



Site options profile #L6

Pyap Wetland Complex

- Draft

Lock 3 Master Plan



Location: Weir Pool 3, River Chainage Markers 480 to 466

Land Tenure: Private landholders

Wetland Size: 110 hectares (Ha)

Normal Pool Level: 9.8 mAHd

PROPOSED OPTIONS	
Option #1:	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 • Opportunities for increased floodplain watering inundation extent and frequency associated with weir pool raising and • 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. 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 an improved watering regime. • Conservation and improvement of floodplain vegetation. • Improved soil moisture conditions.

Option #2:	Improve floodplain condition by supporting opportunities for environmental watering and increasing the management extent and duration of floodplain watering associated with managed and natural high-flow events, by enabling the retention of water through the installation of regulating structures and complementary embankments to 11.3 mAHd.
Description	There is an opportunity to increase the managed inundation extent on the floodplain area within Pyap Lagoon. This can be achieved through a new regulating structure on the northern bank of the Lagoon with additional blocking banks to 11.3 mAHd. The proposed infrastructure would complement 'Option 1' outcomes enabling water to be retained at greater heights and extent, increasing the management footprint.
Outcomes	• Benefits associated with an improved watering regime. • Enhanced capacity for greater exchange between the river and wetlands. • Conservation and improvement of floodplain vegetation. • Improved soil moisture conditions.

Option #3:	Promote the conservation of the local regent parrot population, by supporting the installation of a new embankment and structure enabling watering activities as described within the Regent Parrot Recovery Project.
Description	Pyap Lagoon falls within the 'Katarapko Regent Parrot Floodplain Habitat Zone', identified as part of the regent parrot recovery initiative. The strategic watering of this site in combination with new embankments and regulating structures to 12.0 mAHd will be able to support the conservation and improvement of vegetation important to regent parrots.
Outcomes	• Conservation and improvement of vegetation important to regent parrots. • Support the conservation of the current regent parrot population.

SITE BACKGROUND

Description

Pyap Wetland Complex (Pyap Lagoon, Pyap Horseshoe) is situated within a large bend of the River Murray approximately 3 km from Pyap and 10 km from Loxton. This permanent wetland complex is comprised of a single terminal horseshoe-shaped wetland basin orientated from east to west and surrounded by floodplain. The Pyap Horseshoe wetland is connected to the River Murray at its eastern end via two small creeks that connect to Pyap Lagoon. The Lagoon is another terminal wetland that was formerly a continuation of the Horseshoe and is connected to the river at pool level. The western end of the Horseshoe terminates within about 90 m of the river. The eastern end of the horseshoe is also connected to a third creek which runs through the floodplain to the east and terminates before meeting the river¹.

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 Pyap Wetland Complex would have had a more variable water regime. The installation of regulators has since enabled the wetting and drying of the lagoons, improving the ecological outcomes within this area.

WETLAND ECOLOGY

Pyap Lagoon has been classified as having low conservation value², however, other parts of the wetland act as important drought refuge for waterbirds and, therefore, it has medium to high conservation value^{2,3}.

Flora: Vegetation composition at Pyap includes river red gum and black box woodland and forest, lignum shrublands, saltbush and samphire shrubland, reedbeds and sedge, see^{1,4} for detailed description of flora at site. No rare, threatened or any submerged vegetation or floating plants were recorded during the vegetation survey conducted in 2013⁵. A later fish survey⁶ indicated a lack of submerged aquatic vegetation. A declared weed, skeleton weed (*Chondrilla juncea*), was found during the monitoring conducted in 2017-2018⁴.

Fauna: Fish and frog surveys were conducted during 2012⁷, 2013⁶ and 2017-2018⁴. Pyap has been found to have relatively high native fish species composition and during the Riverine Recovery Project (RRP) monitoring⁴ one pouched lamprey (*Geotria australis*), an uncommon species for the region, was found. The water regulating structures installed through the RRP in 2018/2019 provide the ability to use hydrological management to remove invasive common carp (*Cyprinus carpio*) from the lagoon and consolidate the lagoon bed. This management is expected to improve water quality, aquatic vegetation diversity, and aquatic vegetation abundance, ultimately improving native fish, frog, and waterbird diversity and abundance.

WETLAND MANAGEMENT

Current Management:

The Pyap wetland complex is primarily managed for wetting and drying cycles. Since the completion of the RRP construction in 2018, the Department for Environment and Water (DEW) manages the wetting and drying of the lagoon to achieve two partial drawdown events and one full drawdown event over a five year period. Current landholders use the floodplain for cattle grazing, wetland restoration, and recreational activities, including camping, kayaking/canoeing and fishing.

Infrastructure:

Vehicle crossings have been installed on the northern and southern arm of the western connection. An additional vehicle crossing with pipes is also present on the eastern creek. As part of RRP, regulating structures were installed at two locations in 2018 to allow for hydrological management (wetting and drying) of the horseshoe lagoon.

