

Native Fish Report Card

Gunbower Creek 2023

North Central Region



SITES: 11

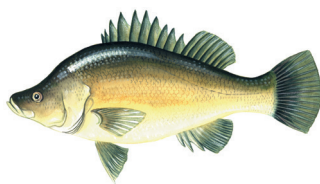
ELECTROFISHING

Fish found in the Gunbower Creek in our 2023 surveys



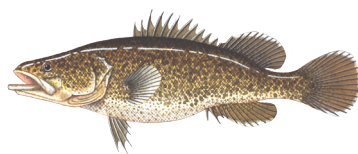
Target Species

✓ recorded in 2023



✓ **Golden Perch**

Macquaria ambigua



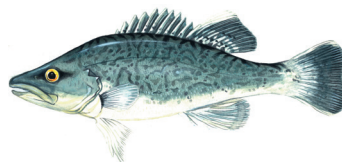
✓ **Murray Cod**

Maccullochella peelii



✓ **Silver Perch**

Bidyanus bidyanus



✓ **Trout Cod**

Maccullochella macquariensis



Non-target species

✓ recorded since 2017*

Large-bodied native species

✓ Bony Bream

Small-bodied native species

- ✓ Australian Smelt
- ✓ Flatheaded Gudgeon
- ✓ Carp Gudgeon sp.
- ✓ Unspecked Hardyhead
- ✓ Murray-Darling Rainbowfish

Exotic species

- ✓ Common Carp
- ✓ Eastern Gambusia
- ✓ Goldfish
- ✓ Redfin

* These non-target species were incidentally captured during NFRC surveys since 2017 but not measured as for target species.

Fish community

The NFRC Program began in 2017, with a focus on targeting the monitoring of population dynamics of key iconic fish species that have high recreational and/or conservation values, in large rivers across Victoria. In the Gunbower Creek, the target species are Golden Perch, Murray Cod, Silver Perch and Trout Cod. Surveys occur in April/May each year, at 11 sites from the offtake with the Murray River upstream of Torrumbarry to the junction of the Murray River at Koondrook. The equipment and habitats surveyed are focused on these species, which are measured to determine population structures. Other fish species that are incidentally captured are recorded, but not measured to determine their population structures.

Summary of key health indicators for target species in 2023

Species	Key Health Indicators		
	Recent recruitment	Multiple size classes	Mature fish present
Golden Perch	No	Yes	Yes
Murray Cod	No	Yes	Yes
Silver Perch*	-	-	-
Trout Cod*	-	-	-

Recent recruitment means young-of-year fish

*- Cannot be determined due to low abundance

Silver Perch were historically abundant throughout Gunbower Creek, while Trout Cod were rare downstream of Torrumbarry on the Murray River system. Both of these species have experienced dramatic declines across their range. The Yarrawonga population of Trout Cod was shown to have extended downstream from Barmah to Gunbower Island in 2012¹. Trout Cod were then captured in 2014, with NFRC sampling detecting this species in six of the seven sampling years from 2017, although in low densities. Silver Perch are also present in low densities. Overall, the Gunbower Creek appears to be maintaining healthy populations of Golden Perch and particularly Murray Cod.

Non-target species

The non-target fish species that have been incidentally recorded in the Gunbower Creek during NFRC surveys since 2017 are:

Large-bodied native species

Other large-bodied species recorded in fish surveys include Bony Bream. Bony Bream are a lowland species across the Murray-Darling Basin which are intolerant of cold water and likely to be restricted to the lower Gunbower Creek (downstream of Koondrook). It is unlikely this species would be detected upstream of the barrier at Koondrook, although a new fishway installed in 2021 may assist fish passage to areas upstream of Koondrook.

Small-bodied native species

The small-bodied species Australian Smelt, Carp Gudgeon, Flatheaded Gudgeon, and Unspecked Hardyhead are common and are expected to be widespread throughout the Gunbower Creek and more broadly within the Murray-Darling Basin. Murray-Darling Rainbowfish are common and widespread in the Gunbower Creek. Once widespread in the Murray-Darling Basin, this species now has a patchy distribution and a restricted range and is considered threatened in Victoria.

Exotic fish species

Common Carp and Goldfish are widely distributed across sampling sites, with Eastern Gambusia more common in the slower flowing waters. Redfin are also distributed throughout, but in lower abundances.

Other native fish species known from the Gunbower Creek

Some fish species known to occur in the Gunbower Creek system have never been recorded during NFRC surveys. For example, no Flatheaded Galaxias or Freshwater Catfish have been detected in the surveys, but these species are more common in offstream habitats (such as billabongs, lagoons and wetlands), with Freshwater Catfish detected in permanent offstream habitats regularly by The Living Murray surveys. No Obscure Galaxias have been recorded during the surveys. No Southern Pygmy Perch have been recorded during the NFRC surveys and this species has been absent from the Gunbower Creek system for over 30 years. These species outlined above are hard to detect using the NFRC sampling methodology.

Other notable species

Surveys have also recorded Rakali, Yabbies and turtle species.

