WETLAND MANAGEMENT

The *Riverine Recovery Project* (RRP) features a significant component to improve the health and resilience of South Australia's River Murray wetlands.

Targeted investment to improve the health of SA's wetlands

Historically (pre-locks and weirs), South Australia's River Murray wetlands received highly variable flows that resulted in intermittent dry and wet periods.

The RRP wetlands project aims to change the way River Murray wetland water levels are managed. This will provide a water regime that native flora and fauna are better adapted to, whilst improving the efficiency of environmental water use.

This project will target investigations and investment into environmental infrastructure at selected wetland sites to optimise water delivery and maximise ecological benefits. This will be achieved by using wetland regulators to mimic the natural drying and wetting cycles that would have occurred prior to river regulation. Reinstating wet and dry events will provide the following environmental outcomes:

- more productive and diverse flora and fauna
- creation of temporary seasonal habitats
- cycling of carbon and nutrients within wetlands
- consolidation of wetland bed sediments leading to reduced wetland turbidity and improved aquatic vegetation growth
- reduced impacts of carp.

The *Riverine Recovery Project* (RRP) is a key component of South Australia's $610 million *Murray Futures* program which is funded by the Australian Government's *Water for the Future* initiative.

RRP aims to improve the river's health and the resilience of its wetlands and floodplains from the South Australian-Victorian border to Wellington.

The project will improve the long-term prospects of floodplains and wetlands by more efficient use of environmental water and deliver up to 15 gigalitres of environmental water savings to the Commonwealth.

Beldora wetland, one of the many wetlands to benefit from investment under the RRP.

Photo: Scotte Wedderburn

The RRP aims to reinstate a more natural mosaic of wetland types across the landscape, by introducing wetland management in an integrated approach along the River Murray from the South Australian-Victorian border to Wellington.

Why do we need to manage wetlands?

The river's locks, weirs, barrages and upstream storages has provided greater security of water supply for human consumption and industry. However, this divides the River Murray into unconnected sections and significantly impacts seasonal and annual variations in water flows.

Each section of the river is maintained at relatively stable water levels, or pools, with the base flow river level usually higher than before weir construction commenced in the 1920s.

This has permanently altered the environmental water flows from the river to adjacent floodplains, anabranches and wetlands.

In the past, wetlands relied on periodic and seasonal drying and wetting to flourish.

Some wetlands and much of the floodplain are positioned above the levels of the regulated river and now have inundation patterns that are too short and too infrequent, but over two thirds (87%) of the total area of wetlands are classed as permanently inundated as their inlets connect below the regulated river level.

Constant inundation and relatively stable water levels restrict natural regeneration processes. This reduces the diversity and extent of habitats as well as the diversity of flora and fauna, and impedes upon natural nutrient cycles. Permanent inundation of wetlands has also favoured invasion by exotic species such as the common carp, which place further strain on wetland ecosystems.

How will Riverine Recovery make a difference through wetland management?

There is a strong history of wetland management in SA. Many wetlands are being monitored and managed by community volunteers, government agencies and irrigators. The RRP builds upon this work, and will use science, local knowledge and environmental infrastructure to re-introduce more natural wetting and drying cycles to selected wetlands along the River Murray in South Australia. More efficient management of environmental water will be introduced to sustain the wetlands and riverine ecosystems that rely on irregular flooding to survive and flourish.

RRP wetland management is about communities and government coming together to improve wetland condition and use water more efficiently for the benefit of communities and long-term health of the River Murray.

Conducting a fish survey during a rapid baseline assessment in early 2012. *Photo: Scotte Wedderburn*

Congolli *(Pseudaphritis urvillii)*. *Photo: S. Wedderburn*

Golden perch *(Macquaria ambigua)*. *Photo: T. Barnes*

These measures will increase the long-term health and diversity of riparian and aquatic habitats, increase native flora and fauna diversity, and improve water quality and wetland productivity.

The RRP will include the following investigations and on-ground works:

- Baseline Survey - define each wetland's ecological and physical characteristics to inform management
- Management plan development and infrastructure design – determine each wetland's ecological water requirements and infrastructure requirements (such as regulator dimensions and functional requirements)
- Construction - build and test new regulating structures
- Operation and Monitoring – to ensure the wetlands are managed in an ongoing and adaptive manner.

The Government of South Australia will be engaging with landholders and water users throughout the life of the project.

Environmental Water Savings

The re-introduction of more natural wetting and drying cycles provides the opportunity to manage the hydrology of these wetlands to provide ecological benefits, whilst providing efficient use and saving of environmental water through reduced evaporation.

These environmental water savings will contribute to the RRP target of providing uo to 15 gigalitres of environmental water to the Australian Government (Commonwealth Environmental Water Holder) to help to protect or restore environmental assets in the Murray-Darling Basin.

Phases in wetland management


Dry phase at Lake Merreti.


Outlet regulator at Schiller's Lagoon.

Case Studies

Brenda Park / Scotts Creek

The Brenda Park / Scotts Creek wetland is located on private land owned by Overland Vineyards between Morgan and Blanchetown. The wetland has been managed since 1999 to address the impacts of local wetland and floodplain modification which occurred in the early 1900s when the land was altered for agriculture. The Brenda Park / Scotts Creek Wetland Community Group, formed by local landholders, works with the South Australian Murray-Darling Basin Natural Resources Management Board (SAMDBNRM) to manage the almost 900 hectare wetland and surrounding floodplain.

Managed wetting and drying commenced in 2002, resulting in improvements in wetland and floodplain vegetation. This has been beneficial to wetland fauna, including the threatened southern bell frog. Because of its long history as a managed site, Brenda Park / Scotts Creek has hosted a variety of scientific research projects covering carp management and native vegetation. RRP has invested in the site by funding hydrological modelling and updating the Brenda Park / Scotts Creek wetland management plan to build resilience and improve ecological response through sound management and secured access to environmental water.

Brenda Park: 2011 flood. *Photo: Callie Nickolai*

Ngak Indau

The Ngak Indau wetland sits within the Katarapko section of the Murray River National Park between Berri and Loxton. Ngak Indau covers some 20 hectares when full, and connects to the River Murray above Lock 4 via a narrow channel and discharges through Eckert and Katarapko Creeks before returning to the River Murray below Lock 4. To address changes to the wetland caused by river regulation, a wetland rehabilitation project at Ngak Indau was initiated in 1995 by the Government of South Australia in partnership with the Glossop High School and the Eckert Creek Wetland Rehabilitation Group. In 1997, two flow control culverts, incorporating carp screens, were installed at Ngak Indau to manage the wetland water level.

Since the installation of these culverts, managed wetland wetting and drying has led to positive outcomes for the wetland's ecology, with the site sustaining a wide range of plants and animals. In 2010, the Government of South Australia upgraded the outlet flow control structures, while the Murray-Darling Basin Authority replaced the inlet structure. Upgrading these structures has benefitted the wetland's flora and fauna, and ensures the quality of surface water is maximised during the wet phase. In 2012, RRP funded hydrological modelling for Ngak Indau and the update of the wetland management plan to ensure sound management of the site can be achieved with secure access to environmental water.

Ngak Indau. *Photo: Callie Nickolai*

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