Tatsamenie Lake Sockeye Fry Rearing and Smolt Projects 2015

Prepared for:

Transboundary Technical Committee

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Prepared by: Brian Mercer

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Metla Environmental Inc

Box 20046
Whitehorse, Yukon
Y1A 7A2

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Abstract

An ongoing sockeye enhancement program has been conducted at Tatsamenie Lake over the period 1990 through 2015. As part of continuing attempts to increase fry to smolt survivals of enhanced Tatsamenie sockeye, fry rearing experiments were conducted at Tatsamenie Lake from 2008 through 2015. The 2009 through 2015 projects involved onshore fry rearing using an IHNV free water source and 'Capilano' rearing troughs. The operational plan in 2015 was to continue with the program and evaluate the adult returns from, 2009, 2010 and 2011. For the 2015 project 209,000 eggs of the 1.288 million eggs that were obtained from the BY 2014 Tatsamenie Lake egg take were allocated to the 2015 rearing project. The emergent fry were reared at Snettisham for approximately 30 days to a mean weight of 0.98 gm before delivery by floatplane to Tatsamenie Lake on May 30. A total of 186,000 fry was delivered to Tatsamenie Lake for the extended rearing project. An additional 731,000 unfed fry were released into the lake. All fry from Snettisham hatchery possessed separate unique thermal marks for both the reared group and the directly planted group. The fry were fed EWOS brand fish food applicable to the fry size. Elevated mortalities were observed beginning six days after fry delivery. Fry mortalities continued to rise over the following three weeks in spite of treatment with Chloramine T and Parasite S. A seven day course of Florfenicol was initiated June 25 which resulted in a decrease to minimal mortalities by July 5. A total of 27,699 (14.9%) of the reared fry died as a result of the disease outbreak. The remaining 164,000 fry were released on July 6 at an average weight of 1.7 gms.

The 2015 Tatsamenie smolt mark/recapture and sampling project generated an emigrating smolt population estimate of 558,000 (S.E. = 64,000). The structure of the population by cohort was: 428,000 (76%) wild age 0+, 1+ and 2+; 78,000 (14%) fed age 0+ and 1+; and 57,000 (10%) age 0+ and 1+ directly planted fry. Approximately 58,000 (10%) of the out migrating smolts were age 0+ fish. Of the 0+ smolts, 54,000 (93%) were BY 2014 fed fry. Results from the 2015 smolt sampling and population estimates indicate the combined age 0+ and age 1+ egg to smolt survival of the BY 2013 fed fry was 80%. The BY 2013 unfed and wild combined age 0+ and age 1+ egg to smolt survivals were 4.5% and 1.6% respectively.

Reconstruction of the Tatsamenie Lake 2015 adult return indicates that 56% and 44% of the adult production was of wild and enhanced origin respectively. Total 2015 Tatsamenie sockeye production was estimated at 2,700 fish, 1.6% of total Taku River sockeye production. Canadian and U.S. fisheries in 2015 caught an estimated 1,196 Tatsamenie origin sockeye for an exploitation rate of 44%.

1. INTRODUCTION

Tatsamenie Lake has been the object of a Transboundary River (TBR) sockeye enhancement program over the period 1990 through 2015. The primary aim of the program is to increase overall sockeye production from lakes considered to have under-utilized sockeye fry rearing habitat. The TBR enhancement program is a joint Canada-U.S. program created and managed under the aegis of the Transboundary chapter of the Pacific Salmon Treaty.

Sockeye enhancement efforts at Tatsamenie Lake prior to 2008 were focused on unfed fry releases into the lake. The enhanced fry originate from eggs collected in the fall from adults returning to Tatsamenie Lake. The eggs are incubated at Snettisham Hatchery in southeast Alaska and the resultant fry are flown back to Tatsamenie Lake the following spring. The increased egg to fry survival as a result of hatchery incubation has been found to significantly increase sockeye smolt production in Tahltan Lake on the Stikine River system (TTC 2015). However, at Tatsamenie Lake the enhanced sockeye egg to smolt survival has been lower than that obtained at other Transboundary sockeye enhancement projects. The survivorship of Tatsamenie sockeye fry does not appear to be influenced by density dependent effects (Riffe and Mercer 2006).

Through a smolt sampling and mark/recapture program, the wild and enhanced egg to smolt survivals at Tatsamenie lake have been tracked from 1998 through 2015 (Appendix 1.) This data indicates that Tatsamenie Lake has a relatively low wild egg to smolt survival (BY 2002 – 2014 average = 2.3%). Hatchery incubation of Tatsamenie eggs has resulted in an increase of the average egg to smolt survival of 4.5% over the same period. However this is still significantly lower than the egg to smolt survival of 18.7% observed at Tahltan Lake over the same period (Unpublished data, TTC). The Tatsamenie egg to smolt survival of fed fry has averaged 44.5% over the brood years 2009 - 2013.

In order to further increase enhanced egg to smolt survivals beyond that provided by hatchery incubation the TTC Enhancement Sub-committee suggested experimenting with short term fry rearing. This short term fry rearing experiment has been conducted at Tatsamenie Lake from 2008 through 2015. 2015 is the third year of the first three years of adult production from the fry rearing experiment.

Site Location

Tatsamenie Lake is located at the headwaters of the Taku River system within the upper Tatsatua Creek drainage in northwestern British Columbia (Figure 1). The lake lies on the eastern side of the coastal cordillera at 800 meters elevation within a transitional area between coastal and interior bio-geoclimatic zones. Tatsamenie Lake is in a remote area of British Columbia and is accessible only by air. It is approximately 160 km and 120 km respectively from Atlin, B.C. and Juneau, Alaska.

Tatsamenie is a narrow partially glacial fed lake 14 km long with an average width of approximately 1.5 km. The lake surface area is approximately 22 km^2 and the maximum depth is 120 m. It can be an important producer of Sockeye salmon (*Oncorhynchus nerka*) in the Taku River watershed with production contributing up to 33% of the U.S. commercial and subsistence

fisheries in southeast Alaska and Canadian fisheries on the lower Taku River in British Columbia (TTC 2015).

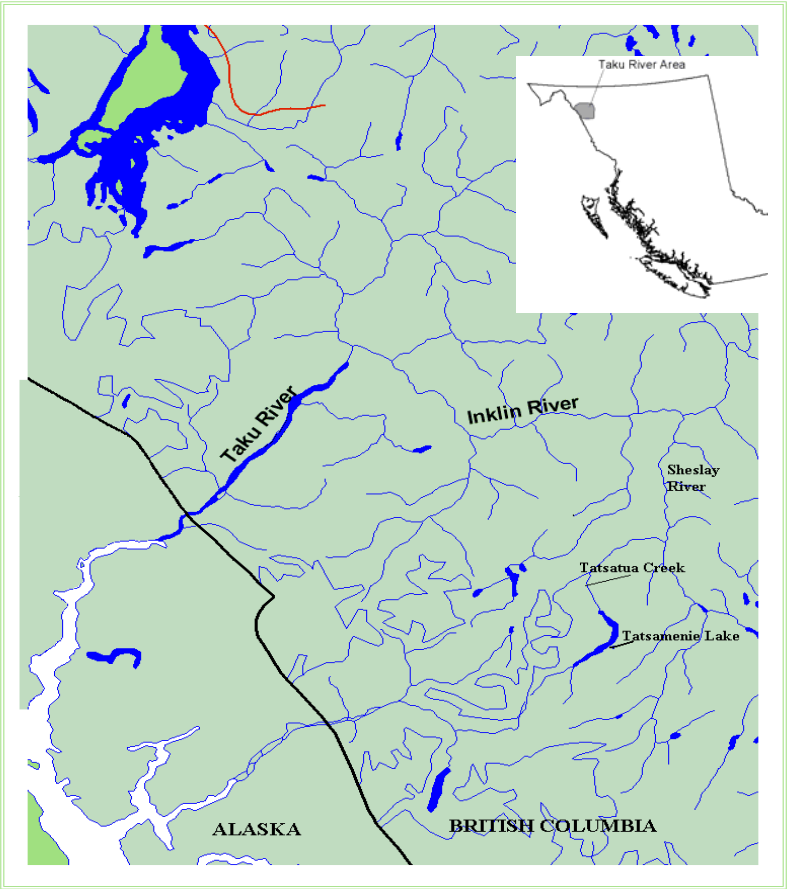

Figure 1. Location of Tatsamenie Lake within Taku River drainage.

1.1 Tatsamenie Lake Sockeye Fry rearing

In 2006, the Enhancement Sub-committee of the TTC developed a proposal to rear Tatsamenie Lake sockeye fry to a "pre-smolt" stage of approximately four grams in net pens in the lake. This proposal was submitted to the Pacific Salmon Commission Northern Fund and accepted. The fry were to be released around August 1, prior to the commencement of adult returns to the lake. This type of pen rearing was utilized with success at Hugh Smith Lake in southeast Alaska (Piston et al. 2006). Increasing the enhanced egg to smolt production through the release of pre-smolts could potentially achieve the sockeye enhancement goals of the system while reducing present egg collection targets and the corresponding reduction of the natural spawning population.

The initial project, conducted in 2008, involved rearing 400,000 fry in Tatsamenie Lake in four net pens (Mercer and Gransden 2008). After 21 days of in-lake rearing, a higher than expected

number of mortalities was observed. Samples were sent to the ADF&G pathology lab in Juneau for analysis where it was determined that IHNV (Infectious Hematopoietic Necrosis Virus) was present in the sampled fish. Over the following weeks an exponential increase in mortalities was observed in all rearing pens and as per prescribed TTC protocol all the fish were destroyed.

While it is known that IHNV is endemic to the Tatsamenie sockeye stock (PSC 1999), the rapid spread of the pathogen in the pen held fish was unforeseen. It is known that juvenile sockeye in high density rearing environments are more susceptible to the rapid horizontal transmission of IHNV. Strict disinfection protocols were followed during the egg take process and the eggs were incubated in an IHNV free environment at Snettisham Hatchery. As all four pens eventually became infected, it is assumed the virus source was the lake water. In the free swimming lake environment with much lower fry densities the risk of horizontal transmission is significantly reduced (Plumb 1999).

In order to avoid exposure of the fry to the endemic IHN virus in Tatsamenie Lake during the early stages of the rearing, it was proposed for the following year to rear the fish in on-shore tanks using IHNV free stream water. In 2009, the fry were reared in "Capilano" type troughs situated near the lake shore using a virus free water source piped into the troughs from a nearby stream (Mercer 2010). The 2009 project was a qualified success with the release of 115,000 sockeye pre-smolts into Tatsamenie Lake. Rearing mortalities in 2009 were negligible and it was estimated that approximately 106,000 0+ and 1+ smolts were produced. Concerns with the 2009 project centered on the high number of 0+ smolts (90 % of out planted fry) produced from the fry out- plants. In the 18 years of smolt sampling at Tatsamenie Lake, age 0+ smolts had not been observed. There was concern regarding the viability of these fish and the smolt to adult survivorship of this age class.

The operational plan from 2010 through 2015 was to continue with the experimental on-shore fry rearing program. These projects built on the experience and expertise gained in 2009. The aim of these projects was to rear fry to approximately 3-4 gm prior to release. The 2010 through 2014 fry rearing projects were successful with the release of fed fry into Tatsamenie Lake with negligible losses (Mercer 2011-2015). Of the fed fry released in 2010, 2011and 2012 only 5%, 13% and 5% of fry out-migrated as 0+ smolts. In 2013 and 2014 nearly all the reared fry exited the system as 0+ smolts within 3 weeks of their release into the lake. Fry rearing procedures in 2013 and 2014 were similar to those of the previous 3 years and it is not certain what triggered the out-migration of 0+ fish. Although not initially intended, the production of relatively large 0+ smolts is now considered to be a possible enhancement option. Ongoing evaluation of adult production from age 0+ smolts will determine if this enhancement strategy is viable.

The specific objectives of the 2015 fry rearing project were to:

1. Rear approximately 200,000 sockeye fry in on-shore rearing troughs from 0.5 gm to a size of approximately 2.0 gm.
2. Transfer fry from trough to in-lake rearing pens and continue to rear for a further 14 -20 days.
3. Release fry into Tatsamenie Lake at a weight of approximately 4 – 5 gm.

1.2 Smolt Sampling and Population Estimate

In 1996 and annually from 1998 through 2014, Sockeye smolt mark-recapture (m/r) and sampling projects were conducted at Tatsamenie Lake. The smolt enumeration program was initiated to monitor wild and enhanced egg to smolt survivals and attempt to determine the causes of lower than expected enhanced fry to smolt survival rates. In order to obtain definitive enhanced fry to smolt survival rates it was necessary to enumerate the total out-migrating smolt population as well as determine the age structure and origin (wild or enhanced) of the population. Using stratified population estimates and representative smolt sampling for age and otolith thermal marks it is possible to quantify the smolt production of each identifiable cohort based on age and origin. Using these methods it is possible to track the survivals and growth of the wild, reared, and directly out-planted enhanced fish.

The objectives of the 2015 Tatsamenie Lake smolt mark-recapture project were to:

1) Obtain an estimate of the total number of enhanced and wild smolts emigrating from Tatsamenie Lake.
2) Sample smolts for weight, length, emigration timing and percent composition of enhanced and wild smolts by age class.
3) Track the outmigration behaviour of fry released from an experimental on-shore fry rearing project.

1.3 Adult run reconstruction

In order to track and quantify the adult production from the enhanced as well as wild component of the run it is necessary to reconstruct the annual Tatsamenie adult sockeye run. This has been conducted for BY 2011 and BY 2012 in previous reports (Mercer 2013, 2014).

2. METHODS

2.1 Fry Rearing Methods

The methods and protocol used for the 2015 fry rearing project were the same as those detailed in previous reports (Mercer 2011 through 2014). The same site, equipment and water source was used in 2015 as in previous years.

Impoundment Dam and Piping

A dam and water impoundment structure was constructed 50m upstream of the mouth of the creek. The dam was made from two logs (each one meter long and 25cm in diameter) stacked one on top of the other. Two openings were cut into the dam logs to allow insertion of two intake pipes (Figure 2). The top log was notched to allow for overflow to ensure a constant water level and flow rate into the intake. This structure was used in 2011 through 2014. The 2015 plumbing configuration was identical to that described in previous reports (Mercer 2014).

The plumbing of the system was finished on May 28 and was capable of delivering approximately 500 litres per minute (L.P.M.) into each trough. Each trough was configured to hold 2.9 m^3 of useable water volume. Using the ball valves on the entrance pipes the flows were initially adjusted to 250 LPM into each trough. The fry ready troughs are illustrated in figure 3.

Figure 2. Dam and water impoundment structure.

Figure 3. Troughs ready to receive fry.

As fish food is a bear attractant, a 12-volt electric fence was positioned in a 5 m perimeter around the trough area. The fence stood 1.2 m tall and consisted of three wires evenly spaced

25cm vertically, a metal ground, a control box and a 12-volt deep cycle battery. The fence was electrified at all times except when personnel were entering and exiting the perimeter.

Fry delivery

At 11:00 hours on May 30 2015 a single engine Otter aircraft arrived from Snettisham hatchery carrying a load of approximately 96,000 sockeye fry. A second load of 95,000 fry was delivered at 14:00. Fry were divided into four equal groups into the four troughs using volumetric displacement. The fry were hand carried in buckets between the aircraft and the troughs. Attempts were made to distribute fry evenly resulting in approximately 48,000 fish in each tank.

Feed/rate/schedule

The fry in the Cap troughs were hand fed every day beginning at 07:00 hours at intervals of every 2 hours over a 12 hour period. In order to standardize feed rates, the operational plan was to feed at a rate of 2% body weight/day in the troughs and 3% BWD when in the lake. Fry were fed a mixture of Ewos™ #1 crumble for the first 30 days. After planting fry in the lake pens the fry would be fed # 2 crumble.

The trough water temperatures initially encountered in 2015 did not allow feeding at a rate of 2% body weight/day (BWD). In the first week the mean BWD feed rate target was 1.0%. Feed rates were subjectively determined each day by observing feeding activity and the amount of food left on the bottom of the troughs.

Length and weight sampling

Sampling to determine feed rates, growth, biomass, densities and food conversion was conducted on a weekly basis commencing on June 6th. Snettisham Hatchery personnel reported a mean fry weight of 0.98 gm on delivery. For length-weight samples, 10 fry were randomly selected from each trough and brought back to camp to be individually weighed on a Metzler electronic balance accurate to 0.01 grams. Individual fork length (tip of nose to fork in tail) was recorded to the nearest millimeter. In order to prevent contamination and/or cross contamination of the troughs, separate sampling equipment was used for each trough and all implements (nets, containers) were disinfected with 100 ppm iodine solution between each round of sampling.

Temperature and Dissolved Oxygen readings

Temperature and dissolved oxygen (DO) readings were taken twice each day around 07:00 and again at 19:00. An Oxy-guard ^{TM} oxygen meter was used to obtain the readings. These were taken at a depth of 0.25 m at both the inlet and outlet of the trough. After the fish were transferred to in-lake holding pens, temperature and DO readings were to be obtained from the center of the pen at 1m depth.

Trough cleaning

The cap troughs were cleaned by gently sweeping accumulated debris, uneaten food and feces to the downstream end of the trough using short handled plastic brooms. The stand pipe on the downstream side of the screened trough outlet was removed to create a siphoning action to flush out the accumulated detritus at the end of the trough. Care was taken to minimize disturbance of the fry. Separate cleaning apparatus was used for each pen and disinfected in 100 ppm iodine solution after every use.

Fry transfer and net pen rearing

Due to a pathology event and successive treatments (discussed below) the reared fry were not placed in net pens during the 2015 project.

2.2 Smolt Sampling and Population Estimate methods

Tatsamenie Lake Sockeye smolt population estimates were obtained using mark-recapture (m/r) techniques. Sockeye smolts were captured at the lake outlet, tagged so they were identifiable by day of release and re-introduced into the lake approximately 4 km from the outlet. It was assumed the marked fish would mix with the unmarked fish and that examination of out-migrating smolts at the initial capture site would provide marked-unmarked ratios from which weekly run estimates could be calculated. Daily representative sampling for otoliths and scales provided ratios of wild:enhanced smolts by age class. From previous smolt sampling activities at Tatsamenie Lake it was assumed smolt migration would begin in mid-May and continue until early September.

