

Inland Fisheries Service

RECREATIONAL FISHERIES REPORT



Fisheries Performance Assessment

Technical Report

Lake Crescent – June 2021

Inland Fisheries Service *Fisheries Performance Assessment* Technical Report - Lake Crescent 2021

CONTENTS

1. INTRODUCTION	4
2. FPA SURVEY METHODOLOGY	5
2.1. IN-LAKE POPULATION SURVEYS	5
2.2. ANNUAL POSTAL SURVEY	5
2.3. STOCKING DATABASE	5
2.4. ANALYSIS METHODS	5
3. RESULTS	6
3.1. IN-LAKE POPULATION SURVEY – BROWN TROUT	6
3.2. IN-LAKE POPULATION SURVEY – RAINBOW TROUT	9
3.3. POPULATION ESTIMATE – BROWN TROUT	10
4. ANGLER POSTAL SURVEY	11
5. STOCKING	13
5.1. BROWN TROUT	13
5.2. RAINBOW TROUT	13
6. ADDITIONAL DATA OR INFORMATION	13
6.1. BY-CATCH	13
6.2. TURBIDITY LEVELS	13
7. DISCUSSION	14
8. RECOMMENDATIONS	16
9. APPENDIX	17

Inland Fisheries Service *Fisheries Performance Assessment* *Technical Report Lake Crescent 2021*

Title:	Fisheries Performance Assessment, Technical Report, Lake Crescent (June 2021) Inland Fisheries Service.
Prepared by:	Rob Freeman
Version:	Final
Review by:	Chris Wisniewski
Approved by:	John Diggle

Inland Fisheries Service *Fisheries Performance Assessment* Technical Report - Lake Crescent 2021

I. INTRODUCTION

Lake Crescent and partner fishery Lake Sorell are located on the south eastern edge of the Central Plateau at a height of 803.8 m AHD. Lake Crescent has a surface area of 23,000 ha with a maximum depth of 2.4 m and an average depth of 1.5 m. The water of the lake is often very turbid with average readings of around 40 - 60 NTU's with levels reaching 70 – 130 NTU's and extreme peaks over 500 – 700 (see appendix E). Lake Crescent is the State's most significant 'trophy' brown trout water, with fish ranging between 2-5 kg. The fishery is managed under the Tasmanian Inland Recreational Fishery Management Plan 2018-2028 (TIRFMP), as an 'exception to an assisted fishery' with the fishing season managed for brown trout. Fishing methods are restricted to artificial lures only. A daily bag limit of 2 fish exists, with a minimum size limit of 400 mm and only one fish over 500 mm permitted. Fishery management criteria are defined within the TIRMP and are listed in appendix D. Monitoring of the Lake Crescent trout fishery is done under the TIRFMP to gather information about the fishery so management can be adjusted to meet the criteria for the fishery.

European carp (*Cyprinus carpio*) were found in Lake Crescent during 1995. Lake Crescent was closed to the public from 1995 until the start of the brown trout season in August 2004. An intensive carp management program was initiated to prevent the spread of the species within the State and to eradicate carp from both lakes Crescent and Sorell. The last carp was caught from Lake Crescent in 2007 and the lake was declared carp free in 2009.

Lake Crescent supplies water for irrigation, stock and domestic and town supply in the River Clyde catchment. The water resource is managed under the lakes Sorell and Crescent Water Management Plan 2005. Lake Crescent has significant wetlands including the Interlaken Reserve that is listed under the RAMSAR convention. Lakes Sorell and Crescent support a diverse range of flora and fauna with rare or threatened species, including the endemic native fish the golden galaxias (*Galaxias auratus*) that is listed as threatened under Commonwealth and State legislation. The wetlands are an important refuge for several conservation listed migratory birds that use these areas during droughts.

Inland Fisheries Service *Fisheries Performance Assessment* Technical Report - Lake Crescent 2021

2. FPA SURVEY METHODOLOGY

2.1. IN-LAKE POPULATION SURVEYS

On the 21 April 2021, 500 adult brown trout were collected from the spawning trap at Liawenee Canal and weighed, measured and tagged with individually numbered white t-bar tags. The average weight and length of these fish were 852 g and 419 mm respectively, consisting of 266 females and 234 males (see Appendix F). These fish were released into Lake Crescent on the same day and allowed to mix with the general trout population. A dedicated box trap survey was conducted during the 31 May – 2 June 2021.

During the survey, 40 box traps were set each night over two nights (total of 80 box trap sets) along the northern, western and southern shorelines (see appendix F). Soak times were between 20–24 hours. All trout captured were recorded as male, female or immature and were weighed and measured (fork length). Fish were released away from the trap site after processing (without being re-marked). Past survey data at other waters indicated recapture rates are very low and unlikely to significantly influence the results of a population estimate or summary statistics for length and weight.

2.2. ANNUAL POSTAL SURVEY

Since 1986, the Inland Fisheries Service (IFS) has conducted a postal survey seeking information about anglers' catches. The survey comprises a form sent to around 4,000 anglers of all licence categories asking set questions about their angling (catch of trout) for the past season. Information on catch per day, harvest and angling effort is collated and analysed. This provides a long-term overview of individual fishery performance in addition to characterising fishing effort. In this report, only records post 2003 are analysed as Lake Crescent was not open to fishing during the period 1995 – 2003 due to carp eradication efforts.

2.3. STOCKING DATABASE

The IFS keeps electronic records of fish stocking within public waters dating back to 1980. These records set out information on location, date of stocking, species, age, origin, stock type and genotype, in addition to length/weight data and comments e.g. denoting tagged fish. This information provides an historical record of supplementary recruitment into individual waters. In this report, only records post 2013 are analysed.

2.4. ANALYSIS METHODS

Condition factor was calculated using the basic formula of $K=10^5 \times \text{weight}/\text{length}^3$. This provides a generalised result that can be used to compare other fish and fisheries. Condition factor categories assigned to each level of condition i.e. poor, fair, good or excellent, are reflective of an individual fish or population at a particular time within the reproductive cycle and will therefore change during this cycle e.g. high during peak spawning condition. The short comings of condition factor are acknowledged but are used for relative comparisons only. Categories are indicative and may not necessarily reflect the perception of anglers in general.

