Inland Fisheries Service Report

Recreational Fisheries Report

Fisheries Performance Assessment

Technical Report

Brushy Lagoon – August 2025

Inland Fisheries Service

Inland Fisheries SERVICE

Tasmanian Government

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Fisheries Performance Assessment Technical Report – Brushy Lagoon 2025

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Contents

1. Introduction

Brushy Lagoon was created in 1987 by Sustainable Timbers Tasmania as a firefighting water storage. The lagoon is a small, sheltered waterbody that supports a popular trout fishery. Initially, the lagoon was very popular with anglers, with trout growing to 1 - 2.5 kg and sustaining good catch rates. However, during 1993, redfin perch were discovered and quickly became established in high abundance. As a result, the trout fishery declined to the point where it became marginal.

A strategic change in fishery management led to the lagoon being stocked with adult and yearling rainbow trout, as well as ex-broodstock Atlantic salmon weighing between 2 - 6.5 kg. Since 2010, adult brown trout have been transferred into the lagoon, with more consistent stocking occurring in recent years. Despite these efforts, the success of the fishery remains dependent on regular stockings with higher numbers of brown and rainbow trout and Atlantic salmon.

The last dedicated survey of the fishery was completed during December 1994, using gill nets. Low numbers of both rainbow and brown trout were recorded.

2. FPA Survey Methodology

2.1. In-Lake Population Survey

Over two days (18–19 August 2025), a Smith-Root electrofishing boat was used to capture brown and rainbow trout from shoreline and open-water habitats (Figure 1), with a total shock time of 22,100 seconds (6.14 hours of electrofisher on-time). All brown and rainbow trout were weighed and measured (fork length ±1 mm) and then released.

To estimate the brown trout population size using a capture–mark–recapture survey, adult brown trout were transferred into Brushy Lagoon. Between 16 June and 1 July 2025, 1,200 adult brown trout were released. Of these, 550 were fin-clipped to serve as marked individuals, while the remaining 650 were left unclipped. One thousand trout were sourced from Tumbledown Creek (Arthurs Lake), including all 550 clipped fish; the remaining 200 were obtained from Liawenee Canal.

To estimate the population size, the Chapman estimator ($N = [(M+1)(C+1)] / [R+1]$) was used to account for the small sample size.

