

Fisheries Performance Assessment Program

Introduction

Bronte Lagoon is a small Hydro Tasmania impoundment of approximately 4.8 square kilometres, located 18 kilometres north Tarraleah. The lake receives around 3 654 visits per annum and is an important state fishery offering anglers a high quality fishery primarily for brown trout, although both brook and rainbow trout are important additional elements in the fishery.

During the period 7-8 March 2003, the Service undertook an intensive survey within Bronte Lagoon. The purpose of the survey was to gain information on catch per unit effort and the age structure of the brown trout population. Until this time, no in-depth assessment of the trout population of Bronte Lagoon has been undertaken.

Analyses of fishery performance indicators, in conjunction with the results of this survey are reported.

In-Lake Surveys

A total of 100 trout were captured, consisting of 97 brown trout and 3 rainbow trout. Of the brown trout captured, 24 were females, 48 were males, with 25 fish being of an undetermined sex. An important observation is the high percentage (25%) of fish with no gonad development. These fish ranged in length from 335 mm to 485 mm and would normally be mature and show both gonad development and external sexual characteristics. Brown trout captured ranged between 325 – 502 mm in length (see fig 1). The average weight and length was 845 g and 421 mm respectively. The maximum length recorded for an individual fish was for a 5 year old male of 490 mm with a weight of 1 244 g.

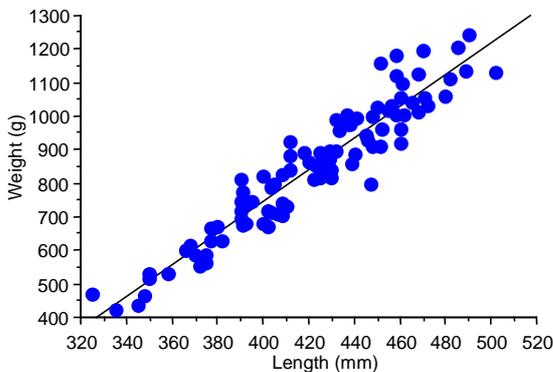


Figure 1. Length and weight of brown trout - Bronte Lagoon 2003.

Sixty five percent of the fish sampled were in the condition factor range 1.0 - 1.2 k with 25 percent 1.2 k or above, indicating the vast majority of fish were in very good condition.

Catch per unit of effort by comparison to most other lake fisheries was modest, suggesting the water holds a reasonable head of brown trout.

From the analysis of age and length data, there were no signs of recruitment failure in the 3 and 4 year old cohorts. There is however, evidence of low numbers of fish occurring in the 5 year old age class (see fig 2). This could be indicative of failed recruitment pre 1998 or alternately, this could be a result of high mortality alone, or a combination of both recruitment failure and high mortality. Any mortality however, is not likely to be a result of high angler harvest, as fish of a similar size within 3 and 4 year old cohorts are not being affected to the same degree.

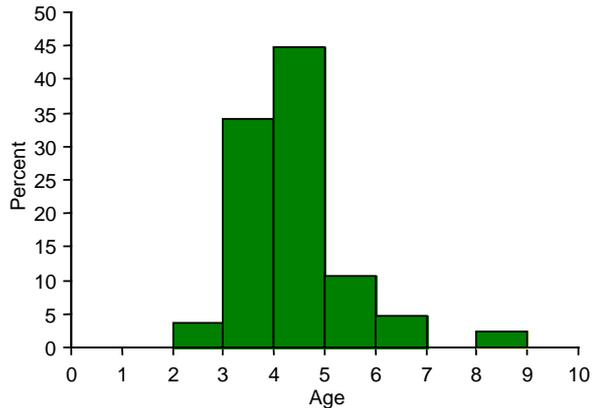


Figure 2. Percentage of brown trout in each age class - Bronte Lagoon 2003.

Growth rates for fish of three years old or greater were low with evidence of fish living to at least 8 years old (see fig 3).

Growth rates within age classes were highly variable with some fish exhibiting relatively high rates of growth while other fish were very slow growing. This variability may be related to the high percentage (25 %) of fish that showed no sexual development. This is despite the vast majority of these fish being of a size where they would normally be mature. Additionally, leakage of fish from adjacent fisheries such as Pine Tier Dam, may also be confounding this observation.

Neither young of the year or 1 year old fish were collected.

