

**Carp Captures at a Glance**

**Lake Sorell**

January – March 2014 (Total)	Adult/Juvenile	Total 1995 to present
<b>1761</b>	<b>0 -1761</b>	<b>39,303</b>

**Lake Crescent**

January – March 2014 (Total)	Adult/Juvenile	Total 1995 to present
<b>0</b>	<b>0 - 0</b>	<b>7797</b>

**Overview**

**Lake Sorell**

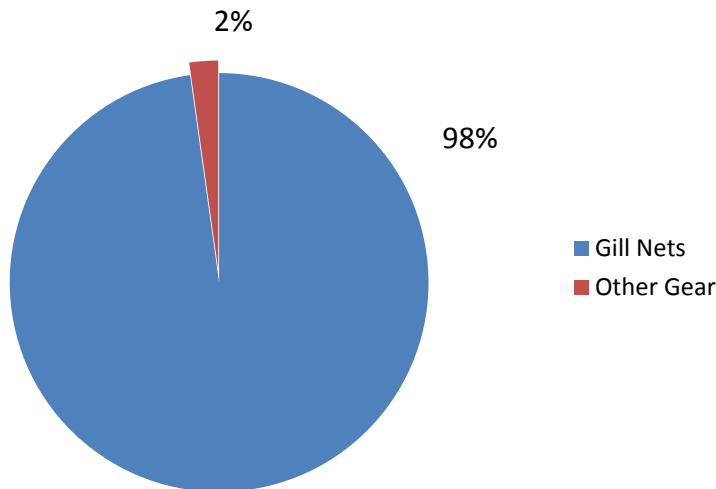
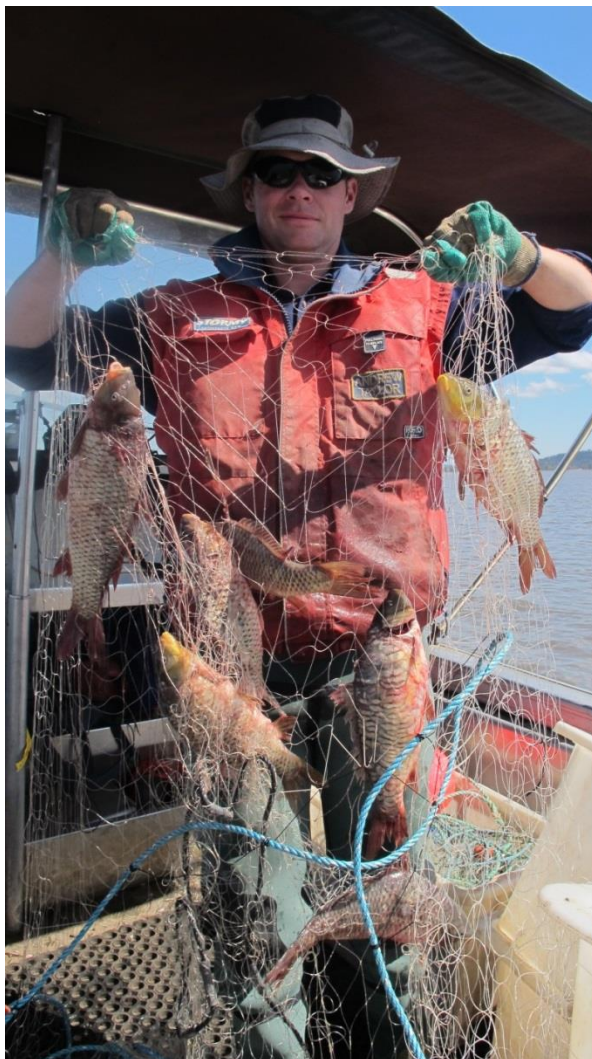


Figure 1. Proportion of carp captures during the January to March 2014 period per method



The IFS carp management team have focused efforts on setting gill nets to catch carp through summer. This has been the most effective method of capturing carp all season. Unsettled weather early in the season and the fact that most fish have not yet matured has made finding aggregations of carp and targeting carp difficult all season. The catches for the period from January to March have been dominated by sub adult male and female fish unlike the catches through spring which were dominated by maturing male fish. This shows the influence of the carp growth and maturation on the susceptibility of carp to capture. The slow growth and maturation of these carp reduces the risk of spawning but has also contributed to the difficulty in capturing large numbers of carp this season.



