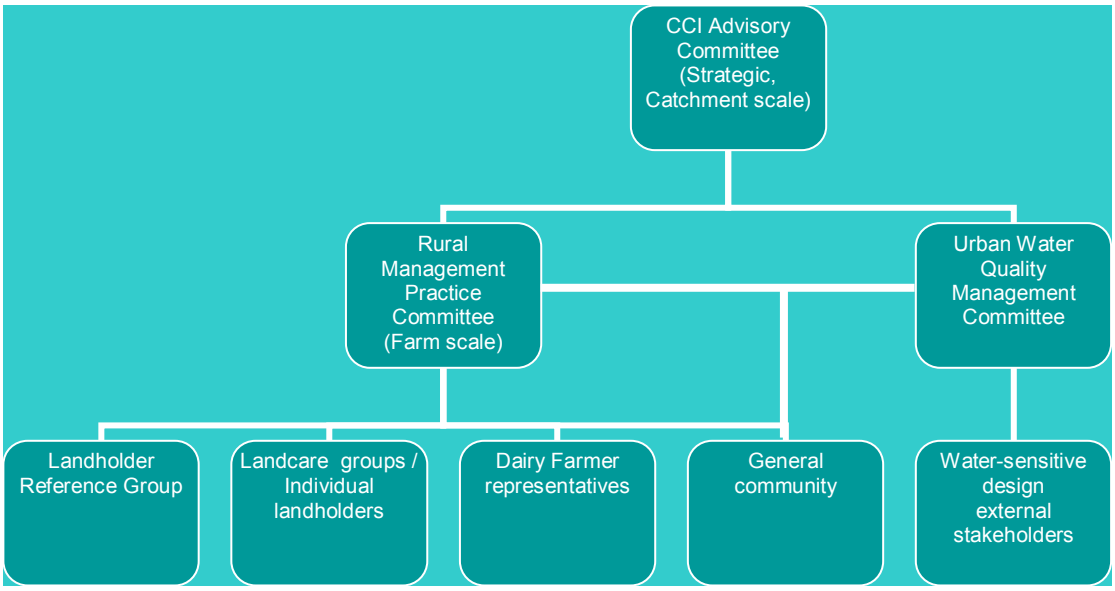

Figure 1.4.1. Stakeholders engaged in developing and reviewing the WQIP for Wallis and Smiths lakes, and the Myall Lakes system.

1.5 Process for developing the Water Quality Improvement Plan

To develop the WQIP, work has occurred in a number of different areas, which include:

- stakeholder input
- scientific modelling
- management research and planning
- Decision Support System.

As shown in Figure 1.5.1, scientific modelling informs and is informed by management research and planning, and both these project components inform a Decision Support System (DSS). The DSS has been used to support the decisions about what to include in the WQIP. The WQIP directs the development of the implementation tools (e.g. guidelines and policies). The projects have been supported by stakeholder input throughout.

Each of the categories shown in Figure 1.5.1 is described in more detail below.

