

YACTAC and Refreshing Rivers Program Targeted Carp Management Initiative – Billabong Creek, Conargo, Report 2 (September and December 2023 Electrofishing Surveys)

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Background

YACTAC in collaboration with the Refreshing Rivers Program, community, local landholders and government are actively supporting the recovery of native fish populations in the Central Billabong system. One initiative is targeting of carp in different areas of the Central Billabong system using an experimental approach to assess if localised removal of carp is effective in reducing numbers of carp (especially large carp) temporarily. If successful and conducted in a strategic manner, localised initiatives like this could be initiated in sections where native fish breeding has been identified, threatened species are released (e.g. catfish), or emergent-submergent vegetation is being established.

Stage 1 is an experimentation feasibility phase, located in the Billabong Creek at Conargo township (Figure 1). This experimental stage includes:

1. Consecutive days of electrofishing upstream and downstream of Conargo for approximately a 5km stretch.
 - a. Carp are counted and 100 sub-sample measured and weighed, and other native species recorded, and length estimated.

Fish Surveys at Billabong creek, Conargo.

Boat electrofishing (Figure 2) took place over a 5 km stretch of the Billabong Creek at Conargo (Figure 1) for two days in September (6th and 7th), and one day in December (20th). All carp were collected, weighed and measured. All other large-bodied native fish were sighted but not brought on board and an estimation of size was given for each native fish. All native fish were returned to the water while all carp were kept and not returned to the water in either of the sampling trips.

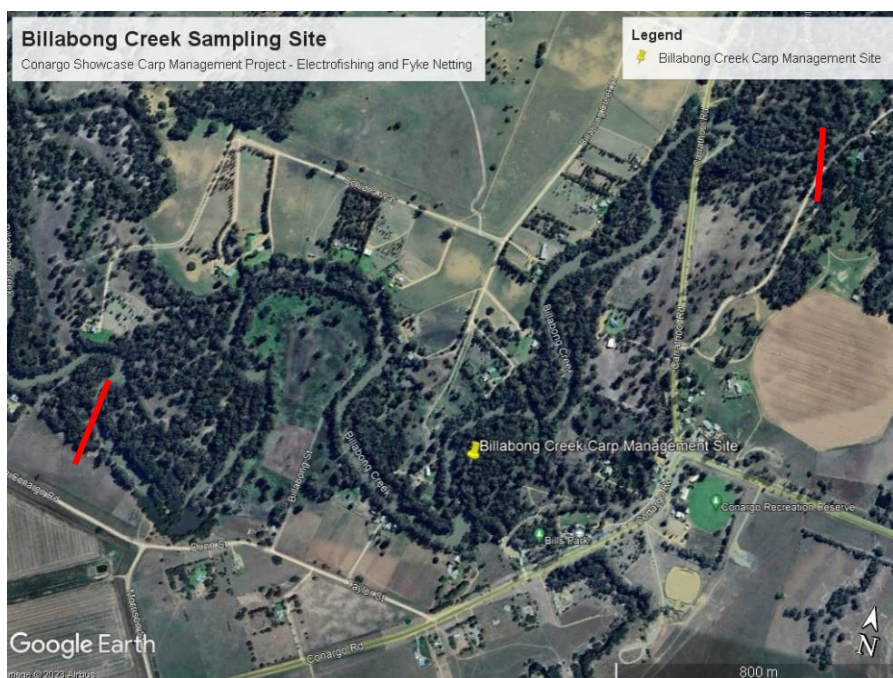


Figure 1. Billabong Creek Carp Management sampling site at Conargo where electrofishing is occurring to reduce carp biomass. Red lines mark the 5km creek stretch where electrofishing took place.



Figure 4. Electrofishing boat on the Billabong creek, Conargo.

Results

A summary table for presence-absence of species for each lagoon is given in Table 1, and photos of fish catches in photo section.

Table 1. Summary results of presence-absence of fish and crustaceans at both lagoons

| Summary Table. | September 2023 | December 2023 |
|-----------------------|----------------|---------------|
| Natives | | |
| Western carp gudgeon | Y | Y |
| Murray rainbowfish | Y | N |
| Golden perch | Y | Y |
| Silver Perch | Y | Y |
| Paratya shrimp | Y | Y |
| Macrobrachium shrimp | Y | Y |
| Western Yabby | Y | Y |
| Exotics | | |
| European carp | Y | Y |
| Goldfish | Y | Y |
| Oriental Weatherloach | Y | N |

* Note. Small-bodied fish were not the target species for electrofishing so may have been present, but not recorded

Table 2. Water quality (WQ) parameters at each wetland. All WQ recorded at 200mm depth and approx. 1200 at both sites on 01/09/2023, and 20/12/2023.

| Parameters | Midday | | | | |
|----------------|--------|-----|------|-----|-----|
| | Temp | pH | DO | EC | NTU |
| September 2023 | 14.2 | 7.8 | 8.3 | 360 | 400 |
| December 2023 | 23.2 | 7.4 | 5.10 | 200 | 196 |

Electrofishing

Fish Survey Summary - A total of 5kms of creek was electrofished over two days in September (6th and 7th) and one day in December (20th).