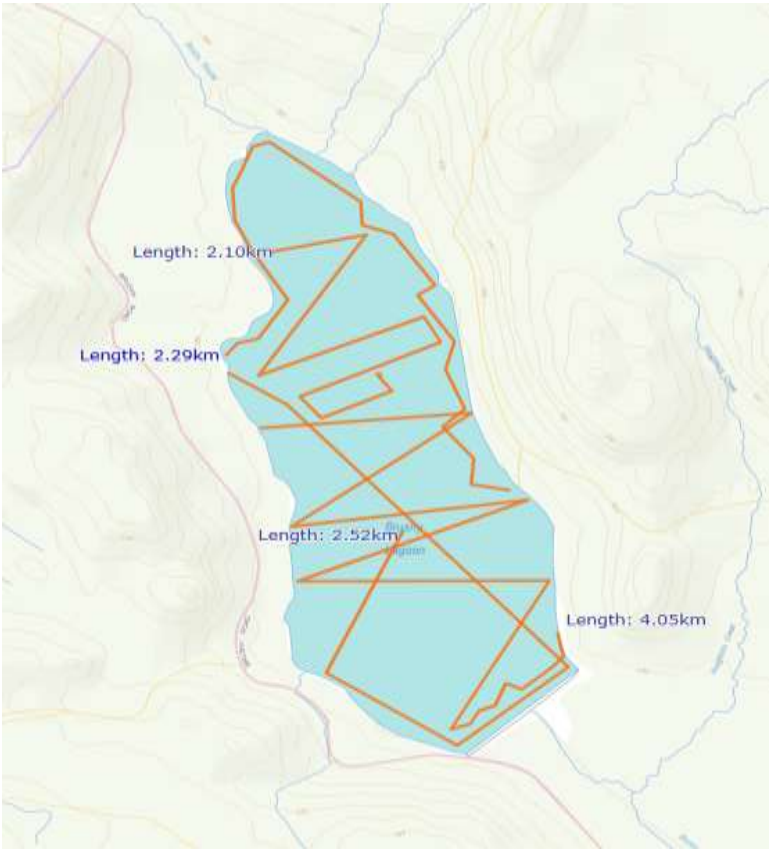

Figure 1: Brushy Lagoon, area electrofished, 18-19 August 2025 (total distance 10.96 km, total time electrofishing on-time 6.14 hrs).

2.2. Annual Postal Survey

Since 1986, the Service has conducted an annual postal survey seeking information about anglers' catches. The survey comprises a form sent to between 4,000 and 5,000 anglers across all licence categories, asking set questions about their trout 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.

Beginning in 2024–25, survey distribution was transitioned from postal to email, with participants submitting responses digitally. A comparison of postal and email returns for all waters is examined in a separate report. In this report, records assessed are from 2000 onward.

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, records post 2010 are analysed.

2.4. Angler Creel Data

Each season IFS officers collect fishing effort information from anglers interviewed at a range of waters. This information is entered directly into a dedicated 'Angler Creel' data collection App. Information on location, date, species, number of fish caught and method etc. are entered and stored in an electronic database. This information is used to examine the catch of trout at individual waters. Once analysed, the summary information is reported as the number of fish caught per day, irrespective if an angler had fished for three or more hours or was continuing to fish. All fish, irrespective of being kept or released were used, including zero catches. In this report, only records from anglers that fished for three or more hours were examined. Additionally, for the purpose of calculating the number of fish captured per day, a full days fishing is deemed to be equal to six hours.

2.5. Angler Diary

An angler fishing diary app was developed by the IFS for anglers' to record their catch of freshwater fish throughout the year. This app records location, fishing from a boat or shore, fishing method, species and number caught, weight, length, sex, fish kept/released and fishing effort. In this report, only records from anglers that fished for three or more hours were examined. Additionally, for the purpose of calculating the number of fish captured per day, a full days fishing is deemed to be equal to six hours.

2.6. Condition Factor

Condition factor for all fish was calculated using the basic formula of $K=10^5 \times \text{weight}/\text{length}^3$. This provides a basic generalised result that can be used to compare other fish and fisheries. In general, these results may not reflect the perception of anglers.

3. Results

3.1. Survey Results

Over 18-19 August 2025, a total of 12 brown trout (9 females, 3 males, no juveniles) with lengths ranging between 308 – 496 mm were captured (Figure 2). The average weight and length were 701 g and 399 mm, respectively. Seven rainbow trout (all triploids) were also captured, with an average weight, 420 g and length 319 mm.

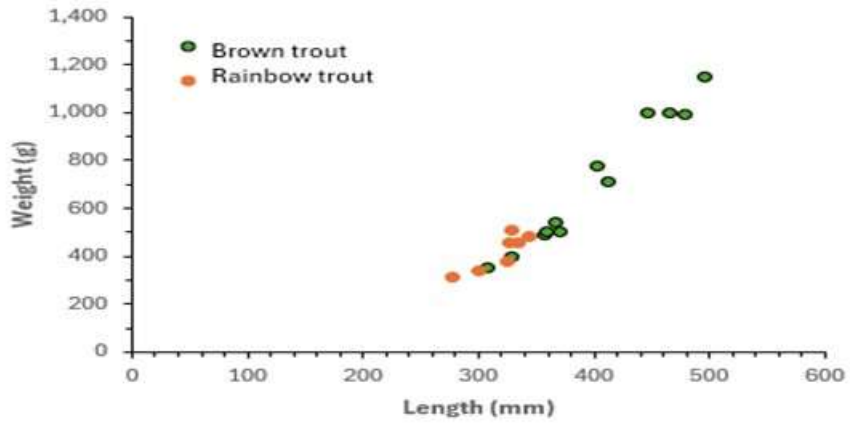

Figure 2: Length and weight comparison for brown and rainbow trout, Brushy Lagoon 2025.