*Figure 2. A haul of carp captured from deep set gill nets*



The carp from the 2009 cohort are in their “teenage years”, and are no longer exhibiting behaviour associated with juvenile fish. Conversely, they are also not mature enough to exhibit spawning behaviour, thus predicting the behaviour of these fish has been difficult. However, carp are still being caught given these circumstances. Fishing techniques and strategies have been adapted to more effectively target fish across a range of habitats, given that fish are more often dispersed around the lake. Even though large aggregations have not been identified this summer, radio tagged “Judas” fish have helped to identify prime fishing locations which hold carp. Lake margins and bays have produced good fishing through January until the fish moved offshore and fishing effort was focused around deeper reefs and shoals in the lake. Fishing in deeper water has proven more difficult, as carp movements are difficult to predict and identifying the exact location of fish is not easy. As temperatures fall and the days shorten, carp movements have slowed and this has reduced the efficiency of net fishing. There is potential that fish will aggregate over winter where they will take refuge from the coldest temperatures in the deeper sections of the lake. Over the past few years these winter aggregations have proven difficult to target but efforts to catch more carp will not stop over the coming winter.

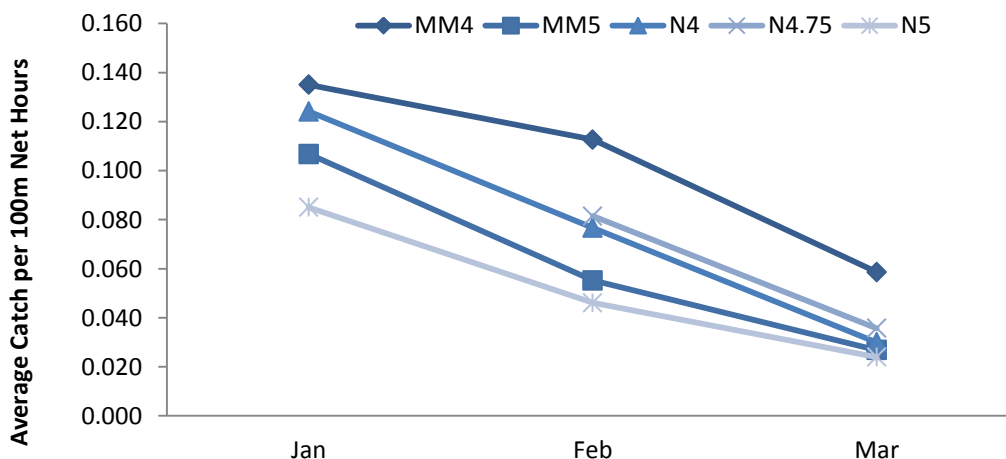


Figure 3. Catch per unit effort for each of the net types from January to March. MM= Multi Monofilament, N= Monofilament, 4= 102mm, 4.75= 121mm, 5= 127mm.



## Juvenile Carp Surveys- Lake Crescent and Sorell

### Lake Crescent

The Lake Crescent juvenile carp survey was conducted from Tuesday the 11<sup>th</sup> to Friday the 14<sup>th</sup> of March. The aim of this survey was to confirm that carp had not re-established back into Lake Crescent, and to look for any signs of new recruitment if spawning had occurred during the past few months. This survey has been undertaken annually since the last known carp was captured from Lake Crescent in 2007. A total of 48 fyke nets were deployed around the periphery of the lake, with emphasis placed on areas with likely juvenile habitat, i.e. strap weed and reeds. In conjunction with these nets, 16 areas around the lake were also surveyed using backpack electro-shockers, with each area being shocked for a minimum 15 minutes. The effort put in between the fyke nets and electrofishing resulted in a total effort of 3407 hours, with brown trout, rainbow trout, and short-fin eels caught. There appeared to be no sign of any carp of any age class present in Lake Crescent.