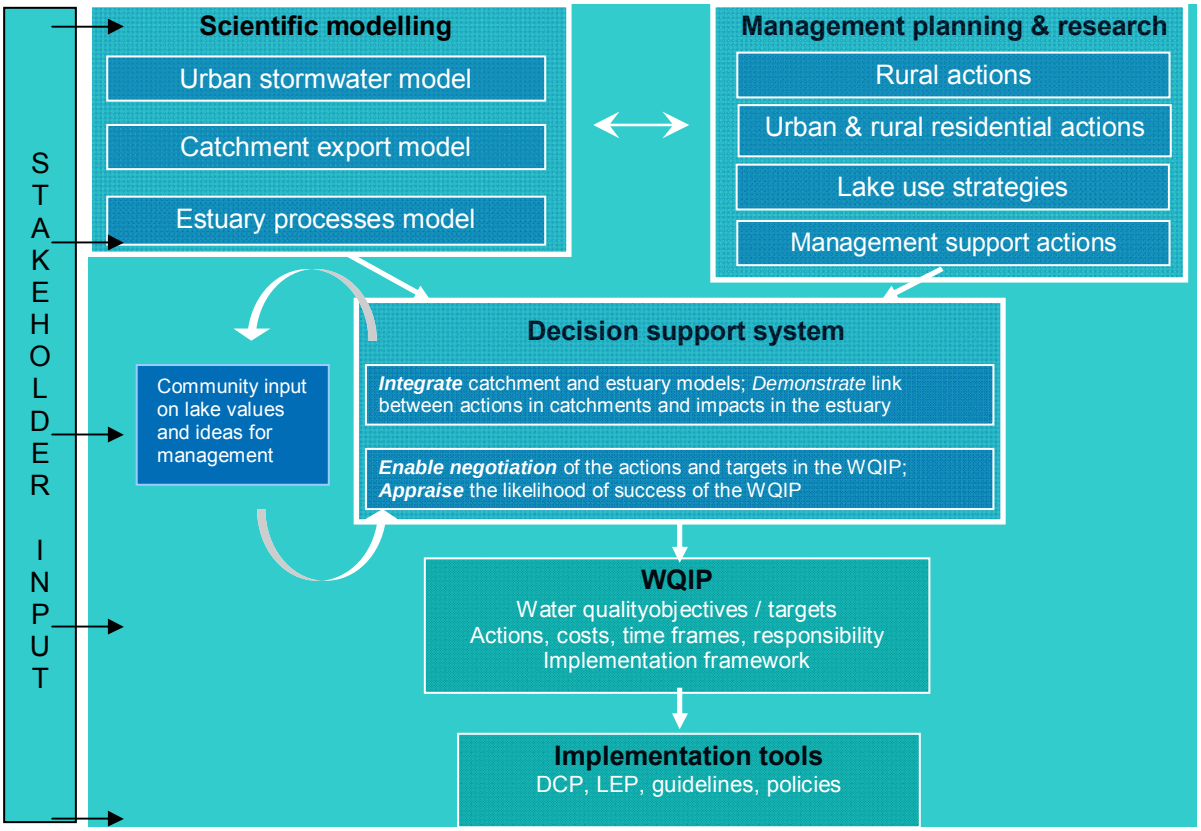

Figure 1.5.1. Components and process of the Great Lakes CCI project towards the development of the WQIP.

1.5.1 Stakeholder input

All stakeholder input for the Great Lakes CCI project occurred in line with an Engagement Strategy that was developed to guide the process of communication and interaction with stakeholders. This strategy was developed to ensure that everyone interested in being involved, was involved to their level of satisfaction to work towards the shared goal of improving water quality. Furthermore, the Engagement Strategy provided a framework for establishing an open and transparent process for developing the WQIP through combining scientific, local and political knowledge; and experience.

The focus for engagement was on forming partnerships and providing opportunities for capacity building and joint learning. More details on the objectives, approach, methodology and results for engagement can be found in Appendix 1 – Engagement Strategy Evaluation Report. This report also recounts the total number and range of engagement activities that were undertaken, and an overview of their success.

A wide range of stakeholders was engaged through the CCI project. Stakeholders were engaged in different ways depending on their needs, wants and capacity. The Engagement Strategy Evaluation Report outlines how various stakeholders were informed, consulted, involved, collaborated with or empowered. Some stakeholders provided input to the strategic direction of the project, while other stakeholders were

engaged to provide specific input to one or two components of the CCI (e.g. Management Research and Planning for rural or urban areas, Figure 1.5.1). Where input occurred as part of a specific component (e.g. Rural Management Research and Planning), the nature of the engagement is discussed in that section.

1.5.1.1 Engagement of the Great Lakes CCI Advisory Committee

An Advisory Committee was established to provide strategic direction for the production of the WQIP. This committee included representatives from the rural community, the Catchment Management Authority, professional fishing groups, oyster growers, Hunter Councils, community catchment and estuary management groups, researchers, National Parks, Landcare, the Department of Environment and Climate Change, the Department of Environment, Water, Heritage and the Arts, the Department of Primary Industries, Marine Parks, MidCoast Water, Greater Taree City Council and Great Lakes Council. Engaging representatives from a broad range of groups allowed the committee to provide strategic advice to the CCI from a variety of natural resource management backgrounds, and also ensured that information about the project would be communicated back through the representatives' own networks and agencies. The Advisory Committee attended regular meetings and was provided with written updates on project progress. The Committee provided an element of stakeholder and community involvement for the life of the project. The Great Lakes CCI Engagement Strategy Report provides more details of the Advisory Committee's role (Appendix 1).

