Inland Fisheries Service

RECREATIONAL FISHERIES REPORT

Fisheries Performance Assessment

Technical Report

Lake Leake – March 2026

Inland Fisheries Service

Inland Fisheries SERVICE

Tasmanian Government

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Inland Fisheries Service *Fisheries Performance Assessment*

Technical Report Lake Leake 2026

Title:	**Fisheries Performance Assessment, Technical Report, Lake Leake – March 2026, Inland Fisheries Service**
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1. Introduction

Lake Leake is an artificial impoundment built during the early 1880's as a town water supply for Campbelltown but now provides irrigation water for downstream users and is managed by Tasmanian Irrigation Pty Ltd. Full supply level is 571.5 m ASL with a total volume of 22,076 ML. The lake inundates a natural marsh and bushland, covering approximately six square kilometres. Lake Leake is subject to annual drawdowns, but the water quality is generally good, with low turbidity typical. Much of the lake contains drowned timber with extensive macrophyte beds throughout.

The lake has a very large population of the invasive redfin perch and has in the past been stocked with short finned eels, rainbow trout and brown trout.

The fishery is managed as a brown trout water, with supplementation of the rainbow trout population with commercially grown fish. Until 2003, the brown trout population was supplemented by stocking 30-40,000 fry per annum. By comparison to natural recruitment, the contribution of these fish has been negligible. In 2013, the Inland Fisheries Service commenced a program to stock the water with adult brown trout collected from the spawning runs from the Central Highlands (mostly Liawenee Canal). These fish contribute to the underlying population, providing an acceptable catch rate for anglers.

Under the *Tasmanian Inland Recreational Fishery Management Plan 2018-28*, Lake Leake is listed as an 'assisted fishery' with the fishing season managed for brown trout. Fishing methods are restricted to the use of artificial lures only. A daily bag limit of five fish exists with a minimum size limit of 300 mm that includes no more than two fish over 500 mm.

2. FPA Survey Methodology

2.1. In-Lake Population Survey

During 10 and 11 March 2026, a Smith-Root electrofishing boat was used during daylight hours to capture brown and rainbow trout across the lake (Figure 1). A range of habitats and lake depths were sampled, with a total length of 21 km electro-fished. All trout captured were sexed, weighed (g) and measured (mm). General observations were also recorded on the abundance of short-finned eels and redfin perch.

Results are presented as catch per unit effort (CPUE), expressed as the number of fish caught per hour of effective electrofishing on-time (i.e. periods when electrical current was applied). Relative shock time is considered a more reliable measure of effective sampling effort than total operating time. During the survey, the electrofishing on-time counter was not functioning. Consequently, electrofishing on-time was estimated at 2,700 seconds per hour of operation. Total operating time over the two survey days was 7.47 hours. This duration was multiplied by 2,700 seconds and converted to hours [(7.47 hr × 2,700 s) ÷ 3,600], resulting in an estimated effective electrofishing effort of 5.60 hours.

At the time of the survey the lake level was 569.15 m ASL, 2.35 m below full supply level.

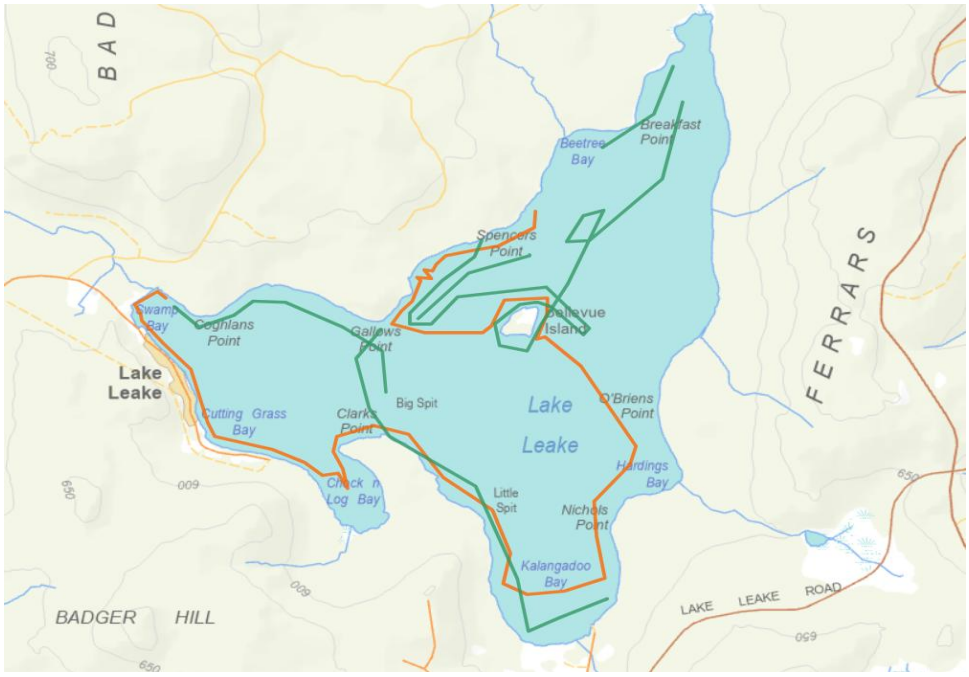


Figure 1: Electrofishing route showing day one (9.4 km), and day two (11.6 km), Lake Leake, 10-11 March 2026.

