



## Mary River Catchment Coordinating Committee



# Annual Report

The MRCCC gratefully acknowledges the support of the following organisations, who contribute to catchment management activities in the Mary Catchment: Australian Government Envirofund, the Burnett Mary Regional Group, Dairyfarmers, the Department of Natural Resources and Mines, the Gambling Community Benefit Fund, Powerlink, the Noosa, Barung, Tiaro and Gympie Landcare groups and the Caloundra, Cooloola, Kilkivan, Maroochy, Maryborough, Noosa and Tiaro Shires.

Front cover drawing – courtesy of Anneliese Hinchcliffe, Chatsworth Primary School, Gympie

**MRCCC Delegates 2004-5**

<b>Interest Sector</b>	<b>Name</b>
Beef/Grazing	Harry Jamieson
Dairying	Michelle Anderson
Dept of Primary Industries	Graeme Elphinstone
Education	Mark Cridland
Environment	Des King
Extractive Industries	Mollie Gilmour
Farm forestry	Ken Matthews
Fishing	Vince Collis
Gen Community Lower	Vacant
General Community Upper	Dave Sands
Horticulture	Jim Buchanan
Irrigation	Brian Thomas
Landcare, Lower Mary	Paul Marshall
Landcare, Upper Mary	Mim Coulstock
Local Government Lower	Jenny Burton
Local Government Middle	Peter McIntosh
Local Govt upper	Ray Kelly
Rural Women	Rosemary Burnett
Special Member	Nai Nai Bird
Special Member	Margaret Thompson
Special Member	Angus Hutton
Special Member	Lin Fairlie
State Development	Bridget Edwards
Sugar	Peter Turner

**2004-2005 MRCCC Office Bearers**

Chair	Harry Jamieson	<i>Beef/Grazing Sector</i>
Vice Chair	Paul Marshall	<i>Lower Mary Landcare</i>
Secretary/Treasurer	Margaret Thompson	<i>Special Member</i>

**MRCCC Staff**

Operations Manager	Brad Wedlock
Catchment Officer	Dale Watson
Catchment Officer	Eva Ford
Lower Mary Waterwatch Coordinator	Lee Field
Administrator	Debbie Seal
Bookkeeping	Yvonne Richardson
Project Support Officers	Lisa Skrokov Karen Jamieson

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## Chairman's Report ~ Harry Jamieson

The past year has been a difficult time financially for our organisation. Last year the MRCCC was recognised as one of the best NRM groups Australia wide. We had demonstrated our capabilities and been rewarded for the work carried out in the Mary River Catchment.

Since 1995, the MRCCC has operated successful devolved grant programs and on-ground works with matching local government and federal government environment funds. Since the inception of the new regional arrangements in 2002, we have been unable to access federal government funding for on-ground works, and as a result, our ability to access local government funding has also been eroded, with the exception of small Envirofund projects. Despite numerous requests for assistance from the community, our capacity to continue with on-ground riparian projects on a catchment wide basis has been seriously impeded.

You may be aware of some of the difficulties the MRCCC and other groups have experienced as we have endeavoured to work with the regional group. However, the MRCCC has recognised that we must find a way forward, and overcome these difficulties to enable the ever-increasing environmental problems in the Mary Catchment to be addressed.

In 2004, the MRCCC entered in to a contract with the BMRG to undertake Rivercare and Water Quality planning for the Mary, Burrum and Great Sandy Strait regions. The Executive Summaries of these works are included in this Annual Report. I sincerely hope that the Board of the BMRG have read and understood these reports. It is imperative that the BMRG Board take these recommendations on board, when considering dissemination of funding for on-ground works on a catchment wide basis, and to support community Waterwatch networks and water quality monitoring in these areas.

The MRCCC has long recognised the need to engage people on the land in sustainable natural resource management. No amount of planning, or training, or networking will be worthwhile, if this basic need is overlooked. On-ground natural resource management outcomes will not be achieved. We simply must see some of the millions of dollars allocated to this region from the National Action Plan for Salinity and Water Quality and Natural Heritage Trust, reaching the "doers" on the ground, particularly where the community has expressed interest in undertaking these works in strategic reaches of our waterways. We must help to build capacity where it is most needed, and engage the people on the land. Otherwise, I fear for the environmental future of our region.

To my fellow Committee members, I thank you for your support. Your interest and commitment ensures that the MRCCC continues to be one of the leading catchment groups in Australia. Special thanks to Deputy Chair, Paul Marshall for sound advice and taking over during my absence overseas. Thanks also to our very capable Secretary/Treasurer, Margaret Thompson. The efficient administration of our organisation is due mainly to Margaret and our Administrator, Deb Seal, who manages the office and supports the Committee and Staff.

A special thank you also to Jim Buchanan, Dave Sands, Des King and Jenifer Simpson, who formed the Future Water Options sub-committee, which resulted in production of the "Water for the Future" Discussion Paper. I am aware that there has been a great deal of liaison with a range of organisations to highlight the issues raised by this Paper.

I also extend our appreciation to all MRCCC Delegates who took part in the Sector Representative Groups and Community Reference Panel for the Water Resource Plan, which is due for release in draft form before the end of the year.

We are fortunate in having well-qualified and dedicated staff. To Brad Wedlock, who oversees our operations, Dale

Watson and Eva Ford, thank you for a job well done throughout a difficult year. These staff have coordinated a number of major projects throughout the year, and kept our Waterwatch networks operating on a quality assured basis on a shoestring budget. I believe it is a mark of their competence and expertise that many other government and community organisations have called upon our staff for advice and assistance. Thank you to Lee Field, who has continued to coordinate the Maryborough Waterwatch network, despite taking on a teaching role this year, and has also extended her role to include environmental education with schools in Maryborough. I would also like to thank casual staff members who assisted with MRCCC projects including Lisa Skrokov, Karen Jamieson and Yvonne Richardson.



*Hervey Bay Mayor, Ted Sorensen, with former MRCCC Chair, Peter Buchanan, at the MRCCC's 100<sup>th</sup> General Meeting, February 2005*

With the recent sale of the premises at Tozer Street, Gympie, our long standing relationship with Dairyfarmers has come to an end. On behalf of the MRCCC, I must express our sincere appreciation to Dairyfarmers for their invaluable support over past years. In mid 2006, the MRCCC will relocate to Cooloola Shire Council's Tozer Park Rd Depot (just around the corner). Meanwhile, we have been informally advised that an application to temporarily lease the Queensland Rail buildings across the road has been approved, although we must wait for official notification prior to preparing these buildings for occupancy. I am reliably informed that our phone, fax and email contacts will remain the same throughout this period.

I would also like to thank all those who attended the MRCCC's 100<sup>th</sup> General Meeting earlier this year. This was a remarkable milestone for our organisation, which celebrated the involvement of a huge number of people who have taken part in catchment management in the Mary for over a decade, and were the trail blazers for sustainable management of our natural resources, and for bringing these issues to prominence in a range of community and government forums.

As we head in to 2006 and beyond, I am confident that the MRCCC will not only continue, but also build upon the award winning work already undertaken throughout the Mary Catchment. Thanking you all once again for your dedication and commitment to catchment Management in the Mary.

Harry Jamieson



*The usual suspects – L to R Brian Stockwell, Brad Wedlock, Graeme Elphinstone and Steve Kelly planning the 100<sup>th</sup> General Meeting*

### MRCCC Operations Manager 2004-5 Overview – Brad Wedlock

This has been a year of extreme highs and lows for the MRCCC. Late last year MRCCC won the 2004 National Rivercare Award in recognition of the work that MRCCC has encouraged, partnered, assisted with or developed since the release of the Mary River & Tributaries Rehabilitation Plan in 2000. This was an extremely momentous occasion, and something that the MRCCC had been working towards for many years. In 2002 when Gympie Landcare won the right to host the Queensland Landcare Conference and Awards, MRCCC's aim was to win the Queensland Rivercare Award at their home event, and hopefully win the National Rivercare Award. Last year that aim was fulfilled.

Following on from being awarded the National Rivercare Award, MRCCC was invited to present a paper at the 2004 Australian Stream Management Conference in Launceston on the development and outcomes of the Mary River & Tributaries Rehabilitation Plan. This was my first presentation of a paper at a National Conference, and it was quite daunting. I followed on from two people I respect considerably, which was overwhelming. It was a fantastic experience. After the conference, I attended the Riverstyles course run by Dr Gary Brierley of Macquarie University in Goulburn. This was another exceptional experience, particularly the opportunity to interact with river managers across Australia – an experience that does not happen very often in Queensland.

In October 2004 the BMRG awarded the MRCCC the Priority Action Project contracts for water quality monitoring recommendations for the Mary, Burrum and Great Sandy Strait (PAP 2.1) and Rivercare Planning and Prioritisation for the Mary River Catchment (PAP 2.2). MRCCC completed the PAP projects in 2005, with excellent feedback received by PAP Project Manager, Bill Thompson and Deb Scott from the BMRG.

The M-05 (previously known as M-POWAR) funding proposal was developed and submitted to the BMRG during 2005. Many meetings and negotiations have occurred over this proposal which incorporates 53 Rivercare Projects located across the Mary River catchment, and partners with Barung, Noosa, Gympie and Tiaro Landcare Groups. Despite the original contract provided by the BMRG for M-POWAR in June being rescinded, negotiations for the redeveloped M-05 proposal are continuing.

Continuing with a catchment-wide ethic, the MRCCC has offered projects and assistance across the catchment, and provided services to local government, schools, community groups and property owners.

In an effort to have a consistent approach to weed management across the Mary River catchment, MRCCC endeavoured to be represented on each Local Government Pest Plan that was developed in 2004-2005. This was achieved, with MRCCC representatives attending:

- Fraser Coast Pest Plan meetings (Hervey Bay, Maryborough, Woocoo Councils).
- Regional Pest Plan developed by Cooloola, Tiaro & Kilkivan Shire Councils.
- NORSROC Pest Plan for Caloundra, Maroochy & Noosa Councils.

MRCCC recognised this as an important action to take, as some high priority weed species prevalent in the upper catchment have not yet reached lower sections of the Mary River catchment, which suggests a need for surveillance to ensure the spread of high priority weeds does not continue further downstream. MRCCC staff have individually assisted some local shires with their own pest plans, such as Hervey Bay City Council and Cooloola Shire Council.

In the first quarter of 2005 MRCCC assisted DPI&F and BMRG with the Munna Creek Grazing Land Management Pilot project in Woocoo Shire. This pilot project built upon the existing Munna Creek Waterwatch Network that was formed in 2002. The participants developed property management plans identifying areas of improvement to productivity, water quality and biodiversity. MRCCC assisted this process by presenting water quality findings collected by the Munna Creek Waterwatch volunteers to the participants of this pilot project. This pilot project is hopefully the first of many workshops, where partners with specialist skills are brought together to develop property management plans for Waterwatch participants.

The Maryborough District Waterwatch Program continued this year under the guidance of Lee Field based in Maryborough. This Waterwatch program has been operating in the Maryborough District since 2002. Lee has concentrated on a school Waterwatch Program this year, in particular working with St Helens State School developing a catchment management program incorporating water testing and riparian rehabilitation with the school students.

In June this year MRCCC assisted Maryborough City Council with their Local Government Week activities. MRCCC were invited by Sarah Davies of Maryborough Water to assist council to promote the importance of water, and community water quality testing. MRCCC has also been assisting Maryborough City Council with sediment monitoring during flow-events in Tinana Creek. Council has identified colour issues with the Teddington Weir water during flow-events, which is potentially generated in upper Tinana Creek. MRCCC staff have also been working with council staff to identify Cabomba as part of the "Cabomba early detection through surveillance program" initiated by the National Aquatic Weeds Group.

Earlier this year MRCCC attended the inaugural Tiaro Shire Freshwater Interpretative Centre working group meeting, and committed where possible to assisting this initiative. MRCCC is constantly on the look-out for funding opportunities which would support this initiative of Tiaro Shire Council. In July 2005 Tiaro Landcare held its extremely successful "Making the Farm Work" field day. MRCCC was present at this day, assisting Tiaro Landcare with water quality testing of local property owners' farm dams and bores. Approximately 50 water samples were tested over the duration of the day, with people lining up 8 deep at one point for water testing. MRCCC also participated at the Tiaro Fishing Competition in October 2004, setting fish traps to help identify small fish, and conducting water testing. In 2005, MRCCC will again be present at the Fishing Competition and will also deliver the highly successful "Turn off the Tap" school presentation to Tiaro Shire Schools over coming months.

Throughout the year MRCCC has been assisting Hervey Bay community groups and schools such as Lower Mary Landcare Group, Wildlife Preservation Society (Hervey Bay branch) and the Friends of Burrum River group. Assistance was provided to the Lower Mary Landcare Group for their "Water for Life" schools program, with Hervey Bay High Schools and some primary schools attending. MRCCC staff showed the students macro-invertebrates collected from the Mary River, Susan River, Saltwater Creek and waterways around Hervey Bay. MRCCC has attended a number of Lower Mary Landcare Group meetings during the year. In June, MRCCC staff performed the "Turn off the Tap" school presentation at Torbanlea and Howard State Schools, in association with Wildlife Preservation Society and Friends of Burrum River group. "Turn off the Tap" was also performed to teachers in Hervey Bay at the Geography and Science Teachers Forum held in April. MRCCC has been assisting BMRG with the Coastal Water Quality Alliance in recent months which incorporates the MRCCC's Maryborough District Waterwatch program.

During 2004 the Wonga Drought Recovery Project was implemented in the Kilkivan Shire, focusing on Widgee and Wide Bay Creeks. In partnership with Growcom, a irrigation water use efficiency demonstration project with a Macadamia farm has been implemented on Widgee Creek. A pre-project field-day was organised, and a further field-day is planned later in the year. In partnership with the Wide Bay Creek Water Advisory Committee members and the Irrigation Association of Australia, an irrigation water quantity monitoring project has been established as part of the Drought Recovery Project. Further projects are planned, and funding proposals have been prepared. A Waterwatch Network is planned for Wide Bay and Widgee Creeks in the next year through National Landcare Program funding. A



*Eva Ford helping Dagon school students understand the impacts of falling water levels upon aquatic biodiversity*

fish passage improvement project is planned for Widgee Creek in Widgee in partnership with Kilkivan Shire. Funding has been sought for this project through the Reef Freshwater Fish Rehabilitation Program administered by DPI&F.

Late in 2004, the "Turn off the Tap" presentation was delivered to 13 Primary Schools in Cooloolo Shire, reaching 2000 primary school students. As well, individual classes from these schools also participated in Waterbug sessions. Further schools-based water education programs are planned for Cooloolo Shire.

For Kidzone 2005, Cooran local Peter Teakle again contributed his artistic skills with his polystyrene foam interpretation of a Mary River Turtle nest. The MRCCC's "Call of the Wild" interactive session was visited by over 1000 students in the course of two (relatively exhausting) days and comprised a brief session on the Mary River Turtle, a demonstration of wildlife sounds, and a chance for students to understand the chain of life through the food web. Stuffed animals added to the experience, with the display generating much feedback.

Also in Cooloolo Shire, the MRCCC were represented on the two Cooloolo Shire Pest Plan working groups – Environmental and Declared Weeds Working Groups. The Gympie & Amamoor Creek Waterwatch Programs continued in 2004, with many thanks to the volunteers who commit their time to this valuable program. A series of riparian rehabilitation projects were undertaken through the Cooloolo Rivercare Program in 2004. More projects are planned through the M-05 proposal submitted to BMRG in July 2005. Frog surveys were conducted during the warmer months of 2004 and early 2005 through the Living with Threatened Species program operated by Eva Ford. A number of new records of rare stream frogs were identified in Cooloolo Shire.



*Rainbow Beach Primary School students searching for macroinvertebrates in water from Seary's Creek!*



*Six Mile Creek Wetland*

In Noosa Shire the MRCCC concentrated on the Lake Macdonald Catchment Care Group activities, particularly Cabomba and riparian rehabilitation projects. A catchment crawl was held along Six Mile Creek from above Lake Macdonald to the confluence of the Mary River to locate Cabomba infestations. No Cabomba was found below Lake Macdonald. A Cabomba surveillance program was trialled for the National Aquatic Weeds Group, and developed in conjunction with Geoff Black (NSC Noxious Weeds Officer) and Phil Moran (NAWG Community Member). Planning is in earnest for the "War on Cabomba" and "Noosa Festival of Water" celebrating Lake Macdonald's 40<sup>th</sup> birthday on 15<sup>th</sup> & 16<sup>th</sup> October 2005. Frog surveys were conducted in Noosa Shire, in conjunction with Noosa Council's Community Bushland Care workshops in February 2005. New rare stream frog records were identified for Noosa Shire, and existing records re-confirmed.

The Living with Threatened Species Program continued in Maroochy Shire during 2004, with frog surveys and weed control being the main focus of activities. In November 2004 a Frog Forum was held at Bellbunya Country Lodge. Over 100 people attended the Frog Forum, and listened to frog experts from across SE Qld speak about frog decline and rare stream frogs in SE Qld. A survey was held after the forum where participants were fortunate to locate the 3 rare stream-frogs – Cascade Treefrog, Giant-barred Frog and Tusked Frog. The MRCCC provided considerable input and feedback to Maroochy Shire Council for their Shire-wide Waterways

Plan. the Maroochy Council Waterways Plan was completed in early 2005, with many volunteer hours of input provided by MRCCC staff. A majority of high priority waterways identified in the plan are located in the Mary River catchment section of the Maroochy Shire, which is reflective of the unique nature of the Mary River catchment. MRCCC has also provided considerable feedback to Maroochy Council for the Biodiversity Plan. Environmental Management Plans were developed for Powerlink on properties that contained threatened species within Maroochy Shire.





fluctuations and the effect these have on water quality, and we need long-term continuous data (greater than 3 years in length). We now have good quality, long-term data for some sites within the Mary River catchment, which will help us to better understand the characteristics and influences on water quality.

The completion of the Water Quality Priority Action Project Report (PAP 2.1 – Water Quality) by MRCCC on behalf of the BMRG highlighted the importance of Waterwatch data for the Mary River Catchment as an important and reliable source of water quality data and also as an important community capacity building tool, helping the community to understand the water quality and catchment health issues of their local waterways and entire catchment. The report made recommendations for the continuation and extension of the Waterwatch program in the Mary River Catchment. It is hoped our regional body will act upon these recommendations.

The MRCCC Waterwatch data has proven itself this year as an important source of quality assured data, with the EPA utilising our data to aid in developing the Draft Water Quality Objectives for the Mary River Catchment, as part of a pilot program for catchments in Queensland. The MRCCC Waterwatch data was recognised as the most extensive water quality data set for the Mary River Catchment, with sites covering more of the catchment than any other organisation in the Mary River Catchment. This allowed MRCCC and the EPA to highlight the fact that one set of guidelines would not be appropriate for the entire Mary River Catchment, due to natural variations in water quality parameters of different subcatchments (for example low pH of Six Mile Creek or higher salinity of Munna Creek).



*MRCCC Secretary Margaret Thompson (left) registers "City Slickers" team member Adam Richardt at the start of the Rally outside Barung Landcare*

Catchment Officer Dale Watson was able to attend the National Waterwatch Conference held in Melbourne in February of this year. Dale aided Brian Stockwell in presenting a workshop on an international perspective of catchment management and water quality issues and relating these international experiences back to examples from the Mary River Catchment. The basic message that "we in Australia have the opportunity to learn from mistakes that have been made overseas and can act now to prevent them" was well received by the national audience.

The MRCCC's May 2005 Catchment Crawl operated with a slightly different program this year, to allow the MRCCC to host "Rally around the Catchment", which started at Lake Baroon and ended at Lake Macdonald. The theme of the event was "Water for Life" which was fitting as Lake Baroon and Macdonald provide the water supply for Sunshine Coast councils. Over 40 participants took part in this observation rally, where participants were asked to test water quality at various sites, and learn more about the catchment that

surrounds or nurtures them. Special mention needs to be made of the sponsors who kindly supported the Rally:

- Dept of Natural Resources & Mines
- Burnett Mary Regional Group
- Kingfisher Bay Resort
- Cooroy Mountain Spring Water
- Kenilworth Country Foods (Kenilworth Cheese Factory)
- Suncoast Gold Macadamias
- Barung Landcare
- Gympie Landcare
- Nestlé

Ultimately, the Barung Landcare Team won the event, after twisting and turning, bribery and corruption and answering weird and wonderful questions in the most creative ways possible. It seemed as though everybody thoroughly enjoyed themselves, and learnt something about the Mary River catchment. The October 2005 Water Week Catchment Crawl is to be held on the 11th, 12 and 13<sup>th</sup> of October 2005 and we will be monitoring the water quality of the Mary River from its headwaters near Maleny to the river mouth at River Heads. This format was successfully used in 2004.