3.2. CPUE

Catch per unit effort (CPUE) from boat electrofishing was 1.9 brown trout per hour (total 12 fish) and 1.1 rainbow trout per hour (total 7 fish).

3.3. Population Estimate

Of the 1,200 brown trout transferred into Brushy Lagoon during June and July 2025, 550 were adipose fin-clipped. During the survey, 12 brown trout were captured, three of which were clipped (25%). Based on this, the estimated population was 1,791 brown trout, with a standard error of 664 (Table 1). This estimate includes the 650 unclipped trout released alongside the clipped fish, suggesting that only a small number of brown trout were present in the lagoon prior to these transfers. The estimated bias level was 0.75, reflecting the influence of the small sample size. Due to this limited sample (only 12 fish), Chapman's estimation method was used.

Parameter	Result
Total fin clipped fish released (M)	550
Total captures (C)	12
Total marked recaptures (R)	3
Population estimate: MC/R = N	1,791
Standard error	664
Lower and Upper 95% CI limits	489 – 3,092
Estimate bias level: MC/4N =	0.75 (>4 acceptable bias)

Table 1: Capture-Mark-Recapture population estimate using Chapman's estimation method, Brushy Lagoon 2025.

3.4. Condition Factor

Of the 12 brown trout captured, 17 percent were classified in good condition, with 50 percent in fair and 33 percent poor (Figure 3). Of the seven rainbow trout captured, five were classified in good condition and two as fair.

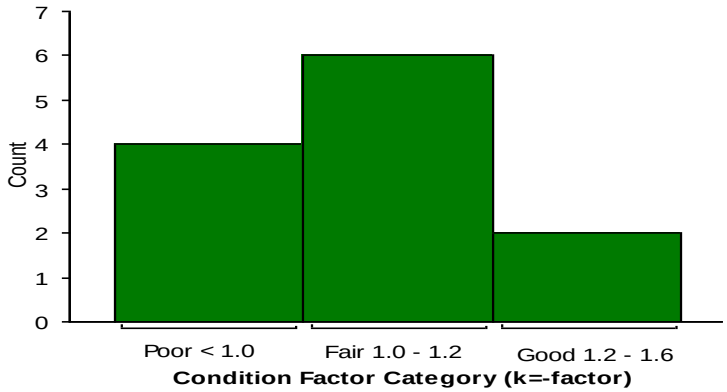

Figure 3: Condition factor category for brown trout, Brushy Lagoon 2025.

3.5. Length Frequency Data

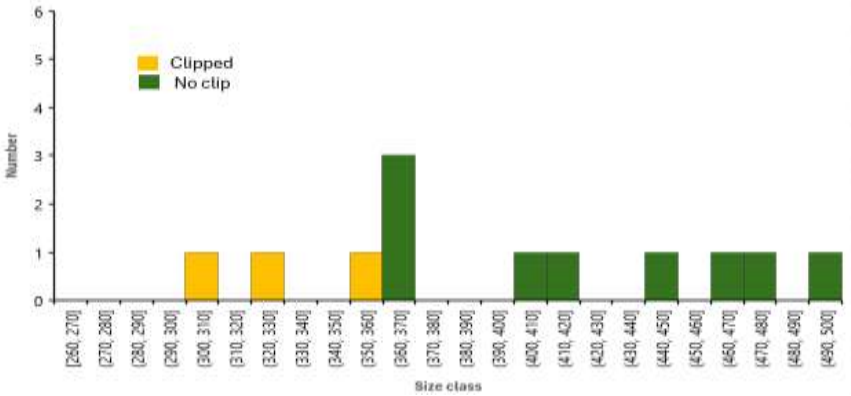

Figure 4: Number of brown trout in each 10 mm length class (n = 12), showing clipped and non-clipped fish.

