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Submission to the Enquiry into management and use of Commonwealth environmental water

Thank you for the opportunity to provide a submission to the enquiry by the Standing Committee on the Environment and Energy into the 2016-17 annual report of the Department of the Environment and Energy, focusing on the management and use of Commonwealth environmental water.

From the experience of Nature Foundation SA in delivering environmental watering projects during the past 5 years, the management and use of Commonwealth environmental water is well on track to deliver *(as far as possible within the constraints of volumes available and delivery capacity)* the desired outcomes of the Environmental Watering Plan for the Murray-Darling Basin. The Commonwealth Environmental Water Holder and his team have laid a very strong, science-based foundation to direct the return of available environmental water to the most beneficial targets and outcomes.

Background to this submission

Nature Foundation SA has held a contract with the Commonwealth Environmental Water Holder (CEWH) since 2012 for the delivery of up to 10 GL of environmental water annually. The initial contract covering 2012-17 has just been extended for 12 months. Nature Foundation SA was the first NGO to sign a contract with CEWH for out-sourced delivery of environmental water, and two of our delivery partners have since engaged directly with CEWH for their own water allocations and taken over watering at our joint sites (Renmark Irrigation Trust and Ngarrindjeri Regional Authority).

Our **Water For Nature** program manages our environmental water allocation from the CEWH. We have currently identified 92 watering sites in the South Australian Murray Valley, 84 sites in 19 wetland complexes plus 8 individual sites. We have a 5 Year Watering Strategy, and each year an annual watering schedule is developed by our Program Manager Natalie Stalenberg in consultation with our Wetland Ecologist Dr Anne Jensen. The annual watering schedule identifies which sites will be watered in the current watering year, taking into account priorities in the Basin Watering Plan, annual priorities published by CEWH and the resource availability forecast by the MDBA.

Maximising use of environmental water for protection and restoration of environmental assets

The Commonwealth Environmental Water Holder (CEWH) has developed a solid strategic and science-based framework for flexible delivery of water within the context of annual flow scenarios, to deliver priority outcomes according to annual conditions. This is a smart approach to optimise delivery of environmental watering while taking account of the high variability of flows and range of potential watering actions. The aims of the strategy range from minimising environmental damage in drought to building resilience in wet conditions. The framework emphasises watering at regional and reach scales, and connectivity with floodplains. Priorities are being given to supporting natural cues and encouraging return-to-river flows to ensure the transfer of productive biomass from floodplain environments back into the mainstream.

However, there is a major caveat in that the volume of water available to the CEWH is very significantly less than the 4,000 GL volume indicated by science as needed to achieve the environmental outcomes contained in the Basin Plan. The CEWH can thus only deliver environmental outcomes within the restrictions of the volumes available (effectively only 1836 GL of average annual yield) and within the delivery capacity of the river systems until the identified constraints are relaxed.

The CEWH has invested significant effort into coordination of flow releases for enhancement of environmental benefits and opportunities for re-use of environmental flows. The volumes of environmental water applied in each succeeding water year since 2012 have increased overall, with the exception of lower volumes applied in flood years, when natural flows have inundated target sites.

An important governance reform has been negotiated to allow carry-over of environmental water to allow application of water at optimal times for desired environmental outcomes. Another important change was the ability to trade a limited volume of water to generate funds to be invested in related activities, including water delivery and monitoring.

This gradual development of understanding, governance and capacity by the CEWH has culminated in the coordinated delivery of flows in 2017-18 to date, which has combined the return flows from 7 watering sites on 7 rivers to deliver to the Lower Murray 568 GL of CEWO e-water combined with other e-water sources for total flows of 730 GL.

The combined e-flow included return flows from the Murrumbidgee River, Goulburn River, Campaspe River, Broken Creek and Gunbower Creek, all coordinated with releases from Hume Dam on the Murray River and return flows from the Darling River. The CEWO strategic framework and strong partnerships with participating parties has enabled this massive cooperative operation to achieve beneficial environmental outcomes. This is the culmination of years of developing relationships and investing expanding scientific knowledge into on-ground operations and project management for effective return of water for river health.

This environmental flow has benefited the Chowilla icon site, the mainstream icon site and the Lower Lakes, Murray Mouth and Coorong icon site, as well as numerous wetlands along the river valley. It enabled management of barrage outflows to create inundated mud flats and enhanced food sources for migratory waders during their summer visit to the Ramsar wetland, particularly in the Coorong.

A key benefit from continued coordinated environmental watering which can be anticipated in future years is that floodplains will be flooded more frequently, thus reducing the risk of anoxic 'black water' events. The serious black water event which occurred in 2016 resulted when the Lachlan River

floodplains were flooded naturally after 20 years without inundation. A massive amount of accumulated debris and vegetative material was washed into the streams, causing an overload of organic matter and de-oxygenation of the water due to mass degeneration of this load. This water flowed from the Lachlan River all the way to the River Murray in South Australia, causing fish kills particularly in the anabranches around Lake Victoria, where fish could not escape the anoxic water.

