FISHERIES PERFORMANCE ASSESSMENT TECHNICAL REPORT

STATEWIDE RIVER SURVEYS –2013

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1 INTRODUCTION

Through the latter half of 2012 the Inland Fisheries Service had received calls by several anglers, trout guides and angling groups observing that the populations of trout in several of Tasmania's river fisheries were depleted for the season 2012/13. Further to these observations has been the apparent increase in cormorant numbers throughout the state. The latter observed by fish farm workers, anglers and IFS staff at fish traps and Hydro Tasmania dams.

Whilst there seems to be an apparent correlation between low trout number in rivers and a higher than normal abundance of cormorants, the observations of low trout numbers needed to be proved in the first instance.

Looking back at past work by the Inland Fisheries Commission it was evident that unusually high cormorant numbers had been used to explain measured decline in trout numbers of river fisheries. An article in the Inland Fisheries Commission Newsletter Volume 14 Number 2 1985 written by Peter Davies documents electrofishing surveys carries out on a suit of rivers and streams in 1978, 1979, 1983 and 1985. The results of these surveys show that for the surveys carried out in the 1970's the numbers of trout over a 100 m stretch of river were generally much lower than those carried out in the mid 1980's. The results also showed that the number of takeable trout, those over 220 mm in length, were particularly low and in some case absent from the stretches of rivers that were electro fished during the 1970's surveys. Davies goes on to conclude: "The survey findings also indicate that Tasmanian stream trout populations were probably in a depressed state when sampled in the late 1970's due to the impact of predation by cormorants resulting from the "plague" of 1976/77".

2 FPA SURVEY METHODOLOGY

2.1 ELECTROFISHING SURVEYS

Using the survey conducted in the 1970's and 1980's as well as some more recent survey work (1996 – 2006 on the Mersey River and state-wide surveys in the mid 1990's) as well as rivers that anglers had made observations on during the 2012/13 season, a list of rivers was put together to be surveyed and these are show in **table 1**.

These sites were surveyed in February 2013. There will be follow up surveys conducted in 2014 and as needed in future years.

At each site three electrofishing runs were conducted over a one hundred metre length of the stream/river. The actual lengths of these stretches of river does not equate to exactly one hundred metres. At each site the coordinates were recorded for future surveys, river height was noted as were the weather conditions for the day. As with all surveys it is

extremely important to detail sights and sampling locations so that any follow up surveys have a reference.

On the day of sampling for each selected site the river height is noted as to whether it is low, medium or high and ambient weather conditions are noted as being sunny, patchy sun or overcast.

Electrofishing is conducted with one staff member using a backpack electrofishing unit and the other carrying a bucket and dip net for capturing and containing the fish. The electrofishing unit is operated so that it covers all habitats in the run; all fish captured are held in the bucket for the duration of the run.

For each run the fishing effort was recorded as seconds for the duration the electrofisher is on. The fish captured during each of the three runs are placed into separate holding containers. After all three runs have finished the fish are weighed and measured and noted as to which run they were caught from.

Table 1: Table of rivers surveyed, showing regional representation and Grid references (GDA 94) and length of site.

River	**Site locality**	**Region**	**Start (Northing Easting)**	**End (Northing Easting)**	**Length of run (metres)**
Tyenna River	Site 1@ Something Wild road bridge	South	478343 5274349	478269 5274277	129
Tyenna River	Site 2 @ Westerway (Ellendale Rd bridge)	South	482895 5275516	482836 5275417	115
Russell River	@ Lonnavale Rd	South	488347 5240769	488255 5240837	126
Saint Patricks River	@ Pecks Hill Bridge	North	528677 5424351	528674 5424351	106
Seven Time Creek	@ confluence with St Patricks River	North	531410 5426562	531403 5426566	106

Meander River	Site 1 @ Meander town bridge	North	468011 5389077	468109 5389005	120
Meander River	Site 2 @ Barretts Bridge	North	469607 5397517	469558 5397402	126
Mersey River	@ Merseylea Bridge	Northwest	455995 5421339	456062 5421254	106
Minnow River	Near Beulah	Northwest	446000 5410200	446086 5410194	103
River Leven	@ Marshalls bridge	Northwest	415780 5428076	415694 5427981	134
Dasher River	@ Paradise Rd Bridge	Northwest	442525 5414162	442469 5414065	130
Gawler River	500m downstream of Frenches bridge	Northwest	427588 5437032	427575 5436920	110
Forth Falls River	@ Wilmot	Northwest	430690 5418697	430606 5418658	124

2.2 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 (wild or domestic strain) and genotype, in addition to some length/weight data and comments of stocked fish, eg denoting tagged fish. This information provides an historical record of supplementary recruitment into individual waters.

2.3 ANNUAL POSTAL SURVEY

Since 1986, the Service has conducted a postal survey seeking information about anglers' catches. The survey comprises of 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. This provides a long term overview of individual fishery performance in addition to characterising effort.

RESULTS

3.1 ELECTROFISHING SURVEY

Table 2: Results of the 2013 survey, numbers of trout per run and conditions of survey.

