Inland Fisheries Service

RECREATIONAL FISHERIES REPORT

Fisheries Performance Assessment

Technical Report

Talbots Lagoon - April 2019

Contents

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1. Introduction

Talbots Lagoon is located approximately 50 Kilometers south of Burnie near the Waratah township. Constructed in 1960 and located within production timber forest, the dam on the Wey River was designed to store water to be diverted into the Emu River via Companion Dam to support industry in the Burnie area.

At full capacity the lagoon holds 5 500 megalitres, covering approximate 270 hectares. There is a good mixture of weedy shallows and deeper rocky shores around the lagoon, catering to all styles of angling.

Until 2015, access to the lagoon for anglers was managed by the landowner under a permitting system, where visitors were required to undertake an annual induction. During 2015, the permitting system was abolished and an Anglers Access agreement between the IFS and the landowner (Forico Pty Limited) was established. Talbots Lagoon is now the most popular lake fishery in the north-west of Tasmania and has a reputation as one of the best fisheries in the state.

Under the Tasmanian Inland Recreation Fishery Management Plan 2018-28, Talbots Lagoon is managed as an ‘assisted fishery’ with a fishing season open from August to April in the following year. Fishing is open to all methods with a daily bag limit of 5 fish, consisting of only two fish over 500 mm with a minimum size limit of 300 mm length.

The lagoon is primarily a brown trout fishery but there are also rainbow trout present and captured in the system.

2. FPA Survey Methodology

2.1. In-Lake Population Surveys

Commencing on 2nd April 2019 and concluding on 4 April 2019, 150 box traps (75 per night for two nights) were set across a wide area of the lagoon, encompassing several habitat types. In total 128 trout were captured, comprising of 114 brown trout and 14 rainbow trout. All fish were weighed and measured (fork length) and identified as male, female or immature. Fish were released away from the trap site after processing to minimize the potential for re-captures.

2.2. Annual Postal Survey

Since 1986, the Service has conducted a postal survey seeking information about anglers' catches. The survey comprises a form sent to ten percent 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 to the broader angling population. This provides a long term overview of individual fishery performance in addition to characterising effort. In this report, only records post 1999-2000 season are analysed.

2.3. Stocking Database

The Service 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 some length/weight data and comments e.g. denoting tagged fish. This information provides an historical record of supplementary recruitment into individual waters.

2.4. Analysis Methods

Condition factor for all fish was calculated using the basic formula of $K=10^5 \times weight/length^3$. This provides a basic 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. NB Categories are indicative and may not necessarily reflect the perception of anglers in general. A growth equation was generated using standardised log-linear data (ln) for weight against length.

3. Results

3.1. In-Lake Population Survey – Brown Trout

During 2-4 April, the Service conducted an in-lake survey at Talbots Lagoon to examine:

- CPUE for brown trout and rainbow trout,
- to assess the population structure of brown trout and,
- the condition of all fish captured.

CPUE

In total, 114 brown trout were captured from 150 box trap sets, equating to a CPUE of 0.76 brown trout per trap. There have been no previous in-lake surveys undertaken at this water, meaning no historical data exists for the purposes of CPUE comparison. This CPUE was much lower than expected based on similar surveys conducted around the state.

Weight and Length Information

The catch consisted of 57 per cent females, 36 per cent males with 7 per cent of indeterminate sex. Weight and length (fork length) information is summarized in Table 1 below.

The average weight across all brown trout (including immature fish) was 1 270 grams. The average weight for fish over 300 mm was 1 366 grams, with 91 per cent of the catch being greater than 300 mm length (see figure 1).

On average, male fish were significantly heavier than female fish by around 160 grams.

Grouping	Measurement	Mean	Minimum	Maximum
All brown trout (n=114)	Length (mm)	459	190	581
	Weight (g)	1 270	90	2 280
	Cond Factor (k)	1.24	0.91	1.77
Male (n=41)	Length (mm)	493	367	581
	Weight (g)	1 443	670	2 080
	Cond Factor (k)	1.18	0.79	1.61
Female (n=65)	Length (mm)	461	282	575
	Weight (g)	1 283	300	2 280
	Cond Factor (k)	1.26	0.91	1.57
Immature (n=8)	Length (mm)	269	190	330
	Weight (g)	283	90	560
	Cond Factor (k)	1.37	1.09	1.77

table 1: Length, weight and condition factor for brown trout separated by sex or immature fish.

The growth curve exhibited in Figure 1 (below), shows acceptable fish growth throughout the various cohorts.

