

## Report on attending the 5<sup>th</sup> Australian Stream Management Conference

“Australian rivers: making a difference” Albury NSW 21-25 May 2007.

Glenda Pickersgill & Brad Wedlock

We wish to thank BMRG for the sponsorship and opportunity to present a paper titled

**“Dam Threat to a Decade of Restoration of the Mary River, Qld.”**

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There was good interest in our paper and given an opportunity to network with others who are interested in river restoration and following the EIS process through the approval using the EPBC act.

The conference was very useful for gaining recent research results over a wide range of stream management topics and was very useful for networking – in particular with:

- Sandra Brizga for the Benchmarking Methodology used in Water Resource planning.
- Wimmera CMA learnings
- Developments in the eWater E2 model that is a catchment modelling framework that looks like superseding IQQM – includes modelling for groundwater.
- Visited Hume dam and looked at problems associated with this dam and upstream storages
- Spreading the information about how river restoration in the Mary R is at threat from the Traveston Crossing dam.
- Peter Cullen. His keynote address was very interesting – see notes below..



**Peter Cullen's keynote address:**

**Managing Aquatic Ecosystems in the 21<sup>st</sup> Century:**

The aim of river management in the 21st century is to retain, or where necessary, restore the resilience of the river system to cope with changes from climate, land cover, bushfires and pest invasion.

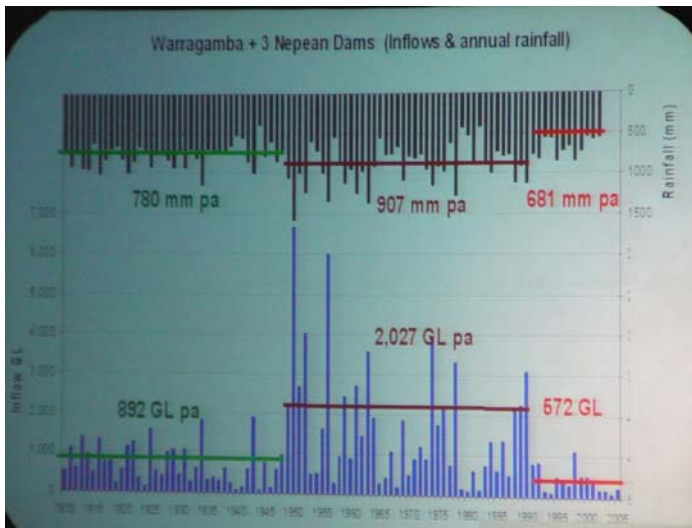
What is resilience of rivers? Its about riparian vegetation protecting the banks, pools providing in channel refugia, flood pulses provide connections to wetlands and floodplains, drive breeding events, transfer biota and materials, connectivity - upstream – downstream and connectivity - vertical to groundwater.



*Above: Peter Cullen delivering the keynote address*

**Priorities for research:**

- River and wetland health assessment
- Identification of environmental outcomes.
- Determination of sustainable levels of extraction of water
- Identification and provision for high conservation value systems
- Managing environmental water



*Above: Graph depicting inflows and annual rainfall, NSW*

**Challenges:**

The last decade has seen flows in the Murray Darling Basin down to about half (refer graph of inflow and rainfall below), what we had become accustomed to due to:

- Climate shift
- Farm dams, forestry, and mismanagement of groundwater
- Effects of improved irrigation efficiencies as return flows dry up
- Impacts of bushfires

This is similarly reflected in the Mary River catchment. Peter Cullen reinforced that there will be increasing pressure through legal action to challenge the rules used to establish over allocation and environmental flows and that we need to have more research focus in this area.

# **Dam Threat to a Decade of Restoration of the Mary River, Qld.**

**A paper for the 5<sup>th</sup> Australian Stream Management Conference, Albury 2007**

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## **Abstract**

The banks of the Mary River and its tributaries were once covered with rainforest species that protected the banks from erosion during floods. However these streams have generally become wider and shallower as a result of clearing, with many banks actively eroding, destroying valuable ecosystems and river flats in the process. The Mary Catchment has been identified in studies as an aquatic biodiversity hotspot and contains a number of endemic endangered species.