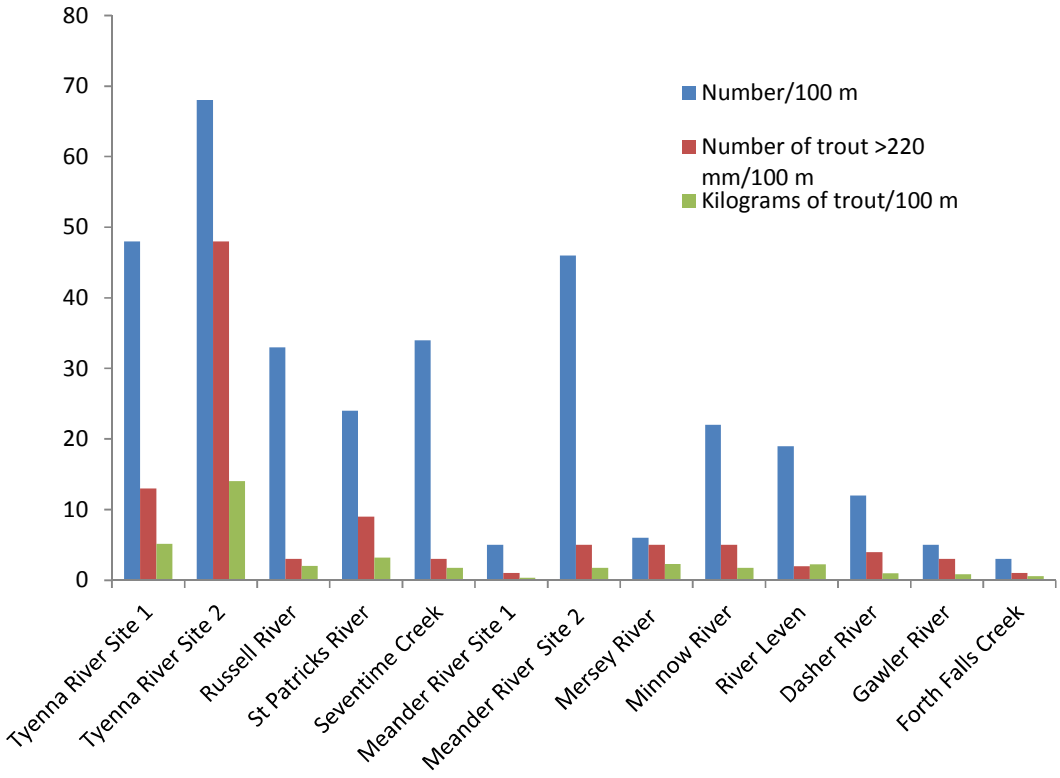
River + site number	Sample date	River height (low, med, high)	Weather (sunny, patchy sun, overcast)	Trout captured (1st run, 2nd run, 3rd run = total)	Total weight of trout caught over three runs (grams)	Duration of runs (seconds)
Tyenna River site 1	21 Feb	low	sunny	26,14,8 = 48	5160	982/854/841
Tyenna River site 2	21 Feb	low	sunny	49,14,5 = 68	14050	1025/692/603
Russell River	25 Feb	low	patchy sun	6,14,13 = 33	2020	950/801/722
Saint Patricks River	17 Feb	low	sunny	14,6,4 = 24	3250	711/506/505
Seven Time Creek	17 Feb	low	sunny	5,8,21 = 34	1800	605/590/545
Meander River site 1	19 Feb	medium	overcast	2,2,1 = 5	390	662/674/593
Meander River site 2	19 Feb	medium	overcast	19,20,7 = 46	1720	991/754/664
Mersey River	26 Feb	low	overcast	2,3,1 = 6	2290	900/800/650
Minnow River	26 Feb	low	overcast	14,4,4 = 22	1720	825/506/548
River Leven	27 Feb	low	overcast	5,8,6 = 19	2240	672/598/627
Dasher River	27 Feb	low	overcast	8,3,1 = 12	980	850/560/512
Gawler River	28 Feb	low	patchy sun	3,2,0 = 5	820	792/764/609
Forth Falls Creek	27 Feb	low	patchy sun	3,0,0 = 3	590	733/680/593

Due to the low numbers of fish caught running a calculated estimate of trout numbers is problematic. The length of the runs at each site has been normalised to 100 metres. For the sake of convenience the numbers of fish caught is represented as trout numbers/ 100 metres. The numbers of trout caught for the 2013 survey has been used as a comparison with previous surveys at the same sites. Davies et al (1985) published results of surveys carried out by the Inland Fisheries Commission and these surveys were in 1978 and 1985.

Overall the number of fish captured by electrofishing was lower and in some cases much lower that would be expected of a "normal" Tasmanian river or stream population of brown trout. **Figure 1** shows the numbers and weight of trout caught for each sample site.

Figure 1:

The number and weight of trout caught for each site during the 2013 surveys.



When compared to the results of earlier surveys at the same or geographically comparable sites it is clear that depletion has occurred with reference to the states of the trout populations on previous sampling periods. In **figures 2**, **3, 4** and **5** the results are plotted against those of previous surveys conducted by the IFC as actual trout captured, the number of takeable (>220 mm) trout and total weight over 100 metres of stream. The assumption is that previous surveys are plotted as raw numbers as well. The sites shown, Tyenna River Site 1 at Something Wild, River Leven at Gunns Plains, Forth Falls Creek at Wilmot and Russell River at Hermitage have been used as they are the only sites where data exists for three sample periods, the 1978, 1985 and 2013 surveys.

Figure 2.

Tyenna River at Site 1 for 2013, 1985 and 1978 surveys

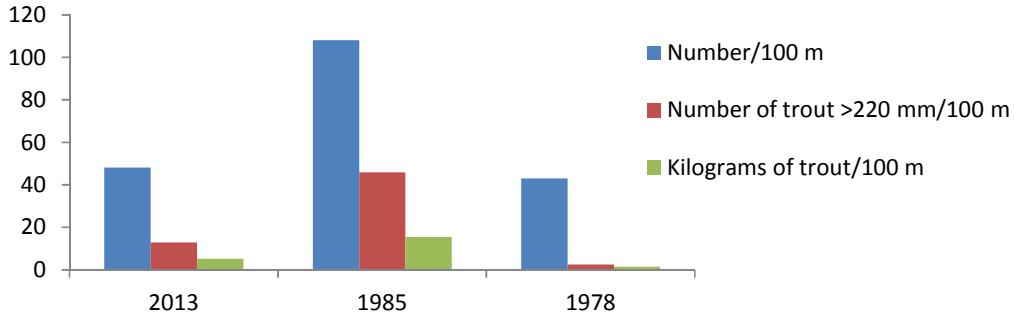


Figure 3.

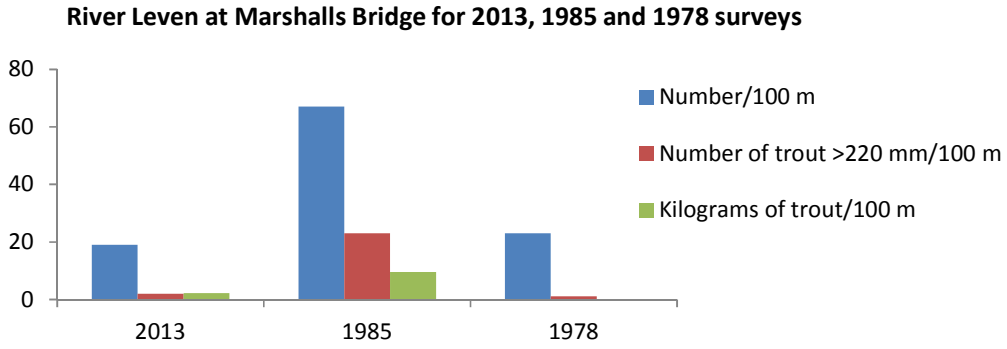


Figure 4.

