

**Mountain Village Chinook Salmon
Drift Test Fishery Project, 2011**

Project URE-22-11

A Report Submitted By

Yukon Delta Fisheries Development Association

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ABSTRACT

A Chinook salmon test fishery using 7.5-inch stretch mesh drift gillnets was conducted near Mountain Village, Alaska from June 7 through July 17, 2011. During this period, 81 test fishing drifts were scheduled but only 74 were conducted. A total of 7 scheduled drifts were not conducted because of very rough waters. During 74 test drifts, 493 Chinook salmon were captured and retained. A total of 429 Chinook salmon were sampled for age, sex, size and genetic stock identification. Additionally, 18 Chinook salmon were observed to have dropped out of the net when the net was being pulled into the boat. These 18 Chinook salmon were included in the catch per effort (CPUE) calculations. Two Chinook salmon were captured that did not have an adipose fin and were thought to have originated from hatchery releases in Yukon, Canada. Total cumulative CPUE index points totaled 1,579.88. The mid-50% passage of the run occurred between June 16 and June 26, inclusive. The median date of passage was 22 June. Of the total number of Chinook salmon retained and sampled, 370 or 86.2% had ageable scales. One Chinook salmon was not identified as to sex. Percent age class composition of the Chinook salmon aged sampled was 1.1% age-1.2, 58.6% age-1.3, 38.6% age-1.4 and 1.0% age 2.4. Additionally one age-2.3 fish was sampled. Females comprised 32.4% of the total number of Chinook salmon sampled. Percent female salmon were similarly low in the first and third quartile, 24.6% and 23.5%, higher in the second quartile, 31.2%, and highest in the fourth quartile, 50.5%. Chinook salmon from 700 mm to 850 mm comprised 69.0% of the sampled fish. Of the female salmon sampled, 74.1% were equal to or greater than 800 mm. Of the male salmon sampled, 82.7% were less than 800 mm. Chinook salmon equal to or greater than 900mm comprised 7.9% of the sampled fish. The vast majority, 82.4%, of fish equal to or greater than 900 mm were female. No fish over 1,000 mm were captured. Local hiring of fishermen was accomplished through Asa'carsarmiut Tribal Council. This employment provided stewardship experiences in test fishing, and an understanding of how information from the MVTF project is used by management in assessing the overall run strength and timing of the Yukon River Chinook salmon stock.

KEY WORDS: Chinook salmon, *Oncorhynchus*, Yukon, Alaska, test fishery, catch per unit effort, run assessment, migratory timing, age, sex, length composition, stewardship

INTRODUCTION

The Yukon River drainage (Figure 1) supports widely distributed populations of Chinook salmon, *Oncorhynchus tshawytscha*, important for subsistence, personal use, commercial, and sport fisheries throughout the drainage, as summarized in the most recently published management report (Bue, et al. 2011) and U.S./Canada Joint Technical Committee report (JTC 2011). The vast majority of the commercial salmon harvests has occurred near the mouth of the Yukon River in Districts 1 and 2 (Figure 2). The subsistence fishery has priority use of these resources, but the fish pass through the major commercial harvesting area in the lower river before they arrive into the upper regions where more than half of the subsistence harvest occurs. Fishery managers are challenged to quickly and accurately assess run timing and abundance inseason to ensure passage of sufficient numbers of salmon for subsistence needs and adequate escapements to Alaskan streams, and also to satisfy treaty obligations to Canada.

ADF&G assesses run strength in the lower Yukon River at the mouth of the Yukon River with set and drift gillnets near Emmonak (river mile (RM) 24; Figure 2) and in the north and middle mouth based out of a remote camp near Akers Camp (RM 26). Test fishing efforts in the lower Yukon River are collectively referred to as the Lower Yukon Test Fishery (LYTF). This test fishery is conducted with 8.5 in mesh set gillnets. Salmon run assessment is also conducted with hydroacoustic equipment near the village of Pilot Station (RM 122; Figure 2). Sonar targets or traces are enumerated and apportioned to fish species by catches in a test drift gillnets weighted by gillnet selectivity curves. A suite of gillnets with mesh sizes from 2.75 in to 8.5 in are used to catch fish in the test fishery at the Pilot Station sonar project (JTC 2011). Additionally, from 2007-2009 the Yukon River Chinook salmon comparative mesh size study project (Howard and Evenson 2010) provided additional run strength and timing information to managers (S. Hayes, ADF&G, personal communication). In the past, a drift gillnet test fishery also operated near the village of Marshall (RM 163; Figure 2) in 1999, 2000, and 2005-2008 (Waltmeyer 2006, 2008; Dubey 2009). Last year, 2010, a Chinook salmon drift test net fishery was successfully conducted near the village of Mountain Village (RM 87; Sandone 2011). All the above-mentioned projects, in conjunction with subsistence harvest reports, commercial harvest data, and age, sex, and length (ASL) data, provided information to assess the Chinook salmon run inseason (ADF&G 2011).

The differences in mesh size use in the three lower river test fisheries may confound the timing and relative abundance relationship among the three projects because of annual varying Chinook salmon run characteristics from year to year. The LYTF has used 8.5 inch mesh size in this set net fishery since its inception in 1981 because historically, this is the mesh that most fishers used in the Lower Yukon Area to target Chinook salmon and this mesh size targets the historically most abundant age class, age-6 fish. In 2010, the Alaska Board of Fisheries (BOF) enacted a regulation that limited the maximum mesh size of gillnets used to catch salmon on the Yukon River to 7.5 inch mesh (Hayes and Estensen 2011). The 7.5 inch mesh gillnet selectively targets younger and smaller individuals on the average, and even a few large size class Chinook salmon, without impairing the Chinook salmon catchability beyond what it would be for an 8-inch maximum mesh size fishery (Howard and Evenson 2010). The MVTF project uses 7.5 inch mesh drift gillnets because it will provide information regarding the Chinook salmon harvest and will also index the run based on the catch of the 7.5 inch mesh. The Pilot Station sonar counts attributed to Chinook salmon are based on a suit of nets from 2.75 to 8.5 inch mesh (JTC 2011). This test fishery is most likely the best indicator of the age, sex, and length composition of the Chinook salmon run in the lower river. Therefore, if unaffected by high water, high debris load, and high turbidity, the sonar counts attributed to Chinook salmon should also be the best indicator of the run size of the Chinook salmon in the lower Yukon River.

With the relatively recent dramatic decrease in harvestable surpluses and continued high demand for Yukon River Chinook salmon, more accurate and precise inseason run assessment is needed. When operational, the Marshall test fishery provided some information regarding relative run size and a

retrospective comparative check on the relative magnitude of Pilot Station sonar counts attributed to Chinook salmon (Waltmeyer 2006). The Mountain Village test fishery (MVTF) improves upon the previous project by providing similar information, but before the fish reaches Pilot Station, and on a timelier basis since this project is 76 river miles closer to the mouth or more than 2 days travel time for Chinook salmon. Results from this project also provide additional insight into the expected Chinook salmon run strength at the Pilot Station sonar site. Additionally, because of this project's strategic location between the LYTF and Pilot Station sonar projects, information from this project can be compared against the information from the LYTF and the sonar counts. Accordingly, MVTF can be used as a check on the other two lower Yukon assessment projects, and vice versa, to assess whether the LYTF and/or sonar are operating correctly. Further, while salmon passage data from the Yukon sonar projects remains the key component of salmon run assessment, data from the sonar project has not been reliable in some past years. High water, high debris load, and high turbidity affect the identification of sonar targets, as well as, test fishing catches at the sonar site. Likewise, the LYTF set net project is also greatly affected by high water and debris. It appears, however, that the MVTF project is not affected by high water and debris to the extent as the other two lower Yukon River projects. Therefore, the MVTF project may not only provide a check as to the accuracy of the Pilot Station sonar counts attributed to Chinook salmon but may also provide the lone reliable assessment project in the lower Yukon river in some high water:high debris years. In the least, in those years, it will cause managers to pause and scrutinize data from the sonar and LYTF project but may also cause managers to weigh other information more heavily in their run assessment. In addition to comparisons among the Lower River run assessment projects, age data will aid in the identification of trends in brood year assessment and may assist in future run forecasting.

Genetic samples collected from sampled Chinook salmon provided an additional assessment of the various Chinook salmon stocks migrating through the lower river and may be used to bolster the sample size of the genetic collection at the Pilot Station sonar site.

The MVTF project is designed to provide data and analyses that directly contribute to the assessment of the current state of knowledge of Chinook salmon for inseason management. The information gathered will aid in the goal for management of both Canada and U.S. Chinook salmon stocks, so that the Treaty obligations, escapement goals, and subsistence priority are met, and appropriate levels of commercial harvests are allowed.

This project also provides an opportunity to build community capacity and stewardship for local residents by promoting training and education in fisheries research and management. This project has received support in the local area. This project supports resource management in a cost effective manner and facilitates communications between various community and government entities.

STUDY AREA

The study area is located upriver from the village of Mountain Village (Figure 2) on the Yukon River, approximately 87 RM from the mouth. The test fishery site is located in association with the north bank (Site 1) of the river (Figure 3), near what the local residents refer to as "Liberty Landing."

OBJECTIVES

The specific objectives of this project are to:

- 1) estimate the relative abundance (CPUE) and run timing of the Yukon River Chinook salmon run at Mountain Village;
- 2) describe the ASL composition of the Chinook salmon caught in test drift nets ;
- 3) provide additional Chinook salmon genetic samples for inseason analysis; and
- 4) provide a conservation and stewardship experience for rural local residents.

METHODS

Test Fishing

Yukon Delta Fisheries Developmental Association (YDFDA), in cooperation with the Asa'carsarmiut Tribal Council (ATC) and ADF&G, conducted a test fishery near Mountain Village to monitor Chinook salmon. Test fishing commenced on June 7 and continued through July 17, for a total of 41 days of scheduled test fishing. This period encompassed most of the Chinook salmon migration. This schedule takes into account: 1) the approximate two day lag time between the LYTF (RM 24), which typically begins operation the first part of June, and the Mountain Village Test fishery (RM 87) and 2) the approximate 1 day lag between the Mountain Village Test Fishery and the Pilot Station sonar project site (RM 124).

Although ATC hired the individual fishermen, YDFDA managed the test fish crew and was responsible for supervision and general oversight of the collection and timely reporting of the data. ATC was responsible for the hiring of local fisherman as test fishers and for the orderly distribution of the test fish catches to local residents. Local residents were hired as professional fishermen and their expertise was employed in identifying drift sites

Gillnet gear consisted of a 50 fathom shackle of 7.50-inch stretch mesh, multi-filament drift gillnet. The net was 45 meshes deep and was constructed of mono-multifilament strands in a light brown color. A total of two drifts were conducted daily with the single north-bank station being sampled twice. The drift locations were determined pre-season and were based on local fishermen's expertise and knowledge. Unlike in 2010, drifts were conducted only on the north side of the river because the vast majority, 95%, of the Chinook salmon captured during the 2010 season was captured from the drift site on the north side of the river (Sandone 2011). During this season, 2011, however, occasional drifts were conducted on the south side of the river, in association with a prominent sand bar, to determine if substantial numbers of Chinook salmon were migrating along the south bank sandbar. Test drifts were conducted twice a day, once in the morning and approximately 12 hours later, in the evening each day.

Prior to the first set of each set of drifts, wind speed and direction, air and water temperature, percent cloud cover, and precipitation were noted and recorded. Observed water condition was noted as calm, slightly choppy, choppy, or rough.

Times were recorded to the nearest minute for each drift. Time was recorded for the beginning of net deployment, when the net was fully deployed, when the net retrieval starts, and when the net was fully retrieved. This temporal information is needed to calculate the CPUE for each drift or set, $CPUE_s$. The CPUE index, standardizes catch reporting to the number of fish caught in 100 fathoms of gear, standardized to one hour of fishing time and is calculated as follow:

$$CPUE_s = \frac{100 \text{ fm} \times 60 \text{ min} \times \text{number of fish}}{\text{fm of gear} \times MFT} \quad (1)$$

where:

MFT = mean fishing time for each set, in minutes.

Mean fishing time (*MFT*) was calculated as:

$$MFT = (C - B) + \frac{(B - A) + (D - C)}{2} \quad (2)$$

where: A = time net deployment started,
 B = time net fully deployed,
 C = time net retrieval started, and
 D = time net fully retrieved.

During each drift, the net was fished, or soaked, for approximately 20 minutes. The net was capable of capturing fish prior to being fully deployed, and during the time it was being retrieved. Therefore, mean fishing time for each set (*MFT*) was adjusted by adding half of the summed total time to set and retrieve the net. However, when an estimated 10 salmon or more were observed in the net, the crew was instructed to pull the entire net into the boat, record the time, and then pick the salmon out of the net. The distance covered by the drift varied depending on the time the net was in the water, as well as water and wind conditions.

To calculate daily $CPUE_d$ for the Mountain Village project, $CPUE_s$ was averaged as follows:

$$CPUE_d = \left(\sum_{s=1}^n CPUE_s \right) / n \quad (3)$$

The average of all daily drifts was used as the daily CPUE statistic ($CPUE_d$) for developing relative abundance and timing information.

Missing daily CPUE values were estimated from the linear regression analysis of the significant relationships between the daily LYTF CPUE versus the MVTF CPUE and the MVTF CPUE versus the sonar counts.

Salmon Migration Timing

In this project, CPUE was the primary indication of relative run strength. At the end of the season, run timing statistics, quartile days, were calculated based on the daily versus the overall total CPUE.

ADF&G uses these run timing statistics to compared and contrasted among the three lower river projects to determine the actual run timing of the Chinook salmon migration.

Migration of Chinook salmon through the Lower Yukon Area was assessed using the median day of passage along with the period when the mid-50% of the run passed the project. Quartile days were defined based on the day when 25%, 50% and 75% of the run passed the project, based on the cumulative Chinook salmon CPUE. The first and third quartile day defined the mid-50% of the run.

Age, Sex, and Length Composition

Three scale samples were collected from up to 30 Chinook salmon per day in the test fishery for subsequent age determination. Scales are taken from the left side of the fish, approximately two rows above the lateral line, on the diagonal from the posterior insertion of the dorsal fin to the anterior insertion of the anal fin (Koo 1955). This is known as the “preferred area”. The three scales taken from the preferred area were mounted on gum cards in the field. At the end of the season, all scale cards were delivered to ADF&G. ADF&G was responsible for processing and reading the scales for age determination.

Sex was determined and recorded based on internal inspection of gonads. Length of each Chinook salmon was measured from mid-eye to fork of tail (METF), to the nearest 5 mm. For graphical and table presentations of Chinook salmon length, each Chinook salmon was assigned to a length range bin dependent on the measured length of the fish. These length range bins included the following ranges: <650mm; 650mm-699, 700mm-750mm; 751mm-799mm; 800mm-850mm; 851mm-899mm; 900mm-999mm; and $\geq 1,000$ mm.

