

# Native Fish Report Card

## Lindsay River/Mullaroo Creek 2024

### Mallee Region

This report card summarises the **2024** Native Fish Report Card (NFRC) survey in the Lindsay River/Mullaroo Creek



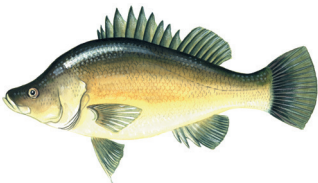
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ELECTROFISHING

## Fish found in the Lindsay River System in our 2024 surveys

### Target Species

✓ recorded in 2024



✓ **Golden Perch**

*Macquaria ambigua*



✓ **Murray Cod**

*Maccullochella peelii*



✓ **Silver Perch**

*Bidyanus bidyanus*

### Non-target species

✓ recorded since 2017\*

#### Large-bodied native species

- ✓ Bony Bream
- ✓ Freshwater Catfish

#### Small-bodied native species

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

#### 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 to monitor population dynamics of key iconic fish species that have high recreational and/or conservation values, in large rivers across Victoria. In the Lindsay River system, the target species are Golden Perch, Murray Cod and Silver Perch. The number of sites differs through time due to the level of collaboration with the Living Murray Project. The equipment used and habitats surveyed target these species, which are measured to determine their population structures. Other fish species that are incidentally captured are counted, but not measured except Freshwater Catfish which are also captured, measured and weighed. Surveys occur in March each year, at 10-13 sites from both the Mullaroo (6-8 sites) and Lindsay (4-5 sites) offtakes with the Murray River upstream of weir seven to the junction of the Lindsay and Murray rivers.

### Summary of key health indicators for target species in 2024

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

Recent recruitment means young -of-year fish.

\* - cannot be determined due to low abundances

Silver Perch were historically abundant throughout the Lindsay River system but have experienced dramatic declines across their range. Silver Perch are present in low densities. Overall, the Lindsay River system appears to be maintaining healthy populations of Golden Perch with the Murray Cod population recovering following the 2016 blackwater event.

### Non-target species

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

#### Large-bodied native species

Bony Bream and Freshwater Catfish were recorded in the 2024 survey. Bony Bream has been recorded in all eight NFRC surveys. It is intolerant of cold water and

common in the lower Murray-Darling Basin, including the Lindsay River system. The species is often in higher abundances in slower flowing habitats. Freshwater Catfish has been recorded in six of the eight NFRC surveys. This species is a lowland species, generally found at altitudes below 200m. It has declined in distribution and abundance across Victoria. In 2021, young-of-year were collected for the first time during NFRC surveys.

#### Small-bodied native species

Australian Smelt, Murray-Darling Rainbowfish and Unspecked Hardyhead were recorded in the 2024 survey. These species have been recorded in all eight NFRC surveys. Australian Smelt and Unspecked Hardyhead are common and are expected to be widespread throughout the Lindsay River system and more broadly within the Murray-Darling Basin. Murray-Darling Rainbowfish is common throughout the Lindsay River system. While once widespread in the Murray-Darling Basin, its range has become more restricted. The species now has a patchy distribution and is listed under the *Flora and Fauna Guarantee Act 1988* in Victoria. Other species recorded in previous NFRC surveys are Carp Gudgeon (all years except 2024), and Flatheaded Gudgeon (six years), which are common and expected to be widespread throughout the Lindsay River system and more broadly within the Murray-Darling Basin.

#### Exotic fish species

Common Carp and Eastern Gambusia were recorded in the 2024 survey. Common Carp has been recorded in all eight NFRC surveys. Eastern Gambusia has been recorded in the last four NFRC surveys (2020-24). It is not as widely distributed and is more likely to be collected in the slower flowing waters. Goldfish and Redfin have been recorded in previous NFRC surveys. Goldfish are widely distributed across sampling sites and have been recorded in all years except 2024. Redfin has been recorded five times and are also distributed throughout, but in low abundances.

