Inland Fisheries Service

Fisheries Performance Assessment Technical Report

Tooms Lake – November 2023

Author:
Tim Farrell (Senior Fisheries Management)

Reviewed by:
Rob Freeman
Dr Ryan Wilkinson (Acting Director)

Approved by:
Rob Freeman (Acting Section Manager)

Version FINAL

Date:
13 November 2024

Contents

Introduction

Tooms Lake is an artificial impoundment situated 36 km northeast of Oatlands. The lake is used as a water supply for Campbell Town as well as providing irrigation water for downstream users. The waters of the lake inundate a natural marshland covering an area of 6.6 square km. Tooms Lake is subject to annual drawdowns that affects water turbidity. The lake catchment is subject to highly variable inflows that influence water quality and trout population dynamics. This presents challenges in managing the fishery from season to season.

Surveys of the trout population have previously been undertaken during 2003, 2015, 2021 and 2022. In the schedule under the *Tasmanian Inland Recreational Fisheries Management Plan 2018 – 28* there are two surveys to be undertaken for identified Assisted fisheries such as Tooms Lake within the lifespan of the plan. A survey to investigate recruitment of brown trout occurred in 2022. To investigate the brown and rainbow trout population a box trap survey was undertaken during November 2023. Backpack electrofishing was also conducted to investigate whether there was any natural recruitment of brown trout from 2023.

FPA Survey Methodology

In-lake Surveys

To assess the brown trout population structure, a survey was conducted during 21 - 22 November 2023. A total of 47 box traps were set, with 15 sets of three traps and a single set of two traps (Figure 1).

All traps were set for two consecutive nights, totaling 94 sets. Most traps were set around the margins of the lake in a range of habitats. Two sets of three box traps were placed in deeper water with platypus escape funnels attached.

Traps were checked and fish caught were weighed, measured and sexed prior to release.

The creeks flowing into Slaters Bay and Wet Bay were backpack electrofished to look for the presence of brown trout fry. Locating fry would indicate there was natural recruitment from spawning during the winter of 2023.