The smolt capture and sampling location was the same as that used since 1996; in the outlet stream approximately 300 m downstream from the lake outlet. Smolts were captured using a graduated mesh fyke net with a 2m x 2m opening and a length of 5m. The net was placed about 2m from the east bank and secured to two steel pipes driven into the stream base. Two wings were constructed on each side of the opening of the fyke net by using 3m x 0.8m welded metal panels used at the Tatsamenie Lake adult Sockeye weir. Each "wing" was angled approximately 30 deg. upstream of the opening of the fyke net for a distance of 6 m (Figure 4). The fyke net funnelled into a 0.5m x 0.5m x 1.5m long "live box" constructed of 0.8cm mesh vexar attached to a wood frame. The box was anchored to pipes driven in the stream substrate and had a hinged lid to access the captured smolts. The fyke net was in operation continuously except for brief periods during mid-day when it was cleaned. All captured smolts were removed from the live box with a fine mesh dip net and transferred to an examination tub. Previously tagged fish were readily discernible and were netted from the tub and placed in another container for later release downstream of the trap site.

A daily tagging goal of approximately 300 smolts was established when catches permitted. When daily catches were less than 300 all available smolts were tagged. Captured smolts that were to be tagged were removed from the box and placed in an anaesthetic bath of MS 222 (tricaine methanesulfanate) at a concentration of 1 gram/50 liters water. Smolts were tagged using injectable elastomer dye purchased from Northwest Marine Technology. The technique

consisted of using a fine needle syringe to inject a two-part elastomer dye into the nose and/or head cartilage of the smolt depending on the mark designated for that particular day (Figure 5). Four separate colours were used; fish were marked either on the head or the nose with the placement of one or two marks. A unique colour and mark location was used for each day within a 10 day cycle. The same sequence was repeated for the next cycle. A 10 day cycle was used as previous studies indicated that over 95% of tagged smolts would have re-emigrated after this period (MacDonald and Smith 1980; Mercer 1998, 2001, 2006, 2010).

Figure 4. Fyke net and smolt trap at outlet of Tatsamenie Lake (2010 photo).

Figure 5. Application of elastomere dye mark.

The tagged fish were placed in a 300 litre transfer tub. Supplemental oxygen was introduced into the tub using bottled oxygen and a diffuser stone at a rate of approximately 0.25 l/min. Any smolts exhibiting abnormal or deleterious effects from the tagging operation were removed from the tub and released downstream of the trap site. Tagged smolts were transported 4 km up the lake by boat and re-introduced along an established transect extending from the western to the eastern shore. The smolts were released along the transect in groups of approximately 10 - 20. Tagging was performed each day between 9:00 and 13:00 and the fish were released within 1 hour after the tagging operation was finished.

Personnel arrived on-site for the smolt project on May 16. The operational plan called for the crew to be on-site prior to full ice out. Based on 15 years of smolt sampling at Tatsamenie Lake indications are that smolt outmigration does not occur previous to ice out. Due to a significantly earlier than average ice out, the lake was already ice free when the crew arrived. Based on the water temperature at time of arrival it was estimated the ice had been fully out for 2 days prior to arrival.

Smolt Sampling

Smolts were sampled throughout the project. The sampling goal was to obtain a representative sample of the run with a target maximum of 1000 fish for the project. Lengths and weights were taken to the nearest mm and 0.1g. Scale smears were placed in standard scale books with 2 smears/fish and 25 fish per book. Heads were removed from the smolts and placed in numbered vials containing 95% denatured ethanol. The otoliths were later removed and examined at the Fisheries and Oceans (DFO) otolith lab in Whitehorse, Yukon using standard examination procedures (Hoyseth, 1994). Scales were analyzed for age by the DFO sclerochronology lab at the Pacific Biological Station, Nanaimo, B.C.

Population Estimate Model

The method used to obtain the emigrating smolt population estimate using the mark-recapture data was the stratified ML Darroch estimator that is incorporated in the Stratified Population Analysis System (SPAS) program. This model was developed for analyzing data from stratified mark-recapture experiments (Arnason et. al. 1995; http://www.cs.umanitoba.ca/~ popan). The SPAS model permits pooling of strata and carries out a number of goodness of fit tests. The separate age and origin cohorts of the smolt population were determined from weighted sampling based on the population estimate for each stratum.

3. RESULTS

3.1 Fry Rearing Results

Water temperatures

Water temperatures in the Cap troughs ranged from a low of 2.0 to a high of 9.5 Cº over the course of the project (Figure 6). The mean low temperature was 3.7 Cº and mean high was 5.9,

with an overall mean of 4.9 Cº. As expected, the prevailing ambient air temperatures regulated the daily maximum and minimum temperatures as well as the diurnal temperature spread.

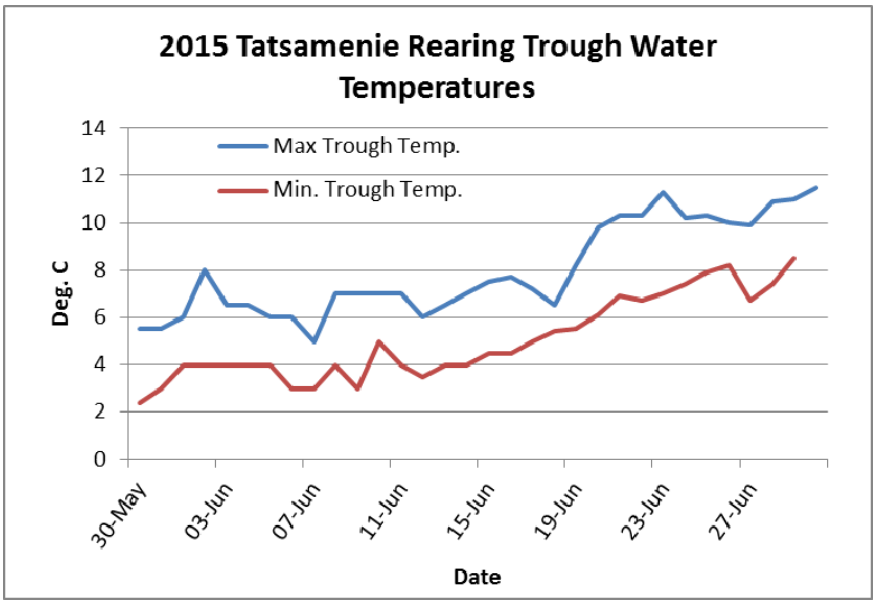

Figure 6. Diurnal temperatures (07:00 and 18:00) in rearing trough #1, 2015.

Growth and Food Conversion

Feeding and growth rates are detailed in Appendix 2 and 3. During the period from May 30 through July 5 the mean weight of the fry reared in troughs increased from an average of 0.98 gm to 1.67 gm, representing an increase of 0.69 gm over 35 days. This is a significantly lower growth rate than has been observed during the previous 5 years of rearing trials. Due to the elevated mortalities observed after 5 days of rearing, the feed rate was lowered to a maintenance diet of approximately 0.05% body weight per day (BWD). The feed reduction was done under advice from the DFO Veterinarian and Snettisham Hatchery as a means of mitigating the causes of morbidity which at the time were unknown.

Fed Fry Mortality and Treatment

Elevated mortality of the trough reared fry was first observed on June 5, six days after delivery of the fry. The mortality rates continued to rise exponentially in all the troughs subsequent to June 5 (Figure 7, Appendix 4). Samples of moribund and dead fry (20 per trough) were collected and forwarded to the pathology Lab at the Pacific Biological Station (PBS) on June 15. After consultation with DFO SEP, the DFO Veterinarian at PBS it was decided to begin a 4 day surface disinfectant treatment with Chloramine T. This occurred June 15 through 18. The treatment consisted of an initial shock treatment of 20gm mixed in 3.0 liters water followed by a drip solution of 105 gm/6 liters water at a rate of 100ml/minute. This treatment, however, had no observable effect and mortality rates continued to rise.

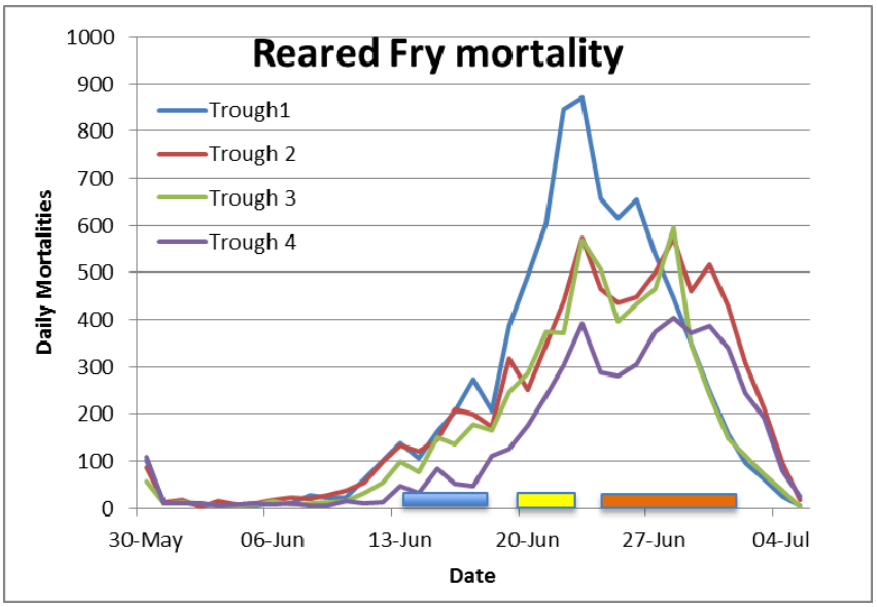

Figure 7. Daily mortality of reared fry in troughs 1 through 4, 2015.
Note: Blue, yellow and brown bars denote respective treatment duration of Chloramine T, Parasite S and Florfenicol.

Preliminary pathology findings on the first samples submitted indicated a bacterial and parasitic gill and skin disease with the parasite being an unknown ciliate. In view of these results, a 3 day treatment of Parasite S was initiated on June 20. Parasite S was administered using a one hour drip to achieve a 225 ppm dose for one hour. Additional samples of moribund and dead fry were collected and delivered to PBS. Mortalities continued to rise during the 3 day Parasite S treatment.

As the previous surface treatments had no effect, a 7 day course of antibiotic treatments was administered starting on June 25. The antibiotic used was Florfenicol administered via the feed at a rate of 0.69 gm/500 gm per trough per day. The Florfenicol was mixed with 10 gm of canola oil/500 gm feed to facilitate adherence of the drug to the feed granules. After 4 days of treatment a significant decline in mortalities was noted. The decline accelerated over the following 7 days. From May 30 through July 5 the total fry mortality was 27,699, approximately 14% of the total held fish (Appendix 4).

In consultation with the DFO Veterinarian it was decided to release the fry directly into the lake rather than continue with the scheduled in-lake pen rearing. This decision was based on the rational that the fry may be more susceptible to IHNV infection due to their compromised health from the bacterial/parasite infection and the course of treatments. The fry were released July 6 in groups of approximately 5000 in 15 separate near shore locations in the northern half of the lake. The locations were chosen subjectively as being suitable fry rearing habitat (i.e. defined littoral area, overhanging and emergent vegetation and the presence of woody debris).

Net pen rearing and fry releases

No net pen rearing of trough reared fry occurred in 2015. Approximately 45,000 fry selected from the direct out plant group were held and fed from May 26 to June 5[1]. With the onset of elevated mortalities in the troughs these pen held fish were released. This was done to prevent possible horizontal transmission of the as yet unidentified pathogen from the trough reared fish to the pen held fish.

3.2 Smolt Sampling and Smolt Population Estimates and Survivorship Results

Population estimates

The 2015 smolt m/r and sampling results are presented in Tables 2 and 3 and in Figures 8 and 9. Mark/recapture and sampling data are presented in Appendix 6 and 7. The total 2015 smolt population estimate was 558,000[2]. There were 6 separate cohorts based on age classes and fry origin that were identified from the 2015 smolt sampling. The structure of the population by cohort was: 423,814 (76%) wild age 1+ and 2+; 77,866 (14%) reared age 0+ and 1+; and 56,699 (10%) age 0+ and 1+ directly planted fry. As discussed below, this estimate is likely biased low due to the late arrival of the field crew and the hiatus (discussed below) in the m/r and sampling project.

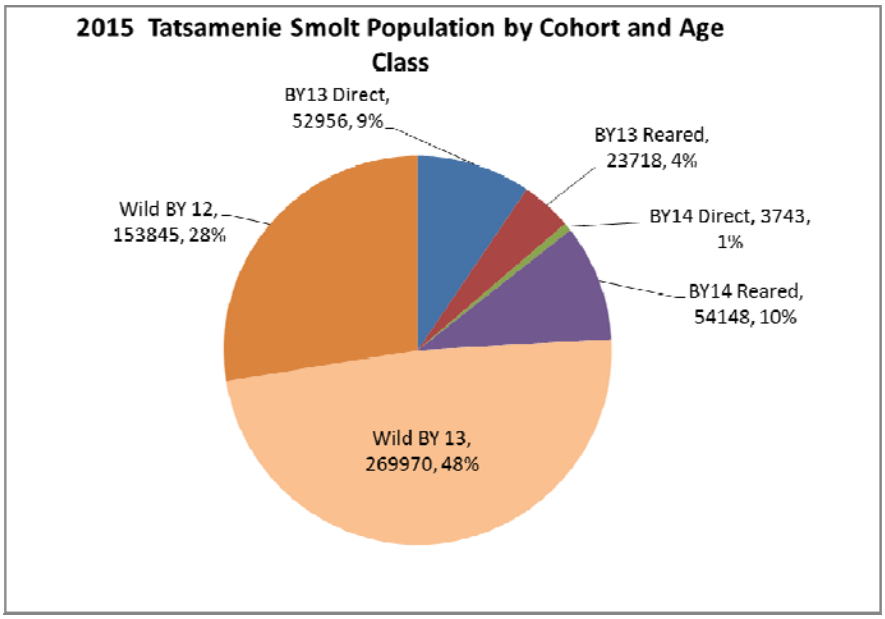

Figure 8. Population and age structure of sockeye smolts out-migrating from Tatsamenie Lake 2015.

Reared age 0+ fish were first observed in the out-migrating smolt population within 24 hours after the reared fry were released into the lake (Figure 9 and Appendix 7). It was hypothesized

[1] These in-lake reared fish were an experimental group intended to re-examine the viability of rearing emergent fry in in-lake pens but a lower density than was used in 2008.
[2] The population estimate is a SPAS generated ML Darroch estimate with a SE of 64,000.

that these fish were from a group released near the lake outlet and were being passively flushed from the system. Due to the low number of smolts/fry captured in the fyke net in the 5 days after the release of the reared fry as well the small size and early release date of the reared fry, it was assumed there would not be a significant immediate outmigration of 0+ fry. Therefore, the smolt m/r and sampling activities were suspended on July 12. This was an administrative decision based on perceived cost-benefits associated with continuing the smolt project when it appeared the outmigration had diminished to a point where it would no longer yield significant results. The smolt m/r project was initiated again on August 4 after the Tatsamenie sockeye weir/egg take crew returned to the site.

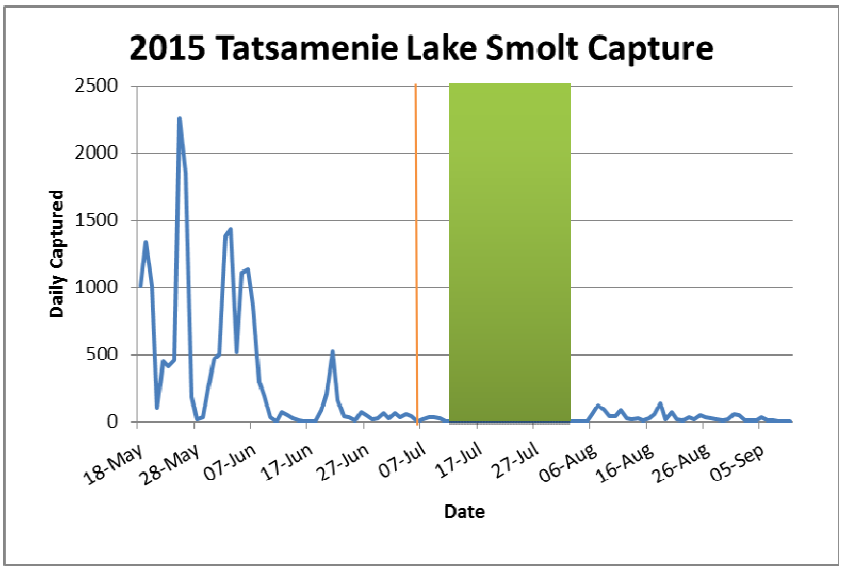

Figure 9. 2015 Tatsamenie Lake daily smolt capture.
Note: green area denotes period trapping suspended and red line depicts date reared fry released into lake.

A total of 499 smolts was captured in the first week of trapping after recommencement of the m/r project. As was expected some out-migration of smolts had occurred during the hiatus in the m/r sampling period. After the smolt m/r recommenced, a population estimate of 36,770 smolts was obtained over the period August 6 through September 10; at which time the m/r project ended. Based on sampling results, approximately 60% of the out-migrating smolts during this period were 0+ fed fish.

It is difficult to quantitatively assess the number of smolts of each cohort that out-migrated during the 26 day interruption of the project. In part, this is because the release of the fed fry occurred over the last 7 days of strata 6 (June 21-July 10). However, an approximate population estimate can be obtained using the average daily smolt outmigration derived from the sum of the population estimates for strata 6 and 7 divided by the total number of days in both strata. This yields an average of 1,883 smolts per day over this period. As the sampling interruption was 25 days, this generates a population estimate for the interruption period of 48,900.

