Carp Management Program
Annual Report
2019-20

Inland Fisheries Service

Tasmanian Government

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This annual report details the Carp Management Program activities for the financial year 2019 – 20.

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.

Design and layout: Land Tasmania Design Unit, DPIPWE.
Photography: Courtesy of Inland Fisheries Service staff and Margot Kelly from ABC Landline.

Minister's Message

Welcome to the 2019/20 Annual Report for the Carp Management Program.

Thanks to the dedicated work of Tasmania's Inland Fisheries Service (IFS) spanning over 25 years, with the support of both State and Federal Governments, carp have been all but eradicated from Tasmania. I was delighted to announce the re-opening of Lake Sorell to anglers and the general public in February this year. This is tremendous news and a testament to the skills, knowledge and expertise of the IFS in developing a multi-pronged Program to address carp.

This innovative program has been recognised both nationally and internationally. The lakes impacted by carp are relatively large in size, with Lake Crescent covering an area of 23 square kilometres and Lake Sorell over 53 square kilometres. Lake Crescent was deemed to be eradicated of carp in 2009, with the last carp removed in 2007. With all efforts now focussed on Lake Sorell, some 41,496 carp have been removed from the lake since work began. With a population now estimated at less than five fish, it is increasingly likely that carp will be eradicated from the Lake. If successful, the ability to eradicate carp from lakes of this size, while also protecting both environmental and recreational values will be a world-first. Both lakes were popular recreational locations prior to their closure, and it is wonderful to again see Tasmanians enjoying both of these beautiful lakes.

I look forward to the complete eradication of carp from Tasmania in the near future.

The Hon Guy Barnett MP
Minister for Primary Industries and Water

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Executive Summary

After 25 years, Tasmania is finally on the cusp of being carp free.

Intensive fishing effort over the 2019/20 spring and summer period only resulted in five carp caught from Lake Sorell. Of the five carp removed, four were female and one was male. This lone male carp was infected with the jelly gonad condition (JGC), a naturally occurring disease which has become more prevalent in recent years, and is now present in 50% of the males in the Lake Sorell population. In the advanced stages of the condition, the JGC has been found to cause sterility, and significantly reduce the reproductive capability of the infected males. In addition to this, our fishing effort has shown a strong bias towards female carp captures in recent years, meaning there are very few males left in the lake, if any.

Juveniles carp surveys during, and after the spawning season did not find any signs of recruitment, despite extensive electrofishing and fyke net effort. All water released from Lake Sorell is still being screened as a precautionary measure, however in February this year, the lake was reopened to the public as the risk of carp transfer is now considered to be very low. It is estimated that less than 5 carp remain in Lake Sorell.

The plan for the coming year is to allow Lake Sorell to remain open for public recreational use, although temporary periods of closure will be required during spring and summer to achieve carp eradication. Eradication and monitoring efforts will continue over the next few years.

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1.

Carp Captures and Fish-down Effort

1.1 Carp Captures at a Glance

Table 1. Carp captures from lakes Sorell and Crescent (2019/20).

Lake	Total 2019/20	Adult / Juvenile	Total 1995 to present
Sorell	5	5 / 0	41, 496
Crescent	0	0	7, 797

1.2 Lake Sorell

Overview

In July-September, maintenance was undertaken at Lake Sorell to prepare for the carp spawning season (October to March). This involved inspecting and repairing the 14 kilometres of barrier net blocking the wetlands, as well as all fyke nets. 4.75 kilometres of gill net was also repaired, which was to be positioned behind barrier nets as a secondary measure to prevent carp from accessing the marshes.

In mid-September, the big fyke nets were sewn into the barrier nets. These were placed in strategic locations to catch mature carp pushing into the shallows seeking spawning habitat. These fyke nets are also an indicator of when carp will begin to push inshore, allowing gill nets to be set to target these movements.

As predicted, the total number of carp caught this season was much less than the 2018/19 season (Figure 1 and 4), despite maintaining a high level of fishing effort throughout the peak carp season. Over the 2019/20 season 5 carp were caught and removed from Lake Sorell, compared to 39 carp over the previous season (Figure 1 and 4). Of the five carp removed in 2019/20, one was caught using the electro-boat, while the other four were caught in non-targeted gill nets (Table 2).

Table 2. Total carp captured from all methods used in Lake Sorell (2019/20).

Gear Type	Jul-Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr-Jun	Grand Total
Non- targeted gillnets	0	0	0	2	2	0	0	0	**4**
Inshore set gillnets*	0	0	0	0	0	0	0	0	**0**
Barrier fyke nets	0	0	0	0	0	0	0	0	**0**
Backpack electro-fisher	0	0	0	0	0	0	0	0	**0**
Boat electro-fisher	0	0	1	0	0	0	0	0	**1**
Gillnets behind marsh	0	0	0	0	0	0	0	0	**0**
Grand Total	**0**	**0**	**1**	**2**	**2**	**0**	**0**	**0**	**5**

**Blocking gillnets which prevent access to particular bays.*

Conversely, no carp were caught using the electro boat in 2018/19, with the majority of carp caught using non-targeted gill nets, and small numbers also caught from inshore set gill nets, barrier fyke nets, and gillnets set behind barrier nets (Figure 1). Inshore set gill nets, barrier fyke nets, backpack electro-fisher, and gill nets set behind barrier nets did not account for any carp over the 2019/20 season (Table 2, Figure 1). The small number of carp caught this year (five fish) should be taken into account with these comparisons.

We set 3.8km of gill net strategically behind the barrier nets, as a secondary line of defense to prevent carp from entering spawning habitat. Gill nets were also set across and within key drainage areas in the marshes behind the barrier nets. Trammel gill nets, which are good at capturing carp of varying sizes, were used to block off these areas. No carp were caught behind the barrier nets over the 2019/20 season, which suggests all carp were prevented from accessing the spawning habitat.

Trammel gillnets were the main type of gill net used for non-targeted effort due to their ability to catch carp of a range of sizes effectively. The majority of nets this season were focused around the shallow regions of the lake in response to favourable environmental conditions. Most nets were set at right angles to the shoreline to target fish moving around the margins of the lake. Some nets were also set in deeper water over the rocky reefs where carp have historically been known to favor. Although intensive gill netting began in October, a carp was not caught in the nets till late December (Table 2). The low numbers of carp caught this season 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.

