Pike floodplain environmental water delivery

2022-23 summary

Government of South Australia
Department for Environment and Water

Operation of the Pike regulator commenced on 7 July 2022, raising water levels within the Pike system to 16.2 metres Australian Height Datum (mAHD), which is 1.55 metres above the normal operating height. This peak height was held for approximately 18 days in September and reached areas of the floodplain that have not been watered since 2016.

Lock 5 weir pool levels were also raised by 0.5 m to assist water flow through the anabranch and to maintain good water quality. Dissolved oxygen and salt levels were monitored on a daily basis and guided adaptive management during the watering event.

Many species of fauna (such as frogs and birds) took advantage of the water and habitat available due to environmental water delivery and high river flows, with breeding activity across the floodplain starting in early spring.

The operation was coordinated and managed to make the most of the high river conditions and was ultimately overtaken by the rising river levels. The high flows reached an area that greatly exceeded areas inundated during the managed watering event and combined with the earlier good winter rainfall, floodplain vegetation thrived.

The high flows have replenished soil water, supporting many floodplain trees and lignum to continue to grow and maintain their condition. Understorey plants underwent a successional cycle, with amphibious and flood-responding species flourishing. Terrestrial plants are re-emerging as the floodplain dries.

Floodplain adjacent Mundic Creek during delivery of water for the environment in 2022.

Floodplain adjacent Mundic Creek during delivery of water for the environment in 2022.

Pike regulator in operation during 2022.

Water spilling from Snake Creek and watering black box

Pike floodplain sentinel satellite images

Before and during the managed inundation

The below images show the contrast between the floodplain, shortly before the commencement of the managed watering event on 5 July 2022, and at the peak height (16.2 mAHD) of the managed inundation on 13 September 2022.

Image source: Sentinel, accessed 28/09/2022, https://apps.sentinel-hub.com/sentinel-playground

Managed inundation and the flood

The below images show floodwaters mixing with water from the managed inundation event on Pike floodplain on 28 November 2022 (left), and at the peak of the 2022-23 River Murray flood event on 27 December 2022 (right).

Image source: Sentinel, accessed 28/11/2022 (left) and 01/01/2023 (right) https://apps.sentinel-hub.com/sentinel-playground

Fauna and flora monitoring at Pike

Juvenile hooded robin.

Woodland birds

- Surveys were conducted at 14 sites in spring and summer 2022, as well as after floodwaters started to recede in autumn 2023.
- 68 woodland bird species were observed, 15 more than last year and reflective of the abundant resources produced by the floodplain during and after the flood.
- The uncommon black-eared cuckoo, usually found in the arid Mallee habitat, was recorded at Pike.
- Breeding was observed in a range of species, including grey butcherbirds and sacred kingfishers.
- A family of 4 wedge-tailed eagles, with 2 juveniles were observed. Rearing 2 young within one clutch is an uncommon occurrence and an indicator of the good conditions.
- Juvenile white-bellied sea eagles have been observed post-flood.

Waterbirds

- Surveys were conducted at 4 sites in spring and summer 2022, during and after operation of the regulators, throughout the high flows, and again in autumn 2023.
- 29 waterbird species observed.
- The largest numbers recorded in a single survey were 219 grey teal, 74 Australian shelduck, 128 silver gulls, 44 pelicans and
  187 black swans recorded during spring, and 180 great cormorants during autumn.
- Shelducks, black swans, maned ducks and grey teal were all seen with young.
- Many nests occupied by ibis, cormorants and spoonbills were observed in the trees lining the major anabranches during the flood event.
- Small numbers of common sandpipers, a migratory wader that breeds in the northern hemisphere and travels to Australia to feed, were observed feeding in shallow waters at Pike floodplain during the managed watering event.

Eastern great egret at Pike regulator.

Small-bodied fish

- Fyke net surveys were undertaken in spring 2022, for one night at 8 sites 3 small and one large nets were used, targeting different water depths and habitat features.
- 1,403 fish from 14 species were recorded (9 native and 5 non-native).
- Carp gudgeon, a native foraging generalist fish, was the most common species recorded (58%), followed by the invasive European carp (25%), and native Australian smelt (7%).
- The remaining 11 species accounted for 10% of the total record.
- Rarer native species recorded included golden perch (7 fish), bony herring (1), Murray rainbowfish (1) and Murray cod (1).
- The size distribution of small-bodied native species indicate they had recently bred.

Murray Rainbow Fish. Photo: Aquasave-NGT

Turtles

Long-necked turtle cooling off at Pike.

- A project to track the movement of turtles commenced in 2022.
- Prior to widespread floodplain inundation, GPS transmitters were attached to the shells of 20 eastern long-necked turtles to allow their movement to be tracked via satellite as they travelled overland between wetland waterbodies or surfaced in the water.
- In addition to GPS, aquatic acoustic transmitters were attached to approximately 20 individuals of each 3 turtle species occurring at Pike floodplain (eastern long-necked, broad-shelled, and Macquarie River turtles).
- Aquatic acoustic transmitters use a network of acoustic receivers (already present for other projects) to track species that generally spend their time in the water.
- The transmitters will send data for up to 18 months. This information will aid in assessing how the turtles navigate infrastructure such as floodplain blocking banks and regulators. It will also help to determine whether they use particular travel routes to enter the floodplain from the river and access known nesting hotspots.

Pike turtle monitoring

Frogs

Spotted grass frog.

- 8 sites were surveyed over 9 nights in spring.
- All 6 species expected at Pike, based on historical records, were recorded.
- Species recorded:
  - Spotted grass frog
  - Long-thumbed frog
  - Eastern banjo frog
  - Murray Valley froglet
  - Peron's tree-frog
  - Southern bell frog (vulnerable species)

Vegetation

Post-flood vegetation monitoring has observed:

- an improvement in the condition of river red gum and black box trees across the floodplain.
- an increase in the floodplain's understorey vegetation species diversity, with a shift towards amphibious and flood-dependant species
- an increase in the occurrence of rare species, such as spiny lignum (*Duma horrida*) and tufted burr-daisy (*Calotis scapigera*).

Understorey vegetation flourishing across the floodplain