Survivorship

The egg to smolt survivals for BY's 2009 through 2013 are illustrated in Figure 10. The egg to smolt survival estimates determined from the 2015 smolt results are summarized in Appendix 5 (a). The egg to smolt survival of the fed fry from BY 2013 (80%) was similar to that observed in BY 2012 (86%). These relatively high survival rates are a direct result of the fed fry out-migrating predominantly as 0+ (pre)-smolts. .

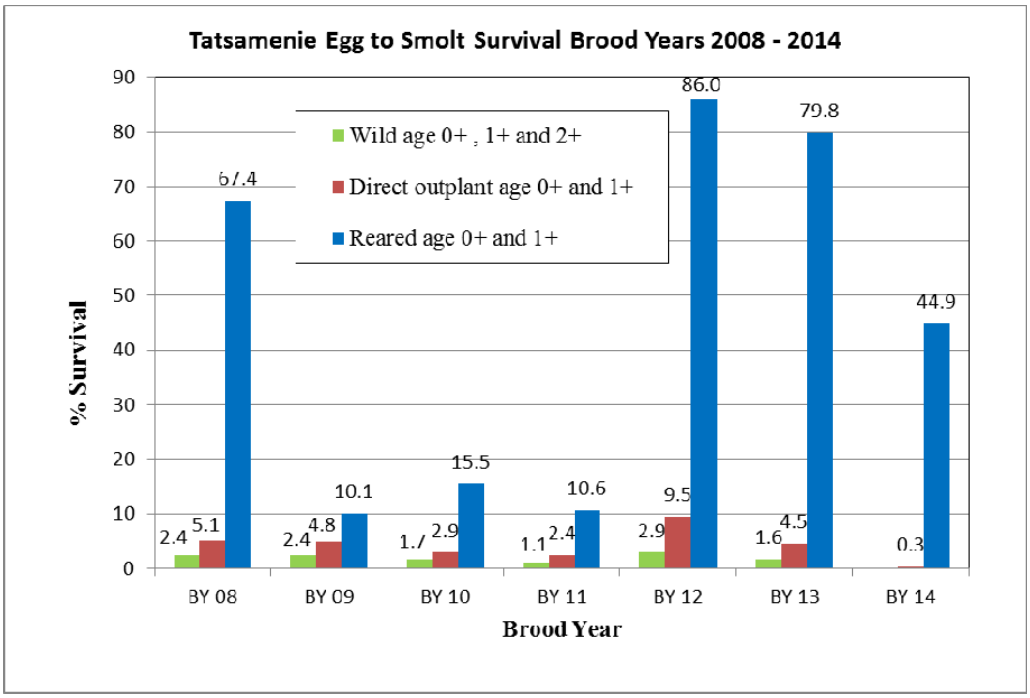

Figure 10. Tatsamenie Lake BY 2008 - 2014 egg to smolt production for wild, directly planted and reared fry for all age classes.
Note: BY 14 only 0+ fry production depicted.

Smolt mean length and weight

The mean smolt length and weight for each cohort is presented in Table 4. The smolt sizes for each cohort observed in 2015 are consistent with observed sizes in previous years. It appears there were significant above average in-lake growth rates of the fed fry cohort that out-migrated as 0+ smolts in 2015. The average size of this cohort was 6.4 gm compared to 5.5 gm for directly planted 0+ smolts and 4.3 gm for wild age 1+ smolts. The growth of this cohort over the sampling period July 7 through September 10 is illustrated in Figure 11. Higher than expected growth rates of this cohort were also observed in 2012 and 2013.

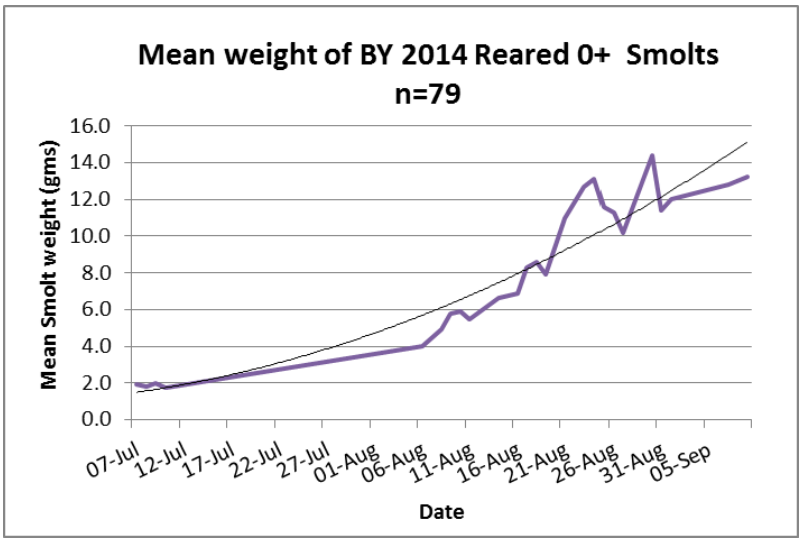

Figure 11. Mean weight of BY 14 reared 0+ smolts over period July 7 through September 10, 2015.

3.3 Adult sockeye returns to Tatsamenie Lake

2015 was the third year of adult returns to Tatsamenie Lake from the fry rearing experiment. In order to determine the survival of the three separate adult cohorts by origin (fed, unfed, wild) it was necessary to reconstruct the 2015 adult sockeye production from Tatsamenie Lake. The full reconstruction of the run is presented in Appendix 5 and in Figure 12. This run reconstruction is based on an expansion of the sockeye escapement into Tatsamenie Lake using Tatsamenie broodstock otolith and age analysis as well as preliminary Canada and US catch figures (TTC 2015). Total 2015 Tatsamenie adult sockeye production is estimated at 2,700 fish. A total of 1,196 Tatsamenie origin sockeye was caught in Canada and US fisheries for an exploitation rate of 44%. Tatsamenie origin sockeye contributed only 1.6% of the total Taku River sockeye catch in 2015. This is significantly less than the estimated Tatsamenie contributions in 2013 (5%) and 2014 (30%).

Of the returning adults in 2015, 56% were wild and 44% were of enhanced origin. The enhanced proportion in 2015 was similar to the previous 4 years (Figure 13). Of the enhanced component in 2015, 40% were unfed and 60% were fed fry.

Based on the adult run reconstruction and the smolt data from previous years, the egg to smolt, egg to adult and smolt to adult survivorship for wild and enhanced fish from BY 2008, BY 2009 and BY 2010 can be calculated. These survivals are illustrated in Figures 14, 15 and 16. As noted in previous reports (Mercer 2014), the fed fry from BY 2008 emigrated primarily as 0+ smolts with a short period of in-lake residency, which resulted in the high egg to smolt survival (67%) for this cohort of fry. The fed fry from BY 2009 and 2010 out-migrated primarily as 1+ smolts resulting in lower egg to smolt survivals of 10% and 14%. The smolt to adult survival of wild fish was significantly higher than the reared fish in all three brood years. The egg to adult production was higher in both cohorts of the enhanced fish only in BY 2008. There are several confounding factors related to smolt size and outmigration timing of the enhanced fish which

preclude meaningful inter-annual comparison of survival rates between the three cohorts. This is discussed below.

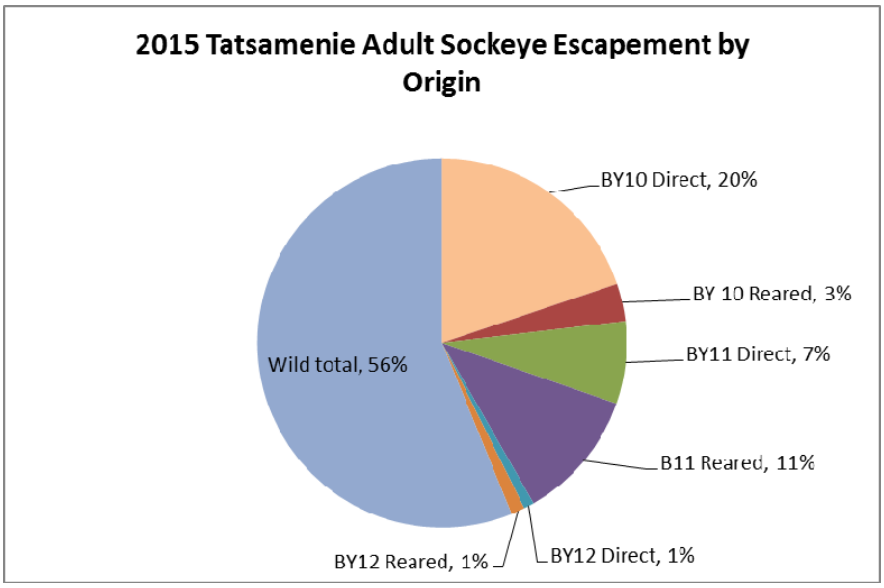

Figure 12. 2015 Tatsamenie sockeye escapement based on proportion by origin of Sockeye broodstock sampled (n=340) during Tatsamenie Lake egg take, 2015.

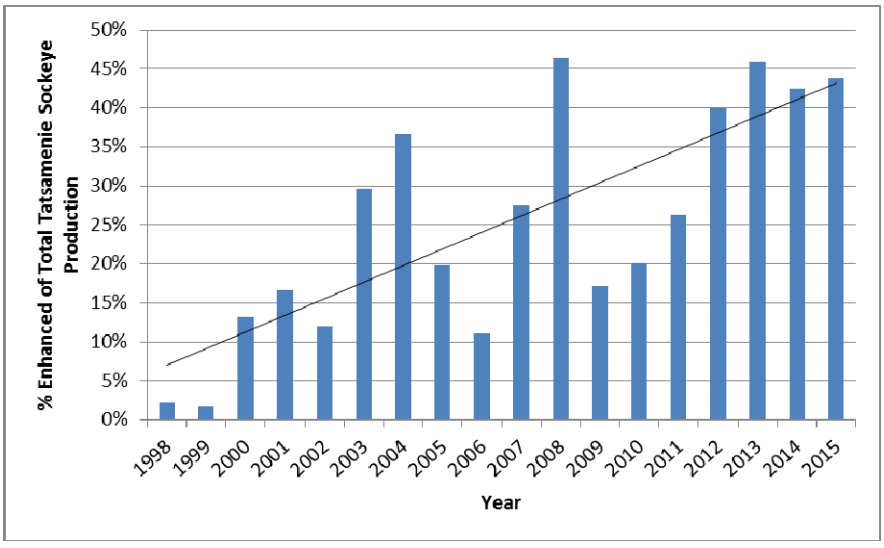

Figure 13. Proportion of enhanced sockeye in Tatsamenie total sockeye production 1998 – 2015.

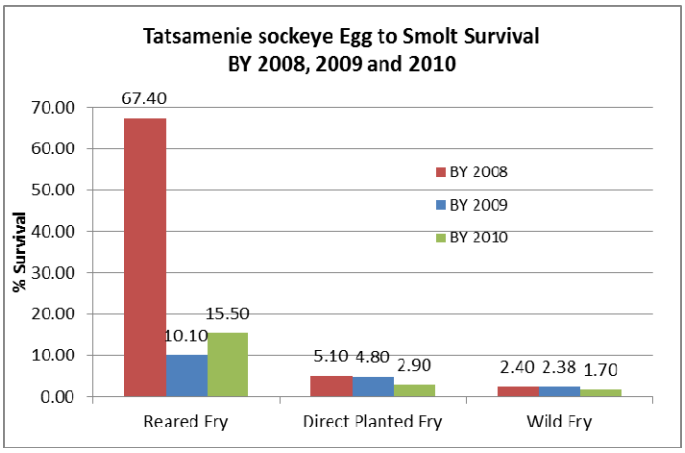

Figure 14. Egg to smolt survivals of Tatsamenie Lake sockeye for BY's 2008, 2009 and 2010.

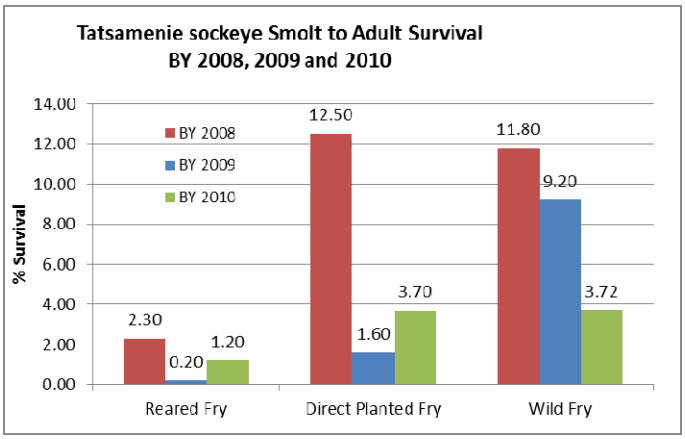

Figure 15. Smolt to adult survivals of Tatsamenie Lake sockeye for BY's 2008, 2009 and 2010.

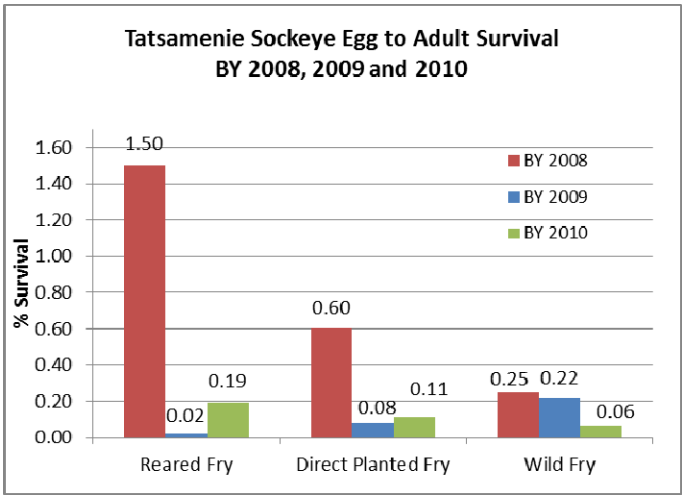

Figure 16. Egg to adult survivals of Tatsamenie Lake sockeye for BY's 2008, 2009 and 2010.

Table 1. Tatsamenie Lake reared Sockeye fry mean weekly weights 2015.

Tatsamenie Reared Sockeye Fry 2015 Bulk Sampling					
Date	TR 1	TR 2	TR 3	TR 4	Mean wt.
30/05/15	0.98	0.98	0.98	0.98	0.98
06/06/15	1.03	1.09	1.00	1.01	1.03
23/06/15	1.22	1.18	1.16	1.19	1.19
30/06/15	1.42	1.35	1.39	1.36	1.38
05/07/15	1.58	1.69	1.93	1.55	1.69

Table 2. Tatsamenie Lake 2015 smolt mark/recapture and sampling results.

2015 Tatsamenie smolt mark/recapture results	
Project: May 18 through Sept. 10	
Total sampled	745
Total captured	20,318
Total tagged	8,345
Total examined	20,318
No. Tags Recaptured	345
Total Smolt Population Estimate	**558,000**
Stratified Darroch Estimate	S.E. 64,157

Table 3. 2015 Tatsamenie Lake sockeye smolt population estimates by strata and cohort (thermal mark and age).

Otolith mark	2,1,2H	2,2,3H	3n,5H	6,2H	Wild	Wild	Wild	
Strata	BY13 Direct	BY13 Reared	BY14 Direct	BY14 Reared	BY 2014 Age 0+	BY 2013 Age 1+	BY 2012 Age 2+	ML Darroch Population
1	0.093	0.056	0.000	0.000	0.000	0.389	0.463	1
2	0.113	0.028	0.000	0.000	0.000	0.377	0.481	1
3	0.115	0.099	0.000	0.000	0.000	0.534	0.252	1
4	0.061	0.030	0.000	0.000	0.000	0.848	0.061	1
5	0.150	0.050	0.000	0.000	0.000	0.750	0.050	1
6	0.008	0.016	0.024	0.524	0.000	0.429	0.000	1
7	0.000	0.008	0.068	0.722	0.000	0.203	0.000	1
Proportion								
1	13726	8236	0	0	0	57650	68631	148243
2	15948	3987	0	0	0	53159	67778	140871
3	4610	3996	0	0	0	21515	10143	40263
4	1814	907	0	0	0	25393	1814	29928
5	16440	5480	0	0	0	82201	5480	109601
6	418	837	1255	27607	0	22587	0	52704
7	0	276	2488	26541	0	7465	0	36770
Population	52956	23718	3743	54148	0	269970	153845	558380

Table 4. 2015 Tatsamenie Lake sockeye smolt mean length and weight by cohort.

2015 Tatsamenie Lake smolt mean weight and length			
		Mean wt (gms)	Mean length (mm)
2,1,2H	BY13 Direct	4.9	82.9
2,2,3H	BY13 Reared	10.8	96.5
3n,5H	BY14 Direct	5.5	79.0
6,2H	BY14 Reared	6.4	81.6
Wild	BY 13 (Age 1+)	4.3	77.4
Wild	BY 12 (Age 2+)	11.2	111.9

4.0 DISCUSSION

4.1 Fry Rearing

The fry rearing component of the 2015 Tatsamenie sockeye enhancement project was not conducted as planned due to a pathology event described above in section 3.1. A total of 27,699 mortalities occurred as a result of the disease outbreak resulting in a total of 162,000 fed fry released into the lake. The fish were released into the lake earlier than scheduled at a smaller size (1.7 gm) than the target release size of approximately 4.0 gm.

Although the cause of the mortalities was attributed to bacterial/parasite infection, the source of the infection is not known. The fry rearing procedures and protocols used in 2015 were essentially identical to those used the past 4 years at this site. It has been recommended by the TTC to conduct the same project again in 2016. The on-site crew will be diligent in disinfecting the feeding troughs with 100 ppm iodophore solution prior to readying the troughs for the incoming fry. No other disease mitigation measures for the 2016 fry feeding protocol have yet been identified.