### Other native fish species known from the Lindsay River System

There is a range of other species historically known from this system, although they have not been detected for many decades.

### Other notable species

Surveys have also recorded Yabbies and turtle species.

## Environmental and Management Context

### Environment

A blackwater event negatively affected fish populations in late 2016. Generally, stream flows were similar during the autumn sampling periods in 2017 to 2022 and 2024 but were higher in 2023. Prior to 2022 surveys, the Murray River has had varying levels of connectivity with the upper Lindsay River since the 2016 flood. As such, the upstream reaches of the Lindsay River (above the Mullaroo Creek junction) have generally experienced lower flows and water levels since 2017. Working collaboratively with The Living Murray (TLM) Project, the number of sites fished and used in the analysis has varied with 12 sites fished in 2017, 13 in 2018– 2020, ten sites in 2021-22 and 11 sites in 2023-24. Sites were surveyed by an electrofishing boat in March 2017-22 and 2024 but were delayed until April in 2023 due to flooding. The water turbidity levels were much higher in 2022 and 2023, which likely reduced the efficiency of the electrofishing surveys.

### Waterway and fisheries management efforts in the Lindsay River System

A range of rehabilitation actions to improve the health of the Lindsay River system and its fish community, have been identified within the Mallee Waterway Strategy 2014-2022. The core current focus involves allocation of water for the environment and improving fish passage. Since 2006, fish monitoring has occurred for the Lindsay, Mulcras, Wallpolla Islands, as part of The Living Murray Program. The [Mallee Catchment Management Authority](#), DEECA and the [Victorian Fisheries Authority](#) support rehabilitation and management of the Lindsay River and its fish community.

See the ARI website for more information about the [Native Fish Report Card program](#)

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

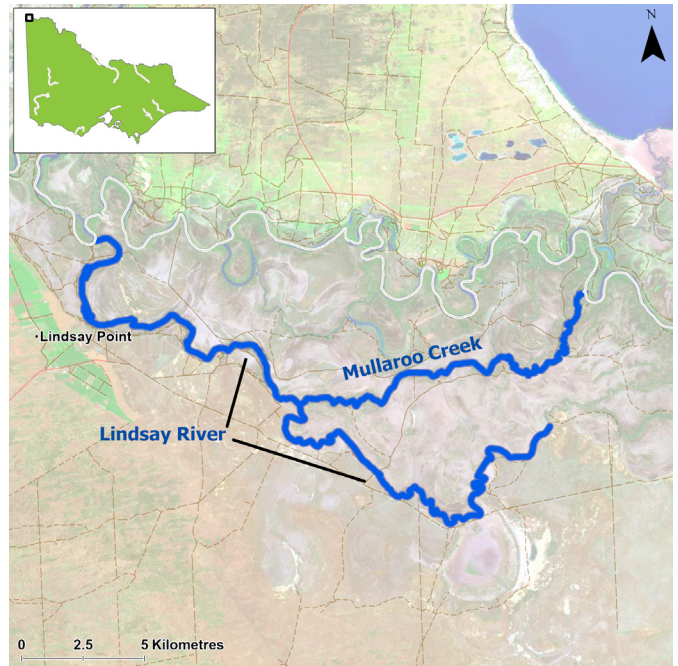


Figure 1. Map showing the section of Lindsay River system where NFRC sampling occurs.

