

Key Points of the Cullen Report

Department of Natural Resources and Mines

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 also found that salinity could become a problem in the region in future due to rising groundwater.

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.

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.

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.

A lack of major flood events in recent years means water storages have not yet been used to capacity.

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.

Some impacts on the river's health were attributed to the diversion of water from the Culgoa River to the various distributary 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.

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

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.

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.

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.

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.

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 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 environmental benefits.

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 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 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.

Other areas of research identified by the panel included 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.

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.

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.