4.2 Smolt population estimate and survivorship

The 2015 emigrating smolt population estimate of 558,000 was slightly higher than the 1996-2014 mean of 555,900. It is probable this estimate is biased low because the field crew was not on site prior to ice out in May. As the smolt outmigration had likely just begun it was presumed that the number of smolts missed in mid-May would be relatively low (< 20,000) in relation to the total population estimate. In addition, it is known a significant number of smolts out-migrated during the 24 day interruption in the m/r project. The estimated number of smolts that out-migrated during the interruption period was estimated at 49,000; bringing the total smolt population point estimate for 2015 to 607,000. Due to the pause in sampling it was not possible to quantify the population composition by cohort during the interruption period. Sampling post-interruption indicated 60% of the out-migrating smolts were age 0+ fish of BY2014 reared fry origin.

The 2015 smolt m/r and sampling project, with the exception of the hiatus in July, was successful in obtaining a large representative sample of emigrating smolts throughout the out-migration period. The relatively large number of smolts tagged and examined allowed for a SPAS generated stratified population estimate within defined statistical parameters. However, due to long time periods with no tag recoveries, pooling of four strata was required to obtain an estimate with a defined standard error (SE). This resulted in a population estimate (558,000) with a relatively large 95% CI of +/-125,000.

2015 is the sixth year of the evaluation of the Tatsamenie Lake reared sockeye egg to smolt survival. The BY 2012 and BY 2013 fed fry egg to smolt survivals are considerably higher than the previous 3 brood years because the majority of these fish out-migrated as 0+ smolts and their in-lake residency period was relatively short. The last three years of smolt evaluation indicate there was a significant egg to smolt survival/benefit associated with the reared fry compared to the unfed fry and wild fish.

However, as Figure 15 illustrates, for BY's 2008, 2009 and 2010 the smolt to adult survival of the reared fry is lower than both the wild fish and directly planted fry. This may be due in part to the relatively smaller size of the 0+ reared smolts in these brood years. The smolt to adult survival of the BY 2009 directly planted fry is also significantly lower than the wild smolt to adult survivals. It is important to note there are confounding inter-annual variables relating to age structure, smolt size, and hatchery IHNV losses that likely influenced the survival/production of each cohort in the Tatsamenie sockeye population. The 3 years of data to date indicate there was significant egg to adult production advantage of the reared fish over the wild fish for BY's 2008 and 2010 but not for BY 2009 (Figure 16). However, there is also significant inter-annual variation in the survivals within each cohort for these 3 brood years. Further evaluation of adult production over the next 4 years will provide a better understanding of the differential survivals of the wild and enhanced sockeye and will present a clearer assessment of the fry rearing project.

Smolt sampling data over the past six years suggests there may be an out-migration window from late July through to mid-August for the 0+ wild and enhanced smolts. It is surmised that the 0+ age class smolts were not detected in the previous 18 years of smolt sampling because the sampling program always ended by June 30 when it was thought at least 90% of the population had out-migrated. In 2015 it again appears there was significant outmigration of age 0+ reared fry during this period. However no age 0+ wild fish and relatively few age 0+ directly planted fish were detected in 2015. Prior to 2015 it was postulated that the 0+ smoltification of the reared fry was a result of the rapid growth and large release size. However, in 2015 the reared fish were released in early July at a mean size of only 1.7 gm. This hypothesis may have to be re-considered in light of the results from the 2015 smolt sampling.

4.3 Adult run reconstruction and 2015 production

The total 2015 Tatsamenie sockeye production of 2,700 was significantly lower than the pre-season forecast of approximately 8,000 (TTC 2015). This low production applied to both wild and enhanced fish. In 2015, the Tatsamenie sockeye production contributed only 1.6% to the combined total Canada and US fisheries catches. In 2013 and 2014 the Tatsamenie contributions were 30% and 5% respectively. The Tatsamenie sockeye production in 2015 was the lowest

observed from this system over the period 1990-2014 (TTC 2015). It is not known why the production from the principle BY's 2010 and 2011 was significantly lower than forecast.

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Acknowledgements

Many people contributed to the development and execution of the 2015 Tatsamenie sockeye fry extended rearing project. Kevin Steck from DIPAC/ Snettisham Hatchery provided technical and material support. Sean Collins and Corino Salomi of DFO Whitehorse and Vancouver (SEP) assisted with regulatory compliance and liaison with other DFO personnel. Dr. Christine McWilliams (PBS Veterinarian) demonstrated diligence and indefatigable patience in assisting the field crew to resolve the 2015 reared fry pathology issues. Bob Gransden, John Bylenga, Neil Bylenga and Jane Wilson once again capably performed fish culture, fry/smolt sampling, smolt mark/recapture, adult otolith sampling and data recording duties.

Appendix 1. Wild and enhanced Tatsamenie Lake smolt production and egg to smolt survivals 1993 – 2014.
Source: Unpublished data from TTC Enhancement sub-committee.

Brood Year	Weir Count	Female Egg Take	Female Other	Female Spawners	Fecundity	Eggs Deposited	Wild Smolt Production 0	1.0	2.0	Total Smolts	% egg to smolt age 1+	% egg to smolt age 2+	% egg to smolt comb.
1993	4040	286	53	1,100	3,671	4,038,100			79,439	79,439	0.0%	2.0%	2.0%
1994	3,559	381	29	1,331	3,056	4,067,536		415,133		415,133	10.2%	0.0%	10.2%
1995	5,780	726	32	3,802	3,796	14,432,392			70,060	70,060		0.5%	0.5%
1996	9,381	1,244	30	4,586	4,068	18,655,848		2,068,001	236,401	2,304,402	11.1%	1.3%	12.4%
1997	8,097	1,212	142	1,857	4,113	7,637,841		455,240	70,882	526,122	6.0%	0.9%	6.9%
1998	5,997	648	25	1,913	4,124	7,889,212		87,008	34,826	121,834	1.1%	0.4%	1.5%
1999	2,104	116	0	554	4,247	2,352,838		26,797	19,078	45,875	1.1%	0.8%	1.9%
2000	7,575	765	18	4,073	4,094	16,674,862		124,574	9,830	134,404	0.7%	0.1%	0.8%
2001	21,822	1,045	221	8,314	4,663	38,768,182		457,563	82,868	540,431	1.2%	0.2%	1.4%
2002	5,495	542	74	1915	4679	8,960,285		130,000	24,801	154,801	1.5%	0.3%	1.7%
2003	4,515	668	48	1,636	4,267	6,979,105		413,760	55,269	469,029	5.9%	0.8%	6.7%
2004	1,951	220	15	568	4,282	2,432,176		83,093	16,135	99,228	3.4%	0.7%	4.1%
2005	3,372	499	13	1,715	3,850	6,602,750		31,361	20,000	51,361	0.5%	0.3%	0.8%
2006	22,475	1,217	37	10,917	4,113	44,901,621		368,000	91,782	459,782	0.8%	0.2%	1.0%
2007	11,123	994	90	5,023	4,100	20,594,300		253,239	43,099	296,338	1.2%	0.2%	1.4%
2008	8,976	1,183	42	2,800	4,232	11,849,600		229,959	23862	253,821	1.9%	0.4%	2.1%
2009	2,032	305	5	808	4,100	3,312,800	23,862	47,150	6322	77,334	1.4%	0.7%	2.3%
2010	3,513	539	18	1,589	3,500	5,561,500	18,739	51,939	6,892	77,570	0.9%	0.1%	1.4%
2011	7,880	513	10	4,116	4,268	17,567,088	2,005	157,616	43,323	202,944	0.9%	0.0%	1.2%
2012	15,605	506	5	9,853	4,327	42,631,768	111,195	976,701	153,845	1,241,741	2.3%	0.4%	2.9%
2013	10,246	433	29	4,558	4,000	18,232,000	14,800	269,970			1.5%		
2014	2,106	369	3	821	3,482	2,858,722	0						
2015	1,537	230	5	654	3,176	2,077,104							
Average	6,438	704	54	2,566	4,070	10,730,087		377,982	61,034	384,549	3.2%	0.7%	4.2%

Brood year	Release year	Eggs to hatchery	Hatchery Smolt Production 0+	1.0	2.0	Total	% egg to smolt age 1+	% egg to smolt age 2+	% egg to smolt comb.	Unfed fry 1+	Fed fry1+
1993	1994	1,144,000			6,705	6,705	0.0%	0.6%	0.6%		
1994	1995	1,229,000		14,442		14,442	1.2%	0.0%	1.2%		
1995	1996	2,407,000				0		0.0%			
1996	1997	4,934,000		364,093	3,456	367,549	7.4%	0.1%	7.4%		
1997	1998	4,651,000		81,544	2,781	84,325	1.8%	0.1%	1.8%	1.2%	5.5%
1998	1999	2,414,000		30,049	555	30,604	1.2%	0.0%	1.3%	0.6%	1.7%
1999	2000	461,000		8,728	590	9,318	1.9%	0.1%	2.0%		2.0%
2000	2001	2,572,000		88,473	0	88,473	3.4%	0.0%	3.4%	1.8%	4.6%
2001	2002	3,499,000		72,098	3,000	75,098	2.1%	0.1%	2.1%	3.8%	1.9%
2002	2003	2,302,000		82,290	2,917	85,207	3.6%	0.1%	3.7%	7.3%	
2003	2004	2,452,000		233,927	460	234,387	9.5%	0.0%	9.6%	9.6%	
2004	2005	750,000		25,935	0	25,935	3.5%	0.0%	3.5%	4.1%	2.0%
2005	2006	1,811,000		26,267	0	26,267	1.5%	0.0%	1.5%	1.4%	
2006	2007	4,810,000		115,500	4,690	120,190	2.4%	0.1%	2.5%		
2007	2008	3,214,000		95,132		95,132	3.0%	0.0%	3.0%		
2008	2009	4,785,000	102501	246,836	0	349,338	7.3%	0.0%	7.3%		
2009	2010	1,220,000	36,970	35,688	0	72,658	6.0%	0.0%	6.0%	7.9%	10.1%
2010	2011	1,886,500	33,637	60,928	622	95,187	5.0%	0.0%	5.0%	2.8%	14.9%
2011	2012	2,189,613	7,799	62,782	0	70,581	3.2%	0.0%	3.2%	2.4%	10.6
2012	2013	2,024,000	266,891	140,330		407,220	20.1%	0.0%	20.1%	3.1%	84.7%
2013	2012	1,728,000	162,000	76,675	0	238,675	13.8%	0.0%	13.8%	4.5%	79.8%
2014	2013	1,288,520	57,891								
2015	2014	730,548									
Average		2,590,111		108,405	2,500	76,172	4.2%	0.1%	4.5%	1.84%	3.14%

Appendix 2 (a). 2015 daily feeding rate and % BWD fed for Troughs 1 and 2.

Date	# of Fish	Morts	Mean wt/fish (gm)	Biomass (kg)	Kg Fed	% BWD FED	Comments
30-May-15	96,000	188	0.98	94.08	1	1.06	Count and size provided by Snettisham
31-May-15	95,812	25	0.98	93.90	1	1.07	
01-Jun-15	95,787	23	0.98	93.87	1	1.07	
02-Jun-15	95,764	8	0.98	93.85	1	1.07	
03-Jun-15	95,756	23	0.98	93.84	1	1.07	
04-Jun-15	95,733	5	0.98	93.82	1	1.07	
05-Jun-15	95,728	17	0.98	93.81	1	1.07	
06-Jun-15	95,711	29	1.06	101.45	1	0.99	sample day
07-Jun-15	95,682	32	1.06	101.42	1	0.99	
08-Jun-15	95,650	45	1.06	101.39	1	0.99	
09-Jun-15	95,605	48	1.06	101.34	1	0.99	
10-Jun-15	95,557	59	1.06	101.29	1	0.99	
11-Jun-15	95,498	115	1.06	101.23	1	0.99	
12-Jun-15	95,383	198	1.06	101.11	1	0.99	
13-Jun-15	95,185	270	1.06	100.90	0.5	0.50	
14-Jun-15	94,915	227	1.06	100.61	0.6	0.60	
15-Jun-15	94,688	307	1.06	100.37	0.6	0.60	Chloramine T treatment #1 (1 hour)
16-Jun-15	94,381	415	1.06	100.04	0.6	0.60	Chloramine T treatment #2 (1 hour)
17-Jun-15	93,966	473	1.06	99.60	0.6	0.60	Chloramine T treatment #3 (1 hour)
18-Jun-15	93,493	379	1.06	99.10	0.6	0.61	Chloramine T treatment #4 (1 hour)
19-Jun-15	93,114	702	1.06	98.70	0.6	0.61	
20-Jun-15	92,412	745	1.06	97.96	0	0.00	Parasite S treatment #1 (1 hour - 250 ppm)
21-Jun-15	91,667	951	1.06	97.17	1	1.03	Parasite S treatment #2 (1 hour - 200 ppm)
22-Jun-15	90,716	1284	1.06	96.16	0.7	0.73	Parasite S treatment #3 (1 hour - 200 ppm)
23-Jun-15	89,432	1442	1.19	106.42	1	0.94	
24-Jun-15	87,990	1120	1.19	104.71	0.8	0.76	
25-Jun-15	86,870	1051	1.19	103.38	1.3	1.26	Day 1 of 7 day Florfenicol treatment in food.
26-Jun-15	85,819	1101	1.19	102.12	1.3	1.27	
27-Jun-15	84,718	1038	1.19	100.81	1.3	1.29	
28-Jun-15	83,680	1017	1.19	99.58	1.5	1.51	
29-Jun-15	82,663	809	1.19	98.37	1.5	1.52	
30-Jun-15	81,854	765	1.38	112.96	1.7	1.50	
01-Jul-15	81,089	585	1.38	111.90	1.7	1.52	
02-Jul-15	80,504	402	1.38	111.10	1.7	1.53	
03-Jul-15	80,102	273	1.38	110.54	1.7	1.54	
04-Jul-15	79,829	119	1.38	110.16	1.7	1.54	
05-Jul-15	79,710	22	1.38	110.00	1.7	1.55	

Appendix 2 (b). 2015 daily feeding rate and % BWD fed for Troughs 3 and 4.

Date	# of Fish	Morts	Mean wt/fish (gm)	Biomass (kg)	Kg Fed	% BWD FED	Comments
30-May-15	95,000	164	0.98	93.10	0.5	0.54	Count and size provided by Snettisham
31-May-15	94,836	19	0.98	92.94	1	1.08	
01-Jun-15	94,817	23	0.98	92.92	1	1.08	
02-Jun-15	94,794	20	0.98	92.90	1	1.08	
03-Jun-15	94,774	11	0.98	92.88	1	1.08	
04-Jun-15	94,763	12	0.98	92.87	1	1.08	
05-Jun-15	94,751	16	0.98	92.86	1	1.08	
06-Jun-15	94,735	24	1.006	95.30	1	1.05	
07-Jun-15	94,711	18	1.006	95.28	1	1.05	
08-Jun-15	94,693	15	1.006	95.26	1	1.05	
09-Jun-15	94,678	18	1.006	95.25	1	1.05	
10-Jun-15	94,660	30	1.006	95.23	1	1.05	
11-Jun-15	94,630	42	1.006	95.20	1	1.05	
12-Jun-15	94,588	67	1.006	95.16	1	1.05	
13-Jun-15	94,521	145	1.006	95.09	1	1.05	
14-Jun-15	94,376	110	1.006	94.94	0.5	0.53	
15-Jun-15	94,266	235	1.006	94.83	0.6	0.63	Chloramine T treatment #1
16-Jun-15	94,031	186	1.006	94.60	0.6	0.63	Chloramine T treatment #2
17-Jun-15	93,845	224	1.006	94.41	0.6	0.64	Chloramine T treatment #3
18-Jun-15	93,621	274	1.006	94.18	0.6	0.64	Chloramine T treatment #4
19-Jun-15	93,347	372	1.006	93.91	0.6	0.64	
20-Jun-15	92,975	460	1.006	93.53	0	0.00	Parasite S treatment #1 (1 hour - 250 ppm)
21-Jun-15	92,515	614	1.006	93.07	1	1.07	Parasite S treatment #2 (1 hour - 200 ppm)
22-Jun-15	91,901	673	1.006	92.45	0.7	0.76	Parasite S treatment #3 (1 hour - 200 ppm)
23-Jun-15	91,228	960	1.19	108.56	1	0.92	
24-Jun-15	90,268	794	1.19	107.42	0.8	0.74	
25-Jun-15	89,474	655	1.19	106.47	1.3	1.22	Day 1 of 7 day florfenicol treatment in food.
26-Jun-15	88,819	738	1.19	105.69	1.3	1.23	
27-Jun-15	88,081	839	1.19	104.82	1.3	1.24	
28-Jun-15	87,242	999	1.19	103.82	1.3	1.25	
29-Jun-15	86,243	718	1.19	102.63	1.3	1.27	
30-Jun-15	85,525	629	1.38	118.02	1.5	1.27	
01-Jul-15	84,896	488	1.38	117.16	1.5	1.28	
02-Jul-15	84,408	354	1.38	116.48	1.5	1.29	
03-Jul-15	84,054	264	1.38	115.99	1.5	1.29	
04-Jul-15	83,790	117	1.38	115.63	1.5	1.30	
05-Jul-15	83,673	26	1.38	115.47	1.5	1.30	

Appendix 3. Weight and length sampling data of trough and pen reared fry at Tatsamenie Lake in 2015.