Over the past decade, millions of dollars in government funding for river restoration has helped landholders and other interested community members to establish programs for restoration of the Mary River catchment. In 2004, the Mary River community was awarded the coveted National Rivercare Award. Now legislative and policy changes empowering the State Government and water corporations to capture, store and transfer large quantities of water out of the catchment into the proposed South East Queensland water grid, place these successful restoration activities and the community that has participated since 1995 at risk.

This paper describes restoration works conducted in the Mary Catchment, and outlines the present and future impacts of the Traveston Crossing Dam proposal on the catchment, the restoration projects and communities.

## **Keywords**

Traveston Crossing, endangered species, Ramsar wetlands

## **Introduction**

South East Queensland is one of the fastest growing areas in Australia. Predicted growth is more than 1 million will settle in SEQ by 2026 bringing the total population to 3.7 million people (Queensland Government, 2006). The Mary River Catchment has significant ecological conservation values. It is situated in a biogeographical transition zone between tropical and temperate environments, and supports many plant and animal species of high conservation significance. Species endemic to the catchment are the Mary River Cod and Mary River Tortoise (both listed as endangered under the EPBC Act and have restricted geographical ranges). Other endangered species include the Australian Lungfish and Grey-headed Flying Fox (listed as vulnerable under the EPBC Act), and the northern limit of the Giant Barred frog (listed as endangered under the EPBC Act). The Mary River is the best and last remaining option for restoration and protection of the wild populations of Australian Lungfish, Mary River Tortoise and Mary River Cod. It is also the only large river in South-East Queensland without a major mainstream dam.

The waters of the Mary River feed into Hervey Bay and the Great Sandy Strait Ramsar Wetlands, which are of international significance. The region's wealth is tied up in hard-to-measure intangibles such as flood pulses and the fertile silts suspended in its waters. The wetlands may stay virtually dry for several years, before being replenished by violent floods. Wildlife in the region is similarly transitory, with migrating birds, fish and mammals particularly the dugong coming and going.

The last decade has seen enormous changes in policy intended to protect Australian catchments and encourage community involvement in river conservation and restoration work. This paper details the evolution of these changes in the Mary River Catchment, examples of resultant on-ground works and how recent water planning place this community work and good will at risk.

### **A decade of river restoration**

Like most major catchments in the last 10 years, the Mary River has been the recipient of Government river restoration programs due to community concerns. In 1993 the State Government selected the Mary Catchment to pilot the “Integrated Catchment Management” (ICM) program. Through this ICM program the Mary River Catchment Coordinating Committee was formed as a forum for community catchment management action.

In 1995 the *Voluntary Riverbank Restoration Grants Scheme* was established - the first action-based projects for the Mary River Catchment. Through this scheme, landholders applied for funds for tree planting, fence construction, restricted stock watering points, hardened cattle pads (to reduce bank erosion at stock access points), pipework and pumps for reticulation, cattle troughs, riffle placement to slow stream flow, stream bed restoration and the control of woody weeds (Kelly, 1998). Some reported benefits in its first year of operation was the estimated 3 million new seedlings emerging in trial plots in the riparian zone. By the end of the program in 1999, stock access had been limited by 300 km of fencing, with 150 new offstream watering points established and over 100 000 native seedlings planted. A reduction in the amount of faecal contamination and nutrients from cattle in the riparian zone was estimated to be the equivalent of a sewage treatment plant servicing 50 000 people (Kelly, 1998). Over 300 properties have been involved in the program.

The Mary Catchment was a focus of Land & Water Australia (then LWRDC) through the River Landscapes Project from 1997 to 1999. During this time demonstration sites and community action programs were established. In 2000 the National Rivercare Program funded *Implementation of the Mary River & Tributaries Rehabilitation Plan* commenced. This was the first river rehabilitation plan in Queensland that followed the new Australian River Restoration Manual guidelines.

This on-going project involves grants and demonstration sites that provide incentives for, and information on, the restoration of the waterways of the Mary River Catchment. The plan prioritizes rehabilitation efforts based on conservation significance, targeting improvements to the habitat of endangered species as well as riparian vegetation communities of conservation and strategic significance. In 2004 the project won the coveted National Rivercare Award and this successful project continues today with over 400 properties engaged.