Environmental water was used to provide a fresh water refuge flow for fish alongside the anoxic flows which reached as far as the Lower Murray. However, even greater benefits were prevented by the constraint of the Wentworth Caravan Park, which would not agree to supplementary flows being passed down the Darling River to increase the stream of fresh oxygenated water.

The probability of a recurrence of this type of black water event can be significantly reduced with more frequent inundation of floodplains, with flushing of accumulated debris, nutrients and salt. Black water events can be a risk from watering some floodplains or wetlands and the Basin Plan requires that environmental watering decisions have regard for this risk, but the environmental benefits may well outweigh black water dis-benefits. The science suggests that a sound long term environmental watering program returning more frequent small floods to floodplains will lead to a rebalancing of accumulated organic material and thus reduce the incidence of blackwater events. Without environmental watering, black water events are likely to be more extreme when a flooding event does occur over dry floodplains.

Environmental watering can also mitigate another risk, that of blue-green algal blooms forming during periods of low flows in warm weather. Management of wetting and drying cycles can kill resting akinetes (propagules) of blue-green algae, interrupting their life cycle, while encouraging competing species which can control levels of algae. Environmental flows can be added to break up existing algal blooms.

In order to maximise use of environmental water, the CEWH has lobbied strongly for necessary policy and legal changes in state governance to shepherd environmental flows through river systems to their target sites. It is essential that these reforms are enacted to ensure that environmental water cannot be captured in transit by irrigation diversions.

[Innovative approaches for the use of environmental water](#)

The Commonwealth Environmental Water Holder has supported innovative approaches to deliver water, in some cases using irrigation technology and techniques to deliver smaller volumes of water efficiently to target sites.

Innovative approaches already in practice include devolution of water allocations to NGO partners, including Nature Foundation SA, Murray-Darling Wetlands Group, Renmark Irrigation Trust and the Ngarrindjeri Regional Authority. This delegation allows the inclusion of individual sites and floodplain complexes on private lands, to complement larger agency projects, usually on public land, which can incorporate whole river reaches and larger-scale engineering projects.

Continued delegations to local and regional groups with proven delivery capacity can extend the reach of environmental watering to a greater range of sites, with greater capacity to minimise environmental damage during dry and drought periods.

These partnerships bring very significant value-adds through in-kind and cash contributions, which also lead to community engagement. For example, the engagement with Nature Foundation SA has led to very significant donations from philanthropic groups to support the **Water For Nature** program, as well

as partnerships allowing delivery of water through existing infrastructure operated by local government and irrigation trusts. Lateral thinking should be applied to spread linkages wider into irrigation-support industries, schools, social well-being networks and service groups.

Monitoring and evaluating outcomes of the use of environmental water

The Commonwealth Environmental Water Holder has funded a major catchment scale monitoring program which provides an overview of the benefits of environmental watering. For example, findings emerging from the extensive EWKR project are just now demonstrating the basin-wide benefits of sustaining environmental flows in the Lower Darling River for native fish populations in all Basin rivers. The commercial and social benefits of maintaining flows in this critical river reach are only just emerging but, importantly, the beneficial outcomes apply Basin-wide, not just in the Lower Darling region.

In addition to the Basin-scale monitoring, delegated delivery agencies provide monitoring reports for the water they deliver. For example, our Wetlands Ecologist Dr Anne Jensen has compiled monitoring reports covering 32 watering sites at 5 locations in the SA Riverland since 2013, with a further 9 sites at 3 locations monitored since January 2016. The data collected demonstrated that stressed mature black box at watered sites consistently recorded significantly improved condition compared to non-watered sites, particularly since the 2016 flood event (attached).

Options for improving community engagement and awareness of the way in which environmental water is managed

Options for improving community engagement and awareness of environmental watering activities should start with additional funding to increase existing activities, particularly public workshops. In addition, new technologies should be funded, including drones and animations, to provide more graphic illustrations of the benefits of environmental watering.

The Commonwealth Environmental Water Holder is already conducting a successful program of awareness-raising and continues to produce and update a range of publications which provide a clear overview of how water is being applied across the Basin each water year.

The system of Local Engagement Officers has been particularly successful, in providing local connections to engage with landholders to create more watering projects. In particular, Nature Foundation SA has had very positive interactions with the LEOs based in Berri and Mildura.

Community workshops have also been very successful and well-attended, for example on native fish mobility and spawning. Additional funding would allow expansion of these initiatives, particularly to spread stories about successful projects and to hold field days with landholders to demonstrate to their peers the benefits of allowing environmental watering on their properties.

It is important to expand information about the benefits of environmental watering for the whole community, to demonstrate social and economic benefits and to counter misunderstandings about perceived impacts, for example blaming environmental watering for the impacts of natural flooding, including inundation of floodplains, algal blooms and black water events.

