2022 Two-spined Blackfish Monitoring

Report to Icon Water.

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ACT Government

Environment, Planning and Sustainable Development

This project was undertaken by Conservation Research, Environment Planning and Sustainable Development Directorate ACT Government for Icon Water on Ngunnawal country.

Yuma
Dhawura Nguna Dhawura Ngunnawal
Ngunnawalwari dhawurawari
Nginggada Dindi yindumaralidjinyin
Dhawura Ngunnawal yindumaralidjinyin

Hello
This is Ngunnawal Country
We always respect Elders, male and female
We always respect Ngunnawal Country

Two-spined Blackfish (*Gadopsis bispinosus*) are a threatened native fish growing to 30 cm total length and occur in the upland regions of the southern Murray Darling Basin. In the ACT they are restricted to the Cotter River. They require cool, clean clear cobble rivers to live and breed.

Two-spined Blackfish are listed as Vulnerable in the ACT (*Nature Conservation Act 2014*).

For more on Two-spined Blackfish

The last environmental flows monitoring for Blackfish in Autumn 202 directly after the 2019 drought and 2020 Orroral Valley Fire. Since then the Cotter Catchment and surrounding area has experienced a significant wet period. This wet period extended through 2022, including this survey period.

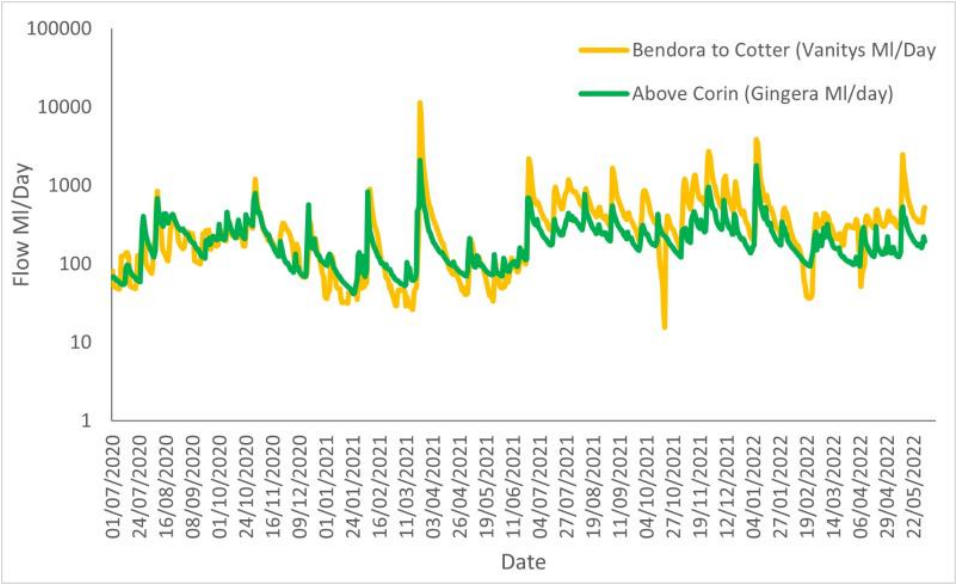
Despite the vegetation growth and high flow there is still significant amounts of sand and sediment in the Cotter River above Corin Dam from the 2020 Bushfires (see photo on right). Sediment smothers the spaces under the cobbles that Blackfish need for breeding, sheltering and feeding.

Cotter River between Bendora and Cotter Dams.

In the Cotter River below Bendora Dam which was unburnt, high flows have caused scouring of sediment and macrophytes (see photo above).

Icon Water provide environmental flows below Corin Dam and Bendora Dam, to support the aquatic ecosystem, including the vulnerable Two-spined Blackfish. However, since Autumn

2020 Bendora and Corin Dams have overflowed for much of the time, particularly through 2021 and 2022.



High Flow in the Cotter River 2020 to 2022.

The normal flow release has been overshadowed during this period by natural high flow and overtopping of the dams.

To monitor Blackfish, 10 river sites were sampled comprised of:

- 5 in the unregulated reach, Above Corin Reach; and
- 5 in the environmental flow reach, Bendora to Cotter Reach.

