



Site options profile #L8

Yatco Lagoon - Draft

Lock 3 Master Plan



Location: Weir Pool 3, River Chainage Markers 459 to 454

Land Tenure: Crown Land Under License and Private Landholders

Wetland Size: 346 hectares (Ha)

Normal Pool Level: 9.8 mAHd

PROPOSED OPTIONS	
Option #1:	Support the current wetland management and associated outcomes with wetting and drying through the repair or replacement of existing central control structure on the main inlet (northern embankment).
Description	The central control structure on the main inlet (northern embankment) managing North Yatco Lagoon is in poor condition and leaks, reducing the efficiency of wetland management outcomes associated with wetting and drying cycles, including managing for invasive fish populations (i.e. carp). As the structure is seen as critical to maintaining current wetland exchange and taking advantage of potential future changes in hydrology through weir pool manipulation (raising and lowering) this option aims to replace or repair this structure with flow control boards in order to support future wetland management operations.
Outcomes	• Benefits associated with implementing a wetting and drying regime. • Improved ability to manage invasive species.
Option #2:	Improve floodplain condition by promoting: • An increase in the duration of floodplain watering associated with managed and natural high-flow events, through the retention of water, utilising existing infrastructure and complementary works • Opportunities for increased floodplain watering inundation extent and frequency associated with weir pool raising • Improved wetland drying management cycle activities through active drawdown and transport of floodplain nutrients associated with weir pool lowering.
Description	The current height of the main inlet structures to the wetland are set to 10.8 mAHd. This presents an opportunity to support the utility of existing structures to hold water within the wetland to extend the duration of watering events such as those associated with high-flow events and weir pool raising. To achieve this, the central regulator in the northern structure would need to be replaced or repaired and a number of outflow points would need to be investigated and potentially remediated to ensure water can be retained. Works would include raising of the access track on the eastern side of the main structure across the lagoon and blocking of several flood runners along the eastern edge of the lagoon, which connect to the river at this level. Some flood runners are understood to be acceptable to block, whilst others will require a regulator to retain connection to the river. The main inlet to the wetland is well positioned to exploit the benefits associated with weir pool manipulation. This presents an opportunity to increase the extent of managed floodplain area and have greater control of watering frequency through weir pool raising. It also presents an opportunity to complement existing management outcomes associated with wetland drying. Active wetland drawdowns associated with weir pool lowering allow for more rapid exposure of substrate and the transport of floodplain nutrients, including salt, back to river, avoiding the accumulation and concentration risks associated with drying via evaporation.
Outcomes	• Benefits associated with implementing a wetting and drying regime. • Enhanced capacity for conservation and improvement of wetland and floodplain vegetation. • Improved soil moisture conditions. • Opportunities to mobilise salt out of the wetland.

SITE BACKGROUND

Description

Yatco Lagoon (North and South) is a permanent shallow wetland situated on the west bank of the River Murray immediately upstream of the irrigation township of Moorook. The main connection to the river occurs at the northern, most downstream end of the wetland complex. The southern lagoon is connected to the river through a smaller, 3.9 km long channel.

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

Prior to the regulation of flows in the River Murray and the construction of locks and weirs, the Yatco Lagoons would have had a more variable water regime. Installation of regulators has since enabled wetting and drying of the lagoons, improving ecological outcomes within this area.

WETLAND ECOLOGY

Yatco Lagoon was assessed as having low- moderate conservation value. It is likely that this assessment has improved since considering investments and management actions through RRP and other programs¹.

Flora: Vegetation composition at Yatco Lagoon includes river red gum and black box woodland, sedges and bulrush, see references^{2,3} for detailed description of flora at this site. The floodplain and riparian zone flora were in a poor condition at the latest baseline survey³.

Fauna: Fish and frog surveys have been conducted on several occasions^{3,4}. Across the surveys eight native and five exotic species of fish were found. No species of state or national significance were recorded. In total, five species of frogs have been recorded at Yatco Lagoon, among them the listed Southern bell frog (*Litoria raniformis*). During the baseline survey conducted in 2005, Yatco Lagoon was found to have a higher mean diversity of waterbirds than other wetlands in the region, this was thought to be because the wetland acts as a drought refuge during dry times and has a high variety of habitats.

WETLAND MANAGEMENT

Current Management:

The north and south lagoons are managed by the Murraylands and Riverland Landscape Board in conjunction with private landholders. Each lagoon can be managed independently for drying and wetting operations. Currently, the northern lagoon takes approximately two summers to draw down. The timing of the wetting and drying cycles are and have been variable and the hydrograph is due for review.

Infrastructure:

In 2008, a causeway between the north and south lagoon was constructed which included the addition of sluice gates on existing infrastructure in order to manage the north and south lagoons separately. Other works during this construction period included upgrading an embankment with additional flow regulators and carp screens to improve the connectivity and fish movements between the river and the lagoon.

New regulators were recently installed (with sluice gates and carp screens) at a series of locations, including between the middle creek and north lagoon, middle creek and south lagoon, and between the south and north lagoons. One of the former structures is still in-situ, but was not upgraded.

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 Yatco, these included:

Environmental

- Acid sulfate soil (ASS) risk is considered to be low in the northern Yatco lagoon, while the risk in the Southern lagoon is considered to be low to moderate, see reference⁵ for hazard assessment and risk associated with acid sulfate soils and metal mobilisation. ASS should be further assessed before any work progresses.
- Capacity to export salt from site needs assessment in relation to current and proposed structures.

Cultural

- Construction works need to be mindful not to disturb areas of cultural importance.

Community/Social

- Local stakeholders have expressed interest in the existing structure being left in place, however, note the existing structure is a flow/management constraint.

Operational/logistics

- Consider upgrading existing structures; central structure in Option 2 under repair.
- Need to ensure good accessibility to structures.

KEY STAKEHOLDER INVOLVEMENT

- Central Irrigation Trust (CIT)
- Commonwealth Environmental Water Office (CEWO)
- Loxton Waikerie Council
- Loxton Waikerie Landcare
- Murraylands and Riverland Landscape Board
- National Parks and Wildlife Service SA
- Private Landholders
- River Murray and Mallee Aboriginal Corporation (RMMAC)
- SA Water

REFERENCES

1. 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.
2. 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.
3. SKM. River Murray Wetlands Baseline Survey – 2005. South Australian Murray Darling Basin Natural Resources Management Board.; 2006.
4. Nickolai C. Yatco Lagoon- Wetland Monitoring Summary 2007 to 30th June 2011. SA MDB NRM Board; 2011 Jul.
5. Shand P, Merry RH, Fitzpatrick RW, Thomas M. Acid sulfate soil assessment of disconnected wetlands between Lock 1 and Lock 5, River Murray, South Australia. CSIRO: Water for a Healthy Country National Research Flagship.; 2009 p. 197.