Genetic Sampling

Genetic samples from this test fishery were collected to provide an independent assessment of the migrational pattern of the various Chinook salmon stocks through the lower river and may also be used to bolster the genetic sample collected at the Pilot Station sonar project for inseason assessment of the run. As a part of the salmon sampling procedure, one axillary process tissue sample was collected from each Chinook salmon sampled. Genetic samples were collected by severing the process with a dog toenail clipper. Severed axillary process samples were placed into separate pre-labeled and numbered vials. Each sample vial number was cross referenced with the scale card and specimen number.

Conservation and Stewardship Experience for Rural Local Residents

This project through its local hire component and involvement of local tribal government provided an opportunity to build community capacity and stewardship. This project provided local residents work experience and training. Through discussions with the ADF&G and the project biologist, test fishers achieved a sense of the importance of the data that they collected to the inseason management of the Yukon River Chinook salmon run. This project supported a resource management project in a cost effective manner and facilitated communications between community and government entities. In addition, the project sought to build community capacity and was supported in the local area.

RESULTS

Test Fishing

The 2011 fishing season was the second year for operation of the Chinook salmon drift 7.5 inch gillnet test fishery near Mountain Village. Test fishing occurred from June 7 through July 17, 2011. Although 81 individual drifts were scheduled during the season, unsafe boating and fishing conditions, because of extremely rough waters, resulted in the cancellation of 7 scheduled drifts (Table 1). Accordingly, a total of 74 drifts were conducted during the 2011 season. Test fish crew conducted individual drifts on the north bank of the mainstem Yukon River during the morning and approximately 12 hours later in the evening (Appendix Table 1). The drift schedule was altered to fish less than 12 hours between drifts when commercial fisheries were scheduled so as not to interfere with commercial fishers. In this case, drifts were conducted 3 or 4 hours prior to the onset of the commercial period. The 7 cancelled drifts were scheduled for the evening of June 20, and both morning and evening of July 5, 6, and 11. Additionally, only 1 drift was conducted during the first day of project operations, June 7, because of the late afternoon start on that day (Table 1).

Individual drifts ranged in mean fishing time (MFT) from 14 to 30 minutes (Appendix Table 1). Individual drifts generally took an average of 2 minutes to set the net out. Net soak time, the time when the net was fully deployed to the time when it was started to be retrieved, ranged from 10 to 20 minutes and averaged 16 minutes. The time for pulling and picking the fish out of the net as it was retrieved ranged from 3 to 23 minutes and averaged 8 minutes (Appendix Table 1). Additionally, location of Chinook salmon caught in the net, both horizontally and vertically, was also recorded (Appendix Table 2).

A total of 493 Chinook salmon and 325 summer chum salmon were captured and retained during the test fishing project (Table 1). Fishermen observed 18 additional Chinook salmon and 8 summer chum salmon

that dropped out of the net as it was being retrieved (Table 1). The Chinook salmon drop outs were included in the calculation of the daily CPUE but recorded as “released” in Table 1. Because sampling was limited to 30 Chinook salmon per day, a total of 429 Chinook salmon were sampled for age, sex, size, genetics, and possible hatchery contribution (Table 2). Catch and retention of Chinook salmon exceeded the 30 per day sample limit on June 16 and 22, when 46 and 78 were captured and retained, respectively (Table 1). Total daily Chinook salmon catches (retained and released) ranged from 1 caught on June 8, July 13-15, and July 17 to 80 Chinook salmon on June 22 (Table 1). During the project operation, 2 Chinook salmon with missing adipose fins were captured, retained, and sampled on June 29 (Appendix Table 3). The missing adipose fin indicated that these fish were possibly from Yukon Territory hatchery releases. The head of each fish was collected but inadvertently discarded. ASL data from individual fish, in addition to the identification of the two fish without adipose fins are noted in Appendix Table 3.

Occasional drifts were conducted along the south bank in association with the prominent sand bar to assess passage along the south bank. Test drifts were conducted on June 13, June 22, June 29, and July 12. A total of 2 Chinook salmon were captured on June 22, when 80 Chinook salmon were coincidentally captured on the north bank.

Recorded air temperature ranged from 7° C to 20° C and averaged 11° C over the course of the project (Appendix Table 2). Recorded water temperature ranged from 11° C to 17° C and averaged 15° over the course of the project (Appendix Table 2).

Catch per Unit Effort (CPUE)

The cumulative total Mountain Village Test Fish (MVTF) CPUE based on the actual catches of Chinook salmon in 2011 was 1,510.16. However, test drifts on 3 days were not conducted because of rough water. CPUE was estimated for these three days from the linear regression analysis of the 2 significant relationships between the daily LYTF CPUE versus the MVTF CPUE ($p=3.6E-06$) and the MVTF CPUE versus the sonar counts ($p=7.95E-08$; Figure 4). The estimated value for July 5, 6, and 11 were calculated based on the average of the predicted values from both linear regression analysis relationships (Table 1). Adding these estimated values into the MVTF CPUE resulted in a total cumulative CPUE of 1,579.88 (Table 1). Daily CPUE ranged from 2.79, recorded on July 13 and 15, to 208.70, recorded on June 22.

An examination of the daily CPUE indicated that Chinook salmon migrated past Mountain Village in 3 pulses of, separated by 1 or 2 days (Figure 5). The pulses at MVTF occurred during the periods: June 16-19, June 22-26, and June 26-July 8 (Figure 5). Highest CPUE was observed within the second pulse, on June 22, 208.70. The second highest CPUE, 117.55, occurred on the first day of fishing, June 7 (Figure 5). However, this relatively large CPUE was calculated from only one drift in the afternoon. I suspect that the high catch during this drift was not representative of the fish passing by Mountain Village on that day based on the CPUE and passage at the LYTF and Pilot Station sonar, respectively (Figure 5). However, small pulses were apparent in the Lower Yukon set test gillnet fishery (LYTF), and the Pilot Station sonar counts attributed to Chinook salmon on that day (Figure 5).

Salmon Migration Timing

Passage of the mid-50% of the Chinook salmon run through the Lower Yukon was very similar for all assessment projects (Figure 5). The mid-50% of the passage passed through the LYTF in 13 days, between June 16 and June 28, inclusive, for the set gillnet test fishery. The median day of passage was June 21. The mid-50% passage for the MVTF occurred between June 16 and June 26, inclusive, a period of 11 days. Median day of passage for the MVTF was 1 day later than the LYTF, June 22. The mid-50% of the run, as defined by Pilot Station sonar counts attributed to Chinook salmon, occurred from June 19

through June 30, inclusive, 12 days, with the median day of passage occurring on June 23 (Figure 5). The median day of passage for the LYTF occurred 1 run day later than expected at the MVTF site; the median day occurred at MVTF site and Pilot Station sonar on the expected day (Figure 5.)

While all three lower Yukon Chinook salmon assessment projects tracked well with each other with regard to timing and daily magnitude of the run (Figure 5), it appears that the LYTF CPUE correlated slightly better to the Pilot Station sonar counts attributed to Chinook salmon ($R^2=0.7079$; $p=8.6E-13$) than the MVTF CPUE ($R^2=0.5266$; $p=7.95E-08$; Figure 4).

Age, Sex and Length Composition

Of the 429 sets of scales taken from the Chinook salmon caught in the MVTF 86.2%, or 370 scale sets were successfully aged. In three of the four sampling periods (quartiles) of the run, male salmon were successfully aged at a slightly higher, but similar, rate than female Chinook (Table 2). The overall average success rate for aging scales that were taken from male Chinook salmon was 86.9%, while the success rate for scales taken from female Chinook salmon was 84.9% (Table 2). The sex of one age-1.4 salmon was not determined and therefore not included in these sex-related aging success percentages.

In general younger, smaller salmon were dominated by males, while the older, larger salmon were dominated by females (Figure 6 and 7). The age composition of fish sampled in the MVTF project comprised 2 major age classes, age-1.3 and age-1.4 (Table 2; Figure 7). These age classes represented brood years 2006 and 2005, with Chinook salmon returning in 2011 as 5 and 6 year old fish, respectively (Table 4). The dominant age classes in the aged sample were age-1.3, 58.6%, and age –1.4, 38.6%. Age 1.2 comprised 1.1% of the aged sample (Table 2). Male Chinook salmon dominated the age-1.3 component, 87.1%, while female Chinook salmon dominated the age 1.4 group, 60.8%. Additionally, 1 male age-2.3salmon and 4 (1%) age-2.4 salmon (2 male and 2 female) were observed in the sample. However, one of the age-2.4 female salmon had a missing adipose fin, which indicates that it may have been hatchery origin (Appendix Table 3). The origin of this salmon was not determined because the head, possibly containing a CWT, was inadvertently discarded. However, it is likely that this fish was of hatchery origin since naturally occurring missing adipose fins are rare. If this fish was indeed a Yukon hatchery-origin salmon, the apparent 2 freshwater checks may have been caused by feeding and/or release checks (Larry Dubois, ADF&G, Anchorage, personal communication). The other salmon missing an adipose was not aged because of the scale samples were regenerated (Appendix Table 3).

During the season, the percentage of sampled female Chinook salmon was relatively stable during the first three quartiles, 24.6%, 31.2%, and 23.8%, respectively, but increased to 50.5% during the fourth quartile (Table 2; Figure 8). Changes in sex ratio are directly related to the decrease of male-dominated age1.3 age class in the fourth quartile, along with an increase in female dominated age 1.4 age class in the same quartile (Figure 9). Overall, male Chinook salmon were more than twice as numerous as female Chinook salmon among those fish captured and sampled (Table 2).

The mean length of the sampled and aged sample populations was similar and not significantly different (Table 2). Most of the sampled salmon, 69.0%, were within the 3 length bins between 700 mm and 850 mm (Figure 8; Table 3). However, most of the male salmon, 81.0%, were observed in the 3 length bins between 650 mm and 800 mm. Additionally, the 700 mm to 750 mm length bin containing nearly half, 46.0%, of the sampled male Chinook salmon population (Table 3; Figure 6). Female Chinook salmon were more evenly distributed among the three length bins contained in the 800 mm to 999 mm range, ranging from 20.1% in the 900-999 mm length bin to 28.8% in the 800-850 mm length bin (Table 3; Figure 6). Chinook salmon greater than 900 mm comprised 7.9% of the sample (Table 3; Figure 6); female Chinook salmon dominated this length bin, comprising 82.4% of these largest fish (Figure 6).

Average lengths of males, by age, ranged from 640 mm for age-1.2 to 823 mm for age-1.4 (Table 2). Overall length of male Chinook salmon ranged from 570 mm to 960 mm for the same age classes. Female average length composition ranged from 580 mm for age-1.2 to 856 mm for age-1.4 salmon. Overall length of female Chinook salmon ranged from 580 mm for an age-1.2 female to 980 for an unaged female Chinook salmon (Table 2). Overall, the weighted mean age of males, 5.23 years, was younger than the weighted mean age of females, 5.76 years, in the aged sample (Table 4). Male Chinook salmon represented 67.4% of the fish sampled while females represented 32.4% (Table 3) and, similarly, 67.8% and 31.9%, respectively, of the males and female salmon aged.(Table 4).

Genetic Sampling

Genetic information is unavailable at this time. However, a genetic sample was taken from each Chinook salmon sampled for age, sex, length, 423 individuals.

Conservation and Stewardship Experience for Rural Local Residents

Local hiring of fishermen was accomplished through ACT and provided stewardship experiences by participation in the test fishery. This project provided local residents work experience and data collection training. This project supported a resource management project in a cost effective manner and facilitated communications between community and government entities. In addition, the project sought to build community capacity and was supported in the local area.

DISCUSSION

The 2011 MVTF project for Chinook salmon operated successfully during its second season. Information from this project provided valuable inseason and post season insight into the relative abundance and timing of the total Yukon River Chinook salmon run, as well as information regarding the timing of various Chinook salmon stocks through the Lower Yukon Area. This information, in conjunction with information from the LYTF and Pilot Station sonar projects provided managers and research biologists with a better understanding of the entire Chinook salmon run. In the future, information from this project will be more useful as the database grows and the utility of the data is more fully understood.

Although test fishing was conducted along both banks of the Yukon River during the first year of operation, in 2010, the vast majority, over 95%, of Chinook salmon were caught along the north bank (Sandone 2011). Because it appears that the north bank is the major migrational pathway for in this section of river, in 2011, test fishing was not routinely conducted on the south side of the river. Although there was some concern that a portion of the run moving along the south bank or north of the prominent sand bar in the test fish area would be missed, catches during the season in exploratory fishing operations failed to find substantial numbers of Chinook salmon passing on the south side of the river. In addition, nearly all of the subsistence fishers from Mountain Village fished along the north bank, upriver from the village, for Chinook salmon. From this information, we assumed that nearly all the fish migrated through this area along the north bank.

Although the MVTF project monitored the run adequately, it appears that on some days the calculated CPUEs were either smaller (June 23) or greater (June 7) than anticipated when comparing MVTF catches with LYTF and Pilot Station sonar passage estimates (Figure 4). Additionally, although both relationships were highly significant ($p < 0.0001$), calculated R^2 values for the linear regression analysis between the LYTF CPUE and Pilot Station sonar counts ($R^2 = 0.7079$) were higher than the linear regression between MVTF CPUE and Pilot Station sonar counts ($R^2 = 0.5266$; Figure 4). To possibly rectify this situation, an additional drift on the north bank of the river may be warranted for both the morning and evening drifts at the MVTF site. In 2011 all test fishing was conducted near the shore. An

additional drift in an offshore sector may provide additional samples that could possibly result in better alignment with the other two assessment programs in the lower Yukon area. However, additional drifts will result in additional Chinook salmon harvest which is may not acceptable to the management agencies. Additionally, a number of variables including size of nets used, fishery removals, variable swimming speeds, and stock compositions, could also affect the assessment of run strength and timing among the projects.

Of the 429 Chinook salmon sampled, 13.8% were not aged because the associated scale samples could not be read either because the scales were regenerated, illegible, or missing. Casual observation indicates that the aged sample is quite similar to the entire sample with respect to sex and length of fish. Additionally, the mean lengths of aged versus unaged salmon by sex were not significantly different.

Although the 7.5 inch drift gillnets used in this project do not adequately sample all lengths, we believe that the vast majority of fish moving through the area at the time of fishing operations during 2011 were susceptible to capture. Evidence supporting this assumption can be found by comparing the Pilot Station sonar test fish catch length frequency distribution to the MVTF catch length frequency distribution (Figure 9). Although a suit of six nets, ranging in size from 2.5 to 8.5 inch stretch mesh are used in test fishing operations at the Pilot Station sonar project site, the length frequency distribution of the MVTF and the Pilot Station sonar are quite similar, except for fish less than 700 mm. It appears that the smaller mesh nets used at Pilot Station catch more fish less than 700 mm than the 7.5 inch stretch mesh used at the MVTF. Interestingly, the Pilot Station and the Mountain Village test fish length frequencies are quite dissimilar to the Lower Yukon Test fish length frequency distribution, which utilizes 8.5 inch stretch mesh gear.

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Table 1. Chinook and chum salmon catches and Chinook salmon CPUE, Mountain Village drift test net fishery, June 2-July17, 2011.

