

## Environmental Impact Summary Fund to Date (2015 – June 2020)

	Summary of Outcomes	
<b>Watering Outcomes</b>	Number of Watering Events	13
	Number of Wetlands watered	23
	Volume of water delivered (ML) <ul style="list-style-type: none"> <li>Fund Donated Water</li> <li>Commonwealth Environmental Water</li> </ul>	1,294 ML 2,612 ML
	<b>Total Volume</b>	<b>3,907 ML</b>
<b>Biodiversity Outcomes</b>	Area of Wetlands directly inundated	201 ha
	Estimated area for improved biodiversity outcomes	4600 ha
	Number of threatened species supported	14

### Environmental Water Donation

From the inception of the Murray-Darling Basin Balance Water Fund (the Fund) until 30 June 2020, the Fund has donated a total of 2800.6 ML of water. Table 1 below outlines the water donation and the use of that donation for each year since the Fund's inception. As outlined below, in some years, a portion of the donated water has been traded to fund either the delivery of environmental water, or the development of infrastructure and on-ground works which would enable the sustainability of water delivery to wetlands and to enable new sites to receive environmental water.

Year	Season	Donation (ML)	Delivered Environmental Water to Wetlands (ML)	Traded to support Environmental Water Delivery (ML)	Carried-Over for Future Delivery (ML)	Sub Total
2017-18	Moderate	400	107	293	0	400
2018-19	Dry	1,000	657	100	243	1,000
2019-20	Dry	1,401	530	790	80	1,401
<b>Total</b>		<b>2,801</b>	<b>1,294</b>	<b>1,183</b>	<b>323</b>	<b>2,801</b>

Table 1 – Water Donation Summary

### Environmental Water Delivery

From the inception of the Fund until 30 June 2020, donations of cash and water from the Fund have enabled the delivery of a total of 3,913 ML of water including 1,294 ML of Fund donated water and 2,219 ML of water from the Commonwealth Environmental Water Office (CEWO) to 22 wetlands across Victoria and New South Wales through 13 watering events.

Figure 1 below shows the combined environmental water delivered in each financial year. Water donations from the Fund commenced in the FY18 financial year.

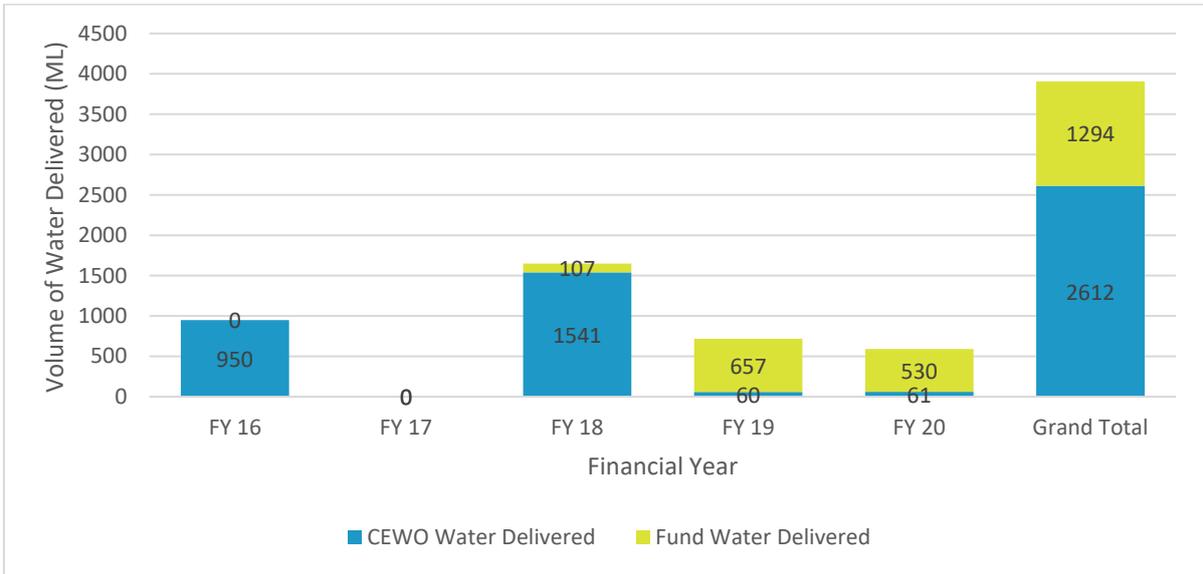


Figure 1 – Environmental Water delivered through the Fund

The watering events have enabled the direct inundation of a total of 201 hectares of individual wetlands and floodplains. This total increases to 330.4 hectares when repeat watering events to the same wetlands are included. This equates to an average of 83 hectares of wetland receiving environmental water each year of operation of the Fund. The benefit of watering wetlands extends far beyond the area of wetland directly inundated through improving the condition of terrestrial vegetation, providing important corridors of habitat for mobile species including migratory waterbirds thereby influencing and improving biodiversity across the broader landscape. We estimate nearly 4600 ha of connected floodplain landscapes have benefitted from the environmental watering supported by the Fund.