*Brad Wedlock, takes the "Flower Power" team through their paces with macroinvertebrates at Little Yabba Creek*

Funding through the National Landcare Program has recently allowed the MRCCC to form a new Waterwatch Network for the Widgee and Wide Bay subcatchments in Kilkivan Shire. A Waterwatch Network has been well overdue for this area of the Mary River Catchment, with many local landholders expressing a keen interest in becoming involved in water testing of their local creeks. The Waterwatch Network will link with the other irrigation water use efficiency and riparian management activities of the National Landcare Project in this area. A Waterwatch field day is planned for October 2005, followed by the training of our new Waterwatch volunteers in this area. There is a large gap of water quality information for these two subcatchments, and this Waterwatch Network will go a long way to help us understand the water quality issues of this area.

The MRCCC would like to sincerely thank the all of our Waterwatch Volunteers for their continued support – without volunteers there would be no Waterwatch in the Mary River catchment.

We would also like to thank the following local governments for their continued and invaluable support during 2005 for the following Waterwatch Networks:

- Caloundra City Council (Upper Mary River Caloundra Waterwatch Network)
- Coooloolo Shire Council (Gympie District and Amamoor Creek Waterwatch Network)
- Maryborough City Council (Maryborough District Waterwatch Network)
- Tiaro Shire Council
- Kilkivan Shire Council



DNRM's Graeme Esslemont event monitoring up a river somewhere.....

### Living with threatened species – Eva Ford

Many exciting things have come to the Living with Threatened Species project this year. Funds have been secured from both the Maroochy and Noosa Shire Councils to set up some frog monitoring sites to keep an eye on stream-frog populations in the long term. While money is not guaranteed for future years we are more than hopeful that these councils have embarked on these projects with long-term commitment in mind. The monitoring will occur 3 times per breeding season along 100m lengths of creek. All frogs and other fauna will be recorded as well as water quality and other environmental factors. Long-term monitoring is essential to determine what are 'normal' fluctuations in frog populations and to pick up on 'abnormal' trends in these fabulous environmental indicators of stream health. Support for monitoring shows great foresight by these councils and a belief that the LTS project will deliver.

Besides frog monitoring and ongoing frog surveys, we look forward to ongoing surveys to increase knowledge of key habitat areas and population levels in the lowland areas of the catchment.. Caloundra City Council looks set to support the first frog surveys in the Conondale area, venturing into the upper reaches along Kilcoy, Gerhatys and upper Walli Creeks – all important linkages to the National Parks of the Conondale and Blackall Ranges. Findings from frog surveys help to fill in the knowledge gaps that abound outside of protected areas and particularly on private property.



*Powerlink transmission lines cross sensitive riparian areas along their route.*

Surveys also provide an excellent forum for education and extension to property owners, members of the public and groups such as Green Corps and bushcare groups. At night the creek environment takes on a whole new personality. There is no vista to marvel at and no desire to plunge in and enjoy the rushing water. But there is a sense of expectation, a sense of nature breathing and of hidden things emerging in answer to the cover of darkness and the cool relief of night. Gone is the noisy bird chatter, the beautiful butterflies and the darting fish. Out come the buzzing crickets, slow forest snails, crayfish on the scrounge, chattering frogs, a gliding snake in ambush and the occasional crashing, growling possum. By far the most noise is from the frog contingent. On survey your world is bounded by the beam of your torch and is limited only by your desire to get close up and inspect those log crevasses and leaf litter layers. Frogs or no frogs, never a volunteer goes home without a new appreciation of the world that erupts while they peacefully sleep.

It is an undeniable fact that we would all be a little put out if we lost our supply of electricity. Well this comes at a cost to our environment as we all know, a cost most of us are prepared to bear. We have in a small way helped to reduce

the impact of electricity supply by improving the management of sensitive areas under the main Powerlink transmission lines that shoot their way across our landscape from south to north. With support from Powerlink, MRCCC has developed Natural Resource Management Plans for 10 sites where the lines cross creeks and riparian zones. The Plans are designed for use by the contractors on the ground as they maintain the vegetation under the lines. The Plans have highlighted the need to 'tread' carefully to reduce impacts on our threatened species, to avoid weed spread and to decrease the need for tree removal.

The Richmond Birdwing Recovery Team has poked up its head this year and is due to be launched in October. Driven by Don Sands (ex CSIRO) and Sue Scott (SciComEd) the group is promoting the butterfly and its feed plant (both listed as vulnerable) and looking to secure current habitats and restore its range to previously inhabited areas. Threatened by clearing, competition from weeds and drought, the butterfly and host vine are in need of assistance from all environmental groups and the public. One of its two remaining areas of occurrence is in the upper Mary River catchment from Kin Kin to Mt. Mee and west to Kenilworth. It used to range north through Gympie and Maryborough to Hervey Bay probably using the river as a major corridor. It is very feasible that we can bring it back to Gympie as Kin Kin is not far as the butterfly flies. The Living with Threatened Species project is happily involved in the recovery team helping to get vines in the ground and increase awareness and concern for this beautiful insect. As always, encouraging riparian health is high priority to assist many of our threatened stream and rain-forest dependant species – Mary River cod, Mary River turtle, Conondale crayfish, Coxen's fig parrot, Red goshawk, the frogs we know and love and the list goes on and on.



*Making the best of an awkward situation – protecting endangered frogs while installing sewerage pipes.*

banks and carefully check the upper soil layer for frogs. They found 2 Tusked frogs and a fine Giant barred frog, all of which were relocated a short distance downstream. The whole area was then fenced with frog-proof material to stop them from coming back into the war zone where excavation and the laying of sewer pipe was about to commence. While disturbance is sometime unavoidable we were happy to be able to make a difference for these individuals. We are now seeking to have the developer support full rehabilitation of the work and adjacent area. Being in the middle of a Sunshine Coast hinterland township it just shows that with a little effort and good local knowledge and communication, we really can live with threatened species.

The success of the Living with Threatened Species project lies with all those who realise our threatened species are worth worrying about and who can be bothered to get involved. The huge and the small efforts of property owners who continue to fence off their creeks, weed sensitive areas of riparian forest and replant trees where damage has been done in the past continues without too much song and dance and most passers-by would not even notice. But these property owners notice and they watch eagerly to measure the success of their hard labour as a new forest emerges over the years and as natural regeneration takes advantage of bare land no longer impenetrable due to weeds. These are the people who make the battle for funds and the long hours 'processing' on the computer all worthwhile for project staff. They are the real working force and the ones who are making a difference between survival and silent disappearance of our precious flora and fauna.

Now here's a story... A site surveyed for frogs in early 2004 and found to have Giant barred frogs (endangered under both state and federal legislation) and Tusked frogs (vulnerable), by chance came to the attention of MRCCC as an area soon to be dug, churned and dumped on. How soon? Well that very day in fact until we said 'STOP!!!' With the help of Noosa Council staff and cooperative developer contractors, work was ceased while a suitable plan of attack could be worked up. The federal Environmental Protection and Biodiversity Conservation Act is very powerful and the Giant barred frog is listed under this act. The MRCCC consulted the National EPBC Compliance Unit to ensure that the recommended actions for this site were acceptable. The site – a small 2 metre length of creek bank about 2m high played host to a lovely crop of Singapore daisy and various other exotic grasses and vines. But adjacent areas boasted lush riparian vegetation and closed canopy over the creek. The weedy area (as well as the riparian zone) was home to both frogs back in 2004, and they were still there. The contractors agreed to hand pull all the vegetation from both



*Graceful Tree Frog, Litoria gracilentia, Cooran 2005*

Frog Survey Records 2004-2005

Waterway name	Shire	Date	Adelotus brevis	Bufo marinus	Crinia parsignifera	Crinia signifera	Limnodynastes ornatus	Limnodynastes peronii	Limnodynastes terraereginae	Litoria caerulea	Litoria chloris	Litoria dentata	Litoria fallax	Litoria gracilentia	Litoria latopalmata	Litoria wilcoxii (lesueurii)	Litoria nasuta	Litoria pearsoniana	Litoria peronii	Litoria rubella	Litoria tyleri	Mixophyes fasciolatus	Mixophyes iteratus	Mixophyes sp	Pseudophyrne raveni	Uperolea laevigata
Pinbarren Creek	Noosa	26-Oct-04	2																							
Pinbarren Creek	Noosa	28-Oct-04	2																							
Pinbarren Creek	Noosa	28-Oct-04	2																			2				
Six Mile Creek tributary	Cool	3-Nov-04	2																							
Belli Creek	Mar	13-Nov-04	2										1		3		20					2				
Coonoon Gibber Creek	Cool	16-Jan-05	3										1		1								1			
Coonoon Gibber Creek	Cool	16-Jan-05		1									1		4								2			
Three Mile Creek	Cool	26-Jan-05		10	4		5	2		2			1	15	2							2				
Dingo Creek	Cool	29-Jan-05																				1				
Dingo Creek	Cool	30-Jan-05	9							1												20				
Six Mile Creek tributary	Cool	30-Jan-05	13					1														1				
Belli Creek	Mar	3-Feb-05																					1			
Mary River	Cool	7-Feb-05		3									1		2					2		1				
Skyring Creek	Noosa	7-Feb-05														1										
Trib into Mary	Cool	7-Feb-05		6										2												
Six Mile Creek	Cool	14-Feb-05	1	1			1						8	3	3											
Six Mile Creek	Cool	14-Feb-05	1	1			1						8	3	3											
Tinana Creek	Cool	14-Feb-05		1										4	1								3			
Belli Creek	Mar	21-Feb-05																				1				
Six Mile Creek	Noosa	22-Feb-05								1				2	5								2			
Swamp	Noosa	22-Feb-05		8									1	1	1	1										
Private Dam	Noosa	23-Feb-05					10																			
Glastonbury Creek	Cool	1-Mar-05		6			1					1				31						1				
Widgee Creek	Kilkivan	1-Mar-05					1									10										
Cooroora Creek	Noosa	4-Mar-05																					1			

Waterway name	Shire	Date	Adelotus brevis	Bufo marinus	Crinia parsignifera	Crinia signifera	Limnodynastes ornatus	Limnodynastes peronii	Limnodynastes terraereginae	Litoria caerulea	Litoria chloris	Litoria dentata	Litoria fallax	Litoria gracilentia	Litoria latopalmeta	Litoria wilcoxii (lesueurii)	Litoria nasuta	Litoria pearsoniana	Litoria peronii	Litoria rubella	Litoria tyleri	Mixophyes fasciolatus	Mixophyes iteratus	Mixophyes sp	Pseudophme raveni	Uperolea laevigata	
Belli Creek	Mar	7-Mar-05	2												1							3					
Obi Obi Creek	Mar	7-Mar-05										6															
Obi Obi Creek	Mar	7-Mar-05		1								2			11												
Boulder Creek	Cool	14-Mar-05		1																							
Dingo Creek	Cool	15-Mar-05		1																		4					
Dingo Creek	Cool	15-Mar-05																				1					
Household off Cooroora Creek	Noosa	15-Mar-05	1																								
Kin Kin Creek	Noosa	17-Mar-05		8																		1					
Six Mile Creek	Cool	17-Mar-05													4							2					
Happy Jack Creek	Cool	18-Mar-05					2															1	2				
Mary River	Cool	23-Mar-05		1								1			24												
Little Yabba	Mar	24-Mar-05		3								1			2							2					
Deep Creek	Cool	9-Apr-05													10												
Cooroora Creek	Noosa	7-Aug-05				10																					
Cooroora Creek catchment	Noosa	11-Aug-05	1																								
Cooroora Creek catchment	Noosa	16-Aug-05										2															
Cooroora Creek catchment	Noosa	16-Aug-05					1																				
Cooroora Creek catchment	Noosa	21-Aug-05										2															
Cooroora Creek catchment	Noosa	21-Aug-05										2															
Cooroy Creek	Noosa	31-Aug-05															1										
Cooroora Creek	Noosa	6-Sep-05	3				1															1?					
Totals			44	52	4	10	6	20	0	4	0	0	36	33	5	115	0	21	0	2	0	40	17	0	0	0	365

## **Priority Action Proposal 2.1 ~ Water Quality Monitoring Mary River Catchment Executive Summary**

### **Introduction**

In 2004, the Mary River Catchment Coordination Committee were contracted by the Burnett Mary Regional Group to develop recommendations for water quality monitoring in the Mary River catchment.

Priority Action Plan (PAP) 2.1 has been initiated to:

- identify and describe the scope of water quality monitoring that is currently occurring within the study area
- assess available information on physical processes and habitat condition in the Mary River catchment to assist with prioritisation of water quality monitoring
- to develop a framework to aid in prioritising areas within the study area where water quality monitoring is needed.
- make recommendations on a suitable holistic Water Quality Monitoring Program within the study area.

### **Mary River Catchment Recommendations Overview**

PAP 2.1 – Mary River Catchment Water Quality Monitoring Report has made the following overall recommendations:

#### **Water Quality “Report Card” Program**

- High-level assessment of 15 estuarine and 39 freshwater sites in the Mary River Catchment study area for physico-chemical, biological and habitat assessment on a monthly basis.
- Potential partners: BMRG, EPA, local government, community Waterwatch networks (MRCCC), water authorities, industry.

#### **Event Monitoring Program**

- Event monitoring at 15 sites within the Mary River Catchment Study area to monitor sediment and nutrient inputs being delivered into the Great Sandy Strait.
- Potential partners: BMRG, DNRM, community Waterwatch networks (MRCCC)

#### **Recreational Health Monitoring Program**

- Bacteriological monitoring of 15 sites within the Mary River Catchment study area .
- Potential partners: BMRG, local government, EPA, community, (MRCCC)

#### **Waterwatch Program**

- Continuation of the quality assured Waterwatch program in the Mary River Catchment, with the addition of 20 new sites to support the “Report Card” monitoring.
- Ongoing schools based Waterwatch program to be initiated throughout the catchment.
- Potential partners: BMRG, community Waterwatch networks (MRCCC), local government

The rationale for these recommendations is summarised in this Executive Summary and detailed in the full report.

#### **Study Area**

The Mary River Catchment study area ranges from the Mary River’s headwaters located in the Conondale ranges in the Sunshine Coast hinterland, heading north to the mouth of the Mary River at River Heads, north east of Maryborough.

The Mary River Catchment study area has been separated into broad Water Zones, based on Australian & New Zealand Environment & Conservation Council (ANZECC, 2000) or Queensland Environmental Protection Agency (EPA, 2005) guidelines. These Water Zones broadly separate the study area into three categories:

- freshwater areas
- estuarine areas
- enclosed coastal areas

Underpinning the Water Zones are Waterway Management Units (WMU’s). WMU’s are discrete management units or sections of the river, creeks, estuaries or coastal areas. PAP 2.1 is utilising the Waterway Management Unit framework (as developed by Priority Action Plan 2.2 – Rivercare Initiatives) to make recommendations for water quality monitoring.

### Current Status of Water Quality Monitoring in the Mary River Catchment

The first stage of PAP 2.1 was to collect all available water quality data, and information on this data (metadata) for the Mary River Catchment. Table 1 below outlines the organisations currently undertaking fresh or estuarine water quality monitoring in the Mary River Catchment.

Table 1: Current Monitoring Programs in the Mary River Catchment: Number of Sites Monitored by each Organisation

Organisations performing Water Quality Monitoring	Mary River Catchment
Department of Natural Resources and Mines (DNRM)	15
Environmental Protection Agency (EPA)	12
Mary River Catchment Coordination Committee (MRCCC)	96
Sunwater	5
Caloundra Maroochy Water Board (AQUAGEN)	17
Noosa Shire Council (NSC)	19
Cooloola Shire Council (CSC)	5
Tiaro Shire Council (TSC)	1
Maryborough City Council (MCC)	1
Gympie Eldorado Gold Mines (GEGM)	2

Data and metadata was also collected from past water quality monitoring activities that had occurred in the catchment, from sources such as the DPI water quality surveys.

Approximately 50,000 data samples were collected for the Mary River Catchment and subsequently used to inform the decision making processes for recommendations on water quality monitoring in the Mary River Catchment.

Through analysis of the existing water quality monitoring programs and consultation with community and key stakeholders, the following major gaps were identified in the current state of water quality monitoring in the catchment:

- ❑ **Mary Catchment Waterway Health Monitoring:** Ambient water quality monitoring in the study area is on-going however many gaps exist, spatially and in a program specific nature. Current monitoring tends to be for compliance or regulatory purposes, in the case of local government and agencies, and restricted by monetary constraints by community organisations such as MRCCC. Water quality monitoring that occurs in the study area is basically physico-chemical analysis and is lacking ecological processes, biological (e.g. fish and macroinvertebrate) and riparian and instream habitat assessment. A structured “Waterway Health” monitoring program that incorporates physico-chemical analysis with biological waterway health indicators does not exist in the study area.
- ❑ **Mary Catchment Event Monitoring:** At present, most monitoring effort in the study area is currently ambient focused, with only random occurrences of event monitoring being undertaken by some groups and agencies (such as DNRM and MRCCC). Significant changes to aquatic ecosystems can occur during flood events. The most valuable water quality data that can be gathered during a rainfall event are sediment transport rates and nutrient levels. There is a paucity of nutrient monitoring during events in the study area. A need was identified for event monitoring data to inform the Sednet and E2 models and to provide information on condition, trend and end of valley water quality targets.
- ❑ **Mary Catchment Recreational Health Monitoring:** Recreational water quality health monitoring was found to be lacking in the Mary River Catchment, with Hervey Bay City Council, Aquagen (Caloundra Maroochy Water Board) and on occasion the Queensland Environmental Protection Agency providing the only examples of monitoring popular aquatic recreation areas for bacteriological problems. Currently within the Mary River Catchment the only recreational health monitoring occurs in Lake Baroon, Borumba Dam and Lake Macdonald. Beaches and swimming holes in urban areas are receiving areas for stormwater inputs from urban catchments. Stormwater can contain high levels of nutrients, chemicals, heavy metals and other harmful substances. Many local government authorities have identified stormwater monitoring as an issue.

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**Mary Catchment Waterwatch or Community-based Water Quality Monitoring:** Existing community interest and support for Waterwatch is comprehensive in parts of the Mary River catchment. In past years Waterwatch has received unfair treatment due to a perception of lack of data confidence. However in recent years Waterwatch Groups have developed stringent Quality Assurance Programs to ensure accuracy and validity of the data collected. The Waterwatch program must also be recognised for its value in community capacity building and environmental awareness raising within the community. The Mary Catchment Waterwatch program operated by the MRCCC focuses on collecting physico-chemical parameters to establish baseline data to form effective sub-catchment water quality guidelines, however the spatial coverage and suite of parameters monitored needs improvement.

**Schools-based Water Quality Awareness Program:** Community consultation throughout the study area saw a 'school-based water quality awareness program' as essential. Currently the only school-based water education program is delivered by the MRCCC, in partnership with Cooloola Shire Council, offering all schools in the Cooloola shire an opportunity to participate in a water education program.

#### **Proposed Water Quality Monitoring Programs in the Mary Catchment**

Analysis of existing water quality information in conjunction with consultation with key stakeholders and the community has identified the need for a multi-tiered water quality monitoring program for the study area. The program will be complementary to existing programs building the scientific knowledge and community capacity of the study area.

Recommendations from this report include the development and establishment of the following:

- "Water Quality Report Card" Program
- Event Monitoring Program
- Recreational Health Monitoring Program
- "Waterwatch" Program.

#### **Mary Catchment Water Quality Report Card Program**

The Water Quality Monitoring Report Card Program will be an integrated monitoring program, targeting both freshwater and estuarine/coastal zones. It will focus on assessing the ecosystem response to natural and human impacts. The monitoring program includes several indicators of waterway health, including biological indicators.

Aims of the Water Quality Monitoring Report Card are to:

- Compare waterway health in waterway management units (WMU)
- Identify causes of waterway health and trends
- Provide information on aquatic ecosystem health on a catchment scale to landowners, councils and the community
- Link with existing water quality monitoring programs
- Provide links for improved communication between community and statutory bodies
- Provide advice and support for agency and local government projects and priorities – i.e. Mary Basin Water Resource Plan; stormwater management plans.
- Contribute to the establishment and assessment of 'end-of-catchment targets' as identified in the Burnett Mary Regional Groups Country to Coast NRM Plan.

Previous recommendations for a program of this nature have concentrated on the following general system attributes:

- Biota
- Habitat – streamside & instream
- Hydrology
- Water Quality
- Geomorphology
- Upstream Catchment

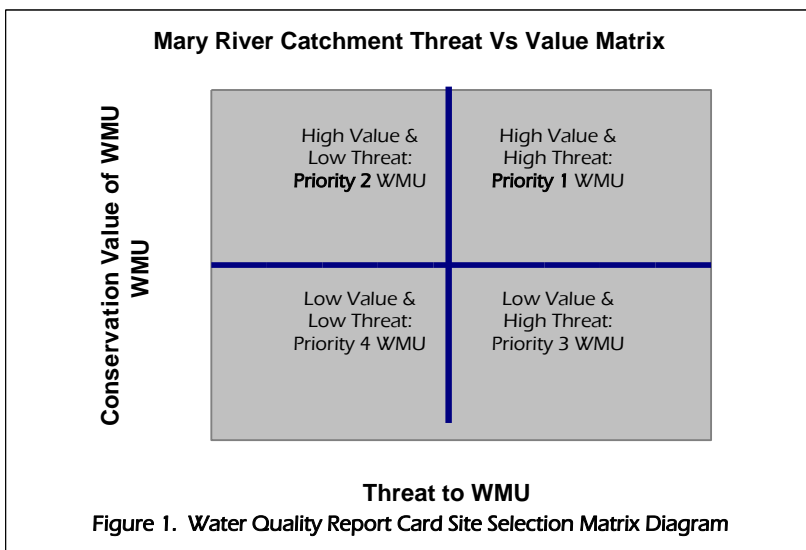
Biota and aspects of habitat are measures of ecosystem condition while the other attributes are ecosystem pressures. It is recommended that the Water Quality Report Card Monitoring Program be undertaken on a six-monthly basis for freshwater zones, and on a monthly basis for the estuarine and enclosed coastal zones.