*Figure 4. Checking fyke nets for any sign of juvenile carp*



## Lake Sorell

The Lake Sorell juvenile carp survey was conducted from Monday the 17<sup>th</sup> to Friday the 21<sup>st</sup> of March. The aim of this survey was to determine if spawning had occurred during the past few months by looking for any signs of new carp recruitment in potential spawning habitat. One of the key objectives of the Carp Management Program is to prevent carp from spawning. This is partially achieved by over 14 kilometres of barrier net, which has been deployed across the front of all the major marshlands around Lake Sorell along with techniques to trap maturing fish.



*Figure 5. Electrofishing amongst the structure looking for juvenile carp*



A total of 63 fyke nets were deployed around the periphery of the lake, with emphasis placed on areas with likely juvenile habitat. In conjunction with these nets, 20 areas around the lake were also surveyed using electro-backpack shockers, with each area being shocked for approximately 10 to 35 minutes. The total hours for the fyke netting and electro fishing came to 5881 hours, with numerous brown trout and eels caught, as well as one carp from the 2009 cohort. Thus with no indication of any new recruitment in Lake Sorell, this suggests that the barrier/gill net/trap combinations currently in place have been effective in preventing carp from spawning.



*Figure 6. A brown trout caught by electrofishing while surveying the back marshes*



### The Clyde River Survey

In conjunction with the Sorell & Crescent juvenile carp surveys, a carp downstream survey of the Clyde River using back pack electro-fishing equipment was also undertaken. The survey examines selected sites that possess ideal carp habitat from immediately downstream of Lake Crescent to Hamilton. The survey has been undertaken annually since carp were first found in lakes Crescent and Sorell.



*Figure 7. Electrofishing shallow water in the Clyde River in search of any signs of carp*



In addition to small numbers of redfin perch and tench, the sampling revealed a healthy population of brown trout with a 100 metre stretch near Bothwell yielding 31 trout up to 400 grams in weight. Larger trout were also sighted in the deep pools, however with the strong water flow at this depth it was difficult to sample these areas. It is likely that recent wet winters, combined with the improved flows delivered by the Clyde River Water Management Plan, have supported trout recruitment and river health. Most importantly no carp were found, which is consistent with previous years and indicates that the containment strategy employed since 1995 continues to be successful.



*Figure 8. A small tench electro-fished in the Clyde River*





### Longline trials for European carp in Lake Sorell.

Longline fishing for carp began in Lake Sorell as part of an Honours project through the Australian Maritime College. Sixty hooks were attached to the longline, 30 baited with sweet corn kernels and 30 with boilies (artificial bait used widely for carp fishing that is made from rice flour, corn meal and egg, and whey proteins). The hooks were attached to a lead core line by a 60cm long snood and spaced 10 m apart. A total of 16 x 8-hour sets were completed in a variety of conditions and locations with each unit of effort comprising of 512 hook-hours. No carp catches were recorded and there was a bycatch of 6 brown trout over the 16 sets. The lack of any carp being caught after a total of 8192 hook/hours fished led to the longlining initiative being wound up in February 2014.



Figure 9. The purpose built rack used to store the snoods for the long line



Further research is being carried out to investigate some of the possible reasons for this lack of carp catches. The investigations will analyse the gear and bait used, and whether the Lake Sorell carp were unable to acclimatise to the baits given their natural diet and the time exposed to the baits.

Research Objectives for the project will be:

1. To identify the bait (corn or boilies) that has the highest success rate for catching carp
2. To find the combination of hook size (small or large) and type (Circle or J) that is most effective for catching carp
3. To determine the acclimatisation period required for carp from Lake Sorell to start consuming corn and boilie baits

Two experiments will be carried out in the coming months. Hook and line fishing targeting carp in Victoria will be carried out with a view to quantifying the odds ratio of success between different baits and hook designs. Data collected will add to previous research carried out in 2013. Secondly adult carp will be placed in tanks and fed a diet from Lake Sorell. After a period of adjustment to living in the tank, carp will be fed corn and boilie baits. The acclimatisation period, defined as time taken to eat one of the baits, will be recorded. Vital information regarding carps feeding behaviour will be observed during these experiments since the ability to do so in Lake Sorell is impaired by water turbidity.



