

Inland Fisheries Service

Central Highlands Fish Trap Report Brown Trout 2023



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Central Highlands Fish Trap Report – Brown Trout 2023

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Introduction

The Inland Fisheries Service (IFS) recognises the value of maintaining wild fisheries as they are best suited to our environment and provide a much sought-after angling experience. The wild brown trout fisheries of yingina / Great Lake, Arthurs Lake and Lake King William have traps to capture trout as they migrate upstream to spawn during late autumn and winter. Traps are used to monitor brown trout populations from these lakes. Some of the trapped fish are transferred to Assisted Fisheries with the remainder counted through and allowed to spawn upstream. The management of adult spawning fish is guided by the *Tasmanian Inland Recreational Fishery Management Plan 2018-28*.

Trapping has occurred at Liawenee Canal, yingina / Great Lake since the 1960's and has been the primary source of wild adult brown trout for stocking Assisted Fisheries. A trap at Sandbanks Creek, yingina / Great Lake became operational in 2015. At Arthurs Lake, a trap has been operating on Hydro Creek since the 1970's. In 2014 traps were built on Scotch Bobs and Tumbledown creeks for monitoring of the brown trout at Arthurs Lake. The trap on the River Derwent above Lake King William, built in 2016 became operational in 2017, has been an important source of additional adult brown trout.

Brown trout spawning run 2023

Trapping of the 2023 brown trout spawning run commenced on 3 April 2023 and finished on 31 July 2023. A total of 12,753 adult brown trout were transferred to waters across the state, a further 5,418 were released upstream of the traps to spawn (Table 1).

Table 1. Wild adult brown trout caught in Central Highland fish traps in 2023

Trap	Number transferred	Number released above trap
Liawenee Canal – yingina / Great Lake	7,590	0
Sandbanks Creek – yingina / Great Lake	1,532	0
Tumbledown Creek – Arthurs Lake	1,154	2,019
Scotch Bobs Creek – Arthurs Lake	245	751
Hydro Creek – Arthurs Lake	1,433	2,616
River Derwent – Lake King William	799	32
Total	12,753	5,418

Table 2. Total number of wild adult brown trout caught in Central Highland fish traps in the past 5 years.

Trap	2023	2022	2021	2020	2019
Liawenee Canal - yingina / Great Lake Est. 2006	7,590	4,746	10,240	9,510	11,747
Sandbanks Creek – yingina / Great Lake Est. 2015	1,532	1,265	2,077	1,105	1,718
Tumbledown Creek – Arthurs Lake Est. 2014	3,173	10,676	8,850	6,243	3,098
Scotch Bobs Creek – Arthurs Lake Est. 2014	996	2,223	3,438	1,703	798
Hydro Creek – Arthurs Lake Est. 2017	4,049	2,850	2,651	2,135	826
Derwent River - Lake King William Est. 2016	831	2,787	6,265	0	10,663
Total	18,171	24,547	33,521	20,696	17,115

Liawenee Canal – yingina / Great Lake

The trap was opened 3 April and closed 13 July. Low water levels in Lake Augusta saw a limited flow in the Liawenee Canal until the start of June, providing good spawning opportunity in the canal below the trap. This likely reduced the number of fish that made their way upstream to the trap (see Figure 1). The peak of the run is usually during May however most fish were captured during April this year. The trap caught 7,590 brown trout.

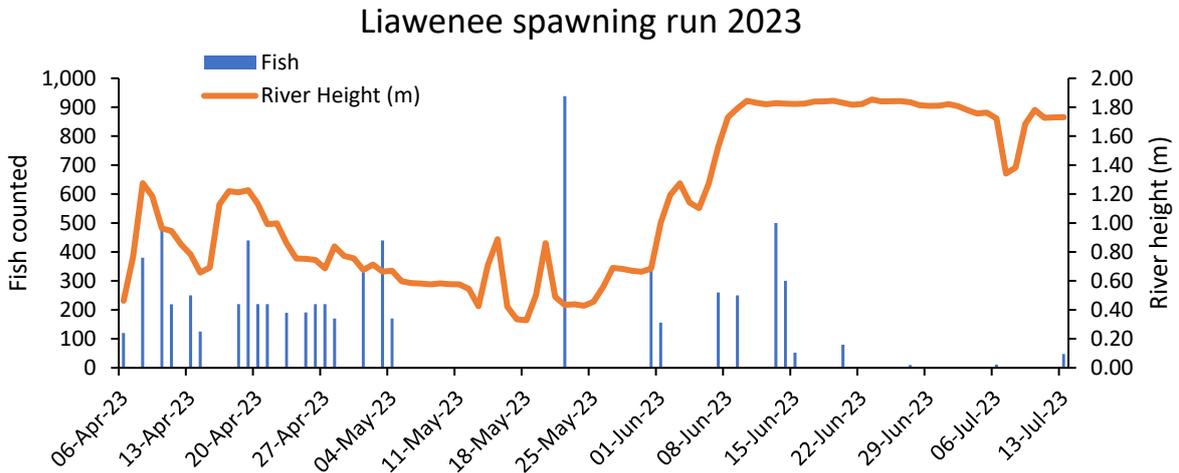


Figure 1. Number of brown trout captured in the trap (counted when they are removed from the trap) and river height for Liawenee Canal fish trap, April to July 2023.

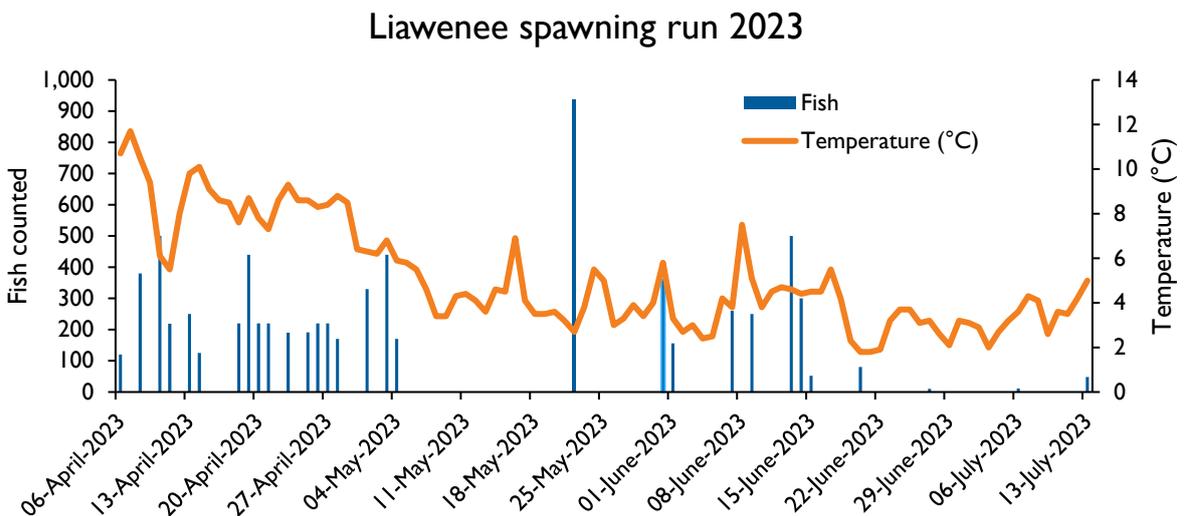


Figure 2. Number of brown trout captured in the trap (counted when they are removed from the trap) and water temperature for Liawenee Canal fish trap, April to July 2023.

Sandbanks Creek – yingina / Great Lake

The Sandbanks Creek trap was opened on 20 April and closed 20 June. Fish steadily entered the trap until the end of June when the run slowed. The trap caught 1,532 brown trout. The catch was on par with the average for the last five years.