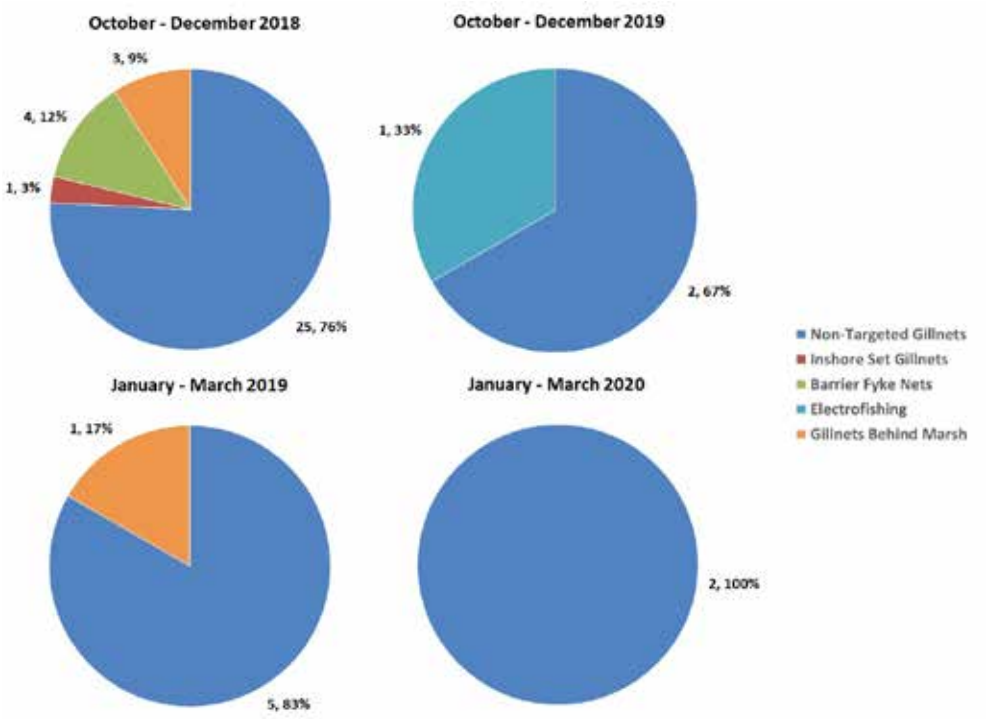

Figure 1. Percentage of total carp captured from each gear type during the carp fishing season (October to March) in Lake Sorell comparing the 2018/19 and 2019/20 seasons.

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 effort during the frequent cold and windy weather periods (Table 3). By mid-December the weather began to stabilise and temperatures began to increase, which resulted in a big increase in netting effort (Table 3). Although the netting effort in December 2019 was similar to that in December 2018, the catch per unit effort was significantly less, with only two carp caught in December 2019, compared to 17 carp caught in December 2018 (Table 3). Due to prolonged warm weather and settled winds, netting effort peaked in January 2020, and exceeded the netting

effort in January 2019 (Table 3). Despite the increased effort, only 2 carp were caught in January 2020, as opposed to 4 in 2019 for the same month (Table 2 & 3). In February the netting effort was significantly reduced as a result of the opening of Lake Sorell to the public, which occurred on the 8th of February 2020. As a result, all fyke nets and fishing gill nets were removed from the lake before the date of the opening.

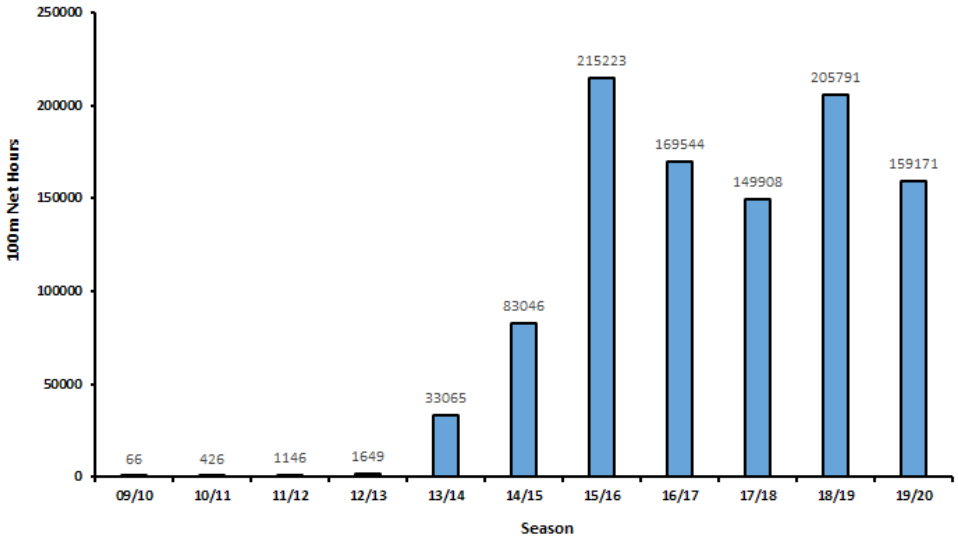

Figure 2. Total non-targeted netting effort in 100m Net Hours used in Lake Sorell (2009-2020).

Overall, the proportion of carp caught by non-targeted gill nets has continued to increase (CMP Annual reports 2016-17, 2017-18, 2018-19), despite the number of carp caught by this method continuing to decrease, while a high level of gill net effort has been maintained over the past five years (Table 3; Figure 2). This is strong evidence which supports that the number of remaining carp is critically low, and maintaining intense netting effort during peak environmental conditions are required to continue to remove them effectively.

Table 3. Non-targeted carp captures and gill net fishing effort in Lake Sorell for the 2017/18, 2018/19, and 2019/20 seasons.

Month	Non-Targeted Carp Captures *			100m Net Hours		
Month	**2017/18**	**2018/19**	**2019/20**	**2017/18**	**2018/19**	**2019/20**
July-Sept	1	0	0	4467	213	0
October	6	2	0	21132	31403	17987
November	26	6	0	30314	41186	34383
December	11	17	2	26450	52509	46207
January	12	4	2	26715	49490	58558
February	13	1	0	30172	30870	2036
March	0	0	0	10130	0	0
Apr-Jun	1	0	0	528	0	0
Grand Total	**70**	**30**	**4**	**149 908**	**205 671**	**159 171**

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

The biggest carp for 2019/20 was caught in November using the electroboat, and highlights the importance of using a range of techniques, despite having very low catch efficiency of all gear types. This individual was a mature female weighing 1637gm, with a gonad weight of 118gm.

The remaining four carp were all under 1300gm in weight. Of the five carp which were caught over the 2019/20 season, four were female and one was a male possessing the jelly gonad condition (JGC). With approximately 50% of male carp now affected by the JGC (Figure 3), and very few males remaining in the population (if any), it is likely that these particular fish will play an important role in the final stages of the eradication, due to their reduced reproductive output.

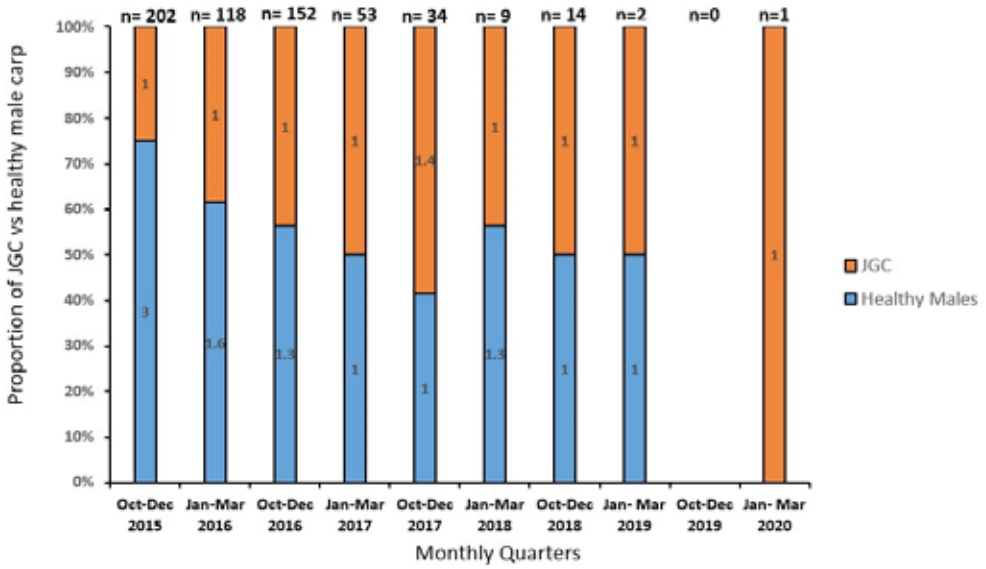

Figure 3. The change in ratio of jelly gonad condition (JGC) males to healthy males from 2015-20, compared by October to December and January to March quarters.

