



Site options profile #L1A

Katarapko Creek - Draft

Lock 3 Master Plan



Location: River Murray anabranch, River Chainage Markers 513 to 482
Land Tenure: Murray River National Park (Katarapko)

Creek Length: 16.2 km
Normal Pool Level: 10.1 mAH

PROPOSED OPTIONS	
Option #1:	Improve fish passage and flow conditions within Katarapko Creek by replacing the 'Stone Weir' structure with a new structure that can have variable heights and provide fish passage.
Description	The 'Stone Weir' structure currently restricts the flow within Katarapko Creek and creates a 'hydraulic step' and physical barrier, which prevents fish passage. This option aims to remove and replace the 'Stone Weir' with a structure, which will include a fish passage, as well as the ability to adjust the structure height. This will allow for fish passage whilst maintaining hydraulic conditions. The adjustable height design will align with the need to maintain water levels in the main channel, whilst introducing management flexibility to respond to river conditions as needed. Recent infrastructure constructed and managed to support outcomes within Eckert's Creek and on the Katarapko Floodplain, when operated, have the potential to improve flow conditions within Katarapko Creek. Structure design, including structure placement, should have consideration of this opportunity and the potential benefits it could yield for Katarapko Creek and in particular, large bodied native fish. A potential increase in future medium to high-flow events proposed under the Constraints Management Strategy (CMS) together with future natural high-flow events will continue to erode the structural integrity of 'Stone Weir' posing a risk to river levels and flow in the river, which would impact irrigation offtakes, navigation and the Loxton riverfront. Design considerations would need to account for access needs, including to support fire management activities on Katarapko Island, accessing structures for proposed floodplain watering options on Katarapko Island, ecological monitoring and recreational opportunities including canoeing, fishing, mountain biking and bushwalking.
Outcomes	• Improved hydraulic conditions for fish. • Improved fish passage. • Risk mitigation through the maintenance of water levels and flow in the river for navigation and irrigation extraction.

SITE BACKGROUND

Description

Katarapko Creek is an anabranch of the River Murray downstream of Lock 4. Located within the Katarapko section of the Murray River National Park, the creek provides high recreational value (e.g., canoeing, kayaking, camping) and contains habitat for native fish. Flows enter Katarapko Creek from the River Murray, downstream of Lock 4 and then converge with flows from Eckerts Creek (at The Splash), ultimately flowing back into the River Murray, immediately downstream of Loxton Township. The 'Stone Weir' structure sits immediately downstream of the Katarapko Creek inlet.

Cultural Significance

The River Murray and Mallee Aboriginal Corporation (RMMAC) holds native title over the River Murray within the Lock 3 Reach. The First Peoples intimate knowledge and understanding of Country and active participation across all levels is vital to the effective management of this landscape.

Post-colonial use

Since river regulation and the construction of locks and weirs along the River Murray, the water regime in the wetland complex has been altered. Following the construction of Lock 3 in 1925, approximately 151 hectares of the wetlands in the wetland complex were permanently connected with the River Murray at weir pool level. The lack of water level variation in these areas resulted in the decline of floodplain habitat within the wetland complex. The installation of regulators has since enabled the wetting and drying of the wetlands, improving the ecology within this area¹.

The original Stone Weir was constructed circa 1908 and consisted of a stone-filled timber crib weir, which was designed to move more water down the main river channel by holding it back from Katarapko Creek. This kept water levels high for the navigation of steam boats and other vessels. This has created a major barrier for the movement of native fish and restricted flows through the creek.

WETLAND ECOLOGY

Ecological Role: Katarapko Creek is part of a larger protected area with diverse habitat and wetland types and is of high conservation value^{1,2}. Katarapko Creek is within the Murray River National Park which is proclaimed to conserve a significant proportion of South Australia's floodplain environments which are not represented widely in other reserve systems³.

Flora and Fauna: The major vegetation communities within the Katarapko floodplain include river red gum (*Eucalyptus camaldulensis*) and black box (*Eucalyptus largiflorens*) woodland, lignum and samphire/ chenopod shrublands. It is home to a wide variety of wildlife, some of them listed as species of conservation significance under national and/or state legislation⁴. Katarapko is a priority floodplain for environmental flows in South Australia and is currently the only Demonstration Reach for Native Fish in South Australia^{4,5}.

WETLAND MANAGEMENT

Current Management:

The Department for Environment and Water's National Parks and Wildlife Service SA is responsible for the management of the Katarapko section of the Murray River National Park. Katarapko Creek is a popular destination for recreational tourism, including kayaking, fishing, camping and birding. As noted in the subsection below, there is currently no infrastructure at the Stone Weir to modify flow levels or provide fish passage through Katarapko Creek.