Sandbanks Creek spawning run 2023

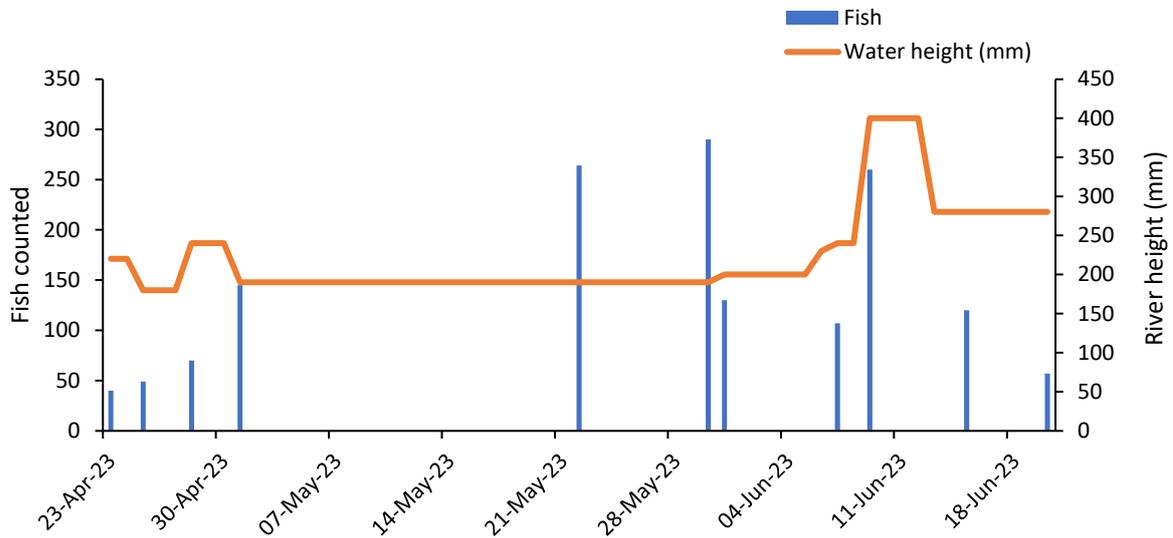


Figure 3. Number of brown trout captured (counted when they are removed from the trap) and river height for Sandbanks Creek fish trap, April to June 2023.

Sandbanks Creek spawning run 2023

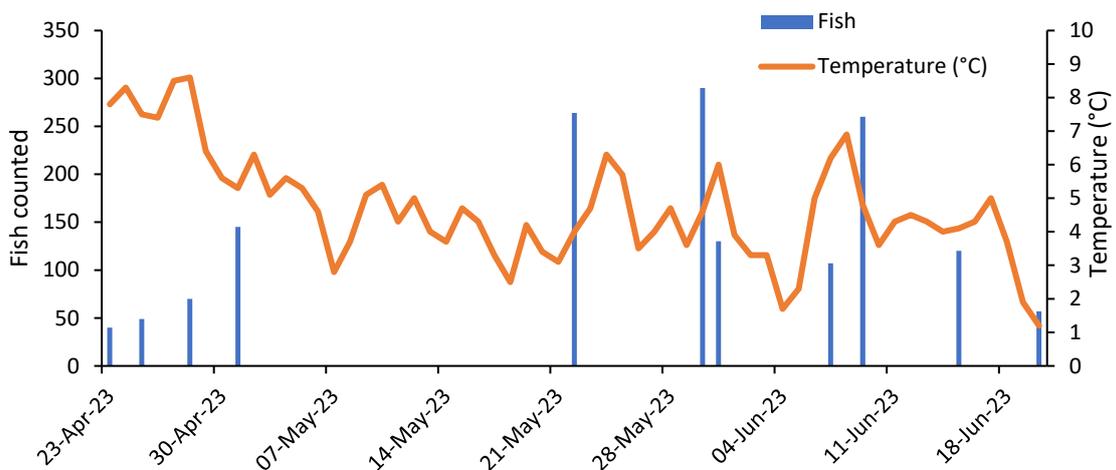


Figure 4. Number of brown trout captured (counted when they are removed from the trap) and water temperature for Sandbanks Creek fish trap, April to June 2023.

Hydro Creek – Arthurs Lake

The Hydro Creek trap was opened on 6 June and closed on 31 July. Fish were captured consistently throughout the spawning run. The trap caught 4,049 brown trout. This was the most fish caught in the last five years. It was also the best performing Arthur’s Lake trap for the first time since it was re-built in 2017. This is likely due to the modifications done to the weir to raise the height by 100 mm, allowing more water to pass through the trap.

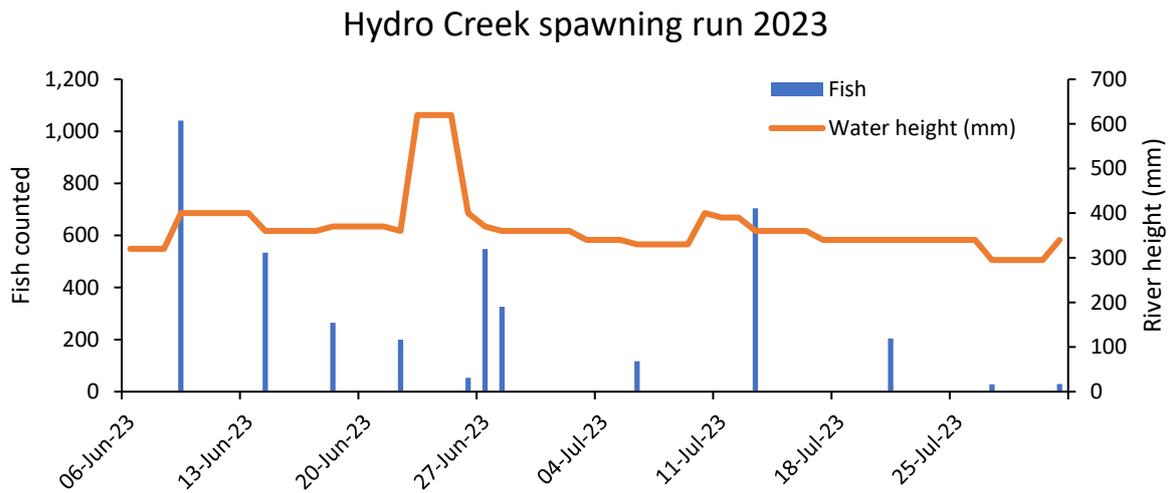


Figure 5. Number of brown trout captured (counted when they are removed from the trap) and river height for Hydro Creek fish trap, June to July 2023.

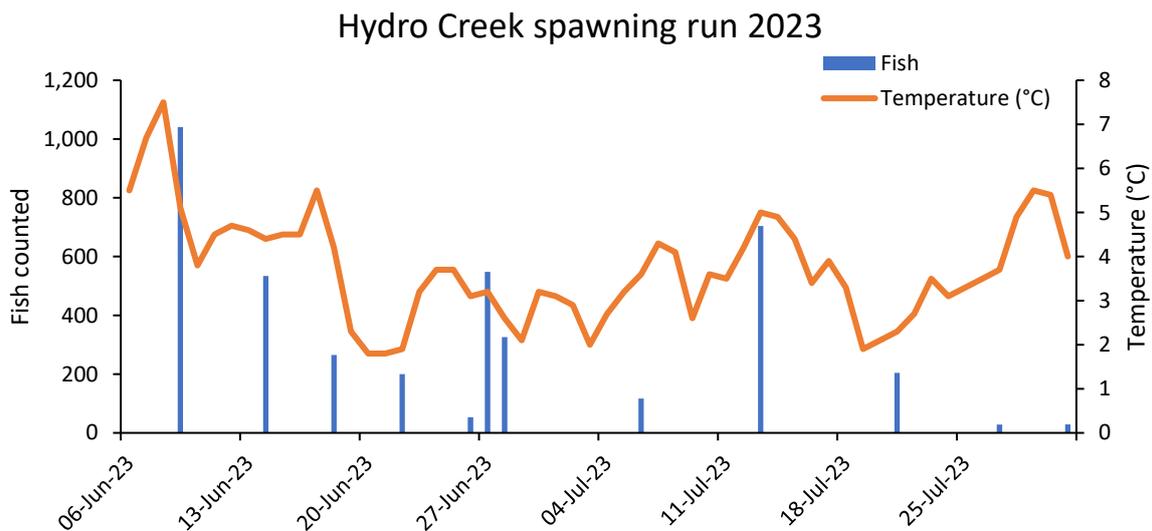


Figure 6. Number of brown trout captured (counted when they are removed from the trap) and water temperature for Tumbledown Creek fish trap, June to July 2023.

