



Fisheries Performance Assessment Program

Introduction

Penstock Lagoon is a relatively small shallow water with a surface area of 1.4 square kms and a maximum depth of 1.8 metres. The lagoon has over a number of years, been subject to significant alterations in water management.

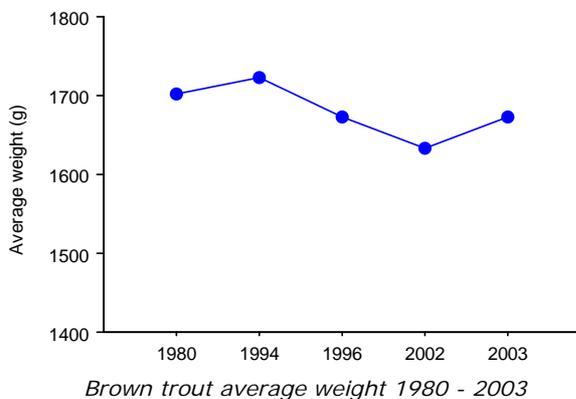
The trout fishery at Penstock Lagoon is valued for a moderate catch rate of quality brown and rainbow trout. Brown trout have been the mainstay of the fishery representing 54% - 93% of the annual harvest between 1991-2001.

During the period 2002/03, the Service undertook two in-lake surveys (August 2002 & May 2003) to examine the population structure of the trout fishery. These surveys were supported by the release of 503 individually tagged adult brown trout that were transferred from Liawenee Canal in May 2002. In addition to this information, an analysis of historical fisheries data and angler catch information was also examined. The following is a summary of this information.

In-Lake Surveys

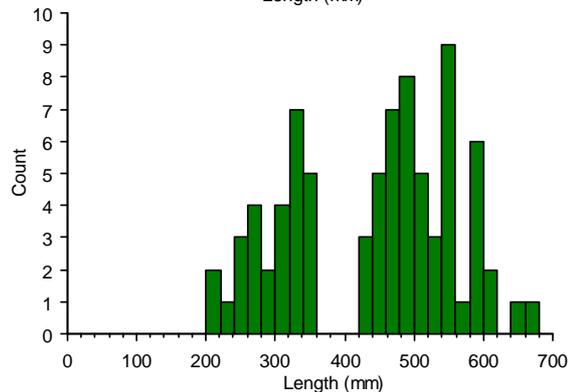
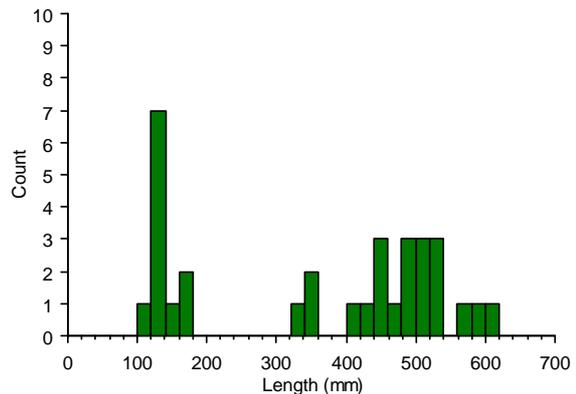
During the survey period, 111 brown trout between 108 – 660 mm were captured. The average length and weight of these fish was 417 mm and 1 247 grams respectively.

Brown trout over 420 mm which are accessible to anglers, were in good to very good condition, with an average condition factor of 1.2, an average weight of 1 645 g and an average length 514 mm. This compares favourably with the long term average weight for brown trout from Penstock Lagoon during the period 1980 – 1996 of 1 693 g.



During the August 2002 survey, 32 brown trout were collected of which 21 were mature. Of these fish, 25 percent were tagged, indicating the total population of mature takeable fish (> 420 mm) to be moderately low. Catch per unit effort data for both surveys also supported this finding.

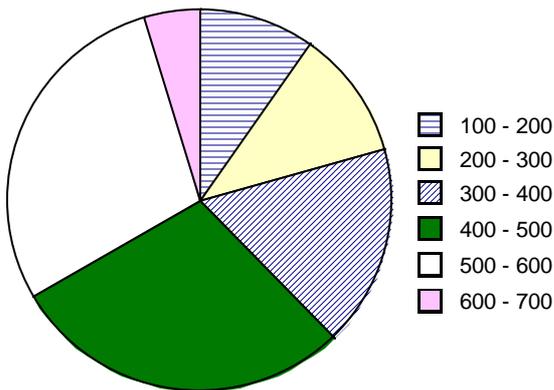
Immature (juvenile) brown trout showed a 155 mm increase in length during the period August 2002 - May 2003, indicating substantial growth from previous stockings.



Length frequency plots for brown trout August 2002 (top) & May 2003 (bottom).