At the same time Landcare Groups across the Mary Catchment also addressed the loss of riparian areas within their respective Landcare districts. The Mary Catchment has been identified as a catchment requiring investment under the “National Action Plan for Salinity and Water Quality” due mainly to the high levels of phosphorus and salt levels experienced across the catchment. Salinity hazard mapping prepared by the Queensland Department of Natural Resources and Mines (2003) shows significant parcels of the catchment are at high risk of developing salinity problems in the future.

### **Landholder and community experiences of river restoration**

#### ***Case Study 1: Helping nature recover over 14 years at 1865 Mary Valley Rd, Kandanga (Pickersgill, 2006)***

CSIRO research (De Rose *et al.*, 2002) showed that riverbank erosion can contribute upwards of 87% of end-of-valley sediments in the Mary River Catchment. After the 1992 flood, a number of actively eroding banks were present on the property, putting at risk valuable river flats and in-stream habitat for the vulnerable Australian Lungfish. The worst site was on an outside meander of the river downstream of the confluence of Kandanga Creek where a sheer cliff face of –5 -6 metres in height remained. The objective of the revegetation was to re-establish a riparian rainforest cheaply through excluding stock, encouraging natural regeneration, direct seeding, planting and weeding where necessary. Riparian rainforest fringes the nearby Kandanga Creek and forms part of an endangered regional ecosystem found only along the tributaries of the Mary River. This

has been found to be an invaluable seed source for ecological succession on riverbanks of the central Mary River where very little soil seed-bank currently exists. Protecting the area from grazing was essential to success. Electric fencing is more economical and easy to fix after floods than permanent barbwire fencing.

A succession of vegetation occurred on the ungrazed banks and those species not naturally recolonising were planted. At the toe of the banks, near the water's edge, bottlebrushes (*Callistemon viminalis*) began to establish from seed deposited on freshly eroded bank. Within a few years, further up the bank the she-oaks (*Casuarina cunninghamii*) quickly began to shade out the grasses and give protection from frost, allowing other species to be established, either by planting or naturally from seed brought in from birds, flying foxes or floated down with floods. This has been observed in many areas throughout the catchment, where stock has been unable to access. (This succession process has also been recorded in the Manning River Catchment (Stockard *et al.*, 1998)).

The weeds are the biggest problem with the focus on Chinese Elm and Camphor Laurel. However another threat to our river bank restoration project looms - the announcement of the proposed Traveston Crossing Dam. This dam proposal has put a dark cloud over the future of many restoration works in the catchment.

### ***Case Study 2 – Annual community tree planting days – Gympie City riverbank***

For 10 years the public has participated in Mary River tree-planting days leading to the extensive rehabilitation of the riverbanks of the Gympie city reaches. This is part of a planned restoration of the river coordinated by Gympie & District Landcare Group. This project has played an important role in raising community awareness.

Many in the community are proud to be part of this project, which involves stabilizing banks, forming walkways and river access points, controlling urban storm water drainage inflows and control of pest species such as Chinese Elm and Camphor Laurel. This river reach is now much more resilient to the erosive effects of periodic flooding, and is a popular spot to observe the Australian Lungfish. The project has transformed a previously unpleasant semi-urban industrial scene into a popular riverside walk featuring native local riparian vegetation.

### **Community involvement in water management and planning**

In the late 1990's the Department of Natural Resources introduced the Water Resource Planning (WRP) concept based on social and economic data as well as environmental and hydrological analyses of entire catchments. The aim of the process was to determine total catchment water resources, existing entitlements, environmental flow requirements and whether further allocations are possible.

On May 2002, the Minister announced the preparation of a draft WRP for the Mary Basin. The draft plan was developed by November 2005 following extensive community consultation initially through the formation of Sector Representative Groups and then selection of a Community Reference Panel and technical assessments of the associated issues including social, economic and environmental factors. The process was extremely well received by the community and the Mary Basin process was showcased by the State Government as an example of effective public involvement in Government planning (Queensland Government, 2003). The draft Mary Basin WRP was released for public comment on 18th November 2005, and closed for comment in February 2006.