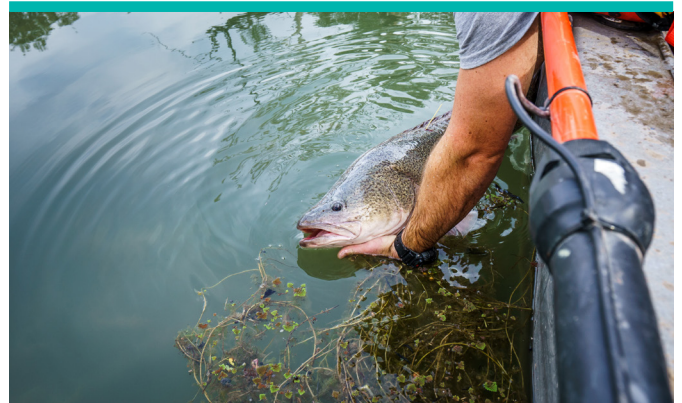


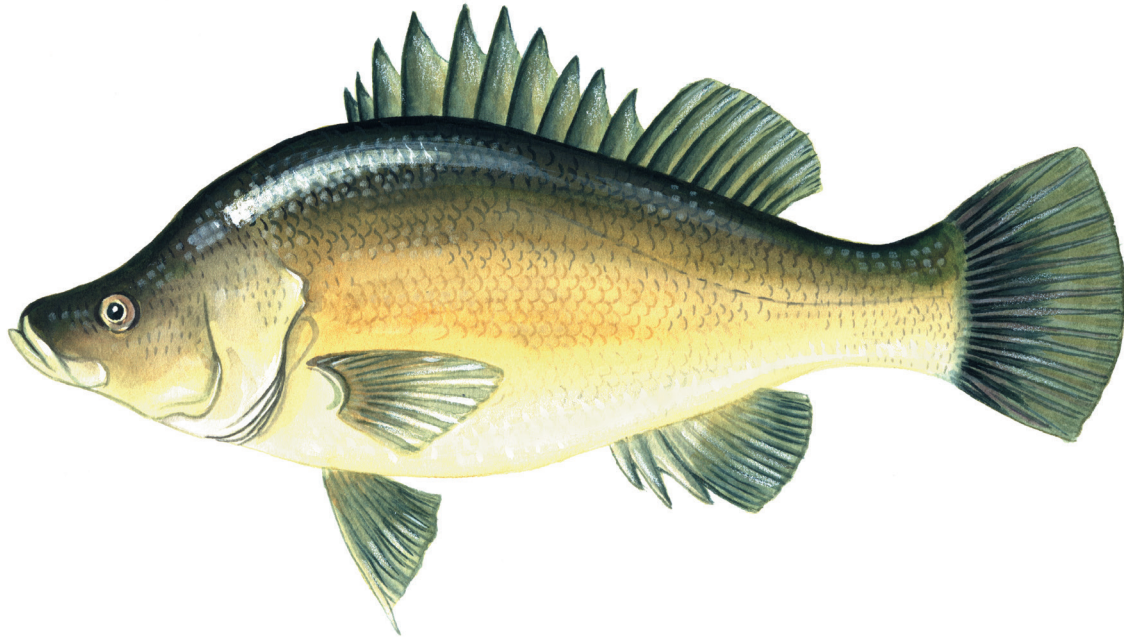
Figure 2. A Murray Cod



Figure 3. A juvenile Silver Perch

# Golden Perch

*Macquaria ambigua*



## Key Health Indicators

- ✘ Recent recruitment
- ✔ Multiple size classes
- ✔ Mature fish present

## Monitoring Results

Total number of fish caught	39
Fish per 1km of waterway	3.24
Largest fish by length (cm)	48.6
Largest fish by weight (kg)	2.26
% of the catch that is legal size	76.9

## Lindsay River System

## RECREATIONAL SPECIES

The abundance of Golden Perch (*Macquaria ambigua*) appears to have declined after the higher abundances in 2017 and 2018. The 2024 catch rate was consistent with surveys since 2019, aside from the relatively low catch rate in 2022 (Figure 4). An increase in juvenile abundances in 2023 contributed to the higher catch rate in 2023 compared to 2022, with a higher proportion of adults in 2024, indicating the cohort of juveniles in 2023 has reached maturity (Figure 5). It is likely that the 2016 and 2022 floods attracted juvenile Golden Perch into the system, with abundances of juveniles in the upper Lindsay system (above the Mullaroo Creek junction) being highest in 2017 and 2023 when flows were high. Recruits were detected in 2017 and 2022. In 2022 the small Golden Perch which were present throughout the study areas were spawned in the Darling River (confirmed using otolith\* chemistry) but had dispersed into, and were growing in, Victorian Mallee floodplains. The movements of these Golden Perch have also been tracked using acoustic telemetry and the results indicate that while some fish have moved out of the area, most fish have remained within Lindsay Island despite the 2022-23 flooding. Golden Perch are consistently captured in the Lindsay-Mullaroo system.