2.2. Annual Postal Survey

Since 1986, the IFS has conducted an annual postal survey (APS) seeking information about anglers' catches. The survey comprises a paper survey form sent to between 4,000 and 5,000 anglers across all licence categories, asking set questions about their catch for the previous season. This information is used to estimate catch per day, harvest and angling effort, and provides a long term overview of fishery performance as well as characterising fishing effort.

Commencing in 2024–25, the APS circulation was transitioned from postal to email, with participants submitting responses digitally. A comparison of postal and email returns for all waters has been examined in a separate report. In this report, records assessed are from 2000 to 2025.

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 or marked fish). This information provides an historical record of supplementary recruitment into individual waters. In this report, records post 2015 are analysed.

2.4. Angler Creel Data

Each season, IFS officers undertake on-site surveys of recreational anglers across a range of waters to collect fishing effort information. Data are recorded in real time using a dedicated digital Angler Creel collection app. Variables captured include fishing location, survey date, species caught, number of fish

retained and released, and fishing method. All records are stored in an electronic database for subsequent analysis and reporting.

Following analysis, results are summarised as the number of fish caught per day, regardless of whether an angler had fished for three or more hours or was still actively fishing at the time of survey. All catches were included in analysis, irrespective of whether fish were retained or released, including zero catches. For this report, only records from anglers that fished for three or more hours were examined. For the purposes of calculating daily catch rates, a full days fishing was defined as six hours.

2.5. Angler Diary

An angler fishing diary feature of the Infish App was developed by the IFS for anglers to record their catch of freshwater fish throughout the year. This feature records location, fishing from a boat or shore, fishing method, species and number caught, weight, length, sex, fish kept/released and fishing effort. For this report, only records from anglers that fished for three or more hours were examined. For the purpose of calculating daily catch rate, a full days fishing is defined as six hours. Records of the 2024-25 season were analysed.

2.6. Condition Factor

Condition factor for all captured fish was calculated using the standard formula:

$$K = 100 \times \frac{W}{L^3}$$

This formula provides a generalised index of fish condition allowing comparisons among individual fish and across different fisheries. It should be noted however, the condition factor results derived using this approach may not always align with the perceptions of anglers'. Condition scores (k) are categorised as follows: below 1.0 indicates poor condition, values between 1.0 - 1.2 indicate fair condition, values between 1.2 - 1.6 indicate good condition and values greater than 1.6 indicate excellent condition.

3. Results

3.1. In-Lake Population Survey

Catch effort

A total of 35 trout consisting of 33 brown trout and two rainbow trout were captured over two days of electrofishing. On day one, 3.12 hours (4.17 total hours) of electrofishing effort was undertaken, covering 9.4 km, (20 brown and 1 rainbow), while day two involved 2.5 hours (3.30 total hours) of effort over 11.6 km (13 brown and 1 rainbow). The greater distance covered on the second day reflected more active boat-based searching to locate trout aggregations. Catch per unit effort (CPUE) for brown trout over the two days was 5.9 fish per hour. This represents a relatively low return for the level of effort applied and indicates a low abundance of brown trout within the lake. CPUE for rainbow trout was considerably lower at 0.36 fish per hour; however, electrofishing efficiency for rainbow trout in lake environments is generally

reduced compared to brown trout, as rainbow trout preferentially occupy open and deeper habitats that are less effectively sampled using this method.

Weight and Length Information

All 33 brown trout were weighed and measured, consisting of 11 females, 15 males and 7 indeterminate fish, with lengths ranging between 125 to 565 mm (Figure 2). The average length and weight for brown trout was 409 mm and 919 g, respectively. The maximum length recorded for an individual fish was male of 565 mm, weighing 1,910 g.