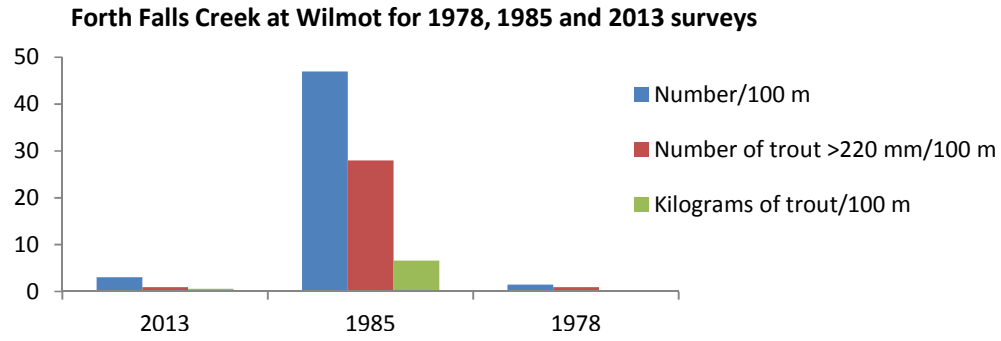
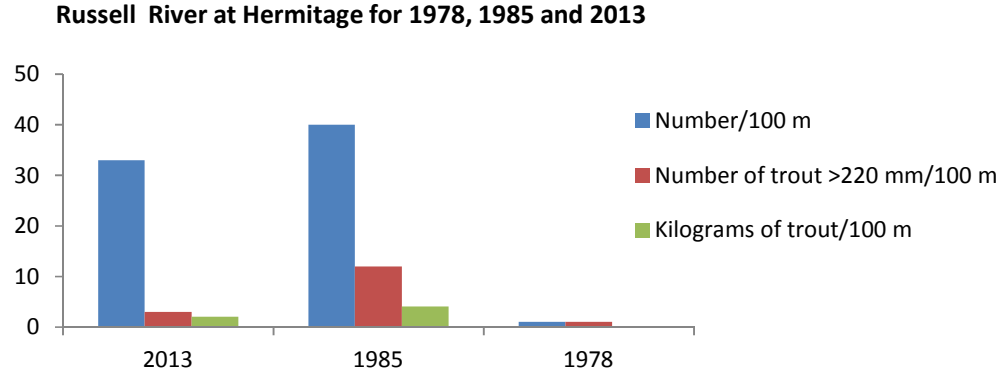


Figure 5.



While numbers of trout present gives an indication as to whether the surveyed river's brown trout population size has been depleted it does show the population structure. A plot of length frequency of the fish caught at each site allows a view of the population structure. By plotting the number of fish captured in each of the each of the 20 mm increments over the maximum length of the fish in the sample. **Figures 6, 7, 8, 9** and **10** show length frequency distributions for sites where 30 or more fish were caught.

Figure 6.

The length frequency distribution of the fish caught at the Tyenna River Site 1, 2013.

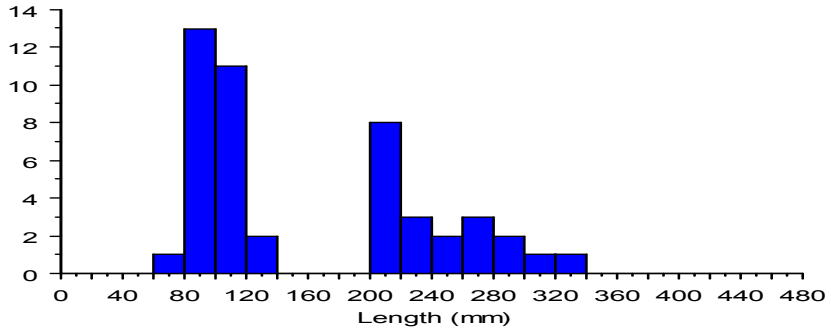


Figure 7.

The length frequency distribution of the fish caught at the Tyenna River Site 2, 2013.

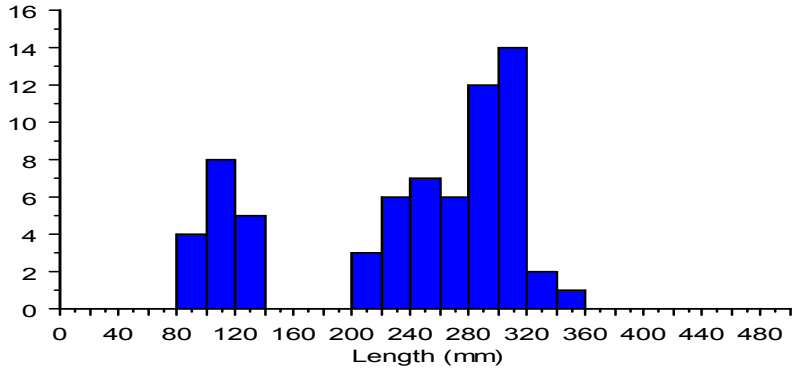


Figure 8.

The length frequency distribution of fish caught at Meander River Site 2, 2013.

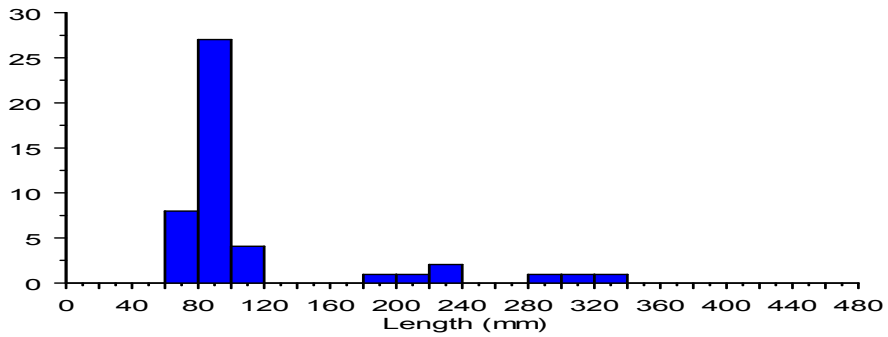


Figure 9.

The length frequency distribution of fish caught at Russell River, 2013.

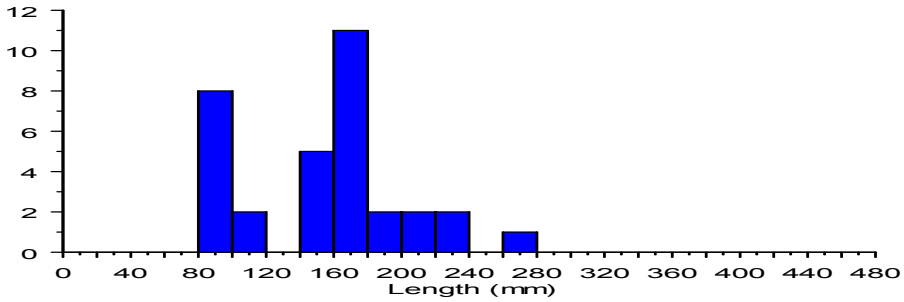
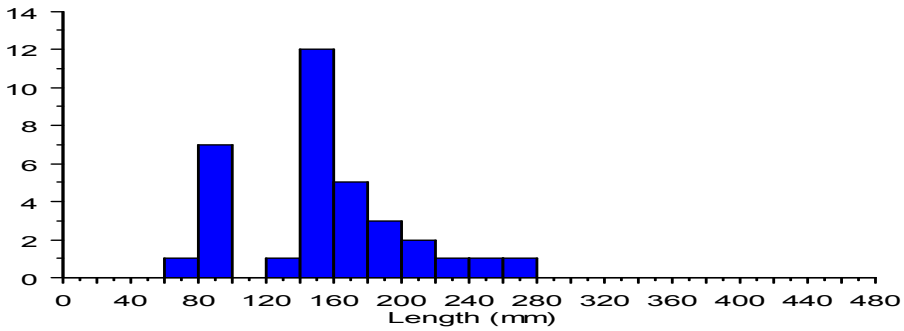


Figure 10.