Environmental and Management Context

Environment

Stream flow was consistent for the majority of Gunbower Creek from 2017 to 2022. However, the two sites downstream of Koondrook, had fluctuating heights, with heights particularly low in 2018, 2019, 2020, 2022 and 2023. In 2018, 2021-23, these sites were fished later in autumn, when water levels had increased slightly. In 2022, water levels were extremely low downstream of Koondrook whilst the fishway was being built. Only one of the sites was therefore surveyed in that year. In 2023, sampling the closest site downstream of Koondrook Weir was further delayed until late June due to river heights and logistics and was higher than previous samplings due to backing up from the flooding Murray River.

River rehabilitation efforts in the Gunbower Creek

Many rehabilitation actions have occurred, and are underway, to improve the health of the Gunbower Creek and its fish community. These are informed by the North Central Waterway Strategy 2014-22 and in particular by the Native Fish Recovery Plan – Gunbower and lower Loddon. Actions include allocations of water for the environment, increasing connectivity by establishing fishways at Koondrook and Cohuna to improve fish passage, fish screens to prevent loss of fish to irrigation channels and pumps, protection and revegetation of riparian areas, investigating options to control Carp, and reintroduction of threatened species including Southern Pygmy Perch into two wetlands (Black Charlie and Reedy lagoons) and River Blackfish into flowing water habitats.

There are a range of fish monitoring efforts related to the rehabilitation efforts above. These include the Victorian Environmental Flow Monitoring and Assessment Program (VEFMAP) and The Living Murray program. The [North Central Catchment Management Authority](#), DEECA and the [Victorian Fisheries Authority](#) support rehabilitation and management of the Gunbower Creek and its fish community.

See the ARI website for more information on the [Native Fish Report Card Program](#).

¹ Douglas, J, Hunt, T and Trueman, W. (2012). Confirmed records of the endangered Trout Cod *Maccullochella macquariensis* from the Murray River at Gunbower Island, Victoria. Victorian Naturalist 129(4):152-155.

The NFRC program, and related monitoring initiatives, provide improved understanding of the structure of fish communities and how rivers can be best managed.

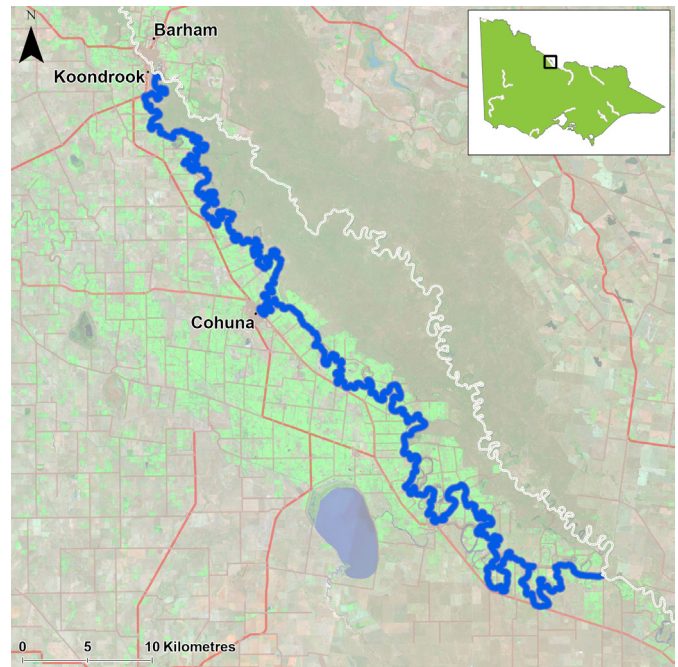


Figure 1. Map showing the section of Gunbower Creek where NFRC sampling occurs.



