Submission Number: 357
Date Received: 19/12/2010

SUBMISSION TO THE INQUIRY INTO THE IMPACT OF THE MURRAY-DARLIHNG BASIN PLAN IN REGIONAL AUSTRALIA.

1. Impact on Regional Communities

I strongly object to the way residents of regional communities supporting irrigated agriculture have been basically ignored in the Guide. For every irrigator, there are 5 support workers that have not been considered. I moved to Griffith 50 years ago to work at the then CSIRO Irrigation Research Laboratory. I have devoted my professional life to improving the production of food and fibre in irrigated agriculture. I believe that, along with colleagues, I had made a significant contribution to understanding the science behind that problems that irrigation farmers experienced and finding solutions to them. The Water Plan is telling me that I have wasted my life because we should not be producing food with irrigation water – it is more important to protect the wetlands by returning 80% of the water to the river so that it is in "good" condition. The model used to measure river health is based on current river flow compared with that predicted under pristine conditions. A cruder predictor is hard to envisage and is a condemnation of the quality of environmental science in Australia.

It is not surprising that many in the community who came to service irrigated agriculture, both directly and indirectly, are depressed. The psychological impact cannot be measured by modellers and economists in $ terms. Some of the things we are sacrificing to live here are:

a. **Health.** The average life expectancy of country people is at least 5 years less than their urban counterparts. It takes weeks to see a doctor in Griffith and over a 2 hour drive both ways to Wagga to see specialists and for operations in a hospital.
b. **Stranded assets**. Even discussion of the Water Plan has resulted in no buyers prepared to offer prices for businesses and houses that were available in a depressed market a year ago.
c. **Isolation**. Travel to capital cities for activities that city dwellers take for granted, takes at least 7 hours by car and public transport is infrequent and expensive.

It is hard to rationalise these hardships with the need to return water to an environment that is not seen to be in terminal decline by those who have lived here for many years. The environmental lobby and the media continually use emotive terms such as "return the river to a healthy condition" and that it is "mismanaged and abused". There is no guarantee that more water will fix the perceived problems. For example, it is impossible to maintain a complex ecological system when 90% of the top predators (ie fish) have been and continue to be removed.

The quality of some of the economic data used by the MDBA leaves much to be desired. I would like to comment on two reports.

"***Economic evaluation of environmental benefits in the Murray Darling basin***" by Prof Mark Morrison.

It uses the concept of "non-market value" of environmental benefits and I believe this concept is flawed, and my view is supported by economists. The study is based on "complex questionaries" that purport to evaluate how much the respondent would be willing to pay for a benefit, such as a "1% improvement in vegetation health". I believe that few respondents would be able to grasp the concept of this improvement while answering the question.

However, the report placed a net present value varying from $2.19 to $13.72 per household on vegetation health, depending on the catchment and gave a total value of over $125 million. The authors admit in the report that many economists "are not comfortable with the techniques used and they "do not have a market analogue for validation".

I believe that the Authority should disregard this report as it is not based on rigorous science and comes to conclusions that cannot be validated.

"***Sustainable Diversions in the Murray-Darling Basin. An analysis of the options for achieving a sustainable diversion limit in the Murray-Darling Basin"*** (Wentworth Group of Concerned Scientists).

The Wentworth Group is an affiliate of the World Wildlife Fund and their independence and purpose must be questioned.

The study is based on models that estimate the "net profit per megalitre ($/ML) for each catchment and then selects water from the lowest profit activity. This model is flawed because it ignores the flexibility in NSW where irrigators with a high security licence receive their allocation in most years and general security allocations vary depending on the availability of water. Furthermore the model has not been validated and therefore may lead to misleading conclusions. The report should be disregarded.

Most of the water retrieved in the Murrumbidgee catchment is likely to reduce cereal production. I estimate that that the 500 GL buyback in the Murrumbidgee catchment (3,000 GL buyback for the Basin) will reduce cereal production by the equivalent of depriving about 1.5 million people of their recommended daily dietary intake of cereals (NHMRC 2006), (eg bread, corn flakes, rice etc) . A similar effect will occur when irrigation water is bought back from horticultural and vegetable producers. The humanitarian and environmental impact of this buyback on replacement food supply from overseas on their food supply and ecosystems must be considered.

2. **<u>Options for water saving measures.</u>**

Irrigated agriculture in the last 30 years has improved water use efficiency (production/ML) by identifying those components of irrigation management where crop growth is sub-optimal and then testing strategies to improve production. Water use efficiency has been improved by techniques such as bed farming, laser grading of fields and recycling systems to reuse drainage water, restricting rice to impermeable soils, drip and sprinkler irrigation, and better scheduling of irrigation. Managers of environmental water appear to be reluctant to examine how their water could be used more efficiently.

