Barossa Water Allocation Plan Amendment

Barossa ecological summary 2022

The aquatic ecosystems of the Barossa Prescribed Water resource Area (PWRA) are predominantly seasonal waterways that start to flow with the onset of winter rains and cease to flow over the dry summer months. Along these watercourses there are also a multitude of permanent pools, where underground water intersects with the bottom of the river channel resulting in permanent water year round regardless of river flow.

The aquatic ecosystems of the Barossa watercourses are adapted to this seasonal flow with many species either having the ability to withstand dry periods (many types of vegetation), an adult terrestrial stage (many of the waterbugs) or the ability to tolerate poor water quality within the permanent pools over summer (fish species and some waterbugs). The duration of the period between flow events through the water courses is considered to be the main driver for condition in these aquatic ecosystems, with longer cease to flow periods leading to more adverse conditions for aquatic ecosystems that are adapted to shorter cease to flow periods.

Since European settlement of the region, the landscape has been extensively modified for agriculture and viticulture. Part of these changes included the development of an extensive dam network to provide water for business activities. While critically important for the ongoing viability of agriculture and viticulture in the region, these dams and other forms of water capture and extraction, have had a significant impact on the way that the watercourses of the Barossa PWRA flow. The key impact being the shortening of the flowing period, delaying the onset of flows until after dams have filled. In combination with the dryer conditions experienced over the last two decades, the changes to the flow regime have driven a decline in aquatic ecosystem condition across the region.

As part of the process to better understand the aquatic ecosystems of the Barossa PWRA there have been several targeted investigations looking at different parts of the ecosystem. The largest of these efforts was a project in 2013 that undertook a detailed snapshot of both the aquatic vegetation and fish populations of the Barossa Valley.

The aquatic vegetation survey sought to assess the vegetation at every one of the permanent pools across the PWRA. In total 163 pools were assessed out of the approximately 200 pools recorded across the PWRA. The survey identified a total of 99 species of plants. Of these, 55 species were alien species including five weeds of national significance (Blackberry, Rubus fruticosus agg.; Bridal Creeper, Asparagus asparagoides; Gorse, Ulex europaeus; French Broom, Genista monspessulana; Willow, Salix nigrum). Most sites were dominated by emergent species, with the native Common Reed (Phragmites australis) and Cumbungi (Typha domingensis) present at 60% of sites. No native species of conservation significance were found (Nicol 2013). The most abundant alien species was Water Couch (Cynodon dactylon), present at 26% of sites. Submerged plants (Myriophyllum verrucosum, Nitella sp.) were recorded at only two sites. This survey was in summer, and a high proportion of the 'bare ground' would be covered by annuals in winter and spring. More details can be found in Nicol (2013). pir.sa.gov.au/__data/assets/pdf_file/0012/232320/Barossa_WAP_Report_-_FINAL.pdf

The 2013 fish survey sampled 37 of the permanent pools across the PWRA in late summer. In total nine species were identified including four native species and five alien. Three of the native species are considered to be 'local' to the area (Western Blue Spot Goby, Flathead Gudgeon and Mountain Galaxias). The fourth species found was a single Silver Perch believed to be an escapee from a privately stocked dam. The alien species found were Tench, Goldfish, Plague Minnow, Redfin Perch and Common Carp. The region was dominated by Plague Minnow, representing 63.3% of all fish captured. Key among the findings of this work as the identifiecation of the strong poluation of Mountain Galaxias in Jacob Creek. More details can be found in Schmarr et al. 2014. pir.sa.gov.au/__data/assets/pdf_file/0009/258642/Western_Mount_Lofty_Ranges_Fish_Condition_Report_2012-13.pdf

Information sheets

A package of information will assist in discussions at the webinar on 24 January 2023. The information sheets provide background details and set out the issues Barossa water resources are facing and what the Plan can do to manage those issues:

#1 – Introduction and Background

#2 – Unbundled Water Rights

#3 – Surface Water and Groundwater

#4 – Ecological Summary

#5 – Issues and Management Options.

In 2018 a repeat fish survey was undertaken to assess how the fish community had changed since the 2013 survey. A total of 16 sites were sampled in early autumn 2018 and represented a subset of the 2013 sites designed to target all parts of the fish community across the PWRA. A total of eight species were caught. Changes to the community included no Silver Perch or Common Carp were caught, however, another non-local native was detected, the Carp Gudgeon, native to the Murray Basin. As with the 2013 survey, the catch was dominated by Plague Minnow, accounting for 58.9% of the fish caught. The survey also confirmed the presence of the Mountain Galaxias population in Jacob Creek. More information can be found in Whiterod et al. (2018).

A survey of Jacob Creek in early spring 2022 was also undertaken to confirm the presence of the Mountain Galaxias population following the very dry 2018-2020 period. This sampling detected ~100 individuals suggesting that they had survived the low flow years and had a recruitment event in 2021.

There has not been any targeted waterbug surveys of the Barossa Valley, however, the South Australian Environmental Protection Authority (EPA) undertake a state-wide program looking at aquatic ecosystem condition that uses waterbugs as one of the key indicators of health. The EPA have monitored 15 sites across the Barossa since 2008 with a total of 22 sampling events. The most recent sampling was in 2021. Five sites were sampled, three of which were classed as fair, one was classed as poor and one was classed as good. The good site was Jacob Creek at the flow monitoring station. Jacob Creek is known to have a population of very rare waterbugs called water pennies (Psephenidae) that only live in areas with good flow, good water quality and rocky/boulder creek beds. More information can be found on the EPA website - www.epa.sa.gov.au/environmental_info/water_quality/water_quality_monitoring#:~:text=What%20are%20Aquatic%20Ecosystem%20Condition,using%20an%20ecological%20condition%20gradient.

In general, the surveys undertaken to date show that the majority of the Barossa Valley is in a heavily degraded, yet stable state. The general understanding is that the parts of the ecosystem that remain in the region are those that tolerant and robust, all of the sensitive species have either retreated into localised pockets (e.g. Jacob Creek) or been lost from the region altogether. This is primarily attributed to the loss of flows from the watercourses but is also heavily driven by the presence of alien species of flora and fauna (especially Redfin Perch). 2018 and 2019 were both incredibly dry years that exacerbated the impacts of water resource development leading to drastic changes in the way the watercourses flow. It is currently not known how the aquatic ecosystems are recovering from these years with the exception of the known survival of the Mountain Galaxias population likely due to the presence of spring-fed refuge pools in the gorge section of Jacob Creek.

More information

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