

# Inland Fisheries Service *Carp Management Program*



**July to December 2019**

# Inland Fisheries Service

## *Carp Management Program*

© Inland Fisheries Service, February 2020, **ISSN 1832-9586**

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**This quarterly report details the Carp Management Program activities from July to December 2019.**

The objective of the program is: *To eradicate carp from Tasmanian waters and, in the meantime, to minimise the impact of carp on Tasmania from economic, recreational and ecological points of view.*

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### Carp captures at a glance

#### *Lake Sorell*

July – December 2019 (Total)	Adult/Juvenile	Total 1995 to present
3	3 / 0	41,494

#### *Lake Crescent*

July – December 2019 (Total)	Adult/Juvenile	Total 1995 to present
0	0 / 0	7797

## Overview

#### *Lake Sorell*

Fishing effort from July to December resulted in the removal of 3 carp from Lake Sorell. This is in comparison to 33 carp removed for the same period in 2018. Of the three carp caught, one was caught using the electro-boat, and the other two were caught in non-targeted gill nets. Gill nets were set over a wide area of the lake, with structure and habitat continuing to be a priority. Most nets were set around the shallow regions of the lake in response to potential rising water temperatures and lake levels in spring and early summer. Nets were set at right angles to the shoreline to target fish moving around the edges of the lake. Some nets were also set in deeper water over the rocky reefs where carp have historically been known to favor. In addition to gillnets, other fishing methods were used over the last three months (Table I, Figure I). These included big fyke nets stitched into barrier nets, the boat electro-fisher and backpack electro-fishers. All these methods select for adult and any potential juvenile carp (which are not susceptible to gillnet capture).

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In late September, 3.8km of gill nets were set behind the barrier nets to make sure carp could not access spawning habitat. Gillnets were also set across and within key drainage areas in the marshes behind the barrier nets, as additional safety. Trammel gillnets, which are good at capturing carp of varying sizes, were used to block off these areas.

*Table 1. Catch data from all methods used in Lake Sorell for the July-December 2019 period.*

<b>Gear Type</b>	<b>July</b>	<b>August</b>	<b>September</b>	<b>October</b>	<b>November</b>	<b>December</b>	<b>Total</b>
Non-Targeted Gillnets	-	-	-	0	0	2	<b>2</b>
Inshore Set Gillnets*	-	-	-	0	0	0	<b>0</b>
Barrier Fyke Nets	-	-	-	0	0	0	<b>0</b>
Backpack Electro-fisher	-	-	-	0	0	0	<b>0</b>
Boat Electro-fisher	-	-	-	0	1	0	<b>1</b>
Gillnets Behind Barrier Nets	-	-	-	0	0	0	<b>0</b>
<b>Total</b>	-	-	-	-	<b>1</b>	<b>2</b>	<b>3</b>

\*Blocking gillnets which prevent access to particular bays.

Juvenile carp surveys started in December and will continue each month through until March. These monthly surveys are to see if there have been any recent spawning events. The juvenile survey done in December was conducted over three days and returned no evidence of spawning. The survey involved intensive backpack-electrofishing effort at twelve selected sites across the lake, which included the main marsh areas; Kermodes, Silver Plains, and Robertsons, as well as a range of other habitats. 30 fyke nets were also set in 15 sites around the lake. Both fine mesh and standard mesh fyke nets were used to target carp in the 30 to 100mm size range. Due to low rainfall over the winter and spring periods, the lake level began falling in early spring, and by December most of the water had drained from the marshes. This resulted in a much smaller amount of available juvenile carp habitat to survey. The potential habitat was concentrated to a few areas, and meant that detection of juvenile carp would be easier. Using the backpack electro-fishers and fine-mesh dip nets, these areas were thoroughly surveyed, and fyke nets were installed behind and in front of barrier nets, where ever the available habitat was present. No juvenile carp were caught, however a healthy population of golden galaxias, shortfin eels, tadpoles, and aquatic invertebrates were found.