Inland Fisheries Service *Fisheries Performance Assessment*

Technical Report Lake Crescent 2021

3. RESULTS

3.1. IN-LAKE POPULATION SURVEY – BROWN TROUT

During 31 May to 2 June 2021, the Service conducted an in-lake survey at Lake Crescent to examine:

- CPUE for brown and rainbow trout
- the length and weight of brown and rainbow trout,
- the condition of all resident and transferred trout,
- assess the population structure of resident brown trout, and
- estimate the population size for brown trout.

CPUE

A total of 445 brown trout were captured from 80 box trap sets consisting of 40 traps set over two nights, with soak times between 20–24 hours. This resulted in a catch per unit effort (CPUE) of 5.6 brown trout per trap. Over the first nights trapping 245 were captured with 200 during the second night.

Weight and Length Information (resident brown trout)

All 245 brown trout captured on the first day were weighed, measured and sex determined. Of these fish, 232 were resident fish and 13 tagged transferred fish. All fish captured on the second day were counted only, they were not weighed or measured.

Resident fish consisted of 116 females and 116 males, with no immature fish captured over the entire survey. Table 1 shows the summary statistics for resident brown trout separated by sex. The mean weight for all resident fish captured was 1,675 g with an average length of 535 mm. The average condition factor was 1.09, with some fish showing very poor condition, with a minimum of 0.54 k. On average, female fish weighed 248 g more than male fish, with both sexes having the same condition factor of 1.09.

Table 1: Length, weight and condition factor for resident brown trout separated by sex 2021.

Grouping	Measurement	Mean	Minimum	Maximum
All resident brown trout (n= 232)	Length (mm)	535	718	535
	Weight (g)	1,675	670	4,040
	Cond Factor (k)	1.09	0.54	1.46
Male (n= 116)	Length (mm)	523	410	670
	Weight (g)	1,551	840	3,040
	Cond Factor (k)	1.09	0.55	1.43
Female (n= 116)	Length (mm)	547	414	718
	Weight (g)	1,799	670	4,040
	Cond Factor (k)	1.09	0.54	1.46

The length/weight plot (see Figure 1) shows while the growth of fish is reasonable, it is below what might be expected from this normally productive water. There are several fish displaying low weights across a range of lengths, especially evident for fish in the 550 mm – 675 mm range, with one very poor fish

Inland Fisheries Service Fisheries Performance Assessment

Technical Report Lake Crescent 2021

measuring 485 mm (670 g). Just over 75 percent of fish are in the 1 – 2 kg range. Seven percent of fish are growing to over 650 mm with some fish showing good weights while others are poor. Tagged (transferred) brown trout showed similar growth characteristics to resident fish of a similar length.

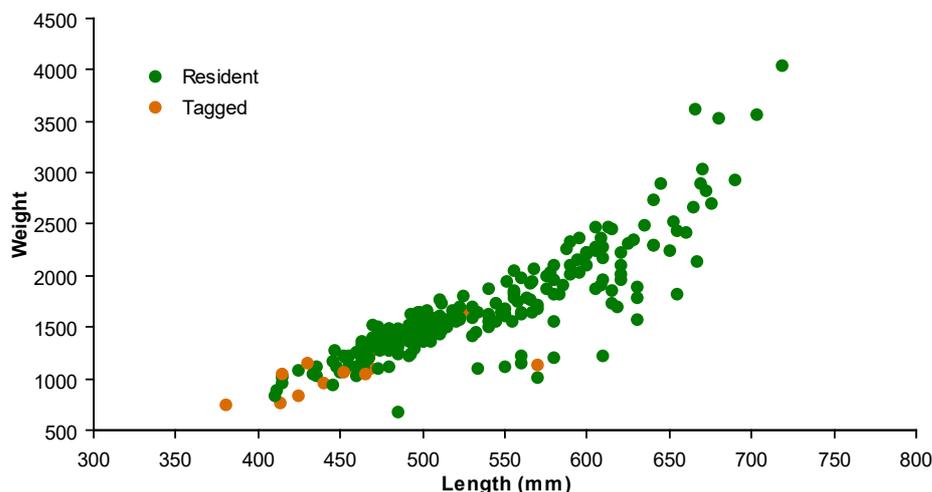


Figure 1: Length/weight scatterplot for transferred (tagged) and resident brown trout, 2021.

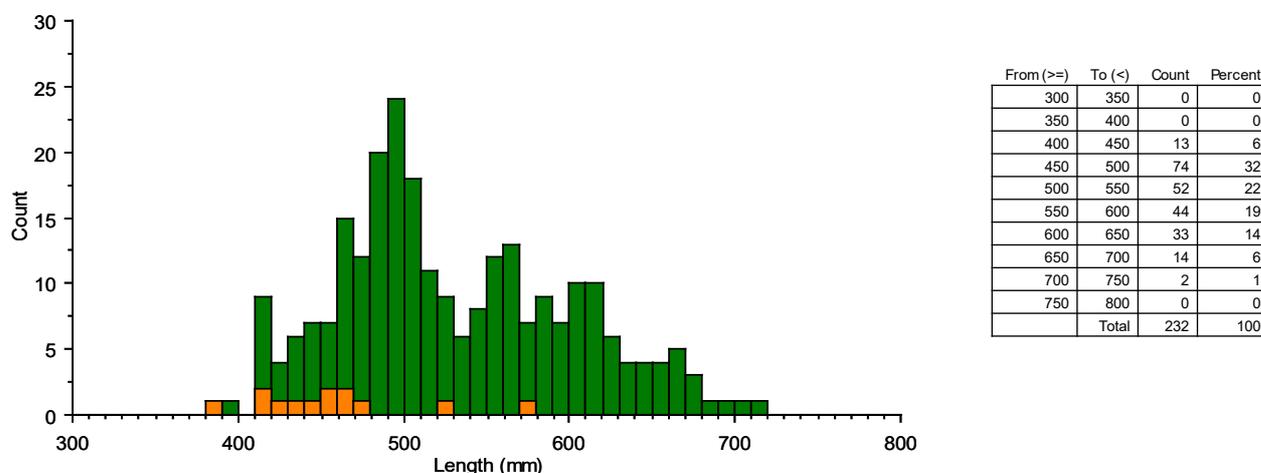


Figure 2: Length frequency for resident and tagged transferred brown trout 2021 with associated table showing the data for resident fish only.