Date	Chinook Salmon					Chum Salmon		
	Retained	Released ^a	Total	CPUE		Retained	Released ^a	Total
				Daily	Cumulative			
6/7/2011 ^b	22	2	24	117.55	117.55	5	0	5
6/8/2011	1	0	1	3.00	120.55	1	0	1
6/9/2011	2	1	3	9.23	129.78	3	0	3
6/10/2011	8	0	8	26.89	156.67	2	1	3
6/11/2011	5	0	5	13.90	170.57	3	0	3
6/12/2011	10	0	10	32.33	202.90	0	0	0
6/13/2011	11	0	11	26.29	229.18	2	0	2
6/14/2011	3	0	3	8.25	237.43	1	0	1
6/15/2011	30	2	32	73.19	310.62	3	0	3
6/16/2011	46	1	47	103.07	413.69	38	2	40
6/17/2011	15	2	17	60.10	473.79	7	0	7
6/18/2011	18	0	18	46.14	519.93	26	0	26
6/19/2011	25	0	25	60.53	580.45	7	1	8
6/20/2011 ^c	13	0	13	66.38	646.84	4	0	4
6/21/2011	24	2	26	68.12	714.95	49	0	49
6/22/2011	78	2	80	208.70	923.65	58	2	60
6/23/2011	30	0	30	93.58	1017.22	19	0	19
6/24/2011	21	2	23	91.52	1108.74	6	0	6
6/25/2011	15	1	16	62.25	1170.99	5	0	5
6/26/2011	14	0	14	37.41	1208.40	6	0	6
6/27/2011	10	0	10	28.57	1236.97	3	0	3
6/28/2011	5	0	5	15.49	1252.46	3	0	3
6/29/2011	22	0	22	65.63	1318.09	6	0	6
6/30/2011	3	0	3	10.60	1328.70	1	0	1
7/1/2011	11	1	12	28.88	1357.58	5	0	5
7/2/2011	6	0	6	17.56	1375.14	9	0	9
7/3/2011	11	0	11	33.31	1408.45	3	0	3
7/4/2011	3	0	3	9.24	1417.69	0	0	0
7/5/2011 ^d	na	na	na	29.46	1447.15	na	na	na
7/6/2011 ^d	na	na	na	22.91	1470.06	na	na	na
7/7/2011	5	0	5	14.29	1484.34	3	0	3
7/8/2011	10	2	12	34.46	1518.80	11	0	11
7/9/2011	4	0	4	11.43	1530.23	6	0	6
7/10/2011	4	0	4	10.00	1540.23	7	0	7

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Table 1. page 2 of 2.

Date	Chinook Salmon					Chum Salmon		
	Retained	Released ^a	Total	CPUE		Retained	Released ^a	Total
				Daily	Cumulative			
7/11/2011 ^d	na	na	na	17.35	1557.58	na	na	na
7/12/2011	2	0	2	5.71	1563.30	2	0	2
7/13/2011	1	0	1	2.79	1566.09	1	0	1
7/14/2011	1	0	1	3.08	1569.17	1	0	1
7/15/2011	1	0	1	2.79	1571.96	3	0	3
7/16/2011	2	0	2	5.00	1576.96	12	1	13
7/17/2011	1	0	1	2.93	1579.88	4	1	5
Total	493	18	511	1579.88		325	8	333

^a Includes fish that dropped out of the net while the net was being retrieved.

^b Only one drift was conducted on the first day of operations because of a late start.

^c Only one drift was conducted on this day. One drift was cancelled because of rough river water conditions. CPUE reflects the one drift conducted.

^d Test fishing was suspended because of rough river water conditions.

Daily Chinook salmon CPUE values for these days, July 5, 6, and 11 were estimated based on the average predicted values from linear regression analyses between daily LYTF CPUE vs. CPUE and daily MVTF CPUE and associated sonar counts.

Table 2. Age and sex composition and mean length by age and sex of sampled Chinook salmon captured in the Mountain Village test 7.5 inch gillnet test fishery, 2011

Brood year (age class)																	
Quartile 1						2006		2005		2004		Aged		Unaged		Quartile	
						(1.2)		(1.3)		(1.4)				Total		Total	
Sample Dates				% Aged		N		%		N		%		N		%	
7-Jun - 16-Jun	Male		85.9%	0	0.0	64	61.5	14	13.5	79	76.0	13	10.7	92	75.4		
			Female	83.3%	0	0.0	9	8.7	15	14.4	25	24.0	5	4.1	30	24.6	
			Subtotal	85.2%	0	0.0	73	70.2	29	27.9	104	100.0	18	14.8	122	100.0	
	Male Mean Length		-		719		808		734		745		736				
			-		4		11		5		13		5				
			-	-	615	795	735	890	615	890	680	860	615	890			
	n			0		64		14		79		13		92			
	Female Mean Length		-		781		863		832		866		838				
			-		21		10		13		17		11				
			-	-	690	920	890	945	690	890	830	910	690	945			
n			0		9		15		25		5		30				

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Table 2. Page 2 of 5

Brood year (age class)																	
Quartile 2					2006		2005		2004		Aged		Unaged		Quartile		
					(1.2)		(1.3)		(1.4)		Total		Total		Total		
Sample Dates			% Aged	N	%	N	%	N	%	N	%	N	%	N	%	N	%
17-Jun - 22-Jun	Male	86.0%	0	0.0	55	51.9	18	17.0	74	69.8	12	9.6	86	68.8			
	Female	82.1%	0	0.0	10	9.4	22	20.8	32	30.2	7	5.6	39	31.2			
	Subtotal	84.8%	0	0.0	65	61.3	40	37.7	106	100.0	19	15.2	125	100.0			
	Male Mean Length			-		725		819		749		727		746			
	SE			-		6		9		7		18		6			
	Range			-	-	650	920	730	890	650	920	650	825	650	920		
	n			0		55		18		74		12		86			
	Female Mean Length			-		790		845		828		851		832			
	SE			-		15		8		11				10			
	Range			-	-	705	890	890	940	695	920	0	0	695	970		
	n			0		10		22		32		7		39			

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Brood year (age class)																		
Quartile 3 ^a						2006		2005		2004		Aged		Unaged		Quartile		
						(1.2)		(1.3)		(1.4)		Total		Total		Total		
Sample Dates				% Aged	N	%	N	%	N	%	N	%	N	%	N	%	N	%
23-Jun - 26-Jun	Male			88.5%	2	2.7	38	51.4	13	17.6	54	73.0	7	8.6	61	75.3		
	Female			100.0%	1	1.4	1	1.4	17	23.0	19	25.7	0	0.0	19	23.5		
	Subtotal			91.4%	3	4.1	39	52.7	31	41.9	74	100.0	7	8.6	81	100.0		
	Male Mean Length				625		725		822		745		719		742			
	SE				55		7		13		9		19		8			
	Range				570 - 680		620 - 830		760 - 920		570 - 920		650 - 780		570 - 920			
	n				2		38		13		54		7		61			
	Female Mean Length				580		730		838		819		-		819			
SE				-		-		12		19		-		19				
Range				- -		- -		920 - 940		580 - 920		- -		580 - 940				
n				1		1		17		19		0		19				

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Brood year (age class)																	
Quartile 4					2006		2005		2004		Aged		Unaged		Quartile		
					(1.2)		(1.3)		(1.4)		Total		Total		Total		
Sample Dates			% Aged	N	%	N	%	N	%	N	%	N	%	N	%	N	%
27-Jun - 17-Jul	Male	88.0%	1	1.2	32	37.2	11	12.8	44	51.2	6	5.9	50	49.5			
	Female	82.4%	0	0.0	8	9.3	33	38.4	42	48.8	9	8.9	51	50.5			
	Subtotal	85.1%	1	1.2	40	46.5	44	51.2	86	100.0	15	14.9	101	100.0			
	Male Mean Length		670		727		849		756		790		760				
	SE		-		7		21		11		50		11				
	Range		-	-	660	835	780	960	660	960	690	955	660	960			
	n		1		32		11		44		6		50				
	Female Mean Length		-		768		870		850		867		853				
	SE		-		9		10		9		24		8				
	Range		-	-	735	800	935	935	735	960	765	980	735	980			
	n		0		8		33		42		9		51				

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Season ^a		Brood year (Age class)												
		2006		2005		2004		Aged Total		Unaged Total		Season Total		
		(1.2)		(1.3)		(1.4)								
Sample Dates		% Aged	N	%	N	%	N	%	N	%	N	%	N	%
7-Jun - 17-Jul	Male	86.9%	3	0.8	189	51.1	56	15.1	251	67.8	38	8.9	289	67.4
	Female	84.9%	1	0.3	28	7.6	87	23.5	118	31.9	21	4.9	139	32.4
	Total	86.2%	4	1.1	217	58.6	144	38.9	370	100.0	59	13.8	429	100.0
Male Mean Length			640		723		823		745		742		744	
SE			35		3		7		4		10		4	
Range			570	680	615	920	730	960	570	960	650	955	570	960
n			3		189		56		251		38		289	
Female Mean Length			580		779		856		835		862		839	
SE			-		9		6		6		14		6	
Range			-	-	690	920	695	945	580	960	760	980	580	980
n			1		28		87		118		21		139	

^a Includes one age-1.4 fish in quartile 2 that was not assigned a sex.

Table 3. Length frequency distribution of sampled Chinook salmon captured in the Mountain Village test drift 7.5 inch gillnet fishery, 2011.^a

Length Bins (mm)	Total Caught		Males		Females	
	number	%	number	%	number	%
<650	6	1.4	5	1.2	1	0.2
650-699	50	11.7	48	11.2	2	0.5
700-750	143	33.3	133	31.0	10	2.3
751-799	76	17.7	53	12.4	23	5.4
800-850	77	17.9	37	8.6	40	9.3
851-899	43	10.0	7	1.6	35	8.2
900-999	34	7.9	6	1.4	28	6.5
≥1,000	0	0.0	0	0.0	0	0.0
Total	429	100.0	289	67.4	139	32.4
Mean length (mm)		775		744		839

^a Includes one fish in the 851-899 length bin that was not assigned a sex.

Table 4. Length frequency distribution and mean age of aged Chinook salmon from the Mountain Village test drift Chinook salmon test fishery, 7.5 in stretch mesh gillnets, 2011.^a

Length Bins (mm)	Total Aged			Males			Females		
	number	%	mean age	number	%	mean age	number	%	mean age
<650	6	1.6	4.67	5	1.4	4.80	1	0.3	4.00
650-699	39	10.5	5.00	37	10.0	4.98	2	0.5	5.50
700-750	132	35.7	5.05	122	33.0	5.02	10	2.7	5.42
751-799	61	16.5	5.34	42	11.4	5.36	19	5.1	5.32
800-850	69	18.6	5.90	34	9.2	5.91	35	9.5	5.89
851-899	36	9.7	5.97	6	1.6	6.00	29	7.8	5.97
900-999	27	7.3	5.93	5	1.4	5.80	22	5.9	5.95
≥1,000	0	0.0	NA	0	0.0	NA	0	0.0	NA
Total or mean	370	100.0	5.40	251	67.8	5.23	118	31.9	5.76
% aged	86.2			86.9			84.9		
Mean length (mm)		774			745			835	

^a Includes one fish in the 851-899 length bin that was not assigned a sex.