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Over the 2019 July to December period, one carp (33%) was caught using the electro boat, while two (67%) were caught in non-targeted gill nets set close to the edges of the lake (Table I, Figure I). Conversely, no carp were caught using the electro boat last year during the same period, with the majority caught using non-targeted gill nets (76%), and small numbers also caught from inshore set gill nets, barrier fyke nets, and gillnets set behind barrier nets (Figure I). The small number of carp caught this year (three fish) should be taken into account with these comparisons.

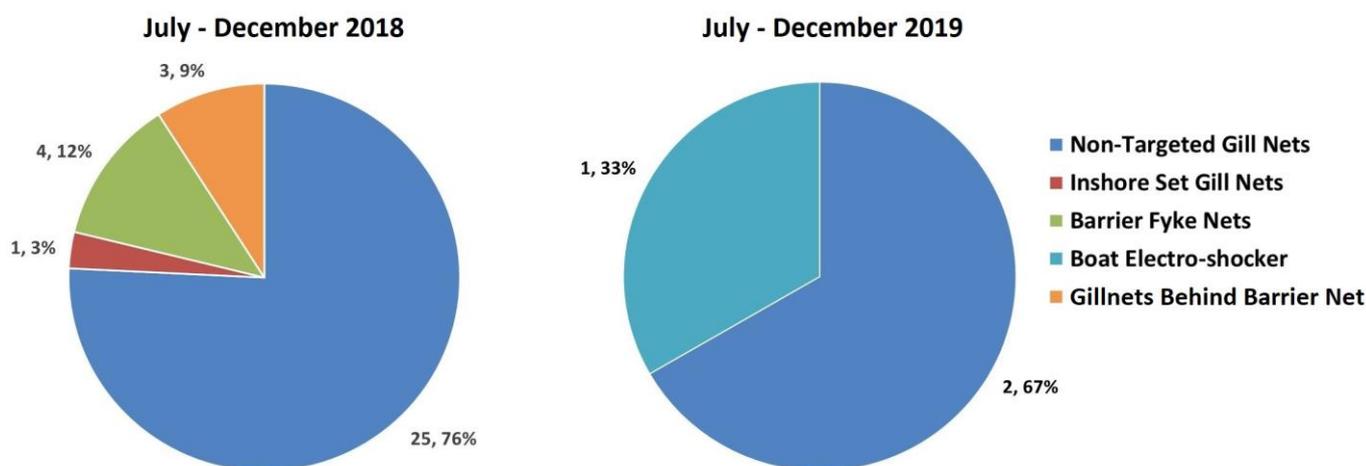


Figure 1. Actual numbers and percentages of total carp captures from all gear types used in Lake Sorell during the July-December period in both 2018 and 2019.

Inshore set gill nets, barrier fyke nets, backpack electrofishers, and gill nets set behind barrier nets did not account for any carp over the 2019 July to December period (Table I, Figure I). Trammel gillnets continued to be the main type of gill net used for non-targeted effort due to their high catch efficiency. Although intensive gill netting began in October, a carp was not caught in the nets till late December (Table I and 2). The low numbers of carp caught during this period are likely to be due to a number of reasons. The most likely factor is the critically low numbers of carp remaining in the lake, with the estimate being less than 20 fish.

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*Picture 1. Jonah Yick and Rob Cordwell celebrate after catching the first carp for the 2019/20 season using the electro boat.*

Secondly, from October through till early December, there were long stretches of cold, windy weather with very little rainfall. These environmental factors resulted in a low average water temperature and a falling lake level which were not favorable for stimulating carp to move around the lake. As a result, during these unfavorable weather conditions, the netting effort was reduced. However when the small periods of warm settled weather did present themselves, the netting effort was increased. The lower netting effort (100m net hours) in October and November 2019 compared to the same months in 2018, reflects the reduced net effort during the frequent cold and windy weather periods (Table 2). By mid-December the weather began to stabilize and temperatures began to increase, which resulted in a big increase in netting effort. Although the netting effort in December 2019 was similar to that in December 2018, the catch per unit effort was significantly less (Table 2, Figure 2), with only two carp caught in December 2019, compared to 17 carp caught in December 2018 (Table 2). Of the three carp which were caught from July to December, all were female and ranged in size from 873gm to 1637gm. There has been a strong female bias in the final stages of the Lake Sorell eradication.