Tatsamenie Lake Extended Rearing Sockeye Fry Individual Length Weight Sampling 2015								
Date	Trough 1		Trough 2		Trough 3		Trough 4	
	weight gms	length mm	weight gms	length mm	weight gms	length mm	weight gms	length mm
6-Jun-15	0.99	48	0.98	48	1.38	54	1.35	54
	0.58	41	1.12	51	0.90	47	0.96	48
	0.94	48	1.09	51	0.93	48	0.73	45
	1.07	50	1.30	53	1.07	51	0.68	44
	1.22	51	0.81	48	1.23	50	1.16	50
	0.95	48	0.86	48	0.93	49	1.01	49
	1.39	54	1.28	54	0.85	45	1.18	50
	0.99	49	1.47	55	1.03	48	0.92	48
	0.98	48	1.03	49	1.09	50	1.02	48
	1.15	52	0.97	49	0.62	41	1.09	50
					1.01	48		
Average	1.03	49	1.09	51	1.00	48	1.01	49
23-Jun-15	0.94	47	1.30	54	0.96	49	1.20	52
	1.44	53	1.14	52	1.20	51	1.50	55
	0.95	50	1.18	52	1.07	50	1.17	52
	1.01	50	1.37	53	1.36	55	0.97	49
	1.62	57	1.33	54	1.29	52	1.20	53
	0.77	45	1.15	52	1.55	57	1.21	53
	1.60	56	1.31	54	1.25	52	1.07	50
	1.41	53	1.02	50	1.00	50	1.16	51
	1.20	52	1.17	53	0.96	48	1.16	51
	1.26	52	1.10	50	0.94	49	1.17	52
	1.33	52	0.95	48	1.45	55	1.21	53
	1.08	50	1.14	52	0.87	48	1.30	55
Average	1.22	51	1.18	52	1.16	51	1.19	52
30-Jun-15	1.55	54	1.30	54	1.42	52	1.37	53
	1.88	57	1.80	55	1.40	55	1.53	55
	1.32	54	1.53	55	1.96	60	1.42	54
	1.17	53	0.97	49	1.26	52	1.53	56
	1.49	53	1.31	55	1.18	52	1.17	51
	1.53	55	1.49	55	1.16	51	1.26	52
	1.25	52	1.51	53	1.22	50	1.32	52
	1.27	52	1.10	50	1.94	59	0.96	49
	1.21	51	1.45	53	1.32	55	1.30	52
	1.40	53	0.91	48	1.29	52	1.46	55
	1.52	55	1.51	55	1.13	50	1.31	53
					1.54	55	1.27	52
					1.26	51	1.76	56
Average	1.42	54	1.35	53	1.39	53	1.36	53
5-Jul-15	1.57	53	2.33	60	1.97	59	1.75	55
	2.08	60	2.09	57	1.76	56	1.49	53
	1.56	53	2.24	60	2.20	60	1.77	57
	1.46	54	1.85	56	2.38	60	0.83	48
	1.46	56	1.82	56	2.35	61	1.33	53
	1.88	57	1.12	48	1.84	56	0.99	48
	1.46	58	1.82	58	2.60	61	0.97	51
	1.47	55	1.54	53	2.22	60	1.49	54
	1.63	55	1.85	58	2.07	58	1.52	55
	1.72	55	1.78	56	1.88	57	1.73	54
	2.05	57	1.11	52	1.00	47	1.63	55
	1.50	55	0.89	48	0.98	48	2.04	58
	1.47	53	1.50	54	1.55	54	1.78	57
	0.87	45	1.52	55	2.04	57	2.28	60
			1.89	57	2.06	57	1.83	58
			1.73	55			1.37	54
Average	1.58	55	1.69	55	1.93	57	1.55	54

Appendix 4. Rearing mortalities in trough reared fry May 30 – July 5, 2015.

Date	Trough 1	Trough 2	Trough 3	Trough 4	Comments
30-May	102	86	56	108	Fry arrive from Snettisham - expected mortality due to transfer of fish
31-May	12	13	10	9	
01-Jun	12	17	12	11	
02-Jun	5	3	11	9	
03-Jun	7	16	5	6	
04-Jun	5	8	5	7	
05-Jun	6	11	7	9	
06-Jun	11	18	16	8	
07-Jun	9	23	8	10	
08-Jun	26	19	9	6	
09-Jun	22	26	13	5	
10-Jun	21	38	16	14	
11-Jun	61	54	33	9	
12-Jun	100	98	54	13	
13-Jun	137	133	98	47	
14-Jun	106	121	77	33	
15-Jun	163	144	151	84	Chloramine treatment 1
16-Jun	205	210	135	51	Chloramine treatment 2
17-Jun	274	199	176	48	Chloramine treatment 3
18-Jun	207	172	164	110	Chloramine treatment 4
19-Jun	385	317	247	125	
20-Jun	493	252	286	174	Parasite-S treatment 1
21-Jun	604	347	375	239	Parasite-S treatment 2
22-Jun	845	439	371	302	Parasite-S treatment 3
23-Jun	870	572	568	392	
24-Jun	656	464	507	287	
25-Jun	615	436	395	280	Florfenicol 1
26-Jun	654	447	434	304	Florfenicol 2
27-Jun	539	499	464	375	Florfenicol 3
28-Jun	444	573	596	403	Florfenicol 4
29-Jun	349	460	346	372	Florfenicol 5
30-Jun	249	516	242	387	Florfenicol 6
01-Jul	158	427	148	340	Florfenicol 7
02-Jul	95	307	111	243	
03-Jul	62	211	72	192	
04-Jul	24	95	38	79	
05-Jul	5	17	2	24	Total
	8538	7788	6258	5115	27699

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Appendix 5 (a) 2015 Tatsamenie Lake adult sockeye run reconstruction based on otolith analysis of Tatsamenie broodstock.

Brood year	Hatch Code	No. Marks from Brood otolith sample	% Escapement	Expanded no fish in escapement	Expanded proportion of Tatsamenie fish caught in fisheries	Total Tatsamenie 2015 adult sockeye production	Total Tatsamenie 2014 adult sockeye production	Total Tatsamenie Enhanced Production from BY10	No. of eggs per cohort	No. of 0+ and 1+ smolts per cohort	Egg to smolt survival (0+ and 1+ combined)	Egg to adult survival	Smolt to adult survival
BY10 Direct	2,1,2H	66	20%	305	237	542	1,452	1,994	1,838,747	54,201	2.9%	0.11%	3.7%
BY 10 Reared	2,2,3H	11	3%	51	40	90	402	492	261,182	40,364	15.5%	0.19%	1.2%
BY11 Direct	3n,5H	24	7%	111	86	197							
B11 Reared	6,2H	38	11%	175	136	312							
BY12 Direct	3n,2H	3	1%	14	11	25							
BY12 Reared	3,3H	4	1%	18									
Wild		187	56%	863	672	1,535							
Total		333	100.0%	1,537	1,196	2,700		2,486					

Appendix 5 (b) Total Taku River and Tatsamenie Sockeye production and harvest, 2013 - 2015.
(Data source: TTC 2015 (draft) and Tatsamenie broodstock otolith analysis).

Based on preliminary data from ADF&G and DFO.	**2015**	**2014**	**2013**
Total Taku Sockeye Production	193,353	159,862	202,667
Total U.S. catch of Taku Sockeye	41,746	49,604	97,510
Total Canadian catch of Taku Sockeye	19,676	17,872	25,113
TotalCatch of Taku Sockeye	61,422	67,476	122,623
Total Taku Sockeye Escapement	131,882	92,386	80,044
Tatsamenie Weir Count	1,537	2,106	10,246
Total 2015 Tatsamenie sockeye production	2,512	5,377	45,401
Total Tatsamenie enhanced sockeye production	1,057	2,390	20,755
Tatsamenie origin Sockeye caught in Canada/US Fisheries	975	3,271	35,155
Proportion of Tatsamenie Origin Sockeye caught in Canada/US Fisheries	1.6%	5%	30%
Exploitation rate on Tatsamenie stock	39%	61%	77%

Appendix 6. Tatsamenie Lake 2015 smolt mark/recapture data.

Week	Date	Daily Captured	Cum Captured	Daily Examined	Cumulative Examined	Daily Tagged	Cum. Tagged	Daily Tags Recovered	Cumulative Tags Recovered	Daily sampled	Cumulative Sampled
1	18-May	1010	1010	1010	1010	356	356	0	0	55	55
1	19-May	1337	2347	1337	2347	312	668	5	5	17	72
1	20-May	1010	3357	1010	3357	313	981	5	10	27	99
1	21-May	102	3459	102	3459	88	1069	3	13	11	110
1	22-May	450	3909	450	3909	315	1384	5	18	20	130
1	23-May	414	4323	414	4323	229	1613	6	24	15	145
1	24-May	454	4777	454	4777	280	1893	20	44	20	165
1	25-May	2263	7040	2263	7040	343	2236	23	67	25	190
1	26-May	1852	8892	1852	8892	332	2568	25	92	26	216
1	27-May	185	9077	185	9077	168	2736	3	95	14	230
2	28-May	16	9093	16	9093	16	2752	0	95	0	230
2	29-May	30	9123	30	9123	20	2772	0	95	10	240
2	30-May	241	9364	241	9364	222	2994	3	98	15	255
2	31-May	474	9838	474	9838	315	3309	6	104	20	275
2	01-Jun	504	10342	504	10342	300	3609	16	120	20	295
2	02-Jun	1382	11724	1382	11724	339	3948	39	159	25	320
2	03-Jun	1431	13155	1431	13155	310	4258	28	187	25	345
2	04-Jun	517	13672	517	13672	248	4506	6	193	25	370
3	05-Jun	1105	14777	1105	14777	342	4848	31	224	30	400
3	06-Jun	1133	15910	1133	15910	329	5177	24	248	10	410
3	07-Jun	869	16779	869	16779	349	5526	13	261	10	420
3	08-Jun	301	17080	301	17080	278	5804	13	274	10	430
3	09-Jun	190	17270	190	17270	166	5970	14	288	10	440
3	10-Jun	31	17301	31	17301	25	5995	1	289	5	445
3	11-Jun	1	17302	1	17302	0	5995	0	289	0	445
3	12-Jun	72	17374	72	17374	65	6060	2	291	5	450
4	13-Jun	47	17421	47	17421	47	6107	0	291	5	455
4	14-Jun	24	17445	24	17445	20	6127	2	293	2	457
4	15-Jun	6	17451	6	17451	0	6127	1	294	0	457
4	16-Jun	3	17454	3	17454	0	6127	0	294	0	457

Week	Date	Daily Captured	Cum Captured	Daily Examined	Cumulative Examined	Daily Tagged	Cum. Tagged	Daily Tags Recovered	Cumulative Tags Recovered	Daily sampled	Cumulative Sampled
4	17-Jun	4	17458	4	17458	0	6127	0	294	0	457
4	18-Jun	1	17459	1	17459	0	6127	0	294	0	457
4	19-Jun	83	17542	83	17542	74	6201	2	296	7	464
	20-Jun	204	17746	204	17746	188	6389	5	301	11	475
5	21-Jun	522	18268	522	18268	305	6694	0	301	15	490
5	22-Jun	160	18428	160	18428	153	6847	2	303	5	495
5	23-Jun	37	18465	37	18465	32	6879	3	306	2	497
5	24-Jun	32	18497	32	18497	29	6908	1	307	2	499
5	25-Jun	11	18508	11	18508	10	6918	0	307	0	499
5	26-Jun	72	18580	72	18580	65	6983	0	307	6	505
5	27-Jun	49	18629	49	18629	44	7027	0	307	5	510
6	28-Jun	16	18645	16	18645	15	7042	1	308	0	510
6	29-Jun	24	18669	24	18669	23	7065	1	309	0	510
6	30-Jun	65	18734	65	18734	59	7124	1	310	5	515
6	01-Jul	24	18758	24	18758	21	7145	2	312	1	516
6	02-Jul	66	18824	66	18824	61	7206	1	313	4	520
6	03-Jul	32	18856	32	18856	31	7237	1	314	0	520
6	04-Jul	55	18911	55	18911	48	7285	2	316	5	525
7	05-Jul	42	18953	42	18953	38	7323	1	317	3	528
7	06-Jul	3	18956	3	18956	0	7323	0	317	0	528
7	07-Jul	15	18971	15	18971	10	7333	0	317	5	533
7	08-Jul	35	19006	35	19006	0	7333	0	317	34	567
7	09-Jul	34	19040	34	19040	0	7333	0	317	34	601
7	10-Jul	27	19067	27	19067	0	7333	0	317	10	611
7	11-Jul	0	19067	0	19067	0	7333	0	317	0	611
7	12-Jul	0	19067	0	19067	0	7333	0	317	0	611
7	13-Jul	0	19067	0	19067	0	7333	0	317	0	611
7	14-Jul	0	19067	0	19067	0	7333	0	317	0	611
8	15-Jul	0	19067	0	19067	0	7333	0	317	0	611
8	16-Jul	0	19067	0	19067	0	7333	0	317	0	611
8	17-Jul	0	19067	0	19067	0	7333	0	317	0	611
8	18-Jul	0	19067	0	19067	0	7333	0	317	0	611
8	19-Jul	0	19067	0	19067	0	7333	0	317	0	611

Week	Date	Daily Captured	Cum Captured	Daily Examined	Cumulative Examined	Daily Tagged	Cum. Tagged	Daily Tags Recovered	Cumulative Tags Recovered	Daily sampled	Cumulative Sampled
8	20-Jul	0	19067	0	19067	0	7333	0	317	0	611
8	21-Jul	0	19067	0	19067	0	7333	0	317	0	611
9	22-Jul	0	19067	0	19067	0	7333	0	317	0	611
9	23-Jul	0	19067	0	19067	0	7333	0	317	0	611
9	24-Jul	0	19067	0	19067	0	7333	0	317	0	611
9	25-Jul	0	19067	0	19067	0	7333	0	317	0	611
9	26-Jul	0	19067	0	19067	0	7333	0	317	0	611
9	27-Jul	0	19067	0	19067	0	7333	0	317	0	611
9	28-Jul	0	19067	0	19067	0	7333	0	317	0	611
9	29-Jul	0	19067	0	19067	0	7333	0	317	0	611
10	30-Jul	0	19067	0	19067	0	7333	0	317	0	611
10	31-Jul	0	19067	0	19067	0	7333	0	317	0	611
10	01-Aug	0	19067	0	19067	0	7333	0	317	0	611
10	02-Aug	0	19067	0	19067	0	7333	0	317	0	611
10	03-Aug	0	19067	0	19067	0	7333	0	317	0	611
10	04-Aug	0	19067	0	19067	0	7333	0	317	0	611
10	05-Aug	0	19067	0	19067	0	7333	0	317	0	611
10	06-Aug	58	19125	58	19125	47	7380	0	317	10	621
11	07-Aug	126	19251	126	19251	116	7496	0	317	10	631
11	08-Aug	88	19339	88	19339	79	7575	0	317	9	640
11	09-Aug	40	19379	40	19379	34	7609	1	318	4	644
11	10-Aug	40	19419	40	19419	34	7643	1	319	5	649
11	11-Aug	85	19504	85	19504	77	7720	2	321	6	655
11	12-Aug	27	19531	27	19531	23	7743	1	322	3	658
11	13-Aug	14	19545	14	19545	12	7755	0	322	2	660
11	14-Aug	26	19571	26	19571	22	7777	1	323	3	663
11	15-Aug	11	19582	11	19582	10	7787	0	323	1	664
11	16-Aug	28	19610	28	19610	24	7811	1	324	3	667
12	17-Aug	54	19664	54	19664	45	7856	1	325	7	674
12	18-Aug	135	19799	135	19799	120	7976	2	327	13	687
12	19-Aug	18	19817	18	19817	16	7992	0	327	2	689
12	20-Aug	72	19889	72	19889	59	8051	3	330	10	699
12	21-Aug	18	19907	18	19907	14	8065	0	330	2	701

Week	Date	Daily Captured	Cum Captured	Daily Examined	Cumulative Examined	Daily Tagged	Cum. Tagged	Daily Tags Recovered	Cumulative Tags Recovered	Daily sampled	Cumulative Sampled
12	22-Aug	12	19919	12	19919	10	8075	0	330	2	703
12	23-Aug	32	19951	32	19951	28	8103	0	330	4	707
12	24-Aug	21	19972	21	19972	19	8122	0	330	2	709
12	25-Aug	46	20018	46	20018	40	8162	1	331	5	714
12	26-Aug	35	20053	35	20053	32	8194	0	331	3	717
12	27-Aug	26	20079	26	20079	23	8217	0	331	3	720
12	28-Aug	20	20099	20	20099	18	8235	0	331	2	722
12	29-Aug	9	20108	9	20108	0	8235	0	331	0	722
12	30-Aug	19	20127	19	20127	17	8252	0	331	2	724
12	31-Aug	57	20184	57	20184	51	8303	0	331	6	730
12	01-Sep	47	20231	47	20231	42	8345	0	331	5	735
12	02-Sep	8	20239	8	20239	0	8345	0	331	0	735
12	03-Sep	9	20248	9	20248	0	8345	0	331	0	735
12	04-Sep	13	20261	13	20261	0	8345	0	331	0	735
12	05-Sep	34	20295	34	20295	0	8345	0	331	0	735
12	06-Sep	7	20302	7	20302	0	8345	0	331	0	735
12	07-Sep	10	20312	10	20312	0	8345	0	331	5	740
12	08-Sep	0	20312	0	20312	0	8345	0	331	0	740
12	09-Sep	5	20317	5	20317	0	8345	0	331	5	745
12	10-Sep	1	20318	1	20318	0	8345	0	331	0	745

Appendix 7. Tatsamenie Lake 2015 smolt age, sex, length, and weight sample results.