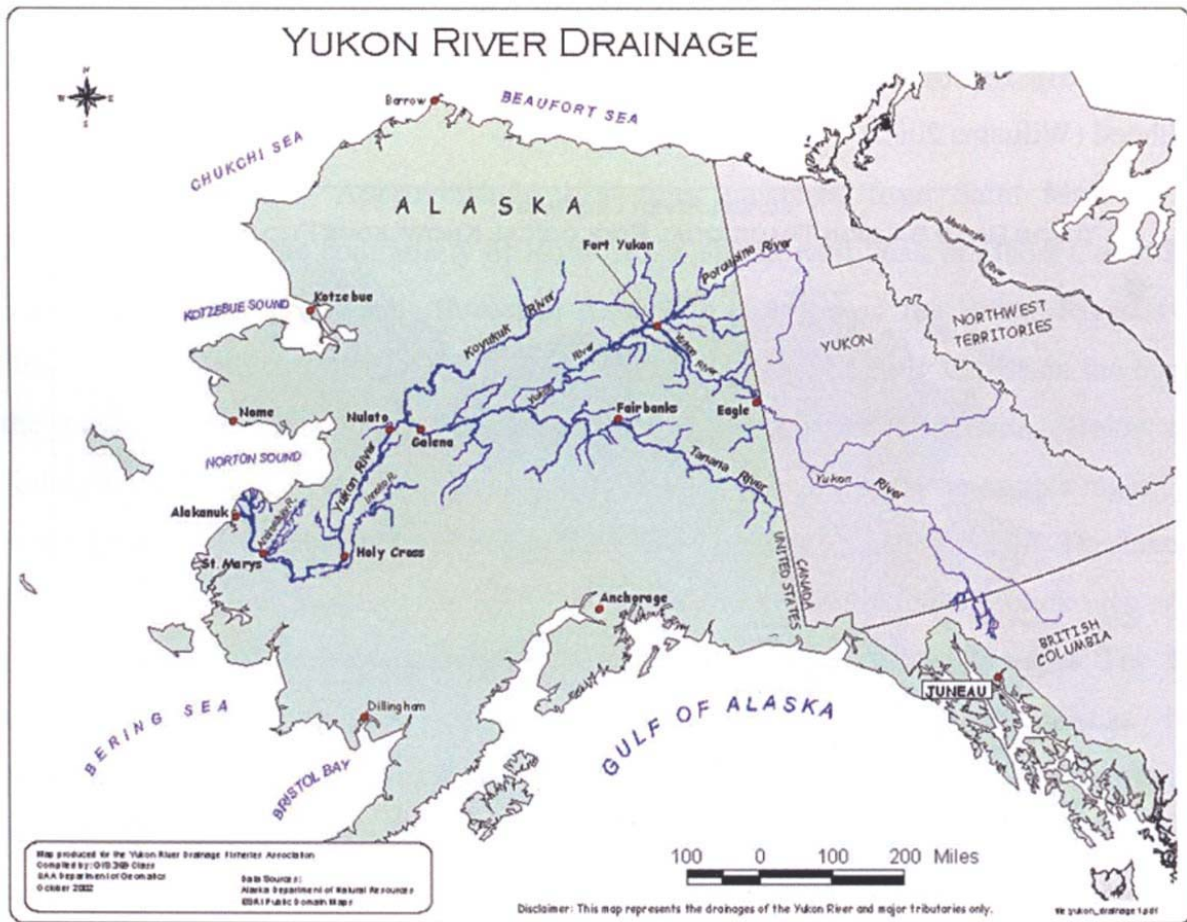


Figure 1. Map of the Yukon River drainage

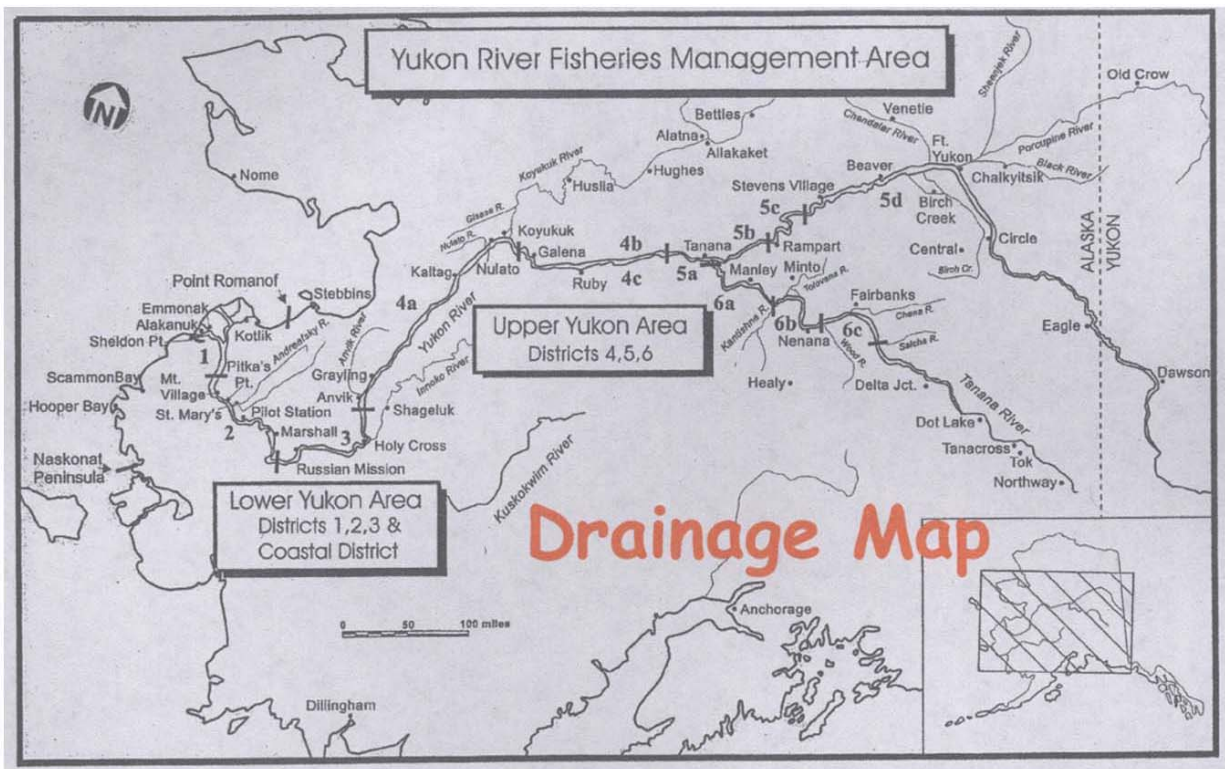


Figure 2. Map of the Alaskan portion of the Yukon River drainage depicting the Alaska Department of Fish and Game commercial fisheries management districts and communities.

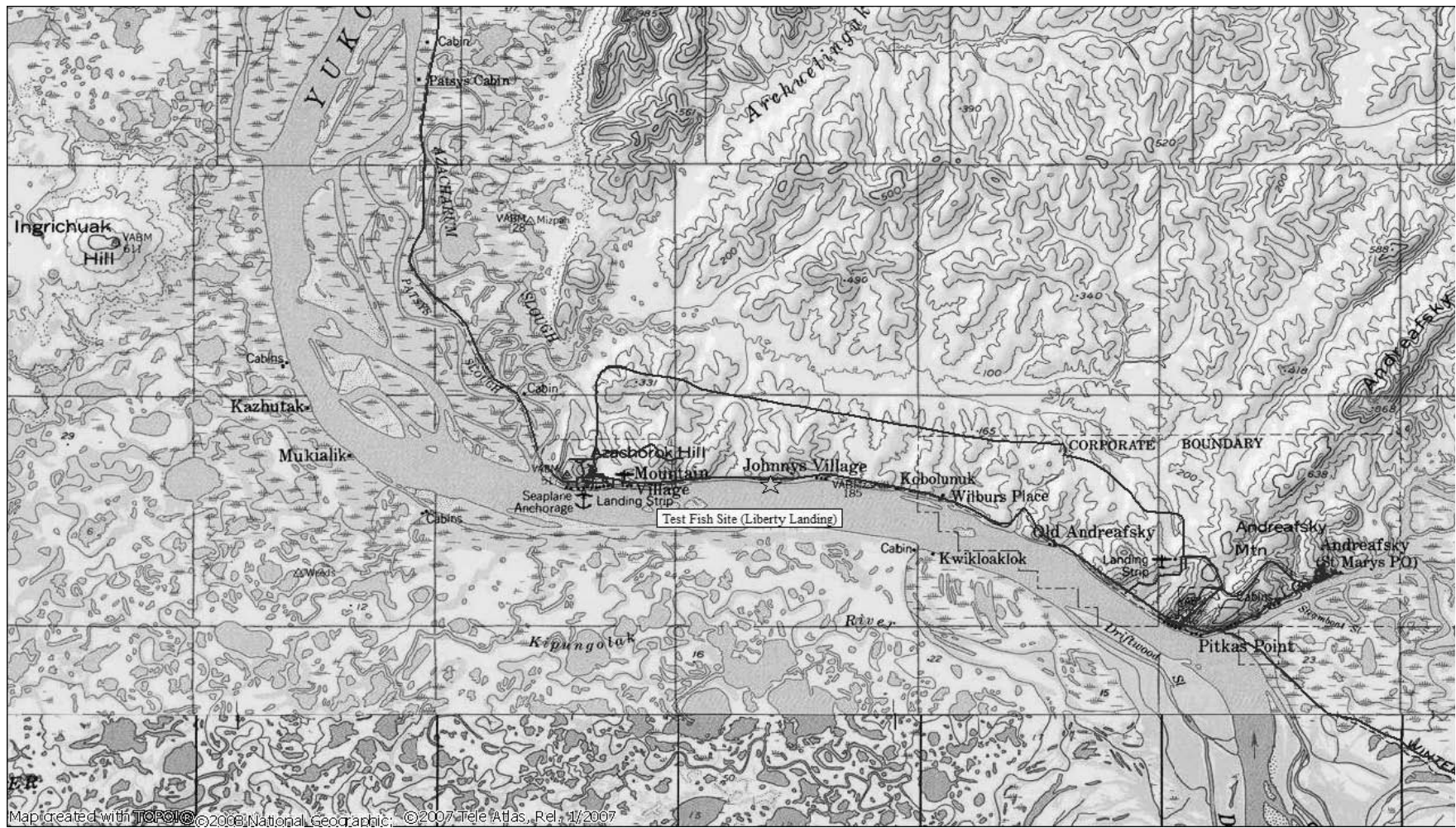


Figure 3. Map of Yukon River in the Mountain Village vicinity, with drift site.

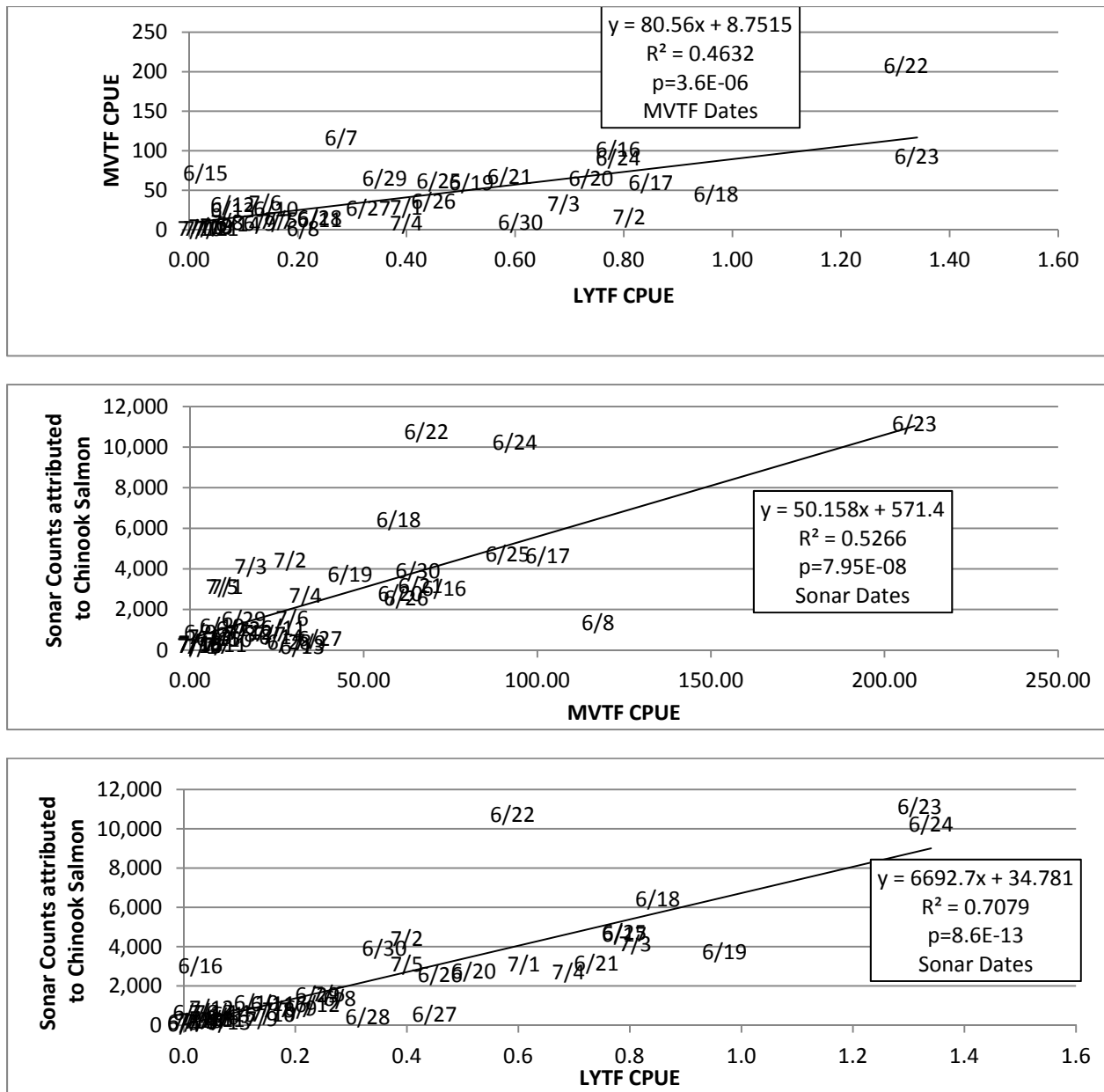


Figure 4. . Linear regression analyses: MVTF CPUE vs. LYTF CPUE (top); Pilot Station sonar counts attributed to Chinook salmon vs. MVTF CPUE (middle); and LYTF CPUE vs. Pilot Station sonar counts attributed to Chinook salmon (lower) 2011.

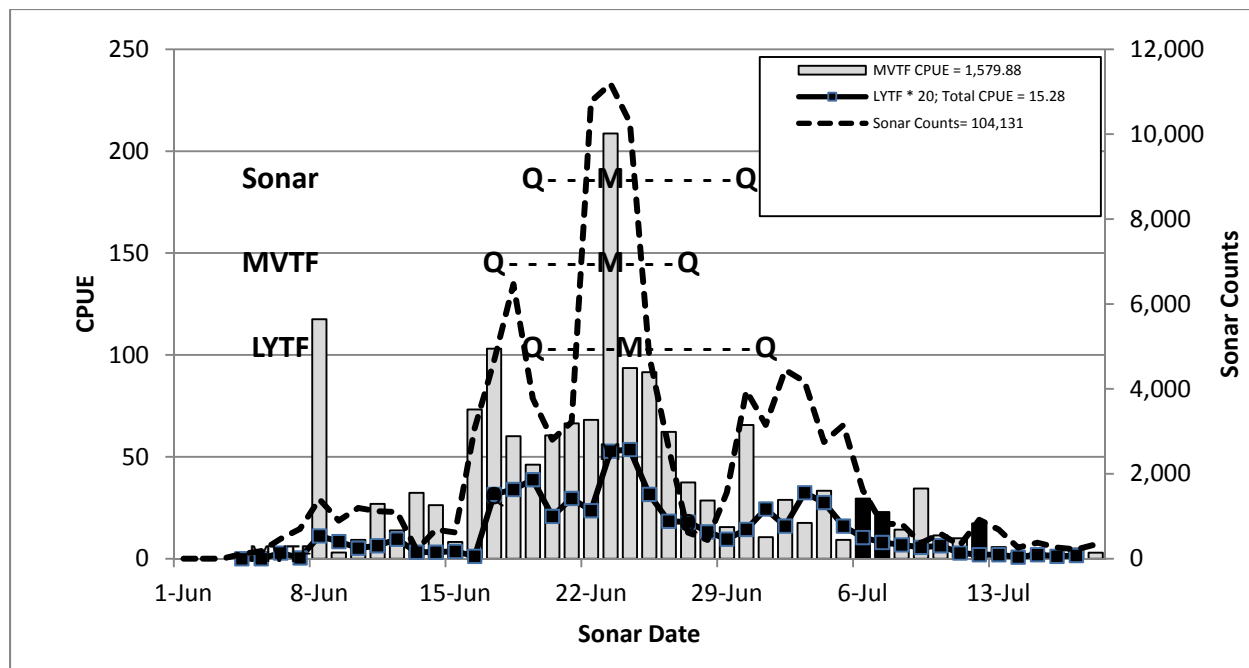


Figure 5. Comparison of Lower Yukon and Mountain Village Chinook salmon test fish catch per unit effort (CPUE) and Pilot Station sonar counts attributed to Chinook salmon, 2011. Quartile days are indicated by Q-M-Q for each project. Solid bars for the MVTF CPUE are estimated values. Note that the dates are adjusted to reflect the run at Pilot Station sonar. The LYTF and MVTF timing is adjusted for travel time. LYTF travel time is 3 days (lagged 3 days); while the MVTF travel time is 1 day to the sonar site (lagged 1 day).