**Stocking** 36,000 Golden Perch fingerlings were stocked into the Lindsay River in 2024 (after NFRC surveys).

\* Otoliths are fish earbones

Lindsay and Mullaroo densities of Golden Perch size classes from 2017 to 2024

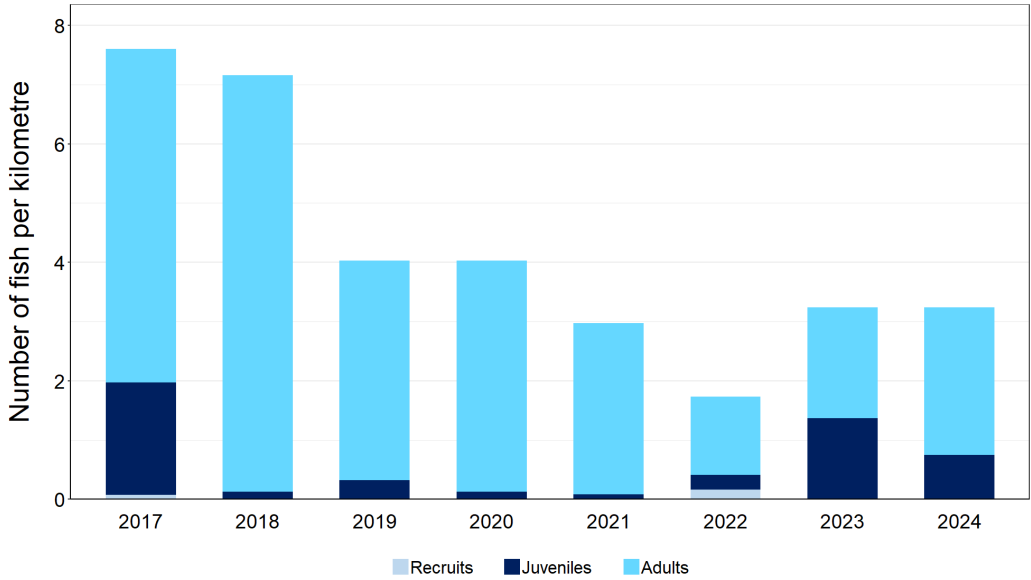


Figure 4. The densities of recruits, juveniles and adult Golden Perch for NFRC surveys in the Lindsay Mullaroo river system from 2017 to 2024