Techniques that could greatly improve the efficiency of environmental water in the Murray Darling Basin include:

a. **Innovative ways to replenish wetlands.** Over 500 GL water is required to flood the billabongs along the Murrumbidgee river but only 50 GL is stored in the billabongs and wetlands. The Guide shows that much of the proposed water retrieved from irrigation, would actually flows through the Murray mouth because of this relationship. Engineering methods such as a network of channels along the river or pumping water into the wetlands would reduce the quantity of water required. Some of the existing irrigation network could be used to supply water to some wetlands. Have environmental scientists experimented with such strategies? Such strategies could give better control of the time and longevity of inundation.

b. **Active management of environmental water.** Active management of environmental water could be important in protecting migratory birds and other species in the future. In Holland, climate change resulted in food for provisioning nestlings of migratory pied flycatchers peaked progressively earlier in the season (Both et al 2006). This resulted in a decline in their populations by 90% over the past 20 years. Locally, to return water to the Snowy River, Murrumbidgee Irrigation divided the Barren Box Wetland (3,200 hectares) into 3 cells to manage water more efficiently. A study by Taylor and Schultz (2010) showed that the "Intermediate Cell (320 hectares) contained some water in most years, unlike other wetlands that have been almost continuously dry for a decade." Their measurements showed that the "overall diversity of waterbirds was impressive – 56 species in all" and "it supported species that do not regularly frequent other local wetlands." However, they concluded that the depth of water in the Intermediate Cell at the Barren Box wetland can be critical for a successful black swan breeding event. They reported that, on one occasion, 100 pairs were stimulated to breed as the water level rose. However, a further increase in water level of less than 10 cm after egg laying caused a total breeding failure. Future active management of the water level in this cell can prevent a repeat of this failure. The division of the Barren Box wetland has demonstrated that active management of the existing environmental water has the potential to markedly increase the benefits from this water.

c. **Reducing size of large wetlands.** The Ramsar wetlands cover an area of 6,363 km^2. (MDBA Guide p.59). Have the number of migratory birds declined over time and if so, why? Has the Authority evaluated the environmental water savings by reducing the size of some of these wetlands? Could improving water management maintain them in near pristine conditions? The division of Barren Box swamp into several cells has increased the diversity and stability of the ecosystem and returned a significant amount of water to the environment.

d. **Removing the barrages at the Murray mouth**. The barrages have created an artificial environment in Lake Alexandrina and it should be returned to its natural condition. The Mott proposal to connect Lake Alexandrina to the sea should be seriously investigated. The Authority is inconsistent in its approach by requiring 80% pristine flow for a river to be in good condition and not recommending the removal the barrages to return the Coorong, Lake Alexandrina and Lake Albert wetlands, (important Ramsar sites) to their pristine condition.

e. **Learning from current wetland management.** Fivebough and Tuckerbill Swamps are 2 of the Ramsar sites in the Murrumbidgee catchment. What do we know about the bird life and water management in these and how can it be used to improve management elsewhere?

f. **Intermediate storages for irrigation water**. These should be considered in an attempt to return the river system to a more natural flow regime.
g. **Protecting fish populations.** Fish populations will not improve until up to 30% of the river is closed to fishing and introduced species eradicated.
h. **Reducing salt load**. Irrigation that leads to the mobilisation of salt which then enters the river system should be minimised. The Water Trading rules fail to address the issue that water used for irrigation beyond a hinge line on the Murray at about Echuca can mobilise proportionately more salt than irrigation higher in the catchment. In future, the environmental impact of the permanent transfer of irrigation water to a new location should be considered before trading is permitted.

3. Improving water efficiency within the Murray Darling Basin The way forward

I believe that it is possible to have a win-win situation in the Murray-Darling basin by adopting the following strategy.

1. Stop the buyback of water and stop investing in strategies to improve water use efficiency in irrigated agriculture. The quantity of environmental water now exceeds the 1500 GL that was the upper level recommended in the Living Murray report for a working river. It is conceded that the benefit:cost ratio is declining for investments in irrigated agriculture.
2. Use the funds saved to invest in the management of environmental water to improve water use efficiency. A simple inexpensive strategy would be to identify wetlands that could be watered with the existing irrigation infrastructure. However, monitoring of the impact on the ecosystem would be essential to develop better ways to manage the system as environmental scientists have generally failed to undertake such studies.
3. Invest some of the funds saved for interdisciplinary research teams to identify how environmental water can be used more efficiently by examining the strategies outlined above as well as other strategies.
4. Use the remaining funds to undertake engineering solutions that best meet the goals of the Water Act.

References

Both, C. et al (2006): Climate change and population decline in a long-distance migratory bird. **Nature 441:81-83** (4 May 2006).

Morrison, M. and McDonald, D. H. (2010). Economic Evaluation of Environmental Benefits in the Murray Darling Basin. Report Murray-Darling Basin Authority.

NHMRC (2006): Nutrient Reference Values for Australia and New Zealand Including Recommended Dietary Intakes**.**

Taylor, I. R. And Schultz, M. C. (2010): Barren Box Intermediate Cell waterbird study. Final Report 2008-2010. Murrumbidgee Irrigation and Charles Sturt University Institute of Land, Water and Society.

Wentworth Group (2010). Sustainable Diversions in the Murray-Darling Basin. An analysis of the options for achieving a sustainable diversion limit in the Murray-Darling Basin" Wentworth Group

Submitted by

Warren Muirhead (B Sc Agr, M Ag Sc, PhD)