Sites have been recommended for the Mary River Catchment Water Quality Report Card Monitoring Program. The basis for site selection has been undertaken through a 'Threat Vs Value' decision making matrix.

Those WMU's identified as having both a high level threat/impact as well as high levels of conservation value have been recognized as Priority One sites for the Water Quality Report Card Monitoring Program. Sites identified as



having a high level of conservation value but only a low level of threat have been identified as Priority Two sites for the Water Quality Report Card Monitoring Program (see Figure 1 below).



This decision matrix is based on the analysis of the conservation values and anthropogenic threats from various data sources in the Mary River Catchment. Factors for calculating these values and threats include:

- Water Quality (Draft EPA Water Quality Objective, 2005, Compliance)
- Point Source Impacts (Sewage Treatment Plants, Septic and Stormwater Impacts)
- Landuse Considerations (Landuse Mapping, Shane Pointon & Karen Newbold, DNR 1998)
- Potential Sediment Inputs (DeRose, etal, 2002)
- Endangered, Vulnerable and Rare Species
- High Environmental Value areas (EPA, 2005)
- Condition Scores - Catchment Disturbance Index (Norris, etal, 2001), State of the Rivers (Johnson, 1996), Index of Stream Condition (MRCCC)

The Scientific Waterway Health Assessment will be split into two monitoring programs:

**1. Estuarine Report Card Monitoring Program:**

15 Priority One and Priority Two sites have been recommend to be monitored on a monthly basis for the Estuarine Report Card Monitoring Program. The approximate costs for the program would be \$48,600 for on-ground monitoring costs per year (not including data analysis and reporting costs).

The estuarine report card monitoring sites closely align with the existing EPA ambient water quality monitoring program, that will enable the many years of data already collected at these sites to be incorporated into this new program. Some additional parameters would need to be sampled to meet the proposed report card monitoring requirements, which would increase costs and time of the existing EPA monitoring marginally.

The Susan River is also recommended for the Estuarine Report Card Program due to its very high conservation values (Ramsar Wetland Zone). Currently, no monitoring occurs within the Susan River, however given the relative proximity to other sites currently monitored by the EPA, they could be incorporated.

**2. Freshwater Report Card Monitoring Program:**

39 sites have been recommended to form the Mary River Water Quality Freshwater Report Card Monitoring Program. If all sites were to be monitored on the recommended 6 monthly basis, the total freshwater on-ground program cost would be approximately \$179,556 (not including program management, data analysis and reporting costs). Efforts have been made, where possible, to recommend sites for the Mary River Freshwater Report Card Program to align with currently operating water monitoring programs (those with the largest amount of existing water quality data

given preference where applicable). This will facilitate maximum use of existing water quality data, and potential for the integration of existing water quality monitoring programs into the Mary River Water Quality Report Card Program. A partner would need to be identified to analyse and assess the water quality information and data collected. A partner would also be needed to develop the report card assessment and data analysis methodology.

#### **Reference Sites within the Mary River Catchment:**

Sites within WMU's in the Mary River Catchment have been recommended as reference sites. WMU's have been nominated as a reference reach based on the amount of change from natural state for Physical Form, Water Quality, Riparian Vegetation, Hydrology and In-stream Habitat. Although the recommended report card monitoring sites are based on the values of a WMU and the threats to the WMU, many of the recommended reference sites are already recommended for the report card monitoring program. The remaining reference sites have not been recommended for report card monitoring either because the threats to the WMU were low, or because they were ephemeral streams, not suited to continual monitoring. The waterway health data collected from these reference sites have potential for use in target setting for other WMU's in the Mary River Catchment.

#### **Community Water Quality Monitoring (Waterwatch)**

Waterwatch will be an essential component of the Water Quality Report Card Monitoring Program. Existing community-based water quality monitoring programs in the study area (namely Waterwatch) will form the basis of this program, while new networks will need to be developed to fill gaps and any further needs of Waterwatch and the Water Quality Report Card Monitoring Program.

By using this approach the existing capacity built over time by community groups and local government can be incorporated into this holistic monitoring program. An integrated program such as this also builds linkages between the scientific community and the general community, thus creating better understanding and appreciation of the complexity of issues faced by all with current waterway management.

The waterway health data collected by Waterwatch will be in accordance with the MRCCC Quality Assurance program and therefore can be integrated into the Water Quality Report Card Monitoring Program. It is recommended that the Waterwatch monitoring be undertaken on a monthly basis for all water zones, as per the existing community water quality monitoring in the Mary River Catchment.

The Waterwatch Program can be initiated in the short term by building upon existing community waterway health monitoring capacity in the study area. To maintain community involvement in water quality and catchment management issues in the Mary River catchment, it is strongly recommended that the existing Waterwatch sites be maintained. Data collected from these sites will continue to inform the community on the water quality of these areas, and continue to build capacity amongst the community.

Many of the existing Waterwatch sites are also located within WMU's where Water Quality Report Card Sites are recommended. It is further recommended that Waterwatch programs be initiated in WMU's that have been recommended for water quality report card monitoring and currently do not have a supporting Waterwatch monitoring site. Twenty sites have been identified that meet this criteria, which would involve the establishment of Waterwatch networks in the Tinana, Widgee, Widebay, Glastonbury, Elamon, Kandanga, Lower Six Mile, Skyring and Yabba Creek sub-catchments.

#### **Event Monitoring Program**

An Event Monitoring Program is recommended for the Mary River Catchment. The proposed event monitoring program has been designed in a two stage process. The primary aim of Stage 1 of the Mary River Catchment Event Monitoring Program will be to supply event water quality data for the improvement of the Sednet and E2 models of sediment and nutrient with the Mary River Catchment. Stage 2 of the event monitoring program will be an upgrade of Stage 1 of the Mary River Event Monitoring Program which will continually feed into the Sednet and E2 models to maintain and improve the consistency and accuracy of the models outputs and provide information on condition, trend and end of valley water quality targets. This second stage will require significantly more resources to be initiated, as it will involve more expensive, but possibly more accurate, automated event sampling equipment and procedures. A Partnership has been formed between the MRCCC and the Department of Natural Resources and Mines Water Quality State Investment Project (WQ SIP) for National Action Plan team to develop Stage 1 of the Mary River Catchment Event Monitoring Program.

#### **Stage 1:**

Stage 1 of the Mary River Catchment Event Monitoring Program has been undertaken by the DNRM Water Quality State Investment Project (WQ SIP) Burnett Mary region coordinator Graeme Esslemont and the MRCCC. It was decided that Stage 1 would collect event monitoring data manually. Road bridge crossings located near to DNRM gauging stations throughout the catchment were identified and formed the basis of the event monitoring sample sites to choose from. Stage 1 of the program has the primary aim of informing the Sednet and E2 sediment and nutrient models.

## Stage 2:

Stage 2 of the Mary River Event Monitoring Program will involve the installation and operation of automated pumping and rising/falling stage event monitoring sampling stations. Taking this step will ensure a far more permanent event monitoring program in the Mary River Catchment, enabling the critical continual calibration and updating of the Sednet and E2 models and to provide information on condition, trend and end of valley water quality targets for the Mary River Catchment. Stage two of the program would not be limited to existing DNRM gauging stations. A decision matrix was devised to aid in the site selection for Stage 2 which identified event monitoring sites on Kilcoy, Little Yabba, Gherrulla, Six Mile, Kandanga, Glastonbury, Widgee, Munna, Gutchy, Tinana, and Susan tributaries as well as four sites on the main trunk of the Mary River.

The total on ground program costs are estimated to be \$179,100 for event monitoring of these 15 sites. This does not include data management and reporting costs (estimated at \$3300 per site) or program management costs.

Stage 1 of the event monitoring program already involves the MRCCC and the DNRM SIP Team. Stage 2 of the event monitoring program would have to be completely established. A partner will need to be identified that can assist with the development of this program.

The event monitoring program will require collaboration with an accredited laboratory to analyse Total Suspended Solids, Total Nitrogen and Total Phosphorous samples taken during flood events. For Community members to assist with the operation of this program as sample collectors, a safety induction program would need to be developed.

## Recreational Health Monitoring Program

A Recreational Water Quality Health Monitoring Program could be initiated in publicly accessible swimming areas, such as popular river recreation areas of the Mary River. Swimming holes in urban areas are receiving areas for stormwater inputs. Stormwater can contain high levels of nutrients, chemicals and other harmful substances. In SEQ, various councils and agencies have coordinated water quality monitoring in popular recreational sites from Redcliffe to Noosa Heads since 1994. The on-going aim of the program is to assess the suitability of popular beaches and river locations for recreational activities such as swimming.

The locations monitored are popular places for both 'primary' contact, (activities such as swimming, where there is a high probability of swallowing water), and 'secondary' contact, (those activities such as canoeing, where there is a low probability of swallowing water) recreation. Sampling duration generally corresponds to the beginning, middle and end of the popular swimming season (October – November; January – February; March – April). Bacteriological samples should be collected each week at all sites, for six consecutive weeks in the first two periods, and for five consecutive weeks in the third. Rainfall data is required for at least 72 hours before each sampling date.

A Recreational Health Monitoring Program will identify sites where consistent contamination or isolated high contamination events are measured, enabling management initiatives to be implemented to reduce or rectify these problems. Major primary contact sites for recreational activities, i.e swimming sites, has determined sites chosen for the Recreational Health Monitoring Program.

Sites selected are those that are regularly used by humans, e.g. popular swimming areas during summer periods. It is recommended that a large sweep of sites be sampled initially to determine faecal coliform levels, and then prioritise monitoring for sites showing high levels of faecal coliform. An interim list of high priority sites for monitoring is given in this report, based on current levels of primary contact at each site.

In south-east Queensland, the EPA has collaborated with local government authorities to achieve this program. The partnership has involved local government staff collecting the samples at the identified sites, and EPA undertaking the analysis of the samples. A similar partnership could be established in the Mary River catchment.

## Consultation

To date consultation meetings have been undertaken with the following community groups who have expressed interest in Waterwatch activities:

- Lower Mary River Landcare Group
- Lake Baroon Catchment Care Group
- Tiaro & District Landcare Group
- Noosa & District Landcare Group
- Maroochy Shire Council
- Caloundra City Council
- Aquagen
- Maryborough City Council
- Tiaro Shire Council
- Cooloolool Shire Council
- Noosa Shire Council
- Kilkivan Shire Council
- Woocoo Shire Council
- Barung Landcare

- Gympie Eldorado Gold Mines
- Environmental Protection Agency
- Department of Natural Resources and Mines
- Department of Primary Industries and Fisheries
- Gympie & District Landcare
- Healthy Waterways Partnership
- MRCCC Local Waterwatch Groups

#### Mary Catchment Further Recommendations

This report further recommends the following actions required to assist catchment management in the Mary River Catchment:

- Analyse existing water quality data to determine if the Mary River catchment is a high nutrient producing area, and identify local nutrient sensitive zones.
- Local water quality guidelines and targets need to be developed for sub-catchments with longer-term data.
- Additional assistance to existing Waterwatch Groups for capacity building activities.
- Develop a generic Waterwatch Program suitable for the region.
- Develop an integrated Quality Assurance Program for water quality monitoring.
- Develop a holistic and integrated approach to water quality data management for the Mary River Catchment.

#### PAP 2.1 Application of Recommendations to BMRG Country to Coast Management Actions

BMRG Management Action (Critical Priorities)	Integration of PAP 2.1 Recommendation
MB1P	"Report Card", community, event and recreational health monitoring data will be able to produce a "State of the Estuary Report" for the Burrum River
CMD1D	"Report Card", community, event and recreational health monitoring data will condition data on habitats and aid in prioritising of coastal habitats Further investigation into this internationally significant patterned fen habitat
CMD1E	"Report Card", community, event and recreational health monitoring data will be available to LGA planners to aid in decisions on effect of developments on water quality and habitat values
CMD1I & CMD1J	"Report Card", community, event and recreational health monitoring data will be available to aid in planning decision for BMRG, LGA and community to implement and monitor BMPs for urban surface water, waste and pest management and reuse practices for future (and current) developments
LR2E	"Report Card", Community and event monitoring data to provide information on sand and gravel extraction assessment of impacts
CD1A	"Report Card", community, event and recreational health monitoring reports will provide information dissemination on water quality issues Community water quality monitoring (Waterwatch) will provide strong basis for community engagement
WR1A	See "Existing Water Quality Monitoring" section of this report
WR1B	Event monitoring data will provide essential sediment and nutrient data for modelling purposes
WR1C & WR1D	"Report Card", community and recreational health monitoring data will be essential for setting of any water quality targets
WR1F	"Report Card", community, event and recreational health monitoring data will provide the basis for decision making in WQIP's outcomes
WR1H, WR1I, WR1J, WR1N & WR1O	See "Community Water Quality Monitoring (Waterwatch)" section of the report
WR1K	Community water quality monitoring (Waterwatch) is recommended to be initiated at "Report Card" sites (not already covered by existing Waterwatch Program
WR1L & WR1M	Water quality data management

## Priority Action Proposal 2.1 ~ Water Quality Monitoring Burrum River Catchment Executive Summary

### Introduction

The Mary River Catchment Coordination Committee was contracted by the Burnett Mary Regional Group to develop recommendations for water quality monitoring in the Burrum River Catchment.

Priority Action Plan (PAP) 2.1 was initiated to:

- identify and describe the scope of water quality monitoring that is currently occurring within the study area
- assess available information on physical processes and habitat condition in the Mary River catchment to assist with prioritisation of water quality monitoring
- to develop a framework to aid in prioritising areas within the study area where water quality monitoring is needed.
- make recommendations on a suitable holistic Water Quality Monitoring Program within the study area.

### Burrum Catchment Recommendations Overview

The Priority Action Proposal 2.1 – Burrum River Water Quality Monitoring Report makes the following overall recommendations:

#### Water Quality "Report Card" Program

- High-level assessment of 6 freshwater and 5 estuarine sites in the Burrum River Catchment study area for physico-chemical, biological and habitat assessment on a monthly basis.
- Potential partners: EPA, BMRG, Community (Friends of Burrum), Hervey Bay City Council, Wide Bay Water

#### Event Monitoring Program

- Event monitoring at 10 sites within the Burrum River Catchment Study area to monitor sediment and nutrient inputs being delivered into the Burrum River Estuary and Burrum Heads Seagrass flats.
- Potential partners: BMRG, DNRM, Community (Friends of Burrum)

#### Recreational Health Monitoring Program

- Bacteriological monitoring of 7 sites within the Burrum River Catchment study area.
- Potential partners: BMRG, EPA, Hervey Bay City Council, Community (Friends of Burrum), Wide Bay Water

#### Waterwatch Program

- Schools based Waterwatch program to be initiated in the Howard and Torbanlea areas
- Quality assured Waterwatch program to be developed in the estuarine zone and Lenthalls Dam headwaters for areas, with the support of the Wide Bay Water Corporation.
- Potential partners: BMRG, Community (Friends of Burrum), Hervey Bay City Council, Wide Bay Water

The rationale for these recommendations is summarised in this Executive Summary and detailed in the full report

#### Study Area

For the purposes of this report, the Burrum River catchment study area has been separated into three key water zones (based on Australian & New Zealand Environment & Conservation Council (ANZECC, 2000) or Queensland Environmental Protection Agency (EPA, 2005) guidelines):

- Lower Freshwater (below 150 metres above sea level). The lower freshwater zone of the Burrum River is defined as from the headwaters in Wongi State Forest to the Burrum River Weir 2.
- Middle Estuarine section. The middle estuarine zone of Burrum River is defined as from the Burrum River Weir 2 to near the confluence of Cherwell River.



*Lenthalls Lake*

- Lower Estuarine section. The lower estuarine section of Burrum River is defined as from upstream of Cherwell River to the mouth at Burrum Heads.

The Water Zones are further separated into Waterway Management Units (WMU). Waterway Management Units provide a spatial reference framework for the study.

The Burrum River catchment commences at the headwaters of the Doongul and Duckinwilla Creek sub-catchments in the Seaview and Robinson Ranges, north of Brooweena, and flows south west entering Hervey Bay at Burrum Heads. The general relief of the Burrum River catchment is low and flat, typical of a coastal catchment of its size.

The catchment area of the Burrum River (including the Cherwell River) is 1010 sq. km (DNRM, 2003). The Burrum River catchment contains two major headwater tributaries, Doongul and Duckinwilla Creeks, which flow into Lenthalls Dam (Hervey Bays City Council municipal water supply). A further two weirs are located downstream of Lenthalls Dam. Weir 1 marks the extent of the tidal influence of the Burrum River.

The study area includes the Cherwell River and its tributaries, but does not include the Gregory or Isis River Catchments. The Cherwell River headwaters (Kolbore Creek) are located east of Childers in the Wongi State Forest, entering the Burrum River estuary approximately 15 kilometers from Burrum Heads.

The area encompassed by the Burrum River catchment is approximately 315,000 hectares. Major land uses within the catchment are forestry, grazing, urban (Howard and Burrum Heads) and rural residential downstream of Howard. The majority of the upper catchment of the Burrum (above Lenthalls Dam) and Cherwell Rivers is contained within Wongi State Forest. Wongi State Forest is a mosaic of native coastal forest and pine plantations

#### Current Status of Water Quality Monitoring in the Burrum River Catchment

Consultation with agencies and local government has identified where continual water quality monitoring is occurring throughout the study area (Table 1).

**Table 1: Currently Operating Water Quality Monitoring Programs in the Burrum River Catchment**

<i>Organisation performing Water Quality Monitoring in the Burrum River Catchment</i>	No. of sites monitored	Water Zone
Department of Natural Resources and Mines (DNRM)	1	Lower Freshwater
Environmental Protection Agency (EPA)	4	Estuary
Wide Bay Water Corporation	5	Lower Freshwater

The environmental consultancy company GHD also undertook fisheries surveys and some water quality data collection in 2000 for an environmental impact study on the effect of raising the height of Lenthalls Dam.

In 1997 Natural Resource Assessments Pty Ltd performed some water quality analysis for the report: "Lenthalls Dam Ecological Assessment of the Downstream Environment".

The Mary Basin Water Resource Plan Draft Environmental Conditions report (Water Quality Appendix) identifies that "only a handful of records exist for most of the important indicators of river health for the Burrum River Catchment (Condina, 2003).

The Friends of the Burrum Group has identified several water quality gaps in the Burrum River.

- No event monitoring program
- No sediment source and transportation modelling
- No flow gauging
- No monitoring of environmental flow release from Lenthalls Dam
- No recreation use water quality monitoring
- No monitoring of aquatic vertebrate or invertebrate species

#### Proposed Burrum River Catchment Water Quality Monitoring Program

Consultation with key stakeholders has resulted in a proposal for a multi-tiered water quality monitoring program for the study area. The programs will be complementary to building the scientific knowledge and community capacity of the study area.

The recommended water quality monitoring programs are:

- Water Quality Report Card Program
- Event Monitoring Program
- Recreational Health Monitoring Program
- Waterwatch Program

### **Burrum River Catchment Water Quality Report Card Program**

The Water Quality Report Card is proposed to be an integrated monitoring program, targeting both freshwater and estuarine zones. It will focus on assessing the ecosystem response to natural and human impacts. The monitoring program includes several indicators of waterway health, including biological indicators.

The aims of the Water Quality Report Card Program are:

1. Compare waterway health within the waterway management units (WMU) of the study area to identify WMU waterway health and trends
2. Identify causes of waterway health and trends
3. Provide information on aquatic ecosystem health on a catchment scale to landowners, councils and the community
4. Link with existing water quality monitoring programs within the study area
5. Provide links for improved communication between community and statutory bodies
6. Provide advice and support for agency and local government projects and priorities – i.e. Mary Basin Water Resource Plan; stormwater management plans.
7. Contribute to the establishment and assessment of 'end-of-catchment targets' as identified in the Burnett Mary Regional Groups Country to Coast NRM Plan.

Previous recommendations for a program of this nature have concentrated on the following general system attributes:

- Biota
- Habitat – streamside & instream
- Hydrology
- Water Quality
- Geomorphology
- Upstream Catchment (EHMP, 2004)

Biota and aspects of habitat are measures of ecosystem condition while the other attributes are ecosystem pressures.