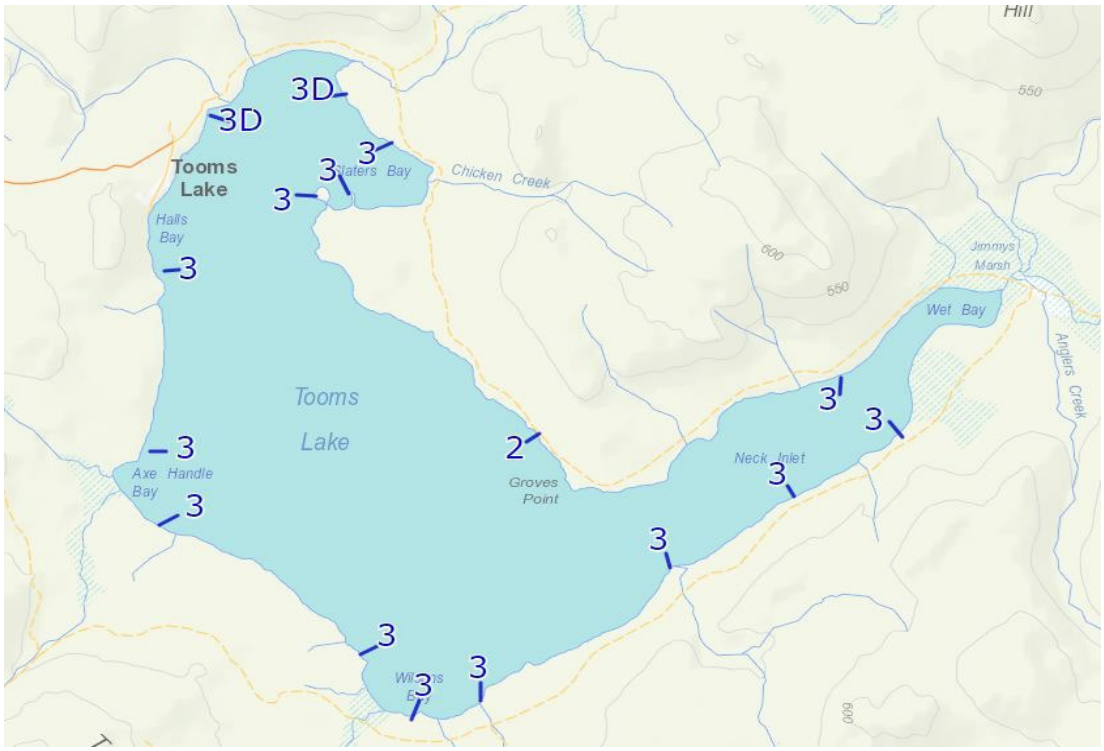


Figure 1: Map showing the location of the box trap sets. The number of traps used in each set is shown, traps that were set in deep water are denoted by "D".

Annual Postal Survey

Since 1986, the Inland Fisheries Service (IFS) has conducted a postal survey seeking information about anglers' catches. The survey comprises of a form sent to a subset of all categories of anglers, asking set questions about their angling (catch of trout) for the past season. This information is entered into a database and information on catch per day, harvest and angling effort is extrapolated. This provides a long-term overview of individual fishery performance in addition to characterising effort. The results for the period 2000-01 to 2022-23 are shown in Appendix A).

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 and stock type, in addition to some length/weight data and comments e.g., denoting tagged fish. In this report, only records post 2019 are examined. Stocking records are shown in Appendix B.

Survey Results

In-lake Survey

Brown trout length and weight data

A total of 35 brown trout and six rainbow trout were caught during the survey. These were weighed, measured and released. Of the 35 brown trout, 12 were males and 23 females. The rainbow trout were all triploid (only triploid had been stocked in recent years).

Table 1 shows the length, weight and condition of the fish caught during the survey with the relationship between weight and length shown in Figure 2.

The last comparable survey at Tooms Lake was during April 2021, where 145 brown trout were caught of which 104 were measured. The mean weight for all brown trout captured was 1,067 g, average length 497 mm and the average condition factor was 0.87. The mean weight for this survey was nearly 300 g less, length 77 mm shorter but average condition factor was better at 1.01.

In 2021 more than 50 per cent of the fish were in 'poor' condition whereas only 14 per cent were 'poor' in the 2023 survey (Figure 3). The majority of brown trout were in 'fair' condition >1.0 k. There was a general trend of poorer condition with increasing length as shown in Figure 4.

Table 1: Descriptive statistics for trout caught during 21 and 22 November 2023 - length, weight and condition factor separated by species and sex.

Grouping	Measurement	Mean	Minimum	Maximum
All brown trout (n=35)	Length (mm)	420	305	540
	Weight (g)	771	300	1,470
	Condition Factor (k)	1.01	0.82	1.28
Female (n=23)	Length (mm)	417	323	515
	Weight (g)	737	410	1,470
	Condition Factor (k)	0.99	0.82	1.28
Male (n=12)	Length (mm)	425	305	540
	Weight (g)	836	300	1,400
	Condition Factor (k)	1.04	0.89	1.20
Rainbow trout (n=6)	Length (mm)	386	367	415
	Weight (g)	592	490	730
	Condition Factor (k)	1.03	0.92	1.15