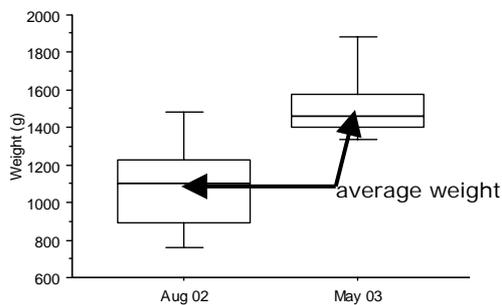
A significant point of interest is the absence of fish in the 360 - 420 mm size range during the May 2003 survey. This is due to an absence of natural recruitment in the years preceding and including 1999, and the low supplementary stocking rate in 1999 (6 000 brown trout fry). After this period, the lagoon was stocked consistently with brown trout fry and adult brown trout from Great Lake to cover this deficiency in recruitment. This gap in recruitment should fill during the 2003/04 season.

One of the pleasing results from the surveys is the evidence that growth in larger (older) fish is strong. Thirty three percent of the total May 2003 sample were greater than 500 mm and there were a number of fish in excess of 600 mm, all of which were in good condition. There were no fish sampled under 100 mm indicating that the brown trout fry recruited to the fishery last season had undergone substantial growth.



Percentage of brown trout in each 100 mm size range (May 2003).

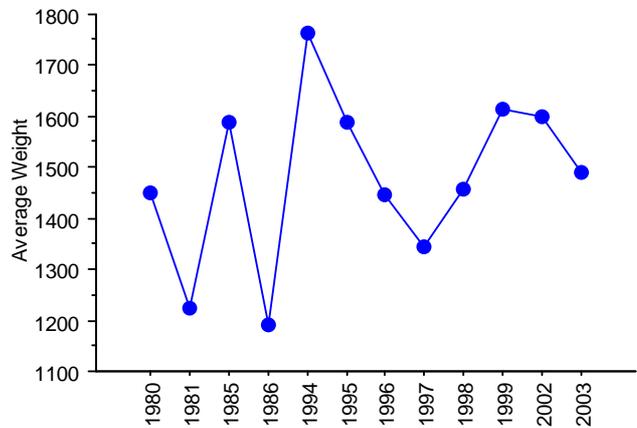
The most noteworthy of observations made regarding transfers of adult fish from Great Lake, was the significant growth these fish sustained throughout the season. The graph below, compares the release and recapture weights for tagged fish surveyed during May 2003. The average increase in weight was 70% while the average increase in length was 13%. The maximum weight gain was by a male that weighed 1.88 kg, which was 1 kg when released, therefore representing a weight gain of 88% and an increase in length of 15%.



Comparison of release and recapture weight for adult brown trout transferred from Great Lake in 2002.

The catch per unit effort for rainbow trout was low during both the August 2002 and May 2003 surveys. The average weight for those fish weighed and measured (8 only), was 1 601 g. An

additional 92 rainbow trout were weighed and measured as part of the 2003 spawner monitoring program. The average weight of these fish was 1 489 g. This compares to the long term average weight of 1 413 g for spawning fish during the period 1980-1999.

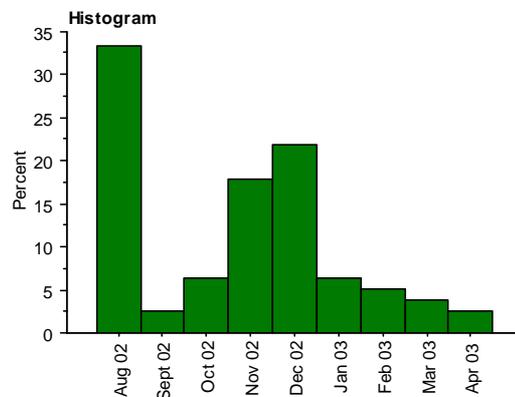


Rainbow trout average weight 1980 - 2003

Tag Returns

Of the 503 tagged fish transferred, 20% were reported as being captured by anglers. Of these reports, 80% of the fish captured were killed and therefore not available for subsequent recaptures. No fish were reported as being captured more than once.