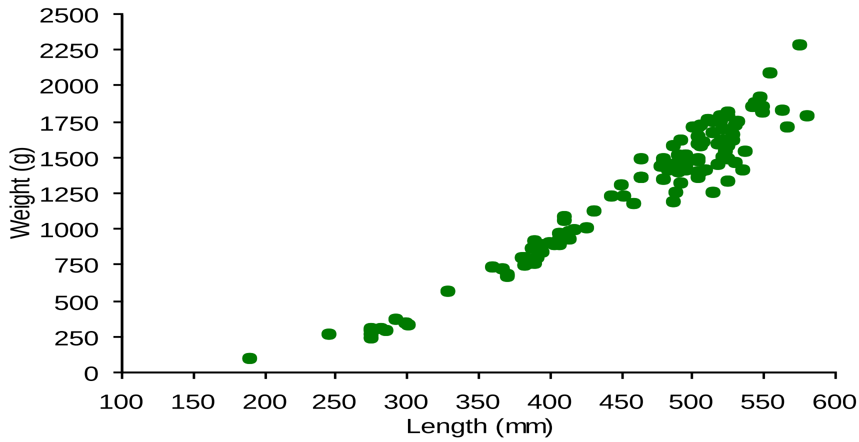
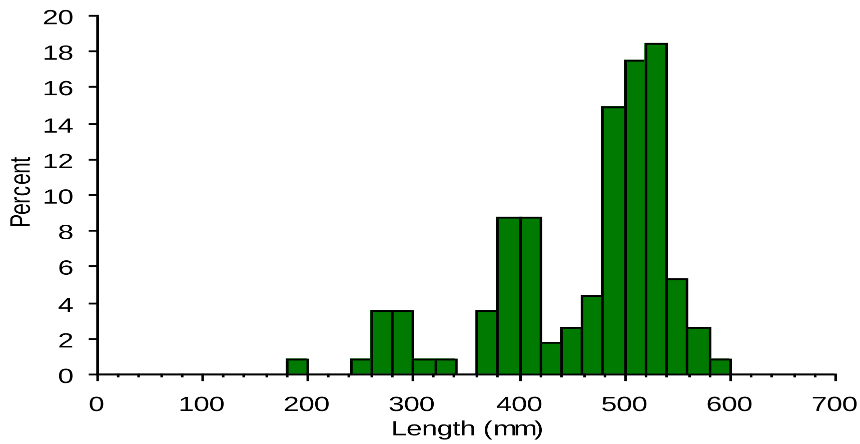


figure 1: Length/weight regression for brown trout captured, April 2019 (Y = -9.233 + 2.661 * X; R^2 = 0.965)

Figure 2 (below) indicates the population is dominated by larger (>4 years old) fish of 480 mm or larger. A strong cohort in the 360 mm to 420 mm (3 YO) bracket is also moving through. There is also evidence of a cohort in the 250-300 mm range (2YO), albeit apparently weaker than the 3-year-old cohort. This could reflect either recruitment strength or selectivity of the sampling methods used.



Length Distribution 100mm ranges

From (>=)	To (<)	Count	Percent
0	100	0	0
100	200	1	1
200	300	9	8
300	400	16	14
400	500	37	32
500	600	51	45
600	700	0	0
	Total	114	100

figure 2: Length frequency for brown trout April 2019.

Figure 3 (below) shows the overall condition of brown trout was good, with an average k-factor of 1.24. Only 6.1 per cent of the fish captured exhibited a poor k-factor (<1), with the remainder in the fair to excellent range.

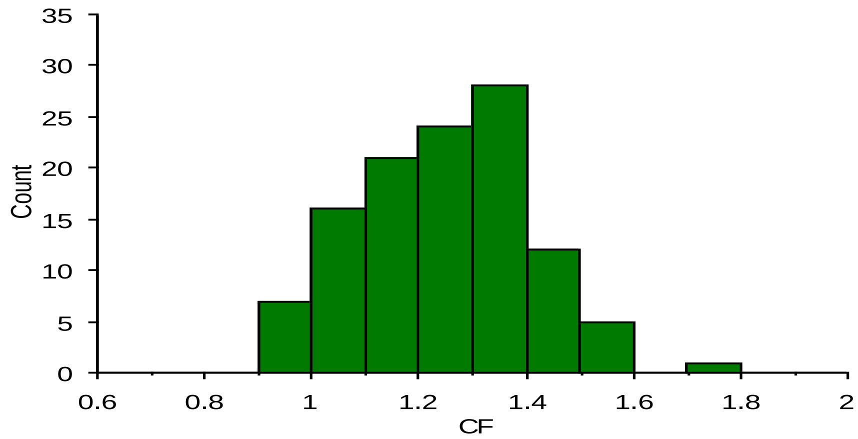


figure 3: Condition factor (k-factor) for brown trout April 2019.