Picture 1. The first carp caught in a trammel gill net for the 2019/20 season.

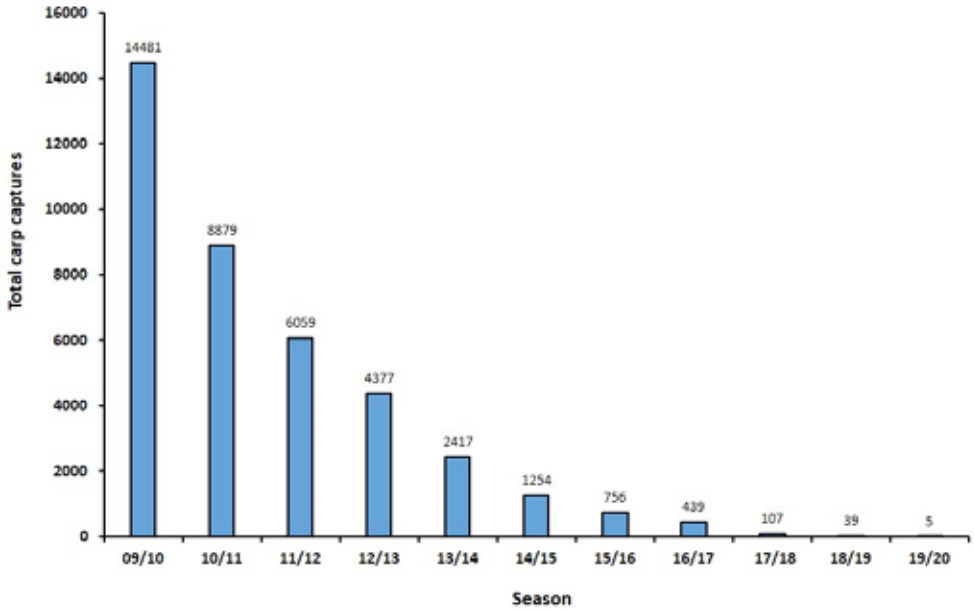

Figure 4. Total carp captures from Lake Sorell (2009-2020).

After 25 years the Tasmanian carp battle is finally drawing close. It is estimated that there are now less than 5 wild fish remaining in Lake Sorell, and when you take into account the stunted average size, poor general condition, and approximately 50 percent of males affected with JGC, their chance of recruitment is now very limited. The remaining population is also female biased, with the majority of the males likely to have been removed already due to faster maturity, and a higher vulnerability to capture. The risk of transfer of carp from this water is now deemed to be highly unlikely, therefore in February 2020, the Inland Fisheries Service made the decision to reopen Lake Sorell to the public. This is a huge milestone for the Carp Management Program, given the lake has been closed since the initial discovery of carp in 1995. Eradication and monitoring efforts will continue over the next few years to target any remaining carp.

The current status of the Tasmanian Carp Management Program featured on ABC Landline in late January 2020. A link to the episode is attached below:

https://www.abc.net.au/landline/carp-wars:-twenty-five-year-mission-to-eliminate/11991592

Picture 2. Many hours were spent electrofishing the shallows of Lake Sorell, with only one carp caught.

Turbidity levels in Lake Sorell have been steadily decreasing since 2009, however over the last few years there have been various short-term jumps and drops in the total turbidity. This can be attributed to changes in lake level, combined with wind conditions during the time the water samples were taken. Wind fetch on the lakes can cause a spike of natural silt re-suspension in the water column. Despite the increase in total turbidity at times, the associated colloidal component of the turbidity is relatively stable, and is still declining slowly.

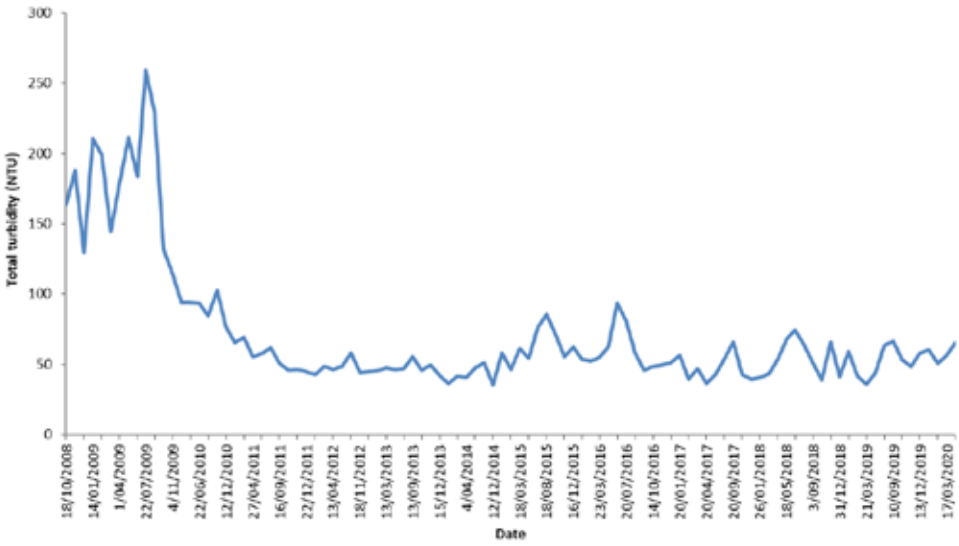

Figure 5. Total turbidity levels in Lake Sorell (2008 to 2020).

1.3 Lake Crescent

No carp were captured in Lake Crescent this year despite continued annual sampling and monitoring, with the last carp caught in 2007. Since the extremely low water levels in 2008, the average total turbidity of Lake Crescent has improved considerably. This is the direct result of high water levels flushing the lake after large rainfall events. The slight increases in total turbidity from December 2017 to the present is explained in the previous section.

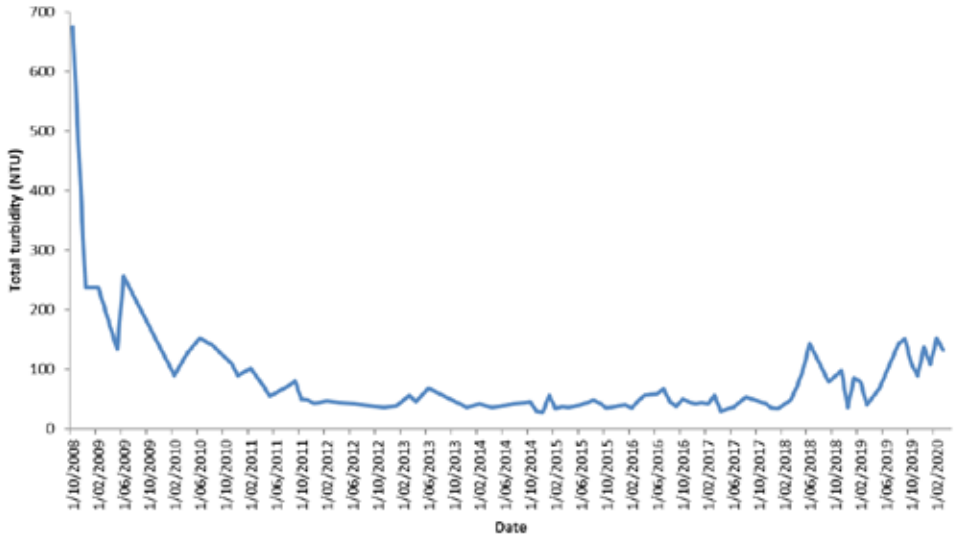

Figure 6. Total turbidity levels in Lake Crescent (2008 to 2020).

2.