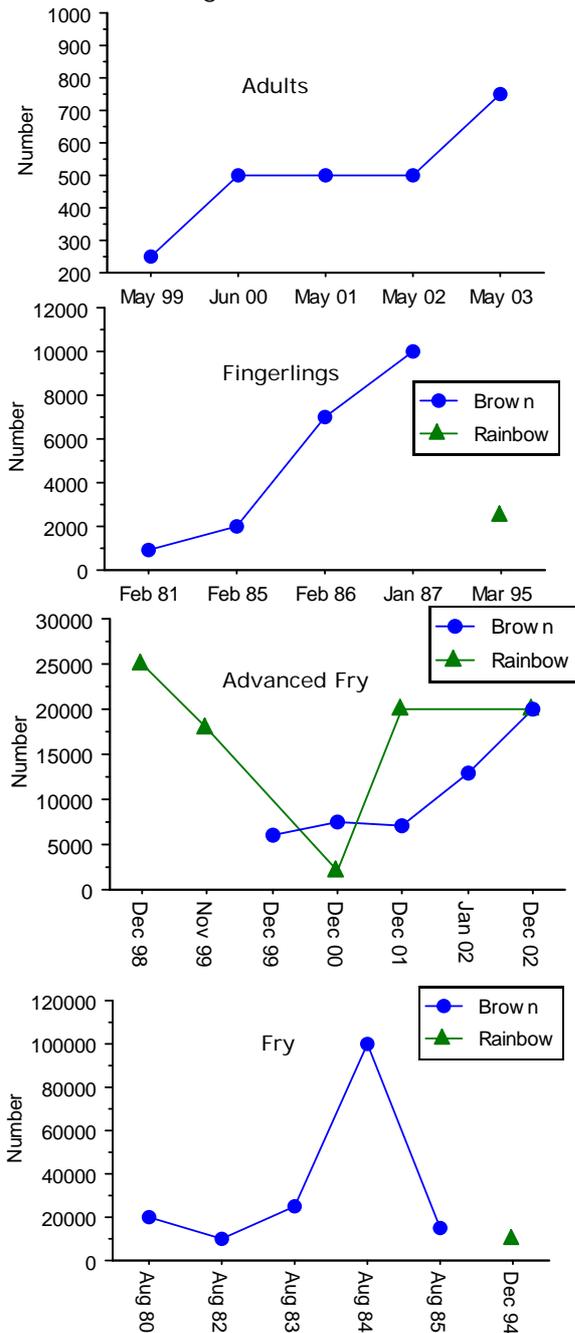
The graph below, shows the recapture dates for tagged fish. One third of the total number of tagged fish reported were captured at the start of the season in August 2002. Forty percent were captured in the period Nov - Dec 2002, with just 18% captured in the post Christmas period Jan - Apr 2003, with the remaining 9% captured in Sept - Oct 2002.



Percentage of tagged fish captured by anglers during each month of the 2002/03 season.

Stocking History

Below is the graphed stocking history of Penstock Lagoon since 1980. The graphs are split into each life history stage. Stocking of Penstock Lagoon using brown trout fingerlings and early stage fry was consistently carried out during the period 1980-87. No supplementary stocking took place after this time until rainbow trout were stocked in 1994-95 and adult brown trout and advanced brown trout fry were stocked in 1999. It is of interest that during this period of no stocking, lower catch rates were experienced at Penstock Lagoon.



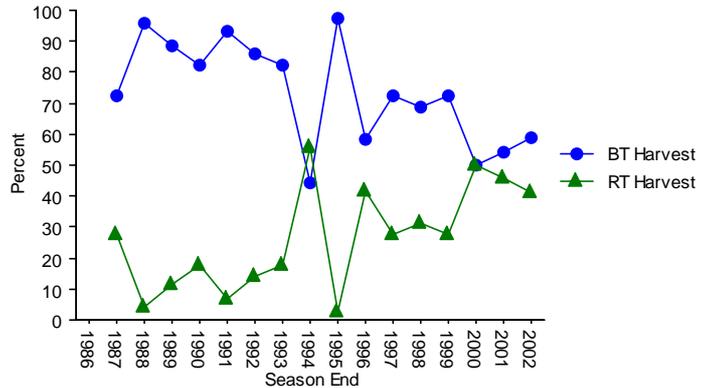
Stocking of trout 1980-03.

Angler Creel Survey

During the 2002-03 angling season, IFS inspectors interviewed 62 fly fishers at Penstock Lagoon. The total number of angling hours reported were 150, with 14 brown trout and 8 rainbow trout captured. This equates to a catch rate of 8.3 hours per fish, with brown trout representing 57% of the catch.

Angler Postal Survey

The graph below shows the comparative percentage of brown and rainbow trout harvested from Penstock Lagoon between 1986 and 2002. This shows a convergence in the number of rainbow and brown trout since 1986, to a point where in 2000, both species represented 50 % of the annual harvest. Since 2000 there has been a slight divergence to where brown trout represent 59% of the annual harvest and rainbow trout 41% (2001/02).



Harvest of brown and rainbow trout by percentage 1980 - 2002.

In general, between 1994 and 1999, there was a period of low catch rates and estimated harvests, which coincided with low angler effort. This was a period when the lagoon experienced elevated turbidities, minimal stocking and poor natural recruitment.

