



King Parrot Creek Fish survey results 2017

Highlights

- The most abundant species captured was Macquarie perch, followed by river blackfish, the highest number of river blackfish captured since surveying started.
- Macquarie perch of various ages were captured, demonstrating good recruitment over the past few years.

Survey Methods and Sites

In April 2017, five sites in King Parrot Creek between Kerrisdale and Flowerdale were surveyed for Macquarie perch (Figure 2). These surveys contribute to the Goulburn Broken CMA's long-term fish monitoring program in King Parrot Creek, which commenced in 2006.

Fish were collected at each site using backpack electrofishing and single wing fyke netting techniques.

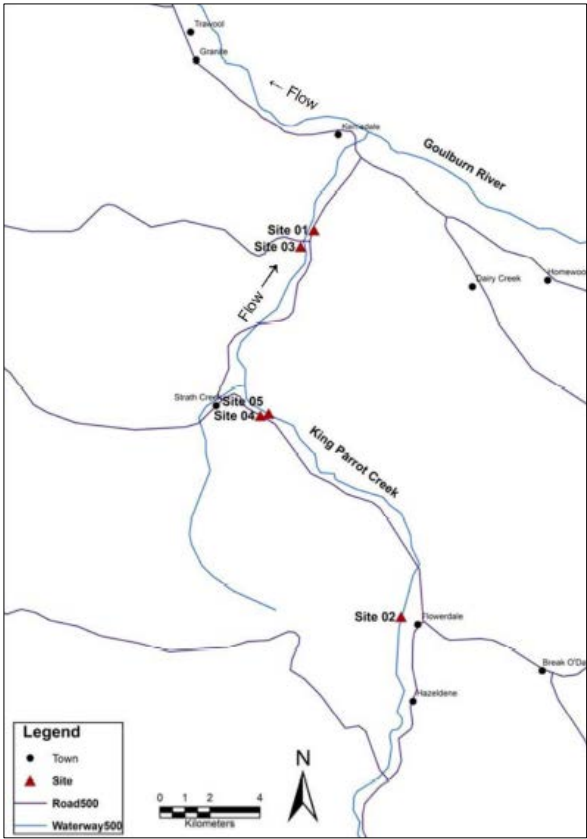


Figure 2. Map of survey sites in King Parrot Creek

This project is funded by the Victorian State Government. Arthur Rylah Institute (DELWP) is engaged to undertake these surveys on behalf of the Goulburn Broken CMA.



Figure 1. Captured Macquarie perch of 1+ years age

Macquarie perch >250 mm long were tagged and a small fin clip taken from 30 Macquarie perch of various sizes for future genetic analysis. All fish were released after being measured and weighed.

2017 Results

A total of 586 fish, representing seven native and six introduced species, were collected during surveys of King Parrot Creek. The most abundant species captured was Macquarie perch (*Macquaria australasica* N = 231) followed by river blackfish (*Gadopsis marmoratus* N = 53). The number of river blackfish captured was the highest since surveys commenced in 2006.

Macquarie perch were recorded at all five survey sites. The highest abundance of Macquarie perch were recorded at site 05, which also accounted for 43% of the young of year (yoy) captured. This result was expected given our previous research identified a key spawning location just upstream of this survey site.

All fish captured during the surveys were in excellent condition which is indicative of a healthy and productive ecosystem. One Macquarie perch was recaptured during the 2017 survey. This individual was initially tagged in 2016 from Site 05 and was recaptured at the same location.

Multiple age cohorts of Macquarie perch were collected with one-year-old fish representing 70% of the total Macquarie perch catch (see Figure 3). This is despite the brief cease to flow period in King Parrot Creek during summer 2016 suggesting juvenile fish are relatively resilient to such events.

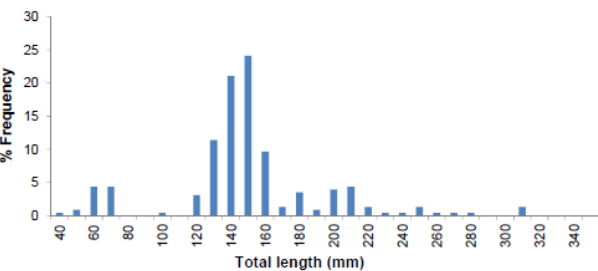


Figure 3. Size frequency histogram (% of occurrence) of Macquarie perch captured in King Parrot Creek 2017

Multiple age cohorts of Macquarie perch demonstrate continuous successful recruitment over the past few years, including the most recent (2016/17) year class.

Redfin were collected for the first time in several years, which is consistent with other waterways recently surveyed (Seven and Hughes Creeks) during autumn 2017 and reflects good breeding conditions for this species over the past year. As redfin pose a serious threat to Macquarie perch through predation and competition for resources (i.e. food and habitat), ongoing management (i.e. reduction/removal) will be an important consideration for the longevity of Macquarie perch in this system.

Long-term Data Analysis

Statistical analysis is currently being undertaken using long-term monitoring datasets of several populations of Macquarie perch in the Yarra and Goulburn-Broken Catchments (including King Parrot Creek) to quantify links between flows and Macquarie perch survival. In essence, outputs from this analysis will allow improved decision making on minimum summer base flows and water extraction thresholds as a method for sustaining Macquarie perch populations in unregulated streams within the Goulburn Broken Catchment.

While the overall abundance of Macquarie perch has significantly increased following the 2009 bushfires and the 2010/11 floods (see figure 4), there is notable absence of large adult Macquarie perch (>300mm) within survey sites.

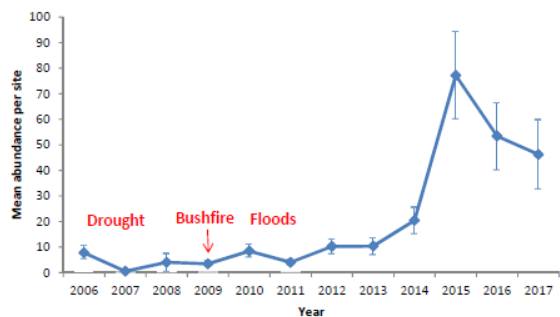


Figure 4. Mean ($\pm$ SE) abundance of Macquarie perch per site during surveys 2006-17

To date, only two Macquarie perch have been reported as recaptured by anglers since the tagging program commenced in 2009. Given that a total of 113 Macquarie perch have been externally t-bar tagged in King Parrot Creek since 2009, it is surprising that more tagged fish have not been reported.

Possible explanations for the low number of large fish within our survey sites include illegal angling, tag rejection or low detection rates where larger individuals are occupying deeper habitats within the creek. Another explanation may be that the increased density of fish in the system may have also increased density dependence pressures and subsequent suppression of growth rates. As such, the overall size of fish in the system may reduce under such pressures for resources (as has been demonstrated in other species globally).

Further aging of fish collected from the creek and comparison with past samples can test this hypothesis. The analysis of data may also shed some light on adult Macquarie perch survival in King Parrot Creek with regard to environmental conditions (e.g. flows, habitat & food resources). This knowledge will then inform priorities for on-ground works to benefit Macquarie perch.