The length frequency distribution of fish caught at Seven Time Creek, 2013.



The length frequency distributions indicate an overall suppression of numbers of brown trout in all cohorts (age classes) of brown trout in the rivers surveyed. While there is no clear consistency in the suppression in numbers for each cohort it is clear that the number of takeable sized trout (>219 mm) in all samples is worryingly low except in Tyenna Site 2 at Westerway. It is reassuring that the young of the year fish or those <120 mm are evident at most sample sites, meaning that there will be no absolute gap in recruitment resulting from the depletion seen in the rivers across the state, at least not for the rivers surveyed.

The Westerway site on the Tyenna is interesting in that the number of sized trout exceeds the number of undersized trout (<220 mm). The <120 mm cohort, young of the year size class is quite strong at this site but the fish in between these size classes are relatively diminished in comparison to the takeable size class..

Seven Time Creek is known as a recruitment stream for the main Saint Patricks River and has a length frequency distribution that approximates this. Although low in numbers it is evident that younger cohorts still exhibit some overall relative strength. Takeable sized fish represent a small proportion of the population but this is to be expected of this stream. The Dasher River is similar in population structure to Seven Time Creek as it too is a recruitment stream for a major river, in its' case the Mersey River.

3.2 STOCKING HISTORY

Of the rivers surveyed only three have receive stocking from the Inland Fisheries Service in the past 20 years, the Mersey River, River Leven and the Meander River.

The Mersey River has received brown trout adults transferred from the Great Lake spawning run at Liawenee canal. The number stocked depends on availability but the lowest number transferred was 150 in 2008 and the highest was 750 in 2004. The fish prior to 2006 were stocked at Union Bridge near Mole Creek and Bells Parade at Latrobe. Since 2006 the stocking point has been near the road bridge at Kimberley.

The Mersey River has at times (late 1980's, early 1990's as well as 2003 and 2004) been stocked with brown trout fry of varying quantities (up to 70,000 in 1993). The success of fry stockings is questionable and more weight has been given to the adult transfers from Liawenee canal due to their provision of extra natural recruitment to the river. Over and above the stocking of brown trout by the IFS there has been some sanctioned stocking by rearing units run by the North West Fisheries Association. Exact numbers are unclear but at least five stocking events of 20,000 fry have been noted since 1990.

The River Leven has been stocked on a regular basis since 1985, initially with brown trout fry (from a low of 5,120 in 1987 to a high of 23,000 in 1994 generally around 9,000 were used). The stocking was carried out by the Ulverstone Rearing Unit that stocked on the IFC's behalf. Rainbow trout fingerlings (domestic) were stocked from 1989 by the Ulverstone Rearing Unit and the IFC. These were stocked at a rate of 500 to 2,100 and continued till 2005.

The IFS resumed stocking the River Leven in 2009 with 5,000 fingerlings (wild) and has continued each year to date, for the latest stocking fry were used due to a January 2013 shut down of the IFS New Norfolk hatchery. Adult brown trout were stocked into the River Leven in 2012 and 2013, 300 were transferred from the Liawenee canal spawning run from Great Lake during May of both years.

The Meander River has been stocked with rainbow trout in recent years. The fish have been stocked as fingerlings (20 grams) for two years and most recently as fry (1 gram), all fish are from wild stock grown from ova at the IFS New Norfolk hatchery.

Details of the stocking of trout carried out on the River Leven and Mersey River can be found in **Appendix 1** of this report.

The stocking of trout, both brown and rainbow does not appear to have had a bearing on the results of the 2013 electrofishing surveys. The results at the Mersey River site, and the Leven River site were poor for brown trout and certainly not any better than the results

from other unstocked rivers. No rainbow trout showed up in the survey catches at any site thus negating any benefit of rainbow trout stockings to the trout populations in either of the rivers in which they were stocked, the River Leven and the Meander River.

3.3 ANGLER POSTAL SURVEY

The apparent depletion of trout has occurred during the 2012/13 season and as such is likely to only show up in the results of that season's APS. Examination of catch rates for the previous season (2011/12) shows no drop below the long term average for any of the rivers surveyed. The same can be said for overall harvest of brown trout.

The evidence from the APS suggest that depletion of trout, specifically brown trout, in the states river populations did not occur broad scale prior to the 2012/2013 angling season. **Figures 11, 12** and **13** show the long term average of catch rate (fish per angler per day) derived from the APS and the catch rate for each season from 1986/1987 to 2012/2013 for the Tyenna River, Mersey River and Meander River. These three rivers were chosen to give regional representation of the fishery and because they have the highest respondent rates (anglers that fished that particular river) of all the rivers for the 2013 electrofishing survey.

All three examples shown in figures 11 -13 show a downturn in catch rate below the long term average. It is difficult to perceive that such a downturn would be evident across these major river systems without a major negative influence. Angler effort has not reduced markedly in any of the fisheries and environmental conditions such as river flow and climatic conditions should have been conducive to good fishery performance. The downturn therefore is most likely from factors external to river flow, climatic conditions or change in angler effort

Figure 11.

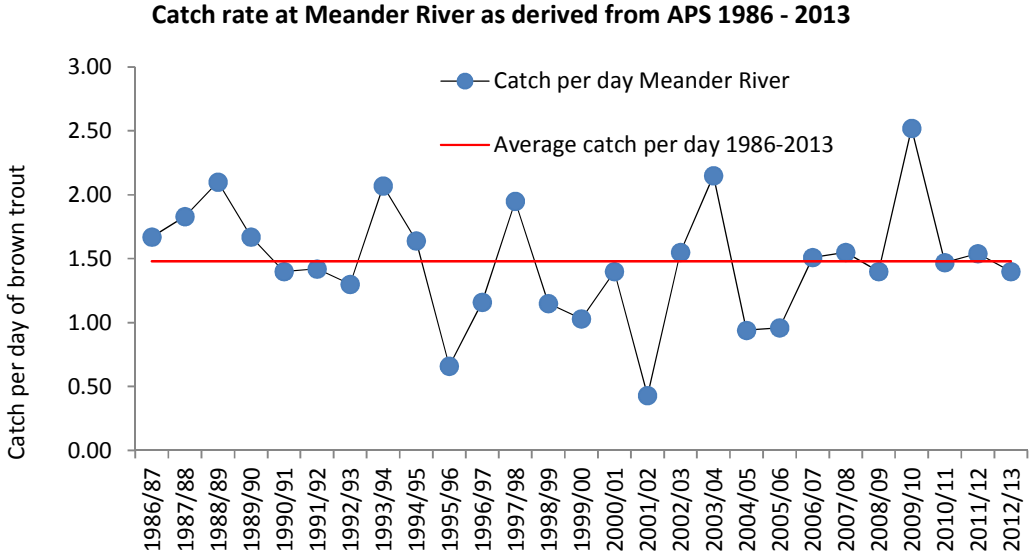


Figure 12.