Conclusion

The Commonwealth Environmental Water Holder has established a robust system for management and use of Commonwealth environmental water which will deliver the desired outcomes of the Basin Watering Plan. The program is just reaching the point of demonstrating its viability, operational function and initial environmental benefits.

Additional funding is essential to secure the long-term future of the program and to realise in full the environmental outcomes expected from the water already delivered. Additional funding is also required to enable expansion of the community engagement program for greater promotion of the benefits of environmental watering and to improve community engagement in watering activities.

The model of delegation of water delivery to regional delivery partners should be supported and expanded, for greater spread of watering effects.

I would be happy to appear before the Committee to provide any additional information or clarification required.

Mr Hugo Hopton
CEO
Nature Foundation SA



Environmental Watering makes a Difference ...

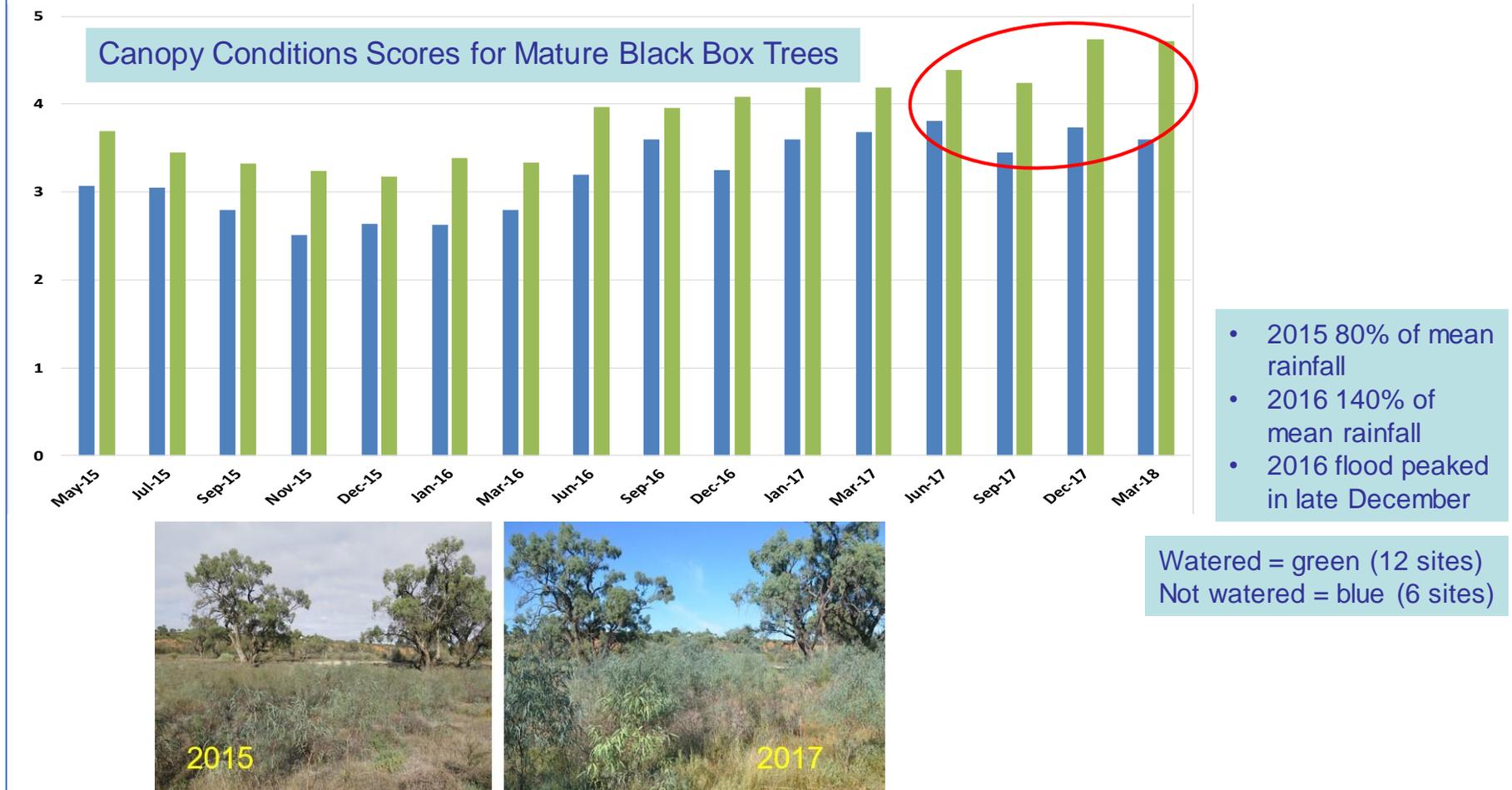


Figure 1 Environmental watering at sites with stressed mature black box has produced a significant improvement in condition (watered trees, green series), compared to the baseline condition of non-watered trees (blue series). All trees benefited from above average rains in winter and spring 2016 and the flood which peaked in December 2016, but the baseline condition has deteriorated in dry conditions since the flood. The watered trees have continued to improve (red circle).