Analysis of the length frequency histogram provides evidence of multiple cohorts of fish within the population. The tagged transferred fish in the 420 mm – 480 mm length range have a similar length structure to fish of a comparable size within Lake Crescent and together form the lower size range of the population. There is no evidence of any natural recruitment of brown trout for the last two to three years, with just one resident fish measuring less than 400 mm. Significant peaks occur in the population at 460 mm and 490 mm length classes, with less significant peaks occurring at 560 and 610 mm. Around seven percent of fish are growing beyond 650 mm. Sixty two percent of fish are greater than the legal upper size limit of 500 mm, with two fish measuring under the 400 mm minimum size limit.

Inland Fisheries Service *Fisheries Performance Assessment*

Technical Report Lake Crescent 2021

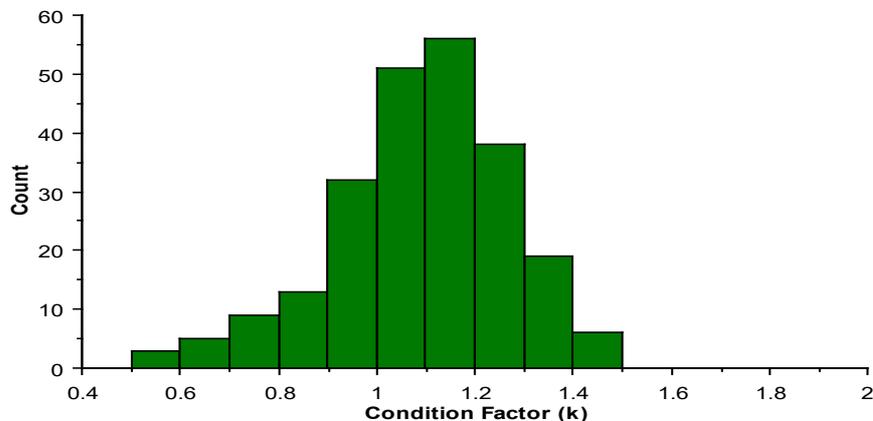


Figure 3: Condition factor (k-factor) for resident brown trout 2021.

The average condition of brown trout was 1.09 and is below that of most lake populations, particularly for large trout waters. Twenty seven percent of fish had a condition factor below one with around 7 percent below 0.8, indicating very poor condition. Around 27 percent had a condition factor of 1.2 or greater, indicating good condition. Only three percent of fish has a condition factor over 1.4 or excellent condition.

Generally, the condition of fish declined with length (age), although this is intrinsically related to the calculation of condition factor. There were however, a significant number of fish in the 550 mm – 675 mm range with a low condition factor. Several larger fish (over 650 mm) had a condition factor over 1.0.

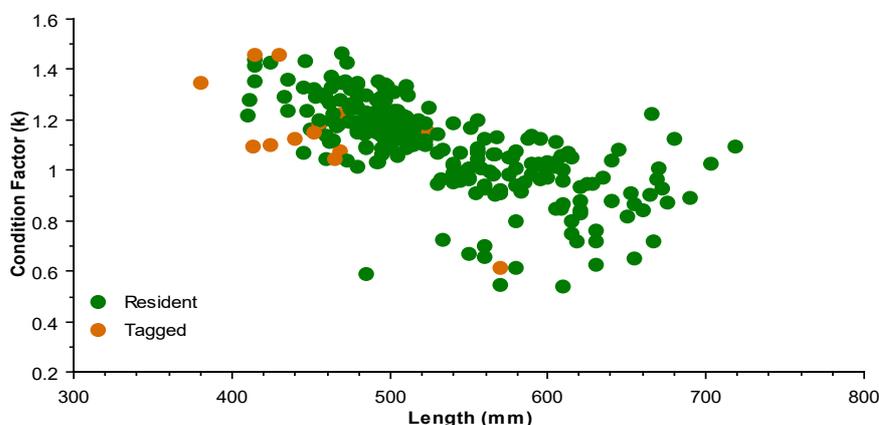


Figure 4: Condition factor (k-factor) by length of fish for resident and tagged brown trout 2021.

Inland Fisheries Service *Fisheries Performance Assessment*

Technical Report Lake Crescent 2021

3.2. IN-LAKE POPULATION SURVEY – RAINBOW TROUT

A total of 42 rainbow trout were captured from 80 box trap sets consisting of, 40 traps set over two nights, with soak times of 20 – 24 hours. This resulted in a catch per unit effort (CPUE) of 0.5 rainbow trout per trap. Twenty three fish were captured over the first nights trapping and 19 the second night.

The average weight for the 23 fish weighed and measured was 936 g with an average length of 465 mm (see Table 2).

The average condition factor for rainbow trout was low at 0.92 k. Longer (older) rainbow trout were in poor condition, while smaller (younger) fish displayed a broad range in condition, ranging from poor to good (see Figure 7).

Table 2: Length, weight and condition factor for rainbow trout captures 2021.