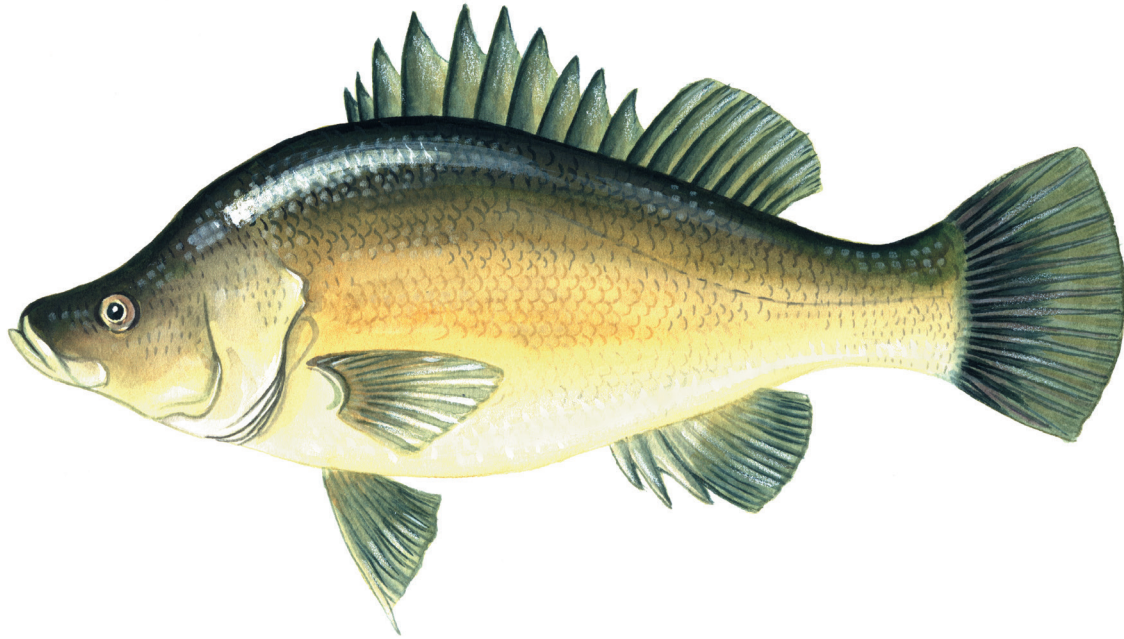
Figure 2. A juvenile Silver Perch



Figure 3. A Golden Perch

Golden Perch

Macquaria ambigua



Key Health Indicators

- ✗ Recent recruitment
- ✓ Multiple size classes
- ✓ Mature fish present

Monitoring Results

Total number of fish caught	32
Fish per 1km of waterway	2.12
Largest fish by length (cm)	53.3
Largest fish by weight (kg)	3.18
% of the catch that is legal size	93.8

GUNBOWER CREEK

RECREATIONAL SPECIES

The abundance of Golden Perch (*Macquaria ambigua*) was consistent from 2018 to 2020, albeit lower than 2017, 2021 and 2022. The increased abundances in 2017 were due to more fish captured at the two sites downstream of Koondrook Weir compared to the following years when water levels were exceptionally low at these sites. A large proportion of Golden Perch collected were adults (Figure 4) with 94% of the catch being adults in 2023 (Figure 5). This indicates conditions in the system are suitable for maintaining adult Golden Perch populations. Juveniles have been present in all years, with recruits only detected in 2019 (Figure 4). It is unlikely that these are natural recruits, as the creek has many barriers which would limit spawning opportunities and egg/larval survival. The construction of the Koondrook fishway in 2021 will allow Golden Perch to access areas further upstream in the Gunbower Creek system. A blackwater event occurred in late 2022 with dead Golden Perch recorded. Rescues were undertaken, with some Golden Perch either transported out of the Gunbower Creek system or taken to the Arcadia fish hatchery and some subsequently returned to the creek when water quality improved, prior to NFRC sampling. Based on the abundances detected in 2023 compared to previous sampling events, it appears the blackwater event in Gunbower Creek did not impact the Golden Perch population heavily.

Stocking Golden Perch were stocked into Gunbower Creek for the first time in 2016. Twenty thousand Golden Perch were stocked in 2016; 40,500 in 2017; 200,000 in early 2018; 70,000 in 2019; 70,000 in 2020, 70,000 in 2021; and 65,000 in April 2022. No fish have been stocked in the first half of 2023.

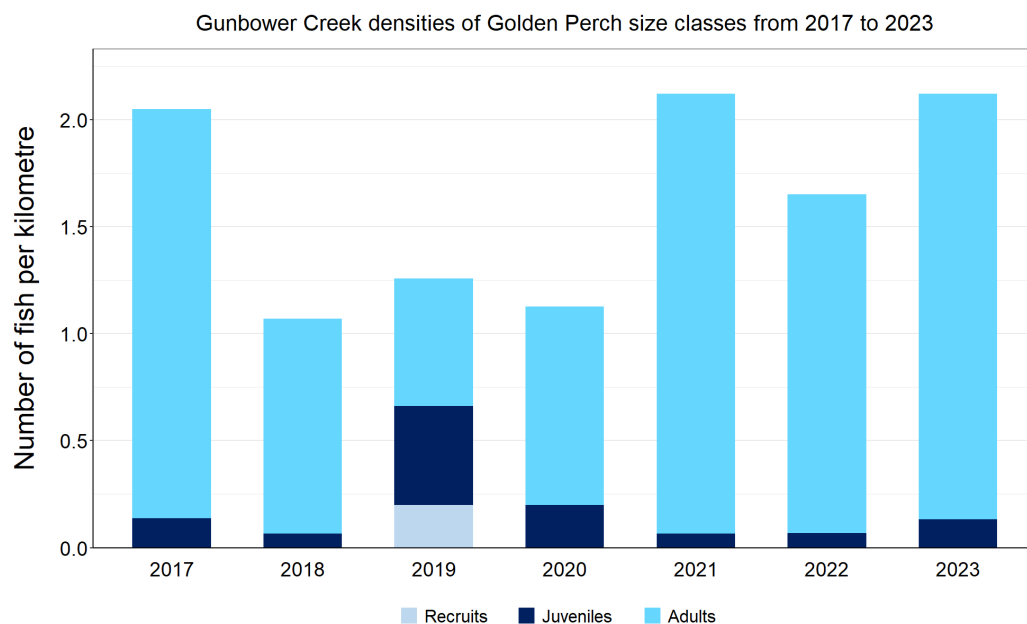


Figure 4. The densities of recruits, juveniles and adult Golden Perch for NFRC surveys in the Gunbower Creek from 2017 to 2023