Golden Perch size range percentage for Lindsay and Mullaroo in 2024

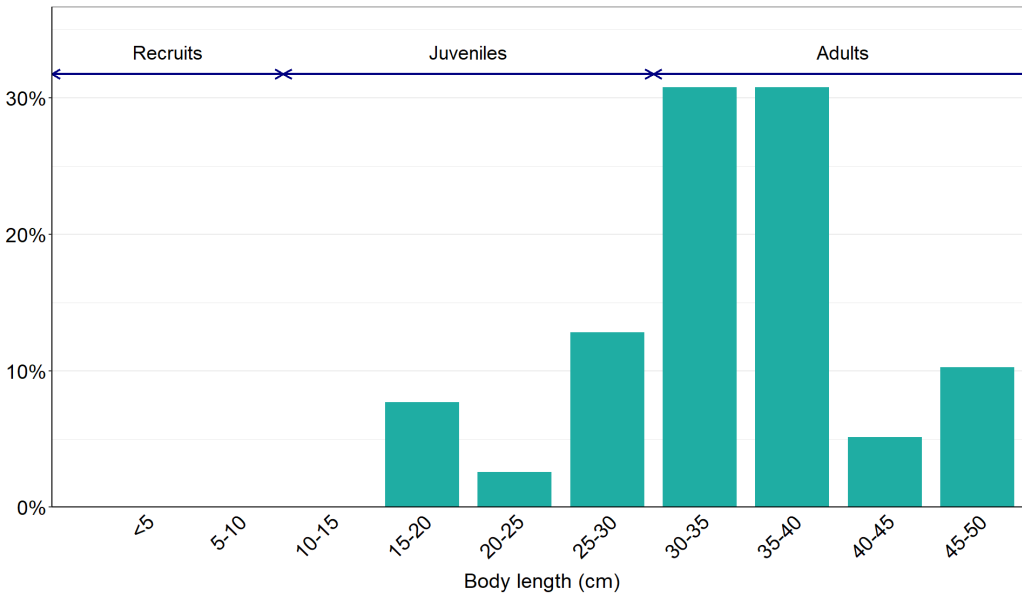


Figure 5. The size range percentage of Golden Perch measured from the Lindsay Mullaroo river system during NFRC surveys in 2024

# Murray Cod

*Maccullochella peelii*



## Lindsay River System

## RECREATIONAL SPECIES

### Key Health Indicators

- ✘ Recent recruitment
- ✔ Multiple size classes
- ✔ Mature fish present

### Monitoring Results

Total number of fish caught	30
Fish per 1km of waterway	2.49
Largest fish by length (cm)	108
Largest fish by weight (kg)	16.9
% of the catch that is legal size	0

### Stocking

Twenty-seven thousand Murray Cod were stocked into the Lindsay River in 2021 and 56,000 in 2023.

The abundance of Murray Cod (*Maccullochella peelii*) in the Lindsay River system declined dramatically following the 2016 blackwater event either through emigration or mortality<sup>2</sup>. Only one Murray Cod was captured in 2017, with abundances increasing from 2018 to 2020 before declining in 2021, 2022 and 2023 (Figure 6). Abundance improved again in 2024, perhaps because of the smaller juveniles observed in 2023 growing, thereby increasing the efficiency of capture by electrofishing. There was a reduction in the number of adults captured between 2023 and 2024, with all legal fish now absent and only a few large fish (75cm+) present (Figure 7). Of the juveniles observed in 2024, most were 20-35cm in length and may take several years to reach legal size (Figure 7). The highest abundances of adults collected were in 2021 and 2022, indicative of fish surviving and reaching maturity following the 2017 spawning event. From 2018-23 multiple size classes including mature fish and recruits have been recorded, except for 2022 and 2024 where no recruits were recorded (Figure 6). The 2022 floods caused a minor blackwater event with Murray Cod and Common Carp found dead in the system (ARI unpublished data). There is a distinct gap in 35-75cm fish in 2024 (Figure 7), which corresponds with the gap between 15-35cm detected in 2022 and 20-50cm in 2023. The first Murray Cod detected during NFRC surveys from the Lindsay River was in 2022, three Murray Cod were detected in 2023 (a recruit, a juvenile and an adult) and three juveniles in 2024. This suggests that increased flows in 2021 and 2022 have increased Murray Cod dispersal within the system.

