

## **YACTAC and Refreshing Rivers Program Targeted Carp Management Initiative – Billabong Creek, Conargo, Report 1 (September 2023)**

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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 weighed, and other native species recorded.
2. Before and After surveys conducted using fyke netting to assess fish populations before and after electrofishing and removal of carp.
  - a. Carp are counted and weighed and other native species recorded

### ***Fish Surveys at Billabong creek, Conargo.***

Fish surveys using fyke netting were conducted in a 2km stretch of the Billabong Creek at Conargo (Figure 1) on September 1-2, before electrofishing of the site (Treatment-experiment site). A control site was also established upstream of Conargo close to the Forest Creek inflow regulator (Figure 2). Sixteen fyke nets; 12 small mesh single wing fykes (10 metre wing, 2mm mesh), and 4 large single wing fykes (single 10 metre wing 30mm mesh) (Figure 3) were set at the Conargo site; and 4 small mesh fykes set at the control site. All nets were set for approximately 18-24 hours, set the day before early afternoon, and retrieved at midday the next day. Data was recorded for each fish species, crustaceans and turtles. Sampling duration was recorded so that catch-per-unit-effort (CPUE) could be worked out. Abundance of each species was recorded. Biomass was measured to the nearest gram and then broken down into native biomass and alien biomass (Table 1 – shows presence/absence). Water quality was also taken at the sampling site (Table 2 – 5 parameters were measured).

Boat electrofishing (Figure 4) took place over a 5 km stretch of the Billabong Creek at Conargo (Figure 1) for two days (6-7 Sept). All large bodied fish were collected or if sighted but not collected, an estimation of size was given. All native fish were returned to the water while all carp were kept and not returned to the water.

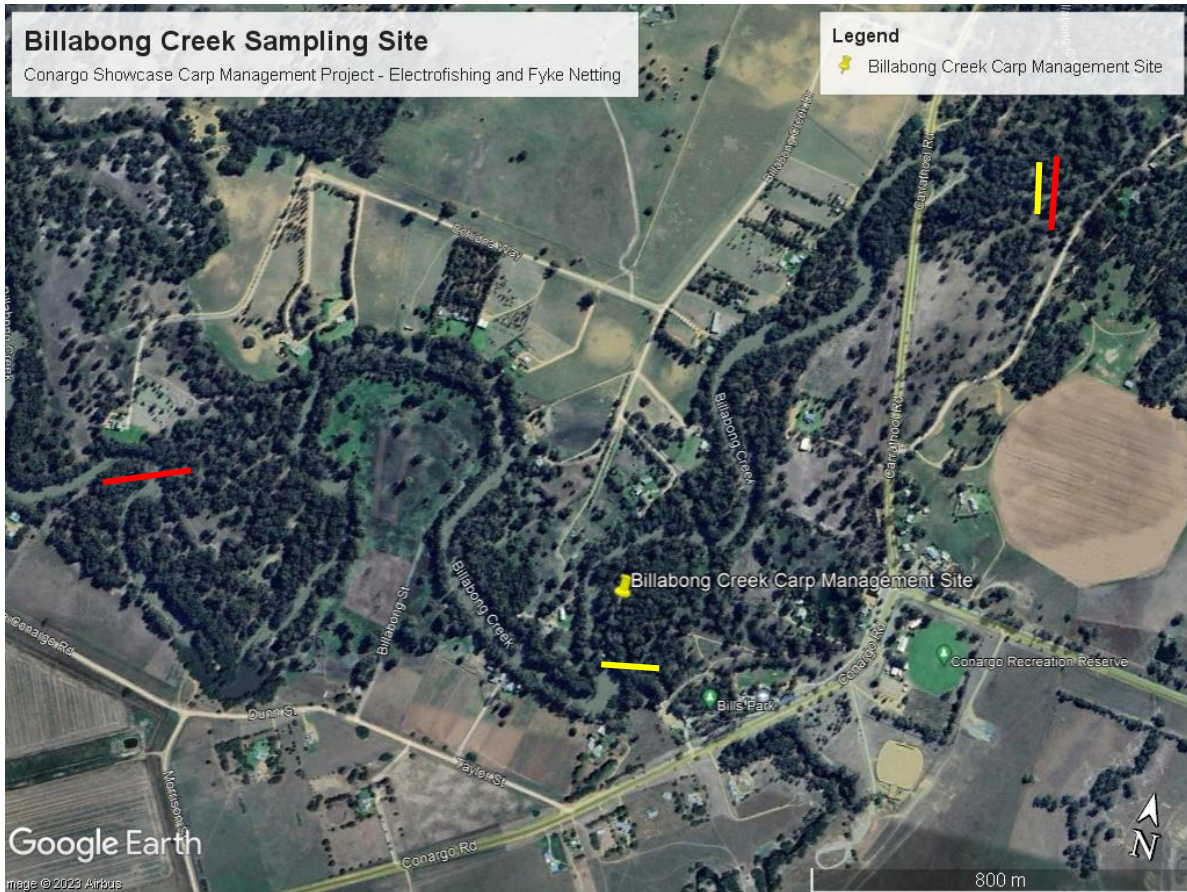


Figure 1. Billabong Creek Carp Management sampling site (Treatment) at Conargo where electrofishing is occurring as well as fyke netting. Red lines mark the 5km creek stretch where electrofishing took place, and the yellow lines the stretch where the fyke netting occurred.