One site between Corin and Bendora was unable to be sampled in the 2022 season due to high flow making it unsafe to survey.

Bendora Reservoir was also sampled

Methods

At each river site, five 30 m transects were sampled with a backpack electrofisher to capture Blackfish.

In Bendora Reservoir, 10 single wing fyke nets were set overnight and collected the next morning.

Captured fish were counted and measured for length and returned to the water.

Measuring an adult Two-spined Blackfish

Indicators

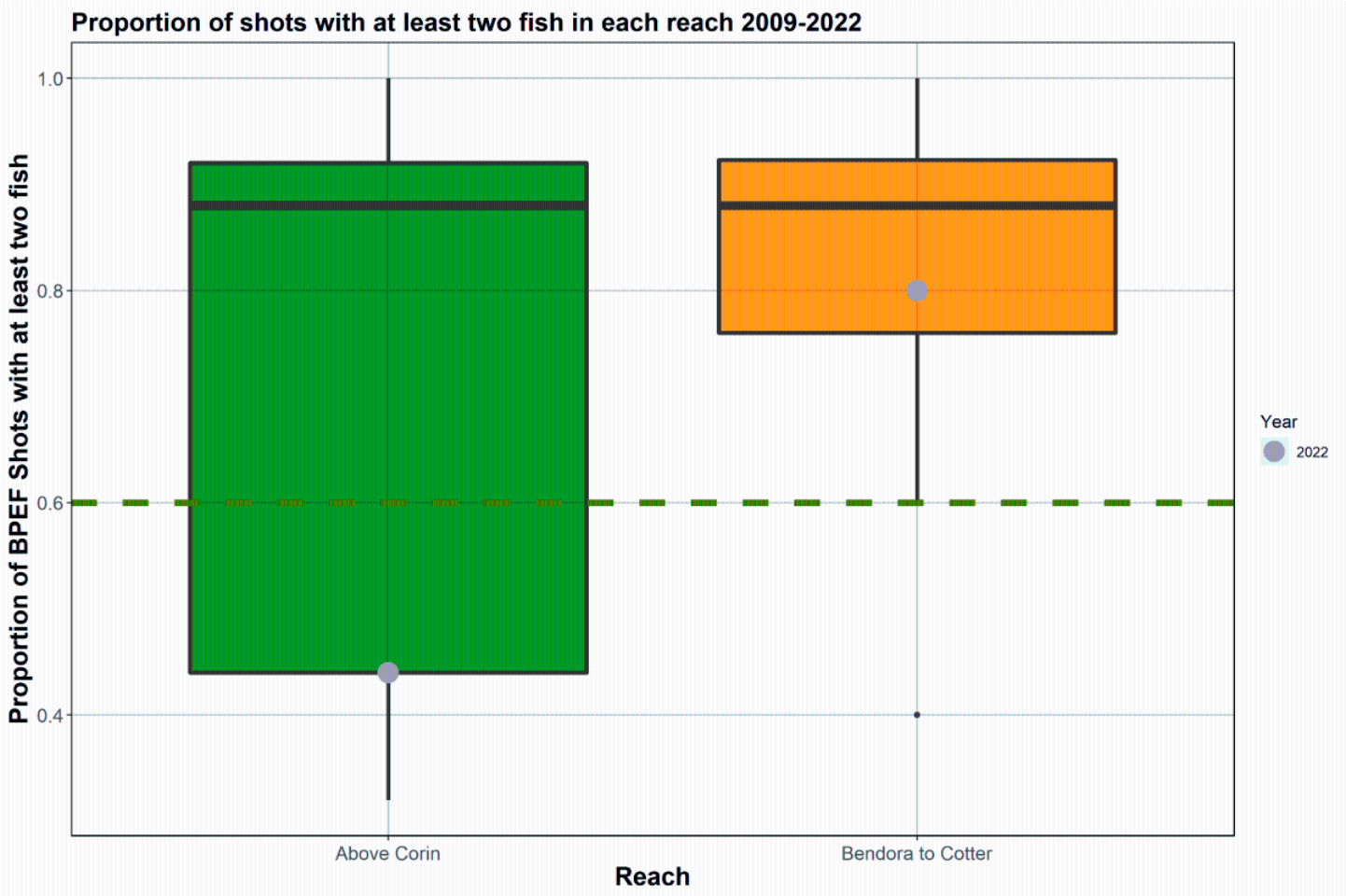
Icon Water's Environmental Management Plan has the following indicators to maintain a sustainable Blackfish population in the environmental flows reaches.