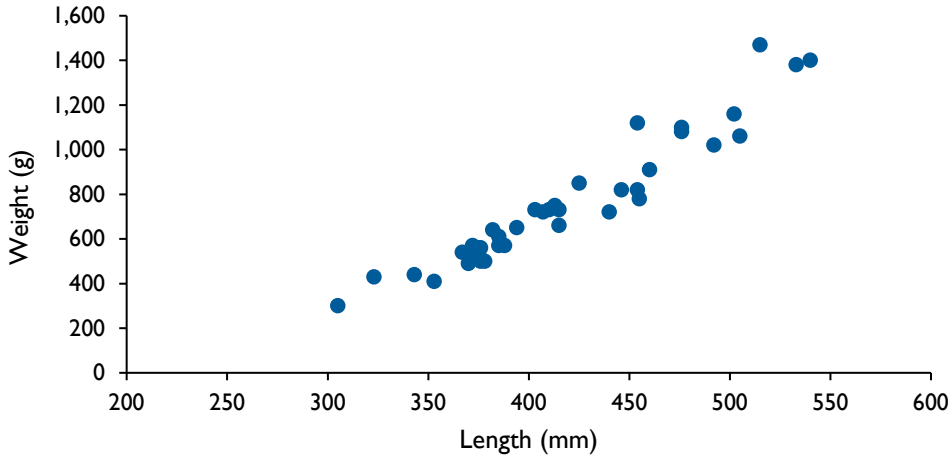


Figure 2. Length vs weight for all trout captured 21-22 November 2023.

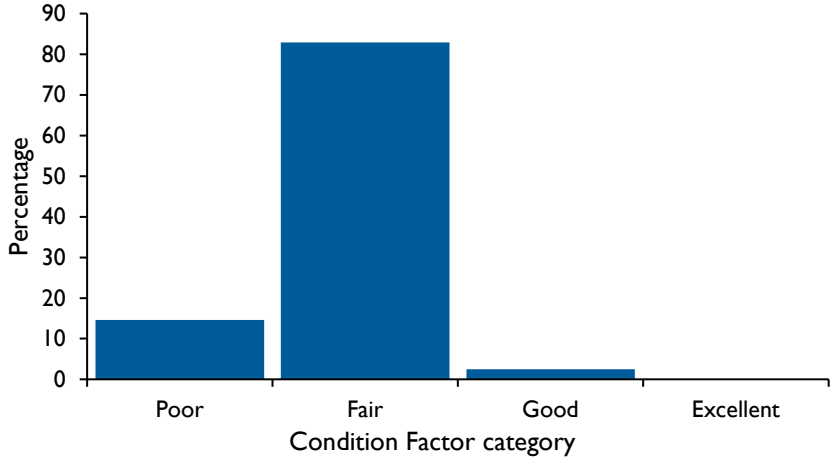


Figure 3. Condition factor (k) category for brown trout captured 21- 22 November 2023.

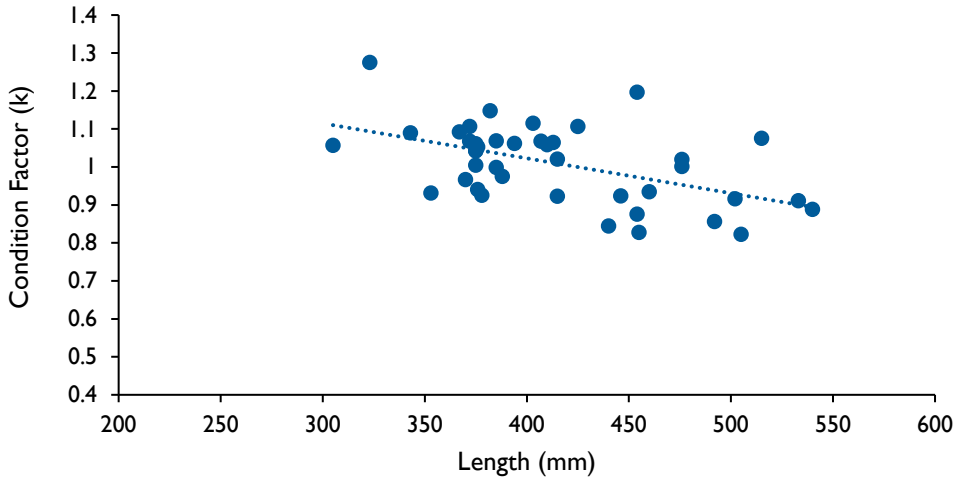


Figure 4: Condition factor at length for all brown trout captured 21-22 November 2023.

