

**2013 In Season Escapement Estimates of Fraser River Salmon at Qualark  
Dual-frequency Identification Sonar (DIDSON) Site with Test Fishing Results  
and Species Apportionment**

2013 Project Report to Southern Boundary Restoration and Enhancement Fund

by

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## TABLE OF CONTENTS

<b>LIST OF FIGURES .....</b>	<b>iii</b>
<b>LIST OF TABLES .....</b>	<b>iv</b>
<b>LIST OF APPENDICES .....</b>	<b>v</b>
<b>ABSTRACT.....</b>	<b>vi</b>
<b>INTRODUCTION.....</b>	<b>7</b>
Project Goals .....	7
<b>METHODS .....</b>	<b>8</b>
Study Area .....	8
Equipment .....	10
DIDSON Configuration .....	11
Sampling Design .....	11
Data Processing Procedures .....	12
Test Fishing.....	14
Sampling .....	15
Precision.....	15
Reporting.....	16
<b>RESULTS .....</b>	<b>16</b>
Environmental Conditions .....	16
Total Salmon Escapement Estimate.....	17
Migration Behavior .....	18
Species Proportioning .....	19
Escapement by Species .....	20
Precision.....	21
<b>DISCUSSION .....</b>	<b>22</b>
<b>REFERENCES.....</b>	<b>25</b>
<b>APPENDICES.....</b>	<b>26</b>

## LIST OF FIGURES

Figure 1. Map showing the Fraser River watershed and location of the Qualark hydroacoustic site near Hope, BC. ....	9
Figure 2. Fraser River cross section at the Qualark hydroacoustics site showing average discharge rates throughout the salmon migration period. ....	10
Figure 3. Plan view of the sampling strategy showing one aim configuration of the DIDSON and three range bins to sample 29.17 m range at the Qualark hydroacoustics site. ....	12
Figure 4. Counting criteria for manual counts of range bins to avoid double counting fish passing through more than one range bin. ....	13
Figure 5. Illustration of fish escapement moving through a fixed location DIDSON imaging sonar configured with one aim and two range windows (rw1 & rw2). ....	14
Figure 6. Average daily discharge and water temperature at Qualark hydroacoustic site during the period of operation in 2013 (preliminary values from sensors deployed at the site obtained courtesy of David Patterson). ....	17
Figure 7. Cumulative daily counts of total salmon escapement derived from DIDSON assessment at Qualark, 2013, including daily cumulative counts by bank. ....	18
Figure 8. Expanded daily upstream counts of salmon escapement derived from DIDSON assessment at Qualark, 2013. ....	18
Figure 9. The proportion of daily escapement occurring beyond the first 5 m HF range bin from 9.17 to 29.17 m from the DIDSON at Qualark in 2013. ....	19
Figure 10. Daily species proportion derived from the test fishery at Qualark, 2013. ....	20
Figure 11. Cumulative daily salmon escapement apportioned by species based on test fishing catch at Qualark, 2013. ....	20
Figure 12. Daily estimates of Sockeye and Pink Salmon in the Fraser River at Qualark hydroacoustics site in 2013. ....	21
Figure 13. Daily estimates of Chinook, Coho and Chum salmon in the Fraser River at Qualark hydroacoustic site in 2013. ....	21

**LIST OF TABLES**

Table 1. Escapement estimates recorded in the 4.17-9.17 m HF range bin compared to the two LF range bins from 9.17-29.17 m at Qualark for 2013.....	18
Table 2. Error and confidence limits of total salmon escapement from Qualark hydroacoustics program, 2013.....	22

**LIST OF APPENDICES**

Appendix 1. Daily total and cumulative salmon escapement by bank, daily catch, daily species proportions and daily and cumulative escapement by species from Qualark hydroacoustic and test fishing programs in 2013.....	26
Appendix 2. Catch by drift from Qualark drift gill net test fishing program in 2013. ....	28

## ABSTRACT

The Qualark DIDSON project produces in season estimates of total daily salmon escapement in the Fraser River near Hope, BC. These estimates combine acoustic counts of fish with species composition information derived from a drift gill net test fishing program conducted at the acoustic site. Although estimates of daily escapement can be produced for all five species of Pacific salmon, the focus of the Qualark program is on Sockeye Salmon. These in-season escapement estimates can be used in conjunction with hydroacoustic estimates from Pacific Salmon Commissions Mission site and test fisheries to manage fisheries on Fraser River salmon stocks. The total salmon escapement in 2013 was estimated to be  $8,596,234 \pm 678,226$ , consisting of 3,956,867 Sockeye Salmon, 4,073,796 Pink Salmon, 395,027 Chinook Salmon (including 70,394 jack Chinook Salmon), 166,095 Coho Salmon, and 4,449 Chum Salmon. The confidence limits reported here represent error in the acoustic estimate related to temporal sampling and counting processes. While there is likely uncertainty related to the species composition information, it has not been quantified and is not reported here. Investigation of catch/abundance relationships over a number of temporal strata and years (based on potential differences in environmental conditions and species specific behaviors) may support test fishing results or lead to predictable relationships that can be used to develop correction factors and improve the accuracy of the test fishing based species apportionment. Two additional methods of species apportionment are under investigation: length distribution and tail beat frequency. These methods, if proven to be effective, may supplement test fishing results.

## INTRODUCTION

The Qualark site was developed using split-beam technology between 1993 and 1998 and employed a test fishing program to apportion the acoustic estimate by species (Enzenhofer and Cronkite, 1998). The Applied Technologies Section of the Department of Fisheries and Oceans re-activated the Qualark hydroacoustic site on the mainstem of the Fraser River in 2008 using multi-beam (DIDSON) technology to monitor the escapement of adult Pacific Salmon (*Oncorhynchus* spp.) to terminal spawning areas in the upper Fraser River watershed (Enzenhofer et al., 2010). A test fishery was implemented to provide biological and daily species composition data for the acoustic estimates. In recent years the site has been transferred from a research program to an operational project operated by DFO Fraser River Stock Assessment. All six Pacific salmon species (Sockeye Salmon (*O. nerka*), Pink Salmon (*O. gorbuscha*), Chinook Salmon (*O. tshawytscha*), Coho Salmon (*O. kisutch*) and Chum Salmon (*O. keta*)) return to spawn in the Fraser River and pass the Qualark site. Sockeye Salmon is the dominant species in the lower Fraser River in even numbered years (e.g., 2012) while in odd numbered years (e.g., 2013), Pink Salmon are often more abundant than Sockeye Salmon.

The Pacific Salmon Commission (PSC) estimates gross escapement of Fraser River Sockeye Salmon at Mission, BC and this acoustic site is strategically located to provide key information for in season management of salmon fisheries to meet multiple obligations under the Pacific Salmon Treaty. Reliable estimates of Sockeye Salmon escapement in the Fraser River are a prerequisite for achieving spawning escapement goals and harvest allocations. The Mission site poses technical challenges for the acoustic enumeration of salmon that contribute to the concerns among managers and other clients about the reliability of the Mission estimate (Enzenhofer et al, 2010).

In contrast to Mission, Qualark has site characteristics that are closer to the ideal for reliably detecting and tracking salmon, including Sockeye Salmon, as they move upstream (see Enzenhofer et al., 2010).