Scotch Bobs Creek – Arthurs Lake

The Scotch Bobs Creek trap was opened on 6 June and closed on 31 July. The run peaked on 18 June with 224 fish caught. The trap caught 996 brown trout. This catch was the second fewest number of fish caught in the last five years.

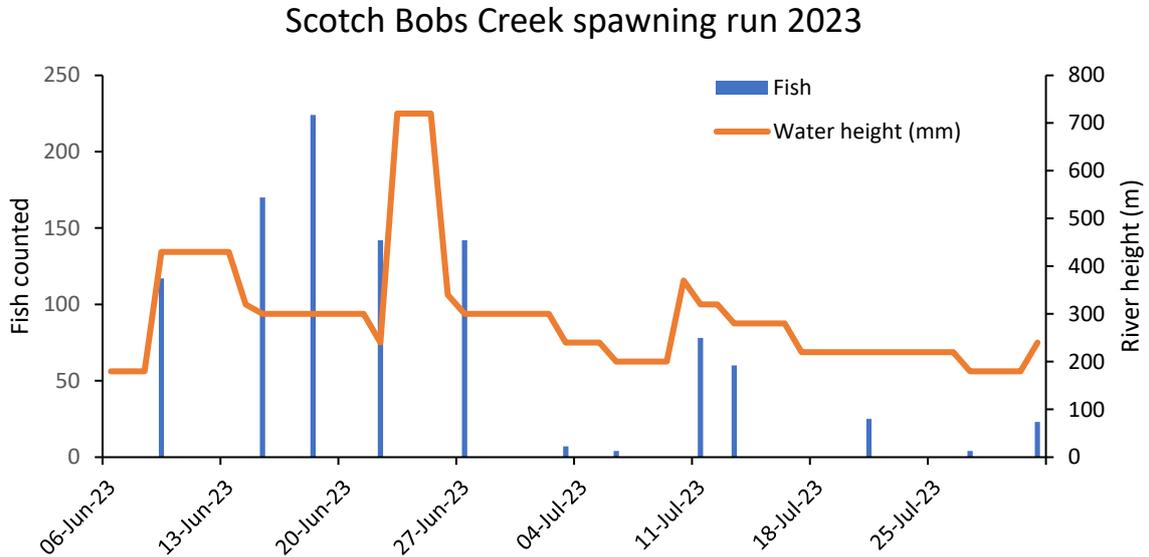


Figure 7. Number of brown trout captured (counted when they are removed from the trap) and river height for Scotch Bobs Creek fish trap, June to July 2023.

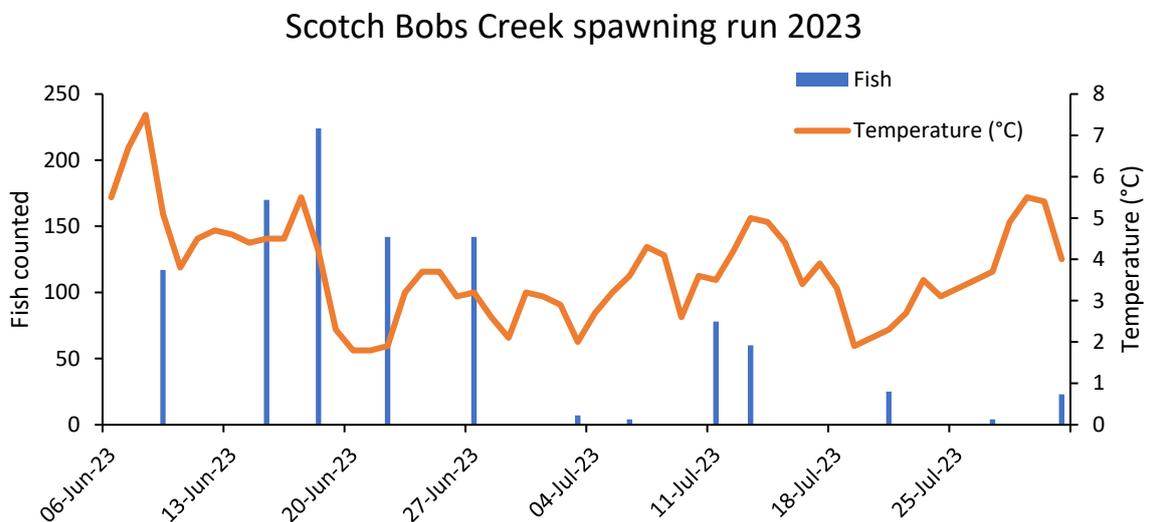


Figure 8. Number of brown trout captured (counted when they are removed from the trap) and water temperature for Tumbledown Creek fish trap, June to July 2023.

Tumbledown Creek – Arthurs Lake

The Tumbledown Creek trap was opened from 22 May and closed on 31 August. The peak of the run occurred on 9 June with 760 fish captured. However, the peak coincided with a rain event and the creek flooded around the weir allowing fish to bypass the trap and progress upstream. A similar flood also occurred on 23 June. These two flood events at the peak of the run likely saw a significant number of fish bypass the trap. As a result, the trap caught 3,173 brown trout. This was the second fewest number of fish caught in the last five years.

Tumbledown Creek spawning run 2023

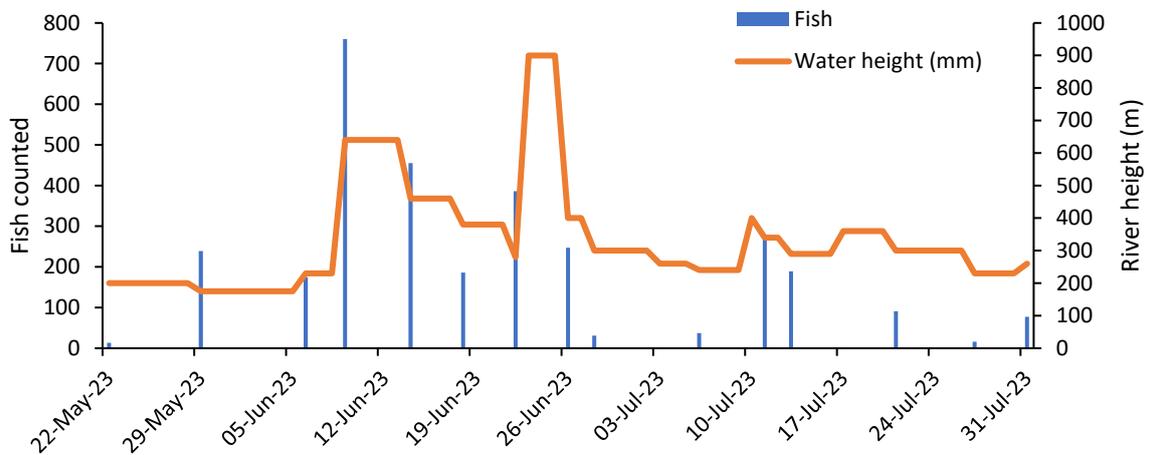


Figure 9. Number of brown trout captured (counted when they are removed from the trap) and river height for Tumbledown Creek fish trap, May to July 2023.