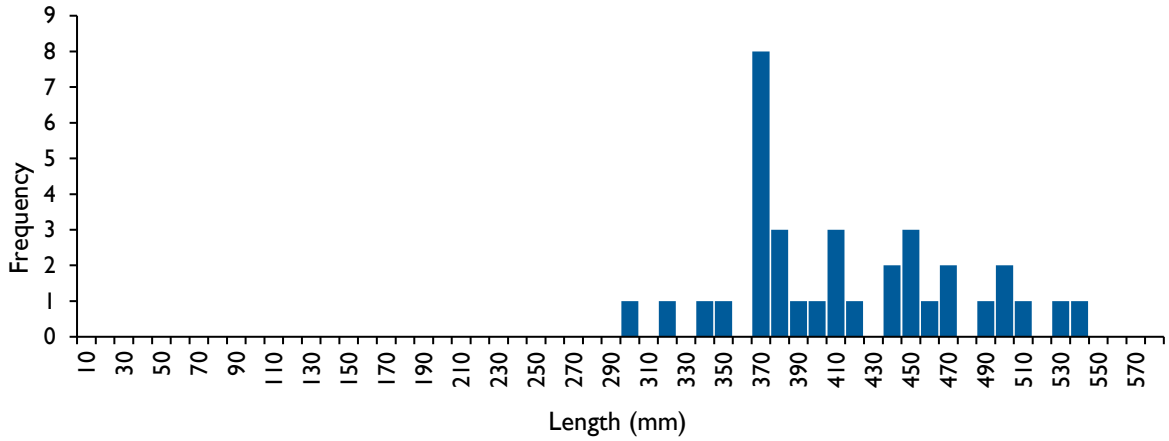


Figure 5: Length frequency distribution of brown trout caught during 21-22 November 2023 in the box trap survey.

With the low number of fish caught, it is not possible to make conclusions from the length frequency distribution of catches from this survey (Figure 5).

CPUE information

During this survey (November 2023), 35 brown trout were captured from 94 box trap sets. This equates to a mean catch per unit effort (CPUE) of 0.37 brown trout per trap. Six rainbow trout were captured for a mean CPUE of 0.06 per trap. The total CPUE for all trout was 0.44.

Compared to the survey conducted 27 to 29 April 2021, fewer fish were caught. During that survey, 145 brown trout and 17 rainbow trout were captured from 66 box trap sets, resulting in a CPUE of 2.2 brown trout and 0.26 rainbow trout per trap. Total CPUE for all trout was 2.46. This result represents an 83 per cent reduction in CPUE for brown trout and 77 per cent reduction for rainbow trout.

Backpack electrofishing

During two hours of electrofishing of the inflowing creeks, no brown trout fry were captured. Only *Galaxias maculatus* were captured. The creeks were not flowing and only remnant pools remained. It was therefore assumed no natural recruitment of brown trout occurred from the 2023 winter spawning period.

Angler Postal Survey

The charts showing the Angler Postal Survey (APS) results from 2000-01 to 2022-23 seasons are shown in Appendix A.

The results show a decline in the number of anglers, fishing effort and harvest (brown and rainbow trout) for the last three seasons 2020-21, 2021-22 and 2022-23.

Fishing effort and the number of anglers fishing at Tooms Lake fell below the long term average during the 2021-22 season and have remained so.

Brown trout harvest dropped below the long term average of 5,791 in 2018-19 and has remained below this level. Rainbow trout harvest fell below the long term average of 4,372 in 2022-23. These correlate with the downturn in fishing effort and visitation over that time.

