

Bookmark Creek and Wetland Pre-Feasibility Fact Sheet

The proposal for Bookmark Creek seeks funding to undertake feasibility investigations into restoring the Bookmark Creek main channel and wetland, through improved flow management and native fish passage.

The proposal aims to improve connectivity and flow through the creek and create greater hydrodynamic diversity in order to improve habitat and passage for native fish. The recommended on-ground works may involve the inlet bank and installation of a new upstream regulator that incorporates a fishway, removing obstructions to flow and creating a hydraulic gradient along the creek. Bookmark

Creek is understood to be one of the few sites in the Murray Darling Basin able to provide a range of flowing habitats for a number of large bodied native fish species.

Bookmark Creek and the associated wetland lies along the western side of the township of Renmark in South Australia. Bookmark Creek is approximately eight km long and together with the River Murray channel surrounds the township of Renmark. Bookmark Creek is permanently connected to the main river channel; however it can be managed as a temporary system. The volume of the creek and wetland at pool level is approximately 239 ML and depth is approximately one metre on average.

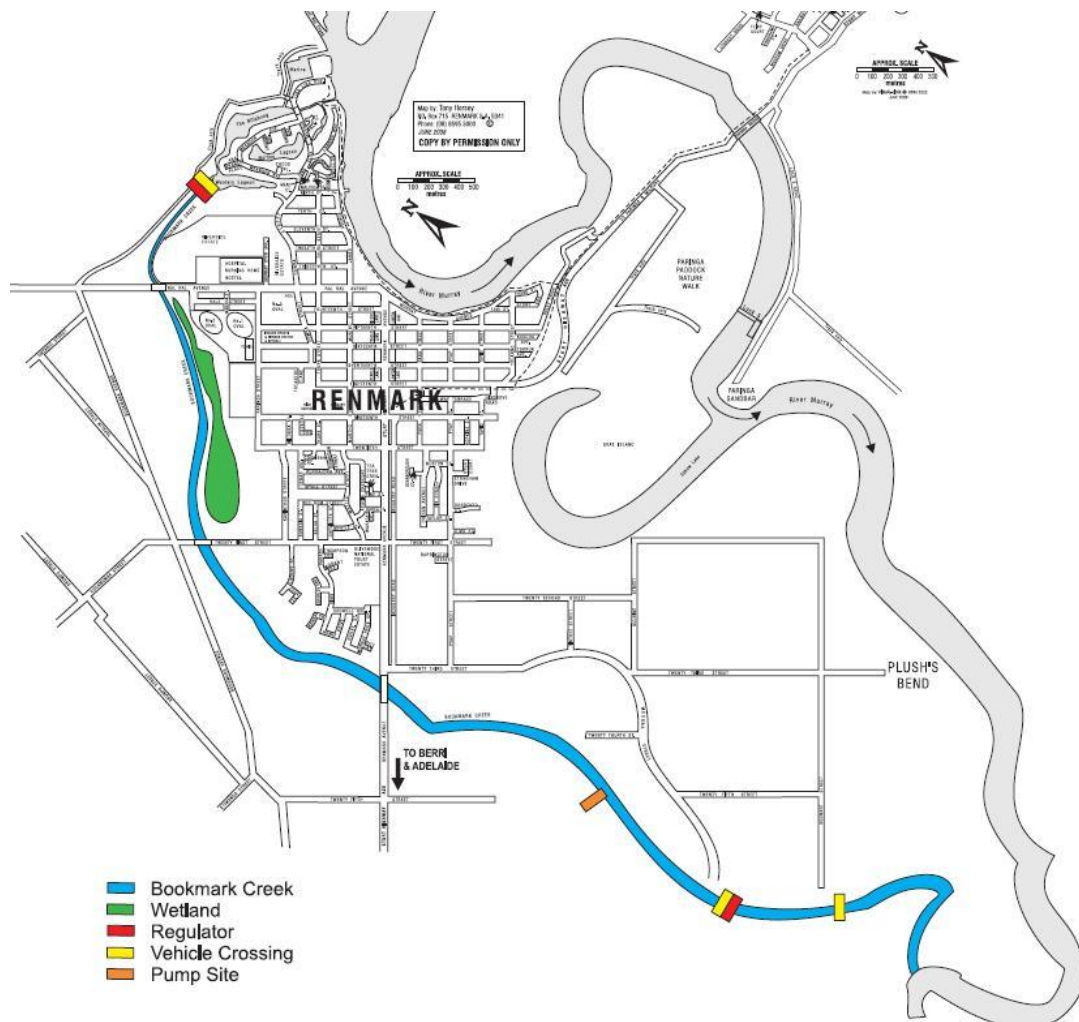


Figure 1: Bookmark Creek Location



ECOLOGICAL SIGNIFICANCE AND CONDITION

Bookmark Creek and wetland has major potential for rehabilitation for aquatic habitats and recovery of native fish populations due to two key opportunities that are only present in a small number of sites in the Murray-Darling Basin. These opportunities are:

- Flow can be used from the Lock 5 weir pool and re-used downstream of the lock, thus there are only minor water losses over the eight km creek; and
- Bookmark Creek has a head difference of three metres because it has inlets both upstream and downstream of a lock. This can be used to create flowing water habitat and hydrodynamic diversity characteristic of the creek prior to river regulation.