Date	Week	Fish #	Slide #	Marked	Thermal Mark	Brood Year	Age	Length (mm)	Weight (gms)	Comments
18-May	1	1	1	Marked	2,2,3H		10	110	10.1	Bk 68622
18-May	1	2	2	Not Marked			10	82	3.9	
18-May	1	3	3	Not Marked			20	108	9.4	
18-May	1	4	4	Not Marked			20	102	7.2	
18-May	1	5	5	Not Marked			10	68	2.4	
18-May	1	6	6	Not Marked			10	67	2.3	
18-May	1	7	7	Not Marked			20	90	8.8	
18-May	1	8	8	Marked	2,1,2H	2013	10	90	4.9	
18-May	1	9	9	Not Marked			20	115	12.1	
18-May	1	10	10	Not Marked			20	118	10.1	
18-May	1	11	11	Not Marked			10	84	4.2	
18-May	1	12	12	Not Marked			20	117	13.1	
18-May	1	13	13	Not Marked			20	116	12.1	
18-May	1	14	14	Not Marked				117	12.8	
18-May	1	15	15	Not Marked			20	113	10.6	
18-May	1	16	16	Not Marked			20	124	15.5	
18-May	1	17	17	Not Marked			10	75	3.4	
18-May	1	18	18	Not Marked			10	81	4.3	
18-May	1	19	19	Not Marked			20	110	11.4	
18-May	1	20	20	Not Marked			20	71	2.5	
18-May	1	21	21	Not Marked			20	115	11.7	
18-May	1	22	22	Not Marked			10	72	3.0	
18-May	1	23	23	Not Marked			10	73	2.7	
18-May	1	24	24	Not Marked			20	114	11.9	
18-May	1	25	25	Marked	2,1,2H	2013	10	91	5.8	
18-May	1	26	26	Not Marked			10	85	4.7	Bk 68623
18-May	1	27	27	Not Marked			20	123	13.7	
18-May	1	28	28	Not Marked			10	114	11.0	
18-May	1	29	29	Not Marked				91	4.6	
18-May	1	30	30	Not Marked			10	85	2.5	
18-May	1	31	31	Marked	2,2,3H	2013	10	68	9.6	
18-May	1	32	32	Not Marked			10	110	3.6	
18-May	1	33	33	Not Marked			10	75	3.1	
18-May	1	34	34	Not Marked			10	78	3.7	
18-May	1	35	35	Not Marked			20	110	9.7	
18-May	1	36	36	Not Marked			10	68	2.4	
18-May	1	37	37	Not Marked			10	85	4.4	
18-May	1	38	38	Not Marked			20	115	12.2	
18-May	1	39	39	Not Marked			10	77	3.1	
18-May	1	40	40	Not Marked			10	71	3.0	
18-May	1	41	41	Not Marked			20	117	12.7	
18-May	1	42	42	Marked	2,2,3H	2013	10	97	6.9	
18-May	1	43	43	Not Marked			10	105	8.4	
18-May	1	44	44	Not Marked			20	116	12.8	
18-May	1	45	45	Not Marked			10	73	3.2	
18-May	1	46	46	Not Marked			10	75	3.5	
18-May	1	47	47	Not Marked			20	105	9.4	
18-May	1	48	48	Not Marked			20	92	5.7	
18-May	1	49	49	Marked	2,1,2H	2013	10	75	3.3	
18-May	1	50	50	Not Marked			10	70	2.6	

Date	Week	Fish #	Slide #	Marked	Thermal Mark	Brood Year	Age	Length (mm)	Weight (gms)	Comments
18-May	1	51	51	Not Marked			10	71	3.0	Bk 68624
18-May	1	52	52	Not Marked			10	69	2.7	
18-May	1	53	53	Not Marked			10	67	2.5	
18-May	1	54	54	Not Marked			10	68	2.9	
18-May	1	55	55	Not Marked			10	70	2.6	
19-May	1	56	56	Not Marked			10	84	4.0	
19-May	1	57	57	Not Marked			20	109	9.1	
19-May	1	58	58	Not Marked			20	115	12.3	
19-May	1	59	59	Not Marked			20	107	9.5	
19-May	1	60	60	Not Marked			10	64	2.1	
19-May	1	61	61	Not Marked			20	111	10.9	
19-May	1	62	62	Not Marked			20	119	12.6	
19-May	1	63	63	Not Marked			20	112	10.4	
19-May	1	64	64	Not Marked			10	73	2.9	
19-May	1	65	65	Not Marked			10	73	3.1	
19-May	1	66	66	Marked	2,1,2H	2013	10	79	4.2	
19-May	1	67	67	Marked	2,1,2H	2013	10	82	3.7	
19-May	1	68	68	Not Marked			10	84	4.0	
19-May	1	69	69	Not Marked			10	79	3.7	
19-May	1	70	70	Not Marked			20	115	11.2	
19-May	1	71	71	Not Marked			10	67	2.5	
19-May	1	72	72	Not Marked			10	85	4.8	
20-May	1	73	73	Not Marked			20	114	1.8	
20-May	1	74	74	Not Marked			20	115	12.0	
20-May	1	75	75	Not Marked			20	112	10.3	
20-May	1	76	76	Not Marked			20	118	12.5	Bk 68625
20-May	1	77	77	Not Marked			20	103	8.2	
20-May	1	78	78	Not Marked			20	118	9.6	
20-May	1	79	79	Marked	2,1,2H	2013	10	84	4.8	
20-May	1	80	80	Not Marked			20	113	11.1	
20-May	1	81	81	Not Marked			20	120	12.9	
20-May	1	82	82	Not Marked			20	116	11.6	
20-May	1	83	83	Not Marked			10	85	4.7	
20-May	1	84	84	Not Marked			20	105	9.1	
20-May	1	85	85	Not Marked			10	73	3.0	
20-May	1	86	86	Not Marked			20	115	11.2	
20-May	1	87	87	Not Marked			20	107	9.1	
20-May	1	88	88	Marked	2,2,3H	2013	10	108	3.0	
20-May	1	89	89	Not Marked			20	120	11.2	
20-May	1	90	90	Destroyed			20	124	9.1	
20-May	1	91	91	Marked	2,1,2H	2013	10	88	10.3	
20-May	1	92	92	Not Marked			20	127	12.6	
20-May	1	93	93	Not Marked			20	115	14.5	
20-May	1	94	94	Not Marked			10	67	4.9	
20-May	1	95	95	Not Marked			20	115	15.4	
20-May	1	96	96	Not Marked			20	114	10.8	
20-May	1	97	97	Marked	2,1,2H	2013	10	96	2.5	
20-May	1	98	98	Marked	2,2,3H	2013	10	104	11.7	
20-May	1	99	99	Not Marked			10	65	11.4	
21-May	1	100	100	Not Marked			10	70	6.7	
21-May	1	101	101	Not Marked			10	68	2.4	68626
21-May	1	102	102	Not Marked			20	108	8.9	
21-May	1	103	103	Marked	2,1,2H	2013	10	72	2.8	

Date	Week	Fish #	Slide #	Marked	Thermal Mark	Brood Year	Age	Length (mm)	Weight (gms)	Comments
21-May	1	104	104	Not Marked			20	112	11.6	
21-May	1	105	105	Not Marked			20	100	7.6	
21-May	1	106	106	Not Marked			20	112	10.9	
21-May	1	107	107	Not Marked			20	113	11.2	
21-May	1	108	108	Not Marked			10	65	2.6	
21-May	1	109	109	Not Marked			10	72	3.1	
21-May	1	110	110	Not Marked			20	108	9.8	
22-May	1	111	111	Not Marked			10	80	3.8	
22-May	1	112	112	Marked	2,1,2H	2013	10	88	5.0	
22-May	1	113	113	Marked	2,2,3H	2013	10	104	9.7	
22-May	1	114	114	Not Marked			20	116	11.2	
22-May	1	115	115	Marked	2,2,3H	2013	10	105	9.8	
22-May	1	116	116	Not Marked			10	88	5.5	
22-May	1	117	117	Not Marked			20	113	10.5	
22-May	1	118	118	Marked	2,1,2H	2013	10	85	4.3	
22-May	1	119	119	Not Marked			10	70	2.9	
22-May	1	120	120	Not Marked			10	70	2.6	
22-May	1	121	121	Not Marked			10	67	2.8	
22-May	1	122	122	Not Marked			20	111	9.8	
22-May	1	123	123	Not Marked			10	67	2.6	
22-May	1	124	124	Marked	2,1,2H	2013	10	85	4.3	
22-May	1	125	125	Not Marked			20	113	10.4	
22-May	1	126	126	Not Marked			20	112	11.1	68627
22-May	1	127	127	Not Marked			20	122	12.7	
22-May	1	128	128	Not Marked			20	120	12.9	
22-May	1	129	129	Marked	2,1,2H	2013	10	83	4.0	
22-May	1	130	130	Not Marked			20	113	10.6	
23-May	1	131	131	Not Marked			10	84	5.0	
23-May	1	132	132	Not Marked			20	118	12.1	
23-May	1	133	133	Not Marked			20	118	11.0	
23-May	1	134	134	Not Marked			20	117	12.5	
23-May	1	135	135	Not Marked			20	109	10.6	
23-May	1	136	136	Not Marked			10	69	2.8	
23-May	1	137	137	Not Marked			10	66	2.1	
23-May	1	138	138	Not Marked			20	101	7.5	
23-May	1	139	139	Not Marked			10	64	2.1	
23-May	1	140	140	Marked	2,2,3H	2013	10	96	6.6	
23-May	1	141	141	Not Marked			10	63	2.0	
23-May	1	142	142	Not Marked			10	104	8.7	
23-May	1	143	143	Marked	2,1,2H	2013	10	83	4.1	
23-May	1	144	144	Not Marked			10	73	3.2	
23-May	1	145	145	Not Marked			10	68	2.5	
24-May	1	146	146	Not Marked			10	76	2.9	
24-May	1	147	147	Not Marked			20	112	10.7	
24-May	1	148	148	Not Marked			20	112	9.7	
24-May	1	149	149	Marked	2,1,2H	2013	10	86	5.0	
24-May	1	150	150	Not Marked			20	106	8.4	
24-May	1	151	151	Not Marked			20	116	11.8	68628
24-May	1	152	152	Not Marked			10	67	2.0	
24-May	1	153	153	Not Marked			10	72	2.8	
24-May	1	154	154	Not Marked			10	80	4.1	
24-May	1	155	155	Not Marked			20	107	9.4	
24-May	1	156	156	Not Marked			10	77	3.5	

Date	Week	Fish #	Slide #	Marked	Thermal Mark	Brood Year	Age	Length (mm)	Weight (gms)	Comments
24-May	1	157	157	Marked	2,2,3H	2013	10	107	8.3	
24-May	1	158	158	Not Marked			20	115	10.6	
24-May	1	159	159	Not Marked			20	107	8.6	
24-May	1	160	160	Not Marked			20	105	8.4	
24-May	1	161	161	Not Marked			20	128	17.6	
24-May	1	162	162	Not Marked			20	112	9.8	
24-May	1	163	163	Not Marked			20	113	11.5	
24-May	1	164	164	Not Marked			20	108	9.9	
24-May	1	165	165	Not Marked			10	69	2.4	
25-May	2	166	166	Not Marked			20	117	15.2	
25-May	2	167	167	Not Marked			20	96	7.2	
25-May	2	168	168	Not Marked			20	105	8.9	
25-May	2	169	169	Not Marked			10	60	2.4	
25-May	2	170	170	Not Marked			20	110	10.9	
25-May	2	171	171	Not Marked			20	111	11.7	
25-May	2	172	172	Not Marked			20	120	15.3	
25-May	2	173	173	Not Marked			20	104	10.4	
25-May	2	174	174	Not Marked			10	81	4.0	
25-May	2	175	175	Not Marked			20	112	11.2	
25-May	2	176	176	Not Marked			10	74	3.3	68629
25-May	2	177	177	Not Marked			20	104	8.2	
25-May	2	178	178	Marked	2,1,2H	2013	10	64	2.6	
25-May	2	179	179	Not Marked			20	115	11.8	
25-May	2	180	180	Not Marked			20	120	15.6	
25-May	2	181	181	Marked	2,2,3H	2013	10	108	9.3	
25-May	2	182	182	Not Marked			20	105	9.9	
25-May	2	183	183	Not Marked			10	66	2.7	
25-May	2	184	184	Not Marked			10	77	4.0	
25-May	2	185	185	Not Marked			20	110	11.0	
25-May	2	186	186	Not Marked			10	65	2.4	
25-May	2	187	187	Not Marked			20	115	11.4	
25-May	2	188	188	Not Marked			10	80	4.6	
25-May	2	189	189	Not Marked			10	66	2.6	
25-May	2	190	190	Not Marked			20	113	12.6	
26-May	2	191	191	Not Marked			10	72	2.9	
26-May	2	192	192	Not Marked			10	62	2.2	
26-May	2	193	193	Not Marked			20	110	9.9	
26-May	2	194	194	Not Marked			20	104	9.1	
26-May	2	195	195	Not Marked			20	116	12.1	
26-May	2	196	196	Marked	2,1,2H	2013	10	77	4.1	
26-May	2	197	197	Marked	2,1,2H	2013	10	86	5.3	
26-May	2	198	198	Not Marked			20	112	11.6	
26-May	2	199	199	Not Marked			20	111	10.8	
26-May	2	200	200	Not Marked			20	109	9.5	
26-May	2	201	201	Not Marked			10	69	2.6	68630
26-May	2	202	202	Not Marked			M0	61	1.8	
26-May	2	203	203	Not Marked			10	75	2.9	
26-May	2	204	204	Not Marked			10	65	2.2	
26-May	2	205	205	Not Marked			10	82	4.4	
26-May	2	206	206	Not Marked			20	100	7.0	
26-May	2	207	207	Marked	2,1,2H	2013	10	87	5.0	
26-May	2	208	208	Marked	2,1,2H	2013	10	70	2.6	
26-May	2	209	209	Not Marked			20	69	2.6	

Date	Week	Fish #	Slide #	Marked	Thermal Mark	Brood Year	Age	Length (mm)	Weight (gms)	Comments
26-May	2	210	210	Marked	2,1,2H	2013	10	114	11.1	
26-May	2	211	211	Not Marked			10	71	3.1	
26-May	2	212	212	Not Marked			10	77	3.5	
27-May	2	213	213	Not Marked			20	69	2.6	
27-May	2	214	214	Not Marked			20	105	9.3	
27-May	2	215	215	Not Marked			20	106	11.1	
27-May	2	216	216	Not Marked			20	127	15.3	
27-May	2	217	217	Marked	2,1,2H	2013	10	96	8.3	
27-May	2	218	218	Not Marked			10	91	5.8	
27-May	2	219	219	Not Marked			10	65	2.3	
27-May	2	220	220	Not Marked			10	78	4.6	
27-May	2	221	221	Not Marked			10	67	2.8	
27-May	2	222	222	Not Marked			20	81	5.2	
27-May	2	223	223	Marked	2,2,3H	2013	10	100	7.9	
27-May	2	224	224	Not Marked			10	104	9.7	
27-May	2	225	225	Not Marked				76	3.1	
27-May	2	226	226	Not Marked			10	71	2.2	68631
27-May	2	227	227	Not Marked			10	70	3.4	
27-May	2	228	228	Not Marked			10	67	2.2	
27-May	2	229	229	Marked	2,1,2H	2013	10	85	4.3	
27-May	2	230	230	Not Marked			10	73	2.8	
29-May	2	231	231	Not Marked			10	71	3.6	
29-May	2	232	232	Not Marked			10	68	3.3	
29-May	2	233	233	Not Marked			10	74	3.7	
29-May	2	234	234	Not Marked			10	66	2.8	
29-May	2	235	235	Not Marked			10	78	5.2	
29-May	2	236	236	Not Marked			10	82	4.5	
29-May	2	237	237	Not Marked			20	98	8.8	
29-May	2	238	238	Not Marked			10	70	3.3	
29-May	2	239	239	Marked	2,1,2H	2013	10	91	6.9	
29-May	2	240	240	Not Marked			20	115	13.9	
30-May	2	241	241	Marked	2,1,2H	2013	10	81	4.4	
30-May	2	242	242	Not Marked			20	120	13.5	
30-May	2	243	243	Not Marked			20	112	10.7	
30-May	2	244	244	Not Marked			10	84	4.6	
30-May	2	245	245	Not Marked			10	66	2.5	
30-May	2	246	246	Not Marked			20	123	12.1	
30-May	2	247	247	Not Marked			10	85	4.8	
30-May	2	248	248	Not Marked			20	114	11.4	
30-May	2	249	249	Not Marked			20	126	15.3	
30-May	2	250	250	Not Marked				112	9.9	
30-May	2	251	251	Not Marked			20	113	10.6	BK# 68632
30-May	2	252	252	Not Marked			20	124	14.9	
30-May	2	253	253	Not Marked			20	120	13.1	
30-May	2	254	254	Not Marked			10	70	2.2	
30-May	2	255	255	Not Marked			20	112	9.8	
31-May	2	256	256	Not Marked			20	106	10.1	
31-May	2	257	257	Not Marked			10	86	5.0	
31-May	2	258	258	Not Marked			10	77	3.8	
31-May	2	259	259	Not Marked			20	106	10.3	
31-May	2	260	260	Marked	2,2,3H	2013	10	110	10.1	
31-May	2	261	261	Not Marked			20	115	12.0	
31-May	2	262	262	Not Marked			20	124	13.7	

Date	Week	Fish #	Slide #	Marked	Thermal Mark	Brood Year	Age	Length (mm)	Weight (gms)	Comments
31-May	2	263	263	Not Marked			20	112	12.2	
31-May	2	264	264	Not Marked			20	116	11.5	
31-May	2	265	265	Not Marked			20	125	16.5	
31-May	2	266	266	Not Marked			20	117	13.1	
31-May	2	267	267	Marked	2,1,2H	2013	20	118	13.5	
31-May	2	268	268	Not Marked			20	114	11.0	
31-May	2	269	269	Not Marked			20	111	9.9	
31-May	2	270	270	Not Marked			20	115	13.0	
31-May	2	271	271	Not Marked			10	82	5.4	
31-May	2	272	272	Not Marked			10	112	10.2	
31-May	2	273	273	Not Marked			M0	115	13.5	
31-May	2	274	274	Marked	2,1,2H	2013	10	85	4.9	
31-May	2	275	275	Not Marked			20	117	12.6	
1-Jun	3	276	276	Not Marked				113	12.0	BK# 68633
1-Jun	3	277	277	Not Marked			20	119	15.2	
1-Jun	3	278	278	Not Marked			10	79	4.3	
1-Jun	3	279	279	Not Marked			20	118	13.3	
1-Jun	3	280	280	Not Marked			10	84	4.8	
1-Jun	3	281	281	Marked	2,2,3H	2013	10	106	8.8	
1-Jun	3	282	282	Not Marked			M0	106	9.5	
1-Jun	3	283	283	Not Marked			10	87	5.7	
1-Jun	3	284	284	Not Marked			10	107	9.0	
1-Jun	3	285	285	Not Marked			20	113	11.1	
1-Jun	3	286	286	Not Marked			10	92	6.5	
1-Jun	3	287	287	Not Marked			10	72	3.0	
1-Jun	3	288	288	Not Marked			10	82	4.2	
1-Jun	3	289	289	Not Marked			10	84	4.0	
1-Jun	3	290	290	Not Marked			20	128	18.1	
1-Jun	3	291	291	Not Marked			10	88	5.7	
1-Jun	3	292	292	Not Marked			20	115	11.4	
1-Jun	3	293	293	Marked	2,1,2H	2013	10	73	3.0	
1-Jun	3	294	294	Not Marked			20	98	7.5	
1-Jun	3	295	295	Not Marked			20	126	14.9	
2-Jun	3	296	296	Not Marked			10	79	4.1	
2-Jun	3	297	297	Not Marked			10	73	3.6	
2-Jun	3	298	298	Not Marked			20	115	13.0	
2-Jun	3	299	299	Not Marked			10	71	2.9	
2-Jun	3	300	300	Marked	2,1,2H	2013	10	75	3.5	
2-Jun	3	301	301	Not Marked			20	113	11.2	BK# 68634
2-Jun	3	302	302	Not Marked			10	76	3.8	
2-Jun	3	303	303	Not Marked			10	77	3.8	
2-Jun	3	304	304	Marked	2,2,3H	2013	10	100	7.8	
2-Jun	3	305	305	Not Marked			10	71	3.0	
2-Jun	3	306	306	Not Marked			20	126	15.0	
2-Jun	3	307	307	Not Marked			20	99	8.0	
2-Jun	3	308	308	Not Marked			10	64	2.2	
2-Jun	3	309	309	Not Marked			10	85	4.6	
2-Jun	3	310	310	Not Marked			10	68	2.5	
2-Jun	3	311	311	Not Marked			10	84	5.1	
2-Jun	3	312	312	Not Marked			M0	100	7.7	
2-Jun	3	313	313	Not Marked			10	72	3.2	
2-Jun	3	314	314	Not Marked			20	115	12.0	
2-Jun	3	315	315	Marked	2,2,3H	2013	M0	102	9.0	

