

Inland Fisheries Service

Fisheries Performance Assessment – Technical Report

Penstock Lagoon – July 2022



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Introduction

Water Management

Penstock Lagoon is a small, shallow water with a surface area of 1.4 square km's and a maximum depth of 1.8 metres. The lagoon was once an important hydroelectric storage for generating power at nearby Waddamana power station. However, during 1993, the Waddamana power station was decommissioned, consequently water flowing through the lagoon was reduced by many orders of magnitude. Water levels in the lagoon are now largely maintained by local inflows via the old Hydro canals, resulting in a mostly clear water fishery with stable lake levels.

Trout Fishery

The trout fishery at Penstock Lagoon has for many years been valued for a moderate catch rate of quality brown trout and lower numbers of rainbow trout. The stocking of brown trout fry and fingerlings have in the past resulted in highly variable rates of survival, leading to unacceptable catch rates. Consequently, management of the fishery is now exclusively reliant on the transfer of adult brown trout from Great Lake, Arthurs Lake and to a lesser extent, Lake King William. Rainbow trout stockings have consisted of a mix of fry, fingerlings and yearlings, but the catch rate has over the past ten years remained consistently low.

FPA Survey Methodology

In-Lake Population Surveys

During 26-28 July 2022, 84 box traps (42 traps over two nights) were set across all habitat types, including two deep water sets. A total of 422 brown trout were captured on the first day of which 296 were weighed and measured. On the second day, all 300 brown trout captured were counted only. All 20 rainbow trout captured were weighed and measured. During the survey brown trout were checked for the presence of either an adipose fin clip or a hole punched adipose fin, this distinguished the 2014 and 2016 adult transfers from all other brown trout.

Condition factor was calculated using the basic formula of $K=10^5 \times \text{weight}/\text{length}^3$. This provides a generalised result that can be used to compare other fish and fisheries. The short comings of condition factor are acknowledged but are used for relative comparisons only. Categories are indicative and may not necessarily reflect the general perception of anglers.

Stocking Database

The Service keeps electronic records of public water stockings 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. In this report, only records between 2000 and 2022 are examined.

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, total seasonal catch and angling effort is extrapolated. This provides a long term overview of individual fishery performance in addition to characterising effort. In this report, only records post 2000 are analysed.

Angler Creel Data

Each season IFS officers collect fishing effort information from anglers while fishing. 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.

Results

In-Lake Survey 2022

During 26 to 28 July 2022, the Service conducted an in-lake survey at Penstock Lagoon to:

- examine the CPUE for brown and rainbow trout,
- to assess the population structure of both brown and rainbow trout,
- assess the survival and growth of two groups of adult brown trout,
 - 1) those released in June 2014 that were adipose fin clipped, and
 - 2) those released in June 2016 that had a distinctive adipose fin punch mark and compare results with previous surveys in 2014, 2016 and 2018.

A total of 742 trout were captured, consisting of 722 brown trout and 20 rainbow trout.

CPUE Information

Over the three days (2 nights) of the survey, 84 box traps (in total) were used to capture 722 brown trout. In respect of CPUE, box traps returned 8.60 brown trout per trap, with most traps catching multiple fish. The CPUE for this survey was significantly higher compared to similar surveys conducted during 2016 and 2018 (Table 1). A survey undertaken in 2014 that utilised a combination of methods (box traps and fyke nets), returned the lowest CPUE of all surveys at 2.15 fish per trap, which was reflective of the lower number of brown trout at that time.

Table 1: CPUE for brown trout, Penstock Lagoon 2014, 2016, 2018 and 2022. * one net removed for last sample night.

Year	Method	No. traps	Sample time	Effort	Catch Number	CPUE fish
2014	Box traps	21	3 overnight sets	*62 trap sets	133	2.15/trap
2016	Box traps	60	2 overnight sets	120 trap sets	417	3.48/trap
2018	Box traps	62	2 overnight sets	124 trap sets	446	3.60/trap
2022	Box traps	42	2 overnight sets	84 trap sets	722	8.60/trap

A total of 20 rainbow trout were captured from 84 box traps, representing 2.6 percent of the total catch of all trout. The average CPUE was 0.24 fish per trap. This figure was well down on the CPUE of 1.08 fish per trap for the 2016 survey, but marginally higher than 2018 at 0.08 and 2014 at 0.05 fish per trap.

Of the 722 brown trout captured, five had a fin clip from the 2014 stocking and ten had a fin punch from the 2016 stocking. In terms of CPUE, 2014 fin clipped fish represented 0.06 fish per trap and the 2016 fin punched fish, 0.12 fish per trap (Table 2). Using this information, it was possible to estimate the number of brown trout remaining from each stocking event and therefore estimate total mortality (Appendix C).

Table 2: Number and percentage of adipose fin marks (clips or punch) and non-marked brown trout 2022.

Total	Number	CPUE	Percent of total catch
Non adipose mark	707	8.42	98
Adipose clip from 2014	5	0.06	0.7
Adipose punch from 2016	10	0.12	1.3

The results of the survey indicate continued survival of the original fin clipped brown trout stocked into the lagoon in May/June 2014. During the 2014 survey these fish represented 31 percent of the catch; 20 percent for 2016, 12 percent for 2018 and 0.7 percent for 2022 (Table 3). The 2016 adipose punched fish represented 26 percent of the survey catch during 2016, 16 percent for 2018 and 1.3 percent for 2022.