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Table 2. Non-targeted carp captures, gillnet fishing effort, and catch per unit effort (carp per 100m net hour) in Lake Sorell from July-December for 2018 and 2019.

Month	Non-Targeted Carp Captures*		100m Net Hours		Catch Per Unit Effort	
	2018	2019	2018	2019	2018	2019
July	-	-	-	-	-	-
August	-	-	-	-	-	-
September	-	-	-	-	-	-
October	2	0	31403	17987	0.0000637	0
November	6	0	41186	34383	0.0001457	0
December	17	2	52509	50285	0.0003238	0.0000398
<b>Total</b>	<b>25</b>	<b>2</b>	<b>125 098</b>	<b>102 655</b>	<b>0.0005331</b>	<b>0.0000398</b>

\*Note: Non-targeted carp captures refers to carp caught in fishing gill nets without the aid of transmitter fish, and not part of aggregations.

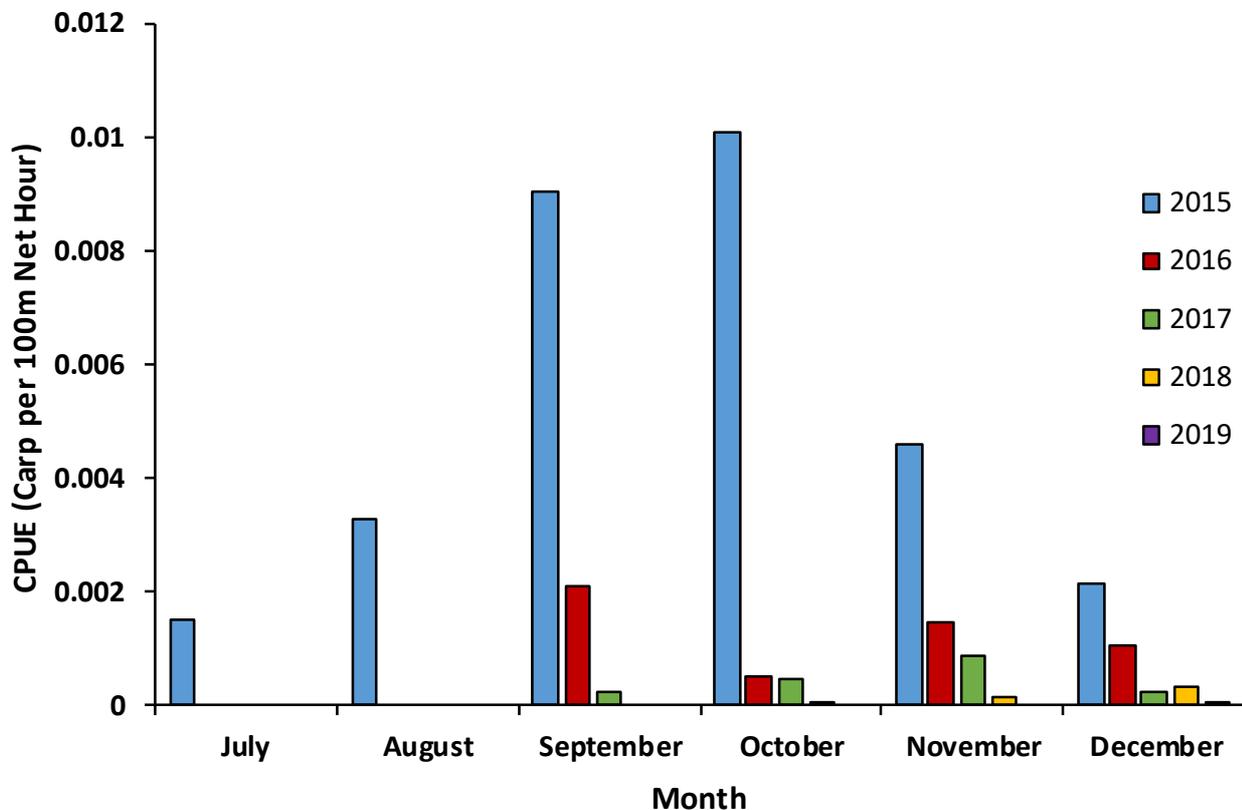


Figure 2. Catch per unit effort of non-targeted gillnet sets in Lake Sorell from July-December in 2015, 2016, 2017, 2018, and 2019.

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In summary, the past six months have indicated that carp are now close to being eradicated from Lake Sorell. When you take into account 50% of the remaining males are affected by the JGC, the small average size of both sexes, and the fact that our data now shows that there is likely to be less male carp in the lake than females, it is clear that the Lake Sorell carp population is struggling. As expected, the catch per unit effort (carp per 100m net hour) was critically low this year, despite maintaining high netting effort during the peak weather conditions. The big drop in carp caught so far this season continues the trend of declining catch rates as the 2009 cohort is fished out. As of the end of December, the spawning risk has dramatically decreased due to the loss of spawning habitat (dewatering of marshes) and falling lake levels. In January, it is expected that the small number of carp will begin to push back out into deep water, making them much more difficult to catch. Preparations are now in place to open Lake Sorell to the public in early February, after the initial closure and discovery of carp in 1995.



*Picture 2. Brock Cuthbertson with the first carp caught in a trammel gill net for the 2019/20 season, in late-December.*

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## *Lake Crescent*

Since the extremely low water levels in 2008, the average total turbidity of Lake Crescent has decreased considerably (Figure 4). This is the direct result of high water levels flushing the lake after large rainfall events. The capture of a lone female carp in an aggregation with transmitter fish in December 2007 proved to be very important, with no other carp caught since this event. Despite annual surveys and monitoring over the past thirteen years there has been no evidence of recruitment or the presence of any carp. Golden galaxias populations have increased due to a high recruitment event in 2018, and as a result big numbers of juvenile galaxias were caught during the surveys.