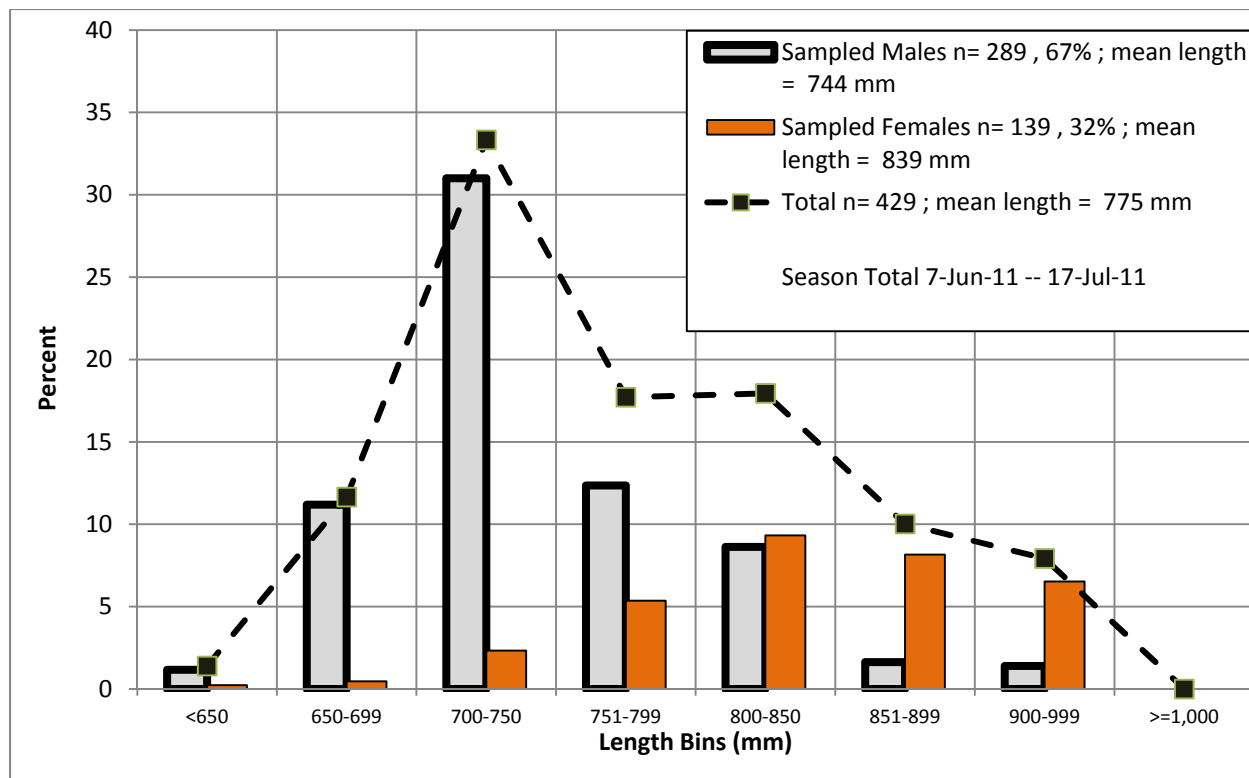


Figure 6. Frequency of sampled Chinook salmon by sex and length bin, and total number sampled by length bin, Mountain Village Chinook salmon test fishery, 2011.

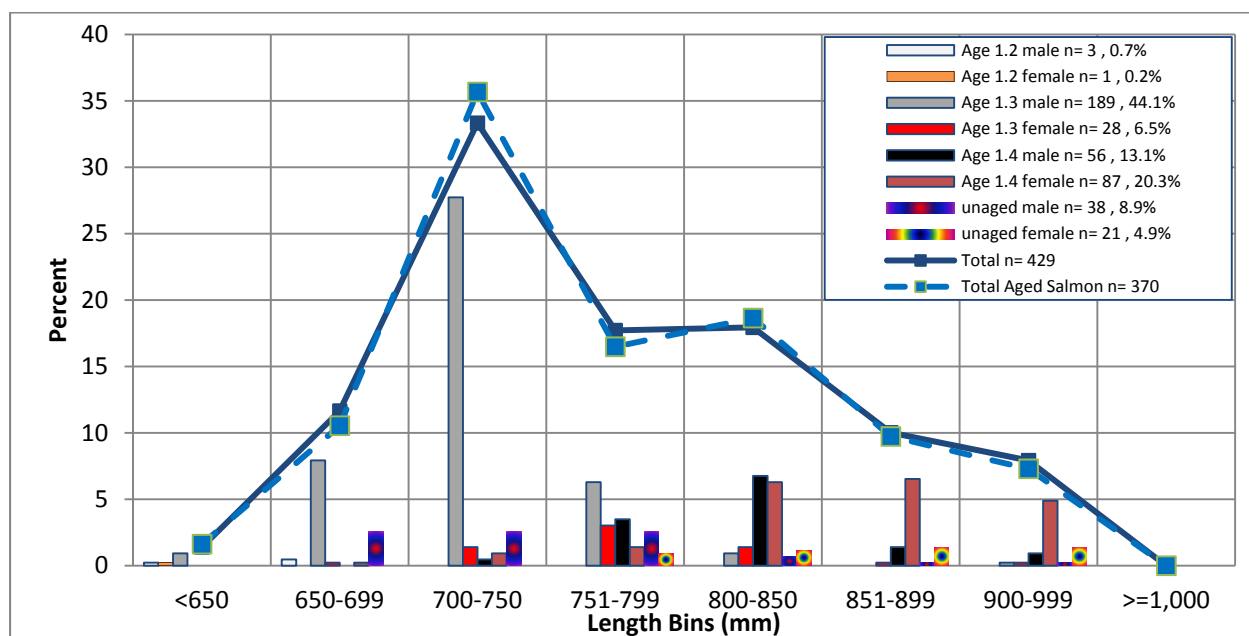


Figure 7. Frequency of Chinook salmon sampled by age and sex, Mountain Village Chinook salmon test fishery, 2011.

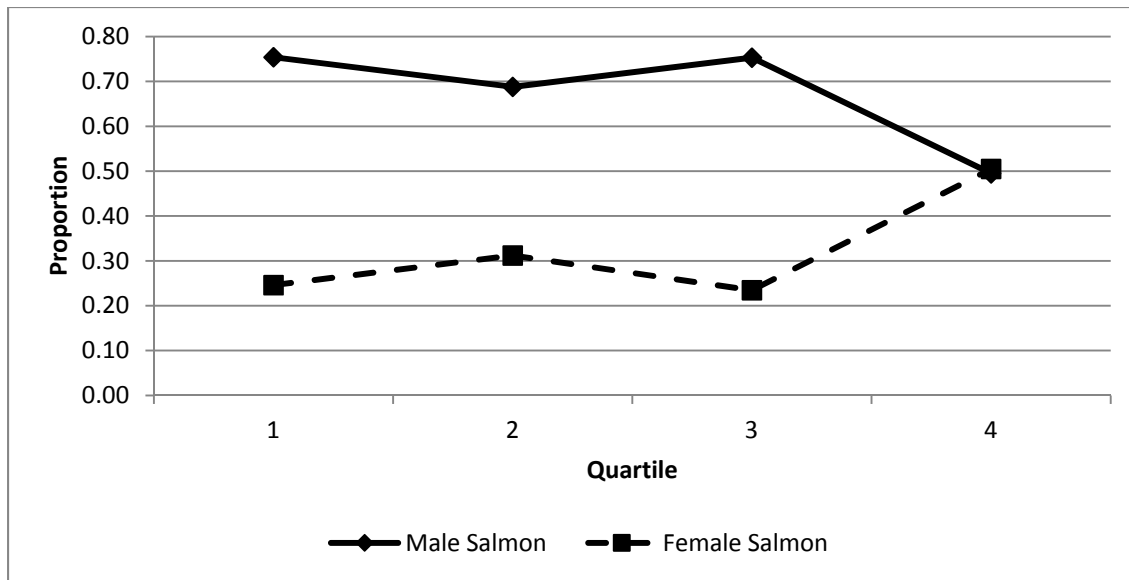


Figure 8. Proportion of female and male Chinook salmon sampled, by quartile, from the Mountain Village drift test net catch, 2011.

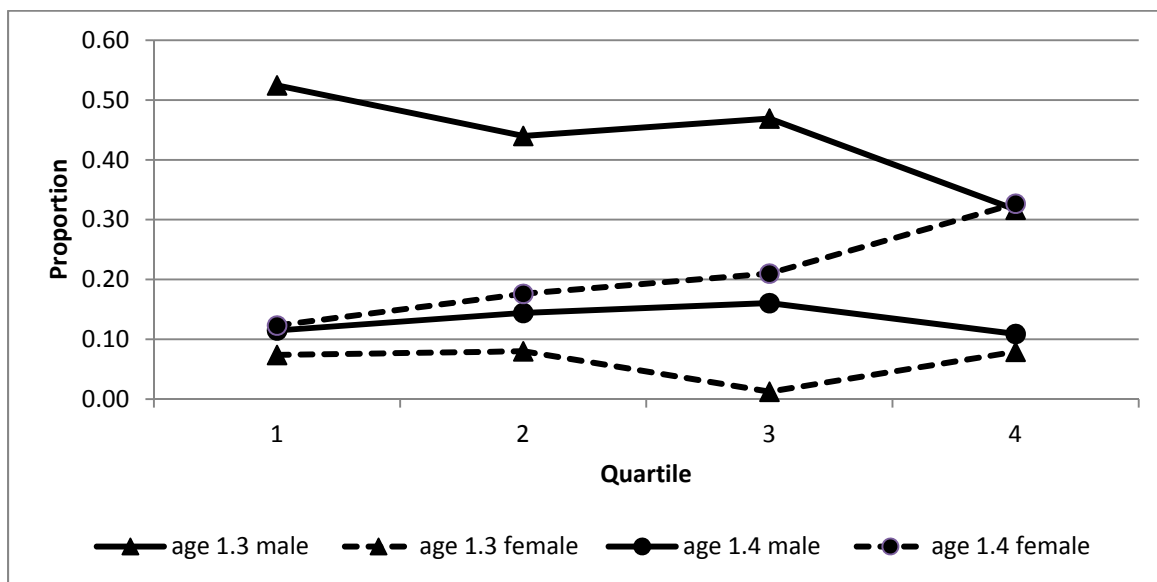


Figure 9. Proportion of male and female Chinook salmon, by quartile and dominant age classes, age-1.3 and age-1.4, sampled from the Mountain Village drift test fish catch, 2011.

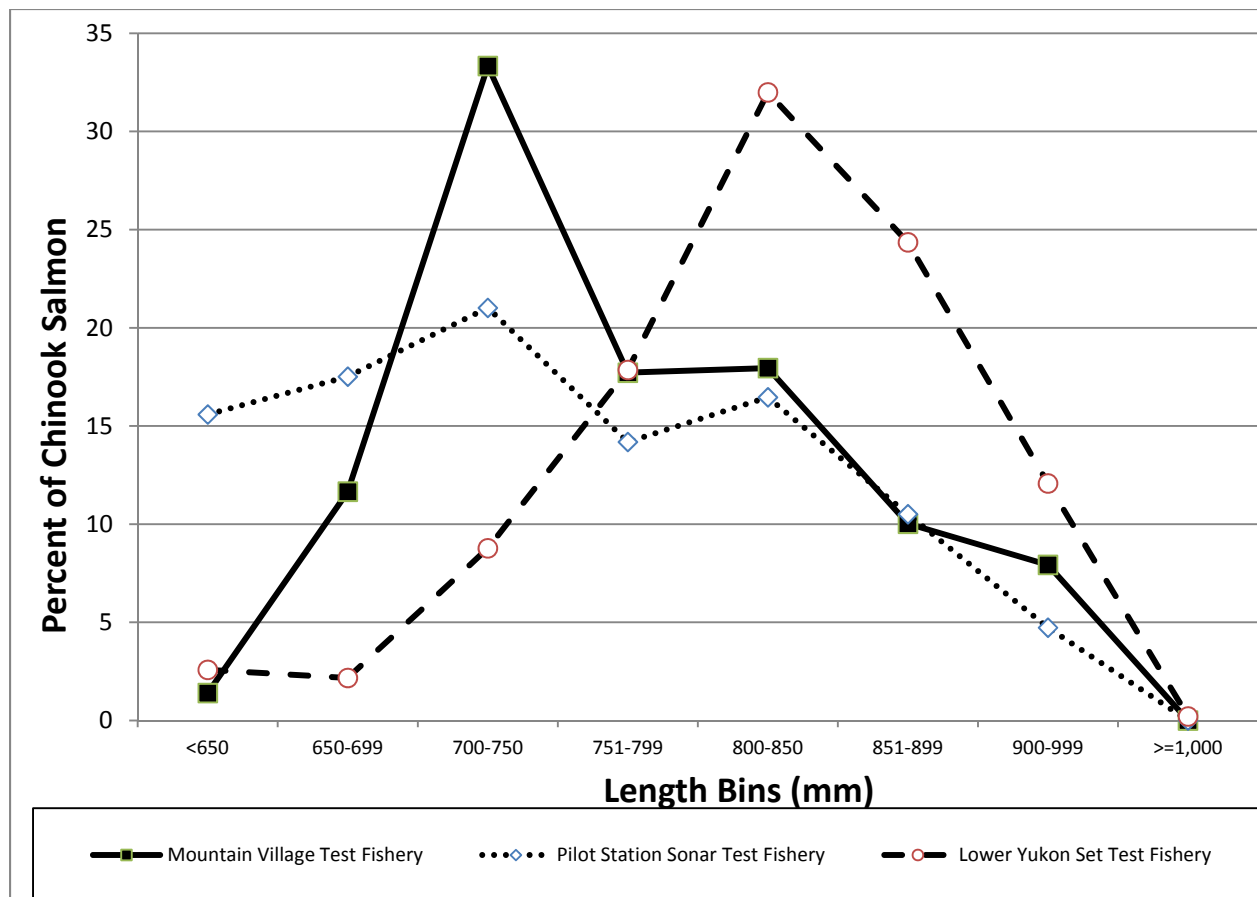


Figure 10. Comparison of length frequency distribution of test fish catches among the Lower Yukon, Mountain Village, and Pilot Station sonar projects, 2011. Note that ADF&G data from the Lower Yukon and Pilot Station test fish projects are preliminary and subject to change.

Appendix Table 1. Chinook salmon drift test fish log, Mountain Village, Alaska, June 7 - July 17, 2011.

Fishing Time							Catch								
							Chinook Salmon				Summer Chum Salmon				Other
Date	Drift No.	Start Net Out	Net Full Out	Start Net In	Net Full In	Mean Fishing Time ^a	Total Kept	Total Release	Total Drop-out	Total Catch	Total Kept	Total Release	Total Drop-out	Total Catch	Total Catch
7-Jun	1	14:26	14:30	14:45	15:00	24.50	22	0	2	24	5	0	0	5	3
8-Jun	2	8:05	8:08	8:23	8:30	20.00	1	0	0	1	1	0	0	1	0
8-Jun	3	20:16	20:19	20:31	20:40	18.00	0	0	0	0	0	0	0	0	0
9-Jun	4	8:13	8:16	8:30	8:38	19.50	2	0	1	3	2	0	0	2	0
9-Jun	5	20:18	20:21	20:35	20:40	18.00	0	0	0	0	1	0	0	1	0
10-Jun	6	9:11	9:14	9:25	9:34	17.00	6	0	0	6	2	0	1	3	0
10-Jun	7	20:27	20:31	20:45	20:55	21.00	2	0	0	2	0	0	0	0	0
11-Jun	8	9:34	9:37	9:51	10:04	22.00	3	0	0	3	3	0	0	3	0
11-Jun	9	21:32	21:34	21:51	21:57	21.00	2	0	0	2	0	0	0	0	0
12-Jun	10	9:30	9:33	9:45	9:53	17.50	8	0	0	8	0	0	0	0	0
12-Jun	11	21:25	21:28	21:48	21:54	24.50	2	0	0	2	0	0	0	0	0
13-Jun	12	9:16	9:18	9:37	9:49	26.00	8	0	0	8	2	0	0	2	1
13-Jun	13	21:03	21:05	21:25	21:29	23.00	3	0	0	3	0	0	0	0	0
14-Jun	14	8:52	8:54	9:11	9:18	21.50	1	0	0	1	1	0	0	1	0
14-Jun	15	21:05	21:08	21:25	21:32	22.00	2	0	0	2	0	0	0	0	0
15-Jun	16	8:35	8:36	8:53	9:00	21.00	5	0	0	5	0	0	0	0	0
15-Jun	17	20:35	20:37	20:54	21:13	27.50	25	0	2	27	3	0	0	3	0
16-Jun	18	10:36	10:38	10:55	11:05	23.00	13	0	0	13	11	0	0	11	0
16-Jun	19	20:28	20:30	20:47	21:10	29.50	33	0	1	34	27	0	2	29	0
17-Jun	20	8:48	8:50	9:00	9:09	15.50	7	0	2	9	2	0	0	2	0
17-Jun	21	21:09	21:11	21:26	21:32	19.00	8	0	0	8	5	0	0	5	0
18-Jun	22	9:10	9:12	9:27	9:43	24.00	13	0	0	13	16	0	0	16	0
18-Jun	23	20:55	20:57	21:14	21:22	22.00	5	0	0	5	10	0	0	10	0
19-Jun	24	9:25	9:28	9:45	9:49	20.50	1	0	0	1	0	0	1	1	0
19-Jun	25	19:25	19:28	19:45	19:58	25.00	24	0	0	24	7	0	0	7	0
20-Jun	26	8:50	8:53	9:10	9:20	23.50	13	0	0	13	4	0	0	4	0
20-Jun	27	na	na	na	na	na	na	na	na	na	na	na	na	na	na

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Appendix Table 1. Page 2 of 3.