Table 3: Summary information for catches of fin clipped and fin punched stockings 2014 and 2016, including survival estimates.

Year	Number captured	Nets set	CPUE (per trap)	Estimated number remaining	Estimated percent remaining
2014 Clips (brown trout)					
2014	60	62	0.97	2,000	100
2016	82	120	0.68	1,400	70
2018	54	124	0.44	910	46
2022	5	84	0.06	127	6
2016 Punches (brown trout)					
2016	109	120	0.91	3,658	100
2018	70	124	0.56	2,268	62
2022	10	84	0.12	476	13

Length and Weight Information – Brown Trout

Of the 296 brown trout weighed, measured and sexed, 171 were male, 124 were female with one identified as indeterminate. There was no statistically significant difference in the average weight or length of male and female brown trout. Male brown trout on average weighed 1,195 g and measured 463 mm with females weighing 1,232 g, and measuring 472 mm.

Most brown trout displayed good growth across all lengths (Figure 1). Fish over 500 mm continued to show good weight gains, with very few longer fish displaying lower weight to length ratios i.e., poor condition. There were no fish over 600 mm, which is similar to the 2014, 2016 and 2018 survey results.

The five 2014 fin clipped fish captured, displayed slightly poorer condition compared to most unmarked fish. These fish are at least eleven years old. The 2016 fin punched fish displayed similar weights to unmarked fish of the same length, despite being a minimum of nine years old.

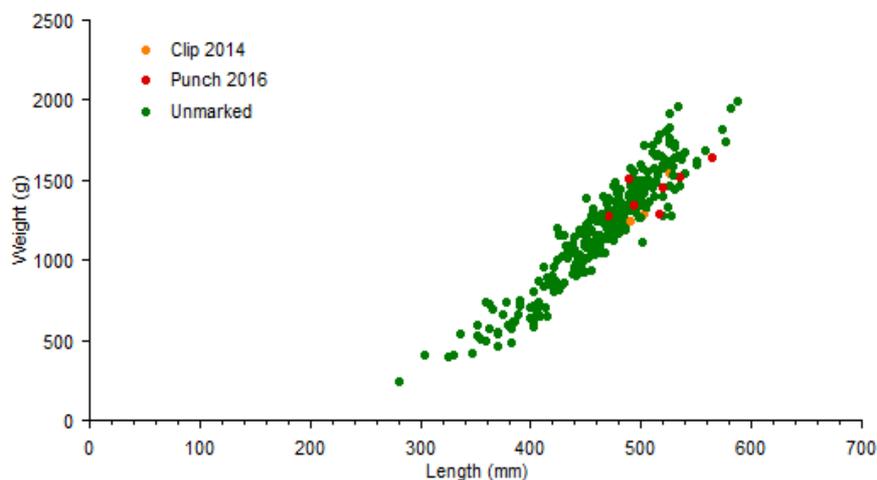


Figure 1: Length weight relationship for brown trout captured in 2022, showing non-clipped, 2014 fin clipped and 2016 fin punched brown trout.

Figure 2 shows the length frequency for the 296 brown trout weighed and measured. Sixty two percent of these fish were between 400 – 500 mm, and 28 percent between 500 – 600 mm. There were a small number of fish in the 280 – 400 mm length range. The source of these smaller fish were a transfer of adult fish from Arthurs Lake during June 2022 and Lake King William during May 2021 (Table 6). There was no evidence of fish less than 260 mm from natural recruitment over the past two years.

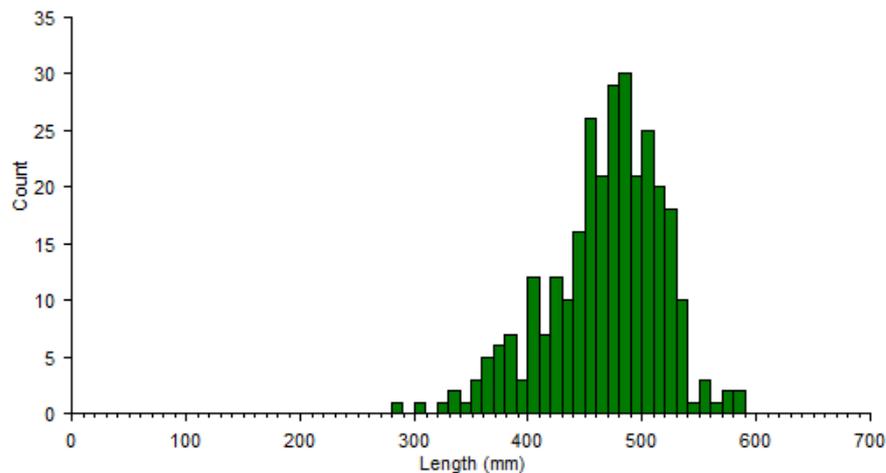


Figure 2: Length frequency histogram for brown trout, Penstock Lagoon 2022.

