

**Key Points of the Cullen Report, DNRM
and
Smartrivers Comments on Key Points of the Cullen Report, DNRM
23/01/03**

Overview

The Queensland Government commissioned an independent review of the science underpinning the assessment of the current and future ecological condition of the Lower Balonne River system in 2002.

The review was undertaken by a Scientific Review panel, consisting of chairman Professor Peter Cullen, Professor Russell Mein and Dr Richard Marchant, in consultation with a Community Reference Group. The panel has released its findings in the report entitled *Review of Science Underpinning the Assessment of the Ecological Condition of the Lower Balonne River System*.

Overall, the panel recognised that the challenge for Government was to use the best available science to ensure river flows are managed to protect the area's important ecological assets, and yet provide the maximum amount of irrigation water possible without significantly degrading the river system.

The report supports the Queensland Government position that the amount of irrigation water being drawn from the Lower Balonne needs to be decreased to avoid significant long-term degradation of the river. *The Panel did not make such a recommendation. They, like Smartrivers, recognised risks and they recommended approaches such as "it is possible to reduce these impacts to acceptable levels by careful management of floods" and "with immediate action to provide the required wetting regime". The Panel, like Smartrivers, recognised that the wetting regime (linked to how and when water is extracted) is as important if not more important than simply the overall volume.*

The panel also found that salinity could become a problem in the region in future due to rising groundwater. *The Panel were not salinity experts and only generalised about risks as you could about any area in Australia. Their key conclusion in this regard was "It is likely that the particular risks of salinity can be managed in the Lower Balonne with appropriate land management". They also noted who was tackling the problem; "It is noted that several of the irrigators have employed consultants to develop salinity management plans".*

Review of NR&M's Integrated Quantity and Quality Model

The panel agreed that the water gauging and flow modelling system used by NR&M was an appropriate tool for evaluation and was up to accepted industry standards and quite appropriate for the regional water planning being undertaken.

This standard, being an error in peak flows of 30-40% and in event volumes of 15-25%, is apparently acceptable by engineering standards but that does not make it acceptable by socio-economic standards. Smartrivers did not debate the general suitability of IQQM as a hydrological model, only that the accuracy of the version applied in the Lower Balonne was unacceptable for decision making purposes.

The panel recommended that NR&M improve its modelling documentation to ensure community access to up-to-date information, on the website, to address stakeholder needs.

The Panel also recommended that "efforts should continue to obtain the information needed for the higher range" because they recognised "problems in defining high flows at some stations". Smartrivers contends that high flows are significantly underestimated, hence the proportion of flow extracted by irrigators has been overestimated. The Panel further recommended "that the IQQM model be run without these increased diversions to assist interpretation". This was because NRM fiddled the upstream model such that the Lower Balonne looked worse than it really was. The Panel also "supports the involvement of stakeholders in verification of the information used in the IQQM data files" because errors were found when the stakeholders were finally allowed to see what information actually went into the model.

NRM admitted in their submission to the Panel that the failure to account for Type A water going into storage is equivalent to somewhere between 11.6 and 23.2% of mean annual diversion. This is a huge discrepancy! It is not even mentioned in the Panel's report so is error in addition to that already identified.

Current Ecological Condition of the Lower Balonne

The report found that the rivers and wetlands of the Lower Balonne system are in a reasonable ecological condition, but this condition will deteriorate if the irrigation infrastructure built in recent years is able to extract its full potential from the river system.

The current ecological condition was one of the two key issues which stimulated the need for the Review and its reporting takes up 10 pages of the 35 page Report, yet this NRM summary gives it just half of one sentence and the Minister did not mention it at all in his press statement. Why are they avoiding it? The Report states that the original Technical Advisory Panel not only got the condition of the rivers completely wrong (that is, it is not severely degraded, it is in essentially reference condition), they should never have used the information put before them. They were wrong when they said the condition became worse downstream and wrong when they said it was as a result of water resource development. All of these conclusions are in complete agreement with those of Smartrivers, which were based on good science. While this result is fantastic from an environmental perspective and proves local irrigators have not caused the severe degradation of which they had been accused, it makes a mockery of the NRM water planning process that such huge errors could be made and accepted despite serious questions raised by stakeholders. One immediate impact of the Panels agreement with Smartrivers conclusion is that the National Competition Council should no longer classify the Condamine Balonne as a stressed river, thereby removing any threat to Queensland's competition payments, and in fact such a threat was never warranted. Wasn't the Minister pleased about this? Failing to stress this result and releasing the new water charge at the same time as the Panels report, were simply parts of a strategy to divert attention, hoping no one would realise the significance of the result.