Brown trout catch rate, which is independent of the other three attributes, has varied from 0.41 to 0.77 since 2018-19. These are below the long term average of 0.81 fish per day. Rainbow trout catch rate has varied from 0.3 to 1.04 since 2018-19. From 2021-22 to 2022-23, the catch rate dropped markedly. Falling from 1.04 to 0.39, well below the long term average of 0.64 fish per day.

Stocking database

There have been four stocking events post the April 2021 FPA survey (Appendix B).

Since April 2021, 330 adult brown trout from Tumbledown Creek (Arthurs Lake) have been stocked on one occasion, averaging 636 grams. This was the first stocking since May 2019. The gap in brown trout stockings was driven by low lake levels and a reduced supply of adults from the Central Highlands.

In each of the last three years, 1,000, 800 and 1,000 rainbow trout were stocked at 380, 400 and 485 grams respectively. These stockings and size of fish is in line with the long term plans for rainbow trout at Tooms Lake.

Discussion

Catches for the November 2023 survey were lower than expected. Compared to the 2021 result, CPUE for brown trout decreased 83 per cent. The APS shows a decline in catch rate for both species. Since 2017-18, the catch rate for brown trout has remained below the long term average. It is evident the abundance of brown trout is low and this is likely to continue until either substantial natural recruitment or stocking occurs.

The harvest of brown trout as estimated from the APS, though probably overestimated, was 1,549. This accounts for much of the lake's existing population.

With the low numbers of both brown and rainbow trout caught, it is difficult to make conclusions about the structure of their populations. The length frequency distribution for brown trout has single fish in many of the 10 mm increments, making analysis of cohort strength impossible. The fish caught during this survey were on average smaller but were in better condition than those from the 2021 survey. This is surprising given the 2021 survey was during April when fish condition would be at its peak. The improving condition of brown trout is further evidence of a smaller population.

There was no evidence of natural recruitment from 2023. No young of the year were observed while electrofishing and no fish caught in the box traps were of a size that could be attributed to fish of less than two years old. An electrofishing survey during April 2022, while not finding young of the year recruits, did identify fish from natural recruitment from 2020. While there were four fish caught in this survey less than 350 mm, it is difficult to separate these from the stocking that occurred in late June 2022. That stocking was from Arthurs Lake, and contained fish as small as 239 mm. By November 2023, it's possible these might be small enough to account for these smaller fish.

There is evidence of natural recruitment of brown trout at Tooms Lake but it is infrequent and only a minor contributor to the population. Stocking continues to be necessary for maintenance of Tooms Lake brown trout population. The rainbow trout population is reliant on stocking.

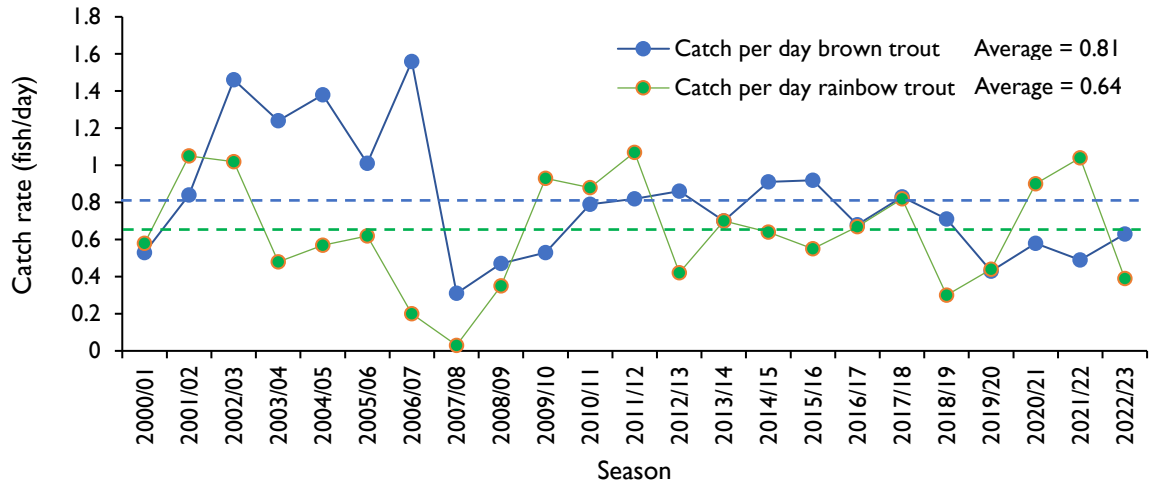
The stocking plan for 2024 recommends 500 wild brown trout and 1,000 domestic triploid rainbow trout. These stockings will be contingent on favourable lake levels and the supply of fish from the Central Highland traps.