Brown trout over the legal size limit of 400 mm measured an average of 478 mm and weigh 1.28 kg. Anglers can therefore potentially take most of fish they capture, within the confines of the daily bag limit.

Table 4 shows the summary statistics for brown trout separated into four categories; all fish combined, no-fin marks, 2014 fin clipped and 2016 fin punched. When the 2014 and 2016 transferred fish are compared to all other fish, on average they are significantly longer and weighed more. This is because these fish have been in the lagoon substantially longer and have had a chance to grow to a larger size. In addition, the non-marked grouping included fish transferred from Lake King William (2021) and Arthurs Lake (2022), which are generally smaller, resulting in a lower average length. Despite this, most fish (58%) grew to around 1.0 – 1.5 kg, with around 19 percent growing to 1.5 – 2.0 kg.

Table 4: Length, weight and condition factor for brown trout captured in box traps, separated by: combined sample, non-finclipped, 2014 adipose clips and 2016 adipose fin punched brown trout.

Grouping	Measurement	Average	Minimum	Maximum
All brown trout (n=296)	Length (mm)	466	280	588
	Weight (g)	1,209	240	1,990
	Cond Factor (k)	1.16	0.87	1.59
No – fin marks (n=286)	Length (mm)	465	280	588
	Weight (g)	1,202	240	1,990
	Cond Factor (k)	1.17	0.87	1.59
Fin clipped 2014 (n=3)	Length (mm)	506	491	525
	Weight (g)	1,357	1,240	1,540
	Cond Factor (k)	1.04	1.01	1.06
Fin punch 2016 (n=7)	Length (mm)	513	471	565
	Weight (g)	1,433	1,280	1,640
	Cond Factor (k)	1.07	0.91	1.29

Length and Weight Information – Rainbow Trout

A total of 20 rainbow trout were captured during the survey. Their average length was 503 mm with an average weight of 1,583 grams. The low catch was below expectation; however, it is likely to reflect the lower number of rainbow trout within the lagoon. All rainbow trout were in good condition with an average condition factor of 1.24 k, with two defined length classes present, 340 - 360 mm and 480 – 600 mm (Figure 3).

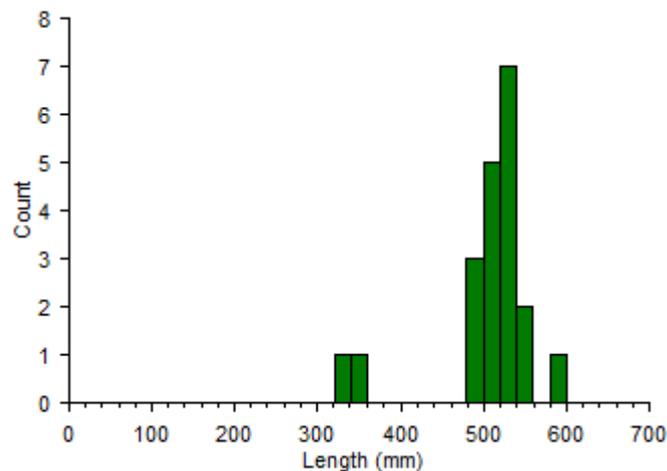


Figure 3: Length frequency histogram for rainbow trout, Penstock Lagoon 2022.

Comparison 2014, 2016, 2018 & 2022 Surveys

Comparative summary data for FPA surveys at Penstock Lagoon between 2014 and 2022 are shown in figures 4 and 5 and table 5. The growth of brown trout is consistent across all survey periods. There are several younger fish in the 180 – 220 mm length range during the 2014 survey. These fish are from previous fry and fingerling stockings (Table 6). Post 2014, all stockings of brown trout were exclusively adult brown trout from Great Lake, Arthurs Lake and Lake King William, consequently, there were no brown trout under 250 mm during the 2016, 2018 and 2022 surveys. Furthermore, during all four surveys, only one brown trout over 600 mm was captured, this was during 2018.

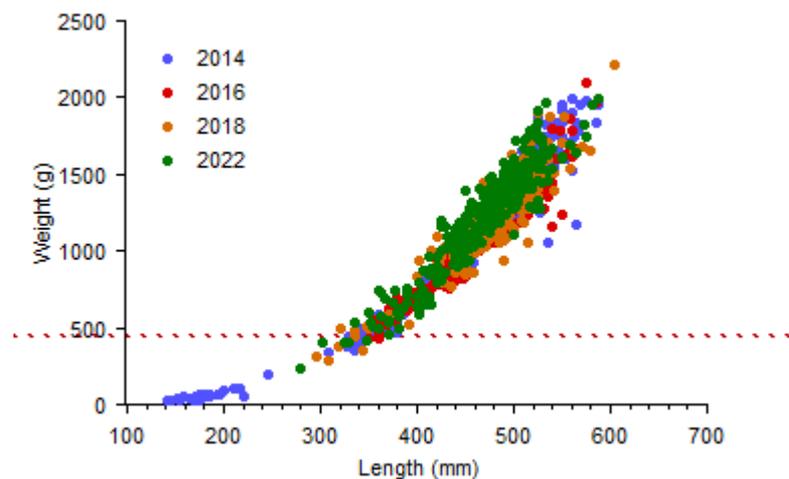


Figure 4: Length/weight regression for comparative surveys undertaken in 2014, 2016, 2018 and 2022 for brown trout, Penstock Lagoon.