Figure 10. Deploying the long line into Lake Sorell

## Commercial eel fishing in Lake Sorell and Crescent

### Lake Crescent

Brad Finlayson fished Lake Crescent with 76 fykes until January 22. He caught 4400 kg of eels and 297 trout up to 8kg in size. There were 36 fyke nets set in the Interlaken wetland and 40 in Andrews Bay, Big Bay and Clyde Marsh. No carp were detected.

### Lake Sorell

Shaun Finlayson fished 97 Fykes in Lake Sorell from December 16<sup>th</sup> to February 9<sup>th</sup>. The nets were set around the main marsh areas (Kermodes, Duck Bay, Kemps Bay, Grassy Point, Silver



Plains and Robertsons Bay) both inside and outside the barrier nets. He caught 8 carp including 1 current tracker fish and 6800 kg of eels from January 1<sup>st</sup> till he pulled out. All carp caught were located outside the barrier net in the main body of the lake.



*Figure 11. A fyke net filled up with short-fin eels*

### **Chemical and Surgical Sterilisation of Carp (FRDC TRF 2012/039)**

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As previously reported the sterilisation project (FRDC TRF 2012/039) is progressing well. Summarised below are the activities and achievements for the period January to March 2014.

### **Monitoring of sterile Judas carp in Lake Sorell**

The sterile Judas carp (deployed in October 2013) are being monitored on a regular basis. Presented below are Kernel density distribution maps of the sterile (surgical and chemical) and



control Judas fish (October 2013 to February 2014). As is evident from the map the three groups had similar and often overlapping distribution patterns. The patterns are also similar to the known (Taylor et al 2012: MFR, 63:587-597) carp distribution patterns over spring-summer in the lake. Within the generic distribution pattern there were some that were unique to each of the treatment groups that can be attributed to home-range/territorial behavior of individual fish.

As and when the Judas fish were re-captured they were also assessed for their ability to express milt. So far none of the recaptured sterile Judas fish have expressed milt confirming that they have remained sterile. Significantly the fish have continued to assist in the capture of feral carp.

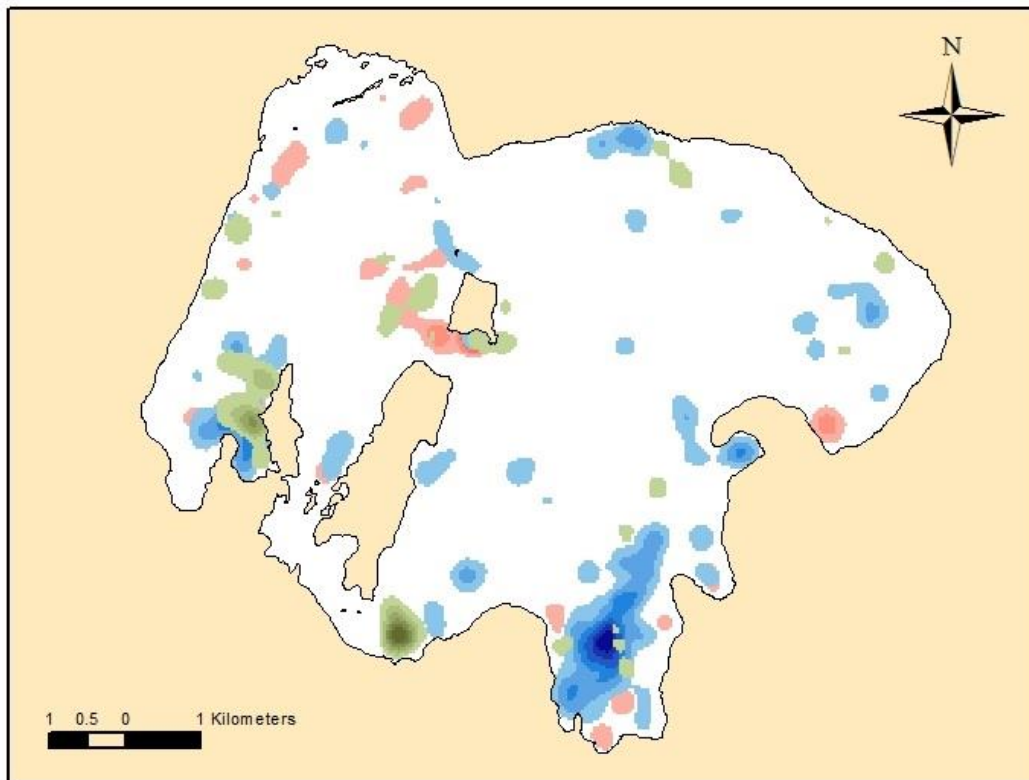


Figure 12. Kernel density map showing distribution of control (green), chemically sterilised (red) and surgically sterilised (blue) males in Lake Sorell (Oct 2013-Feb 2014). Efficiency rating (the average