Notwithstanding the low number of brown trout captured, there were no indications of natural recruitment occurring (Figure 4).

4. Angler Postal Survey 2000-2025

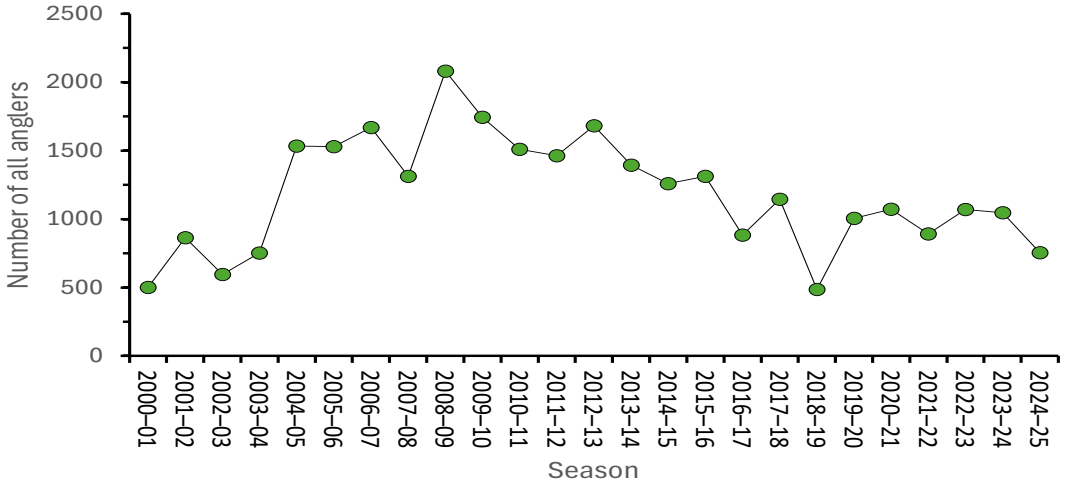

Figure 5: Estimated number of all anglers fishing at Brushy Lagoon each season 1989 - 2025.

Since the 2000-01 season, on average 4.4 percent of all licensed anglers (1,182 anglers) fished at Brushy Lagoon each season. Participation varied from a high of 2,082 anglers during 2008-09 to a low of 486 anglers during 2018-19 (Figure 5).

The average number of days collectively fished by all anglers per season (fishing effort), was 4,021. The maximum effort occurred during 2009-10 with 6,025 days fished, while in 2000-01 this was a low of 1,012 days (Figure 6).