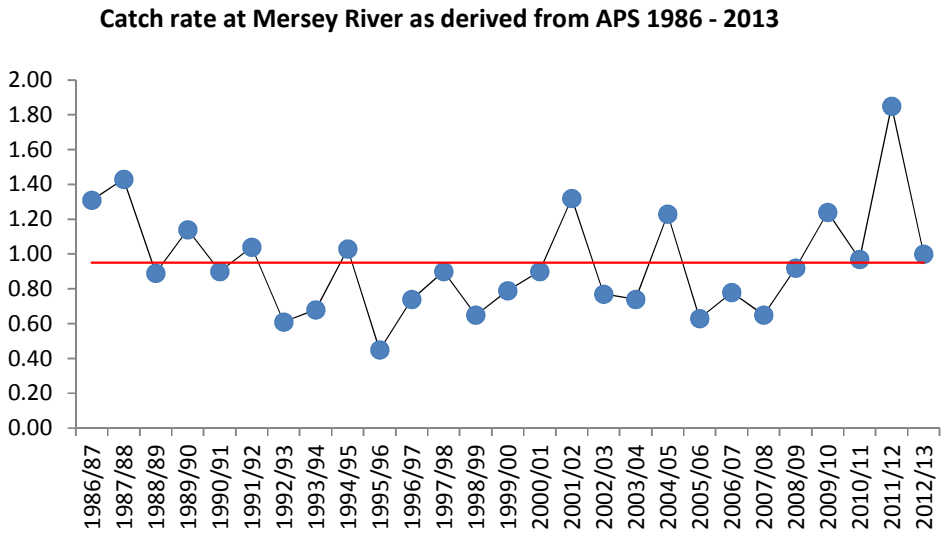
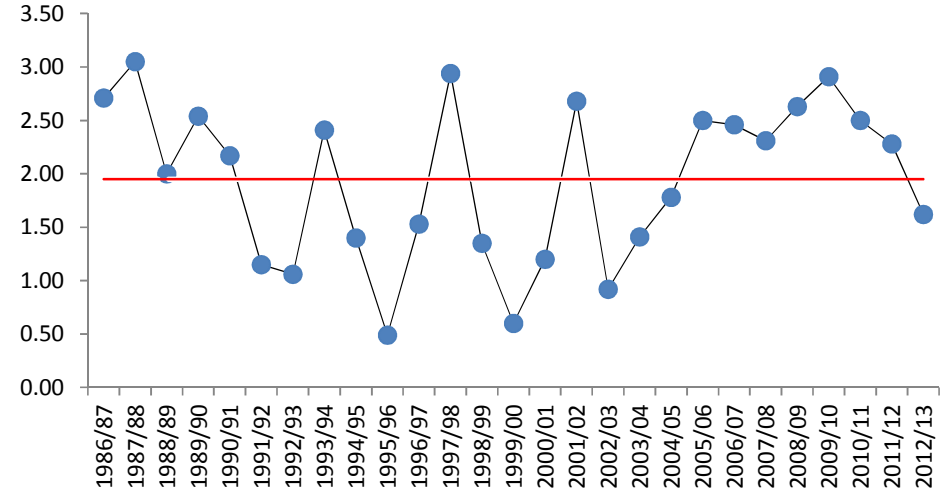


Figure 13.



4. DISCUSSION

The results of the 2013 river electrofishing survey show a definite reduction in brown trout numbers relative to those from a survey of the same or similar sites conducted in 1985. When compared to survey results from 1978 they are equivalent to, though in most case slightly higher in numbers.

The earlier sampling by the IFC in 1978 and 1985 has been discussed by Davies et al (1985) as being representative of two differing periods of river brown trout populations in

Tasmania. The 1978 period is discussed as a year after where very large numbers of cormorants were present in the State. The 1985 sampling by contrast represented a year where populations of brown trout were in very good shape. The angling effort during 1985 was as high as has been recorded for river fisheries across the State based on the number of licenced anglers and the popularity of river fishing at the time.

Examination of the population structure of samples from the 2013 sites indicates that the young of the year cohort has been less affected than those of older year classes. In most sites there is a greater reduction in numbers of the takeable sized fish relative to the immediately younger cohorts.

The population structure at the Tyenna Westerway site differs from many of the other sites. This may be due in part to greater streamside cover and deeper pools with in stream cover provided by willow tree roots and other wooded snags although the Tyenna site further upstream does offer fairly analogous habitat.

By looking at the Angler Postal Survey that has been conducted since 1986/1987 it is apparent that any reduction in the numbers of trout in river population has occurred since the end of the 2011/2012 season. No major downturn in catch rate is evident from the data of the 2011/2012 season relative to the long term average over the life of the APS. In the results of the 2012/2013 survey there is a definite decline in a number of rivers where a statistically valid sample of responses has been collated. The three rivers used as examples, the Tyenna, Mersey and Meander rivers all show a downturn in catch rate from the previous season. Such a downturn would not be expected across three major river fisheries in a single season in the absence of a driving influence.

The stocking records appended to this report show the history of stocking three of the rivers covered by the 2013 survey. No apparent improvement in numbers of trout caught is evident for these rivers; the Mersey River, River Leven and the Meander River. This has no bearing on the use of stocking as a rehabilitation tool as most of the stocking of the rivers occurred prior to the apparent decline in river trout stocks.

While there is no measure of the population of cormorant numbers in Tasmania presently or previously the anecdotal evidence from anglers and the commercial aquaculture industry suggests that during the summer of 2012/2013 the number present in Tasmania was abnormally high. The reasons for the high abundance is most likely the compounded effect of good rains over the three preceding years, both in Tasmania and southeast mainland Australia. Furthermore there were large numbers of cormorants observed during the electrofishing surveys at a couple of the survey sites. In one case a flock of 20+ had gathered around the holding containers whilst the staff returned from the top of the last run of the site.

Cormorants are often observed feeding on trout and other fish in rivers in Tasmania. It is fairly obvious that when in high abundance the effect on trout populations, an obvious prey item for these piscivorous birds, can be drastic. Such effects were postulated during Davies et al's (1985) report.

The results of the 2013 river electrofishing survey indicate there has been a significant decline in riverine brown trout populations in Tasmania. Whilst other environmental factors could have a bearing on individual river populations there is no evidence to suggest that this has been the case across the State. Fishing effort increase has not occurred and even in the event of it being so it is doubtful that it would have caused a significant downturn in riverine trout numbers, at least not in a state wide context.

Conclusion

The numbers of trout in Tasmania's rivers has been reduced. The effect is most prominent on larger size classes of fish from 160 mm through to 300 mm. Fish of this size are the mainstay of anglers' catches and while some fish of larger size may escape the predation of cormorants they are uncommon on most rivers.

