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Committee Secretary,
Standing Committee on Regional Australia,
PO Box 6021, Parliament House,
Canberra 2600

Dear Sir/Madam

Re: Solutions that will Benefit Rivers and Communities in Australia's Food Bowl

It has been brought to our attention that The House of Representatives Regional Australia Committee is inquiring into the impact of the Murray-Darling Basin Authority's 'Guide to the Proposed Basin Plan' on regional communities and the Committee is keen to hear from all who have an interest in the Basin to help find a solution that will equally benefit the rivers and communities in Australia's food bowl [Advertisement, The Land, pg 25, November 25, 2010].

1. Political Objectives of New Guide

While the Murray Darling Basin Authority and members of your committee have variously claimed the new 'Guide to the Proposed Basin Plan' seeks to redress issues of over-allocation within the Basin, in reality the Guide follows two decades of water reform that may have already created an oversupply of environmental flows (Bennett, 2008). In short, let us be clear that the new Guide is essentially a political response to the demands of a new political elite which places a premium on 'natural', dislikes water-intensive forms of agriculture (Farr, 2010), and buys books and attends events that promote the phasing out of agriculture altogether in Australia. For example, Penguin published a book by American scientist and Pulitzer-prizing winning author, Jared Diamond, entitled 'Collapse'. Chapter 13 of the book is about environmental issues in Australia (Diamond 2005). As part of a tour promoting the book, Professor Diamond spoke to large audiences in Melbourne, Sydney and Brisbane including to 700 of Brisbane's elite at the local performing arts complex where there was rousing applause every time the Professor called for the phasing out of agriculture altogether in Australia because of its unacceptably large environmental impact and because of climate change.

The Murray Darling Basin Authority has stated the Guide is influenced by their interpretation of the Water Act 2007 which gives primacy to the environment. We submit that the Act needs amending to ensure the existing rights of the industries and communities within the Basin are respected.

2. Some History

The last significant grab for more environmental flows within the Murray Darling Basin was based on a claim that up to 1,500 GL of water be returned to the river to halt the trend of deterioration in river health (Authority, 2003). Approximately 1,200 GL has already been bought back (Scientists, 2010).

The new Guide without providing any considered technical justification for radical change in the official science claims that at least double this amount of water is now needed as a minimum to solve the problems of over-allocation within The Basin and specifically to save the Lower Lakes and Coorong.

Despite the popular perception that there is a shortage of water within the Basin, during the recent drought the river did not run dry, Adelaide did not run out of drinking water and the world's largest environmental flow release was made into the Barmah Millewa Forest.

The Lower Lakes did suffer during the recent drought because of mismanagement; the South Australian government refused to open barrages blocking the natural ebb and flow between the Southern Ocean and let the area flood with salt water. This is what happened naturally during periods of drought prior to the construction of the five massive steel and concrete barrages completed in 1941.

Furthermore, despite the perception that irrigators continued to use large quantities of water during the drought, in reality the nature of an irrigation licence means that when there is drought there is limited or no allocation for general security licence holders and thus the area of rice and other annual crops is significantly reduced. According to the Australian Bureau of Statistics total water extractions for 2008/09 were only 3,492 GL which is significantly less than the figure the Murray Darling Basin Authority repeatedly quotes for annual average extractions of 13,700 GL (Boyd, 2010).

3. Compromise is Not a Solution

The history of Conservative politics suggests that it is common, particularly for those without their own plan and their own goals, to advocate compromise (Hayek, 1960). Furthermore, public comment by the Chair of your Committee, Tony Windsor, suggests he is guided only by a belief that the truth regarding environmental flows must lie somewhere between the claims of Basin irrigators and celebrity scientists. A result of the type of approach taken by Mr Windsor is that government shifts its position on the amount of water needed to solve the problems of the Murray Darling Basin every time a more extreme claim for environmental flows is proposed – without any proper assessment of the real needs of the environment or communities.