Recommendations

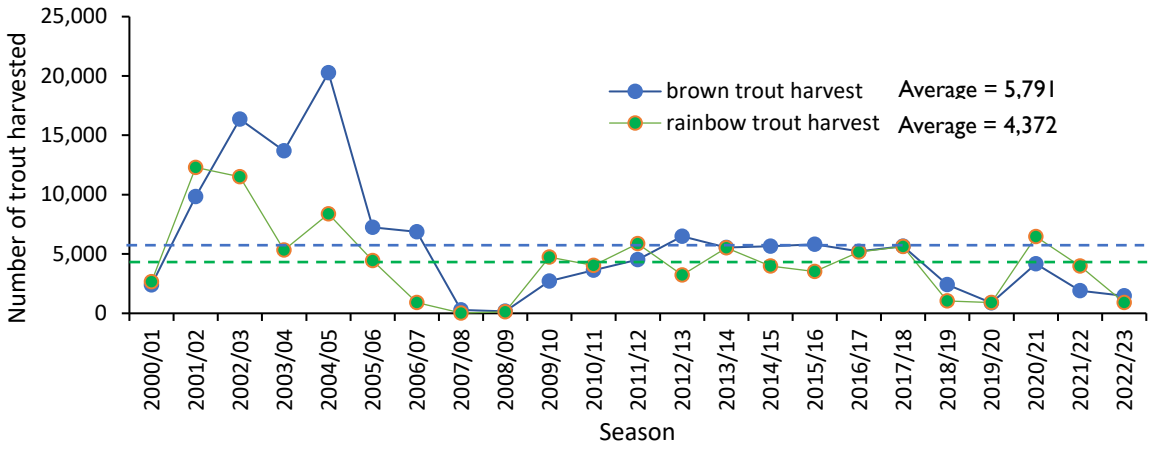
- Stocking of brown trout adults needs to occur as a priority.
- Rainbow trout stocking should be increased to 1,500 yearlings.
- Future assessments should utilise the electrofishing boat to gather are range of sized trout.

Appendices

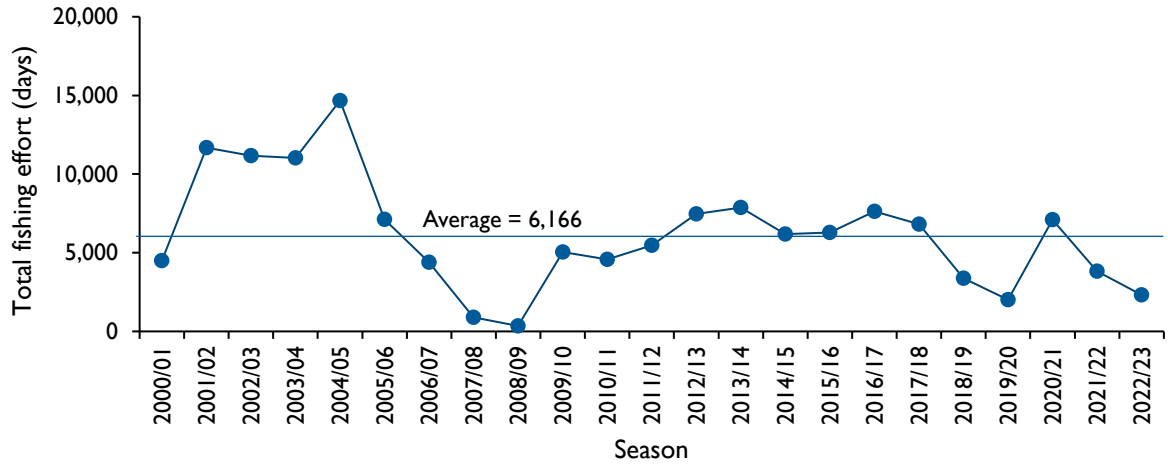
A. Angler Postal Survey results for 1.) daily catch rate; 2.) harvest; 3.) fishing effort and 4.) angler numbers, for each season 2000-01 to 2022-23 season, Tooms Lake.



