



Site options profile #B5

Disher Creek - Draft

Bookmark Creek Master Plan



Location: Weir Pool 4, River Chainage Markers 551 to 543.5

Land Tenure: National and Wildlife Service SA

Wetland Size: 100 hectares (Ha)

Normal Pool Level: 13.2 mAH

PROPOSED OPTION	
Option #1:	Improve floodplain condition in the Western section by enabling the retention of water through the installation of regulating structures and complementary embankments to 14.6 mAH. This will support opportunities for increasing the extent and duration of floodplain watering associated with managed and natural high-flow events, including weir pool raising, as well as pumping.
Description	This option aims to maximise the opportunity presented by weir pool raising and capacity to retain water, through the installation of regulating structures and complementary blocking bank to 14.6 mAH. This will support the capacity to extend the duration of watering events such as those associated with high-flow events and weir pool raising, as well as prompting opportunities for delivering water via pumping. Any activities included in this option need to be mindful of the potential impacts on Murray hardyhead populations currently present in the basin. This option will be completed in conjunction with the Renmark Irrigation Trust (RIT) Environmental Watering Committee and associated Management Guidelines to ensure efforts harmonise with existing plans for the floodplain.
Outcomes	• Benefits associated with an improved watering regime. • Conservation and improvement of wetland vegetation. • Improved soil moisture conditions.

Option #2:	Improve floodplain condition in the Eastern section by enabling the retention of water through the installation of regulating structures and complementary embankments to 14.2 mAH. This will support opportunities for increasing the extent and duration of floodplain watering associated with managed and natural high-flow events, including weir pool raising, as well as pumping.
Description	This option aims to maximise the opportunity presented by weir pool raising and capacity to retain water, through the installation of regulating structures and complementary blocking bank to 14.2 mAH. This will support the capacity to extend the duration of watering events such as those associated with high-flow events and weir pool raising, as well as prompting opportunities for delivering water via pumping. Any activities included in this option need to be mindful of the potential impacts on Murray hardyhead populations currently present in the basin. This option will be completed in conjunction with the RIT Environmental Watering Committee and associated Management Guidelines to ensure efforts harmonise with existing plans for the floodplain.
Outcomes	• Benefits associated with an improved watering regime. • Conservation and improvement of wetland vegetation. • Improved soil moisture conditions.

SITE BACKGROUND

Description

Disher Creek is located on the northern bank of the River Murray Floodplain, approximately 8 km south of Renmark within the Murray River National Park (Lyrop Flats). The Disher Creek Basin is used for saline water disposal from the surrounding agriculture land. The holding capacity of the basin is 360 megalitres (ML). Water exceeding this capacity is pumped to the Noora Saline Water Disposal Basin in order to prevent saline groundwater from entering the river. Recent watering activities are aimed at supporting the nationally threatened small-bodied fish, Murray hardyhead (*Craterocephalus fluvialis*). Disher Creek is one of only four known habits that support Murray hardyhead populations along the River Murray in South Australia¹.

Cultural Significance

The River Murray and Mallee Aboriginal Corporation (RMMAC) holds native title over the River Murray within the Lock 4 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

Disher Creek became a saline water disposal basin in 1967, which collected drainage water from the Renmark irrigation area via the Renmark Area Drainage Disposal Scheme (RADDs). In 1982, the Noora Drainage Disposal Scheme was commissioned which enabled excess water from Disher Creek and Berri basins to be pumped to the Noora Saline Water Disposal Basin in order to reduce the potential salinity impacts on the River Murray¹.

WETLAND ECOLOGY

Disher Creek was assessed as having low conservation value^{2,3}, although the wetland is home to the Murray hardyhead (*Craterocephalus fluviatilis*), a small bodied native fish which is critically endangered at a national level, and therefore is an important site to manage for this species. Disher Creek is also part of the Murray River National Park⁴.

Flora and fauna

The major vegetation communities within Disher Creek include river red gum (*Eucalyptus camaldulensis*) and black box (*Eucalyptus largiflorens*) woodland but many of the trees were dead at the latest assessment in 2008. Other vegetation communities include lignum, chenopod and samphire shrublands but many are in poor condition due to the past and current use of the area as a disposal basin^{1,5}. There is limited information on the flora and fauna composition at the sites as no recent surveys have been conducted.

WETLAND MANAGEMENT

Current Management

Disher Creek lies within the Murray River National Park (Lyrup Flats) and is managed by the National Parks and Wildlife SA, in conjunction with SA Water and the Murraylands and Riverland Landscape Board Wetland Team. Current management aims to maintain water levels in Disher Creek at appropriate water depths (> 60 cm) and water levels (13.2-13.4 mAHD - Lock 4 normal pool level is 13.2 mAHD) within the northern basin habitat area for Murray hardyhead, and to support a viable saline ecosystem which supports aquatic and littoral zone vegetation.