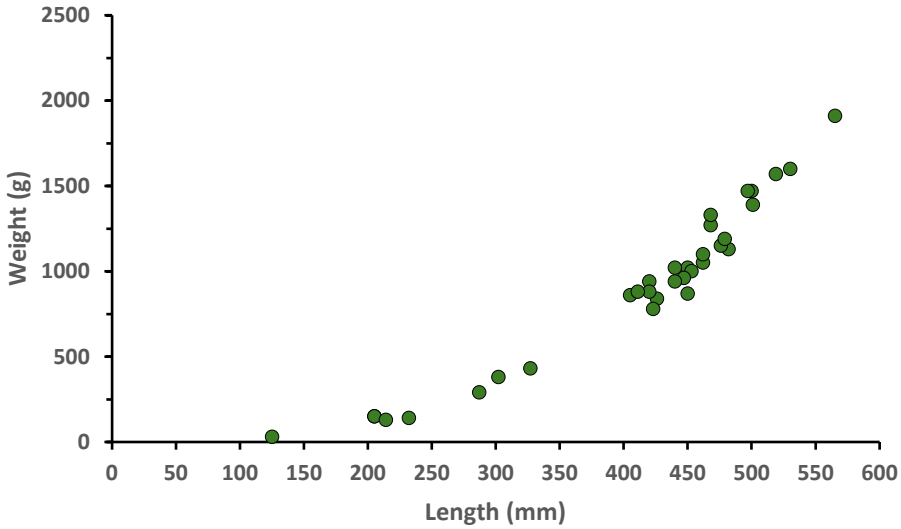


Figure 2: Length and weight of brown trout, Lake Leake, March 2026.

The length-frequency distribution for brown trout (Figure 3) provides limited evidence of substantial natural recruitment over the past three years. Very few smaller fish were recorded, with only a single juvenile (125 mm), four fish in the 200 to 220 mm size class and three fish between 280 and 330 mm. No fish were captured in the 340 to 390 mm length range. In contrast, the majority of the catch consisted of larger individuals in the 400 to 450 mm and 460 to 530 mm size classes, with one additional fish measuring 565 mm.

These larger cohorts are most likely derived from fish that were present in the lake as approximately one to three year old age classes during the 2022 survey (Appendix 1), indicating they are now around five to seven years old or older. This interpretation is further supported by substantial adult trout transfer events undertaken in 2020 and 2021 (Appendix 2), which are also likely to have contributed to the dominance of these larger size classes in the current population.

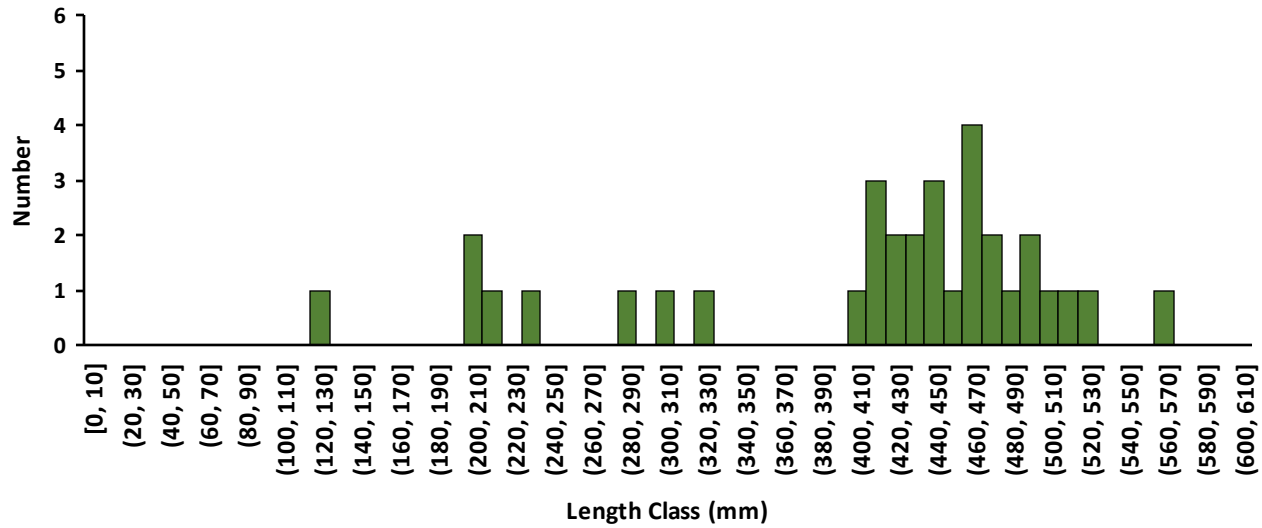
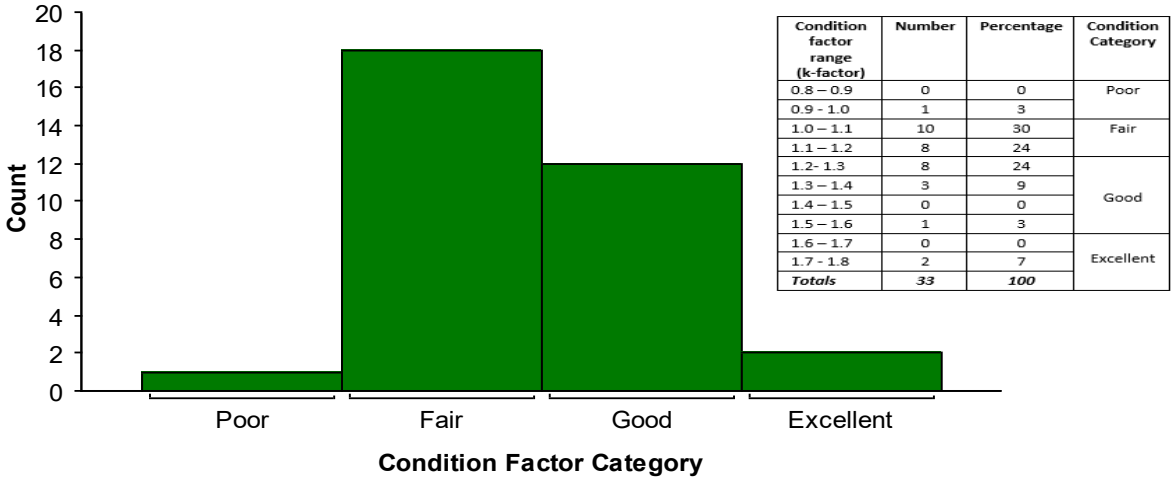