Lindsay and Mullaroo densities of Murray Cod size classes from 2017 to 2024

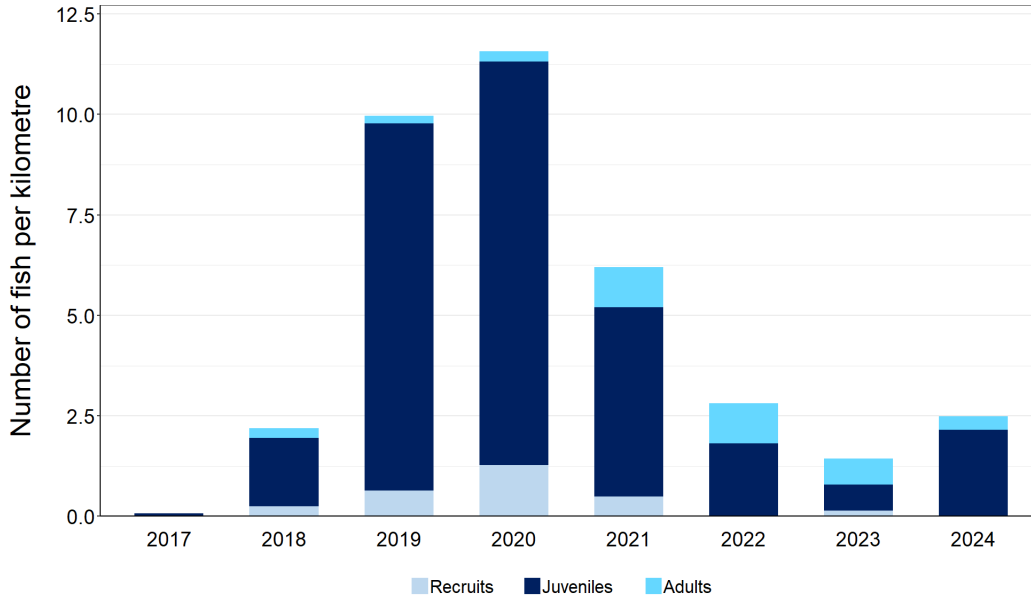


Figure 6. The densities of recruits, juveniles and adult Murray Cod for NFRC surveys in the Lindsay Mullaroo river system from 2017 to 2024

Murray Cod size range percentage for Lindsay and Mullaroo in 2024

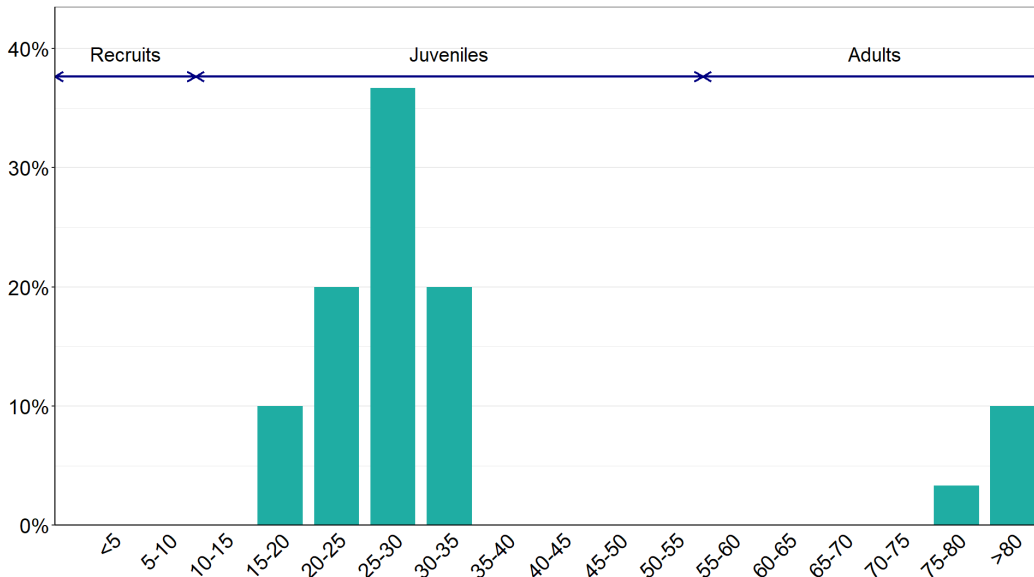


Figure 7. The size range percentage of Murray Cod measured from the Lindsay Mullaroo river system during NFRC surveys in 2024

<sup>1</sup> Tonkin et al. (2017) Fish movement in the Lindsay and Mulcra Island anabranch systems: 2017 Progress report. Unpublished Client Report for the Mallee Catchment Management Authority. Arthur Rylah Institute for Environmental Research. DELWP.