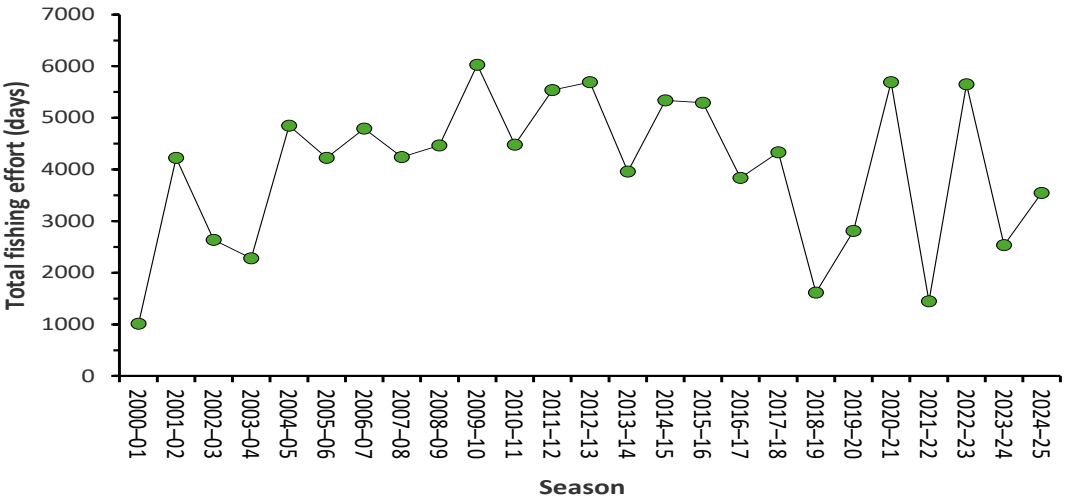

Figure 6: Total fishing effort for each season, Brushy Lagoon 2000 - 2025.

The average daily catch rate for brown trout was 0.2, with a high of 0.4 during 2003-04 and a low of 0.04 during 2000-01 (Figure 7). The average daily catch rate for rainbow was 0.4 with a high of 1.1 during 2001-02 and a low of 0.06 during 2004-05.

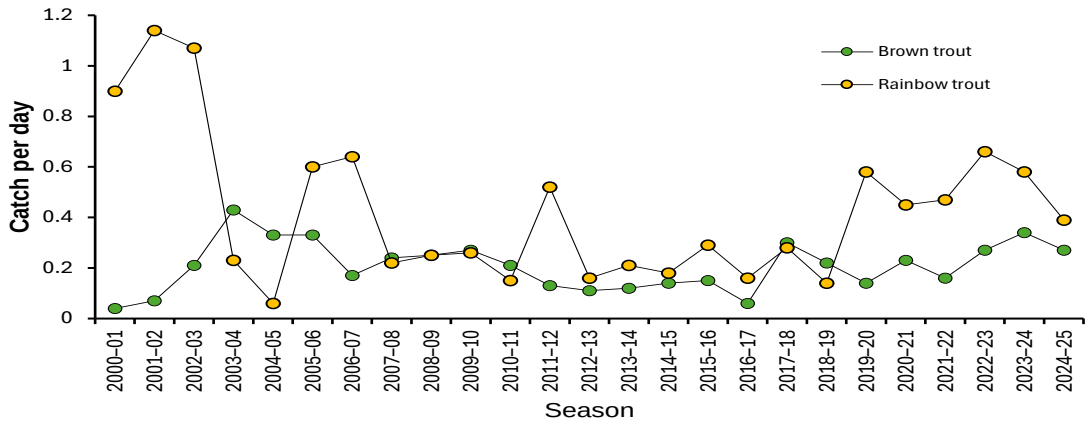

Figure 7: Catch per day of brown and rainbow trout, Brushy Lagoon 2000–2025.

The estimated average seasonal harvest of brown trout was 835, with a high of 1,633 during 2009-10 and a low of 39 during 2000-01 (Figure 8). The estimated average seasonal harvest of rainbow trout was 1,594, with a high of 4,810 during 2001-02 and a low of 225 during 2018-19.