Juvenile Carp Surveys

The annual Lake Crescent juvenile carp survey took place on the 3rd to the 4th of March 2020. The aim of this survey was to make sure that carp had not made their way back into Lake Crescent, and to look for any sign of spawning. We have not seen a carp in Lake Crescent since 2007, but we have done surveys every year to check. We focused on areas that carp like. These include rocky or sandy shores and areas with lots of weed. We fished fourteen areas around the lake using backpack electro-fishers for a minimum of 10 minutes at each location. A total of 290 electrofishing minutes was done, with short-fin eels and golden galaxias making up the majority of the catch. There was no sign of any carp in Lake Crescent.

The Lake Sorell juvenile carp survey was conducted from Monday the 16th to Friday the 20th of March 2020. The aim of this survey was to check for carp spawning. 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.

Picture 3. Numerous golden galaxias were caught during the Lake Crescent juvenile carp survey, including a few large individuals.

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, wherever the available habitat was present. Sixty-six fyke nets

were set at 22 locations around the lake, while backpack electro-fishing was also undertaken at these sites. Electrofishing was done for a minimum of 15 minutes at each location. In total, 6082 fyke net hours were put in over the survey, as well as a total of 287 electrofishing minutes. This resulted in eels and golden galaxiids caught, but no sign of any small carp.

In addition to the March juvenile survey, small monthly surveys were also undertaken in December, January, and February. Each survey was done over three days and involved backpack electrofishing (total of 537 electrofishing minutes), fyke netting (total of 4048 fyke net hours), as well as fine mesh dip netting weedy areas, from the barrier net back to the shoreline. Twelve selected sites were electro-fished, 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 across 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. No juvenile carp were found on any of the surveys which suggests that spawning did not occur over the 2019/20 season.

Picture 4. The Silver Plains drain which was almost completely dry during the March Lake Sorell juvenile carp survey.

3.

Golden Galaxias Survey

The annual golden galaxias (*Galaxias auratus*) survey was conducted during March 2020. This is the 15th consecutive year this action from the Lakes Sorell and Crescent Water Management Plan 2005 has been completed.

At lakes Sorell and Crescent, twelve fine-mesh fyke nets were set overnight at three locations within each lake (Table 4). Sets consisted of four fyke nets at each location, with the number of golden galaxias captured per fyke net recorded (Table 4). In addition, the fork lengths of 160 golden galaxias from Lake Crescent and 132 from Lake Sorell were recorded.

Table 4. Captures of golden galaxias in fyke nets, set at three locations in lakes Crescent and Sorell (2020).

Lake	Location	No. Fyke Nets	Number Captured
Crescent	Site 1 Agnew Creek Shore	4	181
	Site 2 Boathouse Shore	4	119
	Site 3 Lower Clyde Marsh	4	133
	Total	**12**	**433**
Sorell	Site 1 East side of Island	4	418
	Site 2 Inside Grassy Point	4	757
	Site 3 Dogshead Point	4	221
	Total	**12**	**1,396**

The total catch of golden galaxias in Lake Crescent was 433, which was significantly lower than the catch in 2019. One fyke net at the Boathouse Shore, Lake Crescent was overturned by the wind and lost most of its catch. This may have affected the overall result, however all other sites produced reasonable numbers of fish (Table 4). At Lake Sorell, 1,396 golden galaxias were captured, with the Grassy Point site catching significantly more fish compared to other sites, as seen previously.

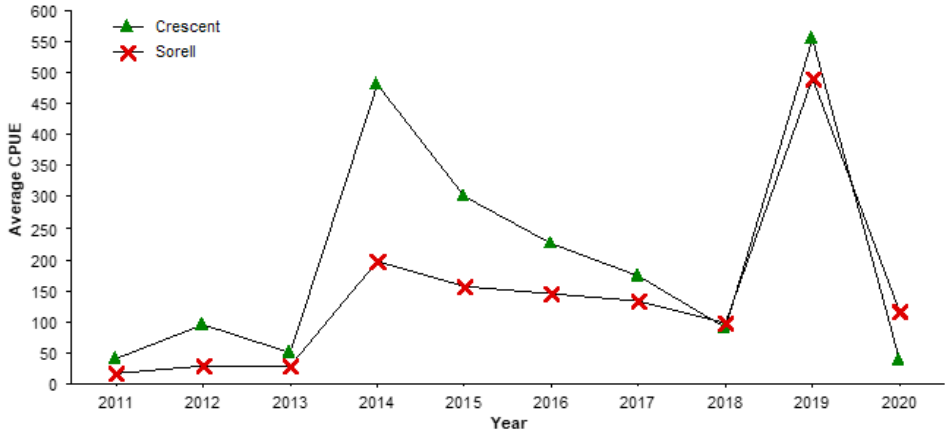

Figure 7. Average (mean) CPUE of golden galaxias for lakes Crescent and Sorell (2011-2020).

The long-term trend in CPUE (Figure 7) for Lake Crescent shows a significant decline in catch compared to 2019. While the 2019 CPUE figure was extremely high, the result for 2020 is low by comparison to the previous 9 years. The CPUE result for Lake Sorell was also similar, falling from an extremely high figure of 490 fish per net, down to 116 (Figure 7). However, this result is still within the bounds of previous surveys, and similar to the 2015 – 2018 period.

Picture 5. A range of size classes of golden galaxias were caught during the Lake Sorell and Crescent surveys.

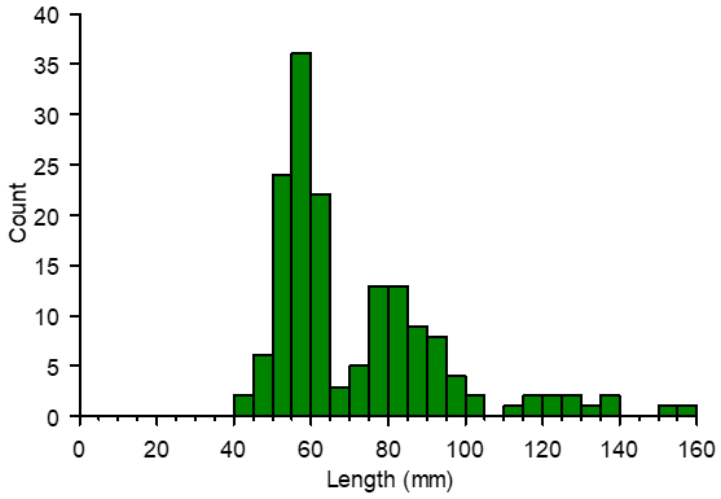

Figure 8. Length frequency of golden galaxias sampled from Lake Crescent 2020 (n=160).

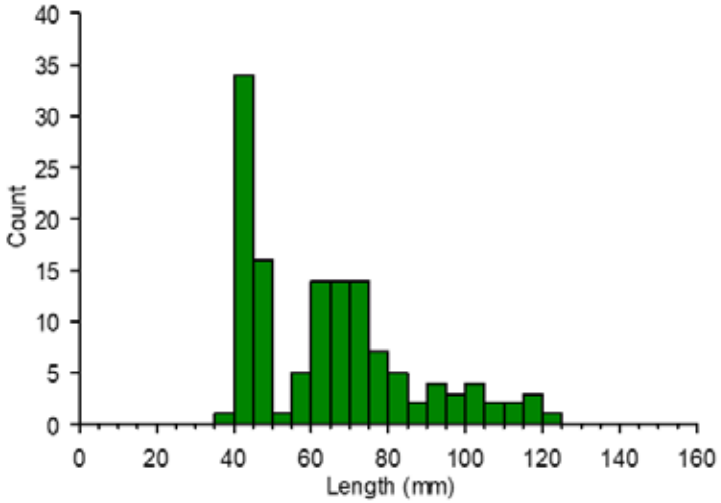

Figure 9. Length frequency of golden galaxias sampled from Lake Sorell 2020 (n=132).