The presence of young of the year fish at all sampling sites is encouraging for the medium term future of the State's river fisheries.

Anecdotally it appears that cormorant numbers have already reduced. It has been noted from previous population booms of these birds that they will move on after their food source has been depleted. This may have indeed happened.

Evidence from previous surveys, Davies et al (1985) indicates recovery from cormorant effected depletion will occur but it will take at least three years post cormorant population explosion.

3 RECOMMENDATIONS

Examination of the 2012/2013 APS results is needed to ground truth the results of this survey.

The survey should be repeated at the same sites during late summer 2014.

Rehabilitation stocking is recommended for some rivers under stress using fry. Whilst adults would be preferred there is an issue of timing and supply of adult brown trout.

Baseline surveys should be carried out prior to any stocking.

4 APPENDICIES

1. Stocking from the IFS stocking database of river's surveyed in 2013.

Brown trout stocked into the Mersey River

Date	Age	Number
1 December 1986	Fry	8,000
1 December 1987	Fry	6,000
1 December 1988	Fry	3,000
2 June 1991	Adult	200
10 May 1992	Adult	200
10 May 1993	Adult	200
2 October 1993	Fry	32,618
7 October 1993	Fry	70,000
25 May 1994	Adult	200
14 September 2003	Fry	10,000
21 June 2004	Adult	735
14 September 2004	Fry	10,000
15 June 2005	Adult	500
23 May 2006	Adult	300
30 May 2007	Adult	500
29 July 2008	Adult	117
29 July 2008	Adult	33
4 June 2009	Adult	600
22 July 2011	Adult	150
26 June 2012	Adult	400
3 June 2013	Adult	300

Brown trout stocked into the River Leven

Date	Age	Number
1 December 1985	Fry	8,000
1 December 1986	Fry	8,000
1 December 1987	Fry	5,120
1 December 1988	Fry	9,800
1 December 1989	Fry	10,000
1 August 1991	Fry	8,000
10 October 1994	Fry	23,000
27 June 2012	Adult	400
4 June 2013	Adult	300

Rainbow trout stocked into the River Leven

Date	Age	Number
31 October 1989	Fingerling	400
2 April 1990	Fingerling	850
16 July 1991	Fingerling	2,000
27 November 1991	Fingerling	2,100
10 October 1994	Fry	500

16 May 2009	Fingerling	5,000
29 April 2010	Fingerling	5,000
16 March 2011	Fingerling	5,000
10 April 2012	Fingerling	5,000
3 January 2013	Fry	10,000

Rainbow trout stocked into the Meander River

Date	Age	Number
27 October 2010	Fingerling	2,400
21 September 2011	Fingerling	2,500
3 January 2013	Fry	10,000

2. Angler Postal Survey Results 1986/87 – 2012/13

Tyenna River

Season	Total No. Days fished	Catch per day brown	Brown trout harvest	Percent of all anglers this water	No. all anglers	Total effort
1986/87	408	2.71	19,401	6	1,482	7,151
1987/88	285	3.05	20,784	6	1,660	6,793
1988/89	184	2.00	7,091	5	1,398	3,536
1989/90	353	2.54	18,705	6	1,772	7,345
1990/91	202	2.17	14,633	4	1,300	6,718
1991/92	173	1.15	3,823	3	1,081	3,324
1992/93	162	1.06	3,791	4	1,140	3,550
1993/94	67	2.41	6,462	3	998	2,673
1994/95	162	1.40	10,041	2	874	7,166
1995/96	303	0.49	5,160	5	1,632	10,355
1996/97	276	1.53	12,075	7	2,336	7,860
1997/98	277	2.94	18,901	5	1,680	6,408
1998/99	256	1.35	7,278	6	1,988	5,385
1999/00	198	0.60	3,037	3	922	5,053
2000/01	165	1.20	3,859	3	877	3,216
2001/02	184	2.68	12,549	4	1,122	4,674
2002/03	165	0.92	3,316	5	1,407	3,600
2003/04	237	1.41	7,223	4	1,049	5,095
2004/05	192	1.78	8,347	4	1,291	4,672
2005/06	114	2.50	7,871	3	1,076	3,138
2006/07	150	2.46	9,747	3	965	3,951
2007/08	158	2.31	10,159	5	1,489	4,397
2008/09	235	2.63	12,782	4	1,273	4,845
2009/10	199	2.91	16,289	5	1,739	5,579
2010/11	268	2.50	13,626	4	1,279	5,450
2011/12	145	2.28	9,813	4	1,236	4,286
2012/13	318	1.62	12,922	6	1,817	7,948

Russell River

Season	Total No. Days fished	Catch per day brown	Brown trout harvest	Percent of all anglers this water	No. all anglers	Total effort
1986/87	18	3.05	964	0	162	315
1987/88	31	3.54	2,622	1	344	739
1988/89	56	1.91	2,056	1	432	1,076
1989/90	143	3.40	10,133	1	359	2,975
1990/91	17	0.23	133	0	118	565
1991/92	27	0.55	288	0	98	519
1992/93	41	0.75	679	0	199	899
1993/94	14	1.42	798	0	166	558
1994/95	3	1.00	133	0	187	133
1995/96	29	2.00	1,982	0	192	991
1996/97	113	1.29	4,158	1	483	3,218
1997/98	69	0.98	1,573	0	164	1,596
1998/99	40	0.70	589	1	397	841
1999/00	8	0.87	179	0	98	204
2000/01	6	1.00	117	0	100	117
2001/02	27	4.66	3,201	0	224	686
2002/03	15	0.86	284	0	216	327
2003/04	80	4.92	8,470	0	215	1,720
2004/05	26	4.07	2,580	0	210	633
2005/06	42	5.45	6,303	0	243	1,156
2006/07	35	2.08	1,923	1	366	922
2007/08	23	2.08	1,336	1	283	640
2008/09	56	1.96	2,268	0	233	1,154
2009/10	29	4.00	3,252	0	213	813
2010/11	23	1.17	549	0	179	468
2011/12	25	1.52	1,123	1	299	739
2012/13	15	1.06	400	0	219	375

St Patricks River

Season	Total No. Days fished	Catch per day brown	Brown trout Harvest	Percent of all anglers this water	No. all anglers	Total effort
1986/87	331	2.48	14,389	5	1297	5,801
1987/88	192	3.63	16,613	4	1221	4,576
1988/89	137	3.11	8,206	4	1144	2,633
1989/90	375	3.57	27,860	6	2021	7,803
1990/91	175	2.63	15,331	5	1576	5,820
1991/92	216	2.42	10,068	4	1426	4,150
1992/93	138	1.35	4,098	3	1026	3,024
1993/94	50	2.14	4,268	3	1054	1,994
1994/95	78	1.41	4,866	4	1248	3,450
1995/96	144	1.18	5,810	3	960	4,921
1996/97	112	2.05	6,550	2	926	3,190
1997/98	178	3.25	13,395	4	1252	4,118
1998/99	178	4.67	17,501	3	1164	3,744