- More than 2 Blackfish per transect are recorded in 60% or greater of the survey transects, in at least one year, over

the last two years.

- Blackfish under 120 mm total length (0 and 1 year old fish) comprise 30% of the catch in a reach.

There is also an indicator for Bendora Reservoir of two or more Blackfish per net-night.



Overall Catch

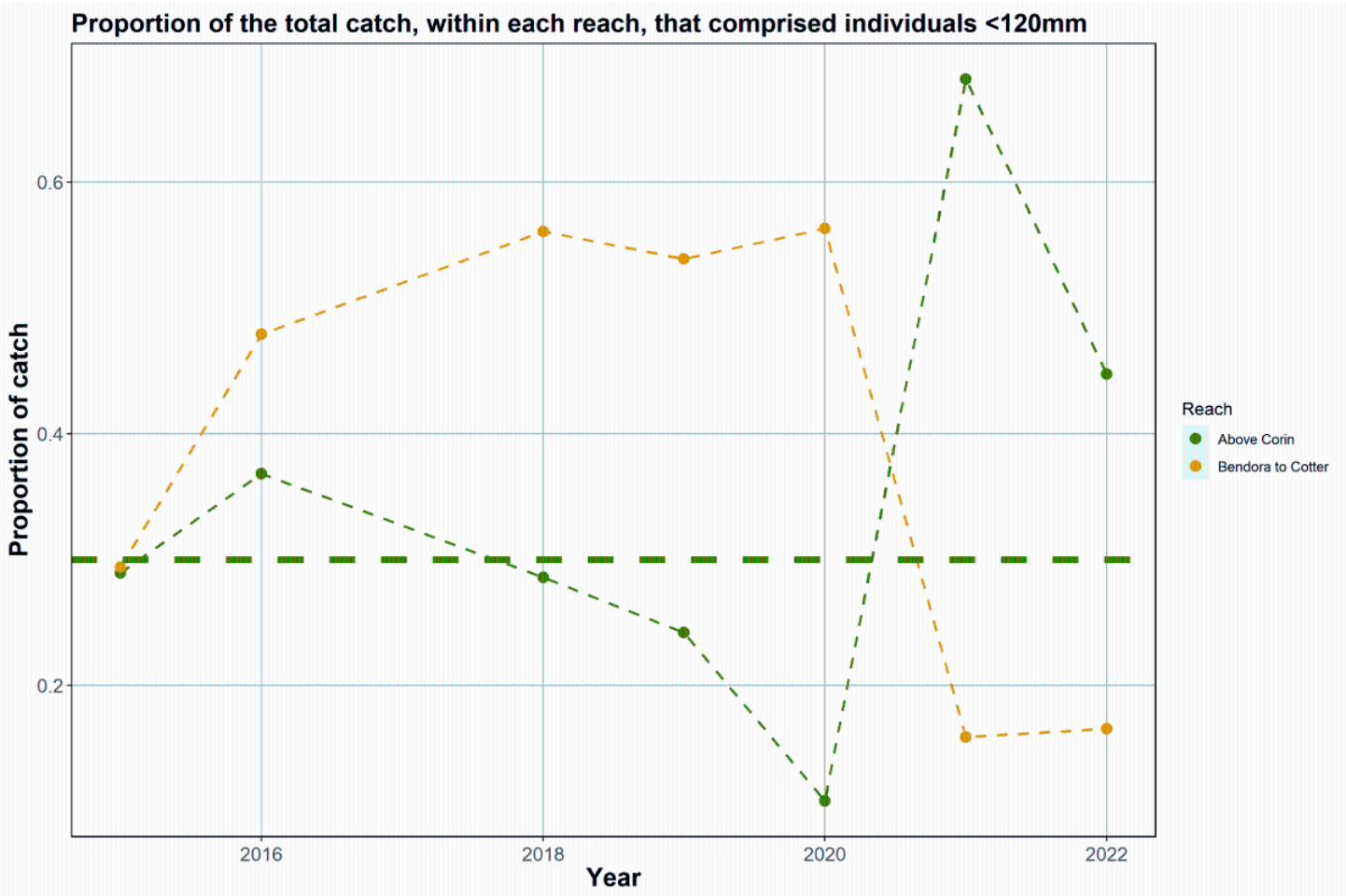
In 2022 the indicator for catch was met in the Bendora to Cotter Reach. The grey dot in the chart is the 2022 result for each reach and the horizontal green dashed line is the indicator level.