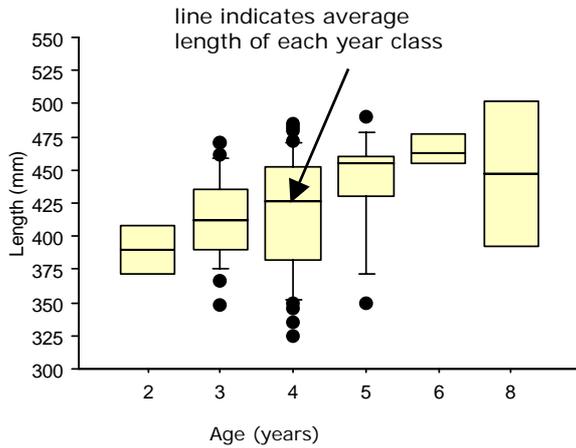


Figure 3. Length at age for brown trout - Bronte Lagoon 2003.

Three and 4 year old fish represented almost 80% of the brown trout collected, with 5 year old fish represent 11 percent of the sample. Brown trout 6 - 9 years old represented 11 percent while 2 year old fish represented just 4 percent of the total sample.

Stocking History

The most recent stocking of Bronte Lagoon occurred in 2003, with a combination of brook and rainbow trout (see table 1). As yet, it is too early to determine the success of these releases.

Date	Species	Age	No	Weight (g)
Dec-02	Brook	Fingerling	15000	3
Jan-03	Brook	Fingerling	5000	23
May-03	Brook	Yearling	1000	375
Nov-03	Brook	Adv Fry	11000	1.5
Dec-03	Rainbow	Fry	40000	0.2

Table 1: Stocking history for Bronte Lagoon.

Angler Creel Survey

During the season 2003/04, 116 anglers were interviewed. Of these anglers, 40 percent were fly fishers, 31 percent were spin fishers and 29 percent were trollers. A total of 77 brown trout, 4 rainbow trout and 3 brook trout were caught, equating to a catch rate of 1.14 brown trout per day (assuming 6 hours fishing per day).

Angler Postal Survey

Since commencement of the postal questionnaire in 1985/86, on average, 12.4% of all licensed anglers (3 654 anglers) fished Bronte Lagoon on a seasonal basis. This number has varied greatly ranging from a high of 3 728 in 1985/86 to a low of 1 815 in 1986/87. The maximum effort (number of days fished) occurred during the 1996/97 season with 17 733 days, while in 1992/93 this figure was just 6 005 days (see fig 4).

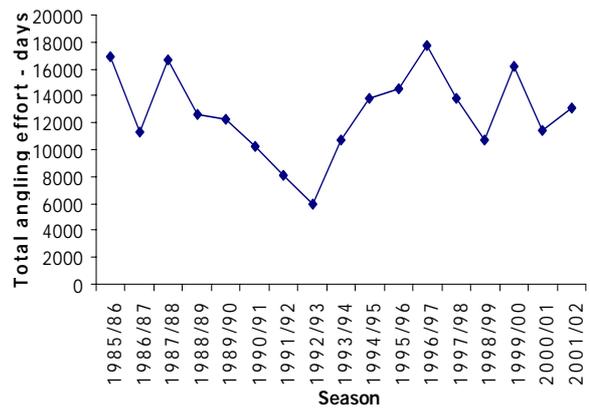


Figure 4. Total number of days fished - Bronte Lagoon 1986 - 2002.

The long term average catch rate for brown trout was 1.03 fish per day, with a high of 1.47 during 1988/89 and a low of 0.58 during 1992/93 (see fig 5).

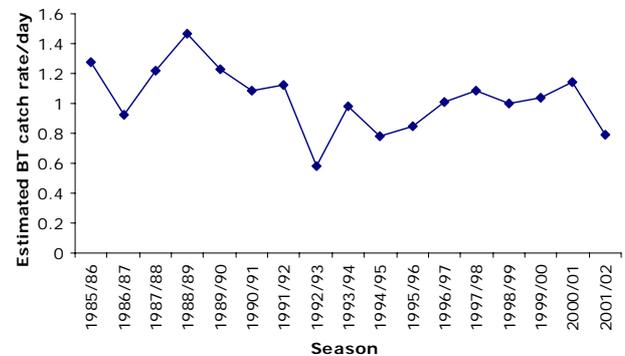


Figure 5. Catch rate per day for brown trout - Bronte Lagoon 1986 - 2002.

The average number of brown trout harvested per year over the period of the questionnaire was 13 420, with a high of 21 576 during 1985/86 and a low of 3 506 during 1992/93. Interestingly, the low harvest figure correlates with both a low catch rate and low fishing effort for the corresponding season.