Grouping	Measurement	Mean	Minimum	Maximum
Rainbow trout (n= 23)	Length (mm)	465	398	610
	Weight (g)	936	620	1,930
	Cond Factor (k)	0.92	0.6	1.2

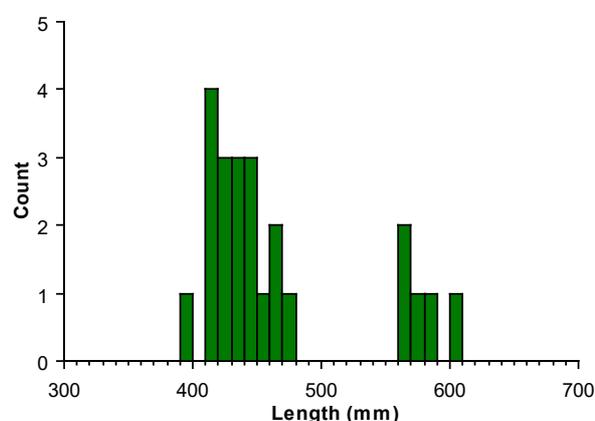
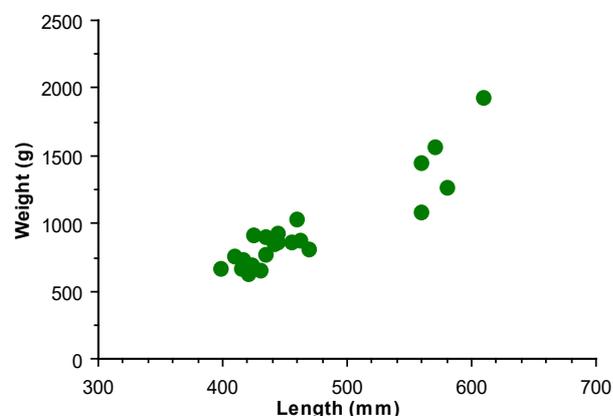


Figure 5: Length/weight scatterplot for rainbow trout, 2021. **Figure 6:** Length frequency for rainbow trout 2021.

The length/weight plot for the 23 rainbow trout weighed and measured (see Figure 5) indicates good weight for a given length of fish. Notwithstanding this, the fish in the 390 mm– 470 mm length range are from a stocking of yearling fish during 2017 (see Appendix B), therefore indicating slower growth rates than expected.

The length frequency plot (see Figure 6) shows two distinct cohorts of fish. The first in the 390 mm – 470 mm range (78% of fish) and a second in the 560 mm – 580 mm range (18% of fish), and one fish at 610 mm. There are no fish under 390 mm indicating no natural recruitment.

Inland Fisheries Service *Fisheries Performance Assessment*

Technical Report Lake Crescent 2021

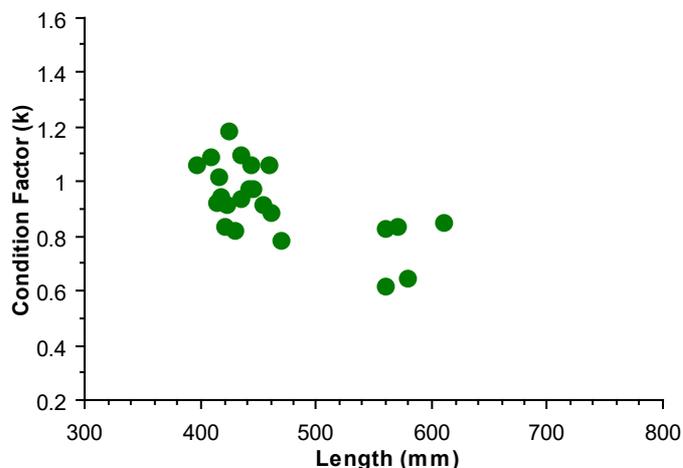


Figure 7: Condition factor (k-factor) by length of rainbow trout 2021.

3.3. POPULATION ESTIMATE – BROWN TROUT

During the survey, a total of 445 brown trout were captured. Of these fish 26 (5.8%) were tagged (see Table 3). This provided an estimate of the brown trout population at 8,558 (95% CI: 5,450 – 11,666) fish.

Throughout the recapture survey, most areas trapped held multiple fish, indicating sampling was generally unbiased across the area trapped. The estimate of bias level in the sample was 6.5, indicating an acceptable bias.

Table 3: Petersen CMR population estimate for Lake Crescent, June 2021.

Parameter	Result
Total fin clipped fish released (M)	500
Total captures [®]	445
Total marked recaptures [®]	26
Population estimate: MC/R = N	8,558
Standard error	1,586
Lower and Upper 95% CI limits	5,450 – 11,666
Estimate bias level: MC/4N =	6.5 (>4 acceptable bias)

Biomass approximation

Given the average weight of resident Lake Crescent Brown trout at 1.68 kg and including the 500 tagged fish from Great Lake at 0.85kg; the total biomass of brown trout is estimated to be 13,950 kg. Assuming rainbow trout represent 8.6 percent of the total catch and therefore represent a similar proportion of the total trout population, it is estimated there are 736 rainbow trout. This equates to a biomass of 692 kg of rainbow trout (average weight 0.94kg). The total biomass for all trout is therefore approximated at 14,642 kg.

Inland Fisheries Service Fisheries Performance Assessment

Technical Report Lake Crescent 2021

4. ANGLER POSTAL SURVEY

The results of the Angler Postal Survey (APS) for Lake Crescent since its reopening during the 2004-05 season, are generated from an average reply rate of 11 respondents per season. Initially during 2004-05, the reply rate was at a high of 15 respondents. This decreased to just 1 or 2 respondents during 2006 – 2008 and no respondents during 2008 – 2010, a period of low lake levels and/or high turbidity. The number of respondents over the past ten years (2011-21) has averaged 17. Consequently, the results need to be interpreted with this information in mind.

After the initial stages of reopening the lake for fishing, fishing effort during 2006 – 2014 declined to very low levels (see Figure 8). After 2014 fishing effort increased to a high of 3,305 days during 2015-16. Since this time, it has decreased to around 1,000 – 1,600 days for the period 2018 – 2021. The number of anglers fishing Lake Crescent generally follows angling effort, with an average of 500 anglers fishing the lake each season over the past ten years (see Figure 9). These results indicate a small number of anglers fishing Lake Crescent for around 2 – 4 days per season.