*Picture 3. The last carp caught from Lake Crescent in 2007. Hopefully a photo like this won't be too far away for Lake Sorell!*

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### Work experience

Brad Bisaro is a current student at the Australian Maritime College (AMC) undertaking a Bachelor of applied science for Fisheries Management. He is now in his 3<sup>rd</sup> year of study, after moving to Tasmania from central Queensland. Brad is a keen salt and freshwater recreational fisher, and wanted to pursue a career involving fish or fishing. During his time at the AMC, he was informed of the Carp Management Program (CMP) by fellow student/CMP casual field assistant Jake Brumley and decided to undertake some work experience in the field at Lake Sorell. During his volunteer shift, he was involved in setting and retrieving gill nets as well as undertaking general boat operations. Due to Brad's great work ethic and initiative, he was offered casual employment in November and December.



*Picture 4. Brad Bisaro with a carp caught out of a trammel gill net in December.*

During his casual employment he was also involved in two juvenile carp surveys on Lake Sorell, which gave him some insight into the range of monitoring the CMP undertakes in order to work towards a complete eradication. This included the setting and checking of fyke nets, fine mesh dip netting, and backpack electrofishing around the margins of the lake. Jake was also lucky enough to be involved in

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two carp captures this season, an experience which is significant given there are so few carp remaining in Lake Sorell now. He was also involved in the processing, dissection, and gonad staging of caught carp. Jake found the work interesting, and learnt a lot about CPUE of fisheries during his studies, therefore he found it useful to be able to see the practical side of sampling a fish population where the CPUE was consistently diminishing. He enjoyed getting involved in the practical side of fisheries management, where he was able to be involved in the different aspects of the CMP, as well as developing important skills in relation to boat operation and aquatic field work. Brad will continue working as a casual CMP field assistant while he completes his bachelor's degree, and hopes to find full time work with a fisheries department in Tasmania after he graduates.