Despite a large decline in CPUE for the golden galaxias at Lake Crescent, annual recruitment remained significant with high numbers of juvenile fish in the 40 - 70 mm length range (Figure 8). There were also good numbers of fish in the 70 – 100 mm length range, with a significant number of fish growing beyond 100 mm. While the recruitment of golden galaxias at Lake Sorell was not as robust as Lake Crescent, there were still good numbers of young of the year fish in the 35 – 55 mm length range (Figure 9). There were also good numbers of fish in the 55 – 90 mm range. Like Lake Crescent, there was a significant number of fish greater than 100 mm. Based on these results, the golden galaxias populations within lakes Crescent and Sorell presently remains healthy, with strong recruitment evident. However, the decline in CPUE for Lake Crescent to long term low levels needs to be noted and monitored in the coming year.

4.
Work Experience

Erin Ollington is a graduate from the Australian Maritime College (AMC) / Institute for Marine and Antarctic Studies (IMAS) who recently completed a Bachelor of Applied Science (Marine Environment). Growing up on the north west coast of Tasmania, she has always had an interest in the ocean, and initially wanted to become a marine biologist. She spent a lot of time on the water under the influence of her father, who was a commercial rock lobster fisherman. Initially she was unsure of whether she wanted to focus on aquaculture, academia/marine biology, or fisheries management. However by the completion of her degree, after being involved in field trips on the AMC research vessel "BLUEFIN", she decided that she was most interested in fisheries management.

Through word of mouth with her fellow AMC peers who had been involved with the CMP, she organised a volunteer shift to spend a few days in the field at Lake Sorell. The activities she was involved in ranged from general boating activities to checking and setting gill nets. She was able to develop important skills in relation to boat operation and aquatic field work. The time Erin spent with the CMP supported her decision to pursue work in fisheries management, in either the fresh or marine environment. The experience also assisted her with developing the practical and theoretical skills she learnt during her university studies, and enabled her to apply them in a working environment. Not only did she enjoy the hands-on aspect of field work, but she is also interested in the management and analysis of biological data.

Erin graduated this August and is now actively looking for employment opportunities in the fisheries field. She plans to base herself in Hobart, and is willing to be involved in any kind of fisheries work, e.g. field, administrative, or data input/collection.

For further enquiries, please contact Erin at: erinnjanai@gmail.com

Picture 6. Erin Ollington taking a break from checking and setting gill nets in Lake Sorell.

5.

Carp Workshop

Due to the COVID-19 pandemic, the Carp Management Program held its yearly workshop on the 7th of May via Microsoft Teams. We looked over the past year's work and started planning for the coming year. Alex Schaap, formerly the director of the Environment Protection Authority (EPA), and a long term observer of the CMP, provided an independent review of the workshop and helped develop the plan for the coming year. The day involved presentations and discussions of different aspects of the data collected during the 2019-20 season. This gave us an understanding of how the carp removal is progressing, whether we can increase catch efficiency, the findings for the season, and what else can be done to complete the eradication of carp from Tasmania.

Key findings were:

- No carp were found in Lake Crescent or downstream in the River Clyde.
- Carp are contained to Lake Sorell.
- No spawning or small carp were found in Lake Sorell.
- The fishing effort was kept at a high level but we only caught 5 carp this year, compared to 39 last year.
- Studies of the JGC which causes sterility is affecting 50% of male carp caught.
- 41 496 carp have been removed from Lake Sorell since 1995.
- We now estimate that less than 5 carp remain in Lake Sorell.

6.

Water Yields and Deficits

Total rainfall of 708.8 mm was recorded at the Lake Crescent field station from 1st July 2019 to 30th June 2020.

Table 5. Rainfall and release data (2019/20).

Month	Rainfall (mm)	Sorell Release (ML)	Crescent Release (ML)
July	71.6	-	12.95
August	68.4	-	954.94
September	69	-	61.29
October	23.2	-	440.67
November	47.4	-	910.97
December	13	-	1673.91
January	48.2	-	2356.21
February	35.4	-	1227.31
March	83.2	-	585.57
April	91.2	-	287.90
May	56.6	-	1.31
June	101.6	-	7.05
Total	**708.8**	**-**	**8520.08**

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

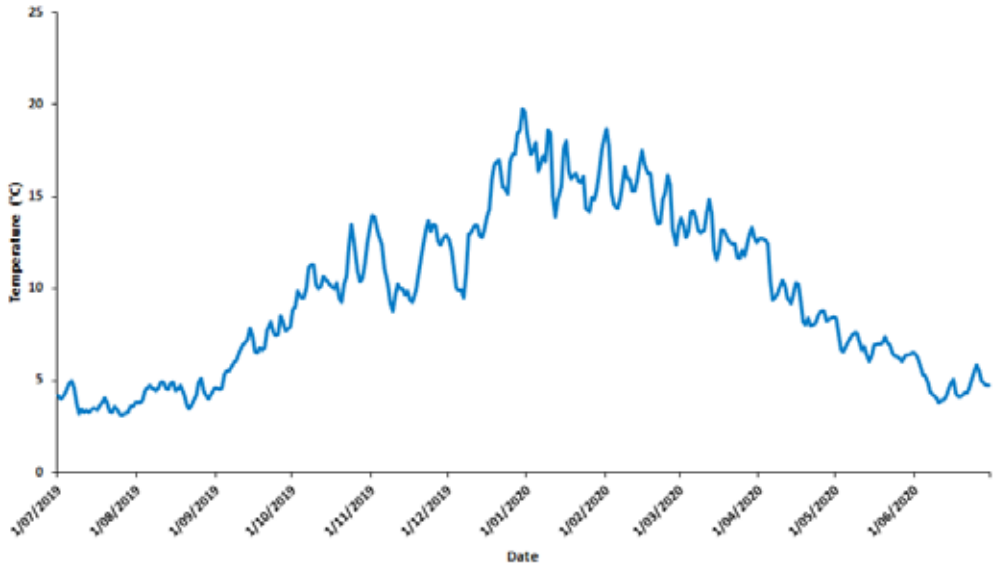

Figure 10. Lake Sorell water temperature from Diamond Shore deep site (July 2019 – June 2020).