Tumbledown Creek spawning run 2023

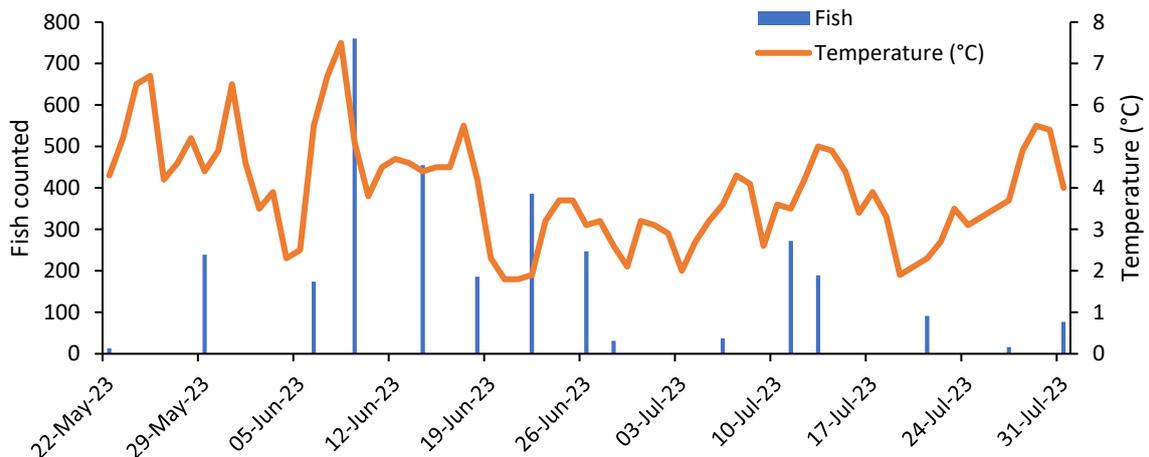


Figure 10. Number of brown trout captured (counted when they are removed from the trap) and water temperature for Tumbledown Creek fish trap, May to July 2023.

River Derwent – Lake King William

The River Derwent trap was opened on 1 June and closed on 27 July. Lake King William was around 14 metres below full supply (BFS) when the trap was installed. The lake level filled up to 3.5 metres BFS, before the trap was removed on 27 July. The trap caught 831 brown trout. There was no clear peak due to low catches throughout the spawning run.

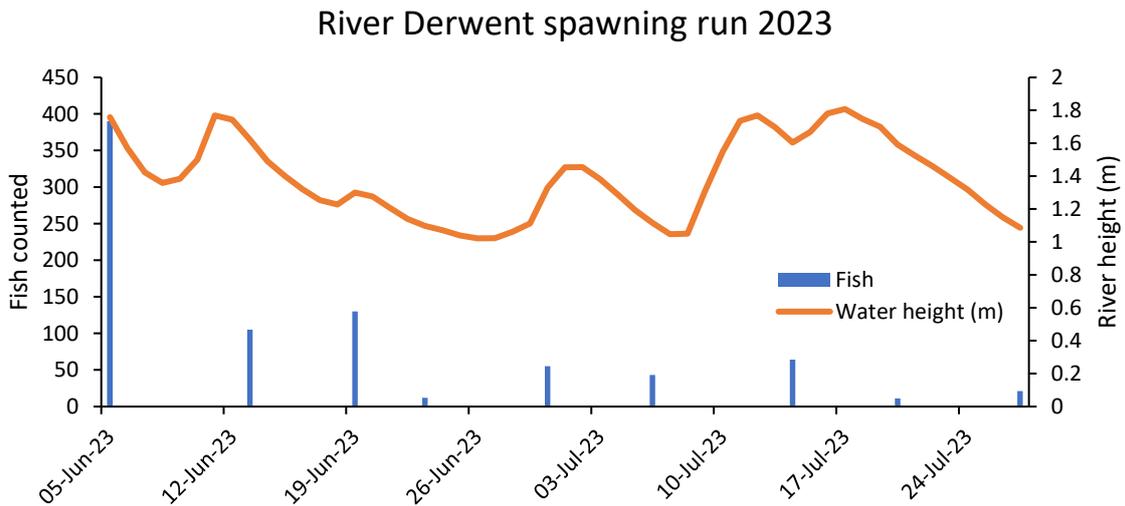


Figure 11. Number of brown trout captured (counted when they are removed from the trap) and river height for River Derwent fish trap, June to July 2023.

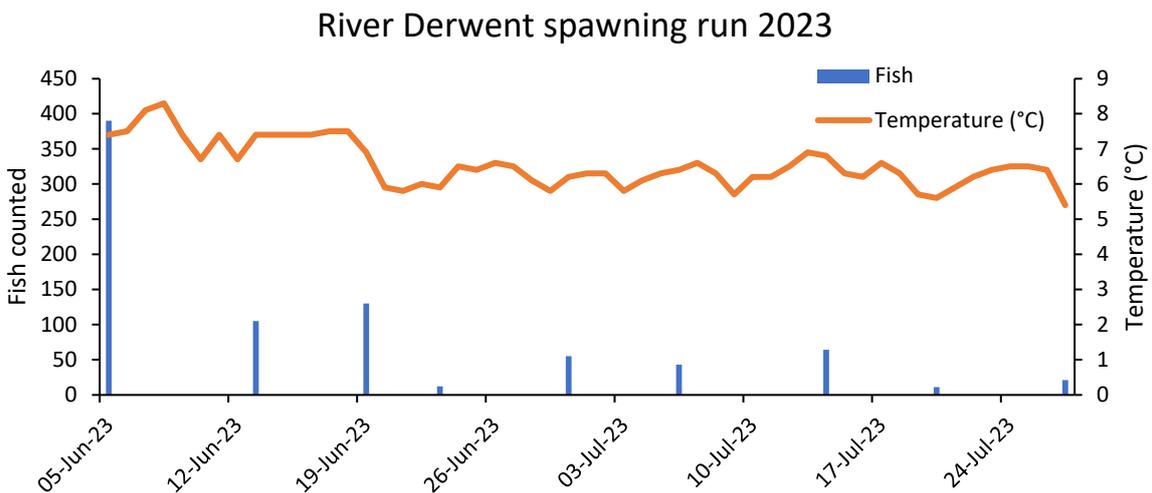


Figure 12. Number of brown trout captured (counted when they are removed from the trap) and water temperature for River Derwent fish trap, June to July 2023.

Weigh and measure – brown trout

One hundred males and 100 females were weighed and measured from each trap. Often, the weigh and measure took place over several days to achieve the sample of 200 fish.

This year due to the low numbers of fish captured in the Derwent River trap, only 28 males and 100 females were measured.

Spawning fish sizes 2023

Table 3. Summary of weigh and measure sample results for each trap in 2023.

Trap	Weight Range	Average Weight (g)	Length Range (mm)	Average Length
Liawenee Canal – yingina / Great Lake	220 - 1,150	733	270 - 490	403
Sandbanks Creek – yingina / Great Lake	250 - 1,320	621	277 - 490	378
Tumbledown Creek – Arthurs Lake	170 – 1,320	466	240 - 496	350
Scotch Bobs Creek – Arthurs Lake	130 - 1,1200	529	224 - 505	363
Hydro Creek – Arthurs Lake	140 - 1,150	487	125 - 490	355
Derwent River – Lake King William	90 - 540	259	205 - 369	283

Liawenee Canal – yingina / Great Lake weigh and measure results

Table 4. Summary of weigh and measure sample at Liawenee Canal in 2023.