Infrastructure:

Stone Weir: The Stone Weir was originally constructed in 1908 to ensure adequate water levels were maintained through the Loxton irrigation area during low flow periods. The present weir is a 50 m wide constructed rock filled weir, which affords pedestrian access to Katarapko Island during periods of low flow. There are no regulators or structures which provide fish passage present at the weir during periods of low flow. A large scour hole has developed downstream of the weir that has the potential to threaten the integrity of the structure⁶. The size of the rock remaining at the crest is generally very large (>500 mm) with smaller sized rocks (>200 mm) at the edges of the weir where velocities are lower. Under regulated conditions, water flows through the permeable stone weir and the weir begins to be overtopped at flows greater than 8 000 megalitres per day (ML/day) in the main channel. It is completely inundated when flow reaches approximately 14 000 ML/day in the River Murray. The presence of the weir also lowers water velocity through Katarapko Creek, limiting the suitability of this creek to provide habitat for native fish.

ISSUES AND DRIVERS

As part of the Master Planning Project engagement process, an ongoing register of issues and drivers relating to sites and options was maintained. These highlighted key considerations and investigations that would need to be factored in and undertaken as part of any next steps towards realising the outcomes described within the option profiles. For Katarapko Creek, these included:

Environmental

- There is a low to medium risk associated with acid sulfate soils at this site⁷. This would require further assessment before any construction works or wetting and drying activities are undertaken.
- Consider how to pest-proof the weir (gate) and minimise construction footprint to avoid vegetation impacts.

Cultural

- Strong First Peoples cultural interests in the area. Construction works need to be mindful not to disturb areas of cultural importance.

Community/Social

- Site has strong community and historical value.
- Stone weir currently maintains water levels in the main river channel through Loxton. If Stone Weir was removed with no replacement structure, the main river water levels would drop approximately 27 cm during flows of 10,000 ML/day at Lock 5, potentially restricting boating and pumping activities through Loxton.
- Campers will have access to site and security will be an issue.

Operational/Logistics

- A large scour hole exists immediately downstream of 'Stone Weir' which presents a construction and design risk.

KEY STAKEHOLDER INVOLVEMENT

- Berri Barmera Council
- Berri Barmera Landcare
- Central Irrigation Trust
- Commonwealth Environmental Water Office (CEWO)
- Friends of the Riverland Parks
- Katarapko Advisory Panel (KAP)
- Loxton Waikerie Council
- Murraylands and Riverland Landscape Board
- National Parks and Wildlife Service SA
- Regent Parrot Recovery Team

- River Murray and Mallee Aboriginal Corporation (RMMAC)
- SA Water

REFERENCES

1. Jensen A, South Australia, Department of Environment and Natural Resources, South Australian River Murray Wetlands Management Committee. Wetlands atlas of the South Australian Murray Valley: a summary of current knowledge of Murray Valley wetlands as a basis for integrated catchment management. Adelaide: Dept. of Environment and Natural Resources; 1996.
2. Thompson MB. River Murray Wetlands - Their Characteristics, Significance and Management. Adelaide: University of Adelaide for the Department of Environment and Planning and the Nature Conservation Society of South Australia; 1986.
3. DENR. Murray River National Park Management Plan (Including Rilli Island, Media Island and Kapunda Island Conservation Parks). 1994.
4. DEW. EPBC Self-assessment- Operation of surface water management infrastructure on the Katarapko Floodplain. 2019.
5. Wallace TA. Eckerts-Katarapko floodplain Tree condition survey data April 2015-March 2019. Report produced by Riverwater Life Pty Ltd for the Department for Water and Environment, South Australian Government (Draft version released April 2019); 2019.
6. DEWNR. Minute, Katarapko Stone Weir – Lowering Crest height, File no: 11/5539, Document no: DEWNRD00011037. 2017.
7. Grealish G, Shand P, Grocke S, Baker A, Fitzpatrick R, Hicks W. Assessment of Acid Sulfate Soil Materials in the Lock 1 to Lock 5 Region of the Murray-Darling Basin. CSIRO: Water for a Healthy Country National Research Flagship.; 2010.



Pictures: Top left, historic picture of the stone-filled timber crib weir; Right, current condition of Stone Weir (March 2020); Bottom left, on top of Stone Weir, looking downstream (March 2020).

Katarapko Creek

Inundation Extents

- 5GL - At pool conditions
- Murray Flood 1956
- Proposed Works

Lock 4

Option # 1

KATARAPKO FLOODPLAIN



0 0.25 0.5 1 1.5 KMS

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Wetland Structures, Model Flow Extents
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