### **The Traveston Crossing Dam Proposal**

Soon afterward, in April 2006, the Premier announced the Traveston Crossing Dam proposal - potentially one of Queensland's largest, shallowest dams - to be constructed on the main stream of the Mary River, in the middle of the catchment floodplain, for the purpose of supplementing Brisbane's water supply. No mention of the Traveston Crossing Dam proposal was made throughout the public consultation process, or in any of the reports prepared for the draft WRP or in the draft WRP itself (the dam-site had been appraised in 1977 and

1991 but ruled out both times (QDPI, 1993). Department of Natural Resources, Mines & Water official documentation made no mention of the dam. All public documents concerning future water infrastructure in the Mary Valley referred to a small regulating weir at Coles Crossing and raising Borumba Dam, as discussed during the WRP process (Queensland Department of Natural Resources and Water, 2006a). So far the government has revealed it has only used one document in its analysis of the decision to dam the Mary River. This report is the GHD (2006) report of suitable dam sites that allows a comparison of various water yields. It does not include financial cost benefit analyses let alone comparative economic, environmental or social analyses.

Before the draft WRP became legislation, the Community Reference Panel for the Mary Basin WRP formally wrote to the Minister unanimously withdrawing their support for the WRP, stating that they had been 'profoundly deceived' by the process (J. Buchanan (MRCCC), R. Fredman (Cooloola Council Engineer) *pers. comm.* 2006). Petitions against the proposal from more than 20 000 citizens were tabled in State Parliament (Hansard, 2006, 3 petitions). The good will that had been building up over the past decade towards an effective community partnership with government and industry in managing water resources and looking after the river evaporated within weeks.

When the WRP was passed by State Cabinet and became legislation in July 2006, the final WRP had been significantly changed from the draft (Queensland Parliament, 2006, MRCCC, 2006). Environmental flow objectives (downstream of the proposed dam site) had been altered to allow the construction and operation of the dam. There was no public consultation concerning these changes to the draft legislation (Queensland Department of Natural Resources and Water, 2006b).

The final WRP provides virtually no protection of environmental flow in the river at crucial locations downstream of the dam site. For example, State Government Integrated Quantity and Quality Model

(IQQM) modelling of environmental flows shows that median flows in crucial stretches of the river will be reduced by 70% (Queensland Department of Natural Resources and Mines, 2005, Burgess and Edward, 2006). It also does not account for linkages between runoff, river water and ground water. Choosing 85% of average annual flow at the mouth of a river as an adequate figure to maintain health of a river is flawed. (Burgess and Edward, 2006). The statistic used should be the median annual flow and the scientific basis of the number 85% has no documented empirical basis (Arthington *et al.*, 2006.).

### ***Overall likely impacts of the Dam Proposal***

The dam site is in a depositional region of the floodplain of the Mary River, on flat land with deep, fertile, well-drained soils. The majority of the proposed ponded area is class 1 agricultural land (QWI, 2006). This makes for a very shallow storage, prone to high annual seepage and evaporation losses and subject to serious water quality problems of salinity, high nutrient loads, low oxygen, toxic metal contamination, algae and weed infestation, greenhouse gas production and sedimentation. If constructed, Traveston Crossing Dam at stage 1 will have an average depth of only approximately 5 metres and at stage two, an average depth of about 8 metres. Much of the dam would be less than 2 metres deep. (Calculated from published volume/surface area figures – QWI, 2006)

The construction of a dam at Traveston Crossing is likely to have significant impacts on the following relevant matters protected under the EPBC Act including: downstream flows reduced by barrages/weirs/dams will affect aquatic and terrestrial ecosystems and biodiversity; the altered natural flood cycle will affect downstream floodplains; fisheries in the upstream, reservoir and downstream areas; and the emission of greenhouse gases associated with large dam projects will increase global warming (Save the Mary River Coordinating Group, 2006). The main channel of the Mary River will be inundated for approximately 36.5 km at Stage 1 and 50.7 km at Stage 2 and have been a focus for river restoration works. The proposed dam would inundate 500 ha of endangered riparian rainforest 'protected' by the Queensland Vegetation Management Act.

### ***Examples of likely impacts on iconic listed species and crucial processes of the Mary River***

The proposal to dam the Mary River at Traveston Crossing combined with recent spawning habitat losses on the Burnett River will completely extinguish more than 80% of the natural spawning and nursery sites for the Australian Lungfish (*Neoceratodus fosteri*). There is no other lungfish living in the world today that can replace the Lungfish in scientific significance. No scientific data has been forthcoming from the State Government which can substantiate the effective use of the Paradise Dam fishway by Lungfish.