### Project Goals

The 2013 operations at Qualark were funded by Southern Boundary Restoration and Enhancement Fund and are the sixth year of parallel operations with Mission.

The goals of this project are to:

1. Produce reliable and timely estimates of gross in season salmon escapement in the Fraser River using three study design elements that are complementary to work conducted by PSC staff at Mission:
  - Operation of the Qualark DIDSON hydroacoustic enumeration systems in a manner consistent with practices developed from 2008 to 2013 (Enzenhofer et al., 2010);

- Implementation of the Qualark test fishery consistent with procedures developed during the period 2008 to 2013;
  - Continued evaluation of fish flux occurring outside the normal acoustic monitoring window at Qualark with acoustic sampling on each bank within the 20 to 30 m range for 10 min. per hour throughout the migration period;
2. Provide validation of Sockeye Salmon escapement estimates produced at Mission with the goal of providing managers with the best possible in-season escapement estimates to utilize for effective management of fisheries; and
  3. Provide data that can be used to develop analytical methods to either modify or combine estimates from the Mission and Qualark hydroacoustic sites to provide a more robust estimate of salmon escapement into the Fraser River based on multiple years of data from 2008 to 2013 when both sites were operating.

This report presents hydroacoustic estimates of daily salmon escapement and the precision of these estimates at Qualark in 2013, including daily test fishing catch and species apportionment data. Recommendations are provided to further improve and support species apportionment estimates.

## **METHODS**

### Study Area

The Qualark hydroacoustic facility is located on the Fraser River in British Columbia, Canada and is 15 km north of Hope, BC and 95 km upstream of Mission, BC. The Qualark site is below many, but not all of the major Sockeye Salmon spawning areas in the Fraser River watershed (Figure 1). There are a number of Sockeye Salmon stocks that spawn below Qualark including Pitt River, Chilliwack River, Harrison River, Birkenhead River, Weaver Creek and Cultus Lake stocks. Estimation of total Sockeye Salmon escapement to the Fraser River requires additional enumeration programs at these locations. Pink Salmon spawn primarily in the mainstem and tributaries of the lower Fraser River below Qualark. Variable proportions of the total Pink Salmon escapement migrate past Qualark and spawn in the mid and upper Fraser River and tributaries.

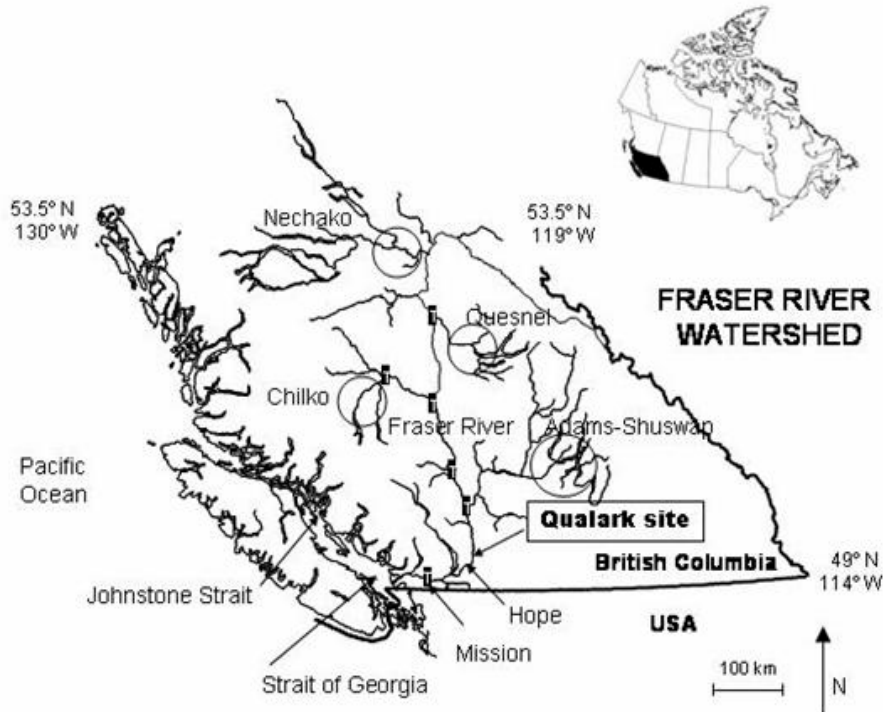


Figure 1. Map showing the Fraser River watershed and location of the Qualark hydroacoustic site near Hope, BC. Some of the major spawning areas including the Nechako, Quesnel, Chilko, and Adams-Shuswap Lake systems are circled.

The Qualark site was originally chosen as an experimental site because the site possessed a number of favorable characteristics (Enzenhofer and Cronkite, 2000). It was on a straight stretch of river with laminar flow, water velocity was high, flows were not tidally-influenced, and substrate and bank configurations were planar and free of obstructions (scalping, benches, and large boulders) that might impair fish detection or introduce noise to the acoustic system. There was minimal human activity that would alter fish behaviour. These characteristics ensure that fish actively migrate through this area rather than holding or milling, which is a key factor to the success of a riverine acoustic site. The relatively high water velocities and consistent bank slopes combined with the energy conserving migration schemes of salmon, result in most salmon, including sockeye, migrating through the Qualark site within 20 m of the shore regardless of discharge and water level. Consequently it is not necessary to continuously ensound the middle of the river, although periodic checks to confirm the absence of fish escapement are necessary and prudent.

The Fraser River is 150 m wide at the Qualark site with discharge ranging from 10,000  $\text{m}^3/\text{s}$  during spring freshet to 700  $\text{m}^3/\text{s}$  during the low water period in winter. The river banks have a natural slope of 21° (right-bank) and 20° (left-bank) with the surface layer consisting of

30-50 cm diameter rock and some large boulders (Figure 2). Left-bank (LB) and right-bank (RB) are relative to an observer facing downstream. Water velocities at the site range from 1.0 m/s near shore to 3-4 m/s in the middle of the river. Flow patterns vary from bank to bank, but in general fine materials are scoured along the right-bank and sand is deposited along the left-bank.

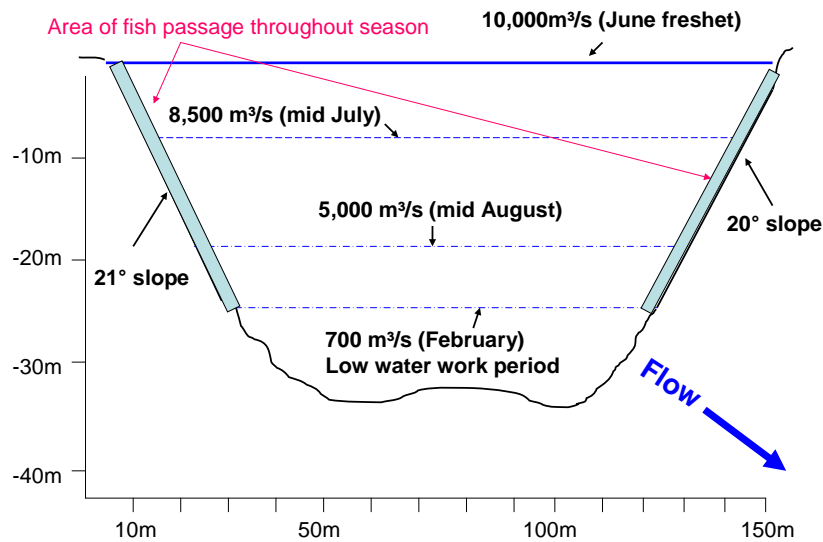


Figure 2. Fraser River cross section at the Qualark hydroacoustics site showing average discharge rates throughout the salmon migration period. Note that the vertical and horizontal scales differ. River flow is toward the viewer.