September 2023

Three large-bodied native fish species (golden perch, Murray cod and silver perch), and two exotic species (European carp and goldfish) were recorded. In total 35 Murray cod (range 270 mm – 735 mm, avg 480 mm, approx. 50 kg), 24 golden perch (range 300 mm – 600 mm, avg 440 mm, approx. 40 kg), and one silver perch (275 mm) were recorded, totalling approximately 90 kg of native fish biomass. Two hundred carp (range 260 mm – 685 mm, avg 440 mm, 470 kg total) were collected and four goldfish (range 90 mm – 105 mm, avg 90 mm, 1kg total), totalling an exotic fish biomass of 471 kg. Approximately 235 kg per day.

December 2023

Three large-bodied native fish species (golden perch, Murray cod and silver perch), and two exotic species (European carp and goldfish) were recorded. In total 31 Murray cod (range 240 mm – 800mm, avg 560 mm, approx. 50 kg), 23 golden perch (range 290 mm – 640 mm, avg 410 mm, approx. 45 kg), and one silver perch (300 mm) were recorded, totalling approximately 95 kg of native fish biomass. One hundred and forty-four carp (range 280 mm – 740 mm, avg 510 mm, 266 kg total) were collected and eight goldfish (range 50 mm – 170 mm, avg 120 mm, 1 kg total), totalling an exotic fish biomass of 267 kg.

Note: Small-bodied fish were not the target of this study so may have been present but not captured or recorded.

Overall Initial Observations

Electrofishing

- Electrofishing is an effective method for removing carp, and at gaining an understanding of the number and biomass of the native fish population.

Pest Fish

- Carp were the dominant species caught during electrofishing with the majority of carp caught being mature breeding size adults. These large adults are the most destructive when it comes to water quality (especially clarity) as they actively stir up the sediment and uproot submergent or establishing emergent vegetation.
- Carp made up approximately 75% of abundance and approximately 85% of total fish biomass in September 2023 and 70% of abundance and 70% biomass in December. This is typical of much of the Murray Darling Basin where carp are the dominant fish in both abundance and biomass. These results show that adult carp are a management problem in the Billabong and do present a risk to meeting community aspirations of native fish recovery and aquatic plant restoration.
- Average per day abundance and biomass of carp did not vary significantly between September and December 2023, indicating that localised reduction of carp may be ineffective. However, high flows occurred between September and December allowing carp to recolonise from other areas into the study area. In addition, electrofishing is not 100% effective and repeated effort (especially at the start) may be required to reduce the carp population within the study area.

Native Fish

- Murray Cod were present during electrofishing making up the majority of native fish caught. The majority of cod caught were mature adults, but a good number of size classes were represented. This indicates that Murray Cod are breeding successfully and maintaining a self-sustaining population, so stocking is not warranted. Being an apex predator they in conjunction with golden perch are an important species for predating on juvenile carp.
- Golden perch were present and were primarily large mature adults. Golden perch are regularly caught by recreational anglers in the Billabong Creek. Being a large adult population that most likely does not breed there, aspects such as pest fish control, fish passage and restocking will be important to maintain the population.
- A single mature silver perch was captured during sampling in both trips. This species is known to inhabit the Billabong Creek, but not in high numbers compared to other natives like Murray Cod.
- No eel-tailed catfish were recorded indicating that a recovery program for catfish is warranted and restocking may help to increase abundance in this stretch of the Billabong Creek.

Preliminary Recommendations

- Electrofishing was successful in removing carp present from all size classes from the 5km experimental section and providing information on the native fish to pest non-native fish ratio. Carp are the dominant species present and follow up electrofishing, netting, and community targeted carp events should be conducted to assess if localised reductions of carp and re-establishment of native fish is possible. Due to the uniqueness of the program, this should be conducted in a scientific manner so that learnings from the initiative can be utilised in other areas or showcase areas.
- There is a lack of emergent vegetation in most of the Conargo section of the Billabong creek, and a concerted revegetation program together with targeted carp control could help to improve habitat quality and bank stabilisation. Preliminary pilot plantings (November 2023) of emergent aquatic vegetation indicates that re-establishment is possible, and these types of programs should be prioritised.
- A catfish re-establishment program should be established to encourage an increase in native fish that can compete with carp. Establishing self-sustaining populations of catfish in collaboration with carp reduction programs should be prioritised.
- Golden perch are established in the system but are unlikely to be breeding in the system. A stocking program between Wanganella and Jerilderie should be continued on a yearly basis.
- Silver perch, although present are in very low numbers and could also form part of an important stocking program to increase diversity within the system and increase competition for carp.

Photos of Sampling (September 2023)



Photo 1. Adult golden perch were caught during electrofishing. Adults dominated the catches in electrofishing for golden perch.



Photo 2. Large adult carp made up most of the electrofishing catch. This size class is the major breeding category and most destructive in water quality and vegetation impacts. These large adults are also too big for native fish to predate on.



3a



3b

Photo 3a, b. Typical bank sections on the Billabong Creek at Conargo. Although a healthy overstorey (dominated by red gum and box trees), and understorey (primarily acacias) is present, there is a lack of emergent vegetation along the banks. Cumbungi stands are present but have been killed or suppressed by the recent years of flooding.

Photos of Sampling (December 2023)



4a



4b

Photo 4 a, b. As in September large adult carp dominated both abundance and biomass in the study reach. These large adults are particularly destructive to water quality and aquatic vegetation.



Photo 5. Large bodied native fish were dominated by Murray Cod and golden perch, although a silver perch was caught in both sampling trips indicating suitability for this endangered species.



6a



6b

Photo 6, a, b. A pilot program was established in 2023 to assess the ability to re-establish bank emergent vegetation using different local species. Preliminary results are positive with stands of emergent vegetation establishing in the planting zone.