The proposed dam wall could severely impact on the seasonal movements and breeding requirements of the Mary River cod (*Maccullochella peelii mariensis*). Radio tracking studies (Simpson, 1994) show that the Mary River cod migrate long distances along waterways, especially during spawning times and there is no evidence of the Mary River cod using a fishway in its natural habitat or being capable of breeding in dams.

If this proposed action were to go ahead it will inundate 80% of the Mary River tortoise (*Elusor macrurus*) nesting banks upstream of the proposed Traveston Crossing Dam wall and its associated riffle/pool habitat (C. Latta (Australian Freshwater Turtle Conservation & Research Association) *pers. comm.* 2006). Downstream there will likely be significant impacts on all the Mary River Tortoise nesting sites due to loss of sediment. There is no evidence of the Mary River Tortoise utilising a fish-way in its natural habitat and significant deaths of similar species in negotiating weirs have been documented on the nearby Burnett River. (Queensland Government EPA, 2004)

A study on hyper-salinity in Hervey Bay, has revealed that a contributing factor is the lack of freshwater flows from both the Burnett and Mary Rivers (Ribbe, 2006). Flood plumes used to reach as far as Lady Elliot Island, once the most productive scallop grounds in Queensland (J. McLeod, Deputy President and Spokesperson on Environment - Independent Trawlers Assoc. Inc. *pers comm.* 2006). The Burnett River now contributes little to marine productivity (particularly the important prawn productivity in the Swains Reef) with few flood plumes ever reaching the sea due to the impact of more than 30 major impoundments. An overall decline in natural stream flow in the Mary River has been recorded since the 1960s. This period corresponds to an increase in dam infrastructure. These findings raise serious questions on further reductions in freshwater flows due to Traveston Crossing Dam. Reductions in low and medium flow events will increase salinity levels within the estuarine reach and reduce the frequency and quantity of freshwater overflows over the Mary River barrage. The natural flushing of the river and mixing of freshwater with the seawater to create appropriate salinity gradients in the estuary helps support marine fish production. The commercial fishing and tourism industries (valued at over \$100 million/year) of the Great Sandy Strait are threatened by reduced river flows.

### ***Effect on Community and Landholder Attitudes Towards River Restoration and Management.***

Within two days of the Queensland Government's announcement of the dam proposal, the Save the Mary River Coordinating Group was formed. This group, which has developed substantial community support, has done much to educate the local and wider community regarding water management and potential impacts of the proposed dam. Main objections to the proposal include: the large-scale dislocation of residents (upwards of 3000 people will be forced to relocate though inundation alone), communities, businesses and infrastructure; the substantial damage to the environment both upstream and downstream of the dam wall; the completely unsatisfactory process of community involvement, consultation and negotiation; and the lack of published comparisons of environmental, economic and social costs of alternatives.

Unfortunately, the announcement to build a dam has already had a significant social impact. Residents have struggled with loss of motivation and depression due to the uncertainty, deliberate misinformation, and the unsatisfactory process. Businesses have been badly affected, and the impetus for on-ground work on river restoration and sustainable land management has been lost. The government is aggressively purchasing land for both stage 1 and stage 2 of the project, even though only stage 1 has been referred to the Commonwealth Government for approval (under the EPBC Act) and preparation of an Environmental Impact Statement for the project has just begun. The State Government is unlikely to pursue active land and riparian management of these properties in the same spirit as the landholders who championed river restoration.

## **Conclusion**

Community attitudes towards the Mary River have changed significantly over the past decade. Millions of dollars in government funding has been allocated for river restoration, which has helped landholders along the river and other interested community members set up programs to restore the Mary River catchment. In 2004 the Mary River community was awarded the coveted National Rivercare Award for implementing the Mary River and Tributaries Rehabilitation Plan.

Before the Traveston Crossing Dam proposal was announced, community and landholder participation in caring for the river had been exemplary. Productive partnerships between government, landholders, industry groups and the wider community were in place. However, since the proposal was announced in April 2006, residents and business owners within the affected area have been severely impacted and the impetus for work on river restoration and sustainable land management has been lost.

Mary River communities have worked hard to restore the Mary River catchment and protect the region's unique ecosystems, and they remain committed to saving the Mary River from a repeat of the disastrous mistakes made in other catchments in the region. Will the Federal Government listen to these communities and act to prevent the destruction of the river's fragile ecosystems and endangered species?

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