Grouping	Measurement	Mean	Minimum	Maximum
All fish n=200	Length (mm)	403	270	490
	Weight (g)	733	220	1,150
	Condition factor	1.102	0.563	1.526
Male n=100	Length (mm)	415	270	490
	Weight (g)	775	220	1,150
	Condition factor	1.053	0.886	1.247
Female n=100	Length (mm)	391	308	460
	Weight (g)	692	360	1,020
	Condition factor	1.151	0.563	1.526

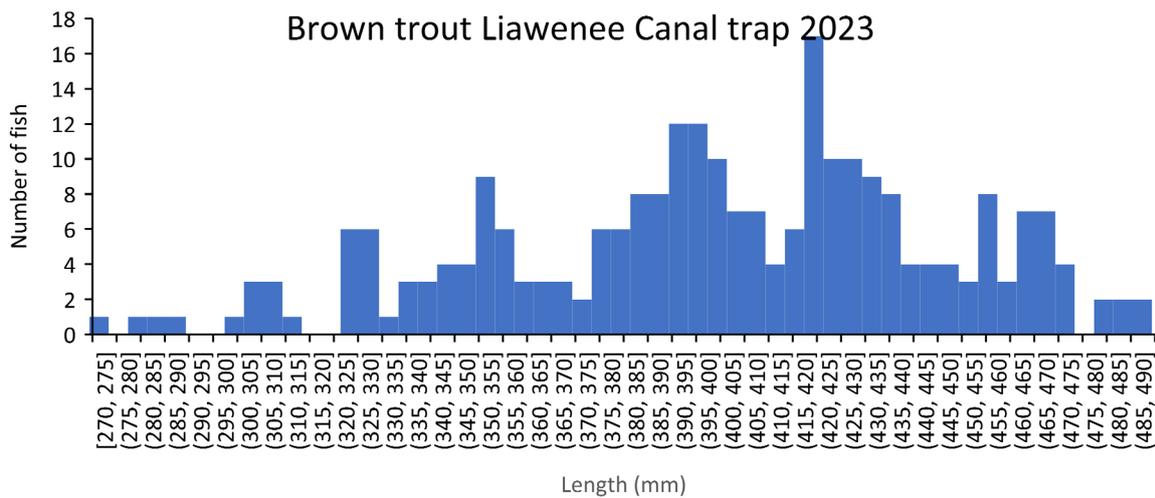


Figure 13. Length frequency histogram of fish sampled at Liawenee Canal in 2023.

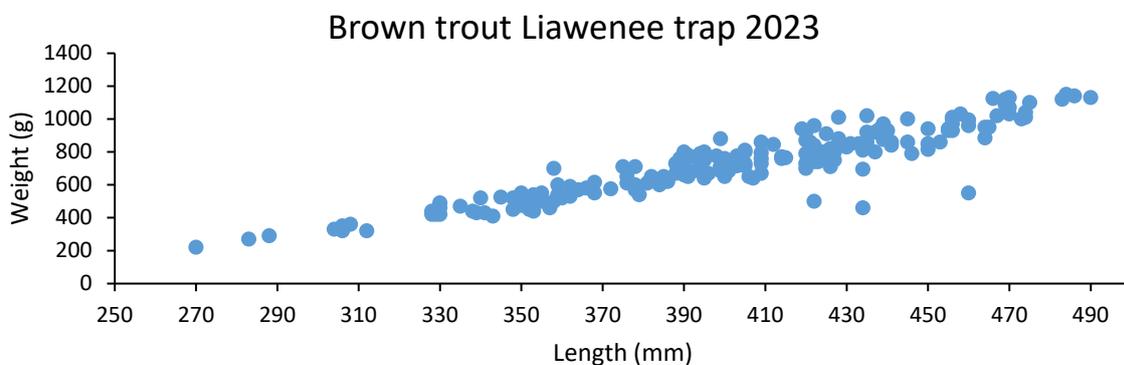


Figure 14. Length vs weight of fish sampled at Liawenee Canal in 2023.

Sandbanks Creek – yingina / Great Lake weigh and measure results

Table 5. Summary of weigh and measure sample at Sandbanks Creek in 2023.

Grouping	Measurement	Mean	Minimum	Maximum
All Trout n=200	Length (mm)	378	277	490
	Weight (g)	621	250	1320
	Condition factor	1.127	0.720	1.404
Male n=100	Length (mm)	379	277	490
	Weight (g)	616	250	1320
	Condition factor	1.097	0.816	1.373
Female n=100	Length (mm)	377	305	480
	Weight (g)	626	350	960
	Condition factor	1.157	0.720	1.404

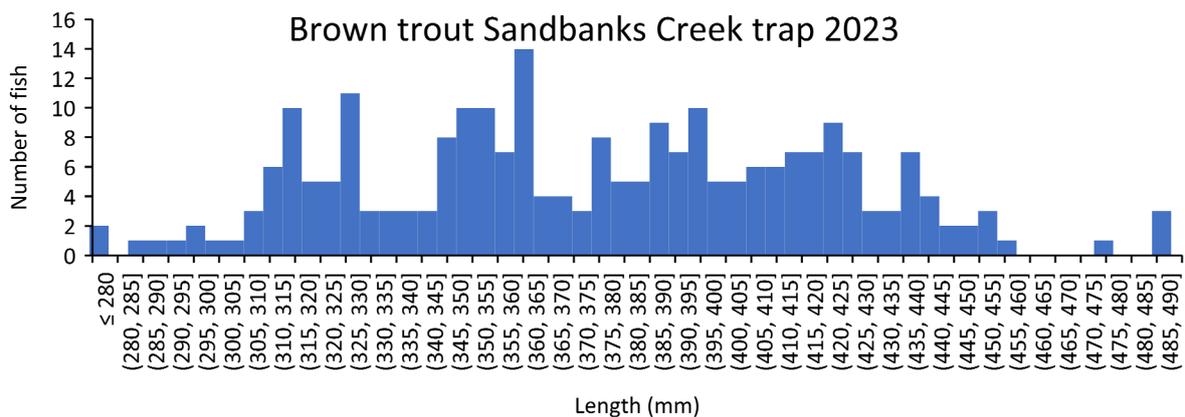


Figure 15. Length frequency histogram of fish sampled at Sandbanks Creek in 2023.

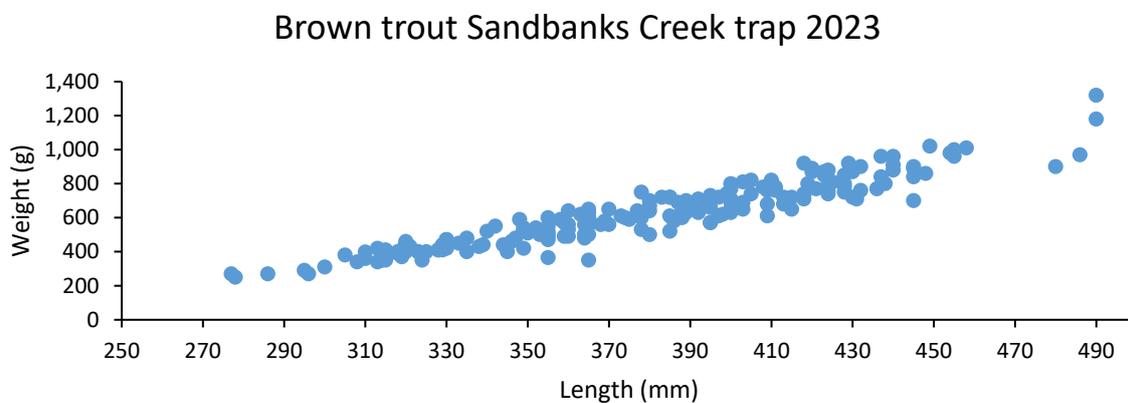


Figure 16. Length vs weight of fish sampled at Sandbanks Creek in 2023.