The Water Quality Report Card Program will be split into two programs:

#### **Burrum River Catchment Freshwater Program**

Freshwater Waterway Health indicators recommended for assessment include:

- Fish (Native Species Richness; Native Fish Assemblage [O/E]; % alien individuals)
- Nutrients (Algal Bioassay; Delta N15 analysis)
- Eco-processes (Gross Primary Production; Respiration; Delta C13 analysis)
- Physico-chemical analysis (Temperature; pH; Dissolved Oxygen; Conductivity)
- Invertebrates (Invertebrate richness; PET richness; SIGNAL score)

Riparian Zone indicators recommended for assessment of freshwater ecosystems include:

- Physical Form (Geomorphologic attributes)
- Streamside Zone (Shade, erosion)
- Hydrology (Change from natural)
- Aquatic Life (Significant Fauna species)

#### **Burrum River Catchment Estuarine Program**

Estuarine & Coastal Waterway Health indicators recommended for assessment include:

- Total Phosphorus
- Turbidity
- Chlorophyll a
- Dissolved Oxygen
- Total Nitrogen
- Sewage Plume Mapping (Algae Delta 15N)
- Seagrass Depth Range
- Lyngbya Majuscula Monitoring
- Spatial Interpolation of Water Quality

It is recommended that the Water Quality Report Card Program be undertaken on a six-monthly basis for freshwater zones, and on a monthly basis for the estuarine zones. After detailed analysis of the information collected a water quality report card can be published on an annual basis to show changes to the health of the aquatic environments sampled over time. The Water Quality Report Card Program is a medium term objective requiring a set-up stage.

The basis for prioritisation of site selection for the Burrum River Catchment Water Quality Report Card has been undertaken through a 'Threat Vs Value' decision making matrix, those WMU's identified as having both a high level threat/impact as well as high levels of conservation value have been recognized as Priority One sites, while sites identified as having a high level of conservation value and only a low level of threat have also been identified as the Priority Two sites for the Water Quality Report Card Monitoring Program.

This decision matrix is based on the analysis of the conservation values and anthropogenic threats from various data sources in the Burrum River Catchment. Factors for calculating these values and threats include:

- Water Quality – Compliance with Draft EPA Water Quality Objective, 2005, Compliance
- Mary Basin Water Resource Plan – Technical Advisory Panel for Burrum River (DNRM, 2003)
- State of the Rivers Reporting - (Johnson, 1996)
- High Environmental Value (HEV) areas (EPA, 2005)
- Rare or significant aquatic fauna
- Endangered species (WildNet Fauna Data)
- Significant sediment inputs (Johnson, 1996)
- Point-source impacts (Sewage Treatment Plants, Septic and Stormwater Impacts)
- Risk from future development – Hervey Bay City Council Planning
- Landuse Considerations (Landuse Mapping, Shane Pointon & Karen Newbold, DNR 1998)
- Fluvial geomorphology

From the outcomes of the prioritisation framework five Priority One estuarine sites and six freshwater sites (three Priority One and three Priority Two) were recommended for the Burrum River Report Card Monitoring Program.

If all five Priority One estuarine Water Quality Report Card sites were monitored on a monthly basis, the approximate costs for the program would be \$16,200 for on-ground monitoring costs per year (not including program management, data analysis and reporting costs). If all six Priority One and Two freshwater sites recommended the Water Quality Report Card Programs on-ground costs are estimated to be \$27,624 per year (not including program management, data analysis and reporting costs).

The EPA monitoring of the estuarine section of the Burrum River closely aligns with the proposed report card monitoring for estuarine zones, using currently monitored EPA sites will allow the vast amount of data already collected to be utilized. Some additional parameters would need to be sampled, which would increase costs and time marginally.

The Wide Bay Water monitoring of Lenthalls Dam, Doongul, Duckinwilla and Harwood Creeks can be incorporated into a report card monitoring program. At present Wide Bay Water monitor physico-chemical parameters that is an essential component of the report card monitoring program. Monitoring upstream of Lenthalls Dam in Duckinwilla and Doongul Creeks away from the backwater effects of Lenthalls Dam at the sites proposed is preferable.

A partner would need to be identified to analyse and assess the water quality information and data collected. A partner would also need to be identified to develop the report card assessment methodology.

#### **Burrum River Event Monitoring Program**

An Event Monitoring Program is recommended for the Burrum River System to supplement EPA's current water quality monitoring program. The event monitoring will establish base-line information regarding the sediment and nutrient supply and transportation in the Burrum River Catchment, and ultimately enable the identification of sediment and nutrient sources. Ideally the data would be used to inform a model of sediment and nutrient sources and transport in the Burrum River Catchment.

There is currently no event monitoring program established in the Burrum River Catchment.

Community consultation with stakeholders in the Burrum River Catchment has identified a need for an event monitoring program, primarily to monitor the sediment and nutrient inputs being delivered into the Burrum River Estuary and Burrum Heads Seagrass flats.

A decision matrix was developed for the site selection of event monitoring sites for the Burrum River. Sites were nominated as a representative site for a specific sub-catchment or respective WMU in the Burrum River Catchment. These nominated sites were then scored against several parameters to determine the sites that would yield the most easily interpreted and accurate data for determining catchment influences and for modelling purposes.

Based on the above considerations ten sites were chosen for the event monitoring program, with four sites on the main trunk of the Burrum River, and sites at the mouths of the Chervill, Isis, Gregory Rivers and at Richmond, Duckinwilla and Doongul Creeks. The estimated total on ground cost of this program is \$115,300 not including data management, reporting or program management costs.

The program would have to be completely established. A partner will need to be identified that can assist with the development of this program. Wide Bay Water's NATA accredited laboratory, could be a significant collaborator with this program. Community members could also assist with the operation of this program as sample collectors.



### **Recreational Health Monitoring Program**

A Recreational Water Quality Health Monitoring Program could be initiated in publicly accessible swimming areas, such as popular river recreation areas or beaches of the Burrum River. Beaches and swimming holes in urban areas are receiving areas for stormwater inputs. Stormwater can contain high levels of nutrients, chemicals and other harmful substances.

In SEQ various councils and agencies have coordinated water quality monitoring in popular recreational sites from Redcliffe to Noosa Heads since 1994. The on-going aim of the program is to assess the suitability of popular beaches and river locations for recreational activities such as swimming.

The locations monitored are popular places for both 'primary' contact and 'secondary' contact recreation. Harmful pathogens, including various bacteria and viruses, are generally difficult to detect or monitor. Therefore counts of faecal coliform bacteria are often used to assess microbiological water quality.

Sampling duration generally corresponds to the beginning, middle and end of the popular swimming season (October – November; January – February; March – April). Bacteriological samples should be collected each week at all sites, for six consecutive weeks in the first two periods, and for five consecutive weeks in the third. Rainfall data is required for at least 72 hours before each sampling date.

The outcome of Recreational Health Monitoring Program is to identify sites where consistent contamination or isolated high contamination events are measured. Major primary contact sites for recreational activities, i.e swimming sites used by humans for recreational purposes and are located in or near urban areas.

It is recommended that a large sweep of sites are sampled initially to determine faecal coliform levels, and then prioritise monitoring for sites showing high levels of faecal coliform. An interim list of high priority sites for monitoring is based on current levels of primary contact at each site.

Seven sites have been identified in the Burrum River Catchment at the Wongi Waterholes, Lenthalls Dam, Burrum Heads, Buxton, Howard, Pacific Haven and Walkers Point.

In South-east Queensland EPA has collaborated with local government authorities to achieve a recreational health monitoring this program. A similar partnership could be established in the Burrum River catchment. Wide Bay Water's laboratory has facilities to analyse faecal coliforms, and therefore could be a partner in this program also.

### **Community Water Quality Monitoring (Waterwatch)**

A Waterwatch Program can be an essential component of the Water Quality Report Card Program. A Waterwatch program will build linkages between the scientific community and the general community, thus creating better understanding and appreciation of the complexity of issues faced by all with current waterway management.

Initial feedback from the Burrum River community has centred around an event-monitoring program for the Burrum River catchment. The residents are concerned about possible contamination of the Burrum River estuary from upstream impacts. The Friends of Burrum River Group have recognised that ambient monitoring is important and have indicated that they would be interested in establishing a Waterwatch Network within the Burrum River estuary to compliment the current water quality data collection by the EPA.

Wide Bay Water staff have also indicated enthusiasm towards the establishment of an Upper Burrum River Catchment Waterwatch Network (Glynis Stewart, pers comm. 2005).

It is recommended that any initiation of Waterwatch sites be aligned with the proposed Water Quality Report Card sites. This will allow physio-chemical data to begin to be compiled by these sites and will give community a chance to be involved and take ownership of a Water Quality Report Card Program.

Within the Burrum River catchment there are several options available to implement a School-based Water Quality Education Program. Water Education programs are particularly important in catchments such as the Mary and Burrum Rivers where inter-basin transfers of urban water occur. Consultation with Howard and Torbanlea State Schools has been favourable for such a program to commence and consultation with these schools will be on-going, with the first educational activity scheduled for May 2005.

The following issues have been identified in relation to establishment of a community Waterwatch network in the Burrum catchment:

- Identification of a partner with experience forming and maintaining Community Waterwatch Networks;
- Purchase of appropriate equipment for the Waterwatch Group;
- Identification of a partner to collate and analyse data;
- Identification of a partner to provide feedback to the Waterwatch Group on water quality data they collect.

### **Consultation**

To date, community needs analysis meetings have been undertaken with the following community groups who have expressed interest in Burrum River catchment water quality monitoring activities:

- Friends of Burrum River Group
- Wide Bay Water Corporation
- Wide Bay Burnett Conservation Council

- Hervey Bay City Council
- Environmental Protection Agency
- Wildlife Preservation Society of Queensland (Hervey Bay Branch)

#### Burrum River Catchment Further Recommendations and Considerations

This report further recommends the following steps to assist catchment management in the Burrum River Catchment:

- Undertake similar water quality monitoring recommendations for the Gregory and Isis River Catchments, as these rivers play a critical role in water quality issues in the lower Burrum River. The community has also expressed these concerns.
- Analyse existing water quality data to determine if Burrum River catchment is a high nutrient producing area.
- Prepare a Burrum Sea-grass Flats Receiving Waters (Catchment) Management Plan that incorporates recommendations for the Gregory, Isis, Cherwell and the Burrum Rivers.
- Collation of existing research / natural resource information in the Burrum River Catchment, and the Gregory, Isis and Cherwell Rivers.
- Undertake similar water quality monitoring recommendations for the Gregory and Isis River Catchments.
- Investigate potential for a community based groundwater monitoring programs in the study area.
- Investigate current groundwater reserves and current rates of extraction.

#### Burrum River PAP 2.1 Application of Recommendations to BMRG Country to Coast Management Actions

BMRG Management Action (Critical Priorities)	Integration of PAP 2.1 Recommendation
MB1P	"Report Card", community, event and recreational health monitoring data will be able to be produce a "State of the Estuary Report" for the Burrum River
CMD1D	<ul style="list-style-type: none"> <li>• "Report Card", community, event and recreational health monitoring data will condition data on habitats and aid in prioritising of coastal habitats</li> <li>• Further investigation into this internationally significant patterned fen habitat</li> </ul>
CMD1E	"Report Card", community, event and recreational health monitoring data will be available to LGA planners to aid in decisions on effect of developments on water quality and habitat values
CMD1I & CMD1J	"Report Card", community, event and recreational health monitoring data will be available to aid in planning decision for BMRG, LGA and community to implement and monitor BMPs for urban surface water, waste and pest management and reuse practices for future (and current) developments
LR2E	"Report Card", Community and event monitoring data to provide information on sand and gravel extraction assessment of impacts
CD1A	"Report Card", community, event and recreational health monitoring reports will provide information dissemination on water quality issues Community water quality monitoring (Waterwatch) will provide strong basis for community engagement
WR1A	See "Existing Water Quality Monitoring" section of this report
WR1B	Event monitoring data will provide essential sediment and nutrient data for modelling purposes
WR1C & WR1D	"Report Card", community and recreational health monitoring data will be essential for setting of any water quality targets
WR1F	"Report Card", community, event and recreational health monitoring data will provide the basis for decision making in WQIP's outcomes
WR1H, WR1I, WR1J, WR1N & WR1O	See "Community Water Quality Monitoring (Waterwatch)" section of the report
WR1K	Community water quality monitoring (Waterwatch) is recommended to be initiated at "Report Card" sites (not already covered by existing Waterwatch Program)
WR1L & WR1M	Water quality data management recommendations

## Priority Action Proposal 2.1 ~ Water Quality Monitoring Great Sandy Straits Executive Summary

### Introduction

The Mary River Catchment Coordination Committee was contracted by the Burnett Mary Regional Group to develop recommendations for water quality monitoring in the Great Sandy Straits.

Priority Action Plan (PAP) 2.1 was initiated to:

- identify and describe the scope of water quality monitoring that is currently occurring within the study area
- assess available information on physical processes and habitat condition in the Mary River catchment to assist with prioritisation of water quality monitoring
- to develop a framework to aid in prioritising areas within the study area where water quality monitoring is needed.
- make recommendations on a suitable holistic Water Quality Monitoring Program within the study area.

### Great Sandy Straits Recommendations Overview

PAP 2.1 – Great Sandy Strait Water Quality Monitoring Report has made the following overall recommendations:

#### Water Quality “Report Card” Program

- High-level assessment of 1 freshwater and 20 estuarine sites in the Great Sandy Strait study area for physico-chemical, biological and habitat assessment on a monthly basis.
- Potential partners: BMRG, EPA, community (Coastcare, Landcare & MRCCC), local government, Wide Bay Water

#### Event Monitoring Program

- Sediment source investigation event monitoring program to be initiated for the Great Sandy Strait, focusing on 6 initial sites for modelling purposes.
- Potential Partners: BMRG, DNRM, DPI Forestry, community (Coastcare, Landcare & MRCCC), Wide Bay Water



#### Recreational Health Monitoring Program

- Bacteriological monitoring of 22 sites within the Great Sandy Strait study area.
- Potential partners: BMRG, local government, EPA

#### Waterwatch Program

- Schools based Waterwatch program to be initiated in the Hervey Bay area, and Waterwatch program to be developed for areas where community interest exists.
- Potential partners: BMRG, community (Coastcare, Landcare & MRCCC)

#### Patterned Fen Investigation

- Identify a partner to undertake baseline studies of the characteristics of the internationally significant patterned fens
- Potential partners: BMRG, EPA, University

The rationale for these recommendations is summarised in this Executive Summary and detailed in the full report.

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## Study Area

The Great Sandy Strait is a sand passage estuary between the mainland of east coast Australia and Fraser Island consisting of a complex wetland system containing intertidal sand and mud flats, mangrove forests, extended seagrass beds, salt flats and salt marshes. For the purpose of this report, the study area has been defined as the waters within the Great Sandy Strait ranging from the northern boundary of the Great Sandy Marine Park to the southern end of Tin Can Bay.

This study area includes Tin Can Bay Inlet incorporating Kauri Creek Fish Habitat Area and the Maroom, Beelbi and Burrum-Toogoom Fish Habitat Areas. The study area contains numerous conservation parks, a dugong protection area (DPA) and the Burrum Seagrass Flats from Burrum Heads east to the border of the Great Sandy Strait Marine Park (following the Hervey Bay Shire boundary).

The study area also includes freshwater inputs into the Great Sandy Strait from small coastal tributaries flowing eastwards.

This study has not investigated Fraser Island coastal waterways. No recommendations for monitoring of Fraser Island coastal waterways will be made in this report. However it is recommended that a separate report for water quality monitoring on Fraser Island and the open coast area east of Fraser Island be commissioned.

### Definition of Great Sandy Strait Zones

The Great Sandy Strait study area has been separated into seven key GSS Zones, described in Table 1. The seven key GSS Zones have been designated based on potential threats or existing boundaries, such as Fish Habitat Areas. Within each of the Great Sandy Strait Zones there may be one or several Water Quality Types, based on Australian & New Zealand Environment & Conservation Council (ANZECC, 2000) or Queensland Environmental Protection Agency (EPA, 2005) guidelines for water quality assessment. These Water Zones broadly separate the study area into three categories:

- freshwater areas
  - upper freshwater (>150 metres above sea level)
  - lower freshwater (<150 metres above sea level)
- estuarine areas
  - upper estuary
  - middle estuary
  - lower estuary
- enclosed coastal areas

The Freshwater Water Quality Zones within the Great Sandy Strait study area (i.e. streams flowing into the zones) are further separated into Waterway Management Units (WMU). Waterway Management Units provide a spatial reference framework for the study.

Table 1. The Great Sandy Strait Zones

Great Sandy Strait Zone	Zone Description
GSS Zone 1	Tin Can Inlet & catchment - including Kauri Creek (northern boundary follows Kauri Creek Fish Habitat Area – includes freshwater and estuarine in-flows)
GSS Zone 2	Wide Bay Harbour Enclosed Coastal zone
GSS Zone 3	Pine Plantation Catchments – Poona, Big Tuan & Maaroom Creek catchments, includes estuaries and freshwater (Maaroom Creek catchment as reference site)
GSS Zone 4	Maaroom Fish Habitat Enclosed Coastal zone
GSS Zone 5	River Heads to Eli Creek (Hervey Bay) Enclosed Coastal zone
GSS Zone 6	Burrum Seagrass Flats (Dundowran/Toogoom Beach) Enclosed Coastal zone
GSS Zone 7	Wide Bay Open Coastal – Pacific Ocean (Sandy Cape (Fraser Island) to Double Island Point)

### Existing Water Quality Monitoring Programs in the Great Sandy Straits

Consultation with agencies and local government has identified where continual water quality monitoring is occurring within the study area. Table 2 below outlines the water quality monitoring currently occurring in the Great Sandy Strait.

Consultation with a variety of groups within the Great Sandy Strait study area has identified the following gaps in the existing water quality monitoring:

- No community-based monitoring program

- No event monitoring program, that includes herbicide transport
- No sediment source and transportation modelling
- No flow gauging of the coastal streams of the Great Sandy Strait
- No formal recreation use monitoring
- No monitoring of aquatic vertebrate or invertebrate species
- No schools-based water quality education program

Table 2 Currently Operating Monitoring Programs in the Great Sandy Strait.

ORGANISATION	Type of Monitoring	Number of Sites
Environmental Protection Agency (EPA)	OLD state-wide ambient program	15
Wide Bay Water Corporation	Water resources	4
Coolooloa Shire Council (CSC)	Water treatment	1
Department of Primary Industries - Forestry	Event based	-
Hervey Bay City Council	Recreational health	20
Coolooloa Coastcare and MRCCC	Baseline data	28

#### The Great Sandy Strait Proposed Water Quality Monitoring Program

Consultation with key stakeholders and community has identified a multi-tiered water quality monitoring program for the study area. The programs will be complementary to building the scientific knowledge and community capacity of the study area.

The recommended water quality monitoring programs are:

- Water Quality "Report Card" Program
- Event Monitoring Program
- Recreational Health Monitoring Program
- Waterwatch Program
- Patterned Fen Investigation

#### Great Sandy Strait Water Quality Report Card Program

The Water Quality Monitoring Report Card Program will be an integrated monitoring program, targeting both freshwater and estuarine/coastal zones. It will focus on assessing the ecosystem response to natural and human impacts. The monitoring program includes several indicators of waterway health, including biological indicators.

Aims of the Water Quality Monitoring Report Card are to:

- Compare waterway health in waterway management units (WMU)
- Identify causes of waterway health and trends
- Provide information on aquatic ecosystem health on a catchment scale to landowners, councils and the community
- Link with existing water quality monitoring programs
- Provide links for improved communication between community and statutory bodies
- Provide advice and support for agency and local government projects and priorities – i.e. Mary Basin Water Resource Plan; stormwater management plans.
- Contribute to the establishment and assessment of 'end-of-catchment targets' as identified in the Burnett Mary Regional Group Coast to Country NRM Plan.

Previous recommendations for a program of this nature have concentrated on the following general system attributes:

- Biota
- Habitat – streamside & instream
- Hydrology
- Water Quality
- Geomorphology
- Upstream Catchment

Biota and aspects of habitat are measures of ecosystem condition whilst the other remainder contribute to ecosystem pressures. It is recommended that the Water Quality Report Card Monitoring Program be undertaken on a six-monthly basis for freshwater zones, and on a monthly basis for the estuarine and enclosed coastal zones.

Sites have been recommended for the Great Sandy Strait Water Quality Report Card Monitoring Program. The basis for decision making on site selection has been undertaken through a 'Threat Vs Value' decision making matrix. Those WMU's identified as having both a high level threat/impact as well as high levels of conservation value have been recognised as Priority One sites for the Water Quality Report Card Monitoring Program. Sites identified as having a high level of conservation value but only a low level of threat have been identified as the Priority Two sites for the Water Quality Report Card Monitoring Program.