Figure 3: Number of brown trout in each length class, Lake Leake, March 2026.

Condition Factor

The average (mean) condition factor (k) for brown trout was 1.20, indicating generally good condition. Of the fish sampled, 43 percent were classified in good to excellent condition, with 54 percent assessed in fair condition (Figure 4). Only a small proportion (3 percent), were in poor condition. Higher condition factors were commonly observed in fish smaller than 300 mm, although many larger individuals also displayed good condition (Figure 5).



Condition factor range (k-factor)	Number	Percentage	Condition Category
0.8 – 0.9	0	0	Poor
0.9 - 1.0	1	3	
1.0 – 1.1	10	30	Fair
1.1 – 1.2	8	24	
1.2- 1.3	8	24	Good
1.3 – 1.4	3	9	
1.4 – 1.5	0	0	
1.5 – 1.6	1	3	
1.6 – 1.7	0	0	Excellent
1.7 - 1.8	2	7	
Totals	*33*	*100*	

Figure 4: Condition factor for brown trout and associated table for each category, Lake Leake, March 2026.

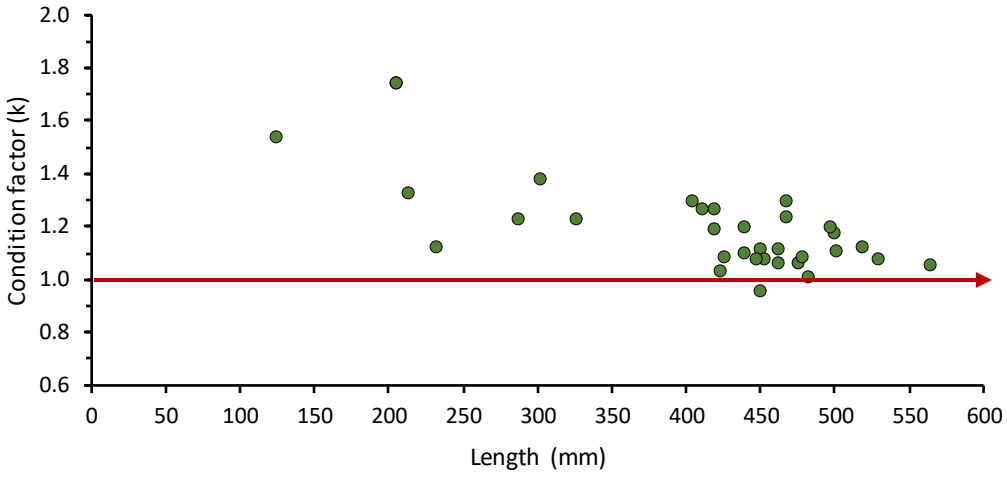


Figure 5: Condition factor for brown trout at varying lengths, Lake Leake, March 2026 (below the red line indicates poor conditioned fish i.e., under 1.0 k)

4. Angler Postal Survey

4.1. Fishing effort

Fishing effort at Lake Leake (Figure 6) has varied widely since 2000, ranging from fewer than 2,000 days to peaks above 15,000 days. Compared with the long-term seasonal average of 6,033 days, effort has fluctuated between periods of below average activity and brief episodes of high participation, particularly during the early 2020s. In the most recent season (2024/25), effort declined sharply to around 3,500 days, well below the long term average and substantially lower than the previous three seasons, all of which recorded effort above 8,900 days. This indicates a pronounced recent contraction in angler participation following a period of unusually high effort.