The RB is accessible by road and heavy equipment was used to refurbish the bank for acoustic work during the low water period in early 2008. The LB site is approximately 150 m downstream of the RB site and is only accessible via boat. Equipment and supplies were moved to the LB by boat and the refurbishment of the acoustic ramp and reinstallation of in-river equipment was done manually during the low water period in February of 2008. Refurbishment of the banks included removing large substrate, leveling the slope, adding sand bags and the track mounted fish deflection weir.

### Equipment

Acoustic data were collected with two standard DIDSON imaging systems (one on each bank). The standard DIDSON imaging systems have high frequency (1.8 MHz) and low frequency modes (1.1MHz) and their output consists of images created by multiple sound beams focused through a moveable lens giving a field of view that is 14° vertical and 29° horizontal (Belcher et al., 2001; Sound Metrics 2007). The RB has hydroelectric lines to the site while the LB power source was a Power Pac (Enzenhofer et al., 2007) that was charged by a combination of a solar panel and a battery charger powered by a generator. The DIDSON systems are affixed

to a track-mounted 6 m long fish deflection weir that can be adjusted in response to changes in river water levels with a remotely controlled winch (Enzenhofer et al., 2010). The DIDSON systems were mounted on an adjustable pole mount that facilitates adjustments to depth, bearing, tilt and roll (Enzenhofer and Cronkite, 2005).

### DIDSON Configuration

The DIDSON system bearing was set perpendicular to flow with the end of the weir barely visible on the edge of the image. The tilt on RB was set at  $-17^{\circ}$  relative to the surface while LB was  $-14^{\circ}$ . A  $-35^{\circ}$  roll was adopted on both banks. This configuration was fixed throughout the program, although minor adjustments were made to the bearing and tilt as the season progressed. The aiming configuration was verified with a target suspended in the ensonified region to ensure that there were no blind zones near the surface or bottom through which fish could pass undetected and is consistent with protocols outlined by Holmes et al. (2006).

### Sampling Design

Based on split-beam sonar work at the Qualark site in the 1990s (Enzenhofer and Cronkite, 2000) and previous years DIDSON assessments, the majority of fish migration was expected to occur within a range of 5 m from the end of the deflection weir. Under normal circumstances the remainder were expected within the next 10 m. During times where set gill nets are deployed in the area during First Nations fisheries, fish migration can occur slightly further offshore. We used a systematic range stratified sampling design on each bank that utilized one aiming configuration of the DIDSON to sample between 4.17 m to 29.17 m in range, divided into three range bin files each hour (Enzenhofer et al., 2010; Figure 3). Data were collected for a total of 50 minutes out of each hour. On each bank three files were recorded hourly consisting of:

- 20 minute 5 m window length (4.17 m to 9.17 m) at high frequency mode (1.8 MHz utilizing 96 beams) producing the best available image resolution for counting the majority of fish escapement (Bin 1);
- 20 minute 10 m window length (9.17 m to 19.17 m) at low frequency mode (1.1 MHz utilizing 48 beams) (Bin 2); and
- 10 minute 10 m window length (19.17 m to 29.17 m) at low frequency mode (Long-Range Bin 3).

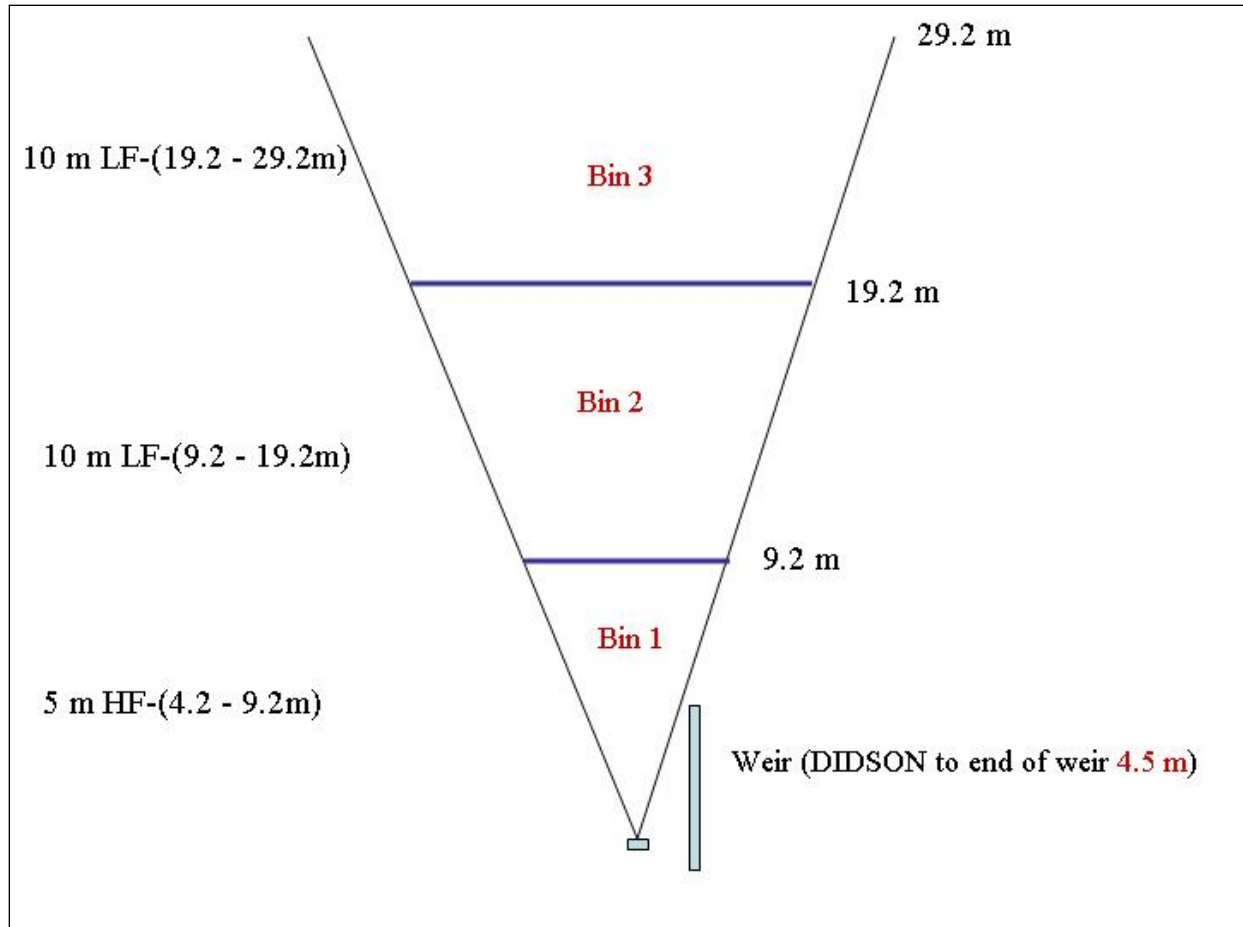


Figure 3. Plan view of the sampling strategy showing one aim configuration of the DIDSON and three range bins to sample 29.17 m range at the Qualark hydroacoustics site. Bin 1 is shown using a 5 m window length at high frequency (HF) starting at 4.17 m from the DIDSON. Bin 2 is shown with a 10 m window length in low frequency (LF) mode, from 9.17 m to 19.17 m from the DIDSON. Bin 3 is a 10 m window length in low frequency mode covering a range between 19.17 m to 29.17 m.