### Wetlands Receiving Environmental Water

A summary is provided in Table 2 and Figure 2 below of the wetlands where repeated watering events over multiple years have been implemented to reinstate the natural flow regimes. This figure also shows the timing of future planned watering events at these sites. A summary of the value and significance of the wetlands and wetland complexes that have benefited from the delivery of environmental water through the Fund is also provided.

Wetland/Complex	Water Source
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	Fund Delivered CEWO Water (ML)	Fund Donated Water (ML)	Total
Carrs, Cappitts and Bunberoo Wetland Complex (7 wetlands, NSW)	950		950
Lucerne Day (NSW)	82		82
Wingillie Station Wetland Complex (11 wetlands, NSW)	1,580	732	2,312
Yambuna Lagoon (VIC)		227	227
O'Kanes Swamp (VIC)		260	260
The Plain Paddock (VIC)		75	75
<b>Total</b>	<b>2,612</b>	<b>1,294</b>	<b>3,907</b>

Table 2 – Total water delivered to each wetland complex across all years of the Fund operation.

Wetland History and Strategy													Ideal years wet out of 10
Property Name	Wetland Name	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	
Wingillie Station	Little Frenchman's Ck	Flood	Dry	Dry	Dry	Flood	Environmental watering	Environmental watering	Dry	Potential Watering	Potential Watering	Potential Watering	10
	Henry Creek	Flood	Dry	Dry	Dry	Flood	Environmental watering	Environmental watering	Environmental watering	Dry	Potential Watering	Potential Watering	6
	451	Flood	Dry	Dry	Dry	Flood	Environmental watering	Dry	Dry	Potential Watering	Potential Watering	Dry	4
	Rick Webster Wetland	Flood	Dry	Dry	Dry	Flood	Environmental watering	Environmental watering	Dry	Potential Watering	Potential Watering	Potential Watering	5
	467	Flood	Dry	Dry	Dry	Flood	Environmental watering	Dry	Dry	Potential Watering	Potential Watering	Dry	4
	481	Flood	Dry	Dry	Dry	Flood	Environmental watering	Dry	Dry	Potential Watering	Potential Watering	Dry	4
	Henry Lake	Flood	Dry	Dry	Dry	Flood	Environmental watering	Environmental watering	Environmental watering	Dry	Potential Watering	Potential Watering	6
	Boundary Creek	Flood	Dry	Dry	Dry	Flood	Environmental watering	Environmental watering	Dry	Potential Watering	Potential Watering	Potential Watering	10
	Wingillie Lagoon	Flood	Dry	Dry	Dry	Flood	Environmental watering	Environmental watering	Dry	Potential Watering	Potential Watering	Potential Watering	10
	Lake Roly Poly	Flood	Dry	Dry	Dry	Flood	Environmental watering	Environmental watering	Dry	Dry	Potential Watering	Potential Watering	6
	3954	Flood	Dry	Dry	Dry	Flood	Environmental watering	Dry	Dry	Potential Watering	Potential Watering	Dry	4
	3955	Flood	Dry	Dry	Dry	Flood	Environmental watering	Environmental watering	Dry	Dry	Potential Watering	Potential Watering	4
Lucerne Day		Flood	Dry	Dry	Dry	Flood	Environmental watering	Dry	Dry	Potential Watering	Potential Watering	5	
Wangumma State Forest	Carrs, Cappitts and Bunberoo	Flood	Dry	Dry	Dry	Flood	Environmental watering	Dry	Dry	Potential Watering	Potential Watering	Potential Watering	6
	O'Kane's Swamp		Dry	Dry	Dry		Dry	Environmental watering	Environmental watering	Potential Watering	Potential Watering	Potential Watering	8
	Yambuna Lagoon		Dry	Dry	Dry	Flood	Environmental watering	Environmental watering	Environmental watering	Dry	Potential Watering	Potential Watering	8
	The Plain Paddock					Flood	Dry	Dry	Environmental watering	Potential Watering	Potential Watering	Dry	3 to 7

Planned Watering
Potential Watering
Environmental watering
Data deficient
Flood
Dry

Figure 2 – Wetland Watering regimes re-established through the Fund

## Wetland Descriptions



### Wingillie Station Wetland Complex, south-western NSW

The Wingillie Station wetland complex is strategically located within a broader floodplain wetland landscape as it is immediately downstream from the Carrs, Cappitts and Bunderoo (CCB)/Backwater Lagoon and Lucerne Day watering sites. It contains a range of vegetation communities and habitat types including semi-permanent and intermittent wetlands which support a range of flora and fauna species including the nationally endangered Southern Bell Frog *Litoria raniformis*.

### Carrs, Cappitts and Bunderoo (CCB) Wetland Complex

The CCB wetland complex is currently jointly managed by NSW National Parks and Wildlife Service and the Tar-Ru Lands Board of Management. The vegetation associated with the wetland complexes contain at least two known scar trees and 17 culturally significant plant species.



### Lucerne Day Wetland

Lucerne Day wetland is strategically located within a broader floodplain wetland landscape with the Wingillie and CCB wetland complexes.