This decision matrix is based on analysis of the conservation values and anthropogenic threats from various data sources in the Great Sandy Strait. Factors for calculating these values and threats include:

- Landuse Considerations (Landuse Mapping, Shane Pointon & Karen Newbold, DNR 1998)
- Water Quality (Draft EPA Water Quality Objective, 2005, Compliance)
- Point Source Impacts (Sewage Treatment Plants, Septic and Stormwater Impacts)
- Development Potential (local government planning scheme)
- Endangered, Vulnerable and Rare Species (WildNet Fauna Data Extract)
- HEV areas (EPA, 2005)
- Ramsar Wetlands (DEH, 2002)
- Directory of Important Wetlands (DEH, 2001)
- Seagrass Beds (McKenzie, 1998)
- Fish Habitat Areas (DPI, 2002)
- Condition Scores - Catchment Disturbance Index (Norris, etal, 2001), State of the Rivers (Johnson, 1996)

13 priority one and 8 priority two Water Quality Report Card sites were recommended for the Great Sandy Strait. 20 of these sites are located in estuarine zones, and 1 in freshwater. The recommended program closely aligns with the existing EPA ambient water quality monitoring program. Where possible, existing EPA water quality monitoring sites have been recommended for the report card sites enabling several years of data already collected at these sites to be incorporated into this new program.

The present monitoring that EPA, Wide Bay Water and Cooloolo Shire Council currently undertake can be incorporated into the proposed Water Quality Report Card Monitoring Program. The current EPA monitoring methodology of the Great Sandy Strait is also very similar to the proposed report card monitoring methodology for the estuarine zones. Some additional parameters would need to be sampled, which would increase costs and time of the current EPA monitoring marginally.

Sites not currently monitored by the EPA include:

- Zone 6: Burrum Seagrass Flats and Dundowra/Toogoom Beaches – Two Sites
- Zone 1: At the estuarine area (mouth) of Kauri, Kauri Creek Freshwater site and Teewah Creek – Two Estuarine and One Freshwater Sites
- Zone 3: The mouth of Big Tuan Creek within Zone 3 – One Site

Given the relative proximity to other sites currently monitored by the EPA, they could be incorporated.

KAU2 (Zone 1) is the only freshwater WMU to have been identified as a high priority for Report Card monitoring. A partner would need to be identified to assist with monitoring this WMU.

A partner would need to be identified to analyse and assess the water quality information and data collected. A partner would also need to be identified that could develop the report card assessment methodology.

If all 20 Priority One and Priority Two estuarine sites were monitored on a monthly basis, the approximate costs for the program is estimated to be \$64,800 for on-ground monitoring costs per year (not including data analysis and reporting costs).

As only one freshwater site is recommended for Report Card monitoring in the Great Sandy Strait, the total freshwater on-ground program sites would be approximately \$4604 (not including program management, data analysis and reporting costs).

#### **Great Sandy Strait Event Monitoring Program**

Currently, no event monitoring water quality data exists for the coastal streams in the Great Sandy Strait study area. Sediment supply to the Great Sandy Strait is the priority issue in terms of event monitoring, due to the drastic smothering affects sediments have on seagrass beds and the aquatic life that depends upon them. Nutrient inputs into the Great Sandy Strait are also a concern due to increased turbidity as a result of increased phytoplankton growth from excessive nutrients, as well as the direct effect of excess nutrients on seagrass growth.

The primary recommendation of this report is to conduct a sediment source identification event monitoring study. A decision matrix was devised in order to assess the major coastal streams flowing into the Great Sandy Strait for their

suitably and priority as an event monitoring site for modelling of sediment sources and transportation. Factors included in this matrix were:

- Catchment Condition Index
- Uniformity of Landuse
- Point Source Pollution
- River Order
- Access to Site

Six sites have been identified as the priority sites for the Great Sandy Strait Event Monitoring Program using the decision matrix located in Poona, big Tuan, Maaroom, Teewah, Schnappers and Beelbi Creeks.

The Department of Primary Industries & Fisheries – Forestry are currently initiating a collaborative project with the Queensland University of Technology to study the catchment processes occurring in Big Tuan Creek and Little Tuan Creek. This will include the study of surface water and groundwater quality (Ken Bubb, pers comm. 2004). DPI Forestry have indicated that they would be very interested in being a part of a collaborative research project for event monitoring of the coastal streams entering the Great Sandy Strait (Ken Bubb, pers comm. 2005).

As there are no event monitoring programs currently operational in the Great Sandy Strait or Hervey Bay, this program would have to be developed and established. A partner will need to be identified to assist with the development of this program.

The event monitoring program will require collaboration with an accredited laboratory to analyse Total Suspended Sediments, Total Nitrogen and Total Phosphorous samples taken during flood events. Wide Bay Water has a NATA accredited laboratory, and as event data is possibly of significance to their operations, there is potential for them to be an important collaborator with this program.

Community members could also assist with the operation of this program, as sample collectors, but safety is a prime concern. Therefore a safety induction program will need to be developed if members of the community assist with this program.

A total estimated budget for the on-ground component of the event monitoring program is \$84,900 plus program manager costs (based on an assumed three events per site per year).

#### **Great Sandy Straits Recreational Health Monitoring Program**

A Recreational Water Quality Health Monitoring Program is recommended to be initiated in publicly accessible swimming areas, such as popular river recreation areas or beaches of the Great Sandy Strait and Hervey Bay. Beaches and swimming holes in urban areas are receiving areas for stormwater inputs. Stormwater can contain high levels of nutrients, chemicals and other harmful substances.

The following sections list the potential monitoring sites of the Recreation Health Monitoring Program for each of the Great Sandy Strait zones.

##### **Zone 1: Tin Can Inlet, including Kauri Creek Fish Habitat Area Zone**

This zone contains the urban centres of Cooloola Cove and Tin Can Bay. Both of these areas are popular with boating enthusiasts and used for swimming purposes. A marina is situated at Tin Can Bay, a stormwater is drained into the Tin Can Inlet and there are currently four Boat-ramps located in this zone. Swimming occurs near Mullens Creek Rest Area and the Tin Can Bay foreshore. Recreational Health monitoring has been recommended near these sites. Cooloola Cove will expand in the near future, therefore stormwater (and contaminants) will become a more significant issue in that area than it is today.

##### **Zone 2: Wide Bay Harbour Zone**

This zone is largely undisturbed, with large tracts of mangrove forests and coastal woodland on the foreshores. Within this area are the fishing villages of Tinnanbar, Poona and Boonooroo. These villages are under increasing pressure from urban development, and are unsewered and septic systems are the primary effluent disposal system. Boat-ramps exist at Tinnanbar, Poona and Boonooroo, and swimming occurs near these. The Poona, Tinnanbar and Boonooroo boat-ramps have all been recommended as recreational health monitoring sites.

##### **Zone 3: Pine Plantation Catchments Zone**

Pine plantations established by DPIF dominate these catchments. Tuan and Poona Creeks are the sub-catchments of the Great Sandy Strait affected the most by pine plantations. The fishing villages of Big Tuan and Little Tuan are located in this zone. A boat-ramp is located at Big Tuan, and the extensive sand-flats adjacent to the Esplanade of Big Tuan are a popular swimming area. Urban development is increasing with a greater volume of septic systems being a concern to the residents of the area. Therefore recreational health monitoring is recommended for the sand-flats of the Big Tuan Esplanade.

##### **Zone 4: Maaroom Fish Habitat Area Zone**

Zone 4 takes in the Maaroom Fish Habitat Area, and also includes Maaroom and Kalah Creek. The majority of Maaroom and Kalah Creek is contained within the Poona National Park. The fishing village of Maaroom is located in this zone, and has a local boat-ramp. Effluent disposal within Maaroom is via septic systems, and this area is also under increasing pressure from urban development.

#### Zone 5: River Heads to Eli Creek (Hervey Bay) Enclosed Coastal Zone

This zone has the most human impacts of the study area, and therefore the most significance to recreational health monitoring. Many popular swimming beaches are located in this zone. A marina is located at Urangan, and there are numerous boat-ramps and sailing clubs also located in this zone. A sewage treatment plant is situated on Eli Creek, and numerous stormwater outlets also occur in this locality. Therefore this zone is recommended for intense scrutiny of recreational health monitoring.

#### Zone 6: Burrum Sea-grass Flats (Dundowran / Toogoom Beach) Enclosed Coastal Zone

This zone is expected to experience a major increase in population growth over the next 10 years. This zone contains some very high conservation value areas. Recreational health monitoring will increasingly become an issue for this zone, as urban growth expands, and stormwater outlets are constructed. There are two boat-ramps in this zone, at Burrum Heads and Toogoom. Toogoom is recommended for recreational health monitoring, owing to its proximity to existing urban development.

In south-east Queensland, EPA has collaborated with local government authorities to implement this program. The partnership has involved local government staff collecting the samples at the identified sites, and EPA undertaking the analysis of the samples. A similar partnership could be established in the Great Sandy Strait with the local government authorities of Cooloola, Tiara, Maryborough, incorporating the existing bacteriological monitoring being undertaken by Hervey Bay City Council.

Wide Bay Water's laboratory has facilities to analyse faecal coliforms, and could therefore also be a partner in this program.

#### **Great Sandy Straits Waterwatch Program**

Initial community consultation within the Great Sandy Strait study area concluded that a 'school-based' Waterwatch program involving some water quality testing was appropriate. Hervey Bay High School already undertakes a significant level of water quality education and monitoring within its curriculum, however the program is not ongoing.

The following schools do not have any structured involvement in water quality monitoring, however they indicated that they would be interested in becoming involved, at some level, in a Waterwatch Program in the Great Sandy Strait study area:

- Urangan High School
- Star of the Sea Primary School
- Kawugan Primary School
- Pialba Primary School
- Yarrilea Primary School

Within the Great Sandy Strait study area community interest in the formation of a quality assured Waterwatch Program also exists. Community members have expressed interest in being directly involved in the collection of water quality data. No Waterwatch Programs currently exist in the Great Sandy Strait study area.

Hervey Bay City Council has expressed interest in incorporating a Waterwatch program into their Community Natural Areas Program (McCulloch, pers comm. 2005)

Waterwatch will become an integral component of the Water Quality Report Card Monitoring Program enabling members of the community to undertake water quality monitoring of certain parameters on a monthly basis. Formation of a Waterwatch program will build community capacity and create linkages between the scientific community and the general community, thus creating better understanding and appreciation of the complexity of issues faced by all with current waterway management. Any waterway health data collected by Waterwatch should be in accordance with the MRCCC Quality Assurance program, therefore can be 'fed' into the Water Quality Report Card Monitoring Program.

It is recommended that any Waterwatch water quality sampling be undertaken on a monthly basis. The Waterwatch Program can be initiated in the short term by building upon the existing community waterway health monitoring capacity in the study area.

The Lower Mary Landcare Group has expressed interest in initiating Waterwatch monitoring within the Hervey Bay area (Lesley Bradley, pers comm. 2005). The MRCCC has conducted a workshop with members of the Lower Mary Landcare Group and Hervey Bay school teachers detailing what is involved in establishing a quality assured



Waterwatch program. The major community concerns in this area appear to focus on impacts of Hervey Bay's stormwater on the Great Sandy Strait and Hervey Bay.

The Tin Can Bay community and Cooloola Coastcare have also indicated their interest in monitoring water quality in the Tin Can Inlet as part of a Waterwatch Program. The main water quality concerns raised by the Tin Can Bay community have been the impact of residential development on Tin Can Bay's precious natural asset, specifically the impact of stormwater pollution on the sensitive mangrove zones and patterned fen heathlands. Impacts of camping, the sewage treatment plant and rubbish tips were also all highlighted.

Site selection of the Great Sandy Strait Waterwatch sites should be based on a combination of the location of recommended Report Card Sites as well as a reflection of the water quality concerns of the local community.

A partner would need to be identified that has experience forming and maintaining Community Waterwatch Networks. Appropriate equipment would need to be purchased for the Waterwatch Group and a partner that could analyse, collate and provide feedback to the Waterwatch Group on water quality data they collect.

#### **Patterned Fens Water Quality Investigation**

In 1995 a post Ramsar conference field trip led to the discovery of the now famous Fraser Island and Cooloola patterned fens. These patterned fens are now internationally recognised as the only known patterned fens in subtropical wetlands and are considered geomorphic oddities. They are also the only known patterned fens in the world to support fish and crustacean species.

The Fraser Island and Cooloola patterned fens developed at the base of high dunes where elaborate peat ridge and pool features have formed in response to high volume, surface freshwater flows from the dune systems. The Cooloola fens are located along the western margin of the Cooloola sandmass, on the coastal plain south of Tin Can Inlet and on the Noosa Plain.

There are several threats to the patterned fens of Fraser Island and Cooloola from the impacts of development in the area, such as water extraction, rubbish dump leachate, fertiliser and road runoff, feral animals and fire.

Adequate data on the extent and significance of the threats listed above is lacking. Of particular concern is the effect of pollution from ground water and surface waters entering the fens. Experience overseas indicates that fens can be sensitive to even small amounts of pollutants. A further gap in knowledge relates to the fens' sensitivity to changes in water levels. Variations in seasonal surface water flow and oscillation of the perched groundwaters needs to be established.

It is recommended that the Cooloola (and Fraser Island) patterned fens be included in any water quality monitoring program in the Great Sandy Strait study area. Given the lack of knowledge on the ground water and surface water level and quality properties of the fens, a baseline study is recommended.

Partners with expertise in research science need to be identified to conduct baseline studies on the characteristics and behaviour of the patterned fens ground and surface waters.

#### **Consultation**

To date, community needs analysis meetings have been undertaken with the following organisations who have expressed interest in Great Sandy Strait water quality monitoring activities:

- Cooloola Shire Council
- Hervey Bay City Council
- Maryborough City Council
- Lower Mary Landcare Group
- Cooloola Coastcare
- Wide Bay Burnett Conservation Council
- Environmental Protection Agency
- Wide Bay Water
- Friends of the Burrum River
- Schools of Hervey Bay and surrounding areas

#### **Great Sandy Straits Further Recommendations**

This report further recommends the following steps to aid in catchment management in the Great Sandy Strait:

- Prepare a Great Sandy Strait Receiving Waters (Catchment) Management Plan that incorporates recommendations for the coastal sub-catchments of the Great Sandy Strait.
- Collation of existing research / natural resource information in the Great Sandy Strait into a Resource Atlas.
- Continue Water Quality Monitoring in order to compare and improve upon the EPA's Water Quality Objects set for the Great Sandy Straits Open Waters and the Coastal Creeks of the Great Sandy Region

Great Sandy Straits PAP 2.1 Application of Recommendations to BMRG Country to Coast Management Actions

BMRG Management Action (Critical Priorities)	Integration of PAP 2.1 Recommendation
MB1P	"Report Card", community, event and recreational health monitoring data will be able to be produce a "State of the Estuary Report" for Great Sandy Strait Estuaries
CMD1D	"Report Card", community, event and recreational health monitoring data will condition data on habitats and aid in prioritising Further investigation into this internationally significant patterned fen habitat
CMD1E	Report Card", community, event and recreational health monitoring data will be available to LGA planners to aid in decisions on effect of developments on water quality and habitat values
CMD1I & CMD1J	"Report Card", community, event and recreational health monitoring data will be available to aid in planning decision for BMRG, LGA and community to implement and monitor BMPs for urban surface water, waste and pest management and reuse practices for future (and current) developments
LR2E	"Report Card", Community and event monitoring data to provide information on sand and gravel extraction assessment of impacts
CD1A	"Report Card", community, event and recreational health monitoring reports will provide information dissemination on water quality issues Community water quality monitoring (Waterwatch) will provide strong basis for community engagement
WR1A	See "Existing Water Quality Monitoring" section of this report
WR1B	Event monitoring data will provide essential sediment and nutrient data for modelling purposes
WR1C & WR1D	"Report Card", community and recreational health monitoring data will be essential for setting of any water quality targets
WR1F	"Report Card", community, event and recreational health monitoring data will provide the basis for decision making in WOIP's outcomes
WR1H, WR1I, WR1J, WR1N & WR1O	See "Community Water Quality Monitoring (Waterwatch)" section of the report
WR1K	Community water quality monitoring (Waterwatch) is recommended to be initiated at "Report Card" sites (not already covered by existing Waterwatch Program
WR1L & WR1M	Water quality data management

**Priority Action Proposal 2.2 ~ Rivercare  
Mary River Catchment Executive Summary**

**Introduction**

The Mary River Catchment Coordinating Committee were contracted by the Burnett Mary Regional Group to develop recommendations for Rivercare planning and activities in the Mary River Catchment (study area).

Priority Action Plan (PAP) 2.2 was initiated to:

- Identify and describe the scope of Rivercare activities that has occurred within the study area.
- Assess available information on processes and condition in the study area to assist with prioritisation of Rivercare planning and activities
- To develop a framework to aid in prioritising areas within the study area requiring Rivercare planning and activities
- Make recommendations on a suitable Rivercare Program within the study area

**Study Area**

The Mary River catchment covers 940,000 hectares, extending from Maleny in the south to Hervey Bay in the north. The length of the Mary River is 305 kilometres. When the major tributaries are added the total waterway network amounts to 2947 kilometres (Johnson, 1997).

**Identification of significant natural aquatic features of the study area**

The Mary River Cod is one of Australia’s most endangered fish with populations largely restricted to a few tributaries of the Mary catchment (Simpson & Jackson, 1996). Habitat use by Mary River Cod was highly specific, with more than 93% of all Cod observed within 2 metres of submerged timber (Simpson, 1999).

The Australian Lungfish (*Neoceratodus forsterii*) is only found in the Mary River and Burnett River catchments. Listed as Vulnerable under the EPBC Act, Australian Lungfish habitat is found in the middle reaches of the Mary River, Yabba and Obi Obi Creeks (pers. Comm.. Michael Hutchison, 2004).

The SEQ Stream Frog Recovery Plan identifies the Kenilworth area as a high priority area for rare stream frogs targeted in the recovery plan, namely:

- Giant Barred Frog (*Mixophyes iterates*)
- Cascade Treefrog (*Litoria pearsoniana*)
- Southern Day Frog (*Taudactylus diurnis*)

The Mary River Turtle (*Elusor macrurus*) has been recorded in the Mary River upstream of Tiaro to Gympie. The Mary River Turtle is listed as Endangered under the EPBC Act. An undescribed species of turtle is also found in the Mary River catchment, as well as the Burnett and Fitzroy River catchments. This species is known as *Eseya* sp aff *dentata*.

**Compilation of existing Rivercare project sites across the catchment**

Between 1995 and 2004, the MRCCC has been involved in approximately 300 Rivercare Implementation Projects in the Mary River Catchment. These projects have focused on riparian protection and rehabilitation of freehold riparian land. To date over 280 riparian landholders have been assisted by the MRCCC through devolved grant programs.

Rivercare Activities with Land-use					
Beef	Dairy	Horticulture	Rural Residential	Urban	Other
42%	21%	6%	21%	5%	5%
Land-use percentage of Mary River catchment					
Beef	Dairy	Horticulture	Rural Residential / Urban	Other	
48%	3%	3%	6%	40%	
Number of Rivercare projects within Land-use Types					
115	57	11	71	18	

Table 1: Rivercare projects (1995-2004) compared to land-use

### Identification of Benefits from Rivercare projects

Benefits of Rivercare Devolved Grant Programs can be discussed as externalities and direct on-farm benefits. Externalities are those benefits that the community derives, but may not directly pay for those actual benefits. Examples include:

- Ecosystem services that freshwater terrestrial and aquatic ecosystems perform for the benefit of the general community
- Protection and rehabilitation of habitat for important species of fauna and flora, such as the Mary River Cod and Mary River Turtle.
- Lower cost of water purification for downstream users due to lower bacterial levels, nutrients and sediment loads
- Extended life of water storages facilities due to lower sediment ingress
- Improved recreation and commercial fishery and consequential economic benefits to the wider community
- Slowing the decline of freshwater and estuarine fish habitat
- Reducing environmental weed spread
- Lower stream nutrient loads and less favourable environment for water weeds
- Reduced flood peak rates downstream with attendant reduction in farm land loss by bank erosion and infrastructure damage
- Nutrient filtering ability of riparian and wetland areas
- Improved aesthetics of the catchment

On-farm benefits to the individual landholder (particularly dairy and beef enterprises) are those benefits that derive an increased gross margin (financial gain) to the producer.

Significant sensitivities surround the on-farm benefits gained through Rivercare projects, however it is generally accepted the following benefits are derived:

- Nutrient Recycling via animal waste
- Better Feed Management & Production
- Reduced cattle mortality by misadventure
- Reduced cattle disease
- Time saved mustering & inspection
- Erosion loss avoided
- Better quality & accessibility of stock water
- Improved animal heat load management
- Carbon sequestration

Whether these on-farm benefits accrue sufficient on-farm income to be justified purely on financial terms is the subject of much debate.

#### Recommendations:

- |   |
|---|
| * Conduct case-studies to assess on-farm and externality benefits derived from Rivercare Activities in the Mary River catchment     |
| * Develop easy-to-use benefit / cost assessments as a decision tool for assessing individual Rivercare project funding applications |

#### Tributaries classified according to fluvial geomorphic principles to identify waterway management units

Waterway Management Units (WMU) have been identified on the basis of the following criteria:

- Channel morphology
- Valley morphology
- Geology
- Major water infrastructure

The following sources of information were used in WMU classification:

- Aerial photography
- Long profiles of waterways
- Published geological, topographic and road maps
- Site inspections

Within the study area 205 WMU were identified and assessed. Some of the lower order waterways have not been assessed. Generally second and third order waterways have not been assessed due to time constraints.