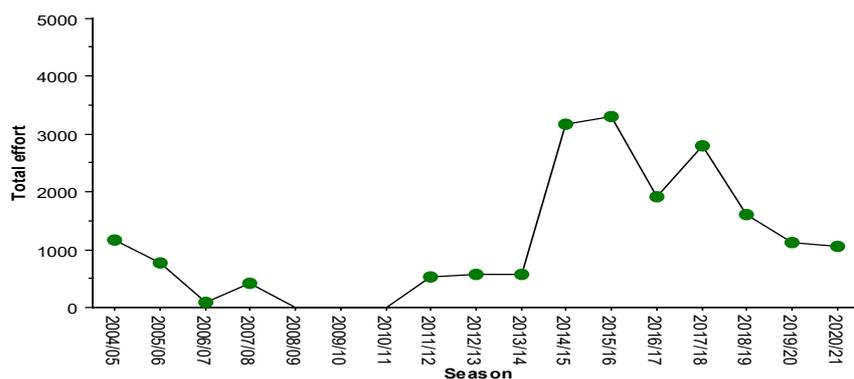


Figure 8: Catch per day for brown trout, 2004 - 2021.

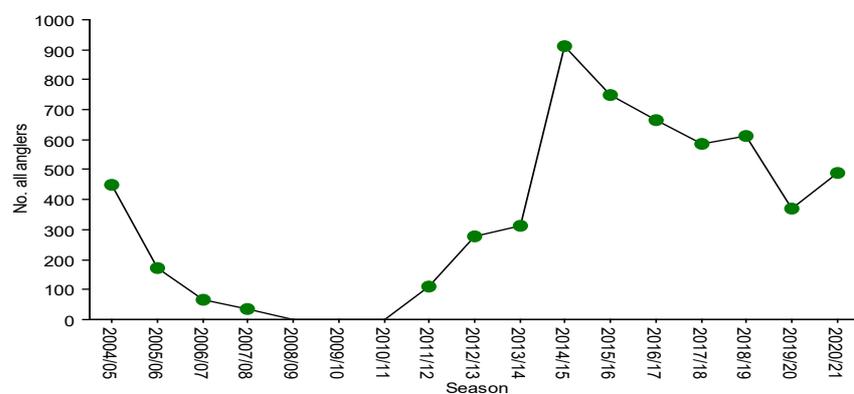


Figure 9: Estimated number of anglers that fished Lake Crescent 2004 - 2021.

Inland Fisheries Service Fisheries Performance Assessment

Technical Report Lake Crescent 2021

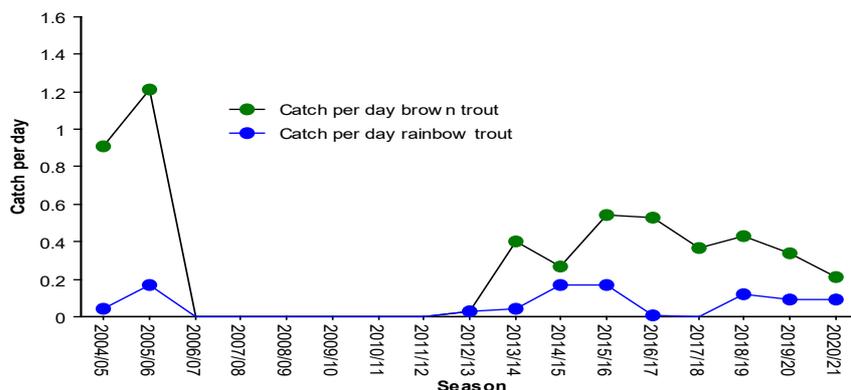


Figure 10: Daily catch rate for brown & rainbow trout 2004 - 2021.

The long term catch rate for brown and rainbow trout has typically been at low levels (see Figure 10). Over the 30 years of the APS reporting has averaged 0.3 brown trout and 0.1 rainbow trout per day. The catch rate during the first two years after the reopening of the lake to fishing resulted in daily catch rates of 0.9 – 1.2 for brown trout and below 0.2 for rainbow trout. Catch rates for both species fell to negligible levels during 2007 – 2013. Since this time, daily catch rates have increased to around 0.3 - 0.5 for brown trout and 0.1 – 0.2 for rainbow trout.

The estimated average annual harvest since the reopening of the lake is around 500 brown trout per season and 100 rainbow trout (see Figure 11). For brown trout this has been as high as 1,800 for the 2015 - 16 season, with negligible harvest during 2007 – 2013. The average harvest over the last ten years is 630 brown trout. The maximum harvest for rainbow trout was during 2015-16 with an estimated 516 fish removed. The average harvest over the last ten years is 160 rainbow trout per season.

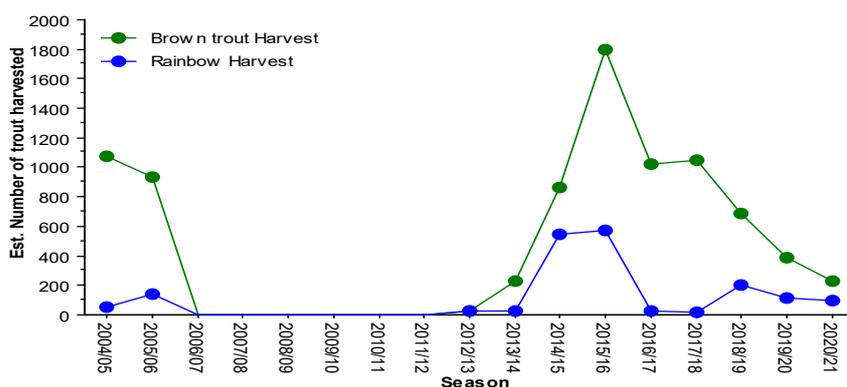


Figure 11: Estimated harvest of brown & rainbow trout 2004 – 2021.

Inland Fisheries Service *Fisheries Performance Assessment*

Technical Report Lake Crescent 2021

5. STOCKING

5.1. BROWN TROUT

Except for two fry stockings during 2013 and 2014, all stockings post 2013 have consisted of adult brown trout transfers (see appendix B). Since 2015, 10,331 adult brown trout have been transferred from various spawning traps on the Central Plateau to Lake Crescent. The largest transfer of adult brown trout occurred during 2017 with 3,266 fish being released. This was followed by 2,000 adult fish during 2018, 1,000 during 2019 and 500 tagged fish for this assessment in April 2021.