### Data Processing Procedures

The DIDSON data files were saved directly onto laptop computer hard drives and subsequently backed up onto an external hard drive. The data was transferred from the DIDSON computers to a processing computer where the files were manually counted by site personnel applying pre-determined counting criteria to estimate net upstream flux (Enzenhofer et al., 2010). The upstream flux of migrating salmon is calculated as the upstream count minus the downstream count (Xie et al., 2002). This flux model assumes that upstream and downstream counts are equal for non-migratory resident species. Counting criteria addressed the potential for double counting of fish which may move out of or into an adjoining range bin (Figure 4 and 5). The expansion of 20 minute counts to hourly counts has been shown to be representative of the hourly flux (Lilja et al, 2007). In this same way the movement of fish in and out of the end of a range bin in a 20 minute file can be assumed to be representative of the behaviour during the whole hour. A minimum size limit was set at 30 cm (measured using the measurement tool on

the DIDSON program) to remove smaller native species from the escapement estimate. Identifiable non-salmon species (E.g. sturgeon) were not included in the counts. Counting procedures relating to playback speed and file viewing settings (use of background subtraction, threshold and intensity settings) were utilized to insure consistency between different counters. Counting of files with counts in excess of 1,500 fish in the first 10 minutes was terminated at the 10 minute mark. Net upstream flux for each range bin was expanded to the hour and summed to represent total daily salmon escapement.

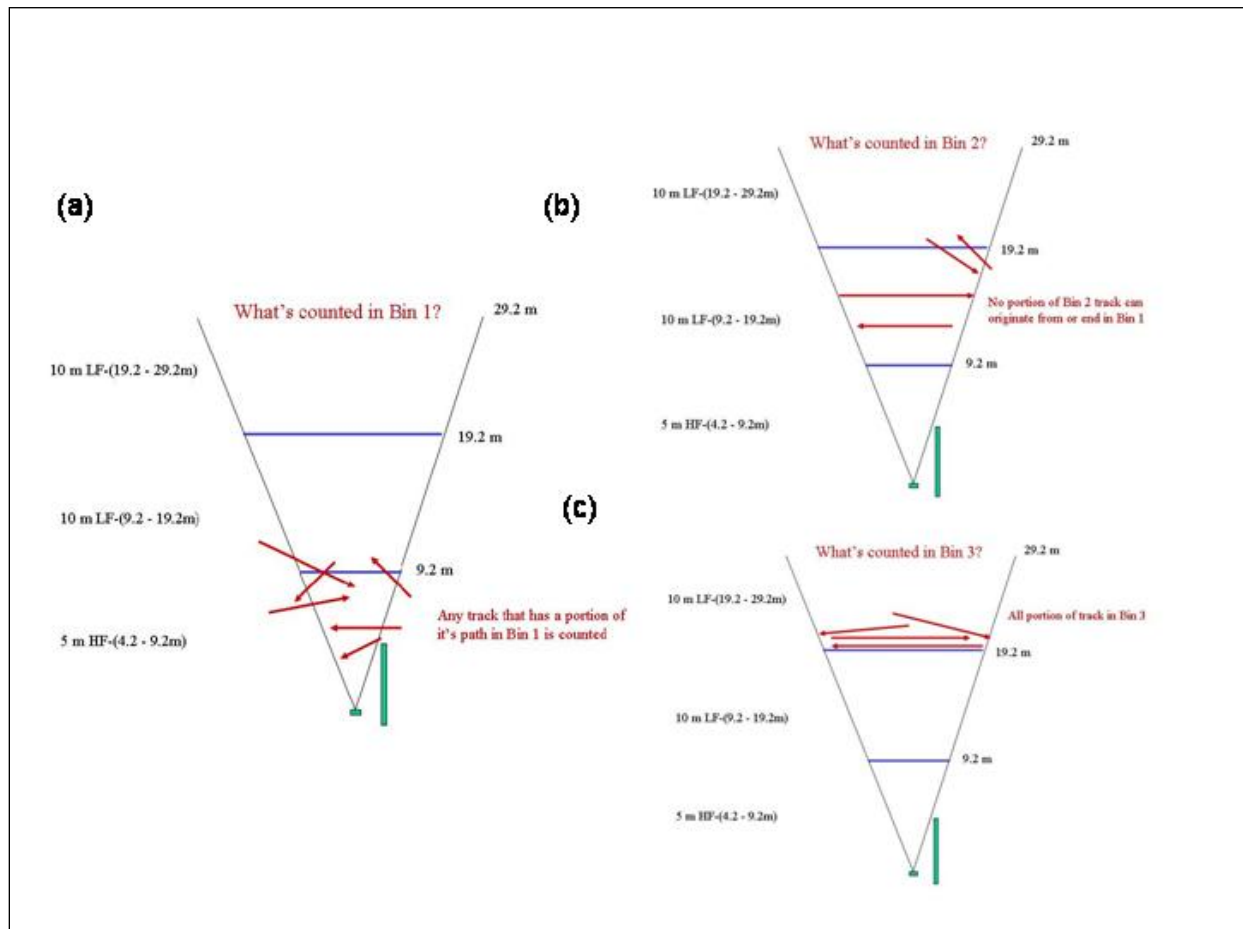


Figure 4. Counting criteria for manual counts of range bins to avoid double counting fish passing through more than one range bin. (a) Any portion of a fish trajectory is included in the Bin 1 count, (b) fish included in Bin 2 counts cannot have any portion of its track in Bin 1, and (c) fish included in the Bin 3 count must have entire portion of track in Bin 3.