Fishing Time							Catch								
							Chinook Salmon				Summer Chum Salmon				Other
Date	Drift No.	Start Net Out	Net Full Out	Start Net In	Net Full In	Mean Fishing Time ^a	Total Kept	Total Release	Total Drop-out	Total Catch	Total Kept	Total Release	Total Drop-out	Total Catch	Total Catch
21-Jun	28	8:40	8:42	8:59	9:08	22.50	5	0	0	5	2	0	0	2	0
21-Jun	29	19:14	19:16	19:33	19:43	23.00	19	0	2	21	47	0	0	47	0
22-Jun	30	8:40	8:42	8:59	9:09	23.00	32	0	2	34	33	0	2	35	0
22-Jun	31	20:01	20:03	20:20	20:30	23.00	46	0	0	46	25	0	0	25	0
23-Jun	32	8:40	8:41	8:58	9:08	22.50	16	0	0	16	4	0	0	4	0
23-Jun	33	20:54	20:56	21:06	21:17	16.50	14	0	0	14	15	0	0	15	0
24-Jun	34	9:04	9:06	9:16	9:25	15.50	15	0	2	17	5	0	0	5	0
24-Jun	35	21:06	21:07	21:17	21:24	14.00	6	0	0	6	1	0	0	1	0
25-Jun	36	10:28	10:30	10:40	10:48	15.00	8	0	1	9	1	0	0	1	0
25-Jun	37	20:53	20:55	21:05	21:15	16.00	7	0	0	7	4	0	0	4	0
26-Jun	38	5:40	5:43	5:56	6:10	21.50	7	0	0	7	3	0	0	3	0
26-Jun	39	17:29	17:33	17:50	17:59	23.50	7	0	0	7	3	0	0	3	0
27-Jun	40	8:38	8:41	8:57	9:04	21.00	10	0	0	10	3	0	0	3	0
27-Jun	41	20:23	20:24	20:40	20:45	19.00	0	0	0	0	0	0	0	0	0
28-Jun	42	7:19	7:22	7:38	7:43	20.00	3	0	0	3	3	0	0	3	0
28-Jun	43	15:32	15:34	15:47	15:56	18.50	2	0	0	2	0	0	0	0	0
29-Jun	44	8:32	8:35	8:52	8:56	20.50	5	0	0	5	5	0	0	5	0
29-Jun	45	20:42	20:44	21:00	21:06	20.00	17	0	0	17	1	0	0	1	0
30-Jun	46	8:26	8:28	8:38	8:44	14.00	1	0	0	1	0	0	0	0	0
30-Jun	47	8:44	8:46	9:02	9:06	19.00	2	0	0	2	1	0	0	1	0
1-Jul	48	8:17	8:20	8:36	8:52	25.50	10	0	1	11	4	0	0	4	0
1-Jul	49	8:49	8:51	9:08	9:12	20.00	1	0	0	1	1	0	0	1	0
2-Jul	50	10:10	10:13	10:30	10:34	20.50	0	0	0	0	3	0	0	3	0
2-Jul	51	1:32	1:34	1:50	1:57	20.50	6	0	0	6	6	0	0	6	0
3-Jul	52	9:11	9:13	9:29	9:34	19.50	4	0	0	4	3	0	0	3	1
3-Jul	53	20:34	20:36	20:52	20:58	20.00	7	0	0	7	0	0	0	0	0

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Appendix Table 1. Page 3 of 3.

Fishing Time							Catch								
		(A)	(B)	(C)	(D)	(E)	Chinook Salmon				Summer Chum Salmon				Other
Date	Drift No.	Start Net Out	Net Full Out	Start Net In	Net Full In	Mean Fishing Time ^a	Total Kept	Total Release	Total Drop-out	Total Catch	Total Kept	Total Release	Total Drop-out	Total Catch	Total Catch
4-Jul	54	9:04	9:06	9:22	9:26		2	0	0	2	0	0	0	0	0
4-Jul	55	20:21	20:23	20:38	20:47	20.50	1	0	0	1	0	0	0	0	0
5-Jul	56	na	na	na	na	na	na	na	na	na	na	na	na	na	na
5-Jul	57	na	na	na	na	na	na	na	na	na	na	na	na	na	na
6-Jul	58	na	na	na	na	na	na	na	na	na	na	na	na	na	na
6-Jul	59	na	na	na	na	na	na	na	na	na	na	na	na	na	na
7-Jul	60	8:08	8:10	8:27	8:30	19.50	0	0	0	0	0	0	0	0	0
7-Jul	61	16:07	16:09	16:24	16:34	21.00	5	0	0	5	3	0	0	3	0
8-Jul	62	9:57	10:00	10:17	10:25	22.50	5	0	1	6	3	0	0	3	0
8-Jul	63	21:01	21:05	21:17	21:28	19.50	5	0	1	6	8	0	0	8	0
9-Jul	64	9:22	9:24	9:41	9:47	21.00	3	0	0	3	5	0	0	5	0
9-Jul	65	21:44	21:45	22:03	22:08	21.00	1	0	0	1	1	0	0	1	0
10-Jul	66	8:59	9:02	9:19	9:30	24.00	4	0	0	4	5	0	0	5	0
10-Jul	67	13:10	13:12	13:29	13:34	20.50	0	0	0	0	2	0	0	2	0
11-Jul	68	na	na	na	na	na	na	na	na	na	na	na	na	na	na
11-Jul	69	na	na	na	na	na	na	na	na	na	na	na	na	na	na
12-Jul	70	9:16	9:19	9:36	9:41	21.00	1	0	0	1	1	0	0	1	0
12-Jul	71	21:50	21:52	22:09	22:15	21.00	1	0	0	1	1	0	0	1	0
13-Jul	72	9:56	9:58	10:15	10:22	21.50	1	0	0	1	0	0	0	0	0
13-Jul	73	19:56	19:58	20:15	20:21	21.00	0	0	0	0	1	0	0	1	0
14-Jul	74	9:23	9:25	9:42	9:48	21.00	0	0	0	0	0	0	0	0	0
14-Jul	75	21:31	21:32	21:49	21:53	19.50	1	0	0	1	1	0	0	1	0
15-Jul	76	8:41	8:43	9:00	9:03	19.50	0	0	0	0	0	0	0	0	0
15-Jul	77	22:58	23:00	23:17	23:24	21.50	1	0	0	1	3	0	0	3	0
16-Jul	78	9:50	9:53	10:10	10:21	24.00	2	0	0	2	10	0	1	11	0
16-Jul	79	7:49	7:52	8:09	8:16	22.00	0	0	0	0	2	0	0	2	0
17-Jul	80	7:32	7:35	7:52	8:01	23.00	0	0	0	0	2	0	1	3	0
17-Jul	81	22:17	22:19	22:36	22:41	20.50	1	0	0	1	2	0	0	2	0

^a Mean Fishing Time (E) = (C-B) + [(B-A) + (D-C)]/2

^b sheefish

^c Sockeye salmon

Appendix Table 2. Weather, fishing conditions, and location of salmon caught in drift gillnet, Chinook salmon Mountain Village drift test fish log, Mountain Village, Alaska, June 7 - July 17, 2011.

Date	Drift no.	Temperature (°C)		Wind		cloud cover (%)	Precip.	Water Cond	Horizontal location of Chinook salmon caught in net (proportion)			Vertical location of Chinook salmon caught in net (proportion)		
		Water	Air	Direction	speed (mph)				inshore	midnet	offshore	cork	middle	leadline
7-Jun	1	13	10	E	15	100	scattered	choppy	0.14	0.27	0.59	0.41	0.14	0.45
8-Jun	2	13	11	SE	2	50	none	calm	1.00	0.00	0.00	0.00	0.00	1.00
8-Jun	3	13	11	SE	10	100	none	slight chop	na	na	na	na	na	na
9-Jun	4	13	11	calm	0	50	none	calm	0.33	0.33	0.33	0.00	0.67	0.33
9-Jun	5	13	12	SE	2	50	none	calm	na	na	na	na	na	na
10-Jun	6	16	13	calm	0	100	none	calm	0.50	0.50	0.00	0.17	0.67	0.17
10-Jun	7	14	15	SE	5	75	scattered	slight chop	0.50	0.50	0.00	0.00	0.00	1.00
11-Jun	8	14	12	SE	5	95	none	calm	0.00	0.67	33.00	0.00	0.67	0.33
11-Jun	9	14	17	calm	0	90	none	calm	0.50	0.00	0.50	0.00	1.00	0.00
12-Jun	10	14	12	E	5	30	none	calm	0.13	0.75	0.13	0.13	0.50	0.38
12-Jun	11	15	16	calm	0	100	none	calm	0.00	0.50	0.50	0.00	0.50	0.50
13-Jun	12	15	12	N	2	100	scattered	calm	0.25	0.50	0.25	0.00	0.50	0.50
13-Jun	13	15	14	SW	12	90	scattered	slight chop	0.67	0.33	0.00	0.00	0.00	1.00
14-Jun	14	15	11	SW	10-20	100	drizzle	slight chop	1.00	0.00	0.00	0.00	0.00	1.00
14-Jun	15	14	10	SW	20-25	100	none	choppy	0.00	1.00	0.00	0.00	1.00	0.00
15-Jun	16	15	9	W	10-20	80	none	choppy	0.25	0.50	0.25	0.00	0.20	0.80
15-Jun	17	15	16	W	2-3	50	none	calm	0.30	0.40	0.30	0.10	0.30	0.60
16-Jun	18	15	12	E	3-5	60	none	calm	0.25	0.50	0.25	0.00	0.20	0.80
16-Jun	19	15	16	E	5	80	none	calm	0.10	0.60	0.30	0.20	0.20	0.60

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Appendix Table 2. Page 2 of 5.

Date	Drift no.	Temperature (°C)		Wind		cloud cover (%)	Precip.	Water Cond	Horizontal location of Chinook salmon caught in net (proportion)			Vertical location of Chinook salmon caught in net (proportion)		
		Water	Air	Direction	speed (mph)				inshore	midnet	offshore	cork	middle	leadline
17-Jun	20	15	12	calm	0	75	none	calm	0.30	0.70	0.00	0.20	0.30	0.50
17-Jun	21	16	20	calm	0	30	none	calm	0.40	0.40	0.20	0.10	0.40	0.50
18-Jun	22	16	13	S	2	90	none	calm	0.2	0.60	0.20	0.10	0.30	0.60
18-Jun	23	16	18	W	5	75	none	slight chop	0.20	0.60	0.20	0.00	0.30	0.70
19-Jun	24	16	12	NW	5	100	drizzle	slight chop	1.00	0.00	0.00	0.00	0.00	1.00
19-Jun	25	16	17	NW	10-15	50	none	little rough	0.30	0.50	0.20	0.04	0.16	0.80
20-Jun	26	15	11	NW	15-20	100	none	rough	0.30	0.60	0.10	0.00	0.40	0.60
20-Jun	27 ^a	na	na	na	na	na	na	very rough	na	na	na	na	na	na
21-Jun	28	15	8	NW	15-25	100	drizzle	rough	0.20	0.80	0.00	0.00	0.20	0.80
21-Jun	29	16	10	W	10-20	100	none	little rough	0.10	0.60	0.30	0.00	0.30	0.70
22-Jun	30	15	8	W	5-10	100	drizzle	slight chop	0.20	0.40	0.40	0.10	0.40	0.50
22-Jun	31	15	10	W	10-15	100	none	choppy	0.10	0.50	0.40	0.20	0.30	0.50
23-Jun	32	15	10	calm	calm	100	none	calm	0.40	0.60	0.00	0.10	0.40	0.50
23-Jun	33	15	12	SW	5	100	none	calm	0.30	0.50	0.20	0.20	0.50	0.30
24-Jun	34	15	13	N	5	100	none	calm	0.30	0.60	0.10	0.33	0.33	0.34
24-Jun	35	16	16	calm	calm	100	scattered	calm	0.50	0.50	0.00	0.00	0.50	0.50
25-Jun	36	11	11	S	2	10	none	calm	0.50	0.50	0.00	0.00	0.50	0.50
25-Jun	37	17	16	SW	10	80	none	little rough	0.30	0.50	0.20	0.00	0.20	0.80
26-Jun	38	15	12	E	2	75	none	calm	0.33	0.33	0.34	0.00	0.25	0.75

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Appendix Table 2. Page 3 of 5.

Date	Drift no.	Temperature (°C)		Wind		cloud cover (%)	Precip.	Water Cond	Horizontal location of Chinook salmon caught in net (proportion)			Vertical location of Chinook salmon caught in net (proportion)		
		Water	Air	Direction	speed (mph)				inshore	midnet	offshore	cork	middle	leadline
26-Jun	39	17	16	SE	10	100	drizzle	choppy	0.00	0.75	0.25	0.10	0.20	0.70
27-Jun	40	17	12	E	5	100	drizzle	choppy	0.00	0.75	0.25	0.20	0.20	0.60
27-Jun	41	14	10	S	10	100	rain	choppy	0	0.00	0.00	0.00	0.00	0.00
28-Jun	42	13	8	SE	5	100	light rain	choppy	0.33	0.33	0.33	0.00	0.00	1.00
28-Jun	43	14	10	calm	0	95	none	calm	0.50	0.50	0.00	0.00	0.00	1.00
29-Jun	44	14	8	SW	15	100	drizzle	choppy	0.25	0.50	0.25	0.00	0.50	0.50
29-Jun	45	16	14	W	20	65	none	rough	0.33	0.33	0.33	0.00	0.00	1.00
30-Jun	46	13	9	W	30	100	none	very rough	0.00	1.00	0.00	0.00	1.00	0.00
30-Jun	47	12	10	W	30	100	none	very rough	0.00	0.00	1.00	0.00	0.00	1.00
1-Jul	48	12	7	W	5	100	none	calm	0.00	1.00	0.00	0.00	0.00	1.00
1-Jul	49	16	10	N	10	80	none	choppy	0.00	0.00	1.00	0.00	0.00	1.00
2-Jul	50	14	11	NE	5	40	none	calm	0.00	0.00	0.00	0.00	0.00	0.00
3-Jul	51	16	9	W	10	100	none	calm	0.00	0.50	0.50	0.33	0.00	0.66
3-Jul	52	14	9	N	10	100	rain	calm	0.00	0.50	0.50	0.00	0.00	1.00
3-Jul	53	15	10	N	25	30	none	choppy	0.00	0.50	0.50	0.00	0.50	0.50
4-Jul	54	14	8	S	5	80	none	calm	0.00	1.00	0.00	0.00	0.00	1.00
4-Jul	55	15	10	S	25	100	rain	rough	1.00	0.00	0.00	1.00	0.00	0.00
5-Jul	56 ^a	na	na	na	na	na	na	very rough	na	na	na	na	na	na

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Appendix Table 2. Page 4 of 5.