*Picture 5. New Norfolk High School students discuss career opportunities with CMP staff*

Jonah Yick from the CMP also attended the New Norfolk High School Careers Day to assist grade 9 and 10 students with planning their career and job prospects. There were many students interested in the work Jonah undertakes while working at the IFS, as well as the educational pathways required to access this field. Hopefully the information gained from this day will inspire the students to follow their dreams, and work in a field which they enjoy.

### Employment and funding

Five casual staff were employed to assist with carp management activities.

**Table 3. Work experience (July – December 2019)**

<b>Name</b>	<b>Background</b>	<b>Timeline</b>
Jed Sutherland	Australian Maritime College	6 <sup>th</sup> – 7 <sup>th</sup> September
Brad Bissaro	Australian Maritime College	5 <sup>th</sup> – 6 <sup>th</sup> October
India Stuerzl	Australian Maritime College	24 <sup>th</sup> – 25 <sup>th</sup> October
Mark Rockcliff	Devonport Anglers Club	23 <sup>rd</sup> – 24 <sup>th</sup> November

**Table 4. Casual positions (July – December 2019)**

<b>Name</b>	<b>Background</b>	<b>Timeline</b>
Jake Brumley	Australian Maritime College	14 <sup>th</sup> October – 29 <sup>th</sup> December
Brad Bisaro	Australian Maritime College	1 <sup>st</sup> November – 24 <sup>th</sup> December
Kim Clark	Interlaken Shack Owner	8 <sup>th</sup> November – 1 <sup>st</sup> December
Florian Devloo-Delva	CSIRO Phd Student	15 <sup>th</sup> November – 6 <sup>th</sup> December
Raihan Mahmud	University of Tasmania Phd Student	26 <sup>th</sup> – 27 <sup>th</sup> December

## Water Management

**Table 5. Water Release data (July – December 2019)**

<b>Month</b>	<b>Lake Sorell release (ML)*</b>	<b>Lake Crescent release (ML)</b>
<b>July</b>	-	12.95
<b>August</b>	-	954.94
<b>September</b>	-	61.29
<b>October</b>	-	440.67
<b>November</b>	-	910.97
<b>December</b>	-	1589.15
<b>TOTAL</b>	-	<b>3969.97</b>