1.5.1.2 Engaging key agencies

Key staff from partner organisations the Hunter-Central Rivers Catchment Management Authority (CMA), MidCoast Water (MCW) and Greater Taree City Council (GTCC) developed Statements of Joint Intent outlining the organisations' commitment to the project, including their role in developing and implementing the WQIP. Discussions amongst representatives of these four agencies have led to the proposal that operational cooperation between them, under the Statements of Joint Intent, be formalised through a Joint Action Plan. The finalised Statements of Joint Intent and draft Action Plan are discussed in Section 3.6 [DG11]and are attached in Appendix 2.

1.5.1.3 Engaging with the general community and industry groups

Community and industry groups received written invitations to be involved in the CCI. Opportunities for interested inividuals to be involved were promoted through media, newsletters, fact sheets, field days, public meetings and Council's website. Once initial contact was made, community members and industry groups were invited to participate

in a workshop that identified 'what they wanted to protect'. At these workshops their future involvement in the project was identified. More details on the groups' involvement are outlined in Appendix 1.

1.5.2 Modelling

1.5.2.1 Catchment investigation and modelling

Two models were used to quantify the loads of sediments and nutrients exported from different land uses and management practices in the urban and rural areas.

For the rural areas of the catchment, the Department of Environment and Climate Change (DECC) calibrated a catchment model called AnnAGNPS (Annualised Agricultural Non-Point Source pollution) that predicts how improved land management practices in rural areas affect water quality in the Great Lakes. This model helped identify where the water quality issues are in the catchment and helped focus management efforts for water quality improvement activities. This has required the collection of data throughout the project area on nutrient exports from specified land uses, and the effectiveness of management actions at reducing these exports.

The catchment model incorporates existing information about soil types, soil erodibility, slope, land use, rainfall and water quality. DECC has collated all existing information from the catchment and, to improve the accuracy of the model, sampled creek water quality across the catchment after rainfall events during 2006/07.

In the urban areas, stormwater modelling was used to estimate the impacts of existing and future urban landscapes on the water quality of Wallis, Smiths and Myall lakes. The model used was 'MUSIC' (Model for Urban Stormwater Improvement Conceptualisation), which has become the standard tool for assessing urban stormwater quality across the majority of Australia. By modelling the urban regions of Forster, Tuncurry, Nabiac, Failford, Smiths Lake and other smaller areas, the CCI project was able to work out what urban stormwater measures could be put in place to reduce the loads of sediments and nutrients entering the lakes. Details of the modelling undertaken are outlined in Section 2.3.5.

Note: faecal coliforms were not modelled in this project. However, the systems currently in place to manage their impacts were assessed and addressed (See Section 1.5.3, Management Planning and Research).

1.5.2.2 Estuary investigation and modelling

To assess the impact of catchment loads on the ecology of the lakes, hydrodynamic (Myall and Wallis lakes), hydrologic (Smiths Lake only) and estuary response models (all lakes) were developed by DECC.

The hydrodynamic models show where water (and the pollutants it carries) goes and how long it stays in those locations. The hydrological model describes how volumes of water vary with time, and how nutrients and sediment concentrations are affected by water volume. The CCI did not develop flow objectives due to the separate process being developed in the Water Sharing Plan (described in Appendix 3).

The hydrodynamic and hydrological models were linked to an estuary response model that relates pollutants to indicators such as seagrass and algae abundance. These indicators can be used to show the change in valuable plants (seagrass) compared to the expansion of nuisance plants (algae). To calibrate the Wallis Lake hydrodynamic and estuary models, research on ecological processes included:

- nutrient concentrations in the seagrass root zone sediments
- sediment nutrient fluxes and benthic metabolism
- benthic algal depth relationships.