Date	Drift no.	Temperature (°C)		Wind			Precip.	Water Cond	Horizontal location of Chinook salmon caught in net (proportion)			Vertical location of Chinook salmon caught in net (proportion)		
		Water	Air	Direction	speed (mph)	cloud cover (%)			inshore	midnet	offshore	cork	middle	leadline
5-Jul	57 ^a	na	na	na	na	na	na	very rough	na	na	na	na	na	na
6-Jul	58 ^a	na	na	na	na	na	na	very rough	na	na	na	na	na	na
6-Jul	59 ^a	na	na	na	na	na	na	very rough	na	na	na	na	na	na
7-Jul	60	13	9	SE	15-20	100	rain	choppy	0.00	0.00	0.00	0.00	0.00	0.00
7-Jul	61	14	12	SE	15	100	rain	choppy	1.00	0.00	0.00	0.00	0.50	0.50
8-Jul	62	15	11	SE	10	100	none	slight chop	0.40	0.40	0.20	0.20	0.20	0.60
8-Jul	63	16	14	SE	15	100	rain	choppy	0.33	0.67	0.00	0.00	0.33	0.67
9-Jul	64	14	11	SE	15	100	rain	choppy	0.00	0.00	1.00	0.00	0.00	1.00
9-Jul	65	16	13	S	10	100	none	sight chop	0.00	1.00	0.00	0.00	0.00	1.00
10-Jul	66	14	10	S	5-10	50	none	calm	0.00	0.50	0.50	0.00	0.00	1.00
10-Jul	67	16	9	S	10	100	none	calm	0.00	1.00	0.00	0.00	0.00	1.00
11-Jul	68 ^a	na	na	na	na	na	na	very rough	na	na	na	na	na	na
11-Jul	69 ^a	na	na	na	na	na	na	very rough	na	na	na	na	na	na
12-Jul	70	14	10	SW	15	100	light rain	choppy	0.00	0.00	0.00	0.00	0.00	0.00
12-Jul	71	16	11	SW	15	100	light rain	choppy	0.00	1.00	0.00	0.00	0.00	1.00
13-Jul	72	14	9	SW	15	100	light rain	choppy	1.00	0.00	0.00	0.00	0.00	1.00
13-Jul	73	14	11	SW	15	100	drizzle	choppy	0.00	0.00	0.00	0.00	0.00	0.00
14-Jul	74	14	9	W	10	100	none	slight chop	0.00	0.00	0.00	0.00	0.00	0.00

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Appendix Table 2. Page 5 of 5.

Date	Drift no.	Temperature (°C)		Wind		cloud cover (%)	Precip.	Water Cond	Horizontal location of Chinook salmon caught in net (proportion)			Vertical location of Chinook salmon caught in net (proportion)		
		Water	Air	Direction	speed (mph)				inshore	midnet	offshore	cork	middle	leadline
14-Jul	75	13	8	W	15	100	rain	choppy	0.00	1.00	0.00	0.00	0.00	1.00
15-Jul	76	14	9	W	5-10	100	none	choppy	0.00	0.00	0.00	0.00	0.00	0.00
15-Jul	77	14	8	W	10	75	none	choppy	0	1.00	0.00	0.00	0.00	1.00
16-Jul	78	13	8	W	10	80	none	slight chop	0.00	1.00	0.00	0.00	0.00	1.00
16-Jul	79	14	11	W	5	80	none	calm	0.00	0.00	0.00	0.00	0.00	0.00
17-Jul	80	14	9	E	5	100	none	calm	0.00	0.00	0.00	0.00	0.00	0.00
17-Jul	81	14	8	W	20	100	none	choppy	0.00	1.00	0.00	0.00	0.00	1.00

a No test fishing was conducted during these scheduled drifts because of unsafe boating conditions as a result of extremely rough water.

Appendix Table 3. Length (mm), sex, and age of individual sampled Chinook salmon by date and scale and fish number, Mountain Village Chinook salmon test fishery, June 7-July 17, 2011.

Date	Scale Card	Fish Number	Sex	MEFT ^a length (mm)	Age	Scale Comment	Genetic Vial Number	Quartile
7-Jun	1	1	M	740	1.3		1	1
7-Jun	1	2	M	720	1.3		2	1
7-Jun	1	3	F	755	1.3		3	1
7-Jun	1	4	M	695	1.3		4	1
7-Jun	1	5	M	740	1.3		5	1
7-Jun	1	6	F	825	1.4		6	1
7-Jun	1	7	F	785	1.3		7	1
7-Jun	1	8	M	710	1.3		8	1
7-Jun	1	9	M	710	1.3		9	1
7-Jun	1	10	M	705	1.3		10	1
7-Jun	2	1	F	800	1.4		11	1
7-Jun	2	2	M	745	1.3		12	1
7-Jun	2	3	M	740	1.3		13	1
7-Jun	2	4	M	735		regenerated	14	1
7-Jun	2	5	M	720	1.3		15	1
7-Jun	2	6	M	750	1.3		16	1
7-Jun	2	7	M	790	1.4		17	1
7-Jun	2	8	M	665	1.3		18	1
7-Jun	2	9	M	810	1.4		19	1
7-Jun	2	10	M	690	1.3		20	1
7-Jun	3	1	M	615	1.3		21	1
7-Jun	3	2	M	650	1.3		22	1
8-Jun	4	1	M	740	1.3		23	1
9-Jun	5	1	M	790	1.4		24	1
9-Jun	5	2	F	840	1.4		25	1
10-Jun	6	1	M	860		regenerated	26	1
10-Jun	6	2	F	780	1.3		27	1
10-Jun	6	3	M	690		regenerated	28	1
10-Jun	6	4	F	830	2.4		29	1
10-Jun	6	5	F	875	1.4		30	1
10-Jun	6	6	M	825	1.4		31	1
10-Jun	7	1	M	670	1.3		32	1
10-Jun	7	2	F	785	1.3		33	1
11-Jun	8	1	M	770		illegible	34	1
11-Jun	8	2	F	920	1.3		35	1
11-Jun	8	3	M	730	1.3		36	1

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Date	Scale Card	Fish Number	Sex	MEFT ^a length (mm)	Age	Scale Comment	Genetic Vial Number	Quartile
11-Jun	9	2	F	820	1.4		38	1
11-Jun	9	3	M	730	1.3		39	1
12-Jun	10	1	M	770		regenerated	40	1
12-Jun	10	2	F	860		regenerated	41	1
12-Jun	10	3	M	780	1.4		42	1
12-Jun	10	4	F	690	1.3		43	1
12-Jun	10	5	M	770	1.4		44	1
12-Jun	10	6	F	920	1.4		45	1
12-Jun	10	7	M	760		regenerated	46	1
12-Jun	10	8	M	730	1.3		47	1
12-Jun	11	1	F	830		regenerated	48	1
12-Jun	11	2	M	710	1.3	regenerated	49	1
13-Jun	12	1	M	770	1.4		50	1
13-Jun	12	2	F	880	1.4		51	1
13-Jun	12	3	F	945	1.4		52	1
13-Jun	12	4	F	830		regenerated	53	1
13-Jun	12	5	M	750	1.3		54	1
13-Jun	12	6	M	735	1.3		55	1
13-Jun	12	7	F	900		regenerated	56	1
13-Jun	12	8	M	770		missing	57	1
13-Jun	13	1	M	890	1.4		58	1
13-Jun	13	2	M	860	1.4		59	1
13-Jun	13	3	M	835	1.4		60	1
14-Jun	14	1	M	695	2.3		61	1
14-Jun	14	2	M	750	1.3		62	1
14-Jun	14	3	M	680	1.3		63	1
15-Jun	15	1	M	760	1.3		64	1
15-Jun	15	2	M	725	1.3		65	1
15-Jun	15	3	M	720	1.3		66	1
15-Jun	15	4	M	720	1.3		67	1
15-Jun	15	5	M	720	1.3		68	1
15-Jun	15	6	M	825	1.4		69	1
15-Jun	15	7	M	710	1.3		70	1
15-Jun	15	8	M	790	1.3		71	1
15-Jun	15	9	M	725	1.3		72	1
15-Jun	15	10	F	895	1.4		73	1

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Date	Scale Card	Fish Number	Sex	MEFT ^a length (mm)	Age	Scale Comment	Genetic Vial Number	Quartile
15-Jun	16	1	F	740	1.3		74	1
15-Jun	16	2	M	750	1.3		75	1
15-Jun	16	3	M	705	1.3		76	1
15-Jun	16	4	M	735	1.4		77	1
15-Jun	16	5	M	710	1.3		78	1
15-Jun	16	6	M	690	1.3		79	1
15-Jun	16	7	M	700	1.3		80	1
15-Jun	16	8	M	710	1.3		81	1
15-Jun	16	9	M	790	1.3		82	1
15-Jun	16	10	M	705	1.3		83	1
15-Jun	17	1	M	685	1.3		84	1
15-Jun	17	2	F	820	1.4		85	1
15-Jun	17	3	M	800	1.4		86	1
15-Jun	17	4	F	910		regenerated	87	1
15-Jun	17	5	M	770	1.3		88	1
15-Jun	17	6	M	745		regenerated	89	1
15-Jun	17	7	M	690		regenerated	90	1
15-Jun	17	8	M	705	1.3		91	1
15-Jun	17	9	F	760	1.3		92	1
15-Jun	17	10	M	720	1.3		93	1
16-Jun	18	1	M	735	1.3		94	1
16-Jun	18	2	F	820	1.4		95	1
16-Jun	18	3	M	635	1.3		96	1
16-Jun	18	4	M	720	1.3		97	1
16-Jun	18	5	F	880	1.4		98	1
16-Jun	18	6	M	680	1.3		99	1
16-Jun	18	7	M	730		regenerated	100	1
16-Jun	18	8	M	835	1.4		101	1
16-Jun	18	9	M	735	1.3		102	1
16-Jun	18	10	F	815	1.3		103	1
16-Jun	19	1	M	710	1.3		104	1
16-Jun	19	2	M	705	1.3		105	1
16-Jun	19	3	F	810	1.4		106	1
16-Jun	19	4	F	920	1.4		107	1
16-Jun	19	5	M	735	1.3		108	1
16-Jun	19	6	M	720	1.3		109	1

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Date	Scale Card	Fish Number	Sex	MEFT ^a length (mm)	Age	Scale Comment	Genetic Vial Number	Quartile
16-Jun	19	7	M	720		regenerated	110	1
16-Jun	19	8	M	715	1.3		111	1
16-Jun	19	9	M	680		regenerated	112	1
16-Jun	19	10	M	730	1.3		113	1
16-Jun	20	1	M	795	1.3		114	1
16-Jun	20	2	M	705	1.3		115	1
16-Jun	20	3	M	740	1.3		116	1
16-Jun	20	4	M	690	1.3		117	1
16-Jun	20	5	M	770		regenerated	118	1
16-Jun	20	6	M	745	1.3		119	1
16-Jun	20	7	M	720	1.3		120	1
16-Jun	20	8	F	890	1.4		121	1
16-Jun	20	9	M	710	1.3		122	1
16-Jun	20	10	M	750	1.3		123	1
17-Jun	21	1	F	790	1.4		124	2
17-Jun	21	2	M	720	1.3		125	2
17-Jun	21	3	M	810	1.4		126	2
17-Jun	21	4	M	845	1.4		127	2
17-Jun	21	5	M	730	1.3		128	2
17-Jun	21	6	M	680	1.3		129	2
17-Jun	21	7	M	725	1.3		130	2
17-Jun	21	8	F	810	1.3		131	2
17-Jun	21	9	M	710	1.3		132	2
17-Jun	21	10	M	780	1.3		133	2
17-Jun	22	1	F	840	1.4		134	2
17-Jun	22	2	M	695	1.3		135	2
17-Jun	22	3	M	710	1.3		136	2
17-Jun	22	4	M	730	1.4		137	2
17-Jun	22	5	F	890	1.4		138	2
18-Jun	23	1	F	900	1.4		139	2
18-Jun	23	2	M	800	1.4		140	2
18-Jun	23	3	F	845	1.4		141	2
18-Jun	23	4	M	680		regenerated	142	2
18-Jun	23	5	M	690	1.3		143	2
18-Jun	23	6	F	805		regenerated	144	2
18-Jun	23	7	M	710	1.3		145	2

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Date	Scale Card	Fish Number	Sex	MEFT ^a length (mm)	Age	Scale Comment	Genetic Vial Number	Quartile
18-Jun	23	8	M	745	1.3		146	2
18-Jun	23	9	M	775	1.3		147	2
18-Jun	23	10	M	670		regenerated	148	2
18-Jun	24	1	M	720	1.3		149	2
18-Jun	24	2	M	675	1.3		150	2
18-Jun	24	3	M	725	1.3		151	2
18-Jun	24	4	M	710	1.3		152	2
18-Jun	24	5	M	845	1.4		153	2
18-Jun	24	6	M	810	1.4		154	2
18-Jun	24	7	M	720	1.3		155	2
18-Jun	24	8	M	920	1.3		156	2
19-Jun	25	1	M	810	2.4		157	2
19-Jun	25	2	M	730	1.3		158	2
19-Jun	25	3	M	670	1.3		159	2
19-Jun	25	4	F	920	1.4		160	2
19-Jun	25	5	M	830	1.3		161	2
19-Jun	25	6	M	720	1.3		162	2
19-Jun	25	7	F	940	1.4		163	2
19-Jun	25	8	F	820	1.4		164	2
19-Jun	25	9	F	970		regenerated	165	2
19-Jun	25	10	F	880	1.4		166	2
19-Jun	26	1	M	730	1.3		167	2
19-Jun	26	2	F	890		regenerated	168	2
19-Jun	26	3	M	700	1.3		169	2
19-Jun	26	4	M	820	1.4		170	2
19-Jun	26	5	F	830	1.4		171	2
19-Jun	26	6	F	870		regenerated	172	2
19-Jun	26	7	F	810	1.4		173	2
19-Jun	26	8	M	820	1.4		174	2
19-Jun	26	9	M	790	1.3		175	2
19-Jun	26	10	M	870	1.4		176	2
19-Jun	27	1	M	870	1.4		177	2
19-Jun	27	2	M	740	1.3		178	2
19-Jun	27	3	M	710	1.3		179	2
19-Jun	27	4	M	660	1.3		180	2
19-Jun	27	5	F	750	1.3		181	2