5.2. RAINBOW TROUT

Since 2013, there have been only two stockings of rainbow trout (see Appendix C). In 2013, 15,000 wild strain fry were released and during June 2017, 310 domestic yearlings.

6. ADDITIONAL DATA OR INFORMATION

6.1. BY-CATCH

During the survey approximately 20 eels were captured, with a wide range of sizes present, 300 mm to 1,200 mm. A small number of golden galaxias were captured but the capture method was not suitable to catch this species.

6.2. TURBIDITY LEVELS

Lake Crescent is a shallow lake with an average depth of 1.5 m. The lake is subject to significant drawdowns relating to high evaporation and irrigation takes, with extremely high turbidity events occurring when inflows are low for an extended period, specifically during drought conditions. Appendix E shows turbidity levels from 2008 to 2021 and associated lake level information. Turbidity levels were very high during 2008 following on from the drought of 2005 -2009, where low lake levels and high turbidity prevailed. In late 2009, significant inflows occurred and the lake level increased, with turbidity levels declining to relatively lower readings. These levels continued to decline until 2012, at which time they remained settled around 50 – 70 NTU's. A significant spike of 150 NTU's occurred during June 2018 but quickly declined to previous levels. A relatively small but sustained turbidity event has since occurred post June 2019, with turbidity levels increasing to around 150 NTU's. The significance of these increases in turbidity and the impacts on the trout population need to be examined further, however there is evidence to show that increased levels of turbidity lead to decreasing trout productivity.

Inland Fisheries Service *Fisheries Performance Assessment*

Technical Report Lake Crescent 2021

7. DISCUSSION

The high CPUE of 5.6 brown trout per trap, in conjunction with the population estimate results, demonstrates the brown trout population within Lake Crescent is at the upper level of expectation. While the figure of 8,500 brown trout is within the criteria established in the TRIFMP, it appears to be greater than the current sustainable capacity of the fishery. The primary reason for this is related to the effect increased turbidity levels has on the ability of brown trout to efficiently capture enough food to maintain growth and condition. Once turbidity levels increase over 50 – 70 NTU's, the ability of trout to feed becomes greatly inhibited. If these conditions continue over an extended period, trout growth slows and body condition declines. These circumstances occurred during mid-2019. Turbidity levels in June 2019 were around 50 – 70 NTU's. After this time there was a critical increase in turbidity peaking at 150 NTU's. It appears this increase caused a decline in the productivity of the trout population. This situation, in combination with a larger population size, has seen a decline in the average size and condition of both brown and rainbow trout across a range of lengths.

Management Criteria (TIRFMP)

The average weight of brown trout was 1.67 kg that is below the criteria set within the TIRFMP, at 2 kg. The percentage of brown trout over 600 mm was above the prescribed criteria of 15 percent (21%), although many were only in fair to poor condition. The long term average condition factor for brown trout has previously been around 1.2 – 1.3 k, this was 1.09 k, well below acceptable levels. Despite these results, there is evidence to show brown trout have grown to a large size relatively quickly when conditions have been favourable, as occurred during 2012 to early 2018, with extended periods of higher lake levels and low turbidity (less than 50 NTU's). A high number of brown trout have grown to over 600 mm with several greater than 700 mm. However, once turbidity reached higher levels, as seen during June 2018 until May 2021 (up to 150 NTU's), trout become unable to access enough food resources to sustain growth and therefore lost condition. The impacts of low lake level and associated high turbidity on the growth and condition of trout are generally linked. Consequently, on-going management of the Lake Crescent fishery needs to consider this link, with appropriate actions being developed and implemented.

Length Frequency Information

The length frequency data shows there are no signs of any natural recruitment occurring, the fishery at present relies solely on trout stocking. The structure of the population is robust with multiple cohorts present. These cohorts largely relate to a series of adult brown trout transfers undertaken during 2015 – 2021. The overall growth rate is however relatively slow, with compression of length cohorts evident across the population. This relates to the lower productivity of the trout population and the total numbers of trout in the lake.

Angling Effort, Catch Rate and Harvest

After the initial interest surrounding the reopening of Lake Crescent during 2004/05 season, angling effort declined to very low levels during 2006 to 2012. This was a period of low lake levels and high turbidity, leading to low catch rates and a negligible harvest of trout. This situation was compounded with a period of no stocking between 2006 – 2012, due to poor water quality. After the lake level improved post 2010, turbidity declined and stocking recommenced. Initially hatchery reared fry and fingerlings were used, with

Inland Fisheries Service *Fisheries Performance Assessment*

Technical Report Lake Crescent 2021

generally poor results. Consequently, stocking progressed to the use of adult brown trout transfers. Stocking adult brown trout caused an increase in participation, catch rate and harvest to generally acceptable levels. This situation persisted between 2013 to 2019, until turbidity levels once again increased, and the daily catch rate and angling effort declined. During 2019 and 2020, there were anecdotal reports from anglers of poor condition fish. The combined impacts of lower lake levels and increased turbidities had driven a decline in the quality of the fishery again, with poor fish condition and slow growth occurring, resulting in poor catch rates and participation.

Rainbow Trout

In terms of the rainbow trout population, the relative abundance of fish was low. This relates to low stocking rates with only two stocking events occurring over the last eight years, one during 2013 (fry) and one in 2017 (yearlings). The fry from 2013 have survived well and are reaching the end of their life expectancy and are in poor condition. The 2017 yearling stocking have grown slowly, being released at 300 g and at the time of capture were around 800 g. These fish displayed a broad range of condition from poor to good. The viability of rainbow trout within Lake Crescent is totally dependent on stocking.

Stocking and Transfers

The impacts of low lake levels and associated increases in turbidity have had an impact on the Lake Crescent trout fishery through time. There is an established link between the growth and condition of trout and turbidity levels. Given this circumstance, it would be prudent to establish stocking protocols that consider turbidity, lake levels and the seasonal climate outlook. The following recommended risk assessment guidelines for stocking under various turbidity levels and seasonal climate outlook, should be incorporated into the annual stocking planning process (see Table 4).