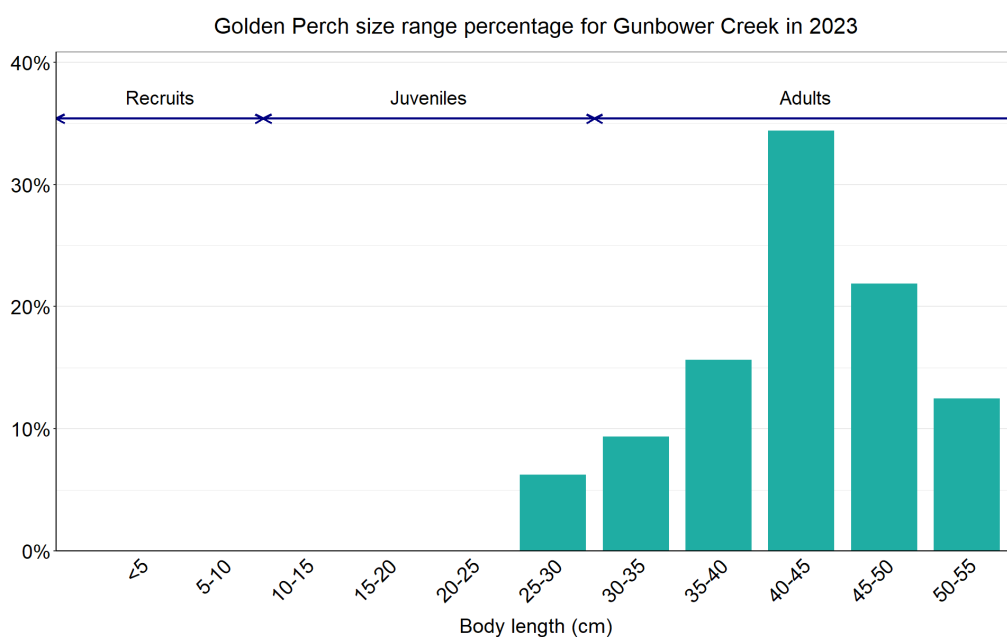
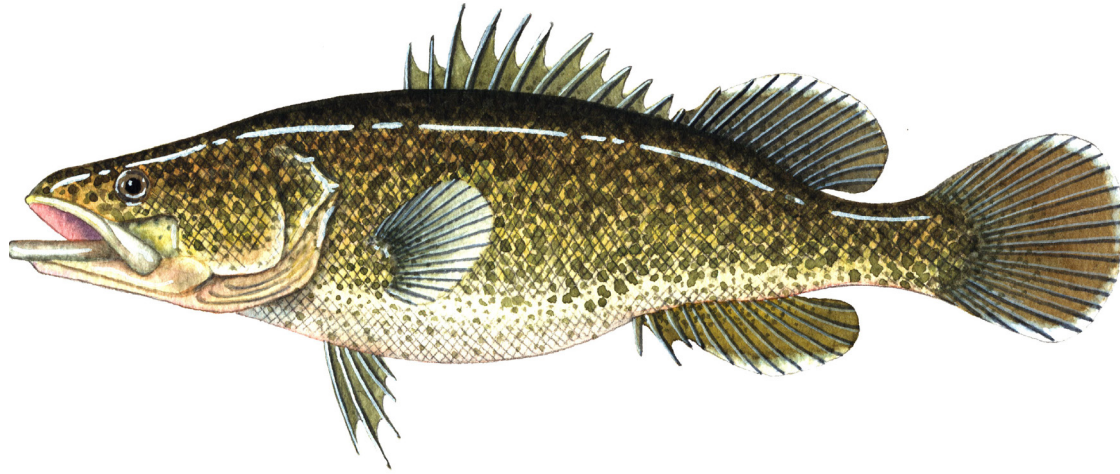


Figure 5. The size range percentage of Golden Perch measured from the Gunbower Creek during NFRC surveys in 2023

Murray Cod

Maccullochella peelii



Key Health Indicators

- ✗ Recent recruitment
- ✓ Multiple size classes
- ✓ Mature fish present

Monitoring Results

Total number of fish caught	40
Fish per 1km of waterway	2.65
Largest fish by length (cm)	100.2
Largest fish by weight (kg)	16.2
% of the catch that is legal size	60

GUNBOWER CREEK

RECREATIONAL SPECIES

The Murray Cod (*Maccullochella peelii*) population was lowest in 2022 and 2023, and has been reducing in size since 2019 (Figure 6). Multiple size classes including mature and young-of-year fish were caught in all seven years, except 2023 when no recruitment was detected. The 2023 size range percentage shows very low abundances of Murray Cod up to 40 cm (Figure 7). A blackwater event occurred in late 2022 (during the species' breeding season) with dead Murray Cod recorded. It is unknown if the juveniles were impacted at higher rates than other size classes. Rescues were undertaken, with some fish either transported out of the Gunbower Creek system or taken to the Arcadia fish hatchery and some subsequently returned to the creek when water quality improved, prior to NFRC sampling. Since 2014, water for the environment has been delivered to Gunbower Creek to reduce water level fluctuations during the breeding period for Murray Cod to enhance egg and larval survival, to maintain winter base flows² and to enhance survival of juvenile fish over winter. Monitoring indicates that the provision of water for the environment is enhancing the survival of young-of-year fish, irrespective of them being stocked or being from natural recruitment. The lack of recruitment detected in 2023 is likely due to the blackwater event.

