

Integrating Riverland Floodplain Infrastructure

The South Australian Riverland Floodplains Integrated Infrastructure Program (SARFIIP) is improving the health and resilience of Riverland wetlands and floodplains.

What is the SA Riverland Floodplains Integrated Infrastructure Program?

The South Australian Riverland Floodplains Integrated Infrastructure program (SARFIIP) is a \$155M program funded by the Australian Government and implemented by the State Government to improve the watering and management of River Murray floodplains in the Riverland.

SARFIIP is being managed by the Department of Environment, Water and Natural Resources with detailed design and construction of infrastructure being delivered in partnership with SA Water between 2015 and 2020.

SARFIIP has four components:

- Pike Floodplain Inundation Measures
- Katarapko Floodplain Inundation Measures
- Salinity Management Measures
- Environmental Pathways Package

Why do we need SARFIIP?

The River Murray is highly regulated and has been impacted by many years of over allocation and use. As a result the health of the river and its floodplains has been in decline for many decades, made worse by the impacts of the Millennium Drought between 2000 and 2010.

Since the drought, returning flows have brought some improvement, but also highlighted how, with long term stress, many areas have only recovered to a limited extent.

Through the Basin Plan there will be more water returned to the environment, but more water is just part of the solution. The ability to effectively and efficiently manage the available water and its benefits is equally important.

The construction of environmental regulators and additional water from unregulated flows and environmental water holders will enable more effective management of flows into and around the floodplains.

With relatively modest flows to South Australia (10 – 15 000 ML/day), SARFIIP will enable floodplain inundation of the Pike and Katarapko floodplains to occur on a scale only otherwise possible under much higher flows (70 – 80 000 ML/day). These flows will help restore floodplain health, including plants and animals dependent on the wetlands and floodplains of the Riverland, while making sure salinity impacts can be managed both short and long term.



Using infrastructure to maximise ecological outcomes

Community engagement

SARFIIP and other projects in the Riverland have been driven by a partnership approach, with project ideas, local knowledge and guidance. The legacy and ongoing success is dependent on continued community involvement and support.

We are working with local stakeholders, including those represented on the Pike Community Reference Committee and Katfish Reach Steering Group.

The First Peoples of the River Murray and Mallee, are being engaged in SARFIIP to draw on their knowledge and protect their unique cultural heritage.

SARFIIP Funding

The South Australian Riverland Floodplains Integrated Infrastructure program (SARFIIP) is a \$155 million program funded by the Australian Government through the Murray Darling Basin Authority and implemented by the South Australian Government to improve the watering and management of River Murray floodplains in South Australia's Riverland.

SARFIIP contributes to the implementation of the Murray Darling Basin Plan by supporting efficient watering to protect and restore key environmental assets in South Australia.



Government of South Australia
Department of Environment,
Water and Natural Resources



Australian Government





New infrastructure will restore blocked fish passage through the floodplain

Pike Floodplain Inundation Measures

The Pike Floodplain is considered ecologically significant with a diversity of terrestrial and aquatic habitats, populations of rare and endangered species, and sites of value to European and Indigenous cultural heritage.

It includes:

- An extensive network of aquatic habitats for fish, and waterbirds
- Red gum woodland habitat sustaining high levels of ecosystem productivity, particularly after floods
- Shrublands that provide breeding habitat for fish and waterfowl, particularly during and after floods
- Black box woodlands providing habitat for hollow-dependent animals, and aquatic fauna as it decays.

The SARFIIP Pike Floodplain project seek to manage threats such as:

- Degradation of extensive areas of the floodplain by salinisation through groundwater discharge and evaporative concentration
- Insufficient flooding, resulting in low productivity and poor vegetation health
- Barriers preventing the free movement of fish between the floodplain and the river for feeding, breeding, dispersal and migration
- Increased rates of siltation accelerated by low flows, lack of hydraulic variability and insufficient flooding.
- The legacy of historical grazing, feral animals and continuing high kangaroo populations



The old inlet at Margaret Dowling Creek is a barrier to fish and limits flow rates

Infrastructure to be constructed to allow surface water management on the floodplain, includes:

- Environmental regulators with fishways at Tanyaca Creek and Pike River
- Regulators on the southern Mundic outlet and Snake Creek
- Blocking banks and ancillary structures within the blocking bank
- A new inlet, bridge and fishway at Margaret Dowling Creek
- Existing flow and fish barriers at Banks D, E, F, F1 and G will be remove.

The new infrastructure , along with the recently constructed Deep Creek regulator will allow 2000 ha of the floodplain to inundated.

The ecological benefits of the floodplain inundation will be maximised by operating the new infrastructure in conjunction with raising weir pools at Locks 4 and 5.

The Margaret Dowling Creek and Deep Creek regulators will be used to deliver higher flows into the anabranch and to control the rate of water level rise and fall. This is important for increasing in-stream variability and delivering localised ecological benefits such as pulse flows to generate native fish movement and spawning cues.





Katarapko Floodplain Photo: Bill Doyle

Katarapko Floodplain Inundation Measures

The Katarapko floodplain is part of the Murray River National Park which attracts up to 40,000 visitors each year for recreational activities, including camping, fishing, canoeing, bird watching and bush walking.

It includes:

- A complex mosaic of habitats including fast and slow flowing creeks, temporary and permanent wetlands, floodplain woodland, shrubland and open plains, and dune systems
- Numerous vegetation communities, over 40 kilometres of permanent waterways and 27 temporary freshwater wetlands.

It supports:

- Four nationally vulnerable species: Southern bell frog, Murray cod, Murray hardyhead and Regent parrot
- A further 15 species have a threatened rating at state level, which include two reptiles and 13 bird species.