Table 4: Lake Crescent stocking risk assessment, relating to turbidity and seasonal climate outlook relating to rainfall.

		Seasonal climate outlook (rainfall)				
		Well above average	Above average	Average	Below average	Well below average
Turbidity range (NTU)	0 – 20	Low	Low	Low	Moderate	Moderate
	20 - 30	Low	Low	Moderate	Moderate	High
	30 - 50	Low	Moderate	Moderate	No stocking	No stocking
	> 50	Moderate	Moderate	High	No stocking	No stocking

- **Low** – normal stocking levels.
- **Moderate** – restricted stocking levels.
- **High** – highly restricted stocking levels or no stocking.
- **No stocking** – no stocking until risk levels fall to moderate or low risk levels.

Inland Fisheries Service *Fisheries Performance Assessment*

Technical Report Lake Crescent 2021

8. RECOMMENDATIONS

- Strong consideration is given to remove up to 20% of the brown trout population, specifically fish over 500 mm that are in poor condition and unlikely to regain weight.
- The fishery management criteria as listed in the TRIFMP (2018-2028) be adjusted, specifically the target population range. Based on previously reported data, the daily catch rate for brown and rainbow trout remain as is at 0.4 (+/- 0.2) & 0.2 (+/- 0.1) fish per day respectively. The estimated population range is amended to 3,000 – 5,000 brown trout, pending lake level, turbidity and the long term climate outlook.
- The minimum size limit and daily bag limit remain unchanged.
- Future stocking/transfers events are only undertaken during times when the turbidity levels and the seasonal climate outlook are favourable, and the risk of stocking trout is acceptable. Table 4 in the Discussion (Section 7), provides a guide for the medium term planning of trout stocking for turbid lake fisheries.
- Monitoring of future angling effort and harvest is achieved by angler feedback, creel checking and assessment via the annual postal survey (or similar mechanism).
- To assess the outcomes of management actions, monitoring of the trout population is conducted during the 2022-23 period.
- Continued annual monitoring of the golden galaxias population is undertaken during March – April and the results are incorporated into the annual stocking planning process.
- Monitoring of lake levels and turbidity is conducted at a minimum of quarterly intervals.

Inland Fisheries Service *Fisheries Performance Assessment* *Technical Report Lake Crescent 2021*

9. APPENDIX

Appendix A: Summary data for tagged adult brown trout, Liawenee Canal fish trap, April 2021.

	Measurement	Average	Minimum	Maximum
All Brown Trout n=500	Length (mm)	419	248	535
	Weight (g)	852	180	1550
	Condition Factor (K)	1.1	0.6	1.4
Male n=266	Length (mm)	433	248	535
	Weight (g)	902	180	1550
	Condition Factor (K)	1.1	0.7	1.4
Female n=234	Length (mm)	403	330	495
	Weight (g)	795	440	1370
	Condition Factor (K)	1.2	0.6	1.4

Appendix B: Stocking records for Lake Crescent – Brown Trout (2013– 2021) (excludes local fish salvages).

Date	Age	Number	Origin	Weight (g)
8/08/2013	Adult	70	Hydro Creek	400
30/10/2013	Fry	10,000	IFS New Norfolk	2.5
7/01/2014	Fry	5,000	IFS New Norfolk	6.2
20/05/2015	Adult	400	Liawenee Canal	900
27/05/2015	Adult	200	Liawenee Canal	900
4/06/2015	Adult	100	Tumbledown Creek	500
12/06/2015	Adult	200	Liawenee Canal	900
19/06/2015	Adult	430	Mountain Creek	700
25/06/2015	Adult	100	Mountain Creek	700
16/07/2015	Adult	70	Liawenee Canal	900
16/07/2015	Adult	430	Tumbledown Creek	500
23/07/2015	Adult	110	Sandbanks	800
23/07/2015	Adult	100	Scotch Bobs Creek	500
30/07/2015	Adult	250	Tumbledown Creek	500
30/07/2015	Adult	175	Scotch Bobs Creek	500
30/07/2015	Adult	50	Sandbanks	800
14/06/2016	Adult	500	Liawenee Canal	1,000
16/06/2016	Adult	200	Sandbanks	1,000
15/07/2016	Adult	250	Tumbledown Creek	600
27/04/2017	Adult	1,400	Liawenee Canal	1,000
28/04/2017	Adult	570	Sandbanks	900
21/05/2017	Adult	255	Liawenee Canal	1,000
24/05/2017	Adult	150	Liawenee Canal	1,000
26/05/2017	Adult	180	Tumbledown Creek	700
31/05/2017	Adult	152	Scotch Bobs Creek	600
7/06/2017	Adult	150	Liawenee Canal	1,000
20/06/2017	Adult	125	Tumbledown Creek	745
20/06/2017	Adult	24	Scotch Bobs Creek	790

Inland Fisheries Service *Fisheries Performance Assessment*

Technical Report Lake Crescent 2021

29/06/2017	Adult	110	Tumbledown Creek	745
18/07/2017	Adult	40	Scotch Bobs Creek	790
18/07/2017	Adult	110	Tumbledown Creek	745
10/04/2018	Adult	1,220	Liawenee Canal	1,000
11/04/2018	Adult	550	Liawenee Canal	1,000
15/04/2018	Adult	230	Liawenee Canal	1,000
10/04/2019	Adult	250	Liawenee Canal	850
12/04/2019	Adult	500	Liawenee Canal	850
17/04/2019	Adult	250	Liawenee Canal	850
2/04/2021	Adult	500	Liawenee Canal	800

Appendix C: Stocking records for Lake Crescent – Rainbow Trout (2013 – 2021) (excludes local fish salvages).