Tumbledown Creek – Arthurs Lake weigh and measure results

Table 6. Summary of weigh and measure sample at Tumbledown Creek 2023.

Grouping	Measurement	Mean	Minimum	Maximum
All Trout n=200	Length (mm)	350	240	496
	Weight (g)	466	170	1320
	Condition factor	1.044	0.719	1.495
Male n=100	Length (mm)	350	240	496
	Weight (g)	475	170	1320
	Condition factor	1.035	0.816	1.495
Female n=100	Length (mm)	350	263	438
	Weight (g)	456	200	720
	Condition factor	1.053	0.719	1.271

Brown trout Tumbledown Creek trap 2023

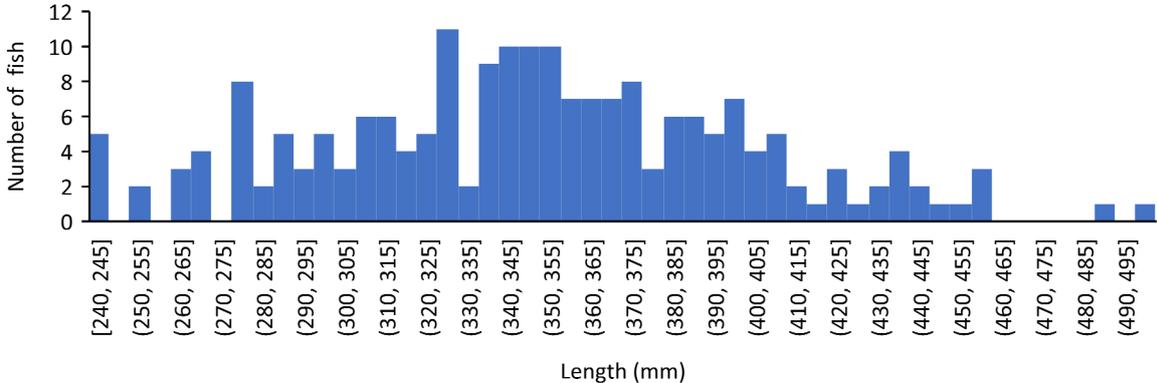


Figure 17. Length frequency histogram of fish sample at Tumbledown Creek in 2023.

Brown trout Tumbledown Creek trap 2023

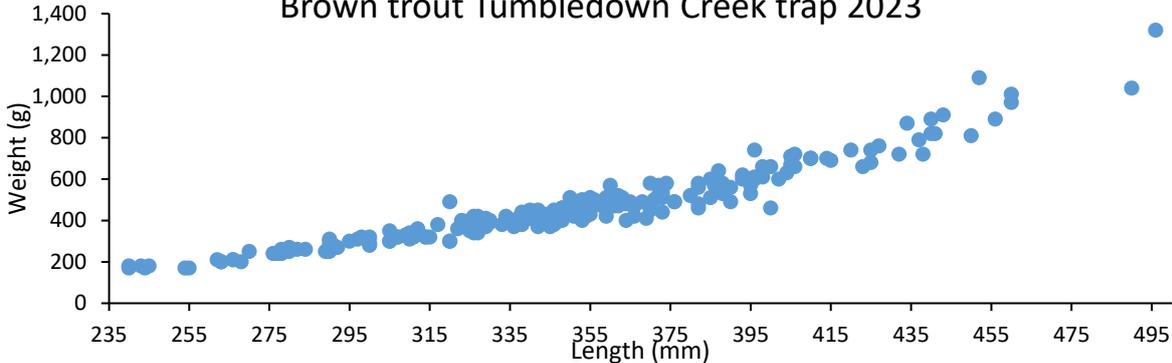


Figure 18. Length vs weight of fish sample at Tumbledown Creek in 2023.

Scotch Bobs Creek - Arthurs Lake weigh and measure results

Table 7. Summary of measurements taken during the weigh and measure at Scotch Bobs Creek 2023.

Grouping	Measurement	Mean	Minimum	Maximum
All Trout n=200	Length (mm)	363	224	505
	Weight (g)	529	130	1120
	Condition factor	1.058	0.809	1.522
Male n=100	Length (mm)	365	224	505
	Weight (g)	542	130	1120
	Condition factor	1.038	0.809	1.361
Female n=100	Length (mm)	361	276	438
	Weight (g)	516	250	880
	Condition factor	1.078	0.862	1.522

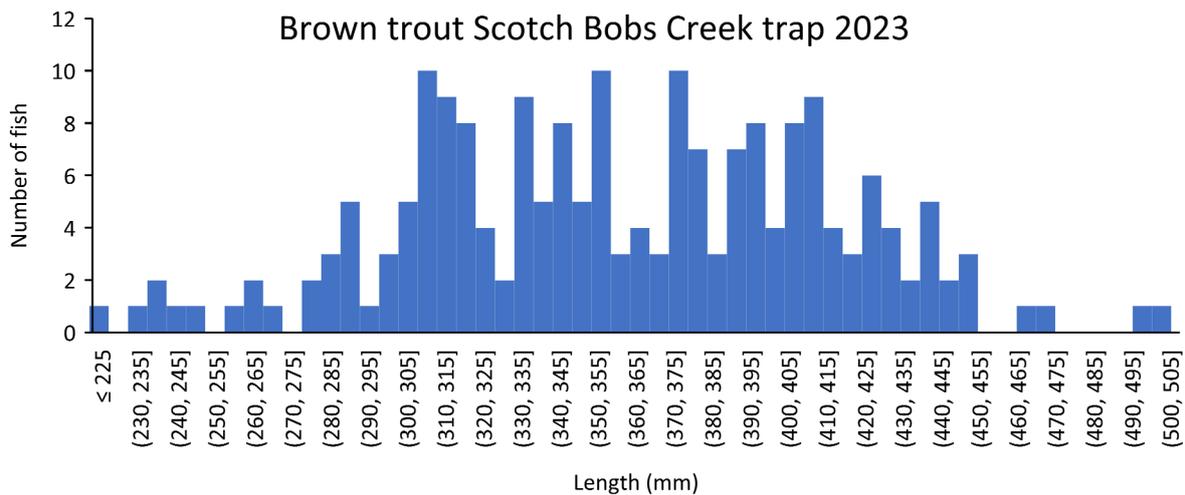


Figure 19. Length frequency histogram of fish sample at Scotch Bobs Creek in 2023.

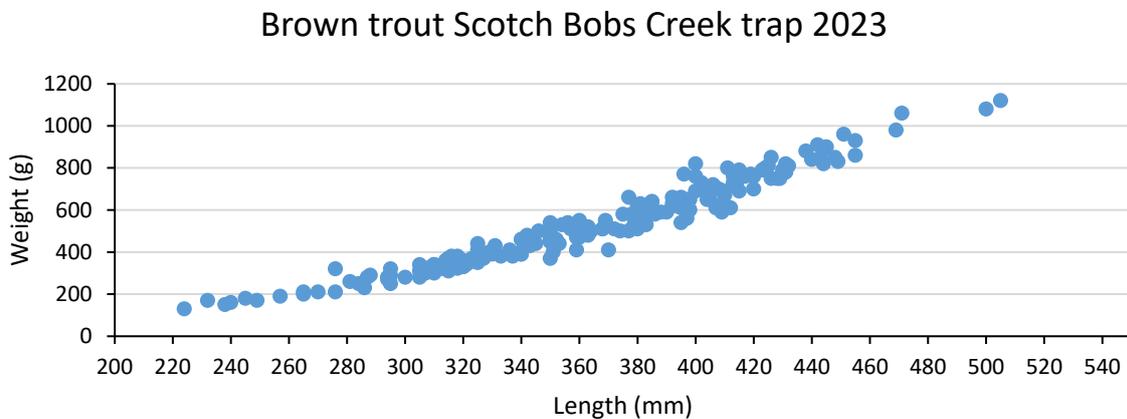


Figure 20. Length vs weight of fish sample at Scotch Bobs Creek in 2023.