A lack of major flood events in recent years means water storages have not yet been used to capacity. *True, but the storages have been used to the full extent that flows in the river and licence conditions have allowed. The lack of a major flood harvesting event should be of no relevance because as the Report states "Extractions from larger floods,....will not have much impact".*

The panel accepted that it takes some time for a river and wetland system to exhibit signs of stress from altered water flow patterns. It is likely that the present health of the Lower Balonne river system reflects past water extraction patterns, not the levels now possible because of the recent increase in irrigation infrastructure.

Possible future impacts have always been recognised by Smartrivers and recognition of that risk is not a point of contention. The potential severity of those impacts and the best means to avoid them however are certainly debateable.

Some impacts on the river's health were attributed to the diversion of water from the Culgoa River to the various tributary channels to spread floodwaters across the floodplain. This has led to the Culgoa changing from an almost permanently flowing stream to a flood pulse river, restricting available fish habitat and refuges during dry periods. This was likely to worsen when the current infrastructure was used to harvest water in the Lower Balonne.

The diversion weirs have little if any influence on floodplain flows and the greatest influence on flows in dry periods is the Government run Beardmore Dam.

Future Ecological Conditions and Trends

The high levels of irrigation water extraction now possible are likely to result in a significant decline in ecological health over the next 40 years through:

- a loss of native floodplain vegetation and degradation in national parks in Queensland (e.g. Culgoa Floodplain) and New South Wales (e.g. Narran Lakes)
- long-term degradation of the lower Balonne floodplain and Narran Lakes
- loss of productivity of floodplain grasslands through reduced flooding
- a reduction in the number and extent of billabongs and pools, which are key refuges for fish and other wildlife in drought periods
- additional flow related stress on the upper Darling River in New South Wales.

The errors in IQQM, which result in underestimates of flood flows and overestimates of the impact of extraction, make the basis of these predictions a worse than worst case scenario. With respect to each individual point above, the Panel stated (underline added): with respect to the Culgoa Floodplain, "these vegetation communities will be at risk"; with respect to fish refugia they stated that they "may become more restricted and water quality may deteriorate". Individually then, these are not high risks. Further, as quoted above, the Panel concluded that larger floods, being those which have most influence on the

floodplain within National Parks, would be little impacted, yet most of the potential impacts reported above relate to floodplains. With respect to the purported potential loss of grassland productivity, this was based largely on anecdotal comments from 2 graziers but the Community Reference Group pointed out to the Panel that the observations could be completely attributed to natural causes. The Panel generally agreed with potential impacts suggested by the CRC for Freshwater Ecology. Some of these same people were on the original TAP which stuffed up so badly and have been used by NRM to review their water management planning process a number of times since.

The panel recommended that no further floodplain land to be lost to development until scientific studies were carried out on the impact of this loss.

Smartrivers submitted to the Panel that a cap was required on floodplain land development.

The panel was also of the view that salinity was a potential problem for parts of the Lower Balonne, and that NR&M and other agencies needed to act to investigate and manage it. There is significant salt in the landscape, which may be mobilised by rising groundwater and could arise from native vegetation clearing, seepage from farm water storages or from excessive irrigation.

As noted above, the Panels comments were very general and the stakeholders are already acting to investigate and manage it.

Management Considerations

The panel called for the management and protection of the region's important ecological assets – its rivers and distributary systems, the internationally recognised Narran Lakes, and the Culgoa National Parks.

So did Smartrivers – but based on good science.

The panel noted that experiences elsewhere had shown that it was technically and politically more difficult to restore degraded systems rather than to prevent degradation in the first place.