1999/00	84	3.09	6,636	2	724	2,144
2000/01	93	1.88	3,411	2	652	1,813
2001/02	61	3.93	6,097	2	737	1,550
2002/03	104	2.81	6,392	3	758	2,269
2003/04	79	2.01	3,418	2	484	1,698
2004/05	164	1.92	7,690	2	810	3,991
2005/06	252	1.67	11,642	2	798	6,936
2006/07	166	5.22	22,865	3	1065	4,373
2007/08	136	3.30	12,525	4	1170	3,785
2008/09	179	2.63	9,710	3	1065	3,690
2009/10	149	2.63	10,990	3	994	4,177
2010/11	314	1.14	7,321	2	614	6,386
2011/12	189	1.25	7,034	3	936	5,586
2012/13	79	1.53	3,024	1	501	1,975

Seven Time Creek

Season	Total No. Days fished	Catch per day brown	Brown trout Harvest	Percent of all anglers this water	No. all anglers	Total effort
1986/87	20	3.50	1,227	0	23	351
1987/88	0	0.00	0	0	0	0
1988/89	0	0.00	0	0	0	0
1989/90	0	0.00	0	0	0	0
1990/91	0	0.00	0	0	0	0
1991/92	0	0.00	0	0	0	0
1992/93	0	0.00	0	0	0	0
1993/94	0	0.00	0	0	0	0
1994/95	0	0.00	0	0	0	0
1995/96	0	0.00	0	0	0	0
1996/97	0	0.00	0	0	0	0
1997/98	5	8.00	925	0	32	116
1998/99	0	0.00	0	0	0	0
1999/00	0	0.00	0	0	0	0
2000/01	0	0.00	0	0	0	0
2001/02	0	0.00	0	0	0	0
2002/03	0	0.00	0	0	0	0
2003/04	0	0.00	0	0	0	0
2004/05	0	0.00	0	0	0	0
2005/06	0	0.00	0	0	0	0
2006/07	0	0.00	0	0	0	0
2007/08	0	0.00	0	0	0	0
2008/09	0	0.00	0	0	0	0
2009/10	0	0.00	0	0	0	0
2010/11	0	0.00	0	0	0	0
2011/12	0	0.00	0	0	0	0
2012/13	0	0.00	0	0	0	0

Meander River

Season	Total No. Days fished	Catch per day brown	Brown trout Harvest	Percent of all anglers this water	No. all anglers	Total effort
1986/87	876	1.67	25,641	8	2038	15,353
1987/88	552	1.83	24,193	6	1785	13,157
1988/89	377	2.10	15,221	5	1525	7,245
1989/90	603	1.67	21,015	7	2270	12,546
1990/91	423	1.40	19,821	6	1773	14,067
1991/92	284	1.42	7,781	4	1278	5,457
1992/93	417	1.30	11,965	6	1710	9,138
1993/94	236	2.07	19,546	6	1941	9,414
1994/95	171	1.64	12,430	5	1685	7,564
1995/96	199	0.66	4,511	5	1728	6,801
1996/97	485	1.16	16,033	4	1369	13,812
1997/98	370	1.95	16,703	5	1779	8,560
1998/99	594	1.15	14,388	6	2045	12,494
1999/00	477	1.03	12,557	5	1647	12,174
2000/01	299	1.40	8,166	3	928	5,828
2001/02	155	0.43	1,702	3	865	3,938
2002/03	277	1.55	9,381	3	812	6,043
2003/04	142	2.15	6,578	4	941	3,053
2004/05	470	0.94	10,756	4	1140	11,438
2005/06	255	0.96	6,798	3	1111	7,018
2006/07	339	1.51	13,566	4	1198	8,930
2007/08	203	1.55	8,767	5	1418	5,650
2008/09	365	1.40	10,596	5	1559	7,525
2009/10	185	2.52	13,093	5	1562	5,187
2010/11	523	1.47	15,741	5	1484	10,636
2011/12	344	1.54	15,724	6	1799	10,167
2012/13	314	1.40	10,998	5	1,566	7,848

Mersey River

Season	Total No. Days fished	Catch per day brown	Brown trout Harvest	Percent of all anglers this water	No. all anglers	Total effort
1986/87	1312	1.31	30,338	11	2895	22,994
1987/88	548	1.43	18,687	8	2255	13,062
1988/89	993	0.89	17,008	11	3204	19,083
1989/90	910	1.14	21,660	9	2713	18,934
1990/91	509	0.90	15,364	9	2521	16,927
1991/92	382	1.04	7,647	5	1500	7,339
1992/93	849	0.61	11,461	8	2281	18,606
1993/94	453	0.68	12,366	8	2441	18,070
1994/95	462	1.03	21,099	10	3059	20,436
1995/96	430	0.45	6,732	8	2544	14,695
1996/97	683	0.74	14,467	7	2255	19,451
1997/98	1497	0.90	31,439	11	3658	34,632
1998/99	625	0.65	8,582	7	2301	13,147

1999/00	794	0.79	16,104	10	2833	20,264
2000/01	676	0.90	11,987	8	2157	13,176
2001/02	176	1.32	5,919	4	1090	4,471
2002/03	480	0.77	8,116	6	1624	10,472
2003/04	524	0.74	8,427	6	1372	11,265
2004/05	458	1.23	13,749	5	1561	11,146
2005/06	477	0.63	8,284	6	1944	13,128
2006/07	485	0.78	9,984	5	1698	12,776
2007/08	393	0.65	7,181	5	1560	10,938
2008/09	621	0.92	11,895	7	2105	12,802
2009/10	511	1.24	17,859	10	3018	14,326
2010/11	1071	0.97	21,292	6	1919	21,781
2011/12	505	1.85	27,635	6	1911	14,926
2012/13	622	1.00	15,547	8	2,412	15,547

Minnow River

Season	Total No. Days fished	Catch per day brown	Brown trout Harvest	Percent of all anglers this water	No. all anglers	Total effort
1986/87	16	5.50	1,542	0	92	280
1987/88	3	6.66	477	0	62	72
1988/89	12	6.66	1,537	0	76	231
1989/90	19	3.63	1,436	0	166	395
1990/91	3	3.33	333	0	39	100
1991/92	8	1.50	231	0	49	154
1992/93	9	2.11	416	0	57	197
1993/94	1	7.00	279	0	55	40
1994/95	6	5.00	1,327	0	124	265
1995/96	16	0.68	376	0	96	547
1996/97	3	0.66	57	0	40	85
1997/98	13	1.53	463	0	98	301
1998/99	16	4.87	1,641	0	85	337
1999/00	18	8.44	3,879	0	98	459
2000/01	29	2.96	1,676	0	100	565
2001/02	6	2.16	330	0	64	152
2002/03	0	0.00	0	0	0	0
2003/04	31	1.77	1,182	0	80	666
2004/05	16	1.68	657	0	60	389
2005/06	9	6.88	1,706	0	69	248
2006/07	0	0.00	0	0	0	0
2007/08	1	1.00	28	0	35	28
2008/09	4	7.00	577	0	51	82
2009/10	0	0.00	0	0	0	0
2010/11	29	6.34	3,742	0	127	590
2011/12	0	0.00	0	0	0	0
2012/13	10	2.90	725	0	93	250

