

Environmental watering of the Katarapko Floodplain

Frequently Asked Questions



Katarapko floodplain receiving a drink during environmental watering in Spring 2020

Background on Katarapko

Katarapko Floodplain is located between Loxton and Berri, straddling Lock and Weir 4 and covers more than 9000 hectares. Most of the area falls within the Murray River National Park, with the rest on private land, Crown land and the Gerard Aboriginal Reserve.

It is a unique landscape that attracts over 40,000 visitors every year to enjoy camping, fishing, canoeing, bird watching and other recreational activities. It is a special place because of its cultural, ecological and recreational value. It is home to threatened species and includes a range of habitats, with lagoons, swamps, wetlands and creeks.

With prolonged dry conditions, Katarapko has been experiencing a decline in ecological health due to altered flow regimes, a build-up of salty soils and lack of natural flooding. This lack of water has had a direct effect on the health of the vegetation across the landscape, damaging the floodplain condition and wide range of plants and animals who rely on it.

To help improve the health of Katarapko, the Department for Environment and Water (DEW) have constructed environmental infrastructure to mimic a natural flood (as needed), to enable managed inundations of the landscape when the river is lower than naturally required to inundate those areas.

What has been constructed at Katarapko?

A number of important environmental works have been undertaken at Katarapko to better use environmental water to improve the health and condition of the floodplain. The works include:

- Removal of major barriers to improve flow and fish passage
- Bank upgrades
- Construction of a blocking bank
- Construction of environmental regulators and fishways to improve fish passage at:
 - Log Crossing
 - Piggy Creek
 - Bank J
 - The Splash
 - Sawmill Creek
- Construction of smaller infrastructure across the landscape to be operated with the regulators:
 - Ancillary structures
 - Cross drainage culverts
 - Outfall regulators

These works have been constructed through the Riverine Recovery Project (RRP) and South Australian Riverland Floodplain Integrated Infrastructure Program (SARFIIP). These programs funded numerous works to improve the health and resilience of the Katarapko Floodplain.

How does the infrastructure support floodplain inundation?

There are various types of surface water infrastructure within Katarapko that will assist in undertaking a managed floodplain inundation. Some structures, such as regulators, have the ability to influence hydraulics whilst others, such as blocking banks, are fixed structures that assist with movement of water across the landscape.

An environmental regulator is a weir-like structure built across a watercourse system, designed to raise water levels to enable inundation of large areas of the floodplains and wetlands. Each regulator or smaller structure is operated differently depending on the landscape, design and purpose. When the regulator is in operation, fish will be able to move past the regulator through the fishway structures. These have been specially designed to enable fish passage for large, medium and small-bodied native fish.

The blocking bank has been designed to enable managed inundations that facilitate delivery of water for the environment to long-lived vegetation and to contain water on the side of the floodplain. The bank spans from Carpark Lagoon to Lock 4, a total length of 8.2 km with 5.7 km of raised track from the ground. There are spillways within the blocking banks that allow connectivity during a natural flood and overflow during a managed inundation.

Floodplain inundations can be achieved in a variety of ways depending on the ecological objectives:

- **Low inundation:** to raise and vary the water levels within the channels of the anabranches and creeks.
- **Medium inundation:** to raise water levels to a height where water connects wetlands and starts to spill out onto the broader floodplain
- **High inundation:** where the regulators are operated to their full extent to generate broad scale inundation of wetlands and the floodplain
- **Helping a natural flood:** to extend inundations and allow breeding events to be completed, if required.

It is intended to operate the infrastructure in conjunction with Lock 4 to maximise ecological benefits and achieve higher inundation levels. Lock 4 water levels will be raised while operating the environmental regulators to maintain flows through the Katarapko system.

Why do we need infrastructure for environmental benefits?

The health of the Katarapko Floodplain has been declining as a result of river regulation, over extraction and the recent extreme dry conditions. The lack of water availability has resulted in a decrease in the number of high flow events and floodplain inundations, which has led to a loss of habitat for flora and fauna and increases in salinity levels across the landscape.

Key native vegetation communities including river red gums and black box trees are in decline. The health of wetlands have been impacted and the wildlife relies on healthy vegetation to survive.

To restore this landscape the environmental infrastructure will be able to provide much needed water to a significant area of the Katarapko Floodplain and reverse some of the severe ecological decline that has been observed over a number of years. The infrastructure will supplement the natural processes by reinstating some wetting and drying cycles, which is good for the environment. When operated, they have the ability to inundate up to a similar level of a natural flood event within the inundated zone.

What are the expected benefits?

The upgraded works across Katarapko will enable large areas of the floodplain to be inundated when there is enough water available in the River Murray. The long-term aim is to restore the floodplain to a healthy condition, so it is able to handle future dry conditions and to create a long living landscape for all to enjoy. There will be an improvement in connectivity between riverine and floodplain habitats, freshening of groundwater systems, improvements in soil condition and enhanced biodiversity.

The floodplain will enjoy various ecological benefits:

- Increased watering of native vegetation that lives on the floodplain, such as river red gums, black box and lignum
- As the flooding flushes out salt, the soil conditions will freshen and improve, which will benefit trees, grasses and ground cover plants
- The leaf litter and nutrients flushed off the floodplain are good for a wide range of bugs that in turn provide food for fish, frogs, bats and reptiles
- The bugs, fish and frogs help support populations of water birds, turtles and yabbies
- The newly watered parts of the floodplain are likely to develop new saplings which will help ensure that the tree community is sustained in the future.

How often will the environmental regulators be used and when will it operate?