Smartrivers submitted to the Panel that the system was in “not stuff up” mode rather than “need to fix” mode – and the Review completely supported this contention.

The panel is concerned that the water harvesting now possible with new infrastructure will damage the Lower Balonne floodplain. Landholders have noticed a loss of productivity in the grasslands and the panel believes that over a longer time frame, tree-covered land will be replaced with grassland. Further studies are needed to identify how water can still get to this area in order to avoid this possible decline.

In a science review, the anecdotal comments of just 2 landholders should be given little weight. The management question is not one of how water gets to the area, because it will follow natural flow paths during flood events, but when and for how long. Flooding of these areas will not stop and the Panel noted that extraction would have little effect on large floods.

The panel believes that the most important consideration in the Lower Balonne system is to ensure the Narran Lakes receive enough water flow to maintain the vegetation and bird communities. If this is achieved, the flow in the Narran River will be enough to maintain the river and distributary channels in good condition.

The Ramsar listed Narran Lakes Nature Reserve requires a volume of only 9600ML to fill it. This is a very small volume of water which can be supplied by any number of means.

The panel recommended the introduction of more sophisticated “event-based management” and associated targets rather than simple mean annual flow targets, and proposed interim flooding targets of an average of once every 3.5 years for the Narran Lakes. Irrigators would be restricted from harvesting water from floods at certain times so enough water was in the river for the downstream environment. This will probably mean that impacts on irrigators can be minimised, while still being able to return real environment benefits.

Smartrivers submitted the idea of event-based flow management to the Panel. We also advocated avoidance of mean annual flow targets and long term average statistics in general, despite their continued use by NRM.

Monitoring and Research

The report confirms the validity of existing scientific methods used by the Department of Natural Resources and Mines and identifies a number of other matters where NR&M could undertake further monitoring, assessment and research.

The Panel provided no criticism of scientific methods used by Smartrivers consultants, and in fact offered support “the sampling is sufficiently sensitive to respond to these expected temporal and spatial patterns

of variation". They certainly criticised a number of aspects of NRMs approaches: "*The Panel is of the view that attempts by NRM to model fish communities are not justified by the quantity of fish data that are currently available*", with respect to AusRivAS models; "*These are very low numbers for predictive models of this nature, making this approach less reliable*", and with respect to NRMs ecological data collection in general; "*NRM is advised to be more strategic in its collection of ecological data so that necessary information is available when needed for water resource planning*". In other words NRM is still making the same mistakes they did at the time of the original TAP report and what's worse, they are making them all over the state.

The panel considered more work was necessary to better understand the risks to the health of the river system that might be posed by salinity, invasions of pest species, or pollution by agricultural chemicals. ***The Panel recommended Risk Assessment as a suitable management approach. We agree Government should catch up with this approach – Smartrivers already uses it and submitted one to the Panel.***

The Sustainable Rivers Audit of the Murray-Darling Basin was considered an appropriate base framework for monitoring fragile ecological assets. The panel recommended that additional indicators such as bird breeding events, fish breeding events, algal blooms and vegetation communities be incorporated into monitoring.

The Panel did not use the word fragile, NRM obviously chose to add the word for effect.

Other areas of research identified by the panel including gathering a better understanding of the estimation and minimisation of evaporation from water storages, as well as the possible use of storages as alternative breeding and feeding areas for waterbirds.

Smartrivers members were undertaking major improvements in storage depth and cell amalgamation options prior to the Panel convening. These improvements make the offstream storages of water harvestors far more efficient in terms of evaporation minimisation than the Government designed Beardmore Dam and associated storages.

The panel said the proposed ecological study of the Narran Lakes was important to the effective management of the Lower Balonne floodplain, and should be undertaken by the Cooperative Research Centre for Freshwater Ecology without delay.

The CRC has invited Smartrivers ecologist, Dr Lee Benson, to join their Technical Management Group. The information to be gathered by this program could change our ideas on flow management so Smartrivers contends that no radical decisions should be made pending those results.

Further information:

The full report is on the NR&M website at <http://www.nrm.qld.gov.au/wrp/condamine/>. Hard copies are available from the NR&M information Centre on Ph: 07 3237 1435