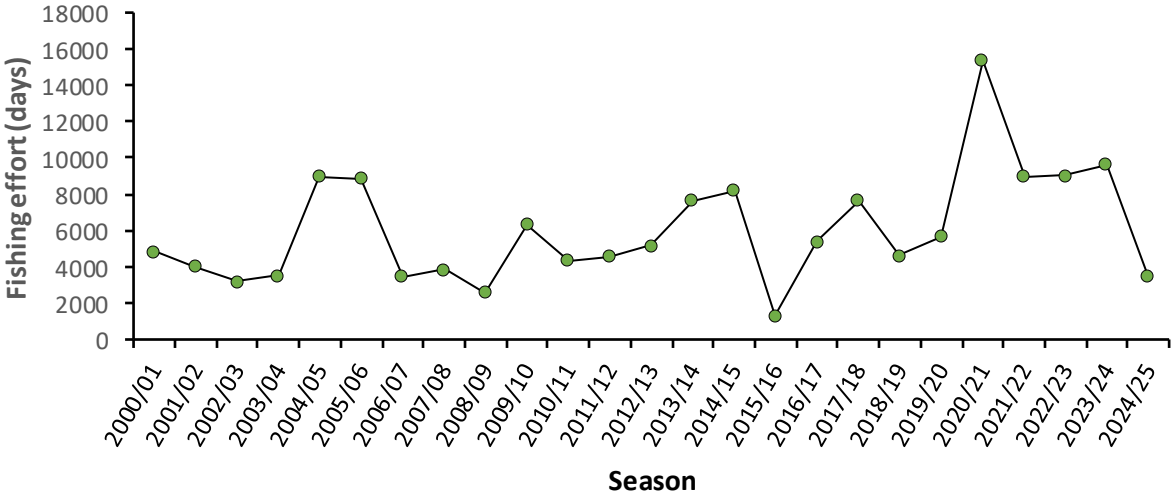


Figure 6: Fishing effort as days per season, Lake Leake, 2000 - 2025.

4.2. CATCH RATE

Brown trout catch rates have consistently exceeded those of rainbow trout, with long term averages of 0.7 and 0.4 fish per day, respectively (Figure 7). Prior to the mid-2010s, brown trout catch rates were typically above the long-term average however, they have generally declined since that time, except for a short-lived peak in the 2022/23 season. In 2024/25, the brown trout catch rate declined to approximately 0.5 fish per day, below both the long-term average and that of the catch rates observed in the most recent seasons.

Rainbow trout catch rates show a similar pattern of variability, with intermittent peaks but no sustained trend above the long-term average. The most recent catch rate at 0.4 fish per day is consistent with the long term average, although is lower than that recorded in several recent seasons.