Vegetation

While no formal vegetation surveys have been undertaken at Bookmark Creek and wetland, vegetation associations have been observed that include River Red Gums (*Eucalyptus camaldulensis* var. *camaldulensis*) with an understorey of Lignum (*Muehlenbeckia florulenta*) and Samphire sp., Black Box (*Eucalyptus largiflorens*) with Lignum understorey, River Red Gum and River Cooba (*Acacia stenophylla*) with an understorey of Lignum, Bulrush (*Typha* sp.) and Common Reed (*Phragmites* sp.) and Samphire sp. found in association with Saltbush (*Atriplex* sp.), Pigface (*Carpobrotus* sp.) and Creeping Monkey Flower (*Mimulus repens*).

Birds

A total of 38 bird species have been observed along Bookmark Creek during two surveys conducted in December 2011 and December 2012, of which 23 are considered to be wetland species. Three birds of conservation significance have been recorded – the Banded Stilt (*Cladorhynchus leucocephalus*) (Vulnerable in SA), Australasian Darter (*Anhinga novaehollandiae*) (Rare in SA) and Intermediate Egret (*Ardea intermedia*) (Rare in SA). The most abundant species recorded across the site were the Pacific Black Duck (*Anas superciliosa*) followed by the Grey Teal (*Chenonetta jubata*). Species have been observed using a range of habitat types including open water, exposed mud, fringing vegetation and snags as well as terrestrial vegetation.

Fish

Fish surveys were conducted in October 2011 and October 2012 with a total of nine native species and five non-native species recorded over two surveys.

Frogs

Six species of frogs were recorded during surveys in 2011 and 2012, including the Southern Bell Frog (*Litoria*

raniformis) (vulnerable under EPBC Act). During the fish survey in October 2012, hundreds of tadpoles were caught in the wetland. These were identified as *Crinia* sp., *Limnodynastes tasmaniensis* (Spotted Grass Frog), *Limnodynastes fletcheri* (Long-thumbed Frog) and *Litoria peronii* (Perons Tree Frog).

CULTURAL AND SOCIAL VALUES

Given the close proximity of the site to the township of Renmark, the site is considered to be an important educational and recreational resource. It is also a highly visible site to locals and visitors to the area. The creek and wetland offer opportunities for fishing, yabbing, camping and ornithological study. Maintaining the condition and integrity of the site is fundamentally important to both the Bookmark Creek Action Group and the broader community. Prior to European settlement the Renmark area was inhabited by the Ngawait people.

MANAGEMENT HISTORY

Historically, Bookmark Creek was an ephemeral anabranch of the River Murray that flowed during periods of high river, extending 10 km from the junction of Ral Ral Creek and the River Murray to approximately 14 km downstream. After the construction of Lock 5, the inlet of Bookmark Creek became permanently inundated at Lock 5 weir pool, with a bank constructed to restrict and regulate flow. With the development of Renmark as the first Australian irrigation district in the late 1880s, the creek was used as a reservoir to supply irrigation water. The creek continued to be used as a reservoir for pumping by the Renmark Irrigation Trust until 1972 after which water for irrigation purposes was supplied through a pipeline system. The creek has also been used as a reservoir for settlement water supply and flood mitigation where necessary.

While the site has not been used as an irrigation disposal basin for many years, Bookmark Creek is classified as a saline disposal creek/basin and as such, there are guidelines around how the site is managed. As a result there have only been two environmental flows through Bookmark Creek in the last 15 years.

Flow-through is currently activated when:

- the flow at Lock 5 is greater than 12,000 ML/day and expected to continue in the 12,000 to 25,000 ML/day range for four to six weeks or to be greater than 25,000 ML/day for three to four weeks; and/or
- the salinity at Lock 5 is less than 450 EC.

Bookmark Creek has been connected to the main river channel since 29 September 2010 and flows cannot be managed as the inlet structure is broken. There are three structures located along Bookmark Creek, see Figure 2.