However, the 2022 result was lower than the long term average (indicated by the black line) implying a somewhat poor season.

The unregulated reach Above Corin was well below the indicator level. This reach is struggling to recover from the

2020 bushfire impact and has been well below the indicator level in the last three seasons.

The Corin to Bendora Reach was not sampled in 2022 and has not been included in this years' analysis

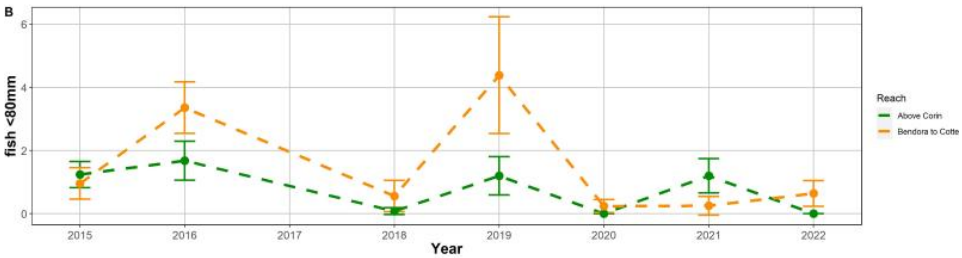


Juvenile Catch

The Bendora to Cotter Reach did not achieve the threshold of 30% or more of the catch being under 120 mm. While it appears that the Above Corin reach did exceed the threshold, it must be remembered that there was a very low overall catch of Blackfish in this reach. Additionally, all the fish making up this component for the Above Corin reach were 1 year olds 80-120 mm, there were no young of year under 80 mm recorded.