Stocking Twenty thousand Murray Cod were stocked in 2016; 55,000 in 2017; 100,000 in early 2018 and 50,000 in late 2018; 115,690 in 2020 (of which 65,000 were in December); 60,000 in January 2022; and 60,000 in February 2023. Murray Cod stocking started in 2001, with 20,000 stocked in most years until 2016. The exceptions to this are: 120,000 in 2012 and 80,000 in 2014. No Murray Cod were stocked in 2019.

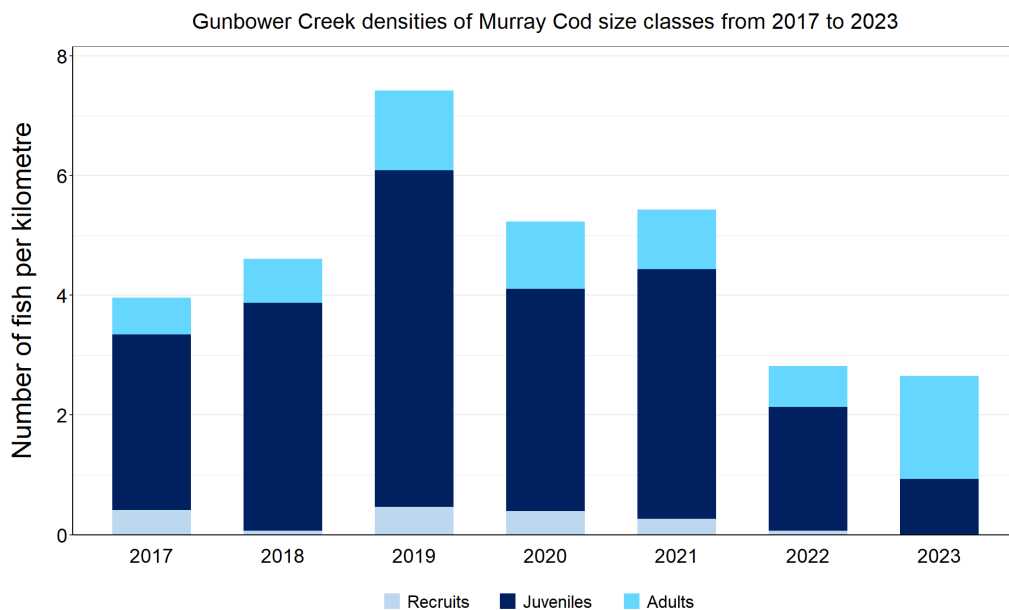


Figure 6. The densities of recruits, juveniles and adult Murray Cod for NFRC surveys in the Gunbower Creek from 2017 to 2023

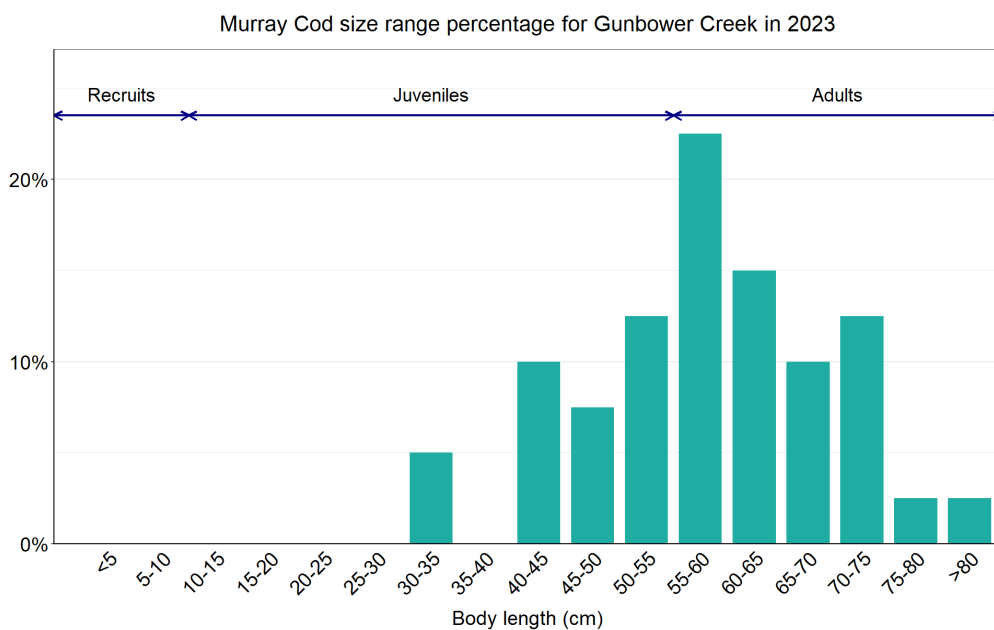


Figure 7. The size range percentage of Murray Cod measured from the Gunbower Creek during NFRC surveys in 2023

² Stuart et al. (2019). From an irrigation system to an ecological asset: adding environmental flows establishes recovery of a threatened fish species. *Marine and Freshwater Research*: 70 (9), 1295-1306.