Figure 4 (below) shows k-factor plotted against fish length, with male/female/immature fish separated. There is an apparent decline in the average condition of the >4-year-old fish in comparison to the 2 and 3 year old cohort. No link between sex and k-factor appears to exist.

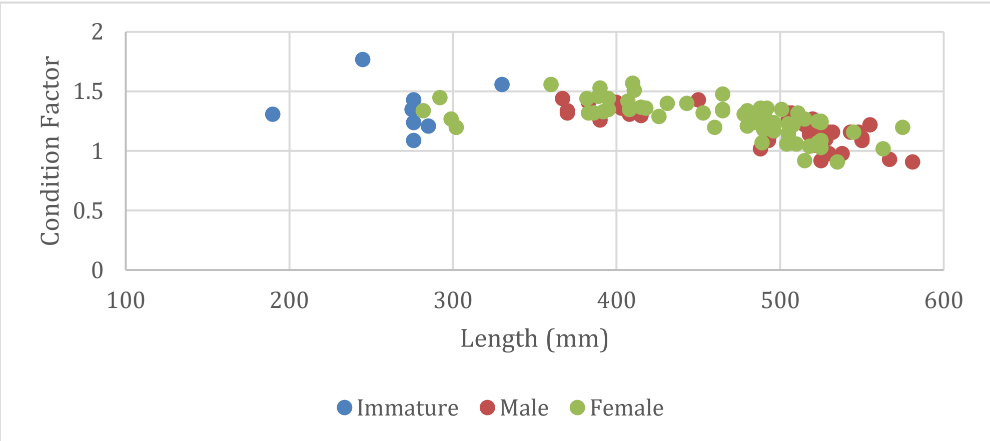


figure 4: Condition factor (k-factor) by length and sex for brown trout April 2019.

3.2. In-Lake Population Survey – Rainbow Trout

Just 14 rainbow trout were captured. The CPUE for rainbow trout was therefore extremely low at 0.093 fish per trap or 10.9 percent of the total catch. Unfortunately, this is too few fish for detailed analysis of this species.

Sizes ranged from 93mm to 538mm in length and 10 grams to 1 710 grams in weight (see appendix A). Condition factor averaged 1.26 and ranged from 0.97 to 1.72. The catch consisted of 5 males, 4 females and 5 immature fish.

3.3. Angler Postal Survey

From 2000 – 2018, on average 2 187 angler days were spent fishing at Talbots Lagoon per season (see figure 5). There has been significant annual variation, which can be linked to both fishery performance and restriction around access. The lowest visitation occurred in the 2003-04 season with only 881 angler days spent at this water. Peak attendance of 4 555 angler days occurred during 2015-16, immediately after the IFS Anglers Access agreement was implemented.

Annual harvest has fluctuated considerably since 2000 (see figure 6), with an average seasonal harvest of 3 287 brown trout over the entire period. A low of 1 037 fish occurred in season 2011-12, whilst the high of 8 377 fish was recorded for the 2007-08 season.

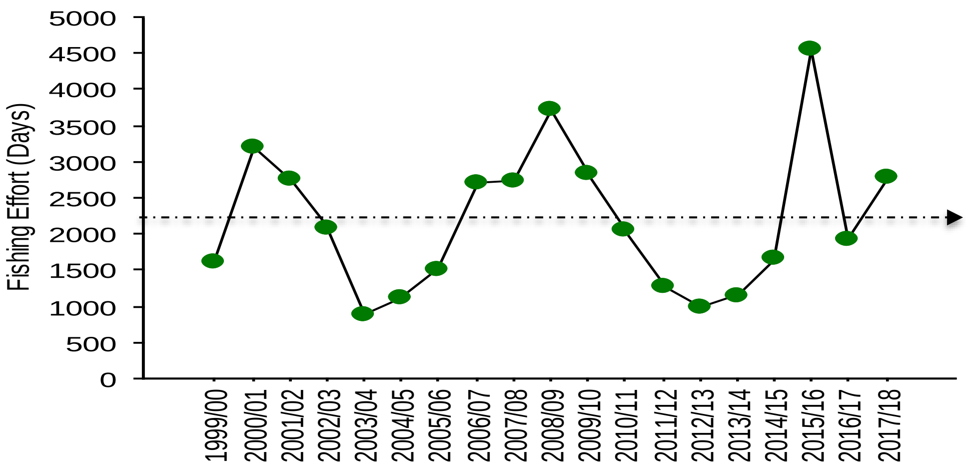


Figure 5: Total fishing effort 2000–18 (dotted line indicates long-term average).