Hydro Creek - Arthurs Lake weigh and measure results

Table 8. Summary of weigh and measure sample at Hydro Creek in 2023.

Grouping	Measurement	Mean	Minimum	Maximum
All Trout n=200	Length (mm)	355	125	490
	Weight (g)	487	140	1150
	Condition factor	1.111	0.671	7.168
Male n=100	Length (mm)	357	125	490
	Weight (g)	508	140	1150
	Condition factor	1.171	0.671	7.168
Female n=100	Length (mm)	352	280	423
	Weight (g)	466	220	850
	Condition factor	1.052	0.736	1.296

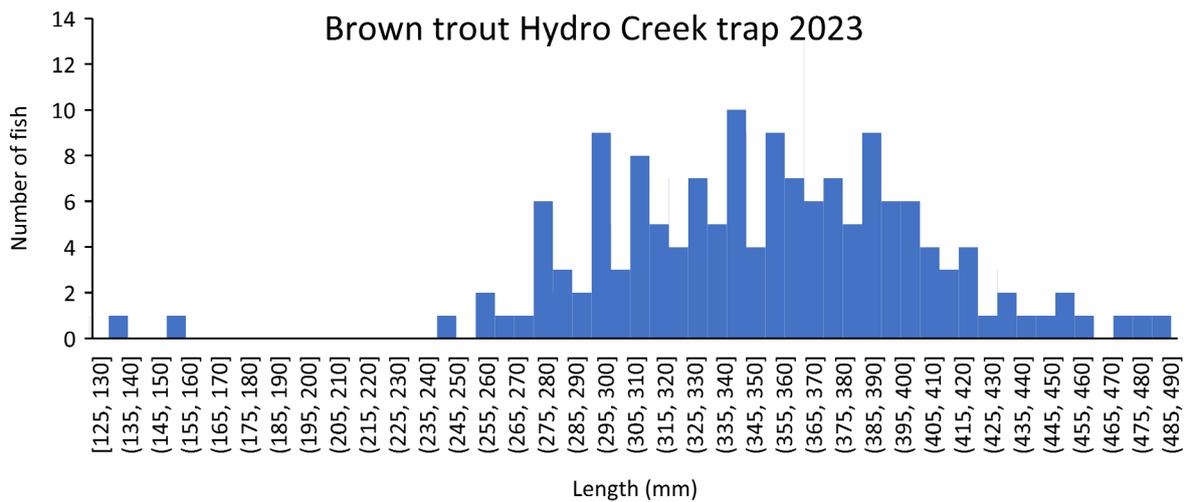


Figure 21. Length frequency histogram of fish sample at Hydro Creek in 2023.

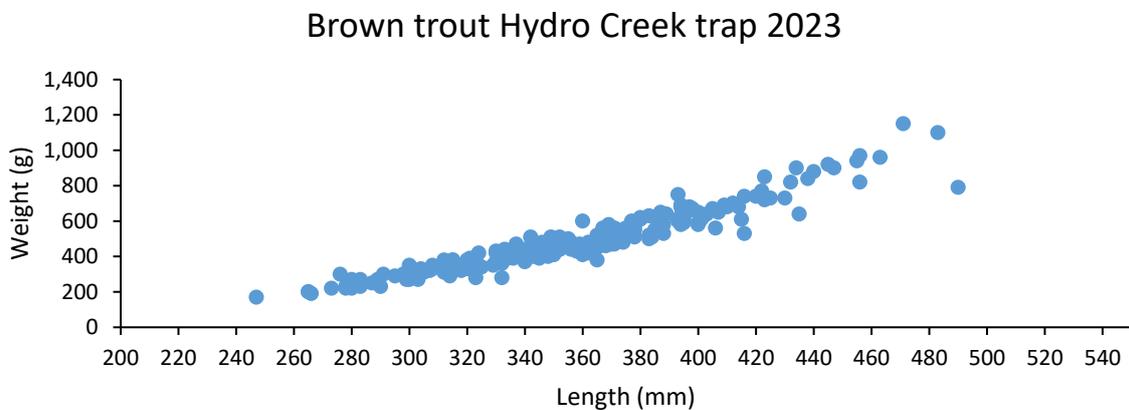


Figure 22. Length vs weight of fish sample at Hydro Creek in 2023.

River Derwent – Lake King William weigh and measure results

Table 8. Summary of weigh and measure sample at River Derwent in 2023

Grouping	Measurement	Mean	Minimum	Maximum
All Trout n=130	Length (mm)	283	205	369
	Weight (g)	259	90	540
	Condition factor	1.114	0.771	2.089
Male n=28	Length (mm)	266	207	350
	Weight (g)	204	90	420
	Condition factor	1.045	0.799	1.500
Female n=100	Length (mm)	288	205	369
	Weight (g)	274	120	540
	Condition factor	1.132	0.771	2.089

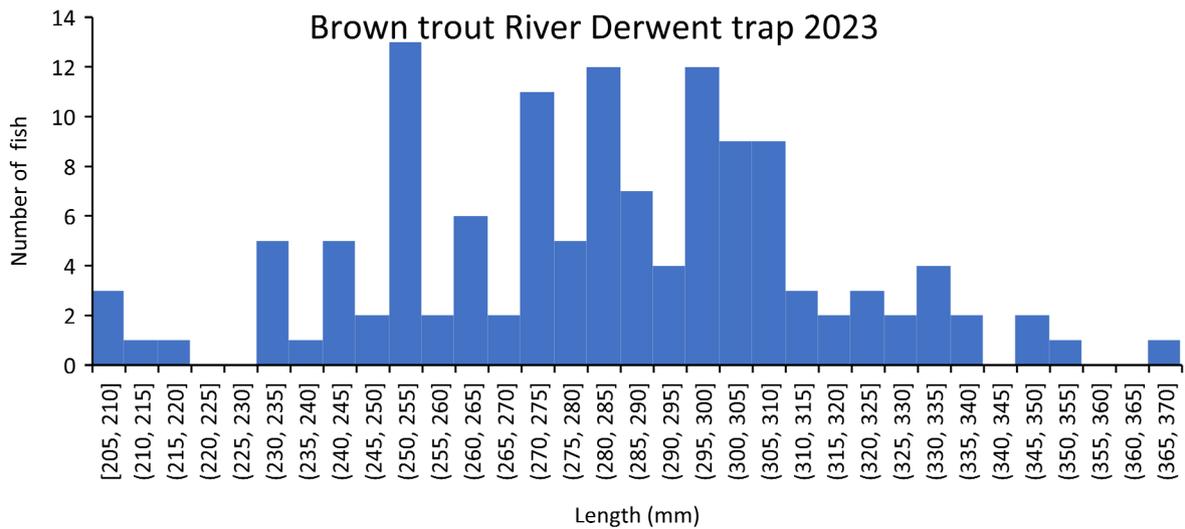


Figure 23. Length frequency histogram of fish sample at Derwent River in 2023.