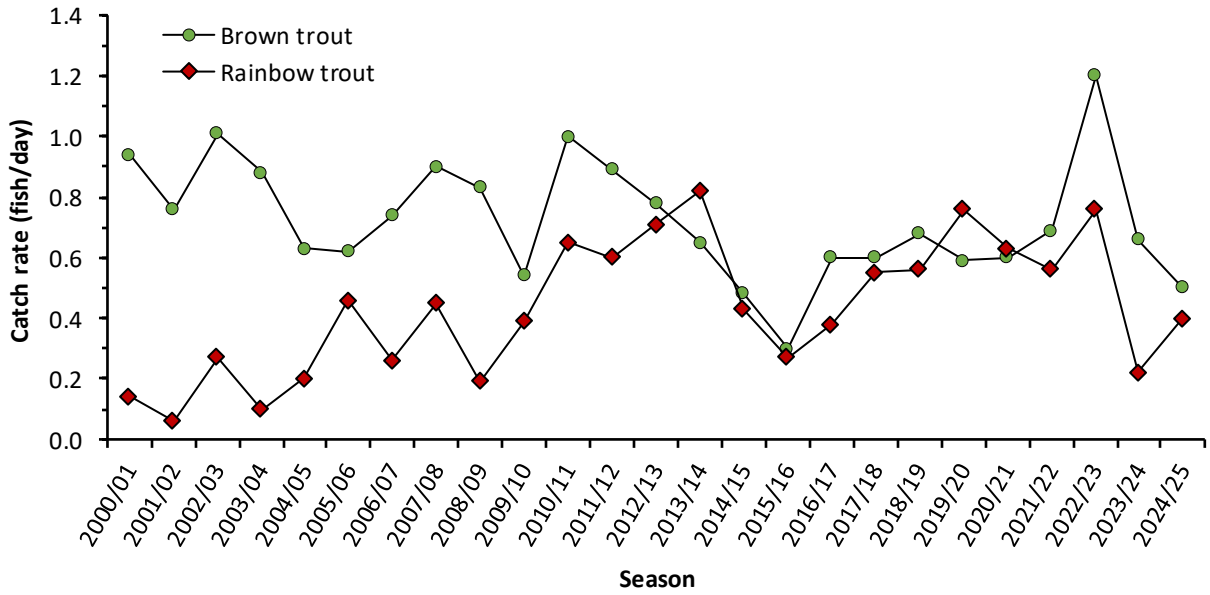


Figure 7: Catch rate for brown and rainbow trout, Lake Leake, 2000 - 2025.

4.3. HARVEST ESTIMATE

Estimated harvest reflects the combined effects of effort and catch rate. The long term average harvest is around 4,330 for brown trout and 2,855 for rainbow trout (Figure 8). Harvests increased markedly during the high effort seasons of the early 2020s, with brown trout exceeding 10,000 fish in 2022/23. In contrast, 2024/25 harvest estimates declined to around 1,800 brown trout and 1,400 rainbow trout, well below the long term averages and substantially lower than recent seasons.

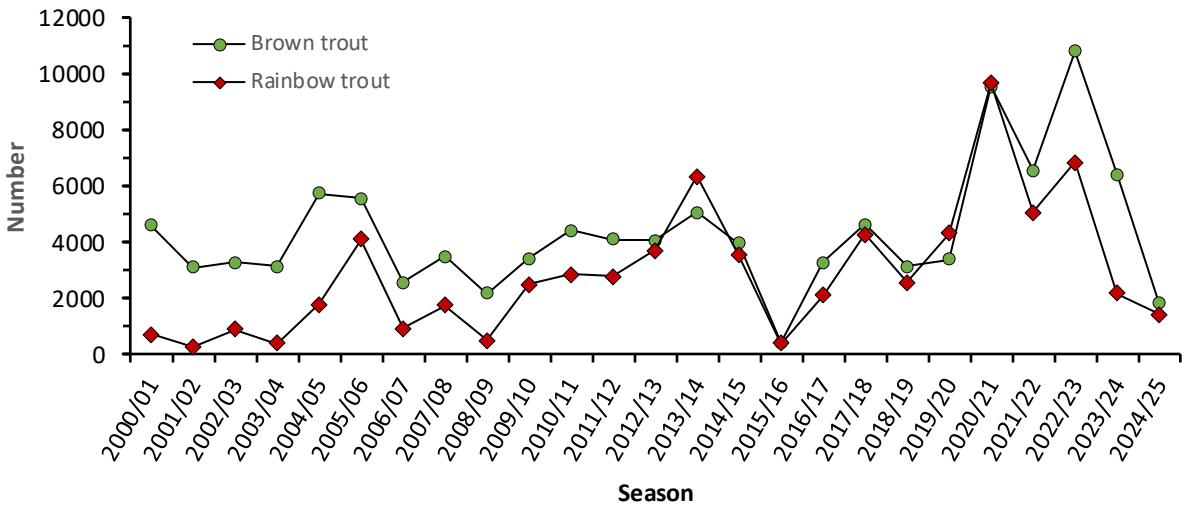


Figure 8: Estimated harvest of brown and rainbow trout, Lake Leake, 2000 - 2025.

Collectively, the three indicators (Figures 6 to 8) show the Lake Leake fishery has transitioned from a period of elevated effort and catch rates during the early 2020s to substantially lower angler participation and overall fishing performance in 2024/25. Recent reductions in harvest reflect both sharply lower fishing effort and catch rates that remain at or below the long term averages. The consistency of this pattern across all indicators suggests that recent catch levels are genuinely low compared to both historical results and recent peak seasons, rather than being driven by short term variability in a single measure.

5. Creel Interview Summary 2024-25

During the 2024/25 season, 18 anglers were interviewed about their fishing activity at Lake Leake. Of these, only anglers who fished for three or more hours were included in the analysis, resulting in 10 valid records. Collectively, these anglers fished a total of 46 hours and caught 16 brown trout and six rainbow trout. Assuming a full day of fishing equates to six hours, the estimated daily catch rates were 0.5 brown trout and 0.8 rainbow trout.

Of the 10 valid records, seven anglers reported fishing from a boat and two from the shore, and one record was void. Six anglers identified artificial lures as their primary fishing method, while four reported fly fishing. All fish during these trips were retained.