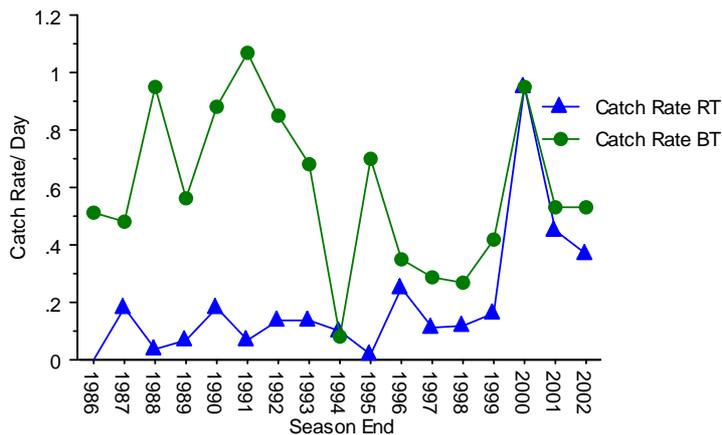
The catch rate (fish per day, see page 4) for brown trout peaked at 1.1 in 1991 and again at 0.95 in 2000. This rate has fallen to 0.53 in 2001 and 2002 which is slightly lower than the 17 year average of 0.59. The 2001 and 2002 figures are however, a significant improvement on the catch rate reported for 1997/98 at a low of 0.27. The catch rate for rainbow trout has generally been low at around 0.1 - 0.2. Following increased interest in the Penstock Lagoon fishery during the 1999/00 angling season, the catch rate increased to 0.45 - 0.95.

The harvest of both rainbow and brown trout has increased significantly since the 1998/99 season to a high of around 6 837 brown trout and 6 812 rainbow trout in the 1999/2000 season. The last reported harvest figure for 2001/02 season was 4 208 brown trout and 2 925 rainbow trout, both of which are significantly higher than the 17 year average of 2 272 for brown trout and 1 010 for rainbow trout.

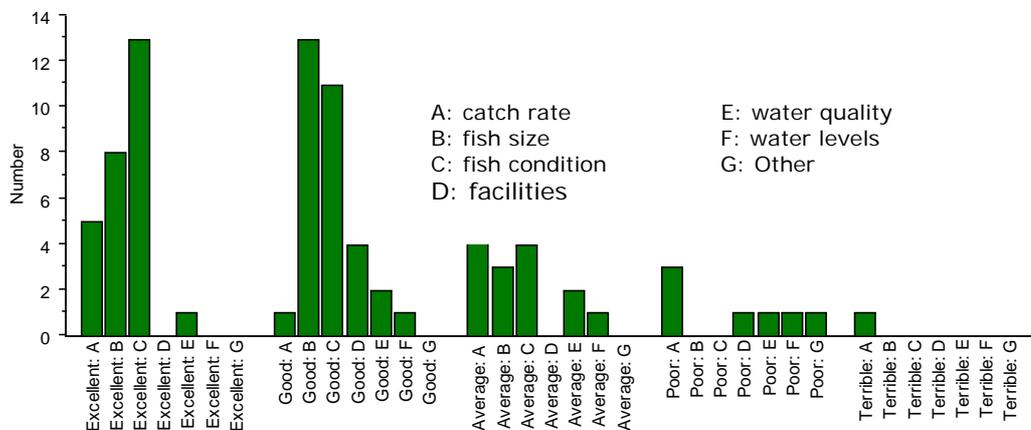
Overall angling effort, i.e. the number of anglers multiplied by the average number of days per angler, has increased markedly since the 1999/00 season. Some 8% of all licensed anglers were estimated to fish Penstock Lagoon in the 2001/02 season which is double the 17 year average of 3.95%. This equates to 7 800 angler days in 2001/02 compared to the 17 year average of 3 565 angler days. This increase in angling effort has been in both full season and short term licence holders.

Angler Satisfaction

Below is the graphed results for the angler satisfaction section of the 2001/02 postal survey. During the 2001/02 season 67% of anglers believed their angling experience at Penstock Lagoon was good to excellent. Sixteen percent of anglers said their experience was average, while 18% believed their angling experience was poor to terrible. Those anglers that rated their experience as average or better, based their opinion on catch rate, the size of fish and condition of fish. A smaller number of these anglers also rated the water management regime as average or better, based on water quality and water levels. Of those anglers that rated their experience at Penstock Lagoon as poor to terrible (18%), almost all said that poor catch rate was the main reason they rated it at this level. A small number stated that facilities were responsible for rating their experience as good.



Catch rate for brown and rainbow trout 1986 - 2002



Angler satisfaction survey results from the annual postal survey 2001/02 - Penstock Lagoon