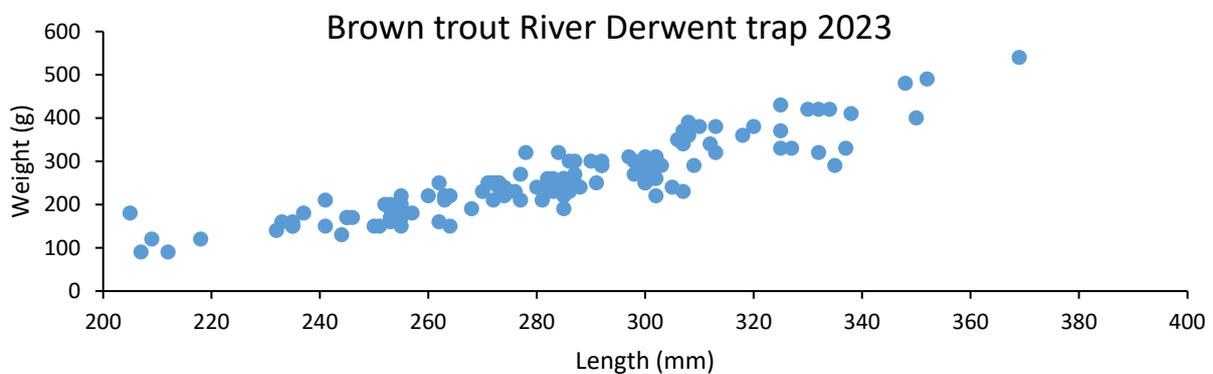


Figure 24. Length vs weight of fish sample at Derwent River in 2023.

Ova collection and hatchery production

One hundred thousand ova were stripped from brown trout trapped at Liawenee Canal, yingina / Great Lake. These were incubated and reared at the New Norfolk hatchery. Of these, 75,000 were sold to the South Australian Fly Fishers Association. The rest were used for the stocking of public and private waters in Tasmania.

Trap history

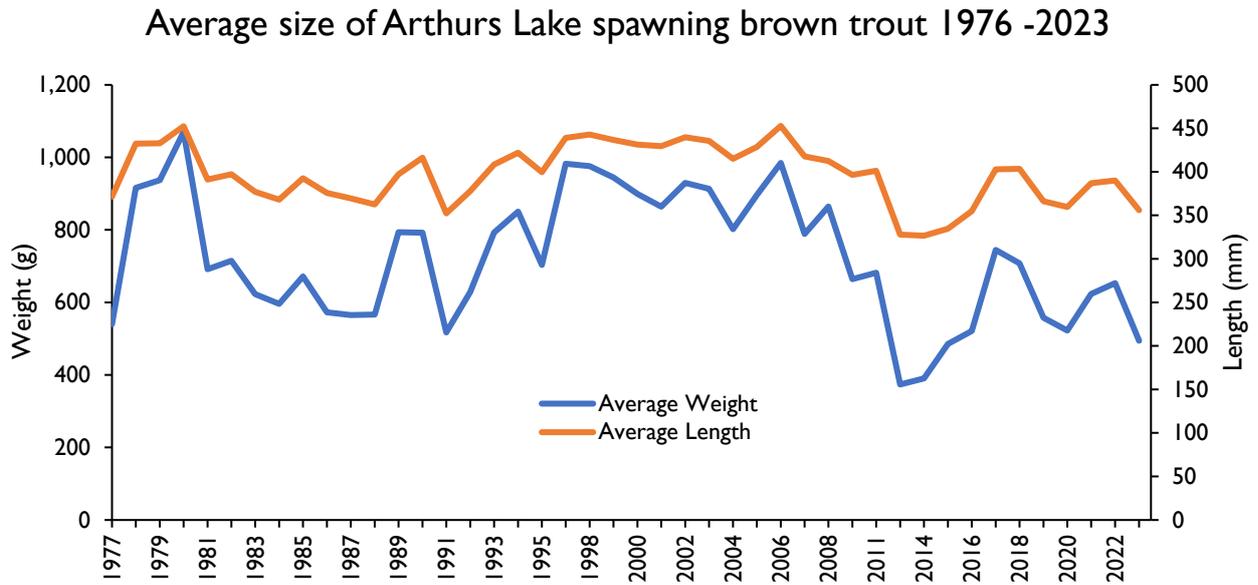


Figure 25. Average length and weight of spawning brown trout from Hydro Creek trap at Arthurs Lake since 1977. Note the data includes the three Arthurs Lakes traps combined from 2020.

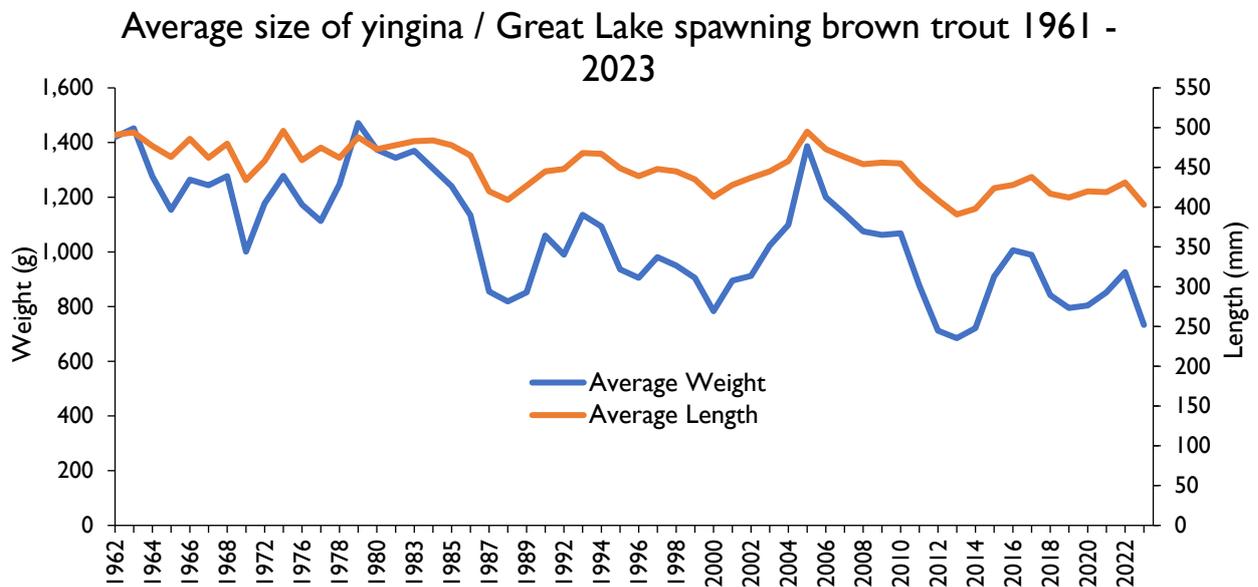


Figure 26. Average length and weight of spawning brown trout from the Liawenee Canal trap at Great Lake since 1962.

Conclusion / Discussion

Low water flows in May saw a reduced brown trout catch from the Liawenee Canal trap. This still resulted in a 60% increase in fish numbers in comparison to the 2022 catch, which was historically low. Capture of fish during April was the difference in 2023 compared to 2022, when the trap didn't open till May.

Flooding at Tumbledown Creek meant that brown trout bypassed the trap on their upstream migration. This resulted in a lower catch than previous years. Average size of brown trout caught in the Arthurs Lake fish traps has fallen to the fourth lowest since monitoring began in 1977.

A combination of low lake levels and low flows provided spawning opportunities downstream of the River Derwent trap above Lake King William, which reduced its catch.

Fish size was down across all traps. This is likely due to the last three years of successful recruitment, through La Nina conditions, which are wet years where streams have good continual flow. The influx of large cohorts of young fish results in a decrease in the average size of fish in the spawning runs. The size of fish at caught at Liawenee is the second lowest on record, slightly better than the lowest during 2013.

As with 2013, 2023 is the first winter after three successive La Nina years. Many of the fish, particularly females, were part of the spawning population for the first time in 2023. These fish were likely to have been born during 2020, the first of three wet winters.

It is probable that the average size of spawning brown trout will continue to decrease for the next couple of years. However, the numbers available for transfer will increase due to these large cohorts of young fish.

Recommendations

- Liaise with Hydro Tasmania to ensure that water releases from Lake Augusta after 1 April can be maintained for the duration of the brown trout spawning run.
- Collect fertilised ova at the first available opportunity. This enables brown trout fry to be stocked out in September.



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