**Assessment of the biophysical condition of the WMU**

The condition of the WMU was assessed using a methodology that considered the following factors:

- Geomorphic and physical condition
- Riparian condition
- In-stream habitat condition
- Aquatic ecology condition

**Assessment of the water quality of the WMU**

The WMU water quality assessment involved analysing water quality values within a WMU. The process involved condition assessment according to:

- Good water quality objective compliance (WQO) (<40% non-compliance)
- Moderate water quality objective compliance (WQO) (>60% non-compliance)
- Trajectory of water quality within the WMU, i.e. improving or degrading

**PAP 2.2 FINDINGS**

**Prioritized WMU according to biophysical aspects**

The WMU biophysical prioritisation is based on the classification proposed in the Australian Manual for Rehabilitating Streams (Rutherford et al 1999). The process involves setting priorities taking into account:

- Rarity (rare before common)
- Condition (good before bad)
- Trajectory (degrading before recovering)
- Ease of fix (easy before hard)

Condition ratings were used in conjunction with assessments of conservation status to prioritise WMU's according to their biophysical status. WMU with high recovery potential and significant natural values were accorded the highest biophysical priorities.

**Prioritized WMU according to water quality aspects**

The water quality values were prioritised using a number of water quality considerations. Regionally significant water quality considerations were determined to be:

- Sediment contribution the coast (highest priority)
- High to moderate salinity hazard rating of sub-catchment (highest priority)
- Compliance against draft EPA WQO guidelines for the Mary – Great Sandy Region (moderate priority)
- Town water off-takes (moderate priority)

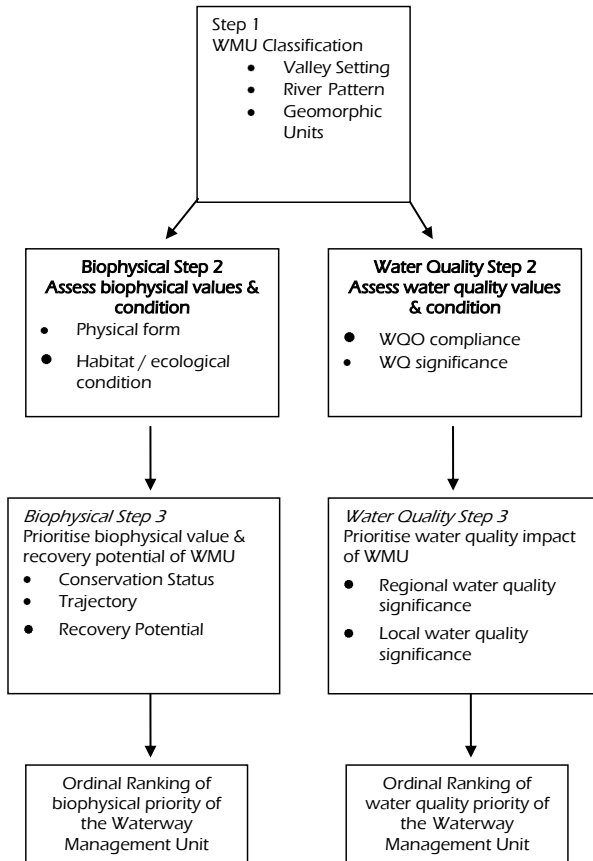
**Estimated costs of Rehabilitation**

Estimates of the costs of rehabilitating WMU's to a 'target' condition were determined. The costs developed do not include in-kind, as this would need to be negotiated at a later date.

Levels of intervention for each WMU were estimated to develop the costings.

Tributary	Rehabilitation Cost	Tributary	Rehabilitation Cost
Mary River	\$27 437 314	Deep Creek	\$4 711 653
Belli Creek	\$1 451 236	Eel Creek (Cooloola)	\$1 967 787
Cedar Creek	\$537 572	Pie Creek	\$723 006
Gheerulla Creek	\$1 115 679	Glastonbury Creek	\$4 970 308
Walli Creek	\$815 473	Widgee Creek	\$5 605 434
Obi Obi Creek	\$6 835 474	Wide Bay Creek	\$12 366 596
Little Yabba Creek	\$1 432 976	Munna Creek	\$8 025 569
Yabba Creek	\$6 913 527	Myrtle Creek	\$6 242 896
Kandanga Creek	\$8 135 740	Tinana Creek	\$12 503 622
Amamoor Creek	\$6 187 238		
Six Mile Creek	\$6 826 732		

**Process used to determine priorities**



**Biophysical priorities – protection & rehabilitation of aquatic ecosystems**

Seven categories have been identified based on conservation status, recovery and trajectory of the WMU. The seven categories are as follows in Table 2:

Priority	Description
1	Protected WMU in good condition throughout
2	Unprotected WMU of regional conservation significance
3	WMU of local conservation significance
4	Deteriorating strategic WMU
5	Linking WMU and significant remnant sections
6	WMU with moderate recovery potential
7	WMU with little chance of natural recovery potential

**Recommendation:**

- \* Highest biophysical priority should be directed towards the protection or rehabilitation of WMU with high recovery potential or significant natural assets
- \* Priorities 1 – 5 provide the best ecological outcome from investment

**Water quality priorities – stabilisation of water quality condition**

Four categories have been identified based on regional water quality influences within the WMU. The four categories are as follows:

1. Water quality of regional significance
2. Locally significant water quality at risk
3. Locally significant water quality at low risk
4. Water quality at risk

Water Quality Category	Key WMU Attributes
Water quality of regional significance (Priority 1)	<ul style="list-style-type: none"> <li>• High sediment to coast</li> <li>• High – moderate downstream salinity hazard potential</li> </ul>
Locally significant water quality at risk (Priority 2)	<ul style="list-style-type: none"> <li>• Good WQO compliance, WMU trajectory degrading</li> <li>• Town water off-take, WMU trajectory degrading</li> </ul>
Locally significant water quality at low risk (Priority 3)	<ul style="list-style-type: none"> <li>• Good WQO compliance, WMU trajectory is improving</li> <li>• Town water off-take, WMU trajectory improving</li> </ul>
Water quality at risk (Priority 4)	<ul style="list-style-type: none"> <li>• Moderate WQO compliance</li> </ul>

Table 3: Water Quality Priorities

**Recommendation:**

- \* Highest water quality priority should be directed towards the WMU which exhibit high to moderate downstream effects
- \* Targeting priority 1 will provide the greatest downstream impact towards improving water quality
- \* Consideration should be given to identifying areas of high nutrient values, and the subsequent downstream effects, as recognised in the Reef Water Quality Protection Plan

**EVR significant WMU**

There are some WMU that contain EVR aquatic species in the Mary River Catchment. These EVR WMU have been identified separately to the biophysical or water quality status, due to the significance these WMU possess in table 4.

WMU	EVR Species Present	WMU	EVR Species Present	WMU	EVR Species Present
AMA2	Yes	KIL1	Yes	SAL2	Yes
BEL1	Yes	KIL2	Yes	SAT2	Possibly
BEL2	Yes	LYC1	Yes	SCR2	Yes
BEL3	Yes	LYC2	Yes	SIX1	Yes
BLF1	Yes	MAR1	Yes	SIX2	Yes
BLF2	Yes	MAR3	Yes	SIX3	Yes
BOO1	Yes	MAR4	Yes	SIX4	Yes
CED1	Yes	MAR5	Yes	SIX5	Yes
CED2	Yes	MAR6	Yes	SKE1	Yes
CED3	Yes	MAR7	Yes	SKE3	Yes
COE2	Yes	MAR8	Yes	SKY1	Yes
COE3	Yes	MAR9	Yes	SUS3	Yes

COO1	Yes	MAR10	Yes	TIN2	Yes
COO2	Yes	MAR11	Yes	TIN3	Yes
ELA1	Yes	MAR12	Yes	WAL3	Yes
ELA2	Yes	MAR13	Yes	WID3	Yes
FLA1	Yes	MAR15	Yes	WID4	Yes
FRY1	Yes	MAY1	Yes	WID5	Yes
GER1	Yes	MUN1	Yes	WON1	Yes
GER2	Yes	MUN2	Yes	YAB3	Yes
GHE1	Yes	MUN6	Yes	YAB4	Yes
GHE2	Yes	MYR2	Yes		
GLA3	Yes	PIN1	Yes		

Table 4: EVR species present in WMU

#### PAP 2.2 RECOMMENDATIONS

##### Protecting intact and rehabilitating repairable WMU

After assessing the biophysical condition and values of the study area it is recommended that those WMU that contain high recovery potential, intact or repairable aquatic ecosystems (priorities 1 to 5) should receive highest priority. This recommendation complies with actions identified in the Freshwater Biodiversity Asset Targets in Table 5.

Burnett Mary NRM Plan	
Management Actions	Descriptions of Management Actions
<b>Freshwater Biodiversity</b>	
"Critical" priorities	
FB1E	Identify freshwater biodiversity EVR species, collate available information on current population sizes
FB1G	Support development and implementation of freshwater biodiversity endangered species recovery plans
"High" priorities	
FB3D	Identify and map high value freshwater biodiversity areas
FB3E	Facilitate provisions for planning support for shires to protect significant wetlands
FB3F	Implement support to landholders to protect significant wetlands
FB3G	Increase understanding of wetlands and develop management plans
FB3J	Undertake mapping and condition assessment of riparian zones and adjacent land-use
FB3K	Develop implementation plans to improve riparian and wetland condition

Table 5: Asset Target linkages to protecting intact and rehabilitating repairable WMU

##### Stabilizing WMU with potential downstream water quality problems

After assessing the water quality condition and values of the study area it is recommended that those WMU that could have the most downstream impact to aquatic ecosystems (priority 1) receive the highest priority. This recommendation complies with actions identified in the Water Resources and Land Resources Asset Targets in Table 5.

Burnett Mary NRM Plan	
Management Actions	Descriptions of Management Actions
<b>Land Resource</b>	
"Critical" priorities	
LR1C	Identify and map high priority biodiversity and erosion hazard sites on grazing land
LR1D	Implement remediation works in priority locations on grazing land
LR1E	Support the development of property management plans on grazing land



LR3D	Implement weed and pest management program
"Important / moderate" priorities	
LR5C	Implement devolved grants to address salinity risk areas
<b>Water Resources</b>	
"Critical" priorities	
WR1G	Develop programs to support and incentives to mitigate impacts in water quality hot-spots
"High" priorities	
WR5A	Assess erosive condition status of high order streams and develop feasible mitigation options
WR5B	Implement protection and rehabilitation activities through Rivercare activities
WR5C	Develop and implement riparian zone devolved grant program
WR5D	Develop and implement assessment program to measure the condition/integrity of native riparian vegetation

Table 6: Asset Target linkages to stabilizing WMU with potential downstream water quality problems

**Maintaining and enhancing aquatic dependent EVR populations**

WMU that contain EVR aquatic species were identified for the study area. It is recommended that property owners within WMU and the general community become aware of EVR aquatic species within the study area. This recommendation complies with actions identified in the Freshwater Biodiversity Asset Targets in Table 7.

<b>Burnett Mary NRM Plan</b>	
<b>Management Actions</b>	<b>Descriptions of Management Actions</b>
<b>Freshwater Biodiversity</b>	
"Critical" priorities	
FB1E	Identify freshwater biodiversity EVR species, collate available information on current population sizes
FB1G	Support development and implementation of freshwater biodiversity endangered species recovery plans

Table 7: Asset target linkages to maintaining and enhancing aquatic dependent EVR populations

**Wonga Drought Recovery Project**

The Drought that affected much of Queensland over the past three years has highlighted many water use issues in rural areas. During the drought, not only did irrigation and stock water become scarce, many also noticed the water becoming more saline. Rising salt levels place much stress on irrigation, stock and domestic water use, as well aquatic life within streams.

For these reasons the Wonga Drought Recovery Project was initiated in the Wonga District north west of the township of Gympie in South East Queensland. Water use efficiency and riparian management were identified as actions that could help alleviate some of the affects of drought and salinised water.

The Mary River Catchments Coordinating Committee developed the Wonga Drought Recovery Project in order to raise awareness and educate landholders on the issues of water-use efficiency and streambank management. These actions have helped prepare the Wonga district for future droughts and salinity problems.

The Wonga Drought Management Project focused on four main areas:

- Irrigation Efficiency
- Water Use Management
- Water Quality Monitoring (Salinity)
- Riparian Management

The actions undertaken within each of these four areas are outlined in the following sections.

### **Irrigation Efficiency**

The major focus of the Wonga Drought Recovery Project was to increase awareness in the Wonga district on the water use efficiency of irrigation systems. The following actions were undertaken to achieve this.

### **Irrigation Water Use Efficiency Practices Survey Form**

A survey form was developed by MRCCC and Growcom, aimed at gauging the importance of irrigation water use efficiency to irrigators in the Wonga district. Appendix 1 shows the circulated survey form. The survey asked landholders questions such as 'do you consider water use efficiency essential to farm management' and 'have you ever undertaken work (or monitoring of) to improve irrigation systems water use efficiency'.

The major finding of the survey form was that although many irrigators realised that water efficiency was an issue, and considered an important part of their farm management, most did not have the means to accurately monitor their water use or the water use efficiency of their irrigation systems. Local fodder producers (namely Lucerne growers) were also highlighted as a group with little to no industry based support, particularly in regards to water use efficiency issues.

The results of the survey forms helped in determining what the needs of the Wonga district irrigators were in terms of irrigation water use efficiency, and helped in forming appropriate management actions of the project to meet these needs

### **Wonga Drought Recovery Project Water Use Efficiency Workshop**

On the 14<sup>th</sup> October 2004 at Falkirk Farm, Jensen Rd Lower Wonga, a workshop was organized by the Mary River Catchment Coordinating Committee, Growcom, Falkirk Farm and Australia Macadamia Management. George Russle and Scott Wallace from Growcom ran the technical side of the workshop covering irrigation systems design and performance topics, such as:



- Distribution Uniformity and its impact on yield
- Simple methods to measure the performance of irrigation systems
- The relative efficiency of various irrigation systems

Irrigators from the Wonga and surrounding district were invited to learn about improving the water use efficiency of their irrigation systems. The improvements were aimed to help reduce the water usage pressures in the Widgee catchment, increase crop yields and to

save irrigators dollars.

Approximately 26 people attended the workshop including local irrigators and Growcom and irrigation industry representatives. Local irrigators hailed the afternoon a success, gaining further information and ideas on how to improve water use efficiency of their irrigation systems. Proceedings were concluded with a BBO lunch for all.

### **Irrigation Water Use Efficiency Demonstration Site on Falkirk Farm**

The Wonga Drought Recovery Project (MRCCC), Growcom, Falkirk Farm and Australia Macadamia Management have set up an Irrigation Water Use Efficiency Demonstration site on Falkirk Farm Jensen Road, Lower Wonga Southeast Queensland (managed by Australia Macadamia Management).

Research by Australia Macadamia Management found that due to uncertainty of irrigators in the Gympie district regarding financial returns from irrigated macadamia crops, many systems have been allowed to become run down and inefficient. Also that research investments into the water use requirements of macadamias in Australia is very limited.

Their research concluded that there was a need to assess irrigation of macadamia crops due to:

- Limits on water storage and replenishments and limited understanding on how to most profitably utilise this resource



*George Russell and Scott Wallace from Growcom at the Wonga Drought Recovery Water Use Efficiency Workshop at Falkirk Farm.*

- Gaps in knowledge of total water requirements, frequency and duration of watering
- Limited appreciation of impacts of water deficit to crops following irrigation
- Limited appreciation of effects of poorly maintained or designed irrigation systems

The set up of the Water Use Efficiency Demonstration Site on Falkirk Farm aims to:

- Provide guidelines with regard to irrigation requirements of macadamia and optimum water use
- Demonstrate the value of improving distribution uniformity of irrigation regimes
- Demonstrate the value of monitoring water use and scheduling irrigation

The Demonstration Site is achieving these aims by initiating a monitoring program set up by undertaking the following steps:

1. Identifying three irrigation blocks suitable for the trial, two to be set up with high distribution uniformity (DU) and one to be left as is for the control block
2. Installing two high DU blocks with pressure gauges to monitor DU
3. Installation of three phytomonitoring devices (dendrometer to measure trunk diameter daily contraction) to determine irrigation frequency and duration requirements
4. Installing soil moisture remote sensor within one of the monitored trees for soil moisture data
5. Installing trial area with a flow meter to record water use
6. Installing air temperature and relative humidity remote sensor
7. Recording production and water use for (a) high DU optimally irrigated block, (b) high DU sub-optimally irrigated block and (c) the "as is" DU block
8. Measuring and recording DU of all three blocks
9. Using relative humidity and temperature data to assist in determining the conditions under which the irrigation strategy can not be used to moderate climatic stress events
10. Using rainfall and water use data to assist in modelling when an investment in irrigation infrastructure may not be viable.

Essentially these steps have led to the a trail area dived into three areas:

1. Irrigated on demand to minimise moisture stress with high distribution uniformity
2. Guesstimated irrigation scheduling with high distribution uniformity
3. Guesstimated irrigation scheduling with poor distribution uniformity.

The trial results will provide guidelines on:

1. Optimum area that can be irrigated for maximum profitability and optimum water use
2. Best approach to upgrading existing irrigation system to maximise water use efficiency and provide the best return on that investment.

Data from the project is being collected, Appendix 2 shows a sample of the phytomonitoring data being collected by the project.

After one growing season (12 months) there will be enough data to begin to provide information for the above guidelines. However data collection will continue for a minium of two years.

#### **Water Use Efficiency Improvement Grants**

A Water Use Efficiency Improvement Application Form was submitted by irrigators who were extracting water directly from streams in the Wonga area (Widgee, Wonga and Widebay Creeks).

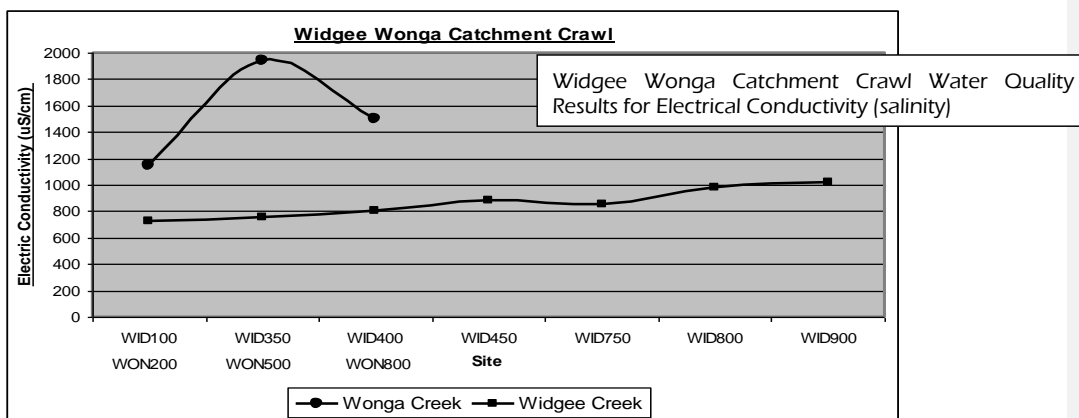
The installation of water meters was the predominant grant activity. The installation of these water meters is now enabling irrigators in the area to accurately record the amount of water they are using when irrigating their crops.

The successful applicants have been provided with a Water Meter Data Recording Sheet (please see Appendix 3). The data sheet records the water meter readings, along with pumping times and size of the area being irrigated. This data sheet will allow important information to be gathered and analysed on irrigation water usage and crop yield rates, previously not available to the irrigators in the area.

#### **Water Quality Monitoring (Salinity)**

The Widgee-Wonga Catchment Crawl was held in May 2004. The Catchment Crawl was designed to provide a 'snap shot' of water quality along the Widgee and Wonga Creeks. Seven sites were tested along Widgee Creek and three Sites along Wonga Creek. By working down the Widgee and Wonga Creeks, sampling water quality parameters, trends in water quality could be investigated. The Widgee Wonga Catchment Crawl has provided baseline water quality data for Widgee and Wonga Creeks.

Stream water quality is very susceptible to the impacts of dryland salinity and is seen as a good indicator of land-based salinity problems, and was the focus of the Widgee Wonga Catchment Crawl. Surface water uses such as the protection of aquatic ecosystems, recreation, irrigation, stock watering and domestic water supply can all be affected by rising water tables and dryland salinity, and the monitoring of these waters is an important part of salinity management.



Electrical Conductivity (EC uS/cm) was used in the Widgee Wonga Catchment Crawl as an indicator of salinity in the Widgee catchment. A high EC reading indicates a high level of dissolved salts in the water sample. The figure below illustrates the EC data collected on the Widgee Wonga Catchment Crawl.