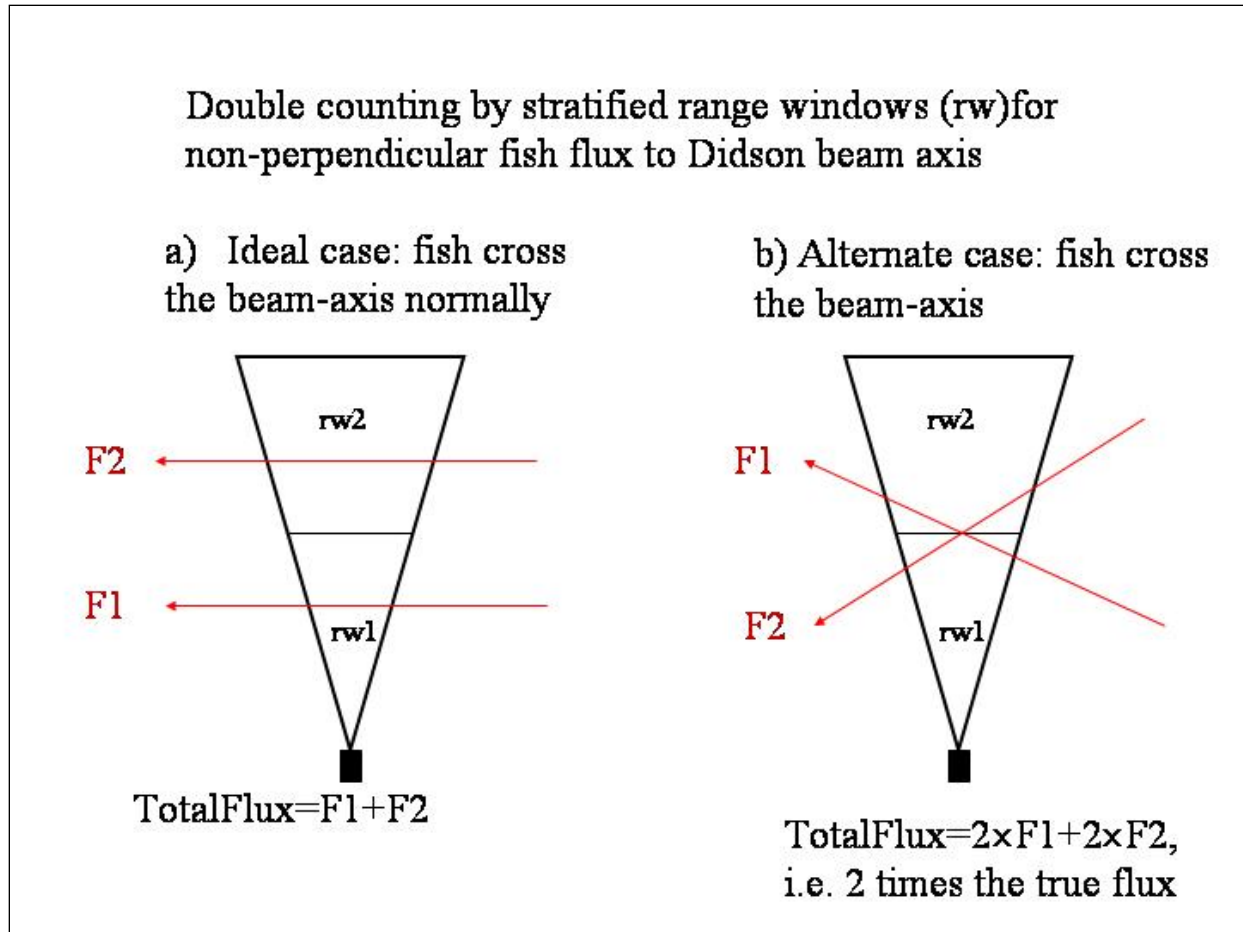


Figure 5. Illustration of fish escapement moving through a fixed location DIDSON imaging sonar configured with one aim and two range windows (rw1 & rw2). a) Two fish tracks (F1 & F2) each passing through only one range window resulting in a correct flux estimate of two, and b) Two fish tracks (F1 & F2) crossing through both range windows potentially resulting in an incorrect double count of four if the counting criteria protocols in Figure 4 are not applied.

### Test Fishing

The test fishery consisted of a drift sequence in the morning (07:00-08:00) and another drift sequence in the evening (19:00-20:00). The shortening of day length later in the season resulted in evening drifts being moved to (18:00-19:00). The complete drift series consisted of 6 drifts per day, seven days per week, one 3-drift set in the morning and one 3-drift set in the evening. Each set of 3 drifts was made close to shore along the right bank and directed at capturing salmon. Two additional drifts per week, spaced out over the week, were made beyond 25 m from the right bank using the 5¼ inch mesh net to test for presence/absence of migrating salmon in the offshore regions. The mesh sizes used for the drifts included 4, 4¾, 5¼, 5¾, 6¾ and 8 inch (stretched mesh, 70 mesh hang, and 30 m length). The morning drifts began on the first day using the 4, 5¼, and 6¾ inch meshes in sequence, and the evening drifts began using the 4¾, 5¾ and 8 inch meshes in sequence. On the second day the morning and evening sequences were reversed and on each subsequent day the pattern of drifts was alternated to allow some randomisation of the sampling. Each drift was approximately 4-6 minutes in duration and

began 150 m upstream of the acoustic system and terminated approximately 700 m downstream of the Qualark site.

The date, drift number, mesh size, start and end times were recorded, along with the number of each species of salmon caught in each drift. The number of each species caught in a drift was recorded as retained or released. Fish that were identified by species but escaped were included with the released fish. Sockeye Salmon were retained, Pink Salmon were retained up to 50 per day and Chinook, Coho and Chum Salmon were released whenever possible but were retained if dead or survival was deemed to be unlikely. Chinook and Coho Salmon were assessed for adipose condition (present/absent) prior to release. Comments were recorded relating to the success of the drift and any bi-catch. Catch from different drifts was kept in separate labelled totes. Test fishing counts by species and drift were verified when the fish were sampled. The test fishing data was compiled daily (for the previous day) and entered into an excel database. The daily species proportion was determined from the test fishery data and applied to the total upstream flux to estimate daily escapement by species.

### Sampling

Sex, post orbital fork (POF) length, weight (kgs), scale samples and DNA samples (adipose fin punch) from up to 50 Sockeye Salmon per day were taken. All additional Sockeye Salmon were sampled for sex, POF length and weight (kgs). Up to 50 Pink Salmon per day were sampled for sex, POF length and weight. Chinook Salmon were sampled for sex, fork length (FL), weight (kgs) and scales (5 per fish) and were assessed for adipose condition (present/absent) and heads were retained for all fish with clipped adipose fins. Coho Salmon were assessed and sampled in a similar fashion to Chinook Salmon except that scales were not taken. Chum Salmon were not sampled.

### Precision

There are two sources of error that affect the precision of the hydroacoustic estimate. The first source relates to the difference in counts of the same file by different personnel. In order to assess the precision between counters a random number generator was used to randomly select 24 files (4 from each of the 6 range bins) to recount. Recounts were conducted by experienced staff. The precision was assessed by calculating the coefficient of variation (CV) and average percent error (APE) between the initial counts and recounted files (Enzenhofer et al., 2010).

$$CV = \sqrt{\frac{\sum_{i=1}^R (X_{ij} - \bar{X}_j)^2}{\bar{X}_j^2}} \times 100$$

$$APE = \frac{1}{N} \sum_{j=1}^N \left[ \frac{1}{R} \sum_{i=1}^R \frac{|X_{ij} - \bar{X}_j|}{\bar{X}_j} \right] \times 100$$

where  $N$  is the number of events counted by  $R$  observers,  $X_{ij}$  is the  $i^{\text{th}}$  count of the  $j^{\text{th}}$  event and  $X_j$  is the average count of the  $j^{\text{th}}$  event.

CV was used to identify discrepancies between counters on a day to day basis. The discrepancies can help identify personnel that require further training or if there was an error in which files were counted. For example, files from an incorrect date are occasionally erroneously selected from the file directory and counted. APE was used to determine the precision of the entire dataset. Counter precision of files with low levels of escapement presents a problem as the difference of one or two fish between counts can lead to a large and highly variable APE. A weighted mean of the APE from all files that were recounted was used to estimate counter precision for the season. The small files that make up a minute portion of the sample do not disproportionately weight the precision estimate when using this method.

The second source of error in the precision of the hydroacoustic estimate is related to the expansion of the 10 or 20 minute files to represent hourly escapement. Lilja et al. (2007) estimated a  $\pm 10\%$  confidence interval on escapement with 10 minute file expansions and a  $\pm 5\%$  confidence interval with 20 minute expansions.