4. The Natural History of the Lower Lakes

Most of the water the Murray Darling Basin Authority plans to take from irrigators under its Guide will be sent to the Lower Lakes in South Australia, ostensibly to keep the River Murray's mouth open and the Lower Lakes full of fresh water. An alternative would be to let the Southern Ocean flood through the River's mouth and fill Lakes Albert and Alexandrina with sea water. This salt water solution is being resisted on the basis the lakes were naturally fresh, but that is not what the microfossils in the sediment of the lakes indicate.

It is not contested that the lakes formed approximately six thousand years ago when the Southern Ocean broke through the modern coastal sand barriers of Sir Richard Peninsula and Younghusband Peninsula filling the interdunal areas. That point of entry, now known as the Murray River's mouth, remains dynamic and has moved 6 kms over the past 3000 years (Bourman et al., 2000).

Sea levels have fluctuated throughout geological time. The ice sheets during the last peak in glaciation contained about 55x106 km3 more ice than today and sea levels were on average about 130 metres lower than they are today (Lambeck, 2004).

At that time the River Murray extended across the continental shelf and its mouth was about 180 kilometres to the south west of its present location. The climate was much colder, drier and windier, and where the Murray enters the sea today there were distinctive desert dunes running parallel to the distant coastline (Bourman et al., 2000).

As the ice melted, sea levels rose reaching a peak 6,000 to 7,000 years ago when sea levels were 1-2 metres higher than their present position after which there has been a sea level fall of about two metres.

The distance seawater will flow naturally onto a landmass is affected not only by the extent of sea level rise, but also by the height of the land barrier which may change with tectonic processes that can cause uplift or subsidence. Studies by Professor Bourman and co-workers from the Universities of Wollongong and Adelaide have shown that the Lower Lakes area has been subsiding over the past 125,000 years at a rate of 0.02mm per year (Bourman et al., 2000).

The Lower Lakes have also been subject to seismic activity with what is referred to as 'regional warping' occurring from the Mount Gambier volcanic region towards the base of the rising Mount Lofty Range, which is immediately south west of the Lakes. Residents of the Lower Lakes experienced an earthquake on May 10, 1897, and then again on September 19, 1902. These tectonic movements may have accelerated coastal erosion processes along the entire Encounter Bay shoreline, which shows a general landward encroachment over the last few thousand years.

John Cann and co-workers from the Universities of South Australia and Adelaide have studied fossil foraminifera – tiny protozoa with shells of calcium carbonate – preserved in the sediments of the Lower Lakes to discriminate episodes of seawater incursion from periods of high river flow (Cann et al., 2000). Comparing the occurrence of species typical of freshwater with species typically found in the sea, they concluded that the Lower Lakes had a maximum marine influence 5,255 years ago and a maximum freshwater influence 3,605 years ago.

The period of maximum freshwater influence is thought to coincide with the period when the Murray Mouth was greatly restricted or closed because climatic conditions in the catchment were much drier.

Dr Cann and co-workers conclude that the change in the foraminifera complex over the most recent 2,000 years indicate a general trend of increasing marine influence, up until the construction of the five large steel and concrete barrages that now block the natural ebb and flow between the Lower Lakes and Southern Ocean.

This conclusion that the lakes were getting saltier for most of the last 2,000 years is not obvious, however, from studies of another group of microfossils, tiny plants called diatoms that occur in sediment cores.

Diatoms are unicellular algae common in rivers, lakes and the ocean with particular species unique to freshwater and others to saltwater.

Jennie Fluin from the University of Adelaide, and co-workers from that University, and also CSIRO, studied the diatoms in a sediment core from the southern section of Lake Alexandrina (Fluin et al., 2007). They found that between 7,000 years and 2,300 years ago, a strong marine influence was present; but they conclude the change in the species abundance over the last 2,000 years shows a general decline in relative abundance of marine species. The data are equivocal, however, and only in the very top section of the core, in a distinctive light grey mud, perhaps deposited after the construction of the barrages, does a species with a low salt tolerance become common.