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Date	Scale Card	Fish Number	Sex	MEFT ^a length (mm)	Age	Scale Comment	Genetic Vial Number	Quartile
20-Jun	28	1	F	790	1.4		182	2
20-Jun	28	2	M	740		regenerated	183	2
20-Jun	28	3	M	650	1.3		184	2
20-Jun	28	4	M	710	1.3		185	2
20-Jun	28	5	F	845	1.4		186	2
20-Jun	28	6	F	770	1.3		187	2
20-Jun	28	7	M	750	1.3		188	2
20-Jun	28	8	F	760		regenerated	189	2
20-Jun	28	9	M	750	1.3		190	2
20-Jun	28	10	M	750		regenerated	191	2
20-Jun	29	1	M	700	1.3		192	2
20-Jun	29	2	M	830	1.4		193	2
20-Jun	29	3	M	650		regenerated	194	2
21-Jun	30	1	F	770	1.3		195	2
21-Jun	30	2	F	870	1.4		196	2
21-Jun	30	3	M	720	1.3		197	2
21-Jun	30	4	M	825	1.4		198	2
21-Jun	30	5	F	900	1.4		199	2
21-Jun	30	6	M	770		regenerated	200	2
21-Jun	30	7	F	895	1.4		201	2
21-Jun	30	8	M	715	1.3		202	2
21-Jun	30	9	F	705	1.3		203	2
21-Jun	30	10	F	890	1.3		204	2
21-Jun	31	1	F	695	1.4		205	2
21-Jun	31	2	M	695		regenerated	206	2
21-Jun	31	3	M	700	1.3		207	2
21-Jun	31	4	M	785	1.4		208	2
21-Jun	31	5	M	680	1.3		209	2
21-Jun	31	6	M	650		regenerated	210	2
21-Jun	31	7	M	770	1.3		211	2
21-Jun	31	8	M	735	1.3		212	2
21-Jun	31	9	M	820	1.4		213	2
21-Jun	31	10	M	810		regenerated	214	2
21-Jun	32	1	M	790	1.4		215	2
21-Jun	32	2	M	700		regenerated	216	2
21-Jun	32	3	M	720	1.3		217	2

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Date	Scale Card	Fish Number	Sex	MEFT ^a length (mm)	Age	Scale Comment	Genetic Vial Number	Quartile
21-Jun	32	4	M	695	1.3		218	2
22-Jun	33	1	M	745	1.3		219	2
22-Jun	33	2	M	825		illegible	220	2
22-Jun	33	3	M	800	1.4		221	2
22-Jun	33	4	F	820	1.3		222	2
22-Jun	33	5	M	780	1.3		223	2
22-Jun	33	6	M	690	1.3		224	2
22-Jun	33	7	M	730	1.3		225	2
22-Jun	33	8	F	880		regenerated	226	2
22-Jun	33	9	M	680	1.3		227	2
22-Jun	33	10	F	850	1.4		228	2
22-Jun	34	1	F	800	1.3		229	2
22-Jun	34	2	M	700	1.3		230	2
22-Jun	34	3	F	790	1.3		231	2
22-Jun	34	4	F	820	1.4		232	2
22-Jun	34	5	M	690	1.3		233	2
22-Jun	34	6	M	765	1.3		234	2
22-Jun	34	7	M	790	1.3		235	2
22-Jun	34	8	M	780	1.4		236	2
22-Jun	34	9	M	705	1.3		237	2
22-Jun	34	10	F	795	1.3		238	2
22-Jun	35	1	M	705	1.3		239	2
22-Jun	35	2	M	730	1.3		240	2
22-Jun	35	3	F	785		regenerated	241	2
22-Jun	35	4	F	860	1.4		242	2
22-Jun	35	5	M	705	1.3		243	2
22-Jun	35	6	M	720	1.3		244	2
22-Jun	35	7	M	890	1.4		245	2
22-Jun	35	8	F	705	1.4		246	2
22-Jun	35	9	M	780		regenerated	247	2
22-Jun	35	10	F	890	1.4		248	2
23-Jun	36	1	M	790	1.3		249	3
23-Jun	36	2	F	860	1.4		250	3
23-Jun	36	3	F	760	1.4		251	3
23-Jun	36	4	M	705	1.3		252	3
23-Jun	36	5	M	850	1.4		253	3

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Date	Scale Card	Fish Number	Sex	MEFT ^a length (mm)	Age	Scale Comment	Genetic Vial Number	Quartile
23-Jun	36	6	F	820	1.4		254	3
23-Jun	36	7	M	790	1.3		255	3
23-Jun	36	8	M	770	1.3		256	3
23-Jun	36	9	F	870	1.4		257	3
23-Jun	36	10	M	765	1.4		258	3
23-Jun	37	1	M	850	1.4		259	3
23-Jun	37	2	M	700	1.3		260	3
23-Jun	37	3	M	710	1.3		261	3
23-Jun	37	4	F	850	1.4		262	3
23-Jun	37	5	M	660	1.3		263	3
23-Jun	37	6	M	820	1.4		264	3
23-Jun	37	7	F	890	1.4		265	3
23-Jun	37	8	F	880	1.4		266	3
23-Jun	37	9	M	650		regenerated	267	3
23-Jun	37	10	M	720	1.3		268	3
23-Jun	38	1	F	900	1.4		269	3
23-Jun	38	2	F	730	1.3		270	3
23-Jun	38	3	F	900	1.4		271	3
23-Jun	38	4	M	720	1.3		272	3
23-Jun	38	5	M	805	1.3		273	3
23-Jun	38	6	M	730	1.3		274	3
23-Jun	38	7	M	570	1.2		275	3
23-Jun	38	8	M	715	2.4		276	3
23-Jun	38	9	M	780	1.3		277	3
23-Jun	38	10	M	680	1.2		278	3
24-Jun	39	1	M	710	1.3		279	3
24-Jun	39	2	M	730	1.3		280	3
24-Jun	39	3	F	725	1.4		281	3
24-Jun	39	4	F	740	1.4		282	3
24-Jun	39	5	M	850	1.4		283	3
24-Jun	39	6	M	640	1.3		284	3
24-Jun	39	7	M	920	1.4		285	3
24-Jun	39	8	M	810	1.4		286	3
24-Jun	39	9	M	700	1.3		287	3
24-Jun	39	10	M	770	1.3		288	3
24-Jun	40	1	M	780		regenerated	289	3

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Date	Scale Card	Fish Number	Sex	MEFT ^a length (mm)	Age	Scale Comment	Genetic Vial Number	Quartile
24-Jun	40	2	F	840	1.4		290	3
24-Jun	40	3	M	680	1.3		291	3
24-Jun	40	4	M	680	1.3		292	3
24-Jun	40	5	M	760	1.4		293	3
24-Jun	40	6	M	730	1.3		294	3
24-Jun	40	7	M	735		regenerated	295	3
24-Jun	40	8	M	850	1.4		296	3
24-Jun	40	9	M	770		regenerated	297	3
24-Jun	40	10	M	730	1.3		298	3
24-Jun	41	1	M	730	1.3		299	3
25-Jun	42	1	F	830	1.4		300	3
25-Jun	42	2	F	790	1.4		301	3
25-Jun	42	3	M	770	1.3		302	3
25-Jun	42	4	M	700	1.3		303	3
25-Jun	42	5	M	690	1.3		304	3
25-Jun	42	6	F	940	1.4		305	3
25-Jun	42	7	M	770	1.4		306	3
25-Jun	42	8	M	620	1.3		307	3
25-Jun	42	9	M	720	1.3		308	3
25-Jun	42	10	U	860	1.4		309	3
25-Jun	43	1	M	850	1.4		310	3
25-Jun	43	2	F	580	1.2		311	3
25-Jun	43	3	M	705		regenerated	312	3
25-Jun	43	4	M	660		regenerated	313	3
25-Jun	43	5	M	720	1.3		314	3
25-Jun	43	6	M	730	1.3		315	3
26-Jun	44	1	M	830	1.4		316	3
26-Jun	44	2	M	760	1.4		317	3
26-Jun	44	3	M	730		regenerated	318	3
26-Jun	44	4	M	730	1.3		319	3
26-Jun	44	5	F	830	1.4		320	3
26-Jun	44	6	M	830	1.3		321	3
26-Jun	44	7	M	740	1.3		322	3
26-Jun	44	8	M	735	1.3		323	3
26-Jun	44	9	M	715	1.3		324	3
26-Jun	44	10	M	725	1.3		325	3

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Date	Scale Card	Fish Number	Sex	MEFT ^a length (mm)	Age	Scale Comment	Genetic Vial Number	Quartile
26-Jun	45	1	F	825	1.4		326	3
26-Jun	45	2	M	755	1.3		327	3
26-Jun	45	3	M	685	1.3		328	3
26-Jun	45	4	M	715	1.3		329	3
27-Jun	46	1	F	765	1.3		330	4
27-Jun	46	2	M	705	1.3		331	4
27-Jun	46	3	F	870	1.4		332	4
27-Jun	46	4	F	790	1.4		333	4
27-Jun	46	5	F	875	1.4		334	4
27-Jun	46	6	M	745	1.3		335	4
27-Jun	46	7	F	745	1.4		336	4
27-Jun	46	8	M	785	1.4		337	4
27-Jun	46	9	M	770	1.3		338	4
27-Jun	46	10	F	800	1.3		339	4
28-Jun	47	1	F	825	1.4		340	4
28-Jun	47	2	M	755	1.3		341	4
28-Jun	47	3	M	770	1.3		342	4
28-Jun	47	4	F	910	1.4		343	4
28-Jun	47	5	F	895	1.4		344	4
29-Jun	48	1	M	665	1.3		345	4
29-Jun	48	2	F	895		regenerated	346	4
29-Jun	48	3	F	805	1.4		347	4
29-Jun	48	4	M	755	1.3		348	4
29-Jun	48	5	F	765		regenerated	349	4
29-Jun	48	6	F	915	1.4		350	4
29-Jun	48	7	M	755	1.3		351	4
29-Jun	48	8	M	745	1.3		352	4
29-Jun	48	9	M	705	1.3		353	4
29-Jun	48	10	M	775		regenerated	354	4
29-Jun	49	1	M	765	1.3		355	4
29-Jun	49	2	M	730	1.3		356	4
29-Jun	49	3	F	880	1.4		357	4
29-Jun	49	4	F	925		regenerated	358	4
29-Jun	49	5	M	755	1.3		359	4
29-Jun	49	6	F	865	1.4		360	4
29-Jun	49	7	M	705	1.3		361	4

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Date	Scale Card	Fish Number	Sex	MEFT ^a length (mm)	Age	Scale Comment	Genetic Vial Number	Quartile
29-Jun ^b	49	8	F	825		regenerated	362	4
29-Jun	49	9	F	910	1.4		363	4
29-Jun	49	10	M	825	1.4		364	4
29-Jun	50	1	F	795	1.4		365	4
29-Jun ^{b,c}	50	2	F	815	2.4	possibly 0.4	366	4
30-Jun	51	1	M	945	1.4		367	4
30-Jun	51	2	M	660	1.3		368	4
30-Jun	51	3	M	700	1.3		369	4
1-Jul	52	1	F	795		regenerated	370	4
1-Jul	52	2	F	860		regenerated	371	4
1-Jul	52	3	F	920	1.4		372	4
1-Jul	52	4	M	670	1.2		373	4
1-Jul	52	5	M	835	1.3	regenerated	374	4
1-Jul	52	6	F	855	1.4		375	4
1-Jul	52	7	M	745	1.3		376	4
1-Jul	52	8	M	785		regenerated	377	4
1-Jul	52	9	M	955		regenerated	378	4
1-Jul	52	10	M	810	1.4		379	4
1-Jul	53	1	F	860	1.4		380	4
2-Jul	54	1	F	735	1.3		381	4
2-Jul	54	2	F	935	1.4		382	4
2-Jul	54	3	M	825		regenerated	383	4
2-Jul	54	4	M	690	1.3		384	4
2-Jul	54	5	M	695	1.3		385	4
2-Jul	54	6	F	850	1.4		386	4
3-Jul	54	7	F	870	1.4		387	4
3-Jul	54	8	F	895	1.4		388	4
3-Jul	54	9	F	765	1.3		389	4
3-Jul	54	10	M	675	1.3		390	4
3-Jul	55	1	M	760	1.3		391	4
3-Jul	55	2	M	690		regenerated	392	4
3-Jul	55	3	F	865	1.4		393	4
3-Jul	55	4	M	745	1.3		394	4
3-Jul	55	5	M	665	1.3		395	4
3-Jul	55	6	M	750	1.3		396	4
3-Jul	55	7	M	720	1.3		397	4

-continued-

Date	Scale Card	Fish Number	Sex	MEFT ^a length (mm)	Age	Scale Comment	Genetic Vial Number	Quartile
4-Jul	57	1	F	830	1.4		398	4
4-Jul	57	2	M	725	1.3		399	4
4-Jul	57	3	F	900	1.4		400	4
7-Jul	58	1	F	920	1.4		401	4
7-Jul	58	2	M	815	1.4		402	4
7-Jul	58	3	M	780	1.4		403	4
7-Jul	58	4	M	675	1.3		404	4
7-Jul	58	5	M	735	1.3		405	4
8-Jul	59	1	M	700	1.3		406	4
8-Jul	59	2	F	910	1.4		407	4
8-Jul	59	3	F	840	1.4		408	4
8-Jul	59	4	F	865	1.4		409	4
8-Jul	59	5	F	760	1.3		410	4
8-Jul	60	1	F	780	1.3		411	4
8-Jul	60	2	M	780	1.4		412	4
8-Jul	60	3	F	920	1.4		413	4
8-Jul	60	4	M	875	1.4		414	4
8-Jul	60	5	M	720	1.3		415	4
9-Jul	61	1	M	960	1.4		416	4
9-Jul	61	2	F	740	1.3		417	4
9-Jul	61	3	F	910	1.4		418	4
9-Jul	62	1	F	890	1.4		419	4
10-Jul	63	1	M	810	1.4		420	4
10-Jul	63	2	F	830	1.4		421	4
10-Jul	63	3	M	710		regenerated	422	4
10-Jul	63	4	F	940		regenerated	423	4
12-Jul	64	1	F	980		regenerated	424	4
13-Jul	65	1	F	875	1.4		425	4
14-Jul	66	1	F	900	1.4		426	4
15-Jul	67	1	F	800	1.3		427	4
16-Jul	68	1	M	950	1.4		428	4
16-Jul	68	2	M	745	1.3		429	4
17-Jul	69	1	F	820		regenerated	430	4

^a MEFT = length measurement from mid-eye to fork of tail.

^b Fish was missing an adipose when sampled. Head was collected for cwt analysis but was inadvertently discarded. Fish are suspected to have originated in a Canadian hatchery.

^c Because this fish is suspected to be of hatchery origin, the age 2.4 is suspect. The age of the fish is probably 0.4. The 2 freshwater checks could have been the result of a feeding and/or release checks.