Existing data was used to develop the models for Myall and Smiths Lakes.

For information on model specifications see Section 2.3.5.

1.5.3 Management planning and research

The management planning and research part of the project focussed on identifying the appropriate technical solutions and management systems that should be used to reduce pollutant export from both rural and urban lands (Figure 1.5.1). The investigations undertaken in this part of the project aimed to:

- inform the rural management actions in the WQIP
- inform the urban management actions in the WQIP
- inform the lake use recommendations in the WQIP
- identify the appropriate management support actions for achieving water quality improvement actions in urban and rural areas (e.g. planning tools, management systems, regulations, incentive programs).

Details on the research undertaken are outlined below.

1.5.3.1 Rural management actions

A Farm Scale Action Plan for water quality improvement is the key outcome of the research and stakeholder engagement described in this section. This action plan is part of the WQIP and can be found in Section 3.2.2. Research projects undertaken as part of this project focussed on understanding current practice, testing the effectiveness of current practice and learning from the experience of others. A description of these research projects is summarised below:

Understanding current practice

This research involved:

- landholder surveys designed to collect factual information about the land management practices being carried out on properties (e.g. fertiliser use, stocking rates, the uptake of strategies to protect water quality).
- mapping current levels of adoption of management practices including riparian fencing, off-stream watering and in-stream erosion control works
- undertaking nutrient budget and management practice assessments on a number of properties in the Great Lakes CCI project area.

Testing the effectiveness of current practice

This specific research was undertaken by DECC and assessed the effectiveness of off-stream watering and fencing combined, when compared to off-stream watering alone. The results of this research are summarised in Section 2.5.2.3.

Learning from the experience of others

Literature research was undertaken to identify and assess agricultural management options for improving water quality. This involved reviewing pollution sources, transport processes, risks of specific industries and management solutions tried in other areas.

1.5.3.2 Rural stakeholder input

A number of specific engagement methods were used to ensure that this rural part of the Water Quality Improvement Plan was accurate from both rural practitioner (e.g. Catchment Officer) and landholder perspectives.

Rural management practice technical committee

A rural management practice technical committee comprising catchment management practitioners and landholder representatives was established to guide the development of water quality improvement options for rural areas. Stakeholders involved in this part of the project included representatives form the Hunter-Central Rivers Catchment Management Authority, Department of Primary Industries, Great Lakes Council and Karuah Great Lakes Landcare. This technical committee provided input by:

- identifying the scope of key research projects undertaken on rural land including the management practice research (undertaken by DECC), the literature review, landholder survey, nutrient budget and management practice assessments (undertaken by the Department of Primary Industries), and the farm-scale planning and assessment tool developed by Nick Bullock and Associates
- developing the Farm Scale Action Plan for water quality improvement and reviewing stakeholder input
- deriving technically feasible scenarios for different farm management practices that were tested in the DSS for their suitability as recommendations in the WQIP.

Details of the Rural Management Practices Technical Group's involvement in the project are outlined in Appendix 1.

Landholder Reference Group

To assist with providing detailed input to the project, a Landholder Reference Group was established. It was also recognised that, since the WQIP makes recommendations that affect landholders and how they manage the land, landholders should be involved in planning these recommendations.

The specific aims of the Landholder Reference Group were to:

- identify farm level water quality issues
- identify farm level solutions to water quality issues
- advise on what is practical in our local area
- define what we should consider as management practice options in the Farm Scale Action Plan for water quality.

Other landholder engagement

Landholder input was not limited to the Landholder Reference Group. Additional workshops were undertaken at key stages of the project. Workshops involved providing feedback on research findings, and an opportunity for landholders to discuss the issues affecting water quality and suggest effective and feasible strategies for water quality

improvement. A number of landcare groups, the Mid Coast Dairy Advancement Group and individual landholders were involved.

Details of the landholder involvement in the project are outlined in Appendix 1.

1.5.3.3 Urban and rural residential management actions

As shown in Figure 1.5.1, management planning and research also occurred for urban and rural residential land, in order to provide information to the DSS and WQIP on how water quality in these areas could be improved.