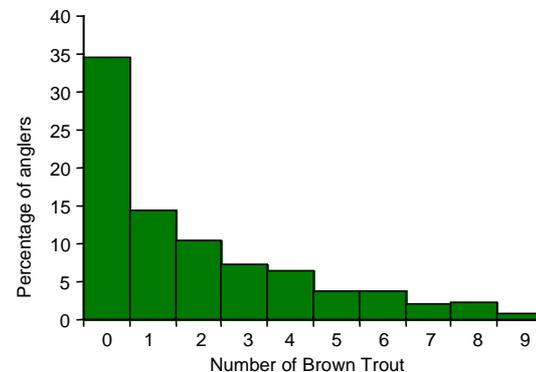


Figure 6. Percentage of anglers and the number of brown trout they caught on a seasonal basis, 1985 to 2002 - Bronte Lagoon.

Sixty five percent of anglers that fished Bronte Lagoon during any given season, indicated they were successful (see fig 6). A total of 15 percent of anglers caught one fish while twenty five and twelve percent of anglers caught 2 and 3 fish respectively. Those anglers that caught 10 or more fish equated to 21 percent, with the maximum number of fish caught by any one individual angler in a season being 151 fish. Rainbow trout accounted for 12 percent of the average annual harvest and influenced anglers catch rate only marginally.

Thirty percent of anglers reported they fished Bronte Lagoon for just one day per season while 37 percent fished between 2-3 days (see fig 7). Thirteen percent of anglers reported they fished 10 or more days during the angling season. This group equates to approximately 2 percent of all licensed anglers who fish in Tasmania.

The majority of anglers who fished Bronte Lagoon during the period 2001 - 2003, believed their angling experience was average or better (see fig 8). This was mainly based catch rate, facilities and water quality. Most did not rate fish size as a significant factor. Few anglers rated their experience as poor or worse giving catch rate and fish size as the primary reasons. The vast majority of respondents that offered comment on lake levels believed they were average or better.

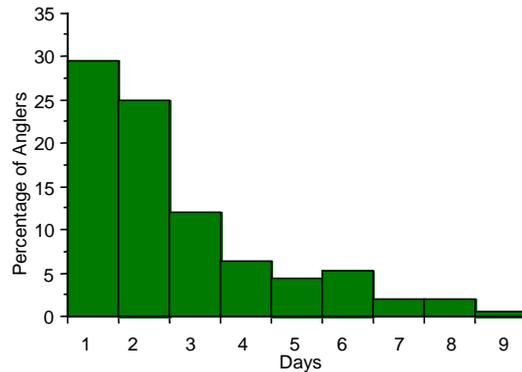


Figure 7. Percentage of anglers and the number of days they fished on a seasonal basis, 1985 to 2002 - Bronte Lagoon.

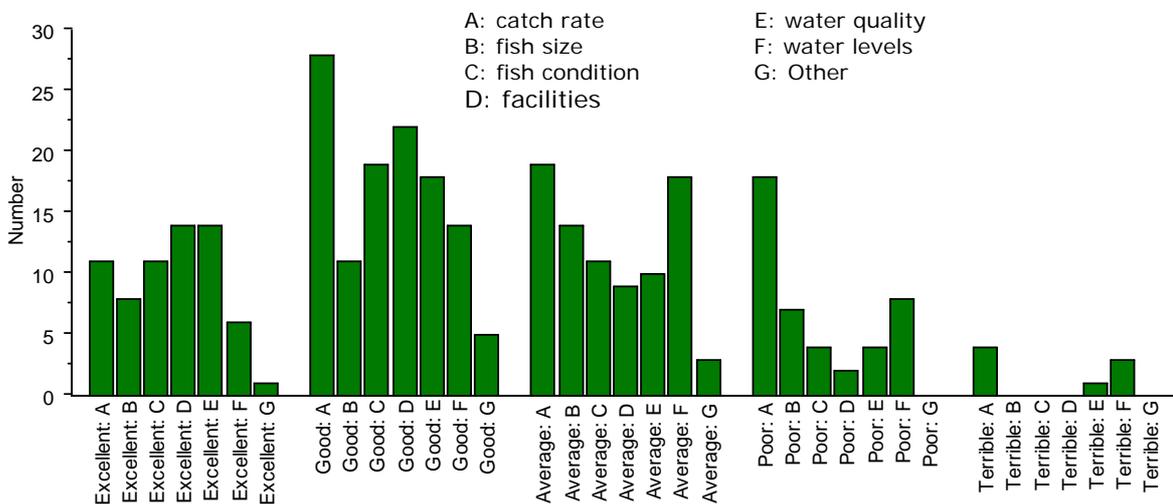


Figure 8. Angler satisfaction survey results from the annual postal survey 2001 to 2003 Bronte Lagoon.