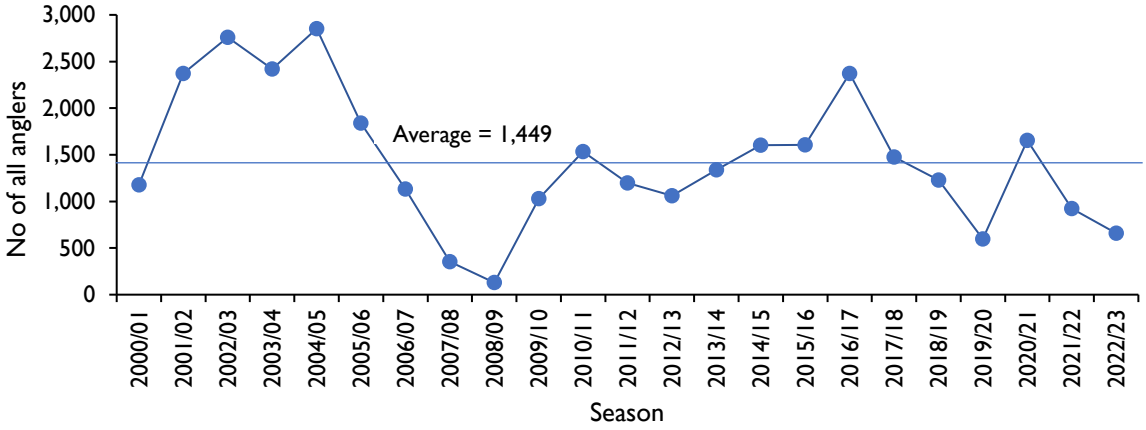
1: Estimated catch rate (fish per day) at Tooms Lake from 1985-86 to 2022-23 season.



2: Estimated harvest (number of fish caught) at Tooms Lake from 1985-86 to 2022-23 season.



3: Estimated fishing effort (angler days) at Tooms Lake from 1985-86 to 2022-23 season.



4: Estimated number of anglers fishing at Tooms Lake from 1985-86 to 2022-23 season.

B. Stocking table (2019-2023)

Species	Year	Age	Number	Origin	Stock	Type
Brown trout	2019	Adult	1,100	yingina / Great Lake	Wild	Diploid
Brown trout	2022	Adult	330	Arthurs Lake	Wild	Diploid
Rainbow trout	2019	Adult	1,500	Commercial Hatchery	Domestic	Triploid
Rainbow trout	2020	Adult	500	Commercial Hatchery	Domestic	Triploid
Rainbow trout	2021	Adult	1,000	Commercial Hatchery	Domestic	Triploid
Rainbow trout	2022	Adult	800	Commercial Hatchery	Domestic	Triploid
Rainbow trout	2023	Adult	1,000	Commercial Hatchery	Domestic	Triploid

Inland Fisheries Service

Phone:
1300 INFISH

Email:
Infish@ifs.tas.gov.au

www.ifs.tas.gov.au