The average length of brown trout has remained relatively stable across all surveys. However, the average weight has increased over time and consequently the average condition factor has increased from 1.05 k during 2014 to 1.16 k for the 2022 survey (Figure 5 a, b, & c).

During 2022, 87 percent of brown trout were above the legal size limit of 400 mm. This is largely due to only adult brown trout being stocked post 2014. This percentage has nonetheless decreased from 96% since the 2018 survey. This is due to the transfer of smaller brown trout from Lake King William and Arthurs Lake. Despite this however, the average weight and condition of fish during 2022 is higher (Table 5).

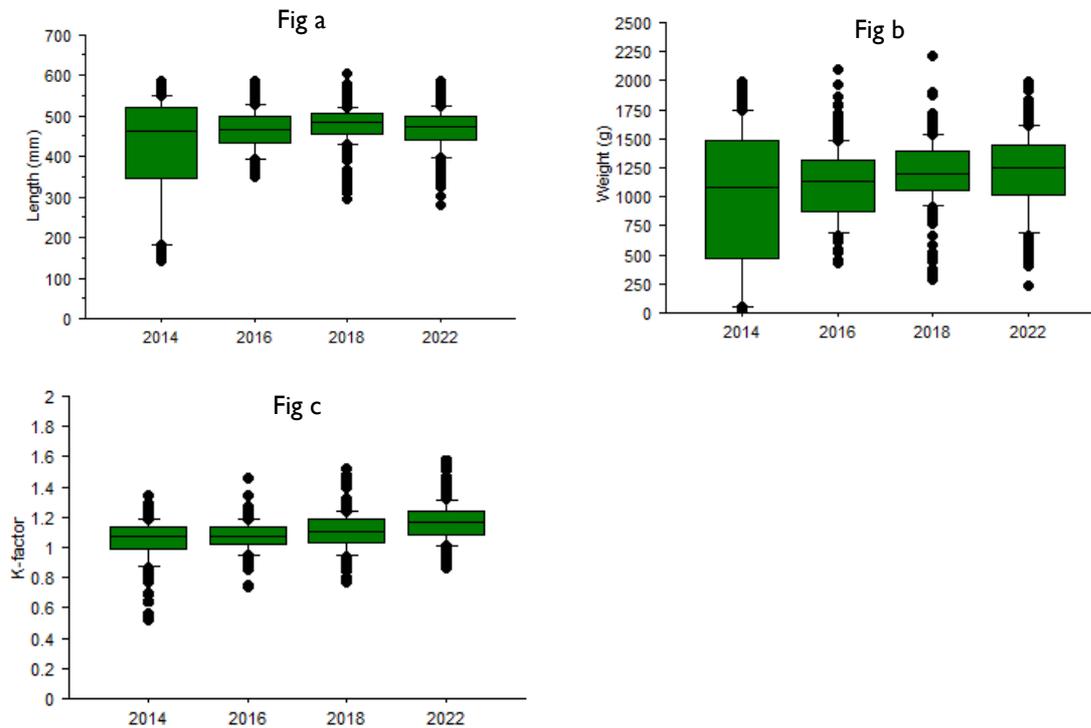


Figure 5: Box plots showing the median and associated upper and lower quartiles for, (a) length, (b) weight and (c) condition factor for surveys undertaken during, 2014, 2016, 2018, for brown trout, Penstock Lagoon.

Table 5: Length, weight and condition factor for surveys undertaken during 2014, 2016, 2018 and 2022, for all brown trout, Penstock Lagoon.

Variable	Average	Count
Weight 2014	976	192
Length 2014	417	192
CF 2014	1.05	192
Weight 2016	1106	231
Length 2016	465	231
CF 2016	1.07	231
Weight 2018	1208	245
Length 2018	477	370
CF 2018	1.10	245
Weight 2022	1209	296
Length 2022	466	296
CF 2022	1.16	296

Stocking History

Over the past 18 years, Penstock Lagoon has undergone several changes to the trout stocking regime. These changes have been driven by access to additional adult brown trout and inconsistent results from fry and fingerling stockings and associated declining catch rates. Table 6 presents this data, showing only adult brown trout were stocked post 2014. The stocking of rainbow trout has mainly consisted of fry or fingerlings. Yearling rainbow trout have been released during 2015 and 2016, but they have not yielded any long term increases in catch or fish quality.