The project area is a priority floodplain for environmental flows, is recognised for having high conservation values, and is a Demonstration Reach for Native Fish.

The Katarapko floodplain is significantly affected by river regulation and the cumulative effects of past local management actions including the saline irrigation disposal basin on the floodplain, and water diverted around Lock 4. As a result, the conservation values of the floodplain are currently in decline. River regulation has greatly modified the frequency, height and duration of flood events occurring within the area.

The highest ranking threat to the ecological health of the Katarapko floodplain is the lack of environmental flows, causing loss of species needs to reproduce and regenerate, loss of habitat, reduced exchange of nutrients and other important elements between the floodplain and river, and reduced flushing of salt from

floodplain soils and freshwater recharge.

Surface water management

The long-term management option to achieve improved environmental flows for the Katarapko floodplain is the construction of surface water infrastructure to enable the inundation of floodplain, creeks and wetlands by controlling water levels and outflows.

The construction of this infrastructure will allow more than 1300ha to be inundated which will have significant benefits for the diverse habitat types and biodiversity. Vegetation communities to most benefit include Black Box, River Red Gum and Lignum.

The works include new structures at Bank J, The Splash, Piggy Creek, Sawmill Creek, Carpark Lagoons; which are connected by blocking banks and access tracks. The new regulators allow for variability of flow rates, inundation heights and effective flooding.

To maximise the benefit of water regulators in the Katarapko floodplain, it is necessary to operate them in conjunction with weir pool raising (raising water levels) at Lock 4, which inundates additional floodplain area for ecological benefits.

Community Participation

The Katarapko floodplain is part of the Katfish Reach project, a community environmental rehabilitation project working for a healthier and more productive aquatic floodplain ecosystem that everyone can enjoy. The name 'Katfish Reach' was coined through the abbreviation of "**K**atarapko and **E**ckert Creek **D**emonstration **R**each for **N**ative **F**ish".

The Katfish Reach model provides opportunity for community and key stakeholders to be actively engaged and involved in planning, delivery and promotion of the project. For more information, visit www.katfish.org.au

Salinity Management Measures

The integration of salinity management into broader floodplain management and operations can achieve ecological, economic and social outcomes.

The Salinity Management Measures (SMM) project will complement the construction of regulators and blocking banks at Pike and Katarapko floodplains, which are being built to manage flooding (inundation) and water levels to improve and protect the region's wetlands and floodplains.

As the project continues through to 2020 it will move from planning, evaluation and concept design into detailed design and construction of infrastructure.

Ongoing activities include groundwater and surface water investigations to understand how management actions may impact real time and long term salinity targets in the River Murray and how groundwater management will benefit ecological recovery. Surveys and monitoring have been undertaken on-ground, in-stream and by air.

This research, together with other monitoring and surveys will inform the most appropriate approaches to managing saline groundwater.

Construction will include the drilling of pump and monitoring bores, construction of pipelines and installation of pumps to move saline water to disposal basins.

SMM project will maximise opportunities introduced by:

- Promoting a neutral impact from salinity caused by infrastructure to control the inundation of wetlands and floodplains
- Protecting existing low salinity groundwater zones
- Managing groundwater near inundation zones to maximise the area suitable for vegetation (in terms of salinity)
- Enhancing the benefits of inundation of the Pike and Katarapko floodplains (approximately 2000 ha) and protecting the River Murray from salinity impacts

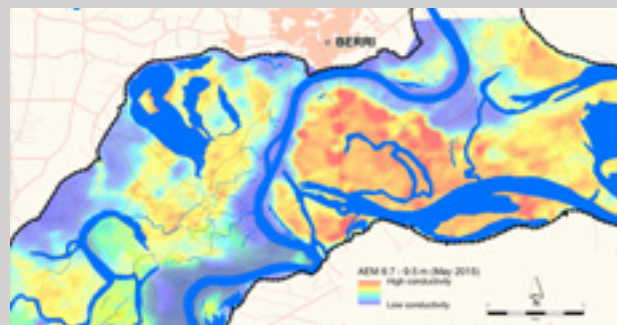
And SMM will contribute to developing opportunities for further, long-term, salinity management in SA.

Environmental Pathways

South Australia has many works to control environmental water ranging from works at Chowilla to smaller structures to control water at individual wetlands. The integration of these projects with weir pool raising and managed environmental flows represents a challenge and opportunity being addressed through the Environmental Pathways Project.

The EPP component will consider opportunities to integrate the environmental water management projects (floodplain, wetlands and weir pool management) in the context of river operations.

The EPP will also consider opportunities for infrastructure investment between Lock 1 and the state border to complement the works and provide connectivity zones between these sites.



Groundwater Salinity Map Extract: Katarapko Floodplain

Yellow-red areas represent more saline groundwater. Blue represents lower salinity. Dark blue areas suggest low salinity river water interacting with floodplain groundwater, flushing these areas. It is these areas that are most likely to provide favourable conditions for healthy floodplain vegetation and fauna habitats.

These projects will seek to increase the resilience and functionality of the river ecosystem.

EPP will:

- Deliver an infrastructure database and options for investment in additional infrastructure
- Identify gaps and issues in the policy and operations of environmental projects and a clear work plan for their resolution.

Project outcomes in the long term include:

- Efficient environmental management and water delivery decisions that optimise environmental outcomes on floodplains
- Additional construction of infrastructure where required to optimise outcomes.

Environmental Monitoring

Environmental monitoring will help to ensure on-ground management actions and achieve the required ecological objectives.

Monitoring will include:

- Surface water monitoring of flow, dissolved oxygen and salinity
- Groundwater monitoring
- Ecological monitoring includes tree health, understorey vegetation, fish, frogs, waterbirds and in-stream habitats

Further information

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