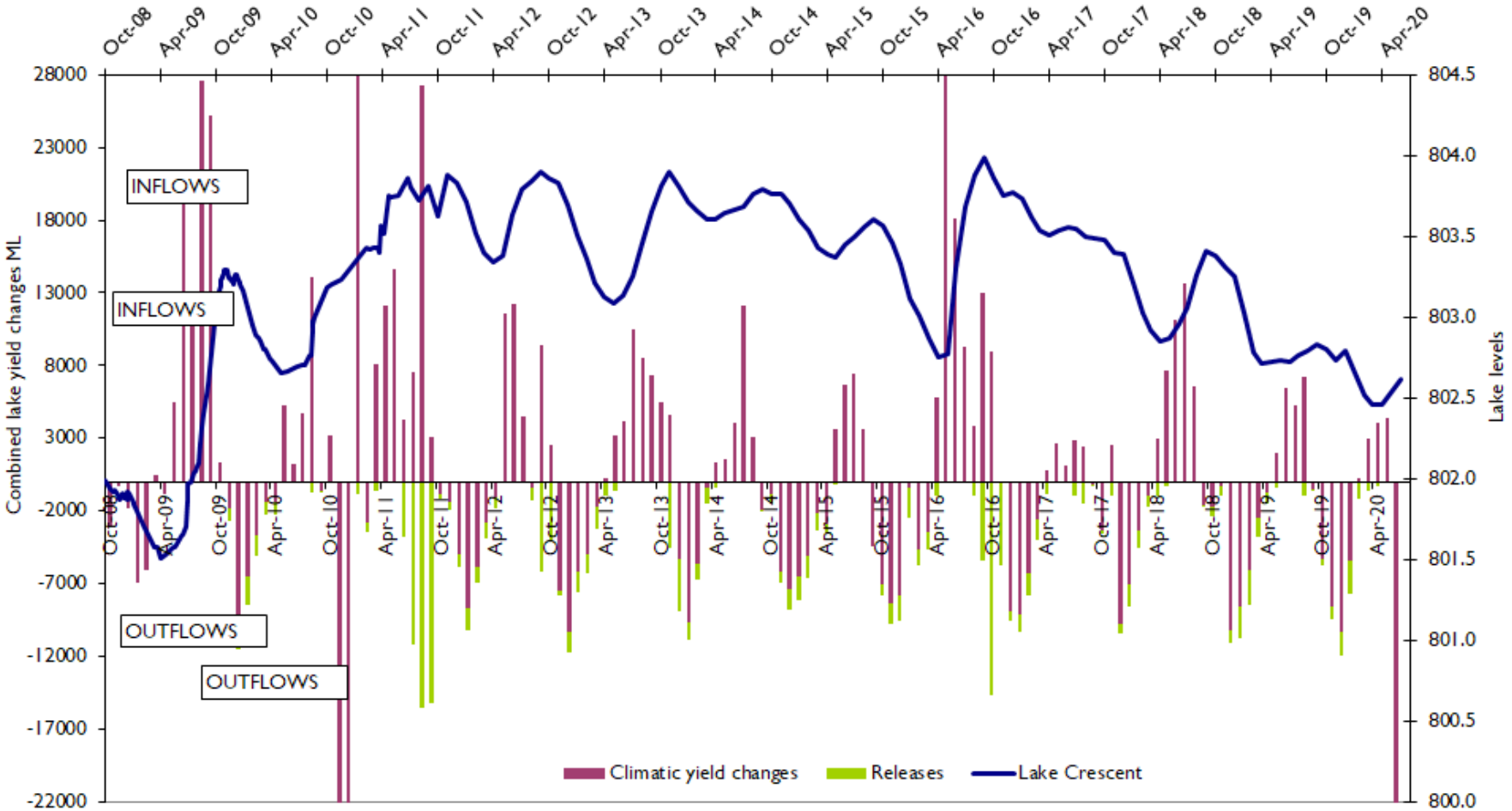

Figure 11. Lake Crescent lake levels, water yields and deficits (2008 – June 2020).

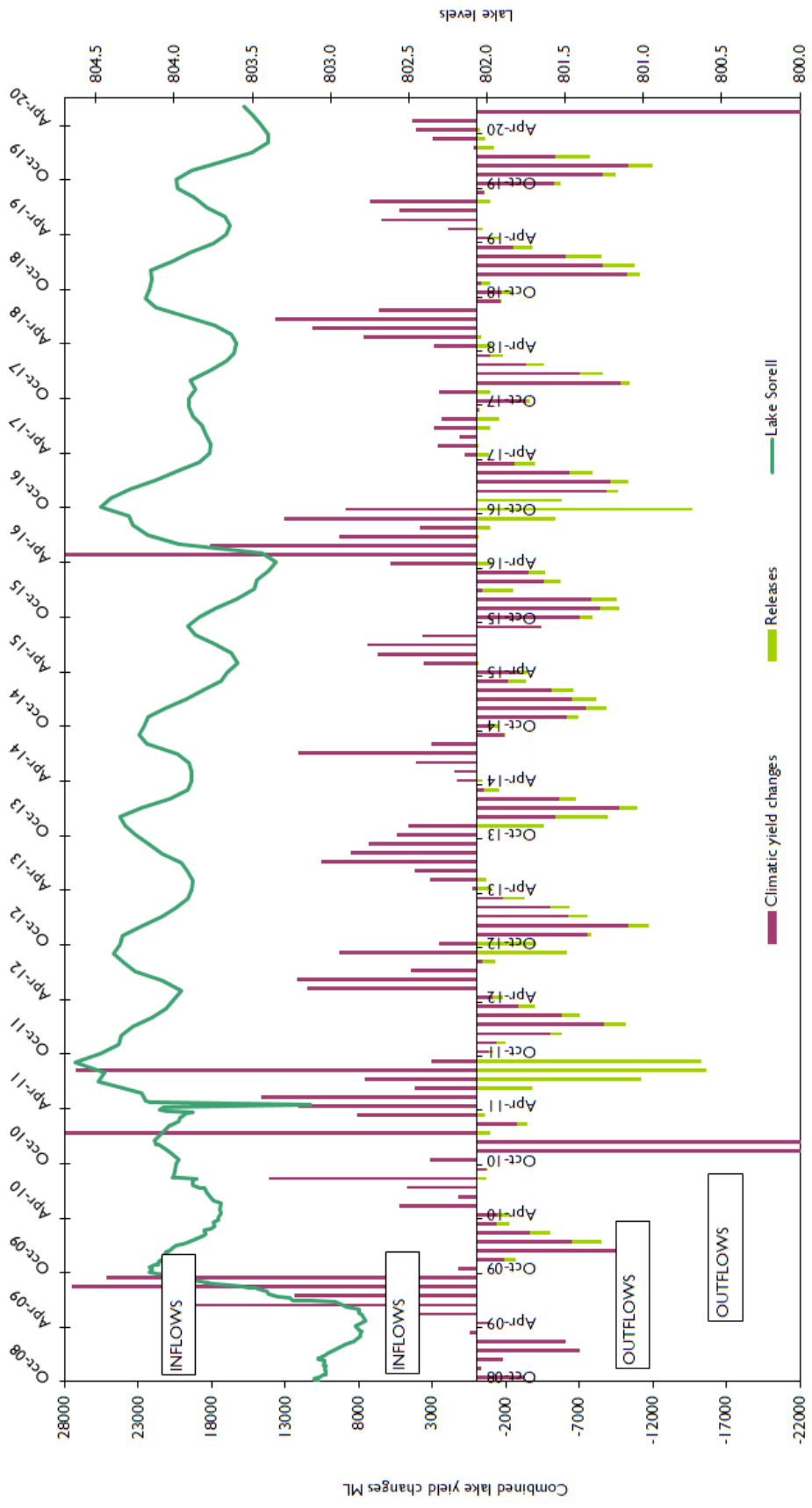

Figure 12. Lake Sorell lake levels, water yields and deficits (2008 – June 2020).

7. Staffing

7.1 Staff Positions

In May, Storm Eastley's twelve month contract expired. Six casual workers were employed to assist with carp management activities during the season.

Table 6. Staff positions (2019/20).

Field Officers	Robert Cordwell (0.9fte) Terry Byard (0.5fte)
Technical Officers	Brock Cuthbertson (1fte) Storm Eastley (1 fte)
Program Leader	Jonah Yick (1 fte)
Section Manager	Chris Wisniewski (1fte)

Table 7. Casual positions (2019/20).