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

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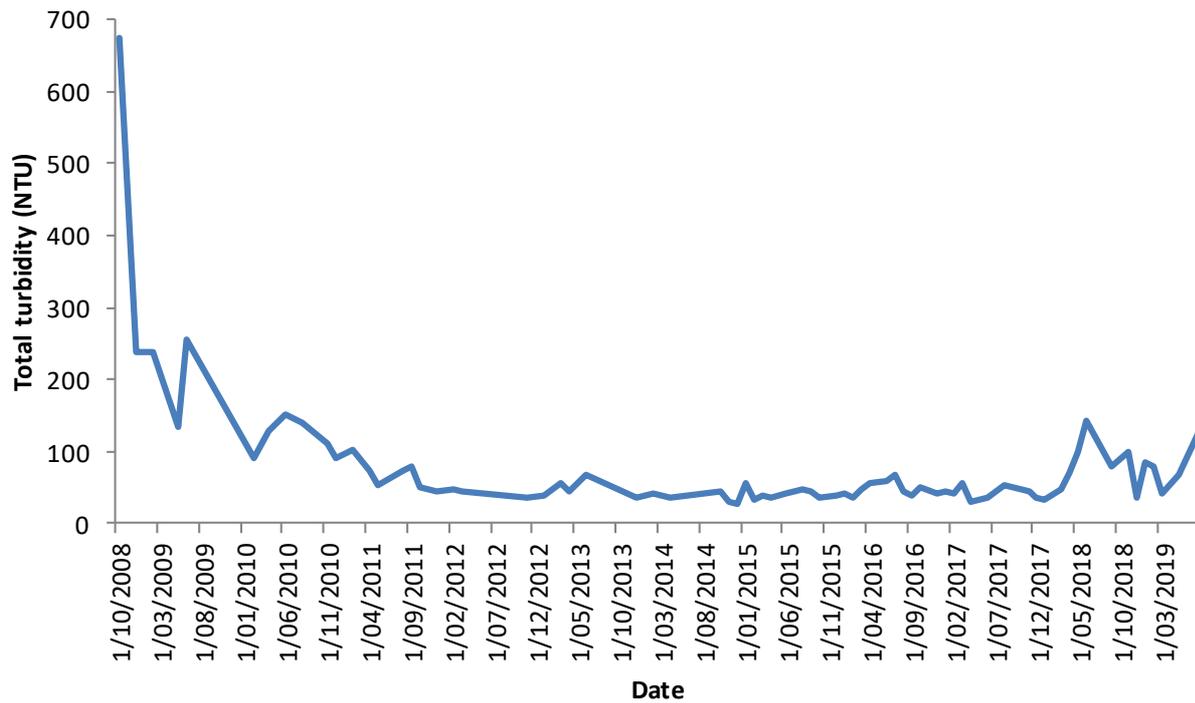


Figure 4. Turbidity levels in Lake Crescent from October 2008 to December 2019.