In summary, studies of the natural history of the Lower Lakes indicate a marine origin, that during long periods the waters of the lakes were salty, and that during other periods they were fresh. It is unclear how salty or fresh and for how long. The area is characterised by environmental variability. While the lakes have been fresh for the last seventy years because of the barrages, in reality, filled with seawater, and with regular tidal flushing, the Lower Lakes would possess a different, but not necessarily less natural, or less healthy, assemblage of plants, animals, fish and microorganisms.

5. Remove the Barrages: Save the Lower Lakes

Our society places a premium on restoring degraded and polluted places to their natural state. It is clear from the scientific literature that the Lower Lakes have a marine origin and they could be healthy if filled with water from the Southern Ocean, rather than taking fresh water from upstream which has been government policy at least since construction of the barrages seventy years ago.

In 2000 the Murray Darling Basin Commission asked the South Australian Government's Department of Environment, Heritage and Aboriginal Affairs to establish an expert scientific panel to evaluate the environmental flow needs of the Lower Lakes (Commission, June 2000). The Scientific Panel took a holistic approach to the issue and identified four key issues driving degradation of the environmental values in the Lower Lakes and Coorong: The reduced area of the estuary; changed water regimes of the lakes and river; freshening of brackish and saline habitats; and reduced habitat for aquatic plants.

The final report from the scientific panel concluded:

"In pre-regulation and pre-barrage times the Lower Lakes, Murray Mouth and Coorong lagoons operated as one extensive estuary system. The barrages have separated the now freshwater lakes from the Murray Mouth. The reduction in the area of highly productive estuarine habitat has affected the abundance of commercial and non-commercial fish species...

"The extent of the different habitats within the region has undoubtedly changed since the introduction of the barrages. Prior to the construction of the barrages, water levels in the lakes would have fluctuated depending on flows down the River Murray. Incursions of marine water would have extended further up the river when the river was not flowing. Estuarine type wetlands would have been more extensive prior to the construction of the barrages, while freshwater wetlands, particularly reed bed, were probably less prominent than they are today. With the construction of the barrages, estuarine type habitats more suitable for waders have declined and have been replaced by freshwater habitats more suitable for other waterbirds. The current operating policy of maintaining a relatively constant water level reduces the amount of shoreline around the lakes which is seasonally exposed when water levels drop. This reduces opportunities for wading birds. Historically, swamp paperbarks were more widely distributed around the lakes than today. These provided important nesting sites for a range of waterbirds and added to the diversity of riparian vegetation…

"The presence of European carp in the lakes remains a major obstacle to reducing turbidity and to stimulating the re-establishment of submerged aquatic plants."

European carp are a freshwater species and regular flushing of the Lower Lakes with salt water would likely reduce the suitability of the Lower Lakes for this pest species.

That the salt water solution is not even discussed in the Guide indicates the Murray Darling Basin Authority is more influenced by popular politics than the scientific literature.

6. What Motivated this Submission?

The Australian Environment Foundation is a not-for-profit, membership-based environmental organization having no political affiliations. The Australian Environment Foundation takes an evidence-based, solution focused approach to environmental issues. Many of the Australian Environment Foundation's members are practical environmentalists – people who actively use and also care for the environment – appreciating that environmental protection and sustainable resource use are generally compatible.

Dr Jennifer Marohasy compiled this submission. Dr Marohasy is a biologist, Adjunct Research Fellow in the Centre for Plant and Water Science at CQ University, columnist for The Land newspaper (Rural Press) and founding member of the Australian Environment Foundation.

7. Recommendations

Amend the Water Act 2007 to ensure the existing rights of Basin communities and industries are respected.

Acknowledge that the Lower Lakes are naturally estuarine.

Acknowledge that it is neither possible, nor desirable, to guarantee supplies of freshwater to the Lower Lakes during periods of drought; at least not supplies adequate to maintain this approximately 85,000 hectare body of water with freshwater.

Consider adaptive management of the barrages or the complete removal of the barrages that currently block the natural ebb and flow of water between the Southern Ocean and Lower Lakes and prevent seawater incursions including during periods of drought.

Yours sincerely,

Max Rheese
Executive Director,
Australian Environment Foundation

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