Silver Perch

Bidyanus bidyanus



Key Health Indicators

- Cannot be determined
- Cannot be determined
- Cannot be determined

Monitoring Results

Total number of fish caught	14
Fish per 1km of waterway	0.93
Largest fish by length (cm)	46.2
Largest fish by weight (kg)	1.51
% of the catch that is legal size	NA

Stocking

No stocking has occurred.

GUNBOWER CREEK

THREATENED SPECIES

The natural range of Silver Perch (*Bidyanus bidyanus*) includes most of the MDB, excluding the cool, higher altitude upper reaches of streams. River regulation and barriers have impacted Silver Perch populations, with these prevalent in Gunbower Creek. The NFRC does not expect to capture enough Silver Perch to measure key health indicators. However, by collecting data for non-recreational species including threatened species such as Silver Perch, it will allow a greater understanding of the current status of the populations providing essential information for their management. Low abundances of Silver Perch have been detected in all seven years with the highest abundances in 2023 (Figure 8). However, due to the low abundances of Silver Perch collected during NFRC, the key health indicators cannot be measured. The Silver Perch detected were predominantly adults (Figures 8, 9). Juveniles were only detected in 2017, 2022 and 2023. Recruits of this species are hard to catch using this sampling method and none have been detected in all seven years. Silver Perch are unlikely to successfully spawn in the creek due to the many barriers to movement. There was an accumulation of juvenile Silver Perch at the Koondrook fishway during construction (Lieschke unpubl. data). The construction of the Koondrook fishway in 2021 should allow juvenile and adult fish to access areas further upstream within the system. A blackwater event occurred in late 2022. Rescues were undertaken, with fish transported out of the Gunbower Creek system or taken to the Arcadia fish hatchery and some subsequently returned to the creek when water quality improved, prior to NFRC sampling. Due to low numbers being captured prior to 2023, it cannot be determined if the blackwater event in late 2022 has impacted the Silver Perch population.

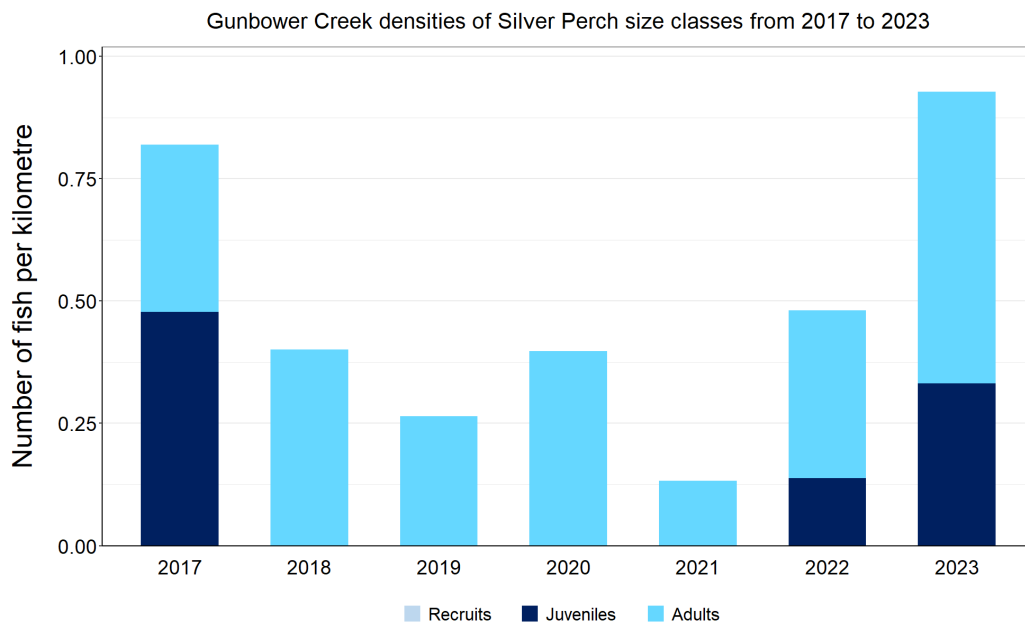


Figure 8. The densities of recruits, juveniles and adult Silver Perch for NFRC surveys in the Gunbower Creek from 2017 to 2023