<sup>2</sup> Tonkin et al. (2020). Murray Cod movement and population structure in the Lindsay Island anabranch system: 2020 Report. Unpublished Client Report for the Mallee Catchment Management Authority. Arthur Rylah Institute for Environmental Research. DELWP

# Silver Perch

*Bidyanus bidyanus*



## 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	0.08
Largest fish by length (cm)	36.2
Largest fish by weight (kg)	0.82
% of the catch that is legal size	NA <sup>#</sup>

<sup>#</sup>This species is a Protected Freshwater Species and taking or possessing is prohibited (Victorian Recreational Fishing Guide 2023-24).

## Lindsay River System

## THREATENED SPECIES

The natural range of Silver Perch (*Bidyanus bidyanus*) includes most of the Murray-Darling Basin, excluding the cool, higher altitude upper reaches of streams. River regulation and barriers have been listed as factors negatively impacting Silver Perch populations, with these relevant to the Lindsay River system. While the NFRC only expects to capture low numbers of this species, the monitoring can provide a greater understanding of the current status of the populations which is essential to inform management of the species. Due to the low abundances of Silver Perch collected during NFRC the key health indicators cannot be measured.

Only a single Silver Perch was detected in 2024. Silver Perch have been captured in seven of the eight years surveyed, albeit in low abundances, and were absent in 2023 (Figure 8). The Silver Perch detected during NFRC surveys are a mixture of recruits (2020), juveniles (2017, 2019, 2021 and 2022) and adults (2018–19, 2021–22 and 2024) (Figure 8). Recruits of this species are difficult to catch using the NFRC sampling methods. Recruits were only detected in 2020 suggesting spawning success in 2019. As Silver Perch are only detected in low abundances, it cannot be determined whether the 2022 blackwater (hypoxia) event impacted the population. Silver Perch are a highly mobile species with previous studies demonstrating positive impacts of high flows and flooding on their survival, growth and condition<sup>3,4</sup>. Whilst Silver Perch have been shown to benefit from flow events, even if those flow events are associated with hypoxia, in systems or circumstances where they cannot move, they are susceptible to hypoxia<sup>5</sup>.