The ANZECC Water Quality Guidelines gives a target value for Electrical Conductivity of 125 to 2200 uS/cm for lowland streams (below 150m altitude). As the figure above illustrates all of the sampled sites fall within these guidelines. Wonga Creek exhibited a noticeably higher EC values than those of Widgee Creek, and both streams exhibit higher average salinity levels than those observed in the main Mary River (average EC of 315 uS/ms for a Mary River Catchment Crawl held 12/05/2004, compared to an average of 859 uS/ms for Widgee Creek). A report by Wylie, Johnston and Forster, Decline of Casuarina and

Eucalyptus in the Mary River Catchment, sampled 40 sites throughout the Widgee catchment in February and November in 1983 for steam salinity. An average of 1321.2 uS/cm was recorded, a little higher than the average of 859 uS/cm recorded on this Catchment Crawl.

Salinity is generally lowest during high flow periods and increases as flow decreases. The rainfall in recent months prior to the Widgee Wonga Catchment Crawl resulted in healthy flows in Widgee and Wonga creeks, and so high EC levels would not be expected. Extreme EC levels may have been recorded during times of drought when higher levels of water evaporation and lower flows can cause a concentration of salts in the water. Flows of fresh water into the river will dilute the salts.

A slight rise in EC along Widgee Creek can be seen as the Salinity Catchment Crawl moves downstream. This small rise may be attributed to an accumulation of salts from inflowing tributaries. As more tributaries flow into Widgee Creek any salts they bring will accumulate.

Other physio-chemical parameters (Temperature, pH, Dissolved Oxygen, and turbidity) were also recorded on the Widgee Wonga Catchment Crawl, and results and discussion on these can be viewed in the full report of the Catchment Crawl. With data such as the data collected on the Catchment Crawl a better understanding of the water quality characteristics and issues in the Widgee and Wonga Catchments has been gained.

A follow up Widgee Wonga Catchment Crawl was held in July 2004, testing all of the same parameters at all of the same sites. The only observed difference in the data of the two crawls, was temperature, which, as expected, was

several degrees cooler in the July Widgee Wonga Catchment Crawl. Data sets for the rest of the parameters (EC (salinity), pH, Dissolved Oxygen and Turbidity) recorded very similar values, and followed very similar trends between sites.

The Widgee Wonga Catchment crawls not only provided valuable information on the water quality concerns for this catchment, but also raised much awareness amongst landholders in the area on water quality and catchment management issues. The MRCCC has plans to establish a Waterwatch Network in the Widgee, Wonga Wide Bay Catchment area to further the results of the Widgee Wonga Catchment Crawl.

#### **Riparian Management**

A riparian management demonstration site has been established on Harch Road in the Wonga District along Widgee Creek.

The project involved the erection of 1.85km of streambank fencing. The erection of the fence has excluded the cattle access to the sensitive riparian zone. This will allow the regeneration of native riparian species. Weed control is an issue this zone, and is being addressed by the landholder.

Floodwaters are known to be a major problem to streambank fencing in the Widgee catchment. Because of this fact 1.13km of the fencing at the demonstration site was constructed in flood resistant design dramatically reducing the costs in labour and materials for fence repairs in the event of flood damage.

Off-stream watering points were also installed as part of the project. Three troughs were placed at strategic points along the stream and fed by an existing pump. This allowed the cattle access to clean drinking water once they were excluded by the riparian fencing.

The demonstration site has shown the community in the area the dual benefits of streambank fencing for improved farm management (such as reduced mustering time and improved cattle drinking water quality) and the protection of the important riparian zone.

There are future activities planned for the riparian zone at the demonstration site including tree plantings and coordinated control of the extremely invasive climbing weed 'Cats Claw'.

#### **Cats Claw Education**

As part of the Widgee Wonga Catchment Crawl time was spent with students from Widgee State School to educate them on the identification and control techniques for the invasive vine weed Cats Claw Creeper (*Macfadyena unguis-cati*). Cats Claw creeper is a massive problem in the Widgee Wonga catchment, and education is needed and wanted by the community on what they can do to help control this very problematic weed.

#### **Frog Monitoring**

A frog monitoring night was held by MRCCC staff at the Wonga Drought Recovery Project Riparian Management Demonstration site on the 1<sup>st</sup> of March 2005. The following species were recorded:

- *Litoria wilcoxii* (Stoney-creek frog) x 10
- *Limnodynastes ornatus* (Ornate burrowing frog) x 1

Crimson-spotted rainbow fish and Mullet were also observed during the search.

Although many Stony-creek frogs were identified, the site recorded a low overall diversity of frog species, which may be attributed to the dry conditions.



*Litoria wilcoxii* (Stoney-creek frog)  
on Widgee Creek

#### **Policeman's Spur Rivercare Project**

The Policemans Spur Rivercare Group (PSRG) was formed in 2003, by a concerned group of residents along Policemans Spur Road which is approximately 10km south of the township of Conondale in the Sunshine Coast hinterland. All residents of the group have river frontage to the Mary River headwaters or Geraghty's Creek, and the majority live along Policemans Spur Road.

The Mary River headwaters and Geraghty Creek flow down from the Conondale Ranges through near pristine riparian rainforest, meeting at their junction along Policemans Spur road. The creeks are in relatively good condition, and have very high scenic and ecological values. The Mary River and Tributaries Rehabilitation Plan (MRTRP) gives Geraghty's Creek a priority rating of 2 (an unprotected reach of regional conservation significance) while the Mary

River headwaters is given a priority of 3 (a reach of local conservation significance), indicating that both are very high priority reaches for protection and rehabilitation.

All members of the group share the common goal of protecting, rehabilitating, reconnecting and extending the riparian zones in this catchment, in order to improve water quality and catchment health as well as improving and protecting habitat for several rare and threatened fauna species, such as the Mary River Cod (*Maccullochella peelii mariensis*) and Conondale Crayfish (*Euastacus hystriacus*).

Building on from other very successful Rivercare projects in the upper Mary River Catchment, the Policemans Spur Rivercare Group has achieved their goals to date, making significant improvements to the health of the riparian zone along Policemans Spur Road.

The Policemans Spur Rivercare Group received funding for Rivercare work, including stream bank fencing, off-stream livestock watering points, weed removal, revegetation and the setting up of a small nursery, from the following the Australian Government Envirofund and the Caloundra City Council. The Policemans Spur Rivercare Group and the MRCCC would like to thank the following groups for their support throughout the project:

- Barung Landcare
- Noosa Landcare
- Caloundra City Council's Weeding Team (in particular Greg Brown)



The Policemans Spur Rivercare Group meet regularly to discuss the progress of the groups on-ground actions and to raise any new issues. The meetings often double as a social gathering, building upon community and neighbourhood relationships.

#### **Policemans Spur Rivercare Groups Weeding Manual**

A weed control manual has been compiled for the PSRSG to provide accurate and useful information on weeding in the upper Mary River catchment. The manual contains information on the majority of weeds occurring in this area. There is a detailed description of each weed along with the recommended control techniques required for the effective removal of each of these weed species. There is additional information on weeding techniques, integrated pest management, weed ecology and proper weed identification.

#### **Policemans Spur Rivercare Groups Weeding Tool Kit**

A weeding tool kit was compiled for the Policemans Spur Rivercare Group, to aid in the concerted effort to control weeds. The weeding kit is circulated among the members of the group, and has made the often gruelling task of weed control a little easier with the provision of effective weed control tools.

#### **Revegetation Funding**

Several landholders of Policemans Spur Rivercare Group received funding for the purchase of seedlings from Barung Landcare nursery for the revegetation and enrichment plantings of the riparian zone along Policemans Spur Road. In total 3000 local native seedlings will be planted by the groups members. Appendix 4 shows the list of plant species to be planted. The Policemans Spur Rivercare Group has also purchased around 800 reusable tree guards and \$1000 worth of mulch, to be shared among the funding recipients when needed. Future tree planting days are planned, when weather conditions are right.

#### **In-Kind Contributions:**

Significant in-kind contributions have been made by the Policemans Spur Rivercare Group, through labour for fencing, installation of off-stream watering, revegetation efforts and especially through ongoing maintenance of riparian zones. The table below outlines the amount of In-kind funding generated by the various activities of the group.

#### **Index of Stream Condition Monitoring**

As part of the Policemans Spur Rivercare Project, Index of Stream Condition (ISC) monitoring was performed at two sites along the Mary River headwaters, in May 2004 and March 2005. The ISC has been developed as a rapid assessment tool to take a 'snap shot' of the condition of a stream and its associated riparian zone. The ISC consists of four sub-indices: Water Quality, Physical Form, Streamside Zone and Macroinvertebrates. The ISC monitors a 400m stream reach, with three transects (transect 1 being the central point of monitoring).

A Corridors of Green Vegetation (COG) analysis was also performed at each of the sites. The COG methodology involves a detailed analysis of the vegetation in 3 quadrants, located along the ISC transect 1, resulting in a score for the site. For more information on the ISC and COG and their methodologies please refer to the ISC manuals and the 2003 MRTRP Monitoring and Evaluation Report.

The ISC and COG monitoring was undertaken at two revegetation sites on the Mary River headwaters along Policemans Spur Road. The O'Donnell site is a 25 year old revegetation project on the corner of Policemans Spur and Aherns Road. The site is recognised by the PSRSG members and local natural resource managers and also the wider

community as a case study for a successful riparian restoration project. The site is now a healthy 30-40m strip of riparian vegetation, where before the project, only a handful of trees stood. The second monitored site was the PSRG's Taylor revegetation site. Here 800 trees were planted to extend the riparian zone of the Mary River headwaters. A thin (20m) strip of relatively healthy vegetation already existed, however the planting is hoped to much improve this section of the stream.

#### **Future**

The Policemans Spur Rivercare Group has achieved some impressive outcomes in its short existence, however this is by no means the end of their activities.

The group is committed to continue its war against weeds in the Upper Mary River Catchment, and although the battle often seems an insurmountable task, will not be deterred! Further weed education and eradication field days are also planned by the group, along with several tree planting days to continue the extension of the riparian zone.

The group will also continue their meetings, understanding the importance of not only getting the on-ground work done, but also the essential aspect of community capacity building and getting to know their neighbours (and a great BBQ to boot).

The PSRG hopes to build on the work they have already achieved, to extend the group and to work closer with other small Rivercare groups in the area (such as the Friends of Kilcoy Creek Group) to continue to improve the health of the Upper Mary River Catchment.

## **Progress Toward the Control of Cabomba in Australia – 2004-2005 Report**

Mic Julien ([mic.julien@csiro.au](mailto:mic.julien@csiro.au)) and Shon Schooler ([shon.schooler@csiro.au](mailto:shon.schooler@csiro.au)), CSIRO Entomology

### **SUMMARY OF PROGRESS**

#### **Argentina**

- We have identified two potential biological control agents and are continuing surveys to find additional agents.
- We are studying the host range of the two most promising agents.
- We are developing methods of rearing the insects in confined conditions.
- We have identified habitat traits that correlate with cabomba populations.

#### **Australia**

- We are currently conducting ecological studies in Australia and have identified a method of controlling small areas of cabomba using shade.
- We have begun studies that examine the impact of cabomba on native plant species.
- We are examining growth of cabomba under different nutrient conditions.
- We are assessing methods of growing cabomba in small tanks so populations of potential biological control agents can be maintained in quarantine during the host specificity testing process.

#### **Biological control**

We are partway through the second year of native range surveys in South America. During field surveys organisms that eat cabomba (natural enemies) were observed and collected. All species were identified to a level where the potential as biological control agents could be assessed.

At present we are concentrating research efforts on two potential candidates, an arctiid moth, *Paracles* sp., and the Bagoiini weevil, *Hydrotimetes natans*. Field host range studies suggest the weevil is specific to fanwort. Laboratory tests indicate that the arctiid moth, however, can also develop on rooted water hyacinth (*Eichhornia azurea*) and will feed, but not complete development, on at least four other aquatic plant species. *Eichhornia azurea* is closely related to water hyacinth, does not occur in Australia and is a prohibited import.

We have also found several generalist plant feeders such as snails, shore flies (Ephydriidae), midge larvae (Chironomidae), caddisfly larvae, seed shrimp (Ostracoda), and aphids. However, these species are likely to feed and develop on Australian native plants and will not be safe to introduce as biological control agents.

#### **Ecology in Argentina**

Fanwort is a common plant in streams and lakes with clear, deep waters in a relatively small area of northern Argentina. Its presence and abundance has been found positively associated to low levels of turbidity, total hardness, conductivity, phosphorus and nitrogen in any of its forms. In fact, as a rule of thumb, suitable waters for floating water plants (i.e. high nutrient waters), are not inhabited by *Cabomba*, possibly due to shading from the former. In its local distribution area, the eastern subtropics of Argentina, *C. caroliniana* flowers all year round. Fruit and seed,

however, are rare, and probably only develop as a response to stress. Although it can be very abundant, it is not a weedy plant in Argentina. It occasionally obstructs waterways, but usually only narrow irrigation ditches. It has never been found to cover significant portions of lakebeds, hinder navigation or other aquatic activities, or to thrive in such a way as to eliminate other aquatic plant species.

Water quality and physical conditions were assessed during surveys. Water analyses have been performed at every *Cabomba* location encountered, and most other water bodies along the areas explored. In addition, other physical/topographic traits have been selected that were considered to have potential influence on the establishment of *Cabomba*. See Table 1 for a complete list of features.

**Table 1. List of chemical, physical and descriptive features assessed in water bodies.**

Chemistry	Descriptive	Physical
Nitrate (N2O3 ppm)	Bed (sand 1, clay 2, rock 3, etc.)	Conductivity ( $\mu$ Siemens)
Nitrite (N2O2 ppm)	Sediments (0, clean; 1, some; 2, deep layer)	Clarity (Secchi disk depth in cm)
Ammonia (NH4 ppm)	Banks (steep, 2; gradual, 1; beach, 0)	Depth (meters)
Phosphorus (PO4 ppm)	Water level (stable, 2; irregular, 1; flood plain, 0)	Temperature (°C)
pH	Co-occurring plant species	
Dissolved oxygen (ppm)	Type of plants (submerged, 2; floating, 0; both, 1; none, 3)	
	Current (slow or none, 1; fast, i.e. erosive, 0)	
	Climate (humid, semiarid, etc.)	
	Topography (plains, 1; hills, 0)	

Using the preliminary data collected to date, there was no correlation between *cabomba* presence and water chemistry or physical variables. The descriptive variables, on the other hand, had a more defining role. The sediment layer thickness and bed type were the sole variables that were statistically significant ( $P < 0.001$ ). Then bank type and types of plants present (floating, submerged or both). Also, a combination of plant types and bed type were significant. In summary, the thickness of the sediment layer, and thus current speed (deep and slow, respectively), the bank type, which has to be steep (implying stable water levels), and low presence of floating aquatics seem to be determinants for *fanwort* presence.

#### Population dynamics of *cabomba* in SE Queensland

Not much is known about how *cabomba* grows in Australia. A key component to understanding plants is documenting their population fluctuations over time and space. Four lakes with *cabomba* presently established are currently being surveyed. These are Lake Macdonald, Ewen Maddock Reservoir, Siebs Dam, and the Main Roads Pond (Bruce Hwy. Caloundra exit). We sample biomass, plant height, and plant density at each site by establishing a transect beginning at the shore and running perpendicular with the shore into deep water. We collect samples from 1m depth intervals with 3 plots (0.25m<sup>2</sup>) sampled at each depth (from 1m to either the maximum depth of *cabomba* or the maximum depth of the lake). Plant material is sorted to species and the number and identity of species in each plot is recorded. The *cabomba* is then taken back to Long Pocket Laboratories where maximum stem length, number of plants, and wet biomass is recorded. Material is then dried to constant weight and weighed. Samples are taken 5 times per year, every 3 months in the winter and every 2 months in the summer (Sept, Nov, Jan, Mar, June).

Current results indicate that biomass tends to increase in the summer months (Figure 1). Three sites had similar amounts of *cabomba*, while the Main Roads sites produced less. This is probably because much of the bottom of this site is packed clay and *cabomba* roots apparently cannot anchor in this substrate. However, *cabomba* does colonize depressions in the lake bottom where sediment has settled. Lining the bottoms of swimming areas with clay might retard *cabomba* growth in these areas. *Cabomba* biomass is greatest between 1 and 4 meters depth and generally decreases to 0 at depths greater than 5 meters (Figure 2). Therefore, deep lakes with steep sides will probably be resistant to *cabomba* colonization.



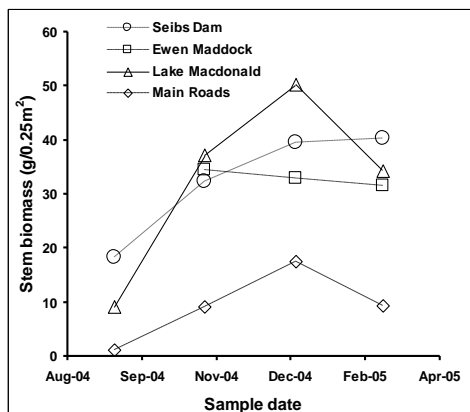


Figure 1. Mean cabomba dry stem biomass over time. Each point is the mean biomass of all samples taken from that site at that date.

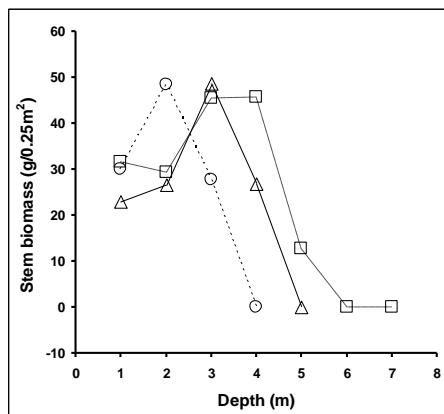


Figure 2. Cabomba biomass decreases with increasing depth. Each point is the mean dry stem biomass sampled from that depth. Samples from November, January, and March were combined.

#### Effect of shade on cabomba populations

Knowledge of the effect of shade on cabomba is important for two reasons. First, if cabomba is not shade tolerant, riparian cover might be an effective means of reducing downstream spread. Therefore, maintaining or restoring riparian canopies might be one technique of reducing the spread of cabomba. Second, floating shade covers can be used to eliminate small populations of cabomba, either for eradication in the early phases of invasion, or for creating open areas to facilitate water extraction, such as for irrigation pumps.

We placed 6 floating shade structures (5m x 5m, pool covers) over cabomba infestations (ca. 2m depth) at Seibs Dam (Noosa Shire). There were two levels of shade (75% and 99%) and these levels were each replicated three times. Biomass samples were taken from under the fabric and from open water sites at 1-2 month intervals. Biomass declined within 2 months for the high shade treatment and within 4 months for the low shade treatment. The remaining cabomba in the high shade treatment after 4 months consisted of rotten root masses and it is unlikely that these would sprout if the shade was removed. We will remove the shade this spring to determine if any regrowth occurs and study recolonization of the open space by the surrounding cabomba.

#### Effect of nutrient concentration on growth of cabomba

The purpose of this study is to determine how cabomba propagules (stem tips, mid-stems, and roots) grow under different nutrient concentrations. Plant fragments were planted in 12 fiberglass tanks (200 L). The 12 tanks were divided into 4 groups of 3 and different amounts of nutrients were added to each group. We expect the results will give an indication of how important nutrients are to cabomba growth and inform us on the best ways to propagate cabomba for future experiments including experiments in quarantine when we import potential biological control agents for host specificity testing. The preliminary experiment indicated that the initial nutrient concentrations were too high and promoted excessive algal growth. In addition there were problems with tadpoles eating the cabomba. The experiment is in progress and results should soon be available. This experiment is being conducted at the Pomona Nursery with the assistance of Brad Wedlock, Josh Birse, Terry Stokes, Phil Moran and Conor Neville.

#### Distribution of cabomba in Australia

The distribution of cabomba is poorly known and we are continuing to collect information about the presence and absence of cabomba throughout Australia. Information is gathered through aquatic weed networks and is held in a GIS database. More detailed information for catchments is also being collected, eg. data for the Mary River Catchment. New infestations have recently been found in the NT and in several ponds near Raymond Terrace, NSW. When possible, sites are visited in order to verify that the species is cabomba and the potential of the site for experimental studies and potential for biological control releases. We stress that the distribution of Cabomba is not being systematically determined nationally. Some catchments authorities and groups are conducting systematic surveys and we are collecting that information as it comes to hand. More focused national surveys are required.

A new infestation was found in the Darwin River below the Darwin River dam. This is undergoing eradication by NT DIPE. Subsequent publicity has resulted in a number of ornamental ponds confirmed having cabomba in the NT.

The first instance of the productions of seeds (and seedlings) in Australia has been recorded in one of these small ponds in the NT. Samples of seeds have verified that it is a species of cabomba, but we are not yet positive it is *Cabomba caroliniana*. Additional plants are being grown in the NT and the resultant samples will verify the species. Arrangements have been made to send samples to Amy Weiss (University of Connecticut, USA) for DNA analysis. This might determine where the original material was collected from and help us understand why this population is reproducing by seeds where other populations only spread by plant fragments.

We recently presented our work by phone to a one-day workshop held in Ontario, Canada. Cabomba has invaded several lakes north of Lake Ontario and agencies there are considering how they might manage it. The lakes are very clear in summer and ice covered in winter. Included at the workshop were delegates from USA as cabomba is also weedy in the north-eastern and north-western states. It seems that we are leading the research on sustainable management of Cabomba worldwide.