6. Angler Diary Summary 2024-25

During the 2024/25 angling season, a total of 41 valid records were submitted by anglers into the Angler Diary for fishing activity at Lake Leake, including both nil and multiple fish captures. Of these records, 34 met the criterion of fishing for three or more hours. These records represented 22 individual fishing trips, with an average trip duration of 6.4 hours.

From 22 fishing trips, 30 trout were captured (18 brown trout and 12 rainbow trout). Of these, 22 percent of brown trout and 58 percent of rainbow trout were released.

Total fishing effort was 225 hours. Assuming a full days fishing equates to six hours, this corresponds to 37.5 fishing days. Based on this result, the average daily catch rates were 0.48 brown trout per day and 0.32 rainbow trout per day.

Fishing method and access information indicated that four anglers fished from the shore and 30 from a boat. Of the 30 recorded trout captures, six were taken using artificial lures and 24 by fly fishing.

7. Discussion

The 2026 electrofishing survey, together with APS, creel interview and Angler Diary data, provides a consistent assessment of the status and performance of the Lake Leake trout fishery. Collectively, these datasets indicate a fishery characterised by low brown trout abundance, a population dominated by older cohorts, limited recent natural recruitment and substantially reduced angler participation and catches.

Electrofishing results confirm that brown trout abundance is low, with a CPUE of 5.9 fish per hour of effective shock time. This represents a relatively low return for the level of electrofishing effort and supports the conclusion that the brown trout abundance is currently low. The much lower CPUE recorded for rainbow trout (0.36 fish per hour) is consistent with expectations for lake based electrofishing, reflecting the species' pelagic habits and susceptibility to shoreline sampling methods.

Brown trout length frequency data were strongly skewed towards larger size classes, with most fish between 400 and 530 mm. Juvenile and sub-adult fish were largely absent from the catch, with only a single individual measuring less than 200 mm and few fish present in intermediate length classes. This pattern provides little evidence of meaningful natural recruitment in the past three years and suggests the current population structure is primarily driven by cohorts recruited from 2020 and 2022, along with residual stocked adult brown trout from 2000 and 2001.

Despite low sample size, brown trout condition was generally good, with a mean condition factor of 1.2 (k). Almost all individuals were assessed as being in fair to excellent condition, with only a single individual classified in poor condition. The relatively higher condition factors observed in fish under 300 mm, together with acceptable condition in larger fish, suggest density dependent growth limitation is unlikely. Accordingly, the low abundance of brown trout appears more plausibly linked to limited recruitment and an ageing population structure rather than constraints associated with lake productivity or food availability.

Angler effort data consistently indicates the Lake Leake fishery has entered a period of substantially reduced participation. During the 2024/25 season, fishing effort declined to approximately 3,500 angler days, well below the long term average and markedly lower than the elevated participation recorded in the early 2020s. This reduction in effort coincided with declining catch rates and resulted in harvest levels that were substantially below long term averages for both brown and rainbow trout.

Brown trout catch rates in the 2024/25 season averaged around 0.5 fish per day, well under the Tasmanian Inland Recreational Fishery Management Plan (TIRFMP) target of 1.0 ± 0.2 fish per day (Appendix 3). Rainbow trout catch rates were 0.4 fish per day, consistent with their long term average and within the management target range.

Estimated harvest reflect the combined influence of reduced effort and lower catch rates. The 2024–25 harvest was estimated at approximately 1,800 brown trout and 1,400 rainbow trout, representing a substantial decline relative to long-term averages. The clear consistency across effort, catch rate and harvest metrics provides strong evidence that recent reductions in catches are real and not simply the result of short-term variability or bias in any single indicator.

The convergence between fishery-independent and fishery-dependent datasets is notable. Low electrofishing CPUE and a brown trout population dominated by older cohorts closely mirror patterns of reduced angler catch rates and declining effort. Together, these indicators suggest the fishery is currently supported by a relatively small number of large, ageing individuals, with limited natural recruitment to replace these cohorts, with ongoing angling pressure and natural mortality occurring. However, the current low level of fishing effort substantially reduces exploitation pressure on the population. This reduced utilisation is likely buffering the fishery against more pronounced declines in abundance or size structure, at least in the short term.

Against TIRFMP performance criteria, Lake Leake demonstrates a mixed outcome. The mean weight of brown trout exceeding 400 mm was above target thresholds, indicating growth and condition objectives are currently being met. However, the proportion of large brown trout (>500 mm) fell below management targets, and daily brown trout catch rates remained well below management benchmarks, highlighting ongoing limitations in population structure and fishery performance.

For rainbow trout, limited electrofishing captures preclude meaningful assessment against size-based performance criteria. Nevertheless, angler catch rates remain within management target ranges.