River Leven

Season	Total No. Days fished	Catch per day brown	Brown trout Harvest	Percent of all anglers this water	No. all anglers	Total effort
1986/87	473	1.42	11,848	6	1690	8,290
1987/88	335	1.38	11,083	7	1942	7,985
1988/89	523	1.30	13,107	7	2187	10,051
1989/90	469	1.96	19,163	7	2215	9,758
1990/91	344	1.60	18,357	5	1615	11,440
1991/92	374	1.02	7,378	5	1450	7,186
1992/93	196	1.33	5,720	4	1283	4,295
1993/94	171	1.35	9,254	4	1165	6,821
1994/95	248	0.85	9,422	5	1623	10,970
1995/96	179	0.95	5,844	4	1392	6,117
1996/97	215	1.16	7,120	4	1409	6,123
1997/98	593	0.75	10,295	7	2208	13,719
1998/99	330	1.42	9,865	3	1022	6,941
1999/00	309	1.55	12,225	4	1285	7,886
2000/01	322	1.02	6,412	5	1254	6,276
2001/02	199	1.25	6,351	4	1026	5,055
2002/03	286	1.53	9,577	3	758	6,239
2003/04	130	1.46	4,085	2	672	2,795
2004/05	227	1.18	6,570	4	1170	5,524
2005/06	151	2.41	10,018	3	1111	4,156
2006/07	112	1.83	5,400	2	665	2,950
2007/08	101	0.77	2,171	3	921	2,811
2008/09	130	1.14	3,072	2	753	2,680
2009/10	218	1.14	6,981	4	1349	6,112
2010/11	220	1.55	6,975	3	947	4,474
2011/12	292	0.73	6,325	4	1236	8,631
2012/13	198	1.06	5,249	3	1,065	4,949

Dasher River

Season	Total No. Days fished	Catch per day brown	Brown trout Harvest	Percent of all anglers this water	No. all anglers	Total effort
1986/87	59	2.27	2,348	1	254	1,034
1987/88	27	2.55	1,644	1	344	643
1988/89	53	1.54	1,575	1	406	1,019
1989/90	29	3.86	2,330	1	387	603
1990/91	14	2.14	997	0	118	465
1991/92	51	1.11	1,095	0	245	979
1992/93	14	0.92	284	0	114	306
1993/94	21	3.42	2,872	0	221	837
1994/95	52	0.96	2,211	1	374	2,300
1995/96	0	0	0	0	0	0
1996/97	11	3.45	1,082	0	161	313
1997/98	78	1.39	2,521	1	395	1,804
1998/99	14	1.92	567	0	113	294

1999/00	7	0.85	153	0	131	179
2000/01	60	1.60	1,871	0	200	1,169
2001/02	21	2.61	1,397	0	224	533
2002/03	2	1.50	65	0	27	44
2003/04	22	6.81	3,224	0	134	473
2004/05	21	7.61	3,893	0	60	511
2005/06	8	4.50	990	0	104	220
2006/07	12	1.00	316	0	133	316
2007/08	25	1.72	1,196	0	177	695
2008/09	47	1.82	1,772	0	155	968
2009/10	16	2.81	1,261	0	106	448
2010/11	37	5.86	4, 413	0	179	752
2011/12	20	1.40	827	0	112	591
2012/13	18	1.83	825	0	125	450

Gawler River

Season	Total No. Days fished	Catch per day brown	Brown trout Harvest	Percent of all anglers this water	No. all anglers	Total effort
1986/87	16	2.75	771	0	162	280
1987/88	11	0.90	238	0	156	262
1988/89	64	4.39	5,400	1	305	1,229
1989/90	47	1.31	1,290	1	332	977
1990/91	8	10.12	2,693	0	39	266
1991/92	47	1.27	1,152	1	295	903
1992/93	40	1.10	964	0	171	876
1993/94	31	1.29	1,595	0	166	1,236
1994/95	35	2.82	4,379	1	312	1,548
1995/96	16	0.56	307	0	288	546
1996/97	21	1.23	740	0	120	598
1997/98	65	1.04	1,573	0	296	1,503
1998/99	35	1.22	904	0	227	736
1999/00	79	1.00	2,016	1	296	2,016
2000/01	53	2.20	2,280	0	150	1,033
2001/02	11	2.18	610	0	64	279
2002/03	6	1.16	152	0	81	131
2003/04	0	0	0	0	0	0
2004/05	43	2.23	2,336	0	270	1,046
2005/06	14	4.42	1,706	0	173	385
2006/07	28	0.67	501	0	199	738
2007/08	5	6.40	890	0	70	139
2008/09	19	4.00	1,566	0	103	392
2009/10	7	2.57	504	0	71	196
2010/11	46	2.58	2,420	0	230	935
2011/12	4	3.00	354	0	37	118
2012/13	18	0.38	175	0	125	450

Forth Fall Creek

Season	Total No. Days fished	Catch per day brown	Brown trout Harvest	Percent of all anglers this water	No. all anglers	Total effort
1986/87	0	0.00	0	0	0	0
1987/88	13	4.69	1,454	0	62	310
1988/89	6	4.16	480	0	101	115
1989/90	16	5.37	1,789	0	55	333
1990/91	4	11.25	1,497	0	39	133
1991/92	11	1.00	211	0	49	211
1992/93	1	1.00	22	0	28	22
1993/94	0	0.00	0	0	0	0
1994/95	29	0.44	575	0	187	1,283
1995/96	0	0.00	0	0	0	0
1996/97	0	0.00	0	0	0	0
1997/98	0	0.00	0	0	0	0
1998/99	20	6.00	2,524	0	28	421
1999/00	41	5.85	6,125	0	65	1,046
2000/01	7	5.14	702	0	25	136
2001/02	1	1.00	25	0	32	25
2002/03	0	0.00	0	0	0	0
2003/04	5	9.80	1,053	0	80	107
2004/05	19	2.68	1,241	0	90	462
2005/06	8	4.75	1,046	0	104	220
2006/07	0	0.00	0	0	0	0
2007/08	1	12.00	334	0	35	28
2008/09	6	4.00	495	0	51	124
2009/10	0	0.00	0	0	0	0
2010/11	11	5.27	1,180	0	102	224
2011/12	0	0.00	0	0	0	0
2012/13	26	0.34	260	0	72	751

Reference:

Davies, P (1985) "Brown trout populations in Tasmanian streams". The Inland Fisheries Commission Newsletter 1985 Vol 14 Number 2.