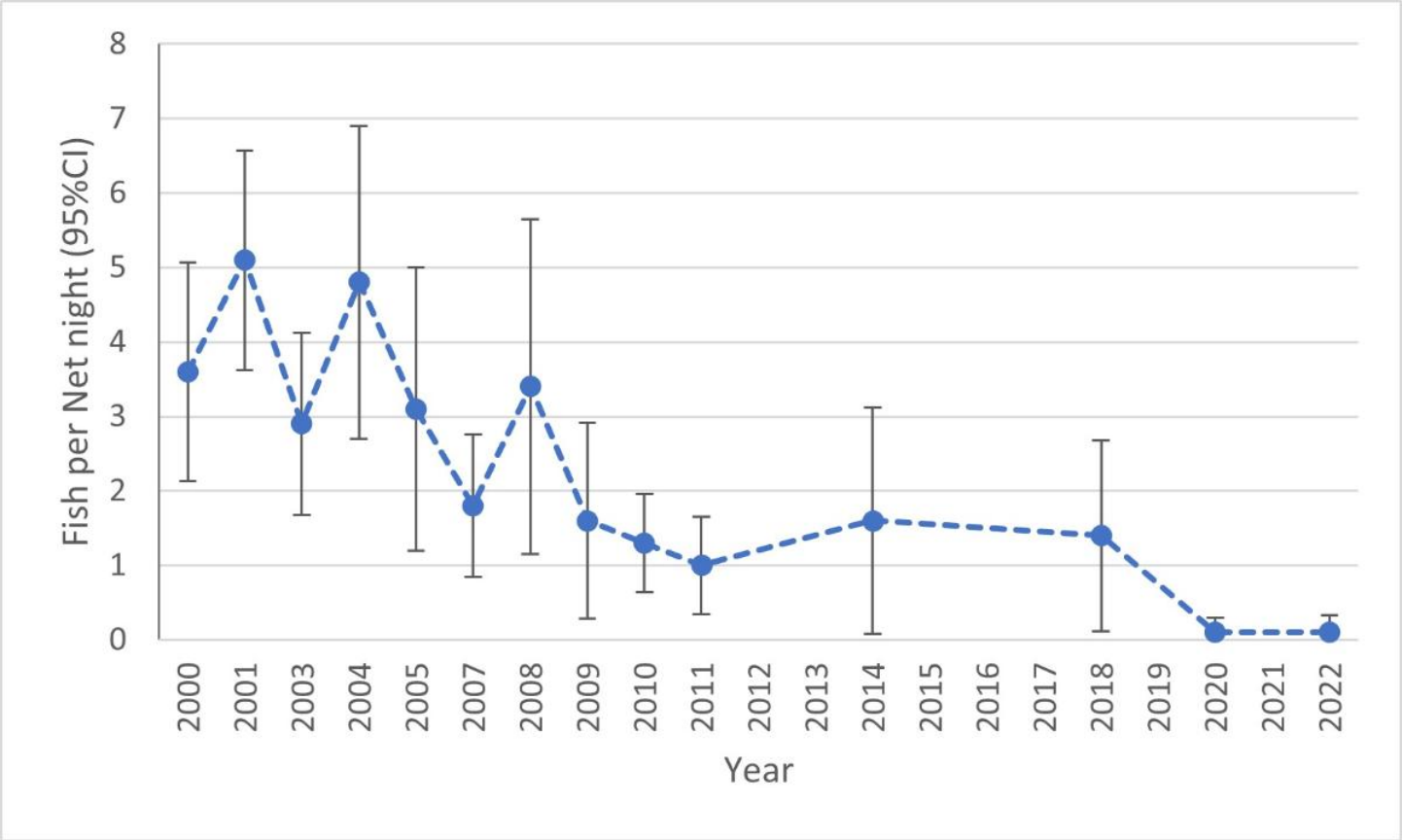
The results in the Bendora to Cotter Reach indicate that the number of juvenile fish was low. In 2020 it was noted that the threshold was achieved in this reach primarily from survival of one year old fish in the 80-120 mm size class. This cohort has now hopefully recruited into the adult population but it appears it has not been replaced by successful breeding the last three seasons. It is likely that this ongoing low recruitment will impact on the overall population over the next 3-5 years.

The graph below shows the low breeding in the past three seasons with few fish under 80 mm and that breeding in the Above Corin Reach is essentially absent in 2022.



Number of young of year Blackfish (under 80 mm) per year

In previous surveys, high flow events during the breeding period have been identified as potentially responsible for low or absent juvenile production in a season. It may be that the high flow experienced in late Spring could have been responsible for low production in the last two years.



Bendora Reservoir

Unfortunately, Bendora Reservoir again did not meet the indicator with 0.1 fish per net-night recorded. It is not known why the Bendora population of Blackfish has declined to almost undetectable levels. There has been some variation over the years in the timing of this survey and construction of the nets used. Investigations could be considered in these areas and in repeatability of the survey both spatially and temporally.

Summary

In 2022 the Blackfish population in the environmental flow Bendora to Cotter Reach partially met the threshold values for a healthy population. Low juvenile number over the past three season resulted in the juvenile indicator not being met in the Bendora to Cotter reach.

In the Above Corin reach, it is likley that high flow combined with the impact of sediment has limited any recovery of the population following the 2020 fires. The ACT Government is examining the genetic health of the Blackfish population to guide recovery actions.

Additional investigation of the results from Bendora Reservoir are recommended because of the continuing low catch numbers.

The next scheduled environmental flow monitoring for Blackfish is in 2024, this will be critical to investigate whether spawning and recruitment recover to support the population in the environmental flow reach.

We acknowledge the Traditional Custodians of the ACT, the Ngunnawal people. We recognise the special relationship and connection that Ngunnawal people have with this Country. Ngunnawal people are a thriving community whose life and culture are intrinsically connected to this land in a way that is core to their physical and spiritual wellbeing, their cultural practices, law/lore, songlines and stories.

Ngunnawal people have maintained a tangible and intangible cultural, social, environmental, spiritual and economic connection to these lands and waters for thousands of years.