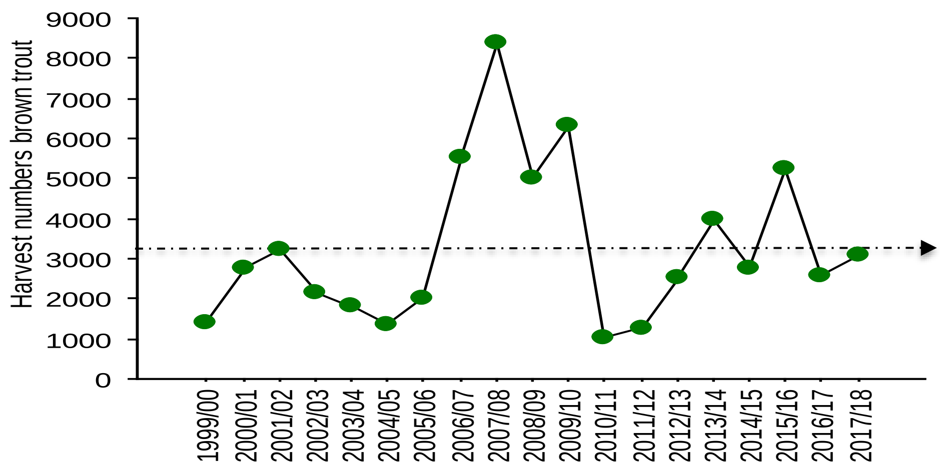


Figure 6: Estimated harvest of brown trout 2000–18 (dotted line indicates long-term average).

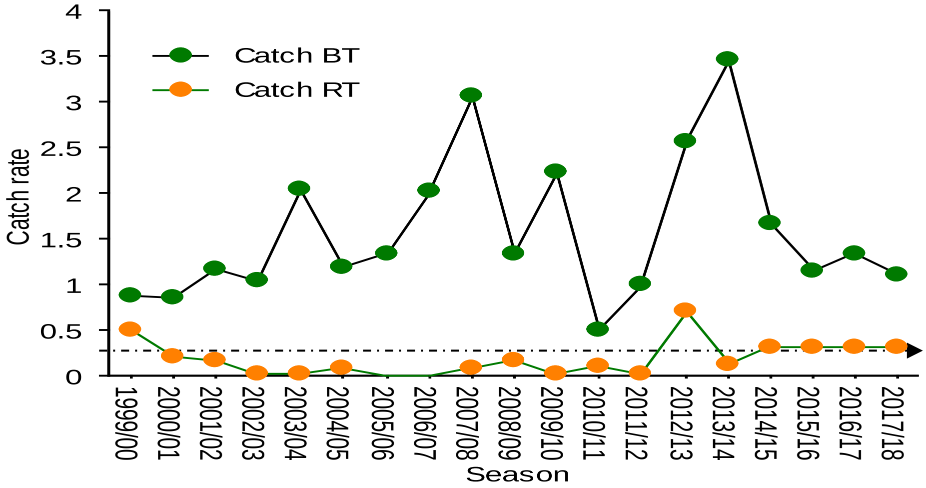


Figure 7: Daily catch rate for brown & rainbow trout 2000–18 (dotted line indicates long-term average).

Brown trout daily catch rates have ranged between 0.5 and 3.07 fish per angler day, with an overall average of 1.57 (see figure 7). Rainbow trout catch rates through the same period have averaged 0.18 rainbow trout per angler day with a peak of 0.7 fish per day during the 2012-13 season.

3.4. Stocking

Brown trout

The brown trout populations within Talbots Lagoon is entirely from natural recruitment from upstream sources.

Rainbow trout

Natural recruitment of rainbow trout is low but consistent and maintains a small viable population. There have been four supplementary stockings of rainbow trout (see appendix B), however these events show no evidence in influencing either harvest or catch rate for this species.

4. Discussion

The Talbots Lagoon fishery at present, appears to be performing well in terms of increased angler visitation, daily catch rates and fish size.

In comparison to other lake fisheries, the CPUE was lower than expected. For example, CPUE data from other recent Fisheries Performance Assessments include:

- Little Pine 2018: 4.64 fish per box trap
- Bronte Lagoon 2018: 1.76 fish per box trap
- Penstock 2018: 3.60 fish per box trap

Given the overall catch rate reported by anglers at 1.57 fish per day is comparably high, it is thought the CPUE would be higher. It is assumed that cooler night time temperatures during the survey resulted in fewer fish venturing into the shallows, hereby limiting box net captures, explaining the lower CPUE value.