Water-sensitive development and design strategy

For urban and small rural residential areas, the project has developed a strategy for water-sensitive development and design. This strategy identifies what needs to be done to improve water quality, taking into account barriers to uptake of water-sensitive urban design (Batkin Walkerden Associates 2007).

A number of research projects have been completed to implement the recommendations identified in this strategy. Research projects have largely focussed on how legal instruments such as the Development Control Plan (DCP) and Local Environment Plan (LEP) can be used to ensure the uptake of water quality improvement activities as well as considering new options. Research has involved:

- identifying how the standard LEP template can be used to support the WQIP
- identifying how the DCP can be used to better manage the impact of stormwater on water quality of the receiving waters for a range of development types
- investigating legal, ecological and political opportunities for a nutrient offset scheme
- investigating the potential for developing a land-based development offset scheme for achieving water quality outcomes.

The outcomes of this research inform the implementation framework for urban areas (Part 3 of the WQIP).

1.5.3.4 Urban and rural residential land stakeholder input

Two stakeholder groups (internal and external) were established to assist with developing the Water Sensitive Urban Development and Design Strategy. The external stakeholder group involved industry representatives including builders, architects and developers, environmental groups, and local planning, engineering and surveying consultants. The internal stakeholder group included engineers, planners, environmental managers, operation managers and asset managers from Great Lakes Council, and engineering and development assessment planners from Greater Taree City Council.

This project was designed specifically to build the capacity of Council staff to improve the integration of their decision-making and planning processes. A representative from MidCoast Water was also involved in the internal stakeholder group to help form strong links between organisations, the Water Sensitive Urban Development and Design Strategy and the Sustainable Water Cycle Management Strategy being developed by MidCoast Water.

These stakeholders helped provide input by:

- identifying the issues to be covered in the Water Sensitive Urban Development and Design Strategy
- localising the options for water-sensitive development and design, as well as identifying the local barriers to uptake
- developing a strategy to overcome the barriers to water-sensitive development and design
- working with experts in the field of offset schemes to develop a scheme suitable for the Great Lakes catchments
- identifying where the council planning scheme can be used to implement the options identified for water-sensitive development and design.

1.5.3.5 Lake use strategies

Through initial discussions with community stakeholders, lake use activities were repeatedly identified as having a significant impact on water quality. Initially the CCI project was designed to focus on land-based catchment impacts only. However, as a result of this stakeholder input, a project was established to document lake use issues and identify possible strategies for improvement. The issues that the community had raised about lake use impacts were discussed further by key stakeholders, and potential areas for improvement have been documented (Section 3.5). This documentation will allow plans that deal specifically with lake use (e.g. Estuary Plans) to consider these areas of potential improvement as they are reviewed and implemented.

1.5.3.6 Management support actions to achieve water quality improvement actions (planning tools, management systems, regulations or incentive programs)

A number of management support actions have been developed to help implement the actions identified in the WQIP. The following methods have been identified and the proposed approach outlined in Part 3 of the Plans:

- approach for implementing the WQIP
- institutional arrangements
- pollution control systems

- Adaptive Management Strategy.

Approach for implementing the WQIP

Section 3.1 of the Plan describes a recommended approach for engaging stakeholders in improving water quality. It emphases the importance of building partnerships and creating joint learning opportunities for increased sustainability in both urban and rural areas.

As part of the Farm Scale Action Plan (Section 3.3.2), the approach for implementing the plan in rural areas is described. This section of the WQIP recognises landholders as key partners in achieving the farm-scale strategies identified in the action plan. The approach was developed based on input from the Rural Management Practices Technical Group, Landholder Reference Group and other workshops held with landholder groups and individuals described in the management action section outlined above.

Institutional arrangements

Institutional arrangements among government agencies underpin the implementation of the Water Quality Improvement Plan. They formalise cooperation amongst key agencies, articulating common goals and the commitments each agency makes to serve the public interest, and are outlined in Section 3.6. To formalise this cooperation, facilitated workshops were held with key staff from Midcoast Water, Great Lakes Council, Greater Taree City Council and the Hunter-Central Rivers Catchment Management Authority to establish an action plan outlining areas of future collaboration and cooperation in relation to the WQIP.