proportion of tagged fish identified on a given day) for each group was 74, 86 and 72 % respectively. Please note some of the overlapping patterns are obscured.

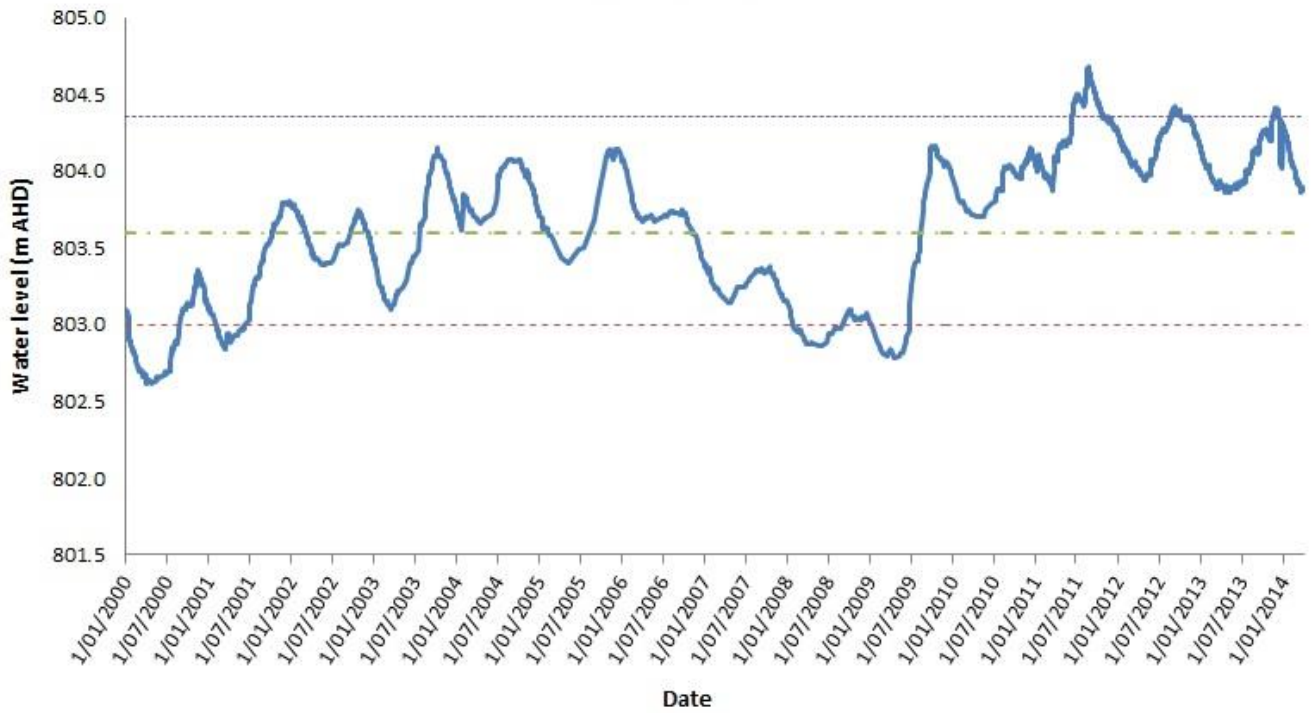
## Water Management

Table 1. Water Release data (January – March 2014)

Month	Lake Sorell release (ML)	Lake Crescent release (ML)
January	350	1189
February	300	1152
March	450	1086
<b>TOTAL</b>	<b>1100</b>	<b>3427</b>

\* Note: There is no continuous flow monitoring on the Lake Sorell release. Only spot checks are done.

### Lake Sorell



### Lake Crescent

