## **Floodplain Restoration**



### Hydrology

#### The Fading Pulse of the Murray River

Healthy floodplains are a vital part of river health. Before European settlement, floodplains were more frequently inundated and around half the surface water run-off made its way down to the sea. The flow of water between river and floodplains evolved into a complex hydrological system which blended terrestrial and aquatic environments. The richly biodiverse Murray floodplain landscapes were occupied by First Nations people for over 60,000 years, and the presence of scar trees and other cultural artefact document their living history. Indigenous ecological knowledge reveals a complex understanding of the inter-relationship between groundwater, surface water and the health of riverine ecosystems.

The Victorian Murray Floodplain Restoration Project

(VMFRP) is a landscape-scale intervention that would revive 14,000 hectares of high-value wetlands and flood-dependent forests by installing discrete infrastructure to restore seasonally appropriate environmental water straight into the floodplains.

Since 1922, river regulation via dams, weirs and locks has provided Victorian regional communities along the Murray with a reliable water supply to support Australia's regional economic prosperity. Agriculture, recreation, and tourism require predictable, stable and secure water supply. Regulating infrastructure designed to control the amount of water flowing through the Murray River has significantly reduced the magnitude, frequency and duration of water on the floodplains. Through this regulation, the natural dynamic water movement – that is the heartbeat of the Murray is fading.



From 1936 the Hume Dam has regulated the flow of the Murray River

VMFRP is the latest of a series of initiatives by State and Commonwealth governments to deliver 'variability' back into the floodplains to protect these culturally and environmentally significant places. The way water moves through our floodplain landscapes is critical to restoring the health of the Murray. Built on knowledge gained in 2012 through **The Living Murray (TLM)** program, Victoria's land and water managers understand that works and measures are critical to delivering environmental water to restore floodplain ecological resilience.

For more information about individual VMFRP projects please visit www.vmfrp.com.au.



#### Monitoring the heartbeat of the Murray River

The rhythm of the Murray River flows (shown in heartbeat graph below) can be likened to a 'pulse'. The natural heartbeat in the first line, shows the healthy floodplain heartbeat alternating between 'highs' of wetting and 'lows' of drying. Floodplain drying is shown in the low flows. Drying is an important part of the floodplain lifecycle, giving both water-dependent and connected dryer landscape plants and animals time required for growth, flowering and germination. The wide peaks in the first line of the graph reflects the long wetting periods that allow water to soak into the floodplains, giving the River Red gum forests the long drinks they need to thrive. The highest peaks show that approximately every 10 years, water reached the edges of the floodplain. The loss of this vital heartbeat means the dying Back Box woodlands in the higher parts of the floodplain are most at risk.





A clear picture of the fading heartbeat of the Murray can be seen after the construction of Lock 1 in 1922 and the Hume Dam in 1936 (shown in lines two and three). Regulation via locks and weir pools significantly reduced low flows and flattened the pulse of the river. Massive dams capture water, reducing the number, magnitude and duration of floods necessary to push water out to the far edges of the floodplain. The last major flood in 1956 (see line four), stands out as a now infrequent event when compared to the frequency before regulating infrastructure in line 1. The trend of the 1950s continues today.

Regulation has altered the seasonal pulse of floodplain wetting and drying. The managed

release of water from dams into the river now occurs gradually through the summer months. This new timing is not 'in sync' with the seasonal pulse of plant and animal lifecycles. Flowering, feeding and breeding have evolved to occur in the wet spring months, and seeding and growth in dryer summer and autumn months.

Through VMFRP, Victoria's land and water managers have a unique opportunity to reverse the decline in the condition of the Murray River floodplains. VMFRP would ensure seasonally appropriate flooding reaches the ecologically significant floodplain landscape-corridors – strengthening the heartbeat of the Murray River region.

# Australian Government













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