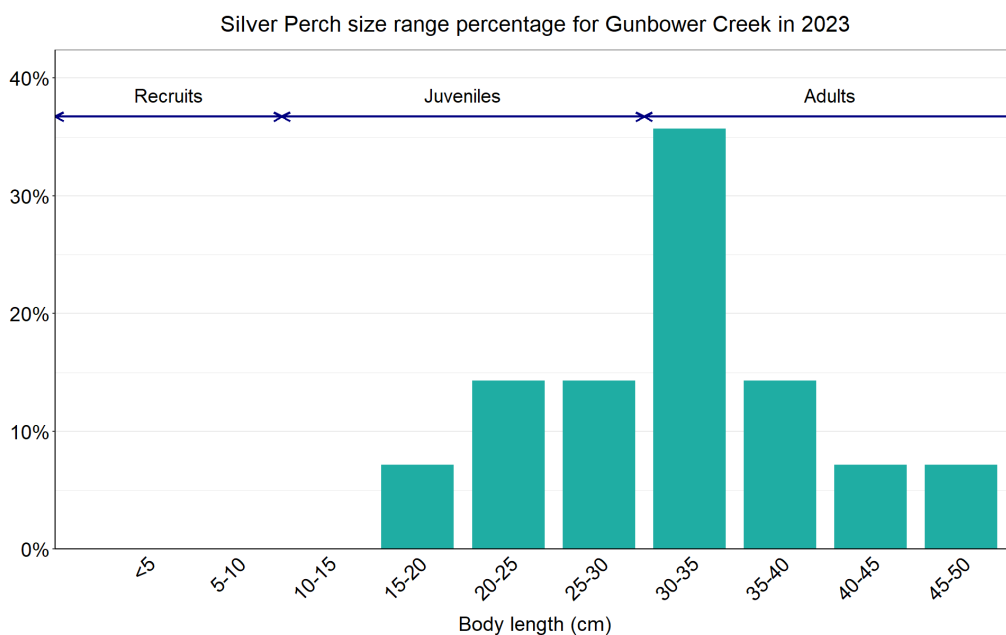
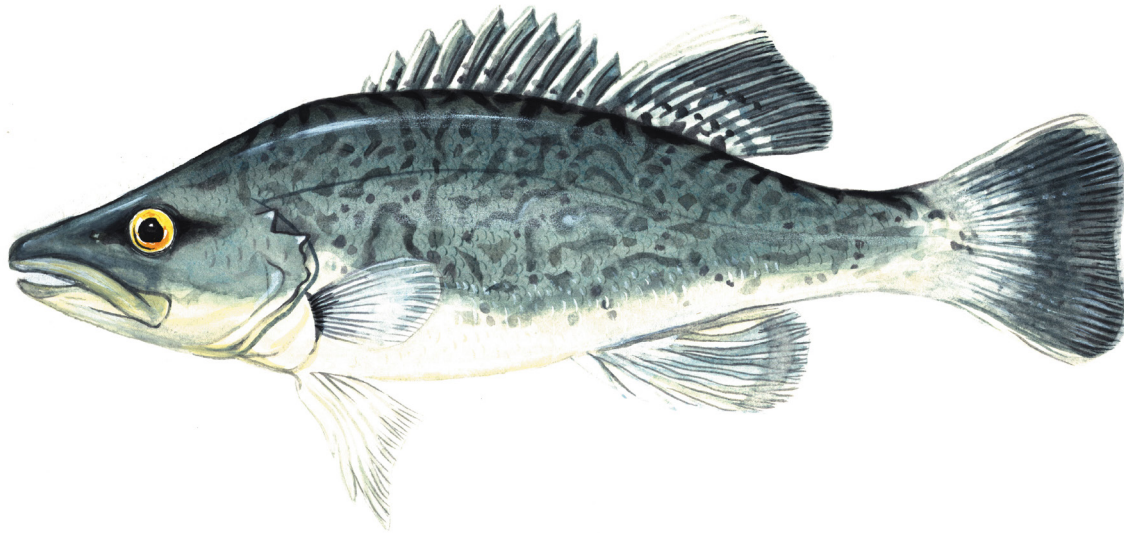


Figure 9. The size range percentage of Silver Perch measured from the Gunbower Creek during NFRC surveys in 2023

Trout Cod

Maccullochella macquariensis



Key Health Indicators

- Cannot be determined
- Cannot be determined
- Cannot be determined

Monitoring Results

Total number of fish caught	1
Fish per 1km of waterway	0.07
Largest fish by length (cm)	40
Largest fish by weight (kg)	0.85
% of the catch that is legal size	NA

Stocking No stocking has occurred.

GUNBOWER CREEK

THREATENED SPECIES

The natural range of Trout Cod included Gunbower Creek, but the species was absent in this area from the 1980s. The NFRC does not expect to capture enough Trout Cod to measure key health indicators. However, by collecting data for non-recreational species including threatened species such as Trout Cod, it will allow a greater understanding of the current status of the populations providing essential information for species management. Due to the low abundances of Trout Cod collected during NFRC the key health indicators cannot be measured. Trout Cod was first detected again in Gunbower Creek³ in 2012 and have regularly been recorded since then, albeit in low numbers. Trout Cod have been recorded in six of the seven years of NFRC sampling (Figure 10). No recruits have been detected, and juveniles have only been detected in 2017 and 2021 (Figure 11). Only a single adult was recorded in 2023. This indicates that Trout Cod are persisting in the creek, but it is uncertain if they are breeding. It is possible that larvae or recruits enter the system via the national channel inlet upstream of Torrumbarry Weir. Monitoring during Koondrook and Cohuna fishway installations in 2021 captured juveniles (in higher abundances than NFRC sampling) immediately downstream of the weirs - potentially accumulating, which indicates a barrier to fish passage. The construction of the Koondrook fishway in 2021 should allow fish to access areas further upstream in the system. A blackwater event occurred in late 2022. Rescues were undertaken, with fish either transported out of the Gunbower Creek system or taken to the Arcadia fish hatchery and some subsequently returned to the creek when water quality improved, prior to NFRC sampling. Due to low numbers being captured prior to 2023, it cannot be determined if the blackwater event in late 2022 has impacted the Trout Cod population.