Name	Background	Timeline
Jake Brumley	Australian Maritime College	14th October – 29th December
Brad Bisaro	Australian Maritime College	1st November – 15th January
Kim Clark	Interlaken Shack Owner	8th November – 20th February
Floriaan Devloo-Delva	CSIRO PhD Student	15th November – 6th December
Raihan Mahmud	University of Tasmania PhD Student	26th – 27th December
Will Ertler	Australian National University	3rd January – 2nd February

7.2 Staff Requirements as per Industrial Agreement

IFS staff are required to undertake weekend work and hours beyond general conditions of service as part of the industrial agreement. The following table outlines the work undertaken by CMP staff for the year.

Table 8. Weekend work, public holidays and extra hours (2019/20).

Staff Member	Saturdays	Sundays	Public Holidays	Extra Hours
Jonah Yick	9	10	0	195.95
Brock Cuthbertson	11	11	1	185
Terry Byard	2	1	0	-
Robert Cordwell	4	3	0	109.3
Storm Eastley	14	14	7	174.3

8. Activities

8.1 Carp Sightings

11 October 2019 - Meadowbank Lake - Tench

15 December 2019 - South Esk River - Tench

25 March 2020 – Pond, Rosevears - Goldfish

8.2 Public Presentations

During the course of the year staff from the IFS gave presentations to the following organisations on the CMP.

Table 9. Public presentations (2019/20).

Date	Organisation
5 September 2019	New Norfolk High School Careers Day
22 November 2019	Talk Trout Tasmania
11 December 2019	National Recreational Fishing Conference
14 May 2020	Tasmanian Fly Tyers' Club

8.3 Timeline of Major Events

Table 10. Timeline of major events (2019/20).

Date	Organisation
July	
10th	Half of front grate removed from Lake Crescent screen structure
30th	Begin checking and repairing barrier nets for holes and tears
August	
6th	Lake Crescent screen structure opened up to release 9ML of water
14th	All barrier net checks and repairs completed
26th	Began cleaning up and removing old CMP infrastructure from Lake Sorell, in preparation for the opening to the public
September	
1st	Closed Lake Crescent screen structures
9th	Lake Crescent shack inventory and clean up
9th	Stop logs added to the Lake Crescent and Sorell screen structures. 12mm mesh installed in Lake Sorell screen structure
10th	Big fyke nets installed into barrier nets and opened up
16th	Undertook a trout salvage in the River Clyde
24th	Permanent gill nets installed behind barrier nets in Lake Sorell
October	
2nd	First fishing gill nets of the season set
3rd	Lake Crescent screen structures opened up
8th	Lake Sorell field station site inspection
November	
4th	Salmon Ponds JGC carp assessments
12th	Rubicon Water begin construction at the Lake Crescent screen structures to install automated gate
21st	First and biggest carp caught for the season: electro-boat, 420mm, 1637gm, female
22nd	Installation of automated gate at the Lake Crescent screen structures completed

Date	Organisation
December	
22nd – 24th	Monthly Lake Sorell juvenile carp survey
23rd	Second carp caught for the season: trammel gill net, 400mm, 1250gm, female
27th	Third carp caught for the season: trammel gill net, 353mm, 873gm, female
January	
7th-8th	Filming carp feature story with ABC Landline film crew
9th	Fourth carp caught for the season: trammel gill net, 397mm, 1174gm, male, JGC
10th	The operation of the Lake Crescent screen structures is handed back to the River Clyde Trust
13th – 15th	Monthly Lake Sorell juvenile carp survey
15th	Fifth carp caught for the season: trammel gill net, 295mm, female
22nd	All permanent gill nets behind barrier nets removed from Lake Sorell
February	
2nd	All big fyke nets removed from barrier nets
6th	All fishing gill nets removed from the lake
8th	Opening of Lake Sorell to the public
18th – 20th	Monthly Lake Sorell juvenile carp survey
19th	Golden galaxias survey at Weasel Plains and Rotherwood Dams
March	
3rd – 4th	Annual Lake Crescent juvenile carp survey
16th – 20th	Annual Lake Sorell juvenile carp survey
25th – 27th	Lake Crescent and Sorell annual golden galaxias survey
27th	Lake Crescent Field Station closed due to COVID-19
May	
7th	Carp workshop

8.4 Media Articles

July 2019 – Australian Society for Fish Biology Newsletter, Lateral lines – "Feature article and cover shot: Tasmanian carp close to extinction".

4th July 2019 – Journal of Applied Ecology - "eDNA surveys to detect species at very low densities: A case study of European carp eradication in Tasmania, Australia".

3rd August 2019 – The Mercury – "Public Notices: Lake Sorell Closure".

3rd August 2019 – The Advocate – "Public Notices: Lake Sorell Closure".

3rd August 2019 – The Examiner – "Public Notices: Lake Sorell Closure".

27th August 2019 – Inland Fisheries Service Website, Latest News – "Preparations to complete carp eradication".

28th August 2019 –The Advocate – "Carp out? IFS gearing up for victory bid".

29th August 2019 – The Examiner – "Brown Dun".

August 2019 – Fishing & Boating Monthly – "Discovery Channel and Animal Planet in Tassie".

4th September 2019 – Inland Fisheries Service Website, Latest News – "eDNA: A new tool to establish invasive species eradication success".

5th September 2019 – Inland Fisheries Service Website, Latest News – "IFS attends New Norfolk High School Careers Day".

18th September 2019 –The Derwent Valley Gazette– "Carp close".

19th September 2019 – Inland Fisheries Service website, Latest News – "River Clyde fish salvage".

1st October 2019 – Inland Fisheries Service Website, Latest News – "Carp Management Program Annual Report 2018-19".

6th October 2019 –The Examiner – "IFS targeting Lake Sorell carp army's last stragglers".

8th October 2019 –The Advocate – "Lake's last carp 'like needle in haystack'".

8th October 2019 –The Examiner – "Last carp targeted".

9th October 2019 –The Derwent Valley Gazette – "Fishing".

November – January 2019 –Tasmanian Fishing and Boating News – "Carp Management Program".

December 2019 – Fishing & Boating Monthly – "Carp Management Program".

December 2019 – Australian Society for Fish Biology Newsletter, Lateral lines – "State Reports: Tasmania, Inland Fisheries Service: Carp Management Program".

December 2019 – Australian Society for Fish Biology Newsletter, Lateral lines – "Alien Fishes Committee Reports: Tasmania, Carp Management Program".

13th December 2019 – Inland Fisheries Service Website, Latest News – "Only one carp so far".

18th December 2019 – ABC Radio Hobart – Fiona Breen "Carp update".

3rd January 2020 –The Mercury– "Carl Hyland".

14th January 2020 – Inland Fisheries Service Website, Latest News – "Inland Fisheries Service attends the 2019 National Recreational Fishing Conference".

5th February 2020 – ABC news website – "Carp success after long battle against invasive fish".

5th February 2020 – Inland Fisheries Service Website, Latest News – "Welcome back to Lake Sorell".

5th February 2020 –The Advocate – "Fishers back at Lake Sorell after Carp eradication".

5th February 2020 – The Mercury – "Tasmanian lake to reopen to anglers on Saturday after 25 years".

6th February 2020 – The Examiner – "Cape Diem: Lake Sorell to reopen".

6th February 2020 – The Examiner – "Sorell is back on fishing agenda".

6th February 2020 – ABC Radio Hobart – Leon Compton "Re-opening of Lake Sorell".

7th February 2020 – Inland Fisheries Service website, Latest News – "Lake Sorell re-opens tomorrow!".

7th February 2020 – The Tasmanian Liberals Website, Latest News – "Lake Sorell reopens".

7th February 2020 – The Mercury – "Lake Sorell is back".

8th February 2020 – The Mercury – "Invasive carp almost gone".

8th February 2020 – The Mercury – "Public Notices: Notification of the opening of Lake Sorell".