The survey results indicate the majority of takeable fish in the lake are over 4 years in age. There is evidence of recruitment into the fishery over the previous 3 years, however it appears this may have been limited for 2016. It is possible the floods from June 2016 may have had some impact on that year class.

Some informal electrofishing completed on the Wey River approximately 1 km upstream from the lagoon conducted at the same time as the box net survey, found a large number of <1 year old brown and rainbow trout fingerling, demonstrating good recruitment for both species for 2018. In addition, monitoring by the North West Fly Fishing Club of Tasmania over the past few years has reported good numbers of brown and rainbow trout engaged in spawning behavior in key recruitment tributaries around the lagoon.

The majority of the fish in the population are in fair to excellent condition. There appears to be a small reduction in the average condition in brown trout greater than 450 mm in length, however this is not inconsistent with other lake fisheries in the state. This reduction in condition is not related to sex.

Historically, catch rates appear to have had a lagged effect on angler visitation. Lower catch rates during the 2010-11 and 2011-12 seasons likely contributed to the reduced visitation that took place between 2011-12 and 2012-13 seasons. Conversely, peaks in catch rates around the 2007-08 season likely influenced the increased participation in the fishery around this time.

Annual harvests between the 2006-07 season and the 2009-10 season were significantly higher than the long-term average. It is worth noting the decline of catch rates and annual harvest in the 2010-11 season following this period of sustained fishing pressure. This period of high harvest also coincides with three years of drought during 2006-2009, resulting in poor recruitment and consequently lower adult fish numbers in the 2010-11 season. It must be noted that respondents to the Angler Postal Survey for this water have been generally low (ranging between 3 and 26 each year), so a degree of caution is warranted when interpreting these figures.

The abolishment of the permitting system in 2015-16 season and introduction of an Anglers Access agreement resulted in a sharp increase in angling effort. This increase appears to have moderated over recent seasons and the annual harvest from the lagoon has remained consistent with long term trends.

Catches of rainbow trout have remained low at around 0.18 fish per day with an estimated annual harvest of around 400 fish. There is speculation among regular users of the lagoon that this catch rate may rise due to increased use of kayaks (anecdotally) in recent seasons. A one off stocking of rainbow trout in 2007 (the first since 1996) appears to have had no influence on rainbow trout catch rates.

To summarise, at present Talbots Lagoon has a good population of brown trout across a wide range of sizes. Recruitment appears to be annually variable however sufficient to maintain current daily catch rates and annual harvest. At present, management actions are serving the fishery adequately. Size and quality of fish, catch rates, and angler visitation are all at satisfactory levels.

5. Recommendations

- The population structure in the lagoon currently re-enforces the decision to adjust bag and size limits from the traditional 12 fish/220mm down to 5 fish/300mm (with only 2 over 500mm) for the 2016-17 angling season. At present this management strategy appears effective.

- Continued monitoring of annual harvest and daily catch through angler feedback and the annual postal survey is recommended, with alteration of bag and/or size limits to be considered if these values deviate too far from long term trends. Follow up assessment of the trout population should also be considered if this occurs.

- Continue to assist and facilitate the annual monitoring of spawning fish conducted by the North West Fly Fishing Club. Should long term significant reduction in spawning activity be noted, a more thorough investigation may be required.

- No annual stocking is required at current levels of angling effort. Potentially consider actions to reduce rainbow trout harvest should significant fluctuations in the daily catch rates of this species occur. This is particularly relevant with the anecdotal evidence that rainbow trout catch rates have increased due to more anglers utilizing kayaks.

- Future monitoring of trout population to be conducted on an ‘as needs’ basis.

6. Appendix

Sex	Length (mm)	Weight (g)	Cond Factor
M	465	1 300	1.29
F	450	1 180	1.29
M	485	1 300	1.14
M	484	1 310	1.16
I	202	90	1.09
F	464	1 200	1.20
M	522	1 710	1.20
I	375	700	1.33
I	93	10	1.24
I	172	80	1.57
M	491	1 460	1.23
F	503	1 470	1.16
F	538	1 510	0.97
I	120	30	1.74

Appendix A: Raw data for rainbow trout, Talbots Lagoon April 2019.

Date	Species	Number	Age	Type
19-Dec-96	Rainbow trout	5 000	Fingerling	Diploid
18-Dec-95	Rainbow trout	5 000	Fingerling	Diploid
30-May-92	Rainbow trout	2 000	Fingerling	Diploid
08-May-07	Rainbow trout	4 000	Fingerling	Diploid

Appendix B: Stocking records for Talbots Lagoon – all species for all years (1996 – 2018)