Date	Week	Fish #	Slide #	Marked	Thermal Mark	Brood Year	Age	Length (mm)	Weight (gms)	Comments
2-Jun	3	316	316	Not Marked			10	78	4.2	
2-Jun	3	317	317	Marked	2,2,3H	2013	10	114	12.4	
2-Jun	3	318	318	Not Marked			20	110	12.2	
2-Jun	3	319	319	Not Marked			10	68	2.7	
2-Jun	3	320	320	Marked	2,2,3H	2013	10	110	9.7	
3-Jun	3	321	321	Not Marked			10	84	4.9	
3-Jun	3	322	322	Not Marked			M0	113	11.3	
3-Jun	3	323	323	Not Marked			10	85	5.7	
3-Jun	3	324	324	Marked	2,1,2H	2013	10	91	6.9	
3-Jun	3	325	325	Not Marked			10	74	3.6	
3-Jun	3	326	326	Not Marked			20	116	12.5	
3-Jun	3	327	327	Not Marked			20	113	11.2	
3-Jun	3	328	328	Not Marked			10	74	3.0	
3-Jun	3	329	329	Not Marked			20	126	16.1	
3-Jun	3	330	330	Not Marked			10	88	5.9	
3-Jun	3	331	331	Not Marked			M0	102	8.1	
3-Jun	3	332	332	Marked	2,2,3H	2013	10	104	8.5	
3-Jun	3	333	333	Not Marked			10	74	3.4	
3-Jun	3	334	334	Not Marked			20	115	13.5	
3-Jun	3	335	335	Not Marked			20	121	13.3	
3-Jun	3	336	336	Marked	2,2,3H	2013	10	116	12.4	
3-Jun	3	337	337	Not Marked			10	72	3.5	
3-Jun	3	338	338	Not Marked			20	124	15.6	
3-Jun	3	339	339	Not Marked			M0	64	2.2	
3-Jun	3	340	340	Not Marked			10	98	7.3	
3-Jun	3	341	341	Not Marked			10	76	3.6	
3-Jun	3	342	342	Not Marked			20	115	12.8	
3-Jun	3	343	343	Not Marked			10	66	2.5	
3-Jun	3	344	344	Not Marked			20	117	13.4	
3-Jun	3	345	345	Not Marked			20	116	12.7	
4-Jun	3	346	346	Not Marked			10	75	3.6	
4-Jun	3	347	347	Not Marked			10	92	7.1	
4-Jun	3	348	348	Not Marked			20	105	10.3	
4-Jun	3	349	349	Not Marked			20	114	13.4	
4-Jun	3	350	350	Not Marked				108	12.0	
4-Jun	3	351	351	Not Marked			10	66	3.1	BK # 68636
4-Jun	3	352	352	Not Marked			20	116	14.0	
4-Jun	3	353	353	Not Marked			20	105	10.0	
4-Jun	3	354	354	Marked	2,1,2H	2013		77	4.3	
4-Jun	3	355	355	Not Marked			M0	103	9.2	
4-Jun	3	356	356	Not Marked			10	69	3.2	
4-Jun	3	357	357	Not Marked			10	76	4.3	
4-Jun	3	358	358	Marked	2,1,2H	2013	10	89	6.8	
4-Jun	3	359	359	Marked	2,2,3H	2013	10	100	9.4	
4-Jun	3	360	360	Marked	2,2,3H	2013	20	105	10.4	
4-Jun	3	361	361	Marked	2,2,3H	2013	M0	98	8.7	
4-Jun	3	362	362	Not Marked			M0	84	6.4	
4-Jun	3	363	363	Not Marked			10	74	3.9	
4-Jun	3	364	364	Marked	2,1,2H	2013	10	73	3.7	
4-Jun	3	365	365	Marked	2,1,2H	2013	M0	86	5.9	
4-Jun	3	366	366	Marked	2,2,3H	2013	10	104	9.5	
4-Jun	3	367	367	Not Marked				106	10.8	
4-Jun	3	368	368	Not Marked			M0	75	4.6	

Date	Week	Fish #	Slide #	Marked	Thermal Mark	Brood Year	Age	Length (mm)	Weight (gms)	Comments
4-Jun	3	369	369	Marked	2,1,2H	2013	M0	84	6.2	
4-Jun	3	370	370	Marked	2,1,2H	2013	10	87	6.2	
5-Jun	3	371	371	Not Marked			10	76	4.8	
5-Jun	3	372	372	Not Marked				104	10.6	
5-Jun	3	373	373	Not Marked				113	13.3	
5-Jun	3	374	374	Not Marked			10	67	3.3	
5-Jun	3	375	375	Not Marked			10	68	3.4	
5-Jun	3	376	376	Not Marked			10	74	4.6	BK # 68637
5-Jun	3	377	377	Not Marked			20	107	11.9	
5-Jun	3	378	378	Not Marked			10	77	4.5	
5-Jun	3	379	379	Marked	2,1,2H	2013	10	85	5.8	
5-Jun	3	380	380	Not Marked			20	112	13.6	
5-Jun	3	381	381	Not Marked			10	77	5.1	
5-Jun	3	382	382	Not Marked			10	66	2.9	
5-Jun	3	383	383	Not Marked			10	68	3.2	
5-Jun	3	384	384	Not Marked			20	110	12.3	
5-Jun	3	385	385	Not Marked			10	85	6.0	
5-Jun	3	386	386	Marked	2,1,2H	2013	10	78	4.8	
5-Jun	3	387	387	Not Marked			10	64	2.8	
5-Jun	3	388	388	Not Marked			10	102	9.2	
5-Jun	3	389	389	Not Marked			10	72	3.9	
5-Jun	3	390	390	Marked	2,2,3H	2013	M0	103	10.4	
5-Jun	3	391	391	Not Marked			20	101	9.8	
5-Jun	3	392	392	Marked	2,1,2H	2013	10	74	3.9	
5-Jun	3	393	393	Not Marked			10	73	4.0	
5-Jun	3	394	394	Not Marked				85	5.6	
5-Jun	3	395	395	Not Marked			10	84	6.8	
5-Jun	3	396	396	Not Marked			10	71	3.5	
5-Jun	3	397	397	Not Marked			10	76	4.1	
5-Jun	3	398	398	Marked	2,1,2H	2013	10	87	6.4	
5-Jun	3	399	399	Marked	2,1,2H	2013		72	4.0	
5-Jun	3	400	400	Marked	2,2,3H	2013	10	93	6.9	
6-Jun	3	401	401	Not Marked			10	68	2.6	BK # 68638
6-Jun	3	402	402	Not Marked			10	72	3.1	
6-Jun	3	403	403	Not Marked			10	70	2.6	
6-Jun	3	404	404	Not Marked			10	72	3.1	
6-Jun	3	405	405	Not Marked			10	73	3.1	
6-Jun	3	406	406	Not Marked			10	70	2.7	
6-Jun	3	407	407	Not Marked			10	74	2.9	
6-Jun	3	408	408	Not Marked			10	71	3.0	
6-Jun	3	409	409	Not Marked			20	118	12.4	
6-Jun	3	410	410	Not Marked			10	7.7	3.6	
7-Jun	3	411	411	Not Marked			10	103	8.7	
7-Jun	3	412	412	Not Marked			10	74	3.2	
7-Jun	3	413	413	Not Marked			10	73	3.1	
7-Jun	3	414	414	Not Marked			20	112	10.7	
7-Jun	3	415	415	Not Marked			10	72	2.9	
7-Jun	3	416	416	Not Marked			10	71	2.8	
7-Jun	3	417	417	Marked	2,1,2H	2013	10	69	2.3	
7-Jun	3	418	418	Not Marked			10	64	2.1	
7-Jun	3	419	419	Not Marked			20	109	9.0	
7-Jun	3	420	420	Not Marked			10	78	4.0	
8-Jun	4	421	421	Not Marked			10	82	4.2	

Date	Week	Fish #	Slide #	Marked	Thermal Mark	Brood Year	Age	Length (mm)	Weight (gms)	Comments
8-Jun	4	422	422	Not Marked			10	70	2.9	
8-Jun	4	423	423	Not Marked			10	64	2.1	
8-Jun	4	424	424	Not Marked			10	64	2.0	
8-Jun	4	425	425	Not Marked			10	84	4.8	
8-Jun	4	426	426	Not Marked			10	69	2.8	BK # 68639
8-Jun	4	427	427	Not Marked			10	75	2.7	
8-Jun	4	428	428	Not Marked			10	74	3.1	
8-Jun	4	429	429	Not Marked				105	9.5	
8-Jun	4	430	430	Not Marked			10	90	5.8	
9-Jun	4	431	431	Marked	2,1,2H	2013	10	75	3.7	
9-Jun	4	432	432	Not Marked			10	73	2.8	
9-Jun	4	433	433	Not Marked			10	72	3.1	
9-Jun	4	434	434	Not Marked			10	69	2.6	
9-Jun	4	435	435	Not Marked			10	70	2.8	
9-Jun	4	436	436	Not Marked			10	68	2.4	
9-Jun	4	437	437	Not Marked			10	67	2.3	
9-Jun	4	438	438	Not Marked			10	91	6.5	
9-Jun	4	439	439	Not Marked			20	112	11.2	
9-Jun	4	440	440	Destroyed			10	74	3.1	
10-Jun	4	441	441	Not Marked			10	66	2.3	
10-Jun	4	442	442	Marked	2,2,3H	2013	10	119	11.5	
10-Jun	4	443	443	Not Marked			10	67	2.3	
10-Jun	4	444	444	Not Marked			20	100	8.7	
10-Jun	4	445	445	Marked	2,1,2H	2013	10	73	3.4	
12-Jun	4	446	446	Not Marked			10	65	2.3	
12-Jun	4	447	447	Not Marked			10	71	3.5	
12-Jun	4	448	448	Not Marked			10	74	3.8	
12-Jun	4	449	449	Not Marked			10	81	4.0	
12-Jun	4	450	450	Not Marked			10	111	11.7	
13-Jun	4	451	451	Not Marked			10	78	3.9	BK # 68640
13-Jun	4	452	452	Not Marked			10	83	4.8	
13-Jun	4	453	453	Not Marked			10	74	3.3	
13-Jun	4	454	454	Not Marked			10	66	2.7	
13-Jun	4	455	455	Not Marked			10	68	2.5	
19-Jun	5	456	456	Not Marked			10	67	2.4	
19-Jun	5	457	457	Not Marked			10	78	3.6	
19-Jun	5	458	458	Not Marked			10	83	4.5	
19-Jun	5	459	459	Not Marked			10	75	3.6	
19-Jun	5	460	460	Not Marked			10	69	2.6	
19-Jun	5	461	461	Not Marked			10	66	2.3	
19-Jun	5	462	462	Not Marked			10	72	3.2	
19-Jun	5	463	463	Not Marked			10	74	3.4	
19-Jun	5	464	464	Marked	2,1,2H	2013	10	88	5.3	
20-Jun	5	465	465	Marked	2,2,3H	2013	10	110	13.1	
20-Jun	5	466	466	Marked	2,1,2H	2013	10	87	5.6	
20-Jun	5	467	467	Not Marked			10	71	2.9	
20-Jun	5	468	468	Marked	2,1,2H	2013	10	76	3.6	
20-Jun	5	469	469	Not Marked			10	72	3.2	
20-Jun	5	470	470	Not Marked			10	69	2.8	
20-Jun	5	471	471	Not Marked			20	115	13.5	
20-Jun	5	472	472	Not Marked			10	74	3.2	
20-Jun	5	473	473	Not Marked			10	74	3.5	
20-Jun	5	474	474	Not Marked			10	75	3.8	

Date	Week	Fish #	Slide #	Marked	Thermal Mark	Brood Year	Age	Length (mm)	Weight (gms)	Comments
20-Jun	5	475	475	Not Marked			10	73	3.2	
21-Jun	6	476	476	Not Marked			10	67	2.9	BK # 68641
21-Jun	6	477	477	Not Marked			10	72	3.6	
21-Jun	6	478	478	Not Marked			10	68	3.1	
21-Jun	6	479	479	Not Marked			10	73	3.5	
21-Jun	6	480	480	Not Marked			10	67	2.9	
21-Jun	6	481	481	Not Marked			10	69	2.9	
21-Jun	6	482	482	Not Marked			10	68	3.0	
21-Jun	6	483	483	No Sample			10	70	2.8	
21-Jun	6	484	484	Destroyed			10	71	3.0	
21-Jun	6	485	485	Destroyed			10	73	3.9	
21-Jun	6	486	486	Destroyed			10	69	2.6	
21-Jun	6	487	487	Not Marked			10	83	5.7	
21-Jun	6	488	488	Not Marked			10	68	3.4	
21-Jun	6	489	489	Not Marked			10	67	2.8	
21-Jun	6	490	490	Marked	2,2,3H	2013	10	116	1.3	
22-Jun	6	491	491	Not Marked			10	68	2.6	
22-Jun	6	492	492	Not Marked			10	73	3.2	
22-Jun	6	493	493	Not Marked			10	74	3.1	
22-Jun	6	494	494	Not Marked			10	70	2.7	
22-Jun	6	495	495	Not Marked			10	73	3.2	
23-Jun	6	496	496	Not Marked			10	74	3.4	
23-Jun	6	497	497	Not Marked			10	73	3.0	
24-Jun	6	498	498	Mark - not known	2,2,3H	2013		111	10.7	
24-Jun	6	499	499	Not Marked			10	71	2.8	
26-Jun	6	500	500	Not Marked			10	77	3.6	
26-Jun	6	501	501	Not Marked			10	68	2.5	BK # 68642
26-Jun	6	502	502	Not Marked			10	70	2.9	
26-Jun	6	503	503	Not Marked			10	71	3.1	
26-Jun	6	504	504	Not Marked			10	75	3.5	
26-Jun	6	505	505	Not Marked			10	70	2.8	
27-Jun	6	506	506	No Sample			10	70	3.0	
27-Jun	6	507	507	Not Marked			10	73	3.2	
27-Jun	6	508	508	Not Marked			10	76	3.6	
27-Jun	6	509	509	Not Marked			10	75	3.4	
27-Jun	6	510	510	Marked	2,1,2H	2013	10	85	5.6	
30-Jun	6	511	511	Not Marked			10	72	3.1	
30-Jun	6	512	512	Not Marked			10	76	4.0	
30-Jun	6	513	513	Not Marked			10	75	3.6	
30-Jun	6	514	514	No Sample			10	77	4.0	
30-Jun	6	515	515	Not Marked			10	79	4.0	
1-Jul	6	516	516	Not Marked			10	75	3.7	
2-Jul	6	517	517	Not Marked			10	75	3.6	
2-Jul	6	518	518	Not Marked			10	73	3.2	
2-Jul	6	519	519	Not Marked			10	79	4.2	
2-Jul	6	520	520	Not Marked			10	78	4.1	
4-Jul	6	521	521	Not Marked			10	71	3.1	
4-Jul	6	522	522	Not Marked			10	72	3.2	
4-Jul	6	523	523	Not Marked			10	74	3.2	
4-Jul	6	524	524	No Sample			10	79	4.2	
4-Jul	6	525	525	Not Marked			10	80	4.5	
5-Jul	6	526	526	Not Marked			10	75	3.6	BK # 68643