8th February 2020 – The Advocate – "Public Notices: Notification of the opening of Lake Sorell".

8th February 2020 – The Examiner – "Public Notices: Notification of the opening of Lake Sorell".

9th February 2020 – The Examiner – "Fishers' new haven".

10th February 2020 – The Mercury – "Carp clean-up reaps fishing boon".

12th February 2020 – The Derwent Valley Gazette – "Welcome back to Sorell".

13th February 2020 – The Examiner – "Sorell's return proving popular".

14th February 2020 – Tas Country – "Long carp battle now almost over".

14th February 2020 – The Mercury – "Carl Hyland".

21st February 2020 – Inland Fisheries Service Website, Latest News – "Latest carp report now available".

23rd February 2020 – ABC Landline video – "Carp Wars: Twenty-five year mission to eliminate invasive carp".

25th February 2020 – Inland Fisheries Service Website, Latest News – "IFS staff clean up fishing spots".

27th February 2020 – The Examiner – "Lake Sorell reopened".

27th February 2020 – The Examiner – "Brown Dun".

27th February 2020 – DPIPWE Pod news and events – "Carp on the brink of eradication in Tasmania".

February – April 2020 –Tasmanian Fishing and Boating News –"Lake Sorell, What is happening".

April 17th 2020 – ABC Landline Meet the ferals video - "Episode 9, Carp".

Natural_Account	Total Prds	Period 0	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Period 7	Period 8	Period 9	Period 10	Period 11	Period 12	Period 13
5101 - Salaries	220,220.13	0.00	9,920.16	13,716.52	20,274.32	24,514.63	19,510.89	17,532.41	15,055.37	17,633.05	19,830.43	32,241.74	13,823.30	13,422.71	2,744.60
5102 - Lump Sum Leave	37,560.58	0.00	7,582.45	3,546.48	968.11	2,486.85	0.00	227.85	2,704.89	1,537.44	0.00	2,854.80	13,980.19	1,671.52	0.00
5106 - Superannuation	36,111.20	0.00	2,457.83	2,427.12	2,986.85	4,109.87	2,565.55	2,495.32	2,495.32	2,695.49	2,757.56	5,107.23	3,419.11	2,190.87	403.08
5107 - Otime-Penalties	3,156.70	0.00	0.00	0.00	19.53	2,833.14	(1,152.81)	0.00	0.00	135.45	(45.15)	1,366.54	0.00	0.00	0.00
5109 - Allowances	39,486.45	0.00	2,938.89	2,945.55	3,604.60	4,560.42	3,040.28	3,040.28	3,040.28	3,040.28	3,040.28	5,448.62	2,595.54	1,823.52	367.91
5203 - Training	340.00	0.00	0.00	0.00	340.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5207 - Equip Hire/Lse	7,172.31	0.00	697.58	697.58	697.58	697.58	697.58	697.58	697.58	457.85	0.00	915.70	457.85	457.85	0.00
5208 - Equipment Maint	7,464.86	(686.36)	2,059.08	2,072.81	2,059.08	686.36	1,273.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5209 - General Ins	12,818.67	0.00	0.00	0.00	2,278.65	0.00	9,865.37	674.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5212 - Printing/Pubs	1,230.00	0.00	0.00	0.00	979.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	250.91	0.00	0.00
5213 - Library	50.00	0.00	0.00	0.00	0.00	0.00	0.00	50.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5214 - Vehicle Fuel	8,952.32	(1,040.09)	1,110.10	979.86	678.72	943.98	1,270.88	1,686.72	274.41	1,708.45	473.17	365.39	92.98	307.60	100.15
5215 - Vehicle Hire	116.95	0.00	0.00	0.00	0.00	0.00	0.00	116.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5217 - Vehicle Maint	8,835.50	(97.50)	97.50	0.00	18.18	381.82	476.64	275.00	89.09	1,022.82	1,893.77	1,271.68	3,406.50	0.00	0.00
5220 - Comp Hardware	485.45	0.00	0.00	359.09	0.00	0.00	0.00	126.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5223 - Network Costs	672.60	0.00	0.00	54.50	54.50	66.17	54.50	72.50	25.33	109.00	0.00	114.45	54.50	67.15	0.00
5228 - Mob Phones Rads	3,208.68	0.00	0.00	261.45	400.42	261.20	262.70	283.96	140.49	432.61	138.52	431.33	387.53	208.47	0.00
5229 - Equip Purchases	4,880.80	0.00	0.00	0.00	0.00	152.73	36.35	244.55	0.00	4,447.17	0.00	0.00	0.00	0.00	0.00
5230 - Equipment Depn	9,088.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9,088.75	0.00
5231 - MV Depn	12,990.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2,251.31	0.00	0.00	0.00	0.00	10,739.18	0.00
5232 - Vessel Depn	10,627.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10,627.98	0.00
5234 - Op Supplies	2,794.89	0.00	0.00	106.50	72.36	51.30	99.04	2,054.95	0.00	130.36	194.99	20.00	0.00	65.39	0.00
5236 - Cont Services	16,532.58	0.00	0.00	0.00	7.76	1,764.58	241.05	5,027.21	5,194.45	3,735.08	562.45	0.00	0.00	0.00	0.00
5238 - OH & S	1,908.38	0.00	135.00	135.00	135.00	135.00	239.50	325.27	90.00	90.00	90.00	190.00	253.61	90.00	0.00
5240 - Meetings & Conf	934.18	0.00	0.00	500.23	0.00	0.00	0.00	147.66	0.00	250.00	0.00	0.00	36.29	0.00	0.00
5244 - Council Rates	210.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	210.00	0.00	0.00	0.00	0.00
5253 - Vessel Maint	8,665.68	0.00	81.54	599.51	614.15	1,619.24	783.03	1,189.67	1,064.79	1,522.82	725.74	331.91	0.00	133.28	0.00
5254 - Interstate Trav	1,225.56	0.00	0.00	0.00	34.00	516.80	674.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5255 - Intrastate Trav	19,350.01	0.00	648.20	2,637.90	1,334.45	3,517.20	2,337.75	2,144.70	3,906.75	1,527.40	1,295.66	0.00	0.00	0.00	0.00
5258 - Prot Clothing	3,638.00	0.00	2,100.00	245.98	168.36	18.00	973.71	5.00	0.00	0.00	54.95	0.00	0.00	72.00	0.00
5267 - Vessel Outboard	9,095.32	0.00	0.00	1,117.45	125.32	0.00	857.18	60.00	526.00	6,136.64	272.73	0.00	0.00	0.00	0.00
5269 - Office Printing	72.95	0.00	0.00	0.00	36.07	0.00	0.00	0.00	5.90	27.26	3.72	0.00	0.00	0.00	0.00
5270 - WDV Disp Assets	21,777.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	21,777.21	0.00	0.00	0.00	0.00	0.00	0.00
5271 - Advert & Pub	1,218.60	0.00	0.00	716.16	0.00	0.00	0.00	0.00	0.00	502.44	0.00	0.00	0.00	0.00	0.00
5280 - Signage	146.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	70.00	76.03	0.00	0.00
5288 - Infrastruc Depr	571.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	571.42	0.00
State Contribution	(400,000.00)														
IFS Contribution	113,611.23														
Total Expenditure	**513,611.23**	**(1,823.95)**	**29,828.33**	**33,119.69**	**37,887.10**	**49,316.87**	**44,107.84**	**38,478.59**	**59,339.17**	**47,141.61**	**31,498.82**	**50,729.39**	**38,834.34**	**51,537.69**	**3,615.74**

Notes

Tasmanian Government

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