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 Pyap, these included:

Environmental

- There are some risks associated with acid sulfate soils and salinity at this site, and these would require further assessment before any construction works or wetting and drying activities are undertaken, see Addendum 1 to^{1,8} for updated information.
- Need to consider ecological benefit for species other than regent parrot.
- Consider and manage potential for banks in Option 2 and 3 to create impediments to flow.

Cultural

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

Community/Social

- Consider needs of landholders that use floodplain for recreational activities and cattle grazing.

Operational/logistics

- Construction works need to be mindful of potential impacts to fencing.
- Need access to embankment for option 2.
- Need for multiple culverts to prevent erosion or overtopping.

KEY STAKEHOLDER INVOLVEMENT

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

REFERENCES

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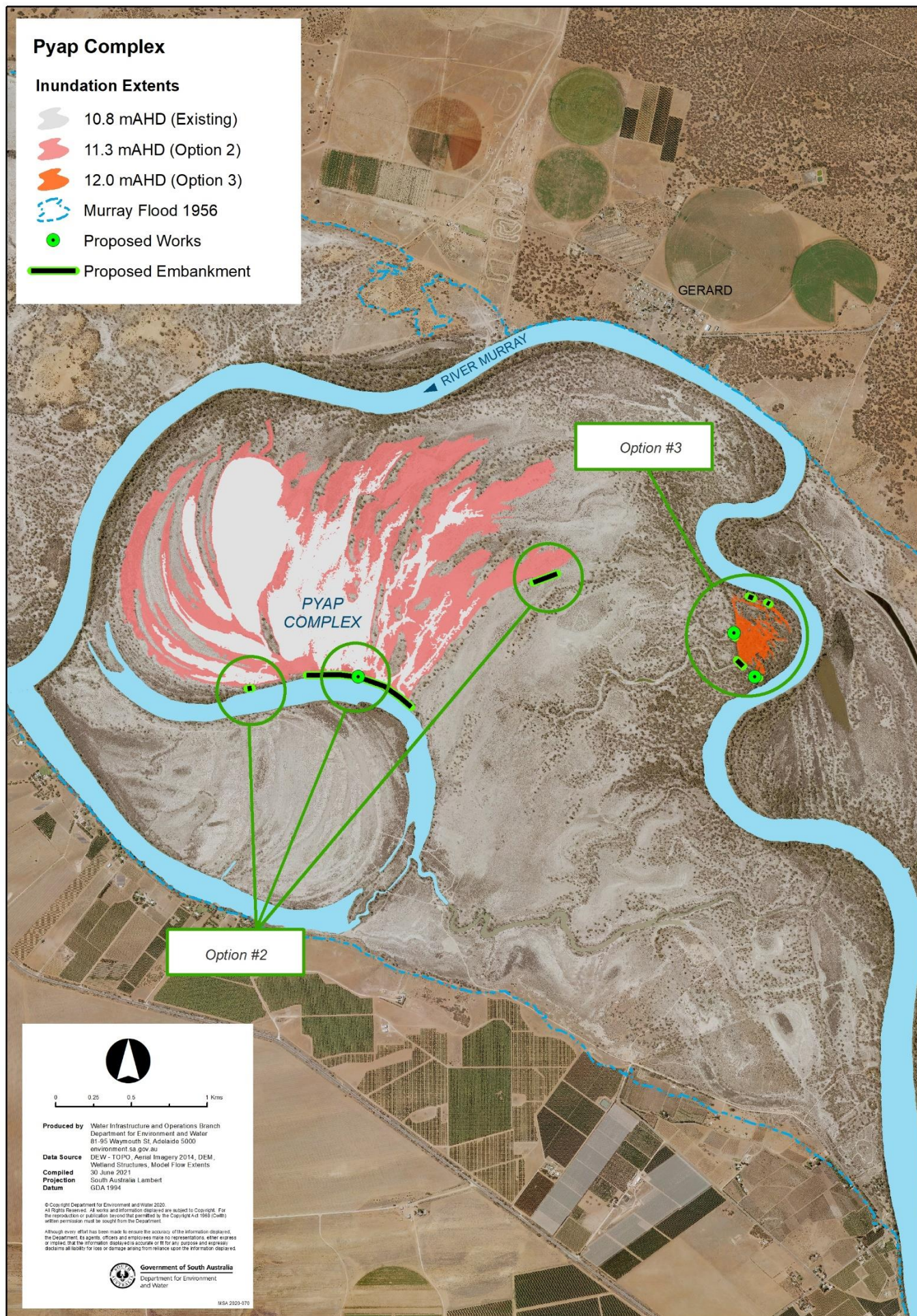


Adult pouched lamprey sampled at Pyap Horseshoe

Pyrap Complex

Inundation Extents

- 10.8 mAHD (Existing)
- 11.3 mAHD (Option 2)
- 12.0 mAHD (Option 3)
- Murray Flood 1956
- Proposed Works
- Proposed Embankment



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Data Source DEW - TOPO, Aerial Imagery 2014, DEM,
Wellfield Structures, Model Flow Extents

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Projection South Australia Lambert

Datum GDA 1994

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