Table 6: Stocking history for Penstock Lagoon, 2007 – 2022. (*split between 2013-14; # stocked Dec 2012)

Year	Species	Number	Age	Type
Brown Trout				
2007	Brown trout	20,000	Fry	Diploid
2008	Brown trout	10,000	Fry	Diploid
2009	Brown trout	5,000	Fry	Triploid
2010	Brown trout	10,000	Fry	Diploid
2011	Brown trout	10,000	Fry	Triploid
2012	Brown trout	15,000	Fry	Triploid
2013	Brown trout	10,000	Fry	Triploid
2014	Brown trout	55,000	Fry	Triploid
2007	Brown trout	3,500	Fingerling	Diploid
2008	Brown trout	250	Fingerling	Diploid
2009	Brown trout	5,000	Fingerling	Triploid
2009	Brown trout	5,000	Fingerling	Diploid
2007	Brown trout	490	Adult	Diploid
2008	Brown trout	280	Adult	Diploid
2009	Brown trout	100	Adult	Diploid
2014	Brown trout	2,320	Adult	Diploid
2015	Brown trout	4,292	Adult	Diploid
2016	Brown trout	3,658	Adult	Diploid
2017	Brown trout	3,694	Adult	Diploid
2018	Brown trout	3,000	Adult	Diploid
2019	Brown trout	3,022	Adult	Diploid
2020	Brown trout	1,500	Adult	Diploid
2021	Brown trout	1,200	Adult	Diploid
2022	Brown trout	1,000	Adult	Diploid
Rainbow Trout				
2007	Rainbow trout	7,000	Fingerling	Diploid
2008	Rainbow trout	5,000	Fingerling	Diploid

Year	Species	Number	Age	Type
2009	Rainbow trout	10,000	Fingerling	Triploid
2010	Rainbow trout	10,000	Fry	Diploid
2011	Rainbow trout	10,000	Fingerling	Triploid
2012	Rainbow trout	10,000	Fry	Diploid
2013	Rainbow trout	15,000#	Fry	Triploid
2014	Rainbow trout	50,000*	Fry	Triploid
2015	Rainbow trout	6,000	Yearlings	Triploid
2017	Rainbow trout	3,000	Yearlings	Triploid
2018	Rainbow trout	2,100	Adult	Triploid
2019	Rainbow trout	1,500	Adult	Triploid
2020	Rainbow trout	1,000	Yearlings	Triploid
2021	Rainbow trout	1,246	Fry	Diploid
2022	Rainbow trout	87	Adults	Diploid

Angler Postal Survey

Average fishing effort during the period 2000 – 2022 was 10,928 angler days per season, with a low of 4,190 days during 2000-01 and a high of 20,685 days during 2020/21 (Figure 6). The initial increase in fishing effort around 2006/07 coincides with prolonged drought, low lake levels and poor catches at other major fisheries. Consequently, a large influx of anglers moved from these waters to less impacted waters, such as Penstock Lagoon. Since this period, fishing effort has trended down to 5,075 days for the 2013/14 season. Following the resumption of adult brown trout stocking in 2014 and resulting higher catch rates (Figure 7), total fishing effort rebounded to high levels. Total fishing effort for the 2021/22 season was 15,966 days.

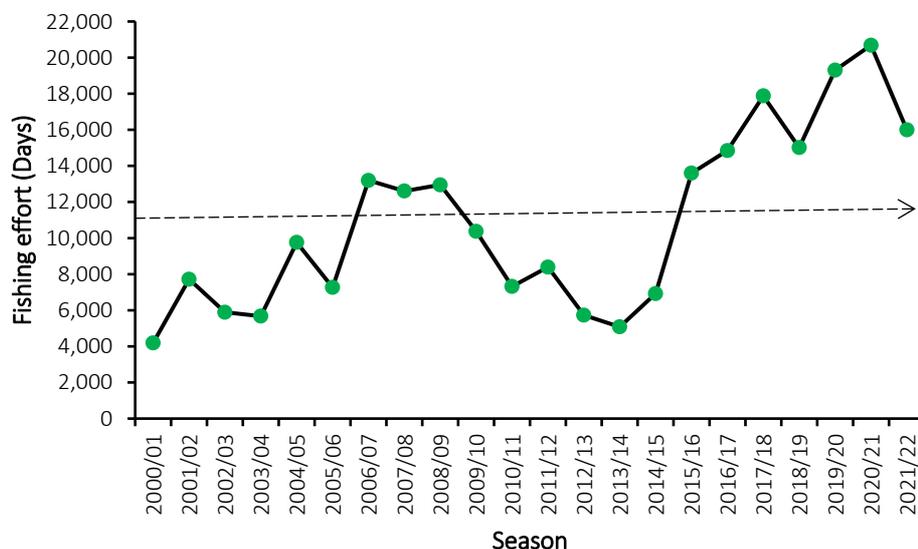


Figure 6: Total fishing effort 2000 – 2022, expressed as the number of days fished by anglers during each season (dotted line indicates long term average).

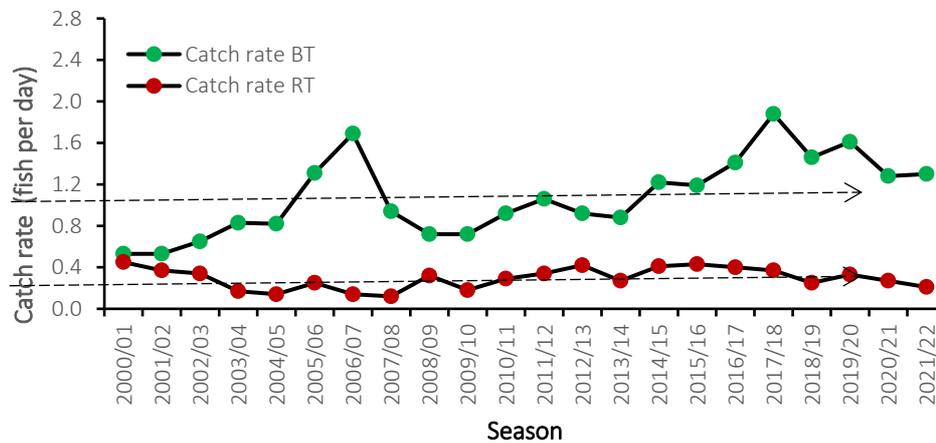


Figure 7: Daily catch rate for brown and rainbow trout 2000 – 2022 (dotted line indicates long term average).