Figure 2. Billabong Creek (Control) site, upstream of the electrofishing-fyke netting sampling-treatment site. Yellow lines mark the stretch where fyke nets were set in the control site.



Figure 3. Single wing small mesh (left) and single wing large mesh (right) were set within the electrofishing site area.



Figure 4. Electrofishing boat on the Billabong creek.

## 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, turtle and crustaceans at both lagoons

Summary Table.	Treatment - Netting	Treatment – Electrofishing*	Control - Netting
Natives			
Western carp gudgeon	Y	N	Y
Unspecked hardyhead	Y	N	N
Murray rainbowfish	N	Y	N
Golden perch	Y	Y	Y
Eel-tailed catfish	N	N	N
Paratya shrimp	Y	Y	Y
Macrobrachium shrimp	Y	Y	Y
Western Yabby	N	N	Y
Exotics			
Gambusia	N	N	N
European carp	Y	Y	Y
Oriental Weatherloach	Y		Y
Turtles			
Long-necked	N	N	N
Short-necked	N	N	N
Broad-shelled	N	N	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.

Parameters	Midday				
	Temp	pH	DO	EC	NTU
Treatment - Netting	14.2	7.8	8.3	360	400
Control - Netting	13.5	8.0	8.1	300	350

### Billabong Creek (Control Site)

Fish Survey Summary – A total of 4 small mesh fykes were set. In general, very few fish were caught. Recorded were two small-bodied native fish species (western-carp gudgeon and Australian smelt), one large-bodied native fish species (golden perch) and two exotics (European carp and oriental weatherloach). Freshwater shrimp (*paratya*), freshwater prawn (*macrobrachium*), and western yabby were recorded. No species of turtles were recorded.

### Billabong Creek (Sampling Treatment Site)

#### **Fyke Netting**

Fish Survey Summary — A total of 4 small mesh fykes were set. In general, very few fish were caught. Recorded were three small-bodied native fish species (western-carp gudgeon, unspecked hardyhead and Australian smelt), one large-bodied native fish species (golden perch) and two exotics (European carp and oriental weatherloach). Freshwater shrimp (*paratya*), freshwater prawn (*macrobrachium*), and western yabby were recorded. No species of turtles were recorded.

## **Electrofishing**

Fish Survey Summary — A total of 5kms of creek was electrofished over 2 days (6-7 September). One small-bodied native fish species was recorded (Murray-Darling Rainbowfish), three large-bodied native fish species (golden perch, Murray cod and silver perch), and two exotic species (European carp and goldfish). In total 35 Murray cod (range 270mm – 735mm, avg 480mm, 50kgs total), 23 golden perch (range 290mm – 640mm, avg 440mm, 38kgs), and 1 silver perch (275mm) were recorded, totalling approximately 90 kgs of native biomass. Over 200 carp (range 260mm – 685mm, avg 440mm, 470kgs total) were collected and 4 goldfish (range 90mm – 105mm, avg 90mm, 1kg total), totalling an exotic biomass of 471kgs. Note: Small-bodied fish were not the target of this study so may have been present but not captured or recorded.

## **Overall Initial Observations**

### Netting and Electrofishing

- Fyke netting is an effective method for recording comparative abundances of fish between different sites and at the same site over different time periods. However, passive techniques such as netting require fish to be moving and this is impacted by water temperatures. The reason why so few fish (of any species) were caught during the netting is most likely due to water temperature (approx. 14°C), which is low for fish to be active. Electrofishing indicated the 'real' numbers of fish present as it is not impacted by water temperature. Netting would be more successful later in the spring and early to late summer as water temperatures rise and fish become more active.

### 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 also in relation to submergent or establishing emergent vegetation as they actively uproot vegetation.

### 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 in both netting and electrofishing, and were primarily large mature adults. Golden perch are regularly caught by recreational anglers in the Billabong. 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. This species is known to inhabit the Billabong, but not in high numbers compared to other natives like Murray Cod.
- No eel-tailed catfish were recorded in netting or electrofishing 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 almost half a tonne of carp from the 5km experimental section and providing information on the native fish to pest non-native fish ratio. Carp are the most dominant species present and follow up electrofishing and netting should be conducted to assess. 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 complete lack of emergent vegetation in the majority 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.

## Photos of Sampling



Photo 1a,b. One juvenile and adult golden perch were caught during fyke netting. Adults dominated the catches in electrofishing.



Photo 2a,b. Macrobrachium shrimp dominated the catch in nets, an important food source for native fish.





Figure 3. Oriental weatherloach were present in small numbers during netting.



Figure 5. 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.



a



b

Photo 6a,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.