# Silver Perch

*Bidyanus bidyanus*

Lindsay and Mullaroo densities of Silver Perch size classes from 2017 to 2024

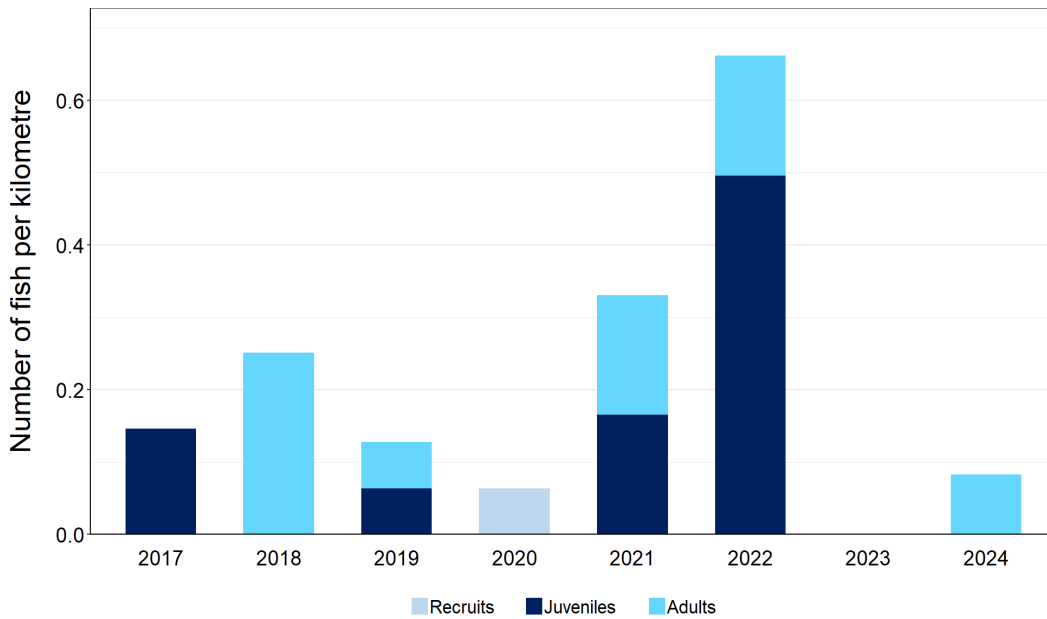


Figure 8. The densities of recruits, juveniles and adult Silver Perch for NFRC surveys in the Lindsay Mullaroo river system from 2017 to 2024

Silver Perch size range percentage for Lindsay and Mullaroo in 2024

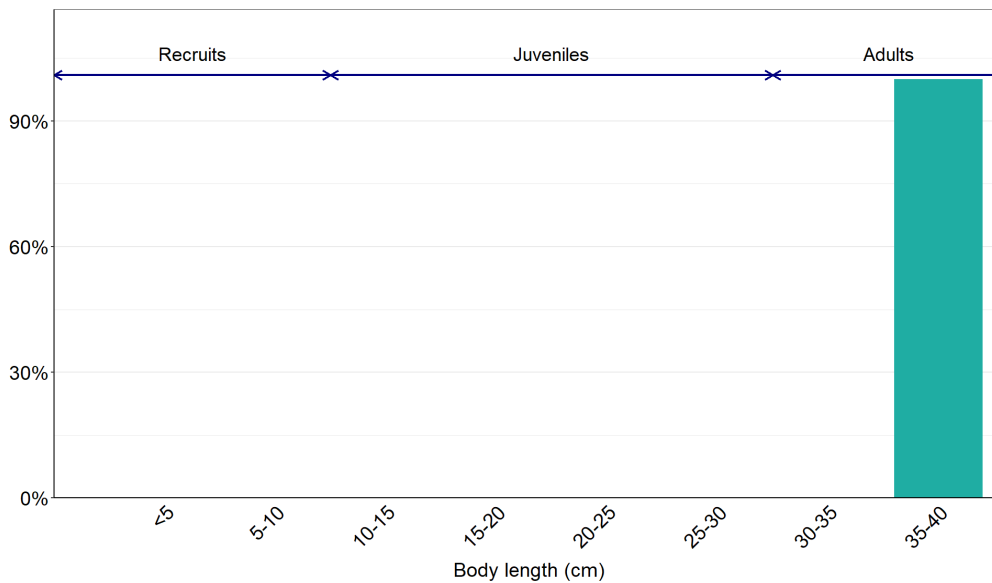


Figure 9. The size range percentage of Silver Perch measured from the Lindsay Mullaroo river system during NFRC surveys in 2024

<sup>3</sup> Tonkin et al. (2017). The effects of flow on Silver Perch population dynamics in the Murray River. Arthur Rylah Institute for Environmental Research. Technical Report Series No. 282. Department of Environment, Land, Water and Planning, Heidelberg, Victoria

<sup>4</sup> Tonkin et al. (2019). Hydrology and water temperature influence recruitment dynamics of the threatened Silver Perch *Bidyanus bidyanus* in a regulated lowland river. *Marine and Freshwater Research*, 70: 1333-1344.

<sup>5</sup> Thiem et al. (2022). Contrasting natal origin and movement history informs recovery pathways for three lowland river species following a mass fish kill. *Marine and Freshwater Research*, 73: 237-246.



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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