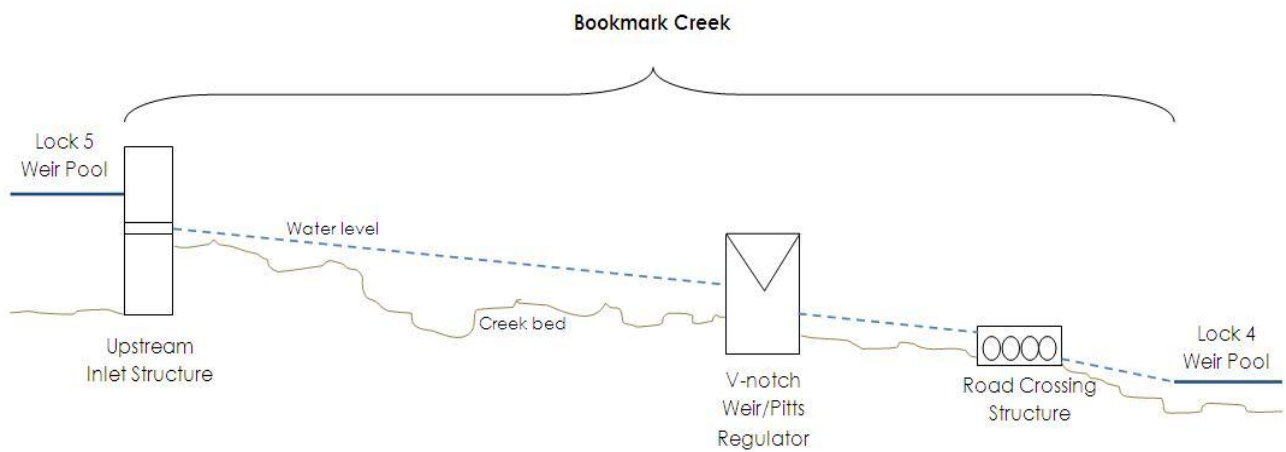


Figure 2: Current Structures at Bookmark Creek (not to scale)

Over the last ten years, ongoing efforts by the South Australian Government and the community have improved water quality and contributed to rehabilitation of wetland riparian and adjacent floodplain habitats. The BCAG has undertaken extensive revegetation work and used the site as a resource for environmental education with local schools and the community. However, to date, few hydrological management actions have been implemented at Bookmark Creek.

CURRENT CONDITION

The reduced frequency and duration of flow through the creek and wetland, combined with previous use as a salt disposal basin, have had an adverse impact on the creek and wetland. Accumulation of salt, decline in tree health and vegetation condition and loss of aquatic and terrestrial species abundance and diversity have been observed. Since flow-through commenced in 2010, there has been a significant improvement in the ecological condition of the site.

THE PROJECT PROPOSAL

The proposal aims to improve connectivity and flow through the creek and create greater hydrodynamic diversity in order to improve habitat and passage for native fish.

Outcomes and Benefits

Potential outcomes include:

- improved fish passage, flow and hydrodynamic diversity, particularly for large-bodied native fish;
- enhanced aquatic, emergent and fringing vegetation to increase the diversity and abundance of habitat for birds, fish, frogs and other wetland species;
- improved water quality;
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- improved ability to manage non-native fish species such as Common Carp;
- enhanced regional ecological values by complementing nearby projects, including Chowilla and Pike floodplain restoration; and
- enhancing the value of previous work undertaken at the site.

Potential benefits include:

- increased species diversity and abundance;
- potential for spawning sites for Murray cod and other large-bodied native species;
- a freshwater lens underneath the creek and wetland beds;
- minimised potential for algae outbreaks; and
- improved amenity of the site.

The outcomes associated with the proposal were identified by community members at workshops in June 2012 and a panel of DEWNR technical experts in September 2012.



FEASIBILITY OVERVIEW

The feasibility stage of this project would aim to identify the optimal water volumes and flow regimes required to achieve the desired ecological outcomes, as well as identifying the most appropriate environmental works and water management regime.

Objectives of Feasibility Investigations

The objectives of the feasibility stage would be to:

- Identify the optimal hydrological management regime
- Develop an environmental works package, through review of options including:
 - inlet regulator upgrade
 - removal or upgrade of barriers to flow
 - opportunities for rock groynes, re-snagging, bank stabilization and low level levee banks
 - removal of salt evaporation regulator
 - potential downstream regulator
- Develop designs and costings for recommended environmental works
- Assess ecological and other risks
- Support the ongoing community and stakeholder ownership and involvement in the project
- Determine ongoing maintenance responsibilities and costs of proposed on-ground works
- Identify approvals required to implement the project.

Project Management

It is anticipated the project would be managed by DEWNR. A stakeholder engagement strategy would be developed prior to the commencement of feasibility and prepared through a collaborative process with the Bookmark Creek Action Group (BCAG) and Renmark to Border Local Action Planning Group (RBLAP). Aboriginal engagement would occur through the First Peoples of River Murray and Murray Mallee.

ACKNOWLEDGEMENTS

The contribution of the South Australian River Murray Regional Community, including the many individuals and various local groups and organisations for their generous involvement and enthusiasm is greatly acknowledged. This partnership approach enabled the community ideas to be captured and prioritised by utilising and sharing local knowledge in the development of proposals.

This project is funded by the Australian Government's Water for the Future initiative through the Sustainable Rural Water Use and Infrastructure program.

For more information

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