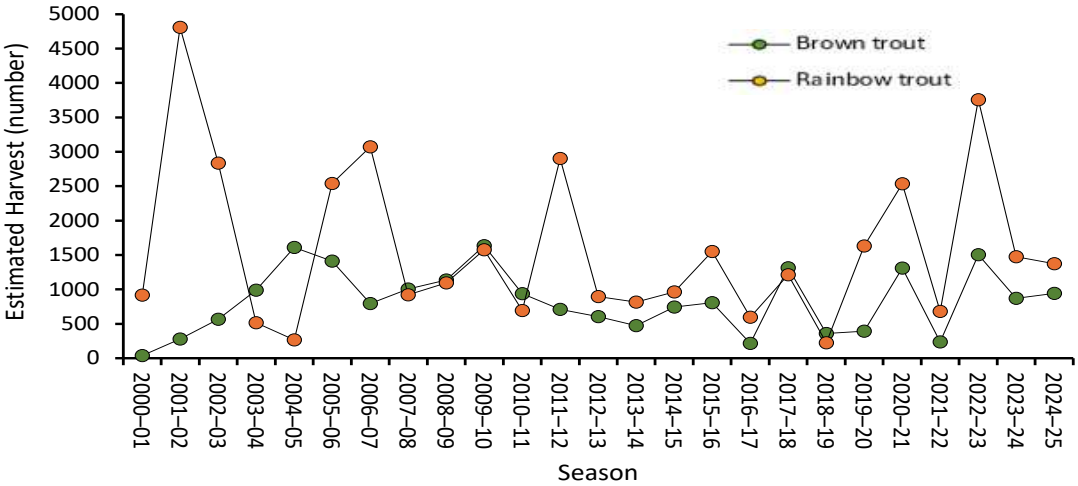

Figure 8: Estimated annual harvest of brown and rainbow trout, Brushy Lagoon 2000-2025.

The estimated average daily catch rate for Atlantic salmon was 0.3, with an average annual harvest of 1,169 fish. Brook trout have been stocked into Brushy Lagoon at various times since 2003-04. These stockings have been totally dependent on excess fish being made available by commercial fish farms. Consequently, the resulting catch rates have been highly variable between 0.6 to 0.01 fish per day.

5. Creel Interview Summary 2024-25

During the 2024–25 season, 36 anglers were interviewed about their fishing activity at Brushy Lagoon. Only those who fished for three or more hours were included in the analysis, resulting in 13 valid records. These anglers fished a combined total of 70 hours, catching three Atlantic salmon but no brown or rainbow trout. Assuming a full day of fishing equals six hours, the daily catch rate for Atlantic salmon was 0.2, while catch rates for brown and rainbow trout were zero.

Across the five seasons with complete creel records (2020-2025) catch rates for rainbow trout were generally higher between 2021 to 2024, whereas catch rates for brown trout remained low, ranging from 0.0 to 0.2 (Figure 9).

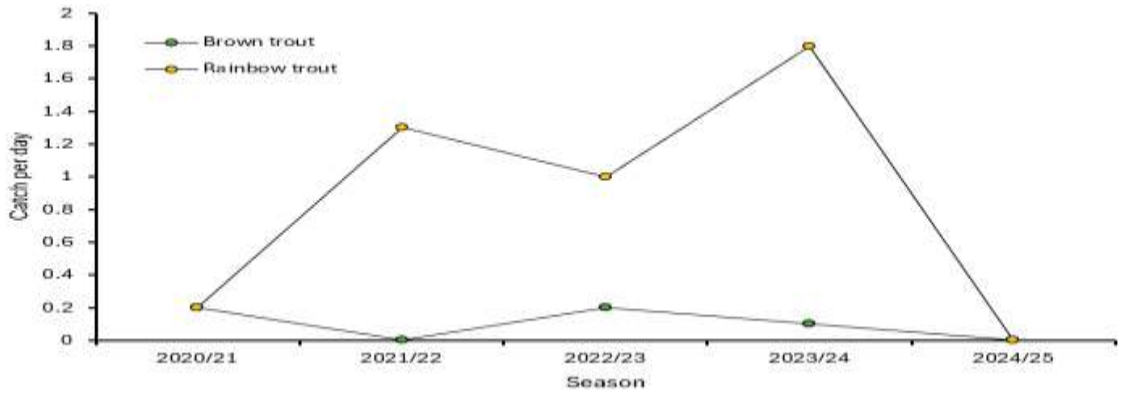

Figure 9: Catch per day for brown and rainbow trout from the Angler Creel Catch App, Brushy Lagoon 2020-25.