Date	Week	Fish #	Slide #	Marked	Thermal Mark	Brood Year	Age	Length (mm)	Weight (gms)	Comments
5-Jul	6	527	527	Not Marked			10	80	4.4	
5-Jul	6	528	528	Not Marked			10	81	4.3	
7-Jul	6	529	529	Marked	6,2H	2014	00	59	2.0	FED FRY?
7-Jul	6	530	530	Marked	6,2H	2014	00	59	1.8	FED FRY?
7-Jul	6	531	531	Marked	6,2H	2014	00	58	1.9	FED FRY?
7-Jul	6	532	532	Marked	6,2H	2014	00	61	2.2	FED FRY?
7-Jul	6	533	533	Marked	6,2H	2014	00	58	1.8	FED FRY?
8-Jul	6	534	534	Marked	3n,5H	2014	00	52	1.3	FED FRY?
8-Jul	6	535	535	Marked	6,2H	2014	00	60	2.0	FED FRY?
8-Jul	6	536	536	Marked	6,2H	2014	00	51	1.2	FED FRY?
8-Jul	6	537	537	Marked	6,2H	2014	00	56	1.6	FED FRY?
8-Jul	6	538	538	Marked	6,2H	2014	00	57	1.7	FED FRY?
8-Jul	6	539	539	Marked	6,2H	2014	00	57	1.7	FED FRY?
8-Jul	6	540	540	Marked	6,2H	2014	00	60	2.0	FED FRY?
8-Jul	6	541	541	Marked	6,2H	2014	00	55	1.4	FED FRY?
8-Jul	6	542	542	Marked	6,2H	2014	00	57	1.7	FED FRY?
8-Jul	6	543	543	Marked	6,2H	2014	00	55	1.6	FED FRY?
8-Jul	6	544	544	Marked	6,2H	2014	00	56	1.6	FED FRY?
8-Jul	6	545	545	Marked	6,2H	2014	00	59	1.9	FED FRY?
8-Jul	6	546	546	Marked	6,2H	2014	00	62	2.1	FED FRY?
8-Jul	6	547	547	Marked	6,2H	2014	00	60	1.8	FED FRY?
8-Jul	6	548	548	Marked	6,2H	2014	00	58	1.8	FED FRY?
8-Jul	6	549	549	Marked	6,2H	2014	00	56	1.5	FED FRY?
8-Jul	6	550	550	Marked	6,2H	2014	00	60	1.9	FED FRY?
8-Jul	6	551	551	Marked	6,2H	2014	00	58	1.8	BK # 68644
8-Jul	6	552	552	Marked	3n,5H	2014	00	50	1.1	FED FRY?
8-Jul	6	553	553	Marked	6,2H	2014	00	58	1.9	FED FRY?
8-Jul	6	554	554	Marked	6,2H	2014	00	63	2.4	FED FRY?
8-Jul	6	555	555	Marked	6,2H	2014	00	65	2.5	FED FRY?
8-Jul	6	556	556	Marked	6,2H	2014	00	60	1.9	FED FRY?
8-Jul	6	557	557	Marked	6,2H	2014	00	58	1.8	FED FRY?
8-Jul	6	558	558	No Sample			00	57	1.6	FED FRY?
8-Jul	6	559	559	Marked	6,2H	2014	00	59	1.7	FED FRY?
8-Jul	6	560	560	No Sample			00	58	1.6	FED FRY?
8-Jul	6	561	561	Marked	6,2H	2014	00	57	1.7	FED FRY?
8-Jul	6	562	562	Marked	6,2H	2014	00	65	2.3	FED FRY?
8-Jul	6	563	563	Marked	6,2H	2014	00	61	1.9	FED FRY?
8-Jul	6	564	564	Marked	3n,5H	2014	00	59	1.7	FED FRY?
8-Jul	6	565	565	Marked	6,2H	2014	00	59	2.0	FED FRY?
8-Jul	6	566	566	Marked	6,2H	2014	00	62	2.3	FED FRY?
8-Jul	6	567	567	Not Marked			10	75	3.6	
9-Jul	6	568	568	Marked	6,2H	2014		52	1.1	FED FRY?
9-Jul	6	569	569	Marked	6,2H	2014	00	61	2.3	FED FRY?
9-Jul	6	570	570	Marked	6,2H	2014	00	60	1.9	FED FRY?
9-Jul	6	571	571	Marked	6,2H	2014	00	59	1.8	FED FRY?
9-Jul	6	572	572	Marked	6,2H	2014	00	64	2.3	FED FRY?
9-Jul	6	573	573	Marked	6,2H	2014	00	61	1.9	FED FRY?
9-Jul	6	574	574	Marked	6,2H	2014	00	60	1.8	FED FRY?
9-Jul	6	575	575	Marked	6,2H	2014	00	64	2.3	FED FRY?
9-Jul	6	576	576	Marked	6,2H	2014	00	60	1.8	BK # 68645
9-Jul	6	577	577	Marked	6,2H	2014	00	58	1.7	FED FRY?
9-Jul	6	578	578	Marked	6,2H	2014	00	62	2.1	FED FRY?
9-Jul	6	579	579	Marked	6,2H	2014	00	60	1.9	FED FRY?

Date	Week	Fish #	Slide #	Marked	Thermal Mark	Brood Year	Age	Length (mm)	Weight (gms)	Comments
9-Jul	6	580	580	Marked	6,2H	2014	00	57	1.8	FED FRY?
9-Jul	6	581	581	Marked	6,2H	2014	00	59	1.9	FED FRY?
9-Jul	6	582	582	Marked	6,2H	2014	00	58	1.8	FED FRY?
9-Jul	6	583	583	Marked	6,2H	2014	00	60	2.0	FED FRY?
9-Jul	6	584	584	Marked	6,2H	2014	00	60	1.8	FED FRY?
9-Jul	6	585	585	Marked	6,2H	2014	00	62	2.2	FED FRY?
9-Jul	6	586	586	Marked	6,2H	2014	00	60	1.9	FED FRY?
9-Jul	6	587	587	Marked	6,2H	2014	00	58	1.8	FED FRY?
9-Jul	6	588	588	Marked	6,2H	2014	00	60	2.0	FED FRY?
9-Jul	6	589	589	Marked	6,2H	2014	00	60	2.0	FED FRY?
9-Jul	6	590	590	Marked	6,2H	2014	00	66	2.6	
9-Jul	6	591	591	Not Marked			10	69	2.7	
9-Jul	6	592	592	Not Marked			10	75	3.4	
9-Jul	6	593	593	Not Marked			10	82	4.8	
9-Jul	6	594	594	Not Marked			10	80	4.2	
9-Jul	6	595	595	Not Marked			10	82	4.6	
9-Jul	6	596	596	Not Marked			10	82	4.8	
9-Jul	6	597	597	Not Marked			10	78	4.2	
9-Jul	6	598	598	Marked	6,2H	2014	10	80	4.5	
9-Jul	6	599	599	Not Marked			10	80	4.7	
9-Jul	6	600	600	Not Marked			10	85	4.9	
9-Jul	6	601	601	Not Marked			10	87	6.1	BK # 68646
10-Jul	6	602	602	Marked	6,2H	2014	00	58	1.7	
10-Jul	6	603	603	Marked	6,2H	2014	00	56	1.7	
10-Jul	6	604	604	Marked	6,2H	2014	00	58	1.7	
10-Jul	6	605	605	Marked	6,2H	2014	00	59	2.0	
10-Jul	6	606	606	Marked	6,2H	2014	00	62	2.0	
10-Jul	6	607	607	Marked	6,2H	2014	00	62	1.9	
10-Jul	6	608	608	Marked	6,2H	2014	00	60	1.9	
10-Jul	6	609	609	Marked	6,2H	2014	00	54	1.4	
10-Jul	6	610	610	Marked	6,2H	2014	00	58	1.8	
10-Jul	6	611	611	Unreadable			00	61	2.1	
6-Aug	7	612	612	Marked	3n,5H	2014	00	85	5.8	Note gap in time!! Smolt trap reinstalled Aug 5 @ 7:00pm
6-Aug	7	613	613	Not Marked			10	102	9.3	
6-Aug	7	614	614	Not Marked				95	8.2	
6-Aug	7	615	615	Marked	6,2H	2014	00	76	4.0	
6-Aug	7	616	616	Marked	6,2H	2014	00	85	6.2	
6-Aug	7	617	617	Not Marked			10	98	8.8	
6-Aug	7	618	618	Not Marked			10	99	8.8	
6-Aug	7	619	619	Not Marked			10	100	9.3	
6-Aug	7	620	620	Not Marked			10	104	10.6	
6-Aug	7	621	621	Not Marked			10	114	13.7	
7-Aug	7	622	622	Marked	6,2H	2014	10	88	6.4	
7-Aug	7	623	623	Not Marked			10	103	9.7	
7-Aug	7	624	624	Not Marked			10	99	7.7	
7-Aug	7	625	625	Not Marked			10	101	9.4	
7-Aug	7	626	626	Marked	6,2H	2014	10	84	5.3	BK # 68647
7-Aug	7	627	627	Marked	2,2,3H	2013	10	159	42.7	
7-Aug	7	628	628	Not Marked			10	100	10.0	

Date	Week	Fish #	Slide #	Marked	Thermal Mark	Brood Year	Age	Length (mm)	Weight (gms)	Comments
7-Aug	7	629	629	Not Marked			10	94	7.5	
7-Aug	7	630	630	Not Marked			10	95	7.8	
7-Aug	7	631	631	Not Marked			10	104	10.6	
8-Aug	7	632	632	Marked	6,2H	2014	00	88	6.0	
8-Aug	7	633	633	Not Marked			10	105	12.4	
8-Aug	7	634	634	Not Marked			10	95	7.9	
8-Aug	7	635	635	Marked	6,2H	2014	00	74	3.5	
8-Aug	7	636	636	Not Marked			10	106	10.4	
8-Aug	7	637	637	Marked	6,2H	2014	10	88	6.4	
8-Aug	7	638	638	Not Marked			10	106	11.2	
8-Aug	7	639	639	Not Marked			10	101	9.5	
8-Aug	7	640	640	Destroyed			10	100	9.3	
9-Aug	7	641	641	Marked	6,2H	2014	10	86	5.8	
9-Aug	7	642	642	Not Marked			10	96	8.4	
9-Aug	7	643	643	Not Marked			10	103	10.0	
9-Aug	7	644	644	Not Marked			10	104	10.1	
10-Aug	7	645	645	Not Marked			10	109	12.2	
10-Aug	7	646	646	Marked	6,2H	2014	00	86	5.3	
10-Aug	7	647	647	Marked	6,2H	2014	00	85	5.9	
10-Aug	7	648	648	Marked	3n,5H	2014	00	69	2.6	
10-Aug	7	649	649	No Sample			10	177	60.3	
11-Aug	7	650	650	Marked	6,2H	2014	10	85	6.5	
11-Aug	7	651	651	Not Marked			10	96	7.8	BK # 68648
11-Aug	7	652	652	Marked	6,2H	2014	00	84	6.4	
11-Aug	7	653	653	Marked	6,2H	2014	00	88	5.8	
11-Aug	7	654	654	Marked	6,2H	2014	00	83	5.2	
11-Aug	7	655	655	Marked	6,2H	2014	00	74	5.2	
12-Aug	7	656	656	Marked	6,2H	2014	00	90	6.7	
12-Aug	7	657	657	Marked	3n,5H	2014	00	70	3.1	
12-Aug	7	658	658	Marked	6,2H	2014	M0	71	3.1	
13-Aug	7	659	659	Marked	3n,5H	2014	00	100	9.2	
13-Aug	7	660	660	Marked	3n,5H	2014	00	74	3.2	
14-Aug	7	661	661	Marked	6,2H	2014	00	94	8.1	
14-Aug	7	662	662	Marked	6,2H	2014	00	93	7.1	
14-Aug	7	663	663	Marked	6,2H	2014	00	83	5.2	
15-Aug	7	664	664	Not Marked			10	102	9.6	
16-Aug	7	665	665	Marked	6,2H	2014	00	88	6.7	
16-Aug	7	666	666	Not Marked			10	103	9.9	
16-Aug	7	667	667	Marked	6,2H	2014	00	93	7.1	
17-Aug	7	668	668	Marked	6,2H	2014	00	101	10.3	
17-Aug	7	669	669	Marked	6,2H	2014	00	95	8.3	
17-Aug	7	670	670	Not Marked			10	108	10.9	
17-Aug	7	671	671	Destroyed			00	98	8.5	
17-Aug	7	672	672	Marked	6,2H	2014	00	99	8.6	
17-Aug	7	673	673	Not Marked			10	105	11.0	
17-Aug	7	674	674	Marked	6,2H	2014	00	103	10.0	
18-Aug	7	675	675	Marked	6,2H	2014	00	98	10.9	
18-Aug	7	676	676	Marked	6,2H	2014	00	94	8.4	BK # 68649
18-Aug	7	677	677	Marked	6,2H	2014	10	97	9.0	
18-Aug	7	678	678	Marked	6,2H	2014	00	102	11.6	
18-Aug	7	679	679	Marked	6,2H	2014	00	90	6.9	
18-Aug	7	680	680	Marked	6,2H	2014	00	95	8.7	
18-Aug	7	681	681	Marked	6,2H	2014	00	88	7.5	

Date	Week	Fish #	Slide #	Marked	Thermal Mark	Brood Year	Age	Length (mm)	Weight (gms)	Comments
18-Aug	7	682	682	Marked	6,2H	2014	00	94	9.4	
18-Aug	7	683	683	Marked	6,2H	2014	00	101	9.8	
18-Aug	7	684	684	Marked	6,2H	2014	00	99	9.6	
18-Aug	7	685	685	Marked	6,2H	2014	00	89	8.2	
18-Aug	7	686	686	No Sample			00	98	10.1	
18-Aug	7	687	687	Marked	6,2H	2014	00	94	7.7	
19-Aug	7	688	688	Marked	6,2H	2014	00	100	10.6	
19-Aug	7	689	689	Marked	6,2H	2014	00	93	7.9	
20-Aug	7	690	690	Marked	6,2H	2014	00	98	8.0	
20-Aug	7	691	691	Marked	6,2H	2014	10	92	7.2	
20-Aug	7	692	692	Marked	6,2H	2014	00	102	9.9	
20-Aug	7	693	693	Marked	6,2H	2014	00	96	8.8	
20-Aug	7	694	694	Marked	6,2H	2014	00	96	9.5	
20-Aug	7	695	695	Marked	6,2H	2014	00	103	9.9	
20-Aug	7	696	696	Marked	6,2H	2014	00	95	8.9	
20-Aug	7	697	697	Marked	6,2H	2014	00	95	8.6	
20-Aug	7	698	698	Marked	6,2H	2014	00	106	10.4	
20-Aug	7	699	699	Marked	6,2H	2014	00	98	8.7	
21-Aug	7	700	700	Marked	3n,5H	2014	00	88	6.9	
21-Aug	7	701	701	Marked	6,2H	2014	M0	104	11.0	BK # 68650
22-Aug	7	702	702	Marked	6,2H	2014	00	103	11.0	
22-Aug	7	703	703	Marked	3n,5H	2014	00	86	6.2	
23-Aug	7	704	704	Marked	6,2H	2014	00	99	10.0	
23-Aug	7	705	705	Marked	3n,5H	2014	00	102	10.4	
23-Aug	7	706	706	Marked	6,2H	2014	00	99	9.0	
23-Aug	7	707	707	Marked	6,2H	2014	00	108	12.7	
24-Aug	7	708	708	Marked	6,2H	2014	00	102	9.2	
24-Aug	7	709	709	Marked	6,2H	2014	00	111	13.1	
25-Aug	7	710	710	Marked	6,2H	2014	00	108	11.4	
25-Aug	7	711	711	Marked	6,2H	2014	00	107	12.0	
25-Aug	7	712	712	Marked	6,2H	2014	00	112	14.3	
25-Aug	7	713	713	Marked	6,2H	2014	00	102	11.2	
25-Aug	7	714	714	Marked	6,2H	2014	00	100	9.0	
26-Aug	7	715	715	Marked	6,2H	2014	00	103	11.7	
26-Aug	7	716	716	Marked	6,2H	2014	00	102	10.0	
26-Aug	7	717	717	Marked	6,2H	2014	00	104	10.9	
27-Aug	7	718	718	Marked	6,2H	2014	10	103	10.5	
27-Aug	7	719	719	Marked	6,2H	2014	00	102	10.2	
27-Aug	7	720	720	Marked	6,2H	2014	00	100	11.3	
28-Aug	7	721	721	Destroyed			00	112	13.3	
28-Aug	7	722	722	Marked	6,2H	2014	00	105	11.0	
30-Aug	7	723	723	Marked	6,2H	2014	00	115	14.4	
30-Aug	7	724	724	Marked	6,2H	2014	00	116	15.8	
31-Aug	7	725	725	Marked	6,2H	2014	00	112	12.1	
31-Aug	7	726	726	Marked	6,2H	2014	00	109	12.7	BK # 68951
31-Aug	7	727	727	Marked	6,2H	2014	00	101	10.3	
31-Aug	7	728	728	Marked	6,2H	2014	M0	105	10.7	
31-Aug	7	729	729	Marked	6,2H	2014	10	107	11.8	
31-Aug	7	730	730	Marked	6,2H	2014	00	104	10.6	
1-Sep	7	731	731	Marked	6,2H	2014	00	110	12.7	
1-Sep	7	732	732	Marked	6,2H	2014	00	107	11.2	
1-Sep	7	733	733	Marked	6,2H	2014	00	109	11.5	
1-Sep	7	734	734	Marked	6,2H	2014	00	110	12.8	

Date	Week	Fish #	Slide #	Marked	Thermal Mark	Brood Year	Age	Length (mm)	Weight (gms)	Comments
1-Sep	7	735	735	Marked	6,2H	2014	00	107	11.8	
7-Sep	7	736	736	Marked	6,2H	2014	10	113	13.8	
7-Sep	7	737	737	Marked	6,2H	2014	00	112	13.7	
7-Sep	7	738	738	Marked	6,2H	2014	00	116	15.2	
7-Sep	7	739	739	Marked	6,2H	2014	00	112	11.9	
7-Sep	7	740	740	Marked	6,2H	2014	00	114	14.4	
9-Sep	7	741	741	Marked	6,2H	2014	00	110	10.9	
9-Sep	7	742	742	Marked	6,2H	2014	00	115	14.1	
9-Sep	7	743	743	Marked	6,2H	2014	M0	117	15.1	
9-Sep	7	744	744	Marked	3n,5H	2014	00	113	13.9	
9-Sep	7	745	745	Marked	6,2H	2014	00	114	13.8	
11-Sep	7	746	746	Marked	6,2H	2014	00	118	18.4	
12-Sep	7	747	747	Marked	6,2H	2014	10	111	13.4	
13-Sep	7	748	748	Marked	6,2H	2014	10	121	17.6	
14-Sep	7	749	749	Marked	6,2H	2014	00	118	15.5	
15-Sep	7	750	750	Marked	6,2H	2014	M0	117	14.7	