#### **Plans for the future**

In South America we will continue research as follows.

- Continue to survey cabomba and to observe and collect its related natural enemies.
- Seek identifications for collected species.
- Continue to develop laboratory rearing methods for potential agents particularly the weevil and the moth.
- Continue to assess the host ranges of the moth and the weevil.
- Expand the surveys to include the native ranges of other *Cabomba* species in Central and northern South America and the Carribean.

In Australia we plan to continue the ecological research and the collection of distribution information. We will continue to urge funding agencies to support a systematic assessment of the distribution of Cabomba in Australia.

The ecological studies will help us understand the growth and spread of the weed, help devise integrated management strategies, allow assessment of management strategies, and guide our selection of biological control agents. The distribution information will help us select appropriate release sites for biological control agents. These studies are being done in collaboration with Queensland DNRM, Lake Macdonald Catchment Care Committee and Noosa Shire Council.

After suitable agents have been selected in South America, we will request permission from AQIS to import them for study in our quarantine facility to ensure that they are safe to release in the field. However the start of this phase of the project is several years away.

We expect the process to take 3 to 5 years, as follows, until we are permitted to release the first agent.

- 1 or 2 more years surveying and selecting potential agents on *C. caroliniana* from Argentina and southern Brazil.
- 1.5 to 2 years conducting host specificity tests of the first agent.
- 0.5 to 1 year to gaining permission from the Australian Government to field release. While waiting for permits we will study the second agent, and so on.

Meanwhile to improve the chances of finding suitable biological control agents we will extend o the surveys to encompass the ranges of other *Cabomba* species. The time required for these surveys is difficult to estimate until we gain greater familiarity with the ranges and the countries involved. The ranges include some countries for which we have limited knowledge of the requirements and limitations to carry out such work, eg Guyana, Surinam.

Because of the rigorous safety requirements for host specificity, we cannot be certain that we will find an effective agent, but the prospects look promising. We will continue to update you with our progress as events unfold.

#### **STAKEHOLDERS**

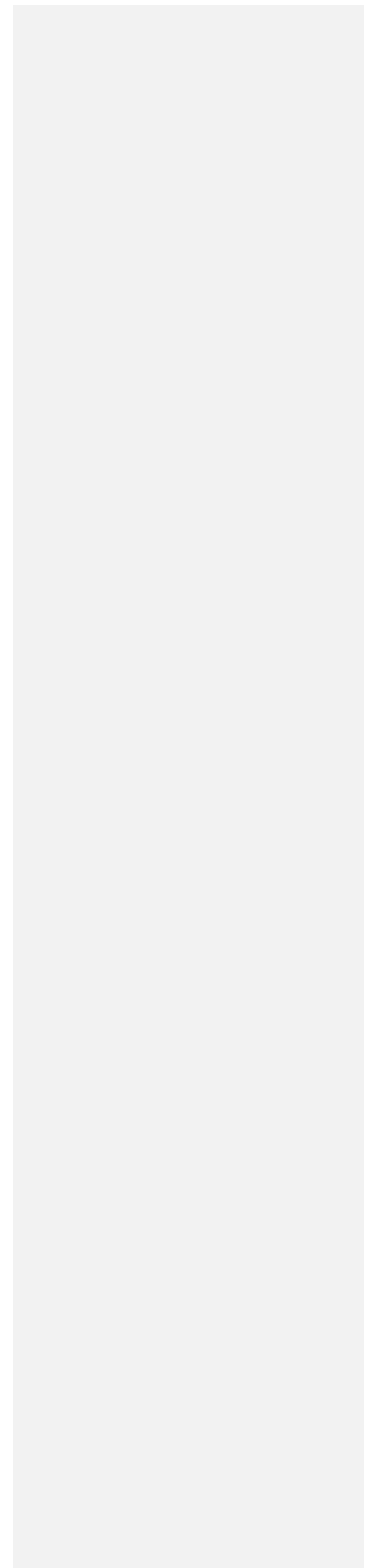
Continued funding by stakeholders (Table 2) for this work has been instrumental in leveraging NHT funds for the project. This work is relatively long-term and to ensure continuity of funds from the Australian Government it is important that stakeholder support continues.

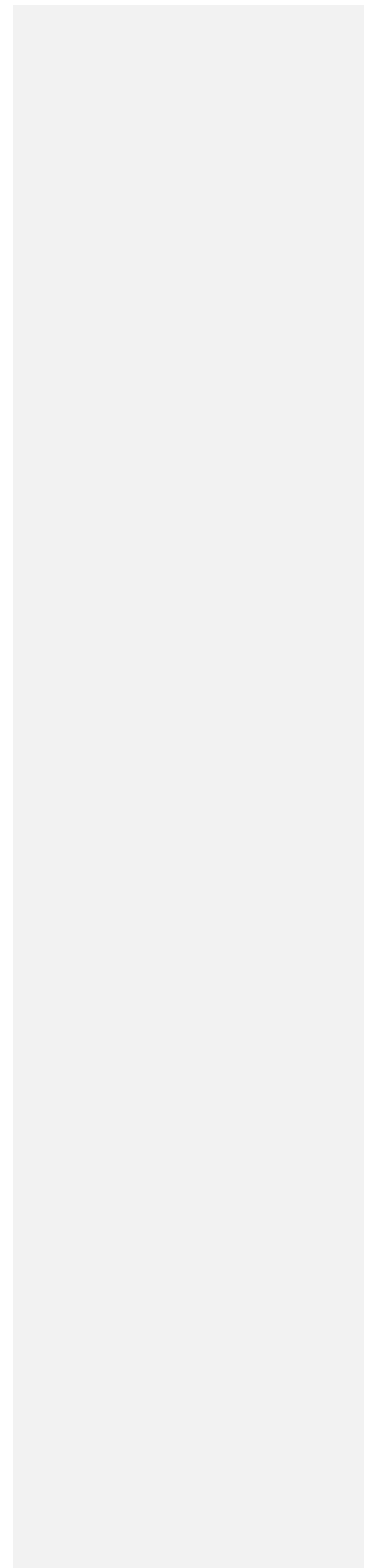
We hope that continued support will leverage future funds from the new Australian Government initiative 'Defeating the Weed Menace' program. Under this program we may be able to apply for funding for three years. Hence it will be a great advantage to our applications if we can highlight a similar time commitment by stakeholders. Thus we urge stakeholders to include future support for this work in their budgets.

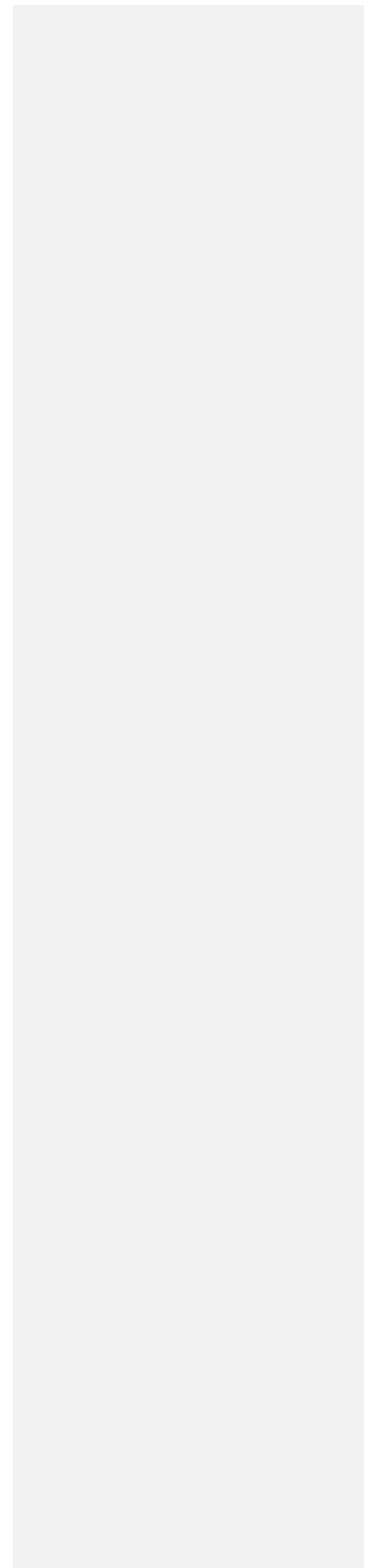
**Table 2. Local government, regional authorities that contribute funds to the project to develop sustainable management of Cabomba**

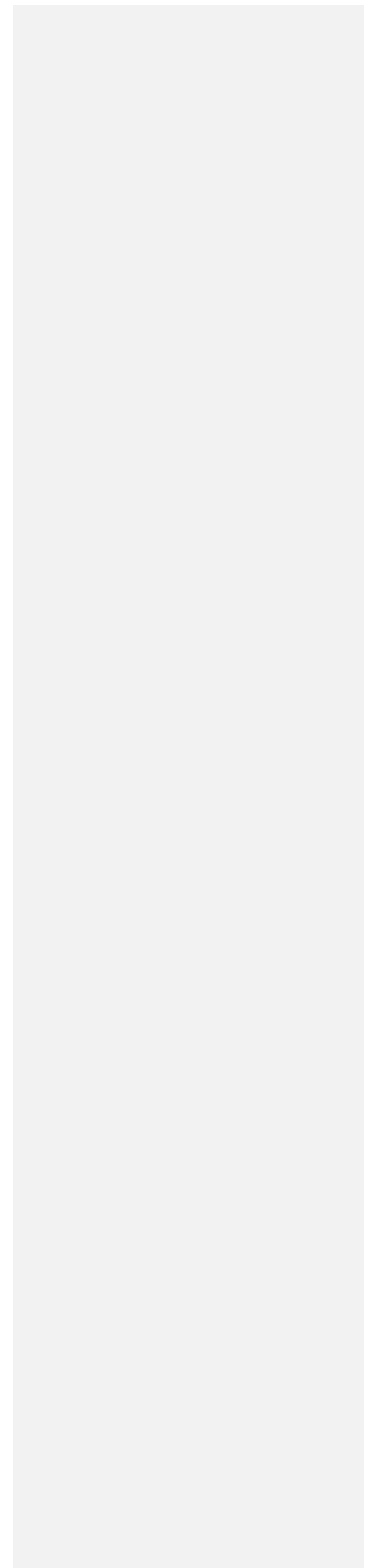
Redland Shire Council
South East Queensland
North Queensland Water
Pine Rivers Shire Council
Maroochy Shire Council
Noosa Shire Council
Sunwater
Caloundra Shire Council
Mid North Coast Weeds Advisory Committee
Maroochy Shire Council
Queensland NR & M
North Coast Weeds Advisory Committee

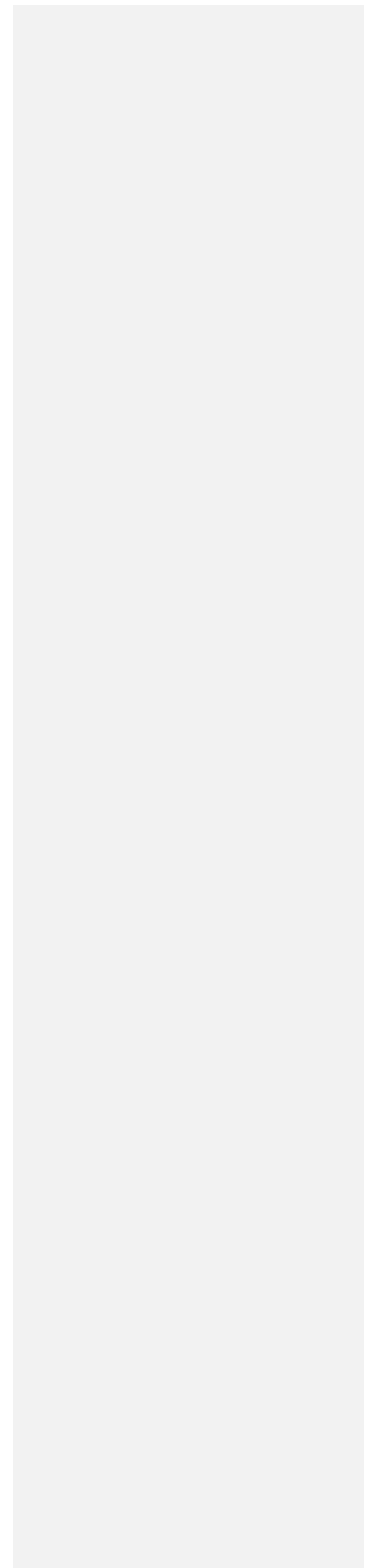
**MRCCC Audited Financial Statement 2004-2005**



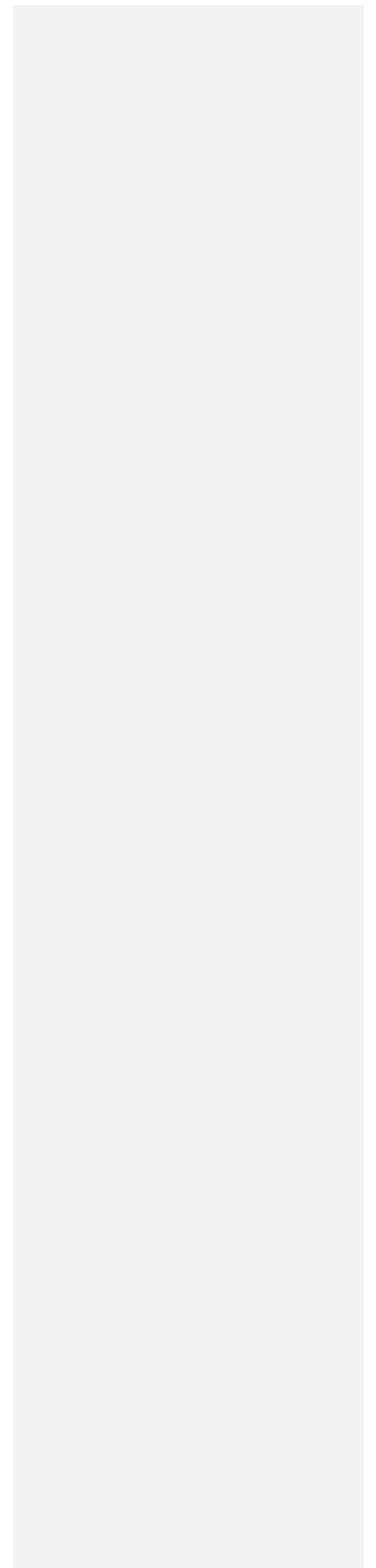












**MRCCC Annual General Meeting  
Wednesday 29 September 2004  
Gympie Civic Centre**

**Draft Minutes MRCCC 2004 AGM**

Mayor Mick Venardos extended a welcome to all attendees and apologised for being unable to attend the whole meeting.

**Meeting opened 10 am**

Harry Jamieson opened the meeting and welcomed a number of guests (as per attached list).

**Apologies:**

As per attached list. *Resolved to accept the apologies. Moved Jim Buchanan, seconded Vince Collis. Carried.*

**2. Confirmation of Minutes of 2003 Annual General Meeting**

Jim Buchanan requested his name be added to the apologies.

Moved Paul Marshall, seconded Dave Sands that minutes with the above addition be accepted as a true and correct record. Carried.

**3. Correspondence**

No correspondence.

**4. Reports**

Chairman's Report

The invaluable help over the past year from Landcare Groups and Brian Stockwell was acknowledged.

Brad Wedlock then delivered a PowerPoint presentation, which was presented at the Awards afternoon at Canberra.

Eva Ford continued the presentation imparting information about the Threatened Species Network the MRCCC is building throughout the catchment.

Dale Watson then spoke on the Wonga Drought Recovery Project centering on Drought and Salinity Prevention, partners Growcom, (Queensland Fruit and Vegetable Growers), Envirofund, landholders and MRCCC..

Friends of Kilcoy Creek, Rivercare. Landholder's contribution about \$83,000 in in-kind support.

Large Woody Debris Project.

Waterwatch Networks.

Twice yearly catchment crawl – May and October. Quality assurance manual has been developed and guidelines adhered to.

Lake Macdonald formed 1999 to combat the growth of Cabomba in the Lake, which is Noosa's water supply.

Water Education Program (Waterwise Program for Cooloola Shire Council) talk by Eva.

MRCCC Future Directions – as per slide presented by Eva.

*Moved Jim Buchanan, seconded Dave Sands that reports be received. Carried.*

Michelle Anderson congratulated the MRCCC on its Waterwise Program. Her daughter in Year 1 has turned into an advocate. David Burnett also drew attention to the amount of work that is achieved out of the Tozer Street Resource Centre and congratulated the team on its endeavours.

Bob Herd, DNR&M then gave a short address on the Mary Basin Water Resource Plan. Bob spoke on water flow in the Mary, worst drought 1902-1904. Maps showed offtake of water if everyone accessed their allocation. Overall water caught in farm dams is not a concern at present. Bob thanked the MRCCC for its cooperation and information in the early days and continuing on as representative on the CRP.

Jim Buchanan then presented a report from the community point of view. Jim read a letter bringing the issue of recognising recycled water being introduced to the river and being accepted as a viable asset. At present it may be introduced but not recognised.

Harry Jamieson thanked the two speakers for their contribution.

**Election of Delegates**

Harry then vacated the chair.

Angus Hutton, Chair Gympie Landcare, then took the chair for the confirmation of sector interests.

Nominations as per list.

*Moved Jim Buchanan, seconded Harry Jamieson that nominations as confirmed be accepted. Nominations not yet confirmed, will be accepted at next meeting.*

Special member, Margaret Thompson.

*Moved Harry Jamieson, seconded Paul Marshall. Carried.*

Note of thanks to retiring delegates.

Harry Jamieson then moved a vote of thanks to returning delegates.

**Election of Office Bearers**

Nomination for Chair, Harry Jamieson.

Moved Margaret Thompson, Seconded Paul Marshall  
Harry was then elected unopposed.  
Nomination for Vice Chair, Paul Marshall  
Moved Harry Jamieson, Seconded Margaret Thompson  
Paul was then elected unopposed.  
Nomination for Treasurer. No nomination received.  
Nomination for Secretary, Margaret Thompson  
Moved Michelle Anderson, Seconded Paul Marshall.  
Margaret was then elected unopposed.

#### **Auditor's Report**

*Moved Vince Collis, seconded Dave Sands that the Annual General Meeting be adjourned until 6<sup>th</sup> December 2004, when the Auditor's Report will be available and at that time the Auditor for 2005 will be appointed. Carried.*

#### **Launch of the Cabomba Bio-control Project** – Speakers Mic Julian and Shon Schooler

Introduced as an aquarium plant, spread easily, phenomenal growth rate, and weed of national significance.  
Seeking \$55,000 of stakeholder funding to match DEH funding of \$148,000.

A number of questions were asked of Mic re hybridization and control and leaking of host species in Australia.  
The Hon. Warren Truss, Federal Minister for Agriculture, Fisheries and Forestry then arrived to make the official launch of the Cabomba Bio-control Project.

Mr. Truss mentioned the enormous effect of weeds both economical and ecological. Weeds often display important special affecting our biodiversity.

The pressures to import plants that while have benefit in the nursery industry may in the long term become a weed species.

We also must be very careful in the introduction of bio-control agents that they do not have an adverse effect of existing Australian species.

Australian Government have committed funds to weed eradication programs for weeds of national significance.

Staff had organised a small skit involving some children, Conor Neville, Eva Ford and Lucy Ricketts to officially launch the Bio-control Project. Everyone was much enamored at the effort of our secret agents at eliminating Cabomba Caroliniana (Conor).

Our thanks to all the participants.

Everyone was then invited to stay for lunch.

**Meeting adjourned** 12.40 pm

#### **Meeting reconvened Monday 6<sup>th</sup> December 2004**

At the Donga, rear of DPI complex, corner of Cartwright Rd and Louisa Sts, Gympie

**Meeting opened:** 9.30 am

**Attendance:** As per attendance book

#### **Adoption of Auditors report**

*Moved Dave Sands, seconded Molly Gibson that the Auditors report be accepted. Carried.*

#### **Appointment of Auditor**

*Moved Ray Kelly, seconded Jim Buchanan, that Michael T Harper be appointed as auditor for the MRCCC for the 2004-5 year. Carried.*

*Moved Mim Coulstock, seconded Ray Kelly that a letter of thanks go to Brown Macaulay & Warren thanking them for their past services. Carried.*

#### **Irrigator Sector Nomination**

*Moved Dave Sands, seconded Ray Kelly that Brian Thomas be accepted as Delegate for the Irrigation Sector on the MRCCC. Carried.*

#### **Nomination of special member, Lin Fairlie.**

*Moved Jim Buchanan, seconded Molly Gilmour that Lin Fairlie be accepted as a special member of the MRCCC.*

*Moved Mim Coulstock, seconded Mark Cridland, that Nai Nai Bird be accepted as a special member. Carried.*

*Additional sector representative proposed from Queensland Rural Women's Network. Moved Peter Macintosh, seconded Ray Kelly that a new sector called Rural Women be accepted onto the MRCCA. Carried.*

Meeting closed at 10.05 am.