Both types of error are cumulative so the presented confidence intervals are based on counter precision error combined with the estimated file expansion error.

### Reporting

An estimate of salmon escapement by species was calculated on a daily basis for the previous day's data. Escapement was reported on a bi-weekly basis to the Fraser Panel and select members of DFO and PSC. Test fishing catch was sent to PSC on a daily basis and a detailed test fishing report was sent out on a bi-weekly basis. The reports were sent by e-mail using a wireless internet card.

## **RESULTS**

### Environmental Conditions

Discharge decreased throughout the project from  $7000 \text{ m}^3/\text{s}$  at the start of the project to  $1700 \text{ m}^3/\text{s}$  at the end of the project (Figure 6). The water temperature varied from  $13$  to  $21 \text{ }^\circ\text{C}$  over the course of the project with a period of mean daily temperatures exceeding  $21 \text{ }^\circ\text{C}$ , the critical temperature threshold for Sockeye Salmon survival, occurring from early to mid-August (Figure 6).

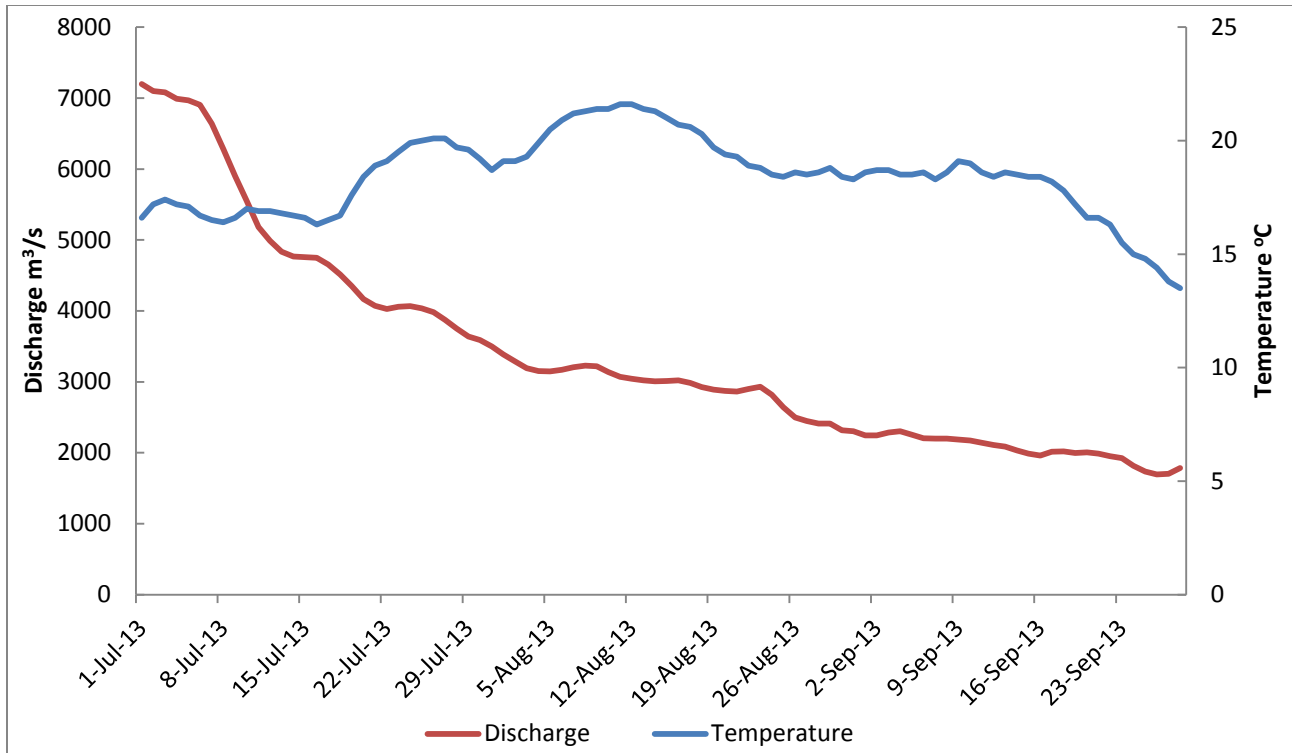


Figure 6. Average daily discharge and water temperature at Qualark hydroacoustic site during the period of operation in 2013 (preliminary values from sensors deployed at the site obtained courtesy of David Patterson).

### Total Salmon Escapement Estimate

Operation of the RB DIDSON system was initiated at 11:15 on 30 June 2013 and the LB DIDSON system was started on 10 July 2013 at 13:37. Installation of the LB was delayed by high water, which hindered access to the weir and ramp. RB escapement estimates were used to estimate LB escapement during this period because analysis of data from previous years found that approximately equal proportions of total escapement along each bank. Since daily escapement is low during this period, bias introduced by this method likely has a minimal impact on the overall estimate of total escapement. The DIDSON systems were shut down on 29 September 2013 (RB at 08:36 and LB at 09:16). The total salmon escapement estimate was 8,596,234 (Figure 7; Appendix 1). The escapement on RB was 4,534,783 representing 53 % of the total estimate. The escapement to LB was 4,061,451 representing the remaining 47 % of the total escapement estimate. Daily salmon escapement estimates peaked in mid-September at approximately 350,000 fish per day (Figure 8).

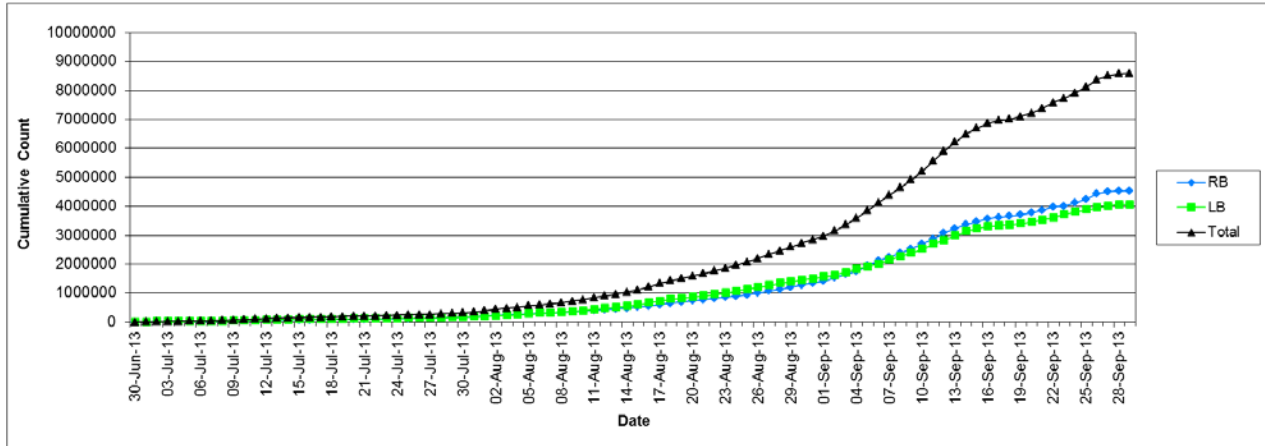


Figure 7. Cumulative daily counts of total salmon escapement derived from DIDSON assessment at Qualark, 2013, including daily cumulative counts by bank.