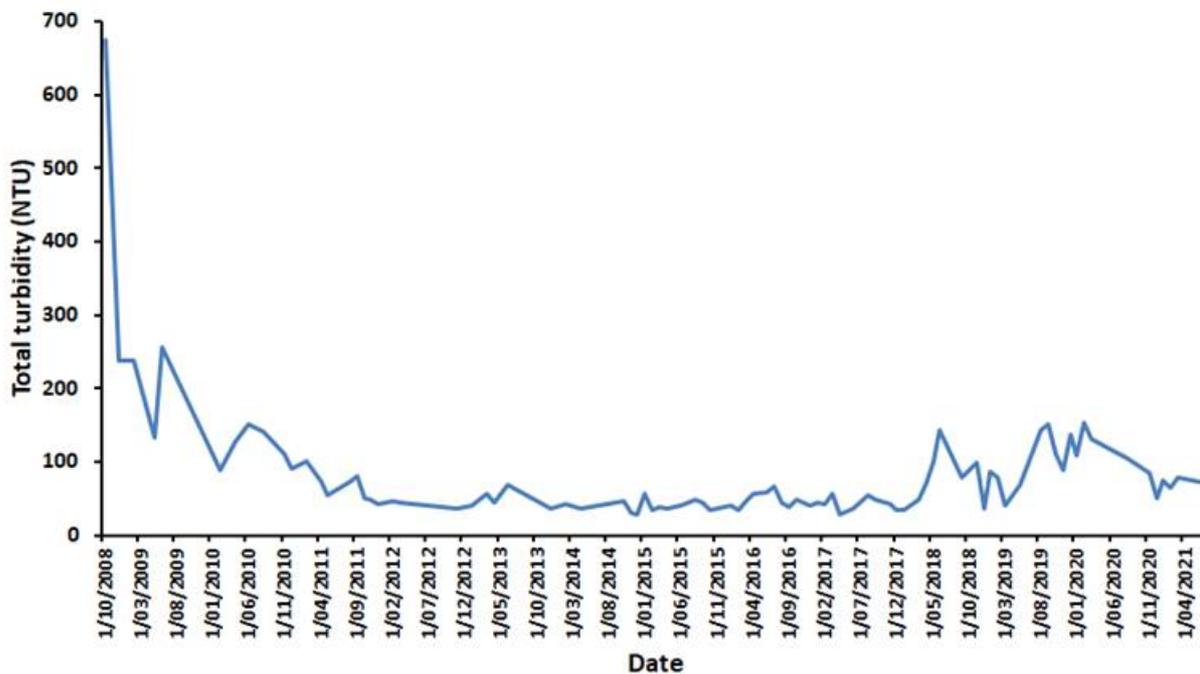
Date	Age	Number	Origin	Weight (g)
14/01/2013	Fry	6,500	IFS New Norfolk	1.7
14/01/2013	Fry	85,00	IFS New Norfolk	0.35
6/06/2017	Yearling	3,000	HAC - Millybrook	310

Appendix D: Performance criteria for Lake Crescent, as listed in the Tasmania Inland Recreational Fishery Management Plan 2018 – 2028 (TIRFMP)

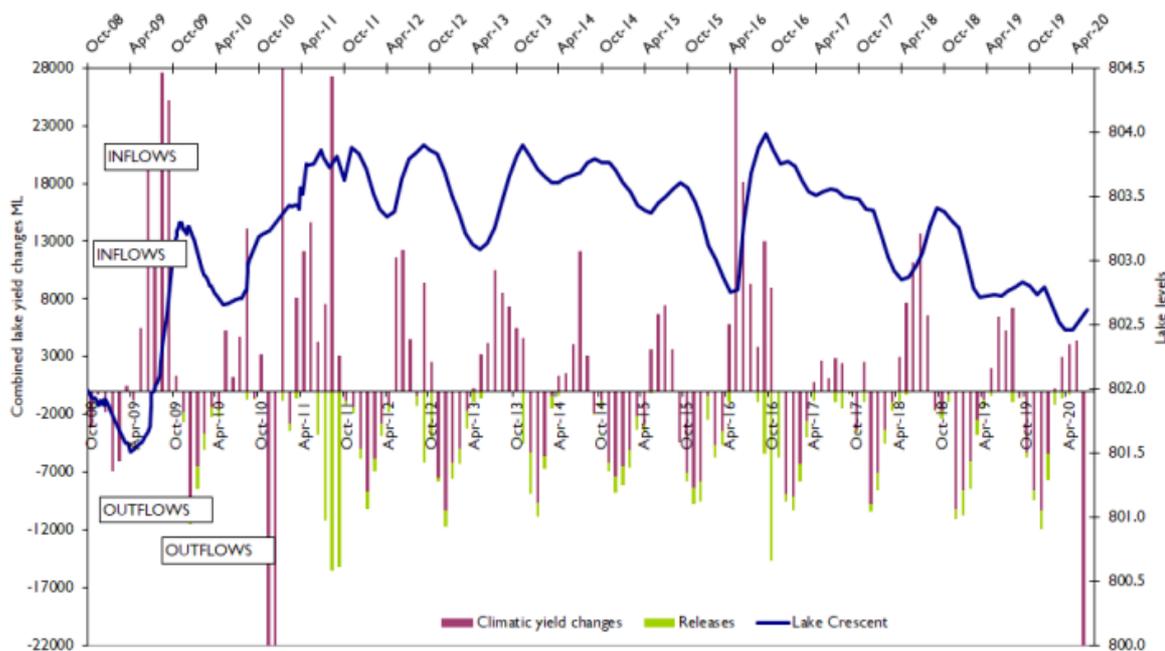
Species	Average weight (g)	Catch rate	Percent of Large fish (%)	Population size
Brown trout	> 400mm 2.0 kg +/- 0.1	0.4 +/- 0.2	> 600mm 15%	6,000 – 10,000
Rainbow trout	> 400mm 1.5 kg +/-0.2	0.2 +/- 0.1	> 500mm 5%	

Inland Fisheries Service Fisheries Performance Assessment

Technical Report Lake Crescent 2021



Appendix E: (Top) Turbidity readings for Lake Crescent 2008 - 2021; (Bottom) associated lake levels, water yields and deficits 2008 – 2020. (Source: Inland Fisheries Service, Carp Management Program Annual Report 2019 - 20).





Appendix F: Box trap set locations, Lake Crescent, June 2021 (12 sets of 3 traps and 2 sets of 2 traps, 40 traps total).