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Committee Secretary
House of Representatives Standing Committee on
Regional Australia
PO Box 6021
Parliament House
CANBERRA ACT 2600

By email: mdb.reps@aph.gov.au

15 June 2012

Dear Secretary,

Submission: Certain matters relating to the proposed Murray-Darling Basin plan.

Background

I write with a submission to the Committee's inquiry into certain matters relating to the proposed Murray-Darling Basin plan, specifically, environmental works and measures (EWM). This submission is on behalf of myself and co-researchers Prof. Max Finlayson and Dr. Julia Howitt of Charles Sturt University.

This submission is based on our research on the environmental works and measures proposed versus those actually delivered under The Living Murray (TLM) program, and on available information on new proposals in the Murray-Darling Basin. To our knowledge this is the first independent, large scale assessment of environmental works and measures in Australia. Our research is in an advanced stage of review for the academic journal *Hydrobiologia* (Pittock, Finlayson, & Howitt, submitted). We would be pleased to brief the Committee in more detail on this research and provide a summary of our research findings in this submission as follows.

Summary

In essence, we argue that further investment in EWM to save water while conserving wetlands is misdirected for a number of reasons:

1. The areas of wetlands likely to be conserved through EWM are only a small minority of those in the Basin;
2. EWM are very expensive and take a long time to implement compared to the alternatives;
3. There is a high likelihood of negative environmental impacts from the EWM, especially when their use changes from an emergency response to a primary management strategy;
4. EWM are overly-narrow and mal- adaptations with a high risk of physical and institutional failure, particularly with increasing climate change;

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5. Other interventions may better conserve freshwater biodiversity, including purchase of water and land, and non-volumetric works and measures that improve river connectivity and water quality.

The Living Murray

In the TLM 33 EWM interventions were proposed as a response to decreased watering of floodplain wetlands and other degradation of aquatic ecosystems in the Basin (MDBMC, 2004). Most of these interventions involved engineering structures to deliver water from the river channel to wetlands and for water control and ponding on floodplains. Fish ladders and reinstalling dead trees in the River Murray channel to enhance aquatic fauna populations were also undertaken. Flood easements to enable larger environmental flows were proposed. Thus most of the EWM were directed at controlling the frequency of inundation of floodplain wetlands (MDBA, 2011a; Pittock, et al., submitted).

Based on the 36,108 ha able to be inundated with the EWM, around a third of the area of the three targeted icon floodplain wetlands would benefit from controlled flows (MDBA, 2011a; Pittock, et al., submitted). As there are 16 designated Ramsar wetland sites in the Basin covering 636,592 ha, 5.7 % of the area of Ramsar sites may be watered using TLM EWM (Pittock, Finlayson, Gardner, & McKay, 2010). Of the 5.7 million ha of wetlands in the Basin the TLM EWM would control flows on 0.6 % of the wetlands (Kingford et al. 2004). Our analysis of the vague information available suggests that the new EWM proposals may only control water over an area roughly two times larger than TLM EWM indicating that only a small minority of the Basins wetlands may ever benefit from these interventions (Pittock, et al., submitted).

In terms of environmental impacts, TLM EWM structures were subject to the Commonwealth Environment Protection and Biodiversity Conservation Act and approved without requirement for further assessment in minimal time (Pittock et al. unpublished manuscript). The referral documents by state government agency proponents cite some concerns over potential impacts on aquatic fauna, vegetation and in reducing water quality but in each case conclude that the benefits in more frequently wetting the target wetlands outweigh the risks, which are not quantified, and can be addressed through operational experience (Pittock et al. unpublished manuscript). Exacerbation of blackwater events (periods of high organic matter inputs associated with very low dissolved oxygen, increased acidity in the river and possible fish kills) is one possible perverse impact dismissed in this way. None of the EWM proposals assess the likelihood of the structures directly or indirectly diminishing the frequency of inundation of the two-thirds of the wetlands areas that are not targeted due to diversion of flows. Despite failing to model the impacts of climate changes to flow regimes the state agencies have assumed that their EWM will be periodically drowned out in wet years by floods that will inundate broader wetland areas and so the EWM are only required to maintain core wetland habitats in times of drought (Office of Water, 2009).