The average daily catch rate for the period 2000 – 2022 was 1.1 brown trout per day (Figure 7). Despite a fall in angling effort and corresponding total seasonal catch, the daily catch rate during 2011 - 2013 was near the long term average. Since 2014, the daily catch rate increased and has been between 1.2 – 1.6 brown trout per day, with a high of 1.9 during 2017-18. The catch rate for 2021/22 was 1.3 brown trout per day.

The average catch rate for rainbow trout has generally remained around the long term average of 0.3 fish per day (Figure 7), with a total seasonal catch of 3,200 fish (Figure 8). An increase in total seasonal catch since 2015-16 likely relates to a stocking of predominately yearling rainbow, in addition to an overall increase in total fishing effort for that period. The estimated total seasonal catch for 2021-22 was 3,317 fish.

The estimated average total seasonal catch of brown trout for the period 2000 – 2022 was 13,141 fish (Figure 8). Since the very high total seasonal catch in 2006/07 of 22,299 brown trout, the annual total seasonal catch figure trended down to 4,488 for the 2013/14 season. Following several consistent years of adult brown trout transfers and the continued under performance of the Arthurs Lake fishery, the total seasonal catch of brown trout returned to high levels, with an estimated 20,838 brown trout caught during the 2021/22 season. In percentage terms, brown trout represented 86 percent of the total seasonal catch with rainbow trout 14 percent (Appendix E).

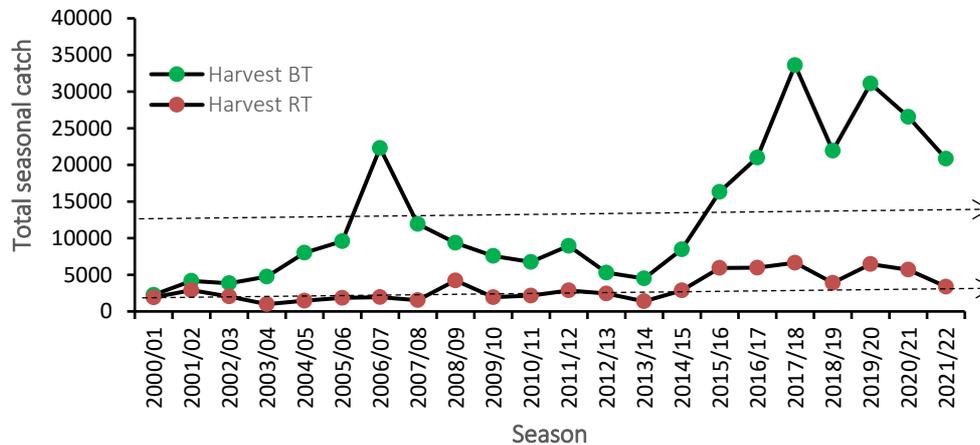


Figure 8: Estimated total seasonal catch of brown and rainbow trout 2000 – 2022 (dotted line indicates long term average).

Creel Interview Data

Over the 2021/22 angling season, 172 anglers were interviewed regarding their days fishing at Penstock Lagoon. For analysis purposes, only those anglers that fished three or more hours were included, resulting in a total of 93 angler records. These 93 anglers fished a total of 601 hours, catching 105 brown trout and 18 rainbow trout. Of these fish, 63 brown trout (60%) and 9 rainbow trout (50%) were released. Based on a full days fishing being equivalent to 6 hours, the daily catch rate for brown trout is estimated at 1.05 brown trout and 0.18 rainbow trout.

Discussion

The CPUE of 8.6 brown trout per trap is significantly higher compared to previous surveys, indicating a high abundance of brown trout. This high abundance is driven by three primary factors; 1) the high number of adult brown trout transferred into the lagoon between 2015 - 2021, 2) the high rates of catch and release fishing practised by anglers, and 3) the high survival of transferred adult brown trout. Despite this high abundance; growth rate, an increase in average weight and a continuing improvement in fish condition, all indicate there are no obvious density dependent factors limiting growth. There are however, no brown trout over 600 mm in length. The reasons for this are due to the removal of larger fish by anglers, (despite high catch and release rates) and the stocking of adult fish of varying ages that may limit potential ongoing growth. Despite these limitations, almost sixty percent weighed between 1 - 1.5 kg and twenty percent 1.5 – 2 kg.

There was no evidence of natural recruitment occurring, within either the lagoon itself or from inflows.