### Yambuna Lagoon

Yambuna Lagoon is located in northern Victoria east of Echuca. It is part of the Lower Goulburn River Floodplain Wetlands of National Significance and is listed as a wetland of importance within the Goulburn Broken Catchment Management Authority Waterways Strategy. It supports a diversity of wetland types along with two threatened plant species.





## O'Kanes Swamp

O'Kanes Swamp, a private wetland located near Yarrowonga in northern Victoria. O'Kanes Swamp is a rain-fed shallow freshwater marsh that is significant as a known Brolga *Grus rubicundus* breeding site.

## The Plain Paddock

The Plain Paddock is 15 ha in size and is located on private property in Northern Victoria adjacent to the Numurkah Natural Features Reserve on the Broken Creek. The wetland supports a threatened vegetation community and is protected by a conservation covenant with Trust for Nature.



## Response to Environmental Watering

### Birds

Monitoring of waterbird diversity and abundance has been undertaken prior to watering, during watering events, and 12 weeks after watering events commenced. The results have demonstrated a clear response to environmental watering events with increases in both diversity and abundance either during the watering event or 12 weeks after the watering. The environmental water delivery events provided suitable habitat across all sites for waterbirds with a diversity of feeding/foraging behaviours. In total, the watering events have provided suitable habitat for 50 waterbird species.



There is also evidence to suggest that the watering events also provide important habitat for other fauna including woodland birds, with 46 species recorded across all sites during the 2019-20 water year alone, including the vulnerable White-fronted Chat *Epthianura albifrons*.

### Threatened Species

Three species listed as nationally threatened under the *Environment Protection and Biodiversity Conservation Act 1999* were recorded in response to the watering events, specifically the Regent Parrot *Polytelis anthopeplus*, Southern Bell Frog *Litoria raniformis* and Murray Hardyhead *Craterocephalus fluviatilis*. A further eleven species listed as threatened in either New South Wales or Victoria have been recorded at seven different wetlands and in response to eight of the watering events. These include the Eastern Great Egret *Ardea modesta* and the White-

bellied Sea-Eagle *Haliaeetus leucogaster*. In addition, two significant migratory species were recorded, Sharp-tailed Sandpiper *Calidris acuminata* and Common Greenshank *Tringa nebularia*, both of which are listed under the federal *Environment Protection and Biodiversity Conservation Act 1999* as part of international migratory bird agreements.

## Frogs

Nine species of frog have been opportunistically recorded calling in wetlands in response to the watering events. Significantly, the endangered Southern Bell Frog was recorded at 6 wetlands and based on the calling intensity and duration it is suspected that the watering events supported breeding for this species.

## Murray Hardyhead Reintroduction

Environmental Watering events supported by the Fund at Wingillie in FY19 and FY20 have enabled the return of a locally extinct fish species to Murray River waters in New South Wales. The nationally endangered Murray Hardyhead *Craterocephalus fluviatilis* was reintroduced to wetlands within the Wingillie Station Wetland Complex. This small, short-lived native fish had not been recorded in rivers or wetlands in New South Wales for more than 10 years.



The Funds' support and environmental water donations have contributed to improve the environmental value of floodplain and wetland habitats on the property for several years in preparation for the reintroduction of Murray Hardyhead. After environmental water was released to site in October 2018, a translocation of 780 Murray Hardyhead from a population in South Australia was successfully undertaken in November 2018. Further watering in FY20 has supported ongoing recruitment and breeding for this species to assist in establishment of a viable self-sustaining population.

The reintroduction represents the first attempt in New South Wales re-establish a freshwater fish species that is likely to have been locally extinct. The translocation is a joint project involving the Commonwealth Government, the NSW Department of Primary Industries Fisheries, Western Local Land Services, the SA Department for Environment and Water, Aquasave - Nature Glenelg Trust, the Murray Darling Wetlands Working Group, the owners of the Wingillie Station in western NSW. The watering event supporting the translocation was made possible with support and water provided through the Murray-Darling Basin Balanced Water Fund in partnership with Murray Darling Wetlands Working Group, Environmental Water Trust and The Nature Conservancy.

## Vegetation

The environmental water delivery has maintained and enhanced native wetland vegetation covering an area of 201 hectares, being the areas directly inundated through watering events. The watering events have improved the condition of River Red Gum, Black Box and Lignum communities with increased tree canopy extent and density, new epicormic growth and flowering, and lignum viability. Vegetation monitoring carried out at selected wetlands across all years has resulted in the identification of 153 plant species including the nationally threatened River Swamp Wallaby-grass *Amphibromus fluitans*. The beneficial impacts of environmental watering on improving vegetation condition extends far beyond the area of wetland inundated.

*This report provides an update on the outcomes achieved through the donations of water and cash from the Murray-Darling Basin Balanced Water Fund under its constitution. The donations are made to the Environmental Water Trust, which has engaged the Murray Darling Wetlands Working Group to deliver environmental watering services with scientific oversight and review provided by The Nature Conservancy.*