6. Angler Diary Summary 2024-25

During the 2024-25 season, there were 32 valid records entered by anglers into the Angler Diary App (including both nil and multiple fish captures), for fishing at Brushy Lagoon. Of these records, 25 met the criteria of fishing for three or more hours. These 25 records were attributed to 20 individual trips, with an average trip being 4.2 hours. The total number of brown trout captured was four, rainbow trout three and Atlantic salmon five. Of all reported fish, only two small rainbow trout were recorded as being released. Total fishing effort was 109.2 hours. Based on the assumption a full days fishing is six hours, this is equal to 18.2 days. The average daily catch of brown trout reported from the Angler Diary, for anglers fishing three or more hours is, 0.22 brown trout per day, 0.16 rainbow trout and 0.27 Atlantic salmon.

7. Stocking

7.1. Brown Trout

Since 2013, brown trout stocking at Brushy Lagoon has primarily involved fry (Appendix A). However, due to the high abundance of redfin perch, predation pressure on fry has been significant, resulting in low survival rates. To address this, a decision was made to stock adult brown trout instead, aiming to reduce predation impacts and establish a base population. Despite this strategic shift, brown trout stocking at Brushy Lagoon has been given a lower priority compared to other waters, leading to consistently reduced transfer numbers.

7.2. Rainbow Trout

Rainbow trout stocking at Brushy Lagoon is largely dependent on the availability of suitable fish from commercial fish farms. The number and size of fish stocked are aligned with farm production cycles. Over the past five years, between 1,000 to 2,000 rainbow trout have been stocked annually, comprising a mix of adult and yearling fish (Appendix B). The most recent stocking consisted of 1,800 yearlings around 300 mm.

8. Discussion

The results from the in-lake survey and angler catch-rate assessments indicate that the number of brown trout in Brushy Lagoon is low. This outcome is primarily due to relatively low and inconsistent stocking levels, combined with the tendency of most anglers to retain their catch. These factors, along with high predation pressure from the persistent great cormorant population across Tasmania during 2024–25, have contributed to the very low abundance of brown trout.

Rainbow trout were also detected at low levels during the survey. While this may partly reflect the lower electrofishing efficiency for this species, it is more likely associated with sustained cormorant predation and the species' higher catchability, both of which can increase angler harvest pressure.

The overall condition of both brown and rainbow trout was fair to good, which is generally typical of trout fisheries within Tasmania that contain a high abundance of redfin perch.

The use of the electrofishing boat, rather than box traps, was considered appropriate, with all major habitat types surveyed and a total of 10.9 km of the lake electrofished.

9. Recommendations

- The ratio of fin-clipped to non-fin-clipped brown trout in anglers' catches will be monitored over the next one to two seasons using the Compliance Creel app.
- Stocking priorities for Brushy Lagoon will be reviewed as part of the annual stocking plan, with consideration given to the desired catch rates for both rainbow trout and more specifically, brown trout.
- Broad fishery management objectives for the Brushy Lagoon fishery should be developed with input from anglers.

10. Appendix

Appendix A: Brown trout stockings at Brushy Lagoon 2010 – 2025.

Year	Number	Minimum age at 2025
2010	0	-
2011	10,000 (fry)	14
2012	0	-
2013	15,000 (fry)	12
2014	1,510	14+
2015	0	
2016	0	-
2017	0	
2018	257	9+
2019	2,028	8+
2020	189	7+
2021	680	6+
2023	1,540	5+
2024	750	4+
2025	1,200	3+

Appendix B: Rainbow trout stockings at Brushy Lagoon 2010 – 2025.

Year	Adult	Fingerling	Fry	Yearling
2010	290	1,500	0	0
2011	1,400	22,000	0	1,100
2012	500	0	0	0
2013	150	8,000	57,000	11,500
2014	600	3,500	0	1,300
2015	1,000	10,000	0	0
2017	300	0	0	900
2018	317	0	0	0
2019	3,300	0	0	0
2020	0	0	0	1,000
2021	1,500	0	0	0
2022	2,182	0	0	0
2023	3,107	0	0	0
2024	1,010	0	0	0
2025	0	6,400	0	1,800