The use of the regulators will not follow a set pattern. Decisions about undertaking a floodplain inundation will be made based on assessments of the condition of the floodplain (in particular vegetation health) and whether it is improving, stable or declining. Other key factors that will influence regulator operations include the flow in the River Murray, availability of environmental water, and the water quality (salinity and dissolved oxygen levels) in the incoming water. In some years, due to water availability or other factors, only a low-level, shorter operation may be undertaken. If the health of the floodplain is declining and there is enough flow in the River Murray then a high level operation may be undertaken. It is likely that there will be low level operations in the first years in an effort to reinstate the health and resilience of the floodplain so that it can better withstand future droughts.

All environmental regulators and supporting structures will be maintained and operated by SA Water, on behalf of the Department for Environment and Water.

What is being monitored?

Surface water monitoring has been established at Katarapko to provide real time information regarding river flows and levels, salinity, temperature and dissolved oxygen in the River Murray and throughout the Katarapko anabranches and creeks. Sampling will be completed to build knowledge and understanding of ecological responses in the river and creeks during and after managed floodplain inundations.

The Floodplain team has developed monitoring plans that outline the required monitoring program, and how it relates to the ecological objectives and targets.

At Katarapko there is an extensive ecological monitoring program which includes vegetation, birds, fish, and frogs. Other monitoring of groundwater and soils is also undertaken and has helped with the development of the Operations Plan for Katarapko, as it provides important data to enable improvement of the planning of future managed inundations.

How will floodplain inundation events be managed?

Monitoring stations provide real-time information, enabling ongoing risk assessments. Automated alarms will trigger if salinity or dissolved oxygen levels fall outside established parameters. This provides an

opportunity to respond to risks and ensure that established water quality thresholds are not exceeded.

When the regulators are in the process of an environmental operation, the conditions can be altered based on real time conditions and understanding through the monitoring and observations of how the event is progressing. Post event we will summarise what did and did not work, to assist with accuracy of forward planning and aim to undertake larger operations into the future.

Management options include:

- slower drawdown of the pool level behind the regulator
- changing the amount of water passing through different structures
- reduced operating height and/or duration.

Prior to, and throughout, each inundation event there will be clear communication provided to key stakeholders and the community on how the event will be managed. Water information is available on the Water Data SA website that is accessible to anyone and provides real time water information.

How will operating the regulator affect fish and fish habitat?

Katarapko is known for its high value of native fish habitat, particularly fast flowing habitat favourable for fish such as Murray cod. When the regulators are in operation it has the potential to slow the water velocity in some parts of the creeks. This has the ability to influence the number of food for fish, breeding behaviour, and impact on the survival of juvenile fish, this varies for each species of fish.

Scientists have indicated that operation of the regulator is likely to create significant habitat for small and medium sized native fish, likely to result in the breeding of carp (in similar ways that carp breed in response to natural floods) and reductions of water velocity. The latter might have a negative impact on some native species such as Murray cod and positive impact on smaller native fish such as Smelt and gudgeons.

The advice to operators is to focus on providing conditions that benefit native species to ensure that they can compete with pest species. Other measures may be implemented to exclude carp from key wetlands where particularly strong breeding responses have been recorded. This will be managed accordingly as documented in the Operations Plan.

Will the salinity increase in the river?

The Katarapko Floodplain, like most floodplains of the River Murray in South Australia, has salty groundwater located just under the surface. The lack of natural flooding has caused this groundwater to become highly saline because it continues to accumulate and is not flushed away frequently. This surface salt and saline groundwater is known to enter the River Murray following natural floods.

Any watering event whether natural or managed, comes with the risk of changes in water quality. The modelling at Katarapko indicates that floodplain inundations may result in a short-term increase in salinity within Katarapko creeks and the river. During a managed floodplain inundation, appropriate steps will be taken to adaptively manage the event to reduce the potential for salinity increases. For example, the following mitigations will be in place:

- Operate only when there are sufficient river flows to enable dilution of any salinity
- Slowly drawdown of the water level behind the regulators
- Reduce the inundation height and/or duration, if salinity levels are not stabilising.

Salinity in the River Murray and in the Katarapko creeks will be closely monitored, as explained above. Frequent operation of the regulator to inundate the floodplain will, over time, reduce the build-up of salt in the soil profile and gradually freshen the soil and water of the floodplain.

Can I still visit Katarapko?

The Murray River National Park, including Katarapko, will remain open for the public to enjoy. Some short-term restrictions to parts of the park will occur during the medium and high inundations, as low-lying parts of the floodplain are inundated.

When the regulator is in operation, and during periods when there are significant increases in river levels, passage through the regulator itself will not be possible. However, boating above and below the structure will be unrestricted. The creeks and waterways above the regulator will be open to boating, canoeing or walking during an inundation event and information will be provided through the SAMDB Natural Resources Centre in Berri and on the DEW website.

When the regulator is not operating, visitors will be able to access the floodplain and creeks as usual to enjoy the

natural beauty of Katarapko. When not operating, small boats will be able to pass between the piers of the regulator with upstream and downstream passage clearly marked with buoys. During higher flows in the river, from 30,000 to 40,000 ML/day and above, small boats will not be able to pass under the regulator.

Despite the short-term restrictions during operational periods, as occurs during natural floods, the overall benefits of operating the environmental regulators will ensure that generations of visitors can enjoy this unique environment into the future.

Will operations impact on water availability and quality for irrigation?

The regulator operations will not impact water allocations for irrigation. Specific allocations for water for the environment will be made available through the Basin-wide Environmental Watering bidding process or operated during periods of unregulated flows.

The regulators will be operated to mitigate the risk of potential water quality concerns outlined above.

More information

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You can also visit our website

www.environment.sa.gov.au/katarapko-floodplain

The South Australian Riverland Floodplain Integrated Infrastructure Program is a \$155 million investment program funded by the Australian Government and implemented by the South Australian Government to improve the watering and management of River Murray floodplains in South Australia's Riverland



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