Angling effort, daily catch rates and the total seasonal catch of brown trout all remain high, although there has been some easing since 2019/20. The catch rate for brown trout reported by anglers during creel interviews was just over one fish per day, which is comparable to the APS results, indicating a high level of confidence in the catch data. Catch and release rates for brown trout are high, with anglers reporting they release 60 percent of brown trout caught. These results in conjunction with the high survival rates for transferred adult brown trout, has implications for the ongoing management of the fishery. Adjustment to the annual transfer of brown trout will need to be considered and the criteria for the fishery, as prescribed in the Tasmanian Inland Recreational Fishery Management Plan 2018-28 (TIRFMP), be reviewed and adjusted to meet realistic desirable goals.

In reference to the TIRFMP goals for Penstock Lagoon; at present, the values set for catch rate and most likely population size have been met, although population size was not specifically assessed by this survey. The goal for average weight of fish greater than 400 mm (the minimum size), is set at; 1.4 - 1.6 kg, presently it is 1.28 kg, but has increased from 1.25 kg since 2018. This increase is despite the transfer of smaller adult fish from Arthurs Lake and Lake King William over this period. The goal for large brown trout is five percent of fish being over 600 mm. Presently, there are no brown trout over this size. The main factors preventing these goals from being achieved are; high angling effort and the subsequent removal of larger trout (< 600mm) by anglers. This is even with high rates of catch and release. Additionally, the stocking of adult fish around 1 kg, and the effects of angling effort, are confining a high number of brown trout to the 1.25 – 1.75 kg range.

For rainbow trout, the catch rate was at the lower bounds of the goal as set in the TIRFMP of 0.3 fish per day. It was not feasible to assess other criteria for rainbow trout due to low sample size. The stocking of fry, fingerling or yearling rainbow trout does not correlate with any significant long term change in catch rate. There is evidence of low numbers of rainbow trout in the 340-360 mm range from the 2019 fry stocking, but these are unlikely to be remain prevalent, as they are taken once reaching the minimum size.

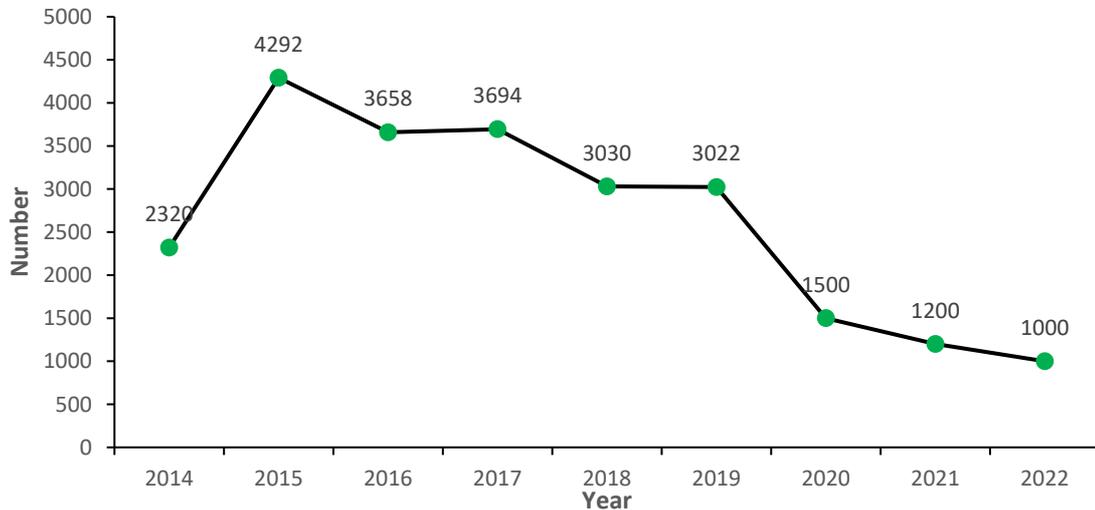
The longevity of the 2014 fin clipped and 2016 hole punched brown trout transfers have presented an opportunity to model mortality of adult brown trout transfers in a fishery with high fishing effort and high catch and release rates. This information can be used to estimate the current population size and assist in determining the future stocking numbers (refer to Appendix C).

In summary, the Penstock Lagoon fishery is performing well, although some minor adjustments to stocking, the take of larger fish and reducing angling effort will provide beneficial outcomes. In addition, the goals for brown and rainbow trout need to be reviewed and set at more realistic levels.

Recommendations

- The use of wild adult brown trout as the primary method of restock is continued.
- Stocking numbers be increased to account for the recent reduction in transfer numbers and to balance high angling effort.
- The policy of using a mix of brown trout of varying sizes is maintained and built into the Annual Stocking Plan.
- Reduce angling effort at Penstock Lagoon by managing similar valued fisheries e.g. improved access and/or increased angler satisfaction at other waters.
- Revise the stocking program for rainbow trout and adopt an alternate strategy to maintain a low abundance of rainbow trout. The use of rainbow trout fry sourced from wild stocks and released at the fry stage is recommended. Past records indicate 15,000 – 20,000 fry will sustain a low number of rainbow trout.

Appendix



Appendix A: Line chart for stocking numbers of adult brown trout, Penstock Lagoon 2014 – 2022.