Pollution control systems

Pollution control systems cover legislative, policy and regulatory tools that are available for water quality protection. This section of the Plan reviews and recommends actions to improve pollution control systems (Section 3.7). These recommendations were informed by discussions at a facilitated workshop and conversations with key staff from organisations involved in implementing the pollution control systems – including Safe Foods, Department of Primary Industries (aquaculture), Catchment Management Authority, Department of Environment and Climate Change (marine parks) and Great Lakes Council – as well as some analysis of sediment and erosion control scenarios run through the urban stormwater model described above.

Adaptive Management Strategy

Recognising that managing complex ecosystems needs to be done in an adaptive and responsive way, the Adaptive Management Strategy outlines the reporting, monitoring and review process that will need to be undertaken during WQIP implementation. The

strategy is based on monitoring and research recommendations provided by researchers, the level of assurance provided by the modellers, as well as input from key stakeholders including the Rural Management Practices Technical Group and members of the Advisory Committee. The Adaptive Management Strategy ensures a feedback loop to allow the WQIP to continually evolve and improve based on new science and monitoring. The Adaptive Management Strategy is outlined in Section 3.9.

1.5.4 A Decision Support System for water quality improvement

As shown in Figure 1.5.1, a DSS has been developed that integrates the management research, modelling results, expert knowledge and stakeholder input into a computer tool to assist with decision making for the WQIP. Possible actions in urban and rural sub-catchments can be defined and run in the DSS to show the likely impacts of these actions on pollutant exports and the ecological condition of the estuary. The DSS enables decision-makers to explore the impacts of a range of management actions on water quality, ecological indicators, and economic and social values. During meetings with the Advisory Committee the DSS has been used to:

- establish ecological condition targets and the associated catchment load targets for the WQIP
- test a range of management scenarios in relation to the ecological condition targets to determine the appropriate actions for the WQIP (including risk assessment and benefit-cost analysis).

The DSS also provides a centralised repository of modelling and documentation on results of the project, which can act as a memory of project methods, results and outcomes. It can be readily updated with new information in the future, which allows the WQIP to be revised as necessary. The DSS can also be used for other catchment and land use planning and management activities.

1.5.4.1 Establishing Ecological Condition Targets

A key part of the development of the WQIP has been the process of setting ecological condition targets. These targets describe conditions that will achieve or maintain the ecological value or use identified for the Wallis, Smiths and Myall lakes.

The process for setting the ecological condition targets relied on an iterative approach that includes both community and expert input. The key stages in this process are described in steps 1 to 4 in Table 1.5.1.

1.5.4.2 Testing management scenarios and determining WQIP actions

Finalising the actions for the WQIP involved testing different management scenarios to achieve the identified ecological condition targets (Step 5 in Table 1.5.1), followed by testing the identified actions against the economic costs and benefits (Step 6).

Table 1.5.1. Key steps for establishing ecological condition targets and WQIP actions for the Wallis, Smiths and Myall lakes systems[pt12].

Step		Process	Details of this process can be found in…
1	Work out what we want to protect	Workshops were held with local community groups and the Advisory Committee to determine the environmental values.	2.6.1 2.10.1 2.14.1
2	Establish ecological indicators	Aquatic ecosystem protection was the most stringent environmental value chosen for our waterways. The most stringent guideline will in many cases also protect the other environmental values.* Aquatic ecosystem protection has three levels of protection: 1. High conservation value 2. Slightly to moderately disturbed 3. Highly disturbed. Scientific research was undertaken to determine locally relevant indicators and indicator levels for *High conservation value* and *Slightly to moderately disturbed* ecosystems. Locally relevant indicators included chlorophyll-a concentration, seagrass abundance and water clarity.	Appendix 10
3	Find out the current situation	Results from scientific research were used to determine the 'current' level of protection for each lake.	2.5.3 2.9.3 2.13.3
4	Decide where you want to be	The Advisory Committee selected an appropriate level of protection to aspire to and established DRAFT Ecological Condition Targets.	2.6.2 2.10.2 2.14.2
5	Work out how to get there (actions to achieve *draft* ecological condition targets)	Rural and urban stakeholders came up with possible management scenarios ranging from 'doing nothing' to 'best practice'. These were tested in the DSS to see how the ecology of the lake would respond and what actions allowed the Ecological Condition Targets to be met. The most appropriate actions were then reviewed for technical, political, financial and social feasibility through workshops with the Advisory Committee and the community. The economic costs and benefits of these actions were also determined to further refine the WQIP recommendations. This feasibility testing was an iterative process.	2.7.1 2.11.1 2.15.1