Due to water levels in Disher Creek being held above pool level as well as the highly saline water present in the vicinity of the Disher Creek River Murray Inlet at Bank D (approximately > 60,000 μScm^{-1}), the Disher Creek inlet structure is usually in the closed configuration to prevent saline water disposal into the River Murray.

Excluding times when River Murray water levels and flows are high enough to remove the salinity risks of opening the Disher Creek inlet, inflows into the creek occur via the Renmark Area Drainage Disposal Scheme (RADDs), Environmental Water pumped from the River Murray.

Murtho Salt Interception Scheme (SIS) saline discharge water can also be utilised during times when an Environmental Water allocation is unavailable near the upper pool level. The Disher Creek outlet structure is typically maintained in the closed configuration and saline outflow from Disher Creek is managed through pumping to the Noora Saline Water Disposal Basin, with pumping rates adjusted to suit inflows as needed (+13.2 mAHD). Recent management efforts at Disher Creek have focused on maintaining water levels to support the Murray hardyhead population, and providing environmental watering events during spring and summer to freshen the creek and support higher levels of Murray hardyhead egg survival. Water levels in Disher Creek are managed by adjusting the stop log configuration in the flow-through structure at Bank A.

Infrastructure

Water is delivered to the Disher Creek Basin from the Renmark Area Drainage Disposal Scheme (RADDs) via a pipeline and an open concrete channel, which then fills the basin from the north. Environmental Water delivery into Disher Creek is via the RADDs channel (pumped by the Renmark Irrigation Trust), and also via pumping from the River Murray over the closed inlet structure at Bank D.

Water may also be delivered to Disher Creek via the Murtho SIS. During Lock 5 flow events exceeding 15,000 megalitres per day (ML/day), if River Murray salinity is less than 450 μScm^{-1} , the Disher Creek inlet structure at Bank D may be opened to provide connectivity and flushing to the creek, a controlled release through the pipe culvert outlet structure (located on the southern embankment of the Disher Creek basin) may also occur – for either of these management options to be undertaken, the basin water level at the inlet must be lower than the river level, and the water level at the outlet must be higher than the river level respectively. The outlet pipe culvert may also be opened when river flows exceed 38,000 ML/day, enabling the basin to be flushed⁽⁶⁾.

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 Disher Creek, these included:

Environmental

- Investigations and/or consideration needed of potential Murray hardyhead impacts, vegetation objectives and possible salinity impacts.
- There are also some risks associated with acid sulfate soils at this site and this would require further assessment before any on-ground work progresses⁷.

Cultural

- Strong Aboriginal Waterways Assessment (AWA) and First Peoples cultural interests in the area.

Community/Social

- Campers will have access to site and security will be an issue.

KEY STAKEHOLDER INVOLVEMENT

- Commonwealth Environmental Water Office (CEWO)
- Murraylands and Riverland Landscape Board
- National Parks and Wildlife Service SA
- Renmark Irrigation Trust (RIT) – including the Environmental Watering Committee
- Renmark Paringa Council
- Renmark Paringa Landcare
- River Murray and Mallee Aboriginal Corporation (RMMAC)
- SA Water

REFERENCES

1. Department for Environment and Heritage. Disher Creek Saline Water Disposal Basin- Hydrological Management Plan. Berri, South Australia: Department for Environment and Heritage. Government of South Australia; 2009.
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3. 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.
4. National Parks and Wildlife Service South Australia, Department for Environment and Water. Murray River National Park [Internet]. 2020 [cited 2020 Nov 23]. Available from: https://www.parks.sa.gov.au/find-a-park/Browse_by_region/Murray_River/murray-river-national-park
5. Harper A, Harper M. Management Guidelines- Environmental Watering Sites Adjacent to Renmark Irrigation District. Renmark Irrigation Trust; 2019.
6. Smith K. Review of Saline Water Disposal Basins Operations and Guidelines for the Department for Water Resources, Final Report. Berri, South Australia: Ken Smith Technical Services; 2002 Mar.
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.



Photo 1: Murray short-necked turtle hatchling.

Photo 2: Murray hardyhead sampled during fish monitoring at Disher Creek.



Disher Creek

Inundation Extents

-  ~5 GL - At pool conditions
-  14.2 m AHD (Option 3)
-  14.6 m AHD (Option 2)
-  Proposed Works
-  Proposed Embankment

Option #3

Option #2

DISHER CREEK

RIVER MURRAY

0 0.1 0.2 0.4 Kms

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

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Projection South Australia Lambert

Datum GDA 1994

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