Water	Average weight (g)	Catch rate (fish per day)	Large fish (percentage)	Population size (BT) at full lake level
Penstock Lagoon				
Brown trout	> 400mm 1.5kg ± 0.1	1.0 ± 0.2	> 600mm 5%	11 000 – 14 000 *
Rainbow trout	> 400mm 1.4kg ± 0.2	0.3 ± 0.1	> 500mm 3%	

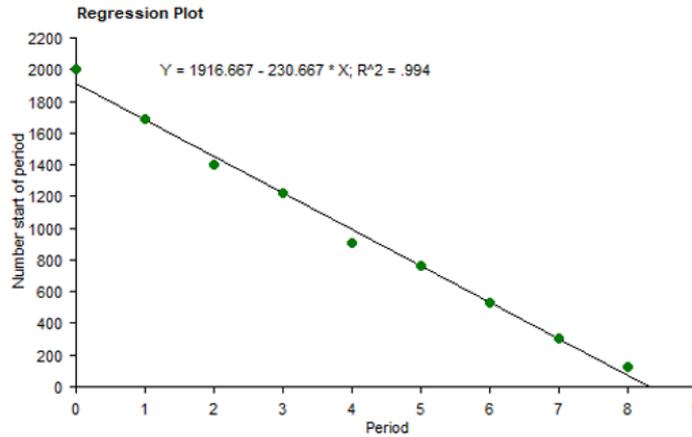
Appendix B: Fishery performance criteria for Penstock Lagoon, from the TIRFMP 2018-28.

Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	
2014	2,000									
2015	1,686	4,292								
2016	1,399	3,618	3,658							
2017	1,224	3,003	3,084	3,694						
2018	910	2,628	2,559	3,114	3,030					
2019	762	1,952	2,240	2,585	2,554	3,022				
2020	533	1,636	1,664	2,262	2,120	2,548	1,500			Brown trout remaining 2022
2021	224	1,144	1,394	1,680	1,855	2,114	1,265	1,200		
2022	127	481	975	1,408	1,378	1,850	1,050	1,012	1,000	
Minimum Age in 2022	11	10	9	8	7	6	5	4	3	9,281

Appendix C: Estimated annual mortality and minimum age of adult brown trout transfers, Penstock Lagoon 2014 - 2022.

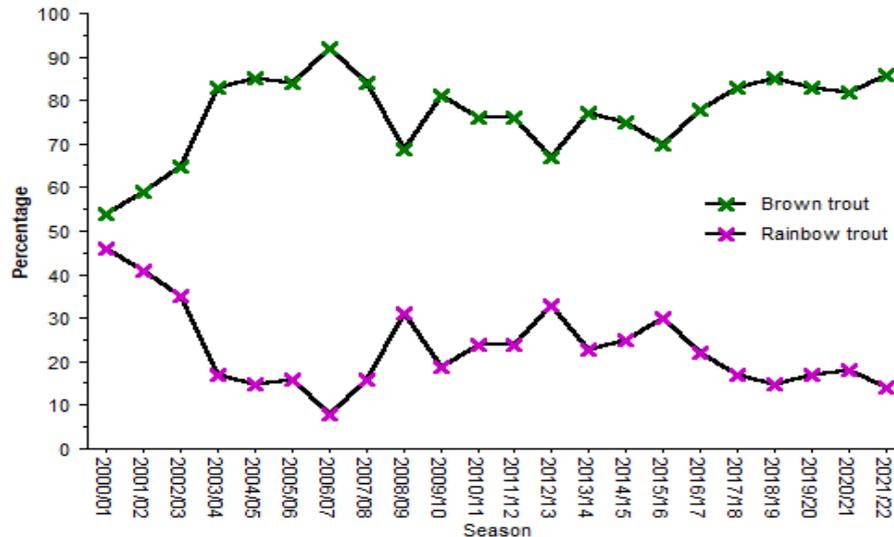
Regression Coefficients
Number start of period vs. Period

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1916.667	32.986	1916.667	58.106	<.0001
Period	-230.667	6.928	-.997	-33.293	<.0001



Appendix D: Regression plot and associated regression equation showing estimated yearly mortality numbers for adult brown trout transfers, Penstock Lagoon 2014 – 2022. Based on initial stocking numbers and CPUE for fin clipped adult brown trout transferred during 2014 and resurveyed in 2016, 2018 and 2022 (period 1 = 2014 and period 8 = 2022)

NB. The above regression plot was achieved by using the actual CPUE results from each survey to estimate the number of brown trout transfers remaining for 2014, 2016, 2018 and 2022. This data was then used to estimate mortality for all non-survey years by fitting a simple regression plot that was shown to be the best fit for that data.



Appendix E: Percentage total seasonal catch of brown and rainbow trout, 2000 – 2022

References

1. IFS, (2018); Tasmanian Inland Recreational Fishery Management Plan 2018-28.
2. IFS, (2014); Fisheries Performance Assessment, Technical Report, Penstock Lagoon – 2014.
3. IFS, (2016); Fisheries Performance Assessment, Technical Report, Penstock Lagoon – 2016.
4. IFS, (2018); Fisheries Performance Assessment, Technical Report, Penstock Lagoon – 2018.