Step		Process	Details of this process can be found in…
6	Final Water Quality Improvement Plan actions and targets	The results of this analysis helped us work out how realistic the targets were and what time frames should be given to intermediate targets (i.e. short, medium and long-term targets). The agreed actions and targets were documented in the WQIP.	2.7.2 2.11.2 2.15.2

* Aquatic ecosystem protection did not require targets for faecal coliforms that are necessary to protect the valued lake uses of human consumption and recreation. Therefore, the systems that are in place to monitor and adhere to targets in relation to faecal coliforms were reviewed as part of the management and research component of the project.

1.5.5 Water Quality Improvement Plan

As Figure 1.5.1 shows, the WQIP is the key output of the Great Lakes CCI project. Stakeholder input, scientific modelling and management planning research were used to derive recommendations and methods for improving water quality.

The Plan forms a set of actions for achieving water quality improvement in Wallis, Smiths and Myall lakes, and recommends tools that will be used to implement these changes across the Great Lakes CCI project region.

The Plan is comprised of three parts:

- **PART 1: CCI Planning Process**
  Provides a background on the Coastal Catchments Initiative and process for developing the Water Quality Improvement Plan
- **PART 2: Individual lake WQIP actions**
  - Wallis Lake – research results, ecological targets, catchment management actions and associated costs for the Wallis Lake Catchment
  - Smiths Lake – research results, ecological targets, catchment management actions and associated costs for the Smiths Lake Catchment
  - Myall Lakes – research results, targets, catchment management actions and associated costs for the Myall Lakes Catchment
- **PART 3: Implementation Framework**
  Covers recommendations on detailed management actions and management support actions that will be used to implement the plan. It covers detailed management actions for rural, rural residential and urban land, lake use, pollution control systems, institutional arrangements and adaptive management.

As described by Table 1.5.1, the strategies and Ecological Condition Targets outlined in the WQIP are largely informed by testing scenarios using the DSS and expert input on their feasibility. These strategies are detailed in the individual lake sections of the WQIP (Part 2). Part 2 also describes the ecological processes occurring within the lakes, the lakes' hydrodynamics, the current condition of the lakes, the models used to develop the strategies and the models' reliability.

The methods for implementing the plan (outlined in Part 3) are determined through research activities under the management planning and research part of the project. The recommendations in Part 3 are also informed by the Ecological Condition Targets set out in the WQIP. For example, if we are nowhere near achieving our desired Ecological Condition Target, then the systems that we put in place for protecting water quality need to be very stringent.

The actions and management systems outlined in the WQIP are informed through the testing of political feasibility. For example, we worked with external stakeholders and councillors to determine if a DCP for small single lots would be acceptable from a community and political perspective.

Part 3 of the WQIP contains recommendations for tools that should be developed in order to implement the identified actions. Some of these tools have been developed as part of the CCI project and others will need to be developed as the plan is implemented – examples include a stormwater DCP and a nutrient offset scheme.

The WQIP is a static document outlining specific actions and targets. However, the WQIP has been integrated into the DSS so that evolution of the plan is possible. It is recognised that over time there will be changes in funding availability and, therefore, areas of focus in relation to management actions. The DSS has been designed so that a range of water quality improvement actions can be tested using different combinations of scenarios. In this capacity, the DSS can be used to demonstrate the ecological benefits of different scenarios and how these relate to the identified targets.