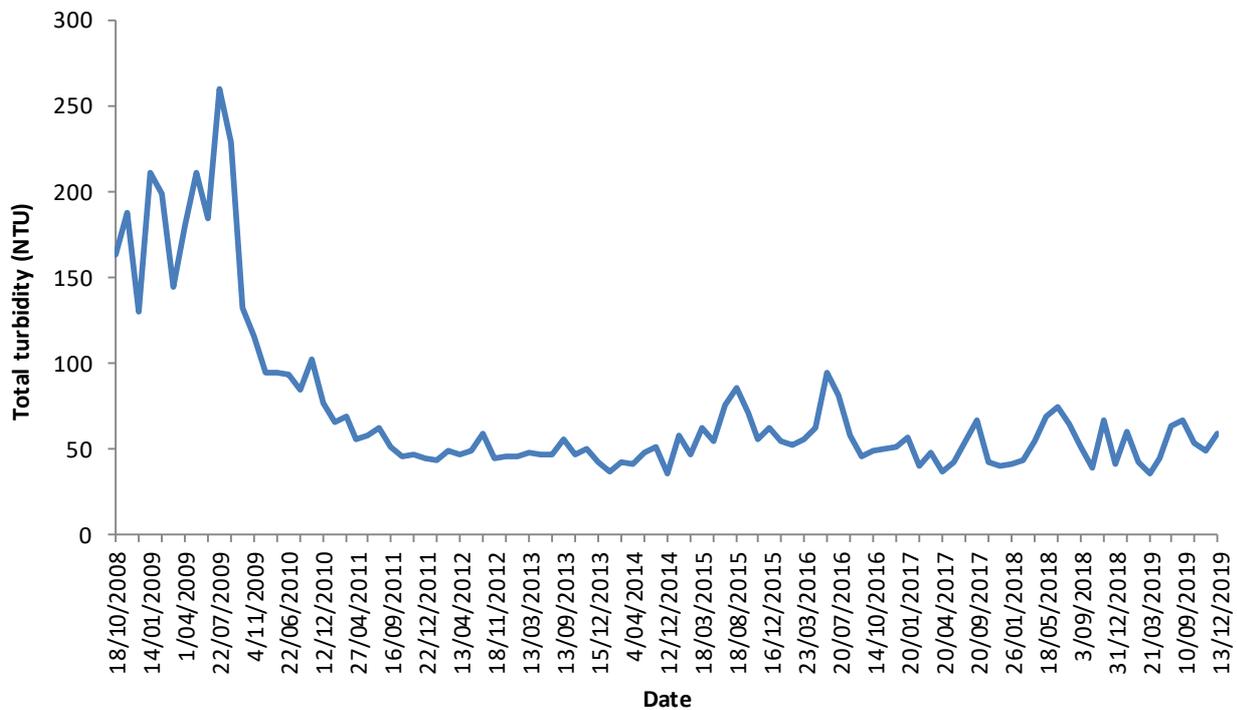
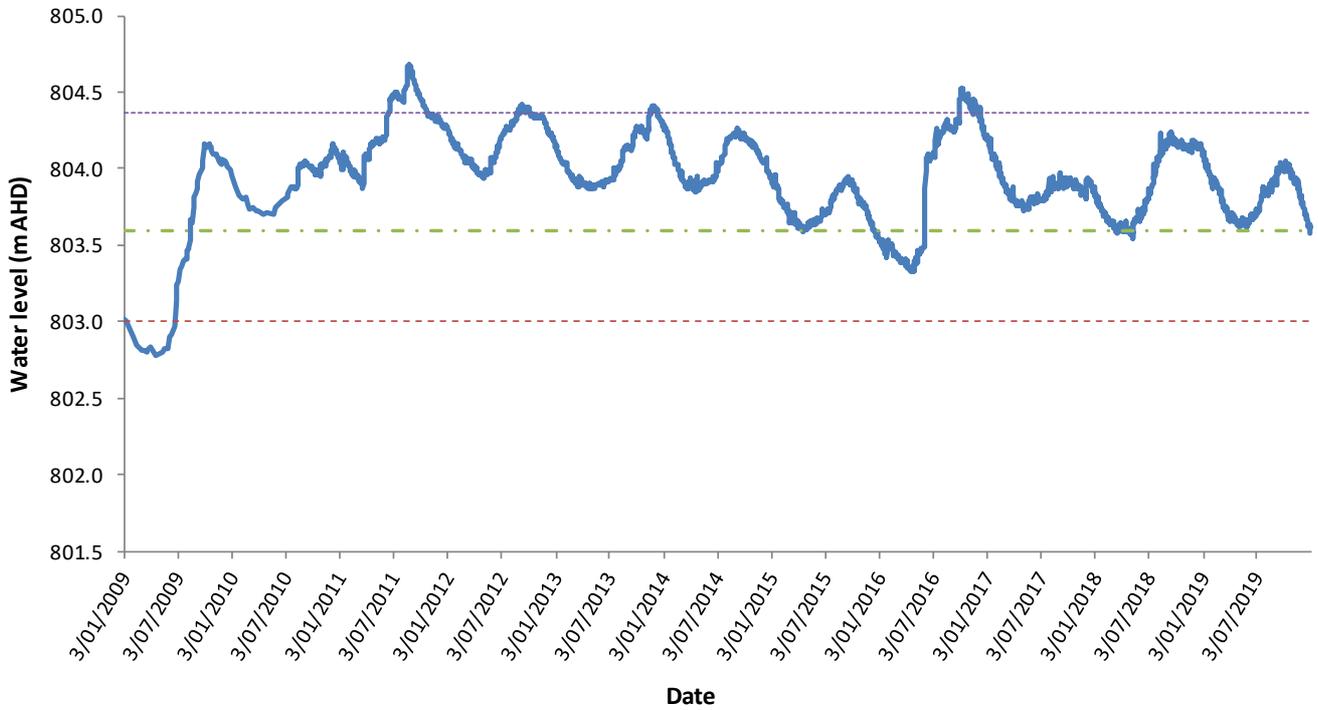


Figure 5. Turbidity levels in Lake Sorell from October 2008 to December 2019.

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## Lake Sorell



## Lake Crescent