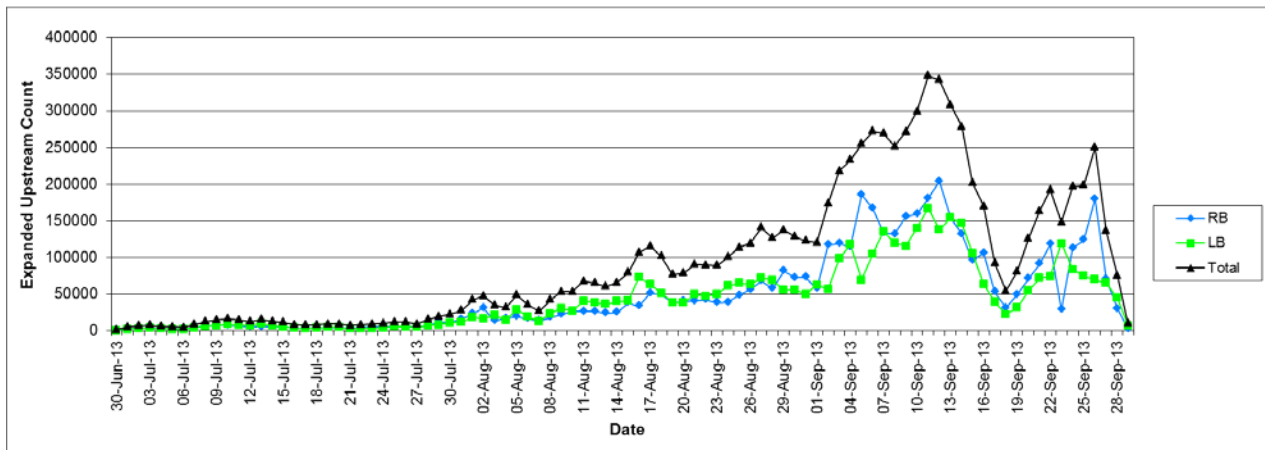


Figure 8. Expanded daily upstream counts of salmon escapement derived from DIDSON assessment at Qualark, 2013, including daily escapement by bank.

Migration Behavior

Approximately 97% of overall migration occurred within 5 m of the end of the fish deflection weir in 2013 (Table 1). During periods of First Nation set gill net fisheries the proportion of migration offshore increases to 7.3% on RB and 14.4% on LB. Figure 9 illustrates the marked difference in the proportion of migration occurring offshore during First Nation set gill net openings in the area of the Qualark site. This marked increase of offshore escapement especially on the LB has been observed in previous years.

Table 1. Escapement estimates recorded in the 4.17-9.17 m HF range bin compared to the two LF range bins from 9.17-29.17 m at Qualark for 2013. Escapement is divided by bank and period of time when First Nations set gill net fisheries were and were not occurring. LB escapement estimates do not include the period of time where RB escapement was used to estimate LB escapement.

Period	Bank	Fish Escapement	Bin 1 (4.17-9.17m)	Bin 2 and 3 (9.17-29.17m)
--------	------	-----------------	--------------------	---------------------------

Overall	Right	4,534,783	97.3%	2.7%
Overall	Left	4,024,392	96.6%	2.4%
No nets	Right	3,907,723	98.1%	1.9%
No nets	Left	3,639,736	98.7%	1.3%
Nets in	Right	627,060	92.7%	7.3%
Nets in	Left	384,656	85.6%	14.4%

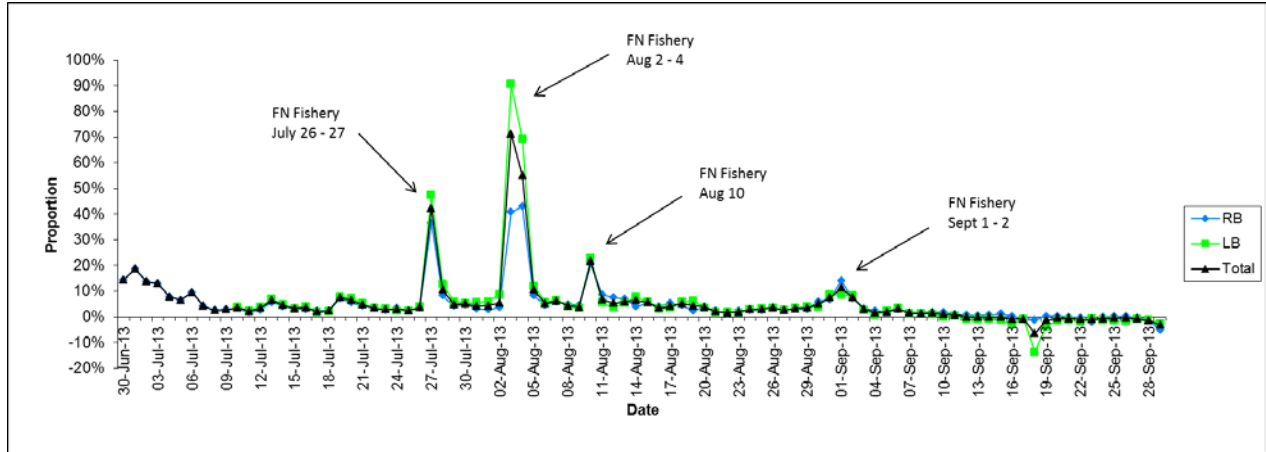


Figure 9. The proportion of daily escapement occurring beyond the first 5 m HF range bin from 9.17 to 29.17 m from the DIDSON at Qualark in 2013. First nation set gill net openings are identified.

Species Proportioning

The test fishing program was initiated on the morning of 1 July 2013, one day after the hydroacoustic program. Species composition from 1 July 2013 was applied to the hydroacoustic estimate for 30 June 2013. The test fishing program shut down 28 September 2013 one day before the hydroacoustic program. Species proportioning from 28 September 2013 was used to estimate species proportioning on the final partial day of hydroacoustic data collection. Species composition in the test fishing program showed relatively large proportion of Chinook Salmon early in the program though Sockeye Salmon were the dominant species (Figure 10; Appendix 1). The Pink Salmon proportion increased from mid-August to the end of the project in October becoming the dominant species by early September. Coho salmon appeared in the mid-September in relatively low levels. Two Chum salmon were caught in the test fishery representing very low levels of abundance. These fish were the first chum caught in the test fishery in the 6 years of operation from 2008 to present. Appendix 2 contains details of test fishery catches by set.