8. Summary

Overall, the Lake Leake trout fishery is currently characterised by low brown trout abundance, strong reliance on ageing natural and previously stocked cohorts, very limited recent natural recruitment and reduced angler pressure. While fish growth and condition remain generally acceptable and current harvest levels are low, the observed population structure highlights an underlying vulnerability to further decline in the absence of renewed recruitment or targeted supplementation. To address this risk, the fishery would benefit from a substantial increase in brown trout adult transfers in the 2026–27 season.

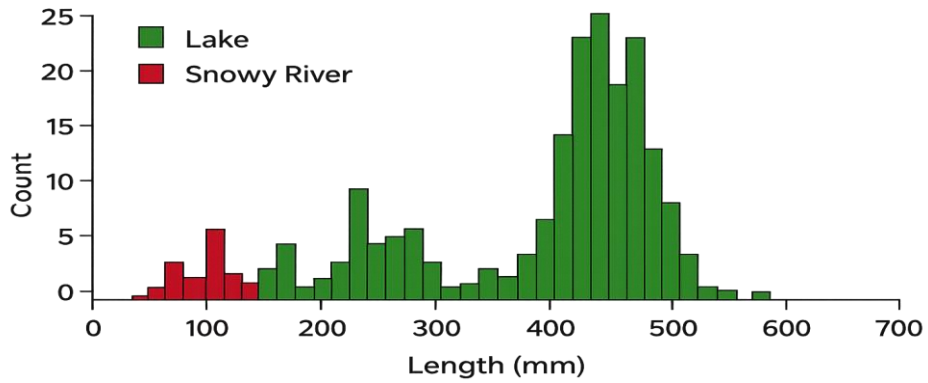
Looking beyond this period, climate projections for Tasmania's eastern region indicate an increased likelihood of below average rainfall and persistently low lake levels. These conditions suggest any future stocking or transfer strategies will require careful evaluation, as environmental constraints may increasingly limit survival and recruitment success. Continued integration of fishery-independent electrofishing surveys

with fishery-dependant angler catch monitoring will be essential for assessing the effectiveness of management actions, evaluating stocking outcomes and tracking future recruitment dynamics.

RECOMMENDED MANAGEMENT ACTIONS

- Maintain harvest controls by retaining the current bag and size limits.
- To offset recent recruitment shortfalls and support the rebuilding of spawning biomass, reinstate a strategic stocking program based on targeted transfers of adult brown trout.
- Maintain rainbow trout stocking, with levels adjusted to prevailing climatic conditions and a preference for stocking yearling or adult fish.
- Continue integrated fishery monitoring using a combination of fishery-independent and fishery-dependant data sources, including electrofishing, angler surveys, creel interviews and the angler diary app to track key performance indicators such as abundance, recruitment, fishing effort and catch rates.
- Re-focus performance reporting on recruitment and catch rate indicators, with particular emphasis on juvenile abundance, cohort progression and brown trout catch rates as early signals of population recovery.
- Continue monitoring lake levels and environmental indicators, including turbidity, to inform and support future fishery management planning.

9. APPENDIX



Appendix 1: Number of brown trout in each length class, FPA survey, April 2022, Lake Leake

Appendix 2: Stocking records for Lake Leake for brown and rainbow trout 2015-2025 (* denotes fish tagged for promotion and # adipose fin clipped fish).

Brown trout			
Stocking date	Number	Weight (g)	Age
August 2025	1*	426	Adult
October 2024	1*	463	Adult
July 2022	3*	926	Adult
August 2021	1203	852	Adult
May 2020	1200	800	Adult
April 2019	1050	900	Adult
May 2018	1100	850	Adult
May 2017	2000 #	977	Adult

Rainbow trout			
Stocking date	Number	Weight (g)	Age
January 2025	4000	50	Fingerling
June 2024	2500	360	Adult
May 2023	1750	485	Adult
June 2022	2100	400	Adult
July 2021	2000	380	Adult

Rainbow trout - continued			
June 2020	2000	300	Yearling
May 2019	2013	500	Adult
July 2018	2100	385	Adult
January 2017	8000	60	Fingerling
June 2017	3000	310	Adult
October 2017	1291	725	Adult
December 2016	10000	20	Fingerling
October 2015	120	500	Adult

Appendix 3: Performance criteria for Lake Leake, as listed in the Tasmania Inland Recreational Fishery Management Plan, Mid Term Review 2018 – 2028 (TIRFMP).

Species	Average weight (kg)	Daily catch rate	Percent of large fish	Population size
Brown trout	> 400mm 1.0 kg ± 0.1	1.0 ± 0.2	> 500mm 30%	15,000 – 22,000
Rainbow trout	> 400mm 1.0 kg ± 0.2	0.5 ± 0.1	> 500mm 15%	Not applicable