We contend that the reliance on these types of EWM for floodplain inundation is both overly-narrow and maladaptation (which in a climate change context is: increasing emissions, placing a disproportionate burden on the most vulnerable, incurring high opportunity costs, reducing incentive to adapt, creating path dependency and increasing existing stressors) (Barnett & O'Neill, 2010; Nelson,

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2010; Pittock, et al., submitted). EWM are politically attractive as a superficially easy way out of the conflict of water allocations between farmers and the environment in the Basin as "projects with potential to deliver more water-efficient environmental outcomes for the Basin's rivers and wetlands, thereby reducing the need to recover water from consumptive users" (MDBLGF 2011). EWM are now being promoted as a primary management strategy rather than just being a supplementary measure for wetland conservation during extremely dry periods. Climate change forecasts already predict a reduction in the frequency of overbank floods in the southern Basin (CSIRO, 2008). The consequential lowering of the reallocation of water for the environment in the Proposed Basin Plan makes it even more likely that there will be insufficient larger flows required to inundate the two-thirds of wetlands not targeted by EWM (MDBA, 2011b). Further, successful operation of the EWM requires substantial resources, skilled people and rapid decision making. When put to the test state governments have proven unreliable in making decisions for water releases in a timely manner, as illustrated in the Gwydir catchment (Foerster, 2008) and have even suspended water sharing plans (NWC, 2009). Consequently such complex, engineered adaptive systems are highly susceptible to risks from institutional shortcomings as shown by recent experiences in the Basin.

Further, other researchers have reported that regardless of the scale of water use in conserving upstream wetlands, large volumes of freshwater from the River Murray are still required to reduce salinity in the Coorong and Lakes, a volume in the order of the MDBA's option for increased Basin environmental flows of 4,000 GL/yr on average (CSIRO, 2011; Lamontagne et al., 2012).

Alternatives

There are alternative options to investment to EWM that may offer different and greater environmental benefits and greater resilience to climate change impacts. The engineered water supply and demand management EWM adaptations described above have not been subject to rigorous cost – benefit analyses. We contend that they have high opportunity costs which, if resources were re-directed to ecosystem-based adaptation (Environment Department The World Bank, 2009) may offer better alternatives.

The TLM originally proposed to fund the removal of constraints involving acquisition of flood easements through private property and renovating flood-prone infrastructure to enable larger releases of environmental flows, but this did not proceed as funds were focussed on wetland structures (MDBMC, 2004; Pittock, et al., submitted). Such works also reduce natural flood risks to people and infrastructure. This has become an opportunity cost because in the subsequent *Proposed Basin Plan* the MDBA now claims that such constraints are a reason for not allocating more water for the environment (MDBA, 2011b; WGCS, 2012).

While TLM has cost $280 million the installation of fishways on the River Murray for $45 million could be considered essential for effective ecological management (MDBA 2011). The $235 million spent on TLM EWM will see 36,108 hectares more regularly inundated at $679 per hectare. By comparison, in expanding conservation reserves with large wetland components the New South Wales and Federal governments spent $35.18 million acquiring nine properties covering 136,845 hectares in the Lachlan and Murrumbidgee valleys at $257 per hectare and $23.75 million for the 91,383 hectare

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Toorale Station with 14 GL/yr of low security water entitlements at the confluence of the Warrego and Darling rivers at $267 per hectare (Pittock, et al., submitted). Hence resources could be directed to purchasing environmentally important wetlands and associated water licences.

The Federal Government has allocated $12.9 billion in its Water for the Future program, of which on $3.1 billion is directed to purchasing water entitlements. At the drought induced peak cost of $2.37 million/GL the Federal Government could purchase water entitlements for 1,268 GL/yr on average (11% of diverted waters), or much more if funds were diverted from infrastructure programs (Pittock, et al., 2010). For instance, the TLM's $235 million could have purchased entitlements for 99 GL/yr on average, increasing average annual flows of the River Murray by 0.9 %. While it is not possible to say with certainty the area of additional wetlands that could be inundated with this extra water, the ecological outcomes are likely to be different to the 0.6% of Basin wetlands watered using highly controlled TLM EWM. Based on these examples, greater direct investment in water and land would conserve more wetlands in the Basin with larger environmental flows even with moderate climate change forecasts (Pittock, et al., 2010). A broader range of bio-physical interventions to conserve free-flowing and regulated rivers in the Basin has also been recommended to spread risk and increase ecological resilience in the face of water abstraction and climate change involving riparian restoration, conserving remaining free-flowing rivers and riparian reaches that gain water from aquifers, and reoperating water infrastructure (Pittock and Finlayson 2011).

Conclusion

EWM measures have been implemented without rigorous consideration of the opportunity costs, other costs and benefits. In assuming that any inundation is good, these interventions have been promoted without considering how they may have negative impacts, directly reduce flooding of larger wetland areas, create a path dependency by facilitating lower environmental water allocations and are likely to fail with climate change. While small areas of wetlands may be conserved by EWM, as this approach has changed from an emergency measure in drought to a primary management strategy the consequences for the Basin's wetlands have been overlooked. EWM are costly and time consuming interventions and it would be an error for their deployment to be expanded through the proposed Basin Plan. Our research indicates that there has been a considerable opportunity cost, and that the resources devoted to EWM if redirected to purchase of flood easements, wetlands and water for ecosystem-based adaptation could better conserve freshwater ecosystems in the Basin.

Yours sincerely,

Dr Jamie Pittock

(On behalf of myself and co-researchers Prof. Max Finlayson and Dr. Julia Howitt of Charles Sturt University who are currently overseas).

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