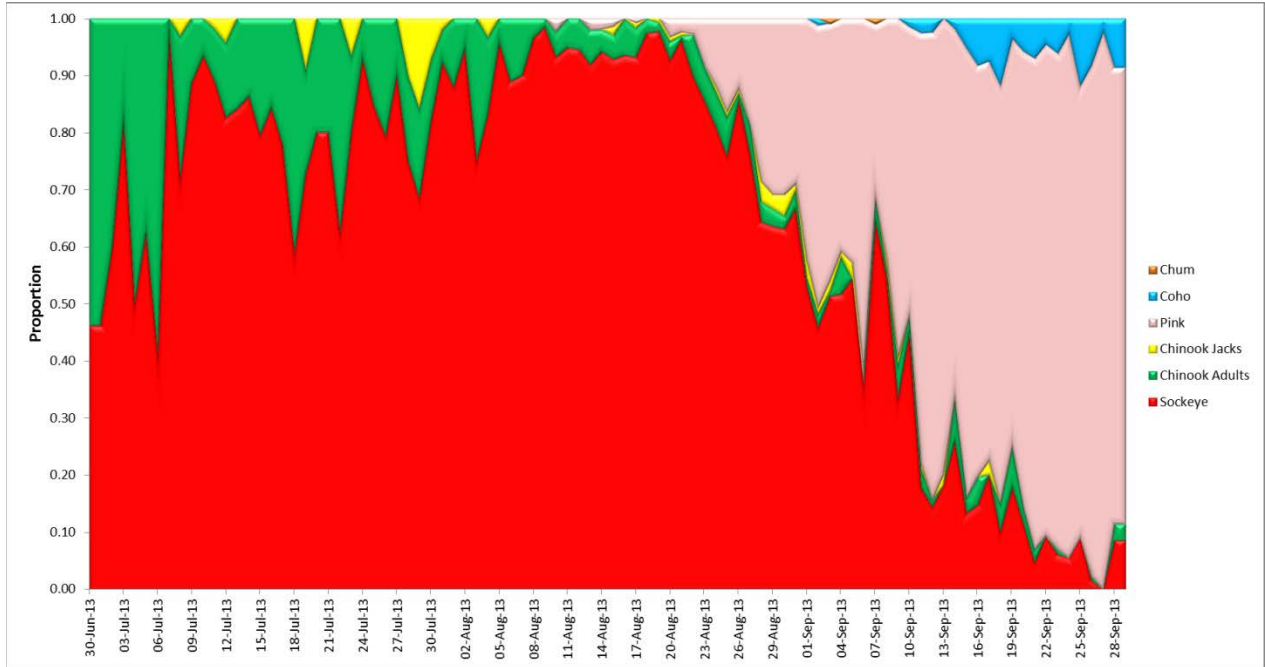


Figure 10. Daily species proportion derived from the test fishery at Qualark, 2013.

Escapement by Species

The species proportioning from the test fishery resulted in a total Sockeye Salmon estimate of 3,956,867 (Figure 11; Appendix 1). The total Pink Salmon estimate was 4,073,796. The total Chinook Salmon estimate was 395,027 including 70,394 jack Chinook Salmon. The total Coho Salmon estimate was 166,095. The total Chum Salmon estimate was 4,449.

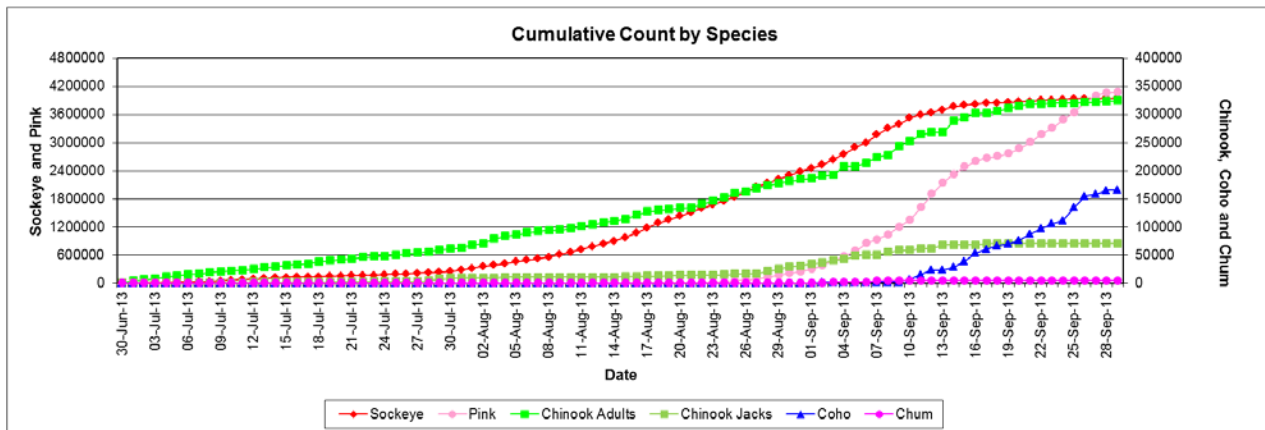


Figure 11. Cumulative daily salmon escapement apportioned by species based on test fishing catch at Qualark, 2013.

The daily estimate of Sockeye Salmon started increasing in the beginning of August and peaked at the beginning of September before dropping off (Figure 12; Appendix 1). Variation in the daily Sockeye Salmon escapement increases at the beginning of Pink Salmon migration. The daily estimate of Pink Salmon increased starting in late August and peaks around mid-

September. A second peak was observed in late September. The valley between these peaks was likely the result of commercial pink fisheries occurring at the mouth of the Fraser from 4 September 2013 to 10 September 2013. This would relate to an approximate travel time of 9 days from the mouth of the Fraser River to the Qualark site.

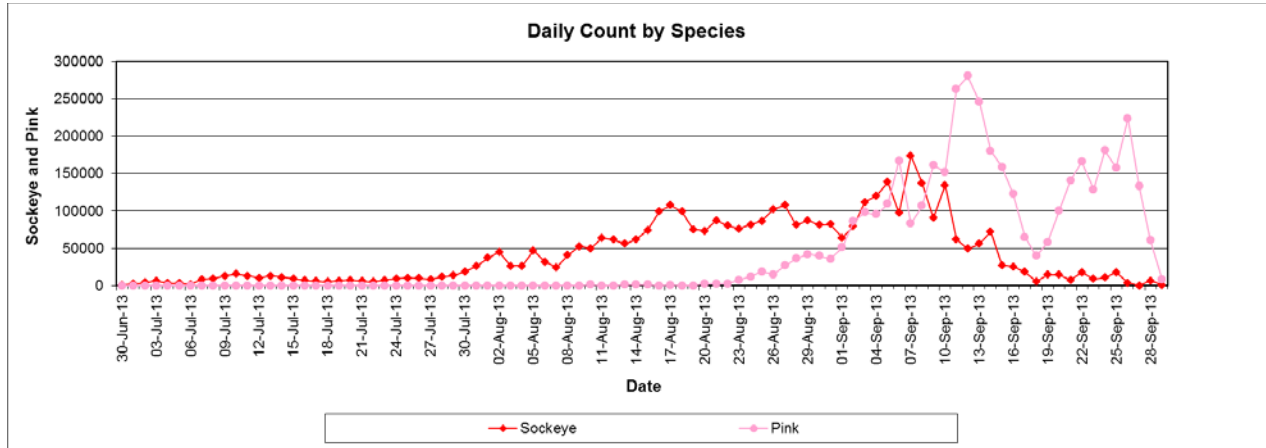


Figure 12. Daily estimates of Sockeye and Pink Salmon in the Fraser River at Qualark hydroacoustics site in 2013.

The daily Chinook Salmon estimate remained relatively stable until the beginning of September when Pink Salmon migration begins to increase (Figure 13). At this point there is large variation in the day to day estimates. The Coho Salmon escapement occurs primarily during the last three weeks of September and also shows a large degree of variation in the day to day estimates. The Chum Salmon abundance is low due to the site being near the upper extent of Chum Salmon spawning habitat in the Fraser River. The Chum Salmon were caught at the beginning of September.