Trout Cod

Maccullochella macquariensis

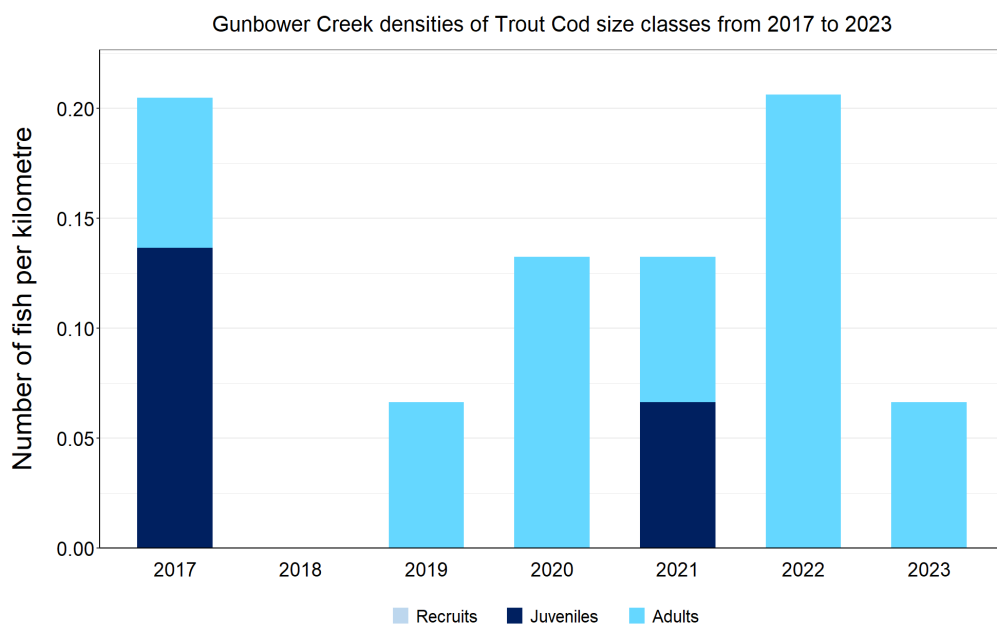


Figure 10. The densities of recruits, juveniles and adult Trout Cod for NFRC surveys in the Gunbower Creek from 2017 to 2023

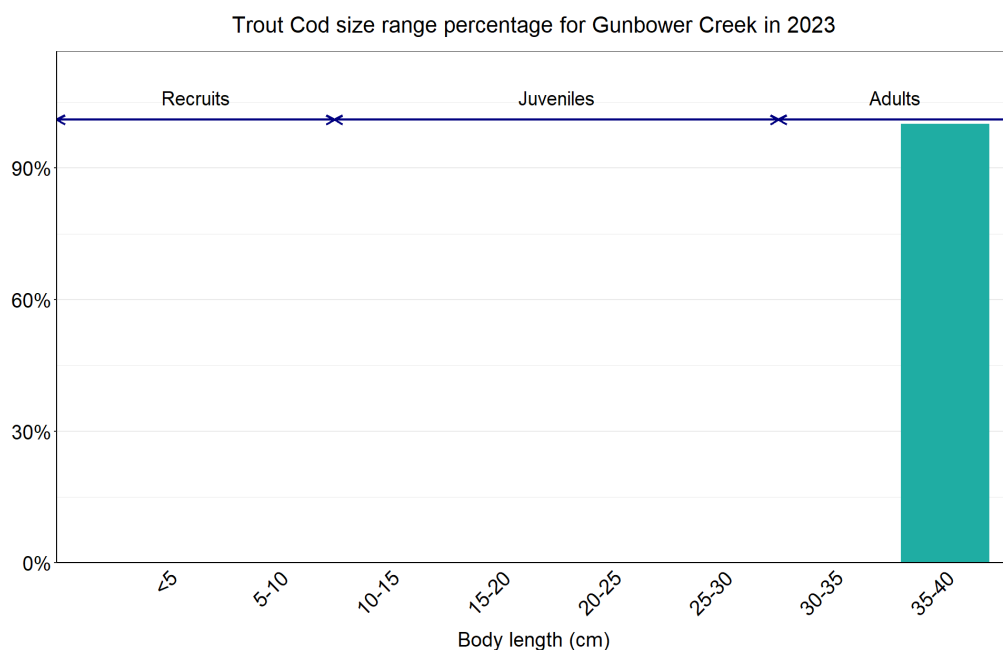


Figure 11. The size range percentage of Trout Cod measured from the Gunbower Creek during NFRC surveys in 2023

³ River Murray Channel Monitoring Plan. The Department of Agriculture, the Environment and Water, through its Commonwealth Environmental Water Office (CEWO), on behalf of River Murray jurisdictions (via the Southern Connected Basin Environment Watering Committee), has agreed to engage a consortium team, led by CSIRO, to implement the River Murray Channel Monitoring Plan



We acknowledge and respect Victorian Traditional Owners as the original custodians of Victoria's land and waters, their unique ability to care for Country and deep spiritual connection to it.

We honour Elders past and present whose knowledge and wisdom has ensured the continuation of culture and traditional practices.

DEECA is committed to genuinely partnering with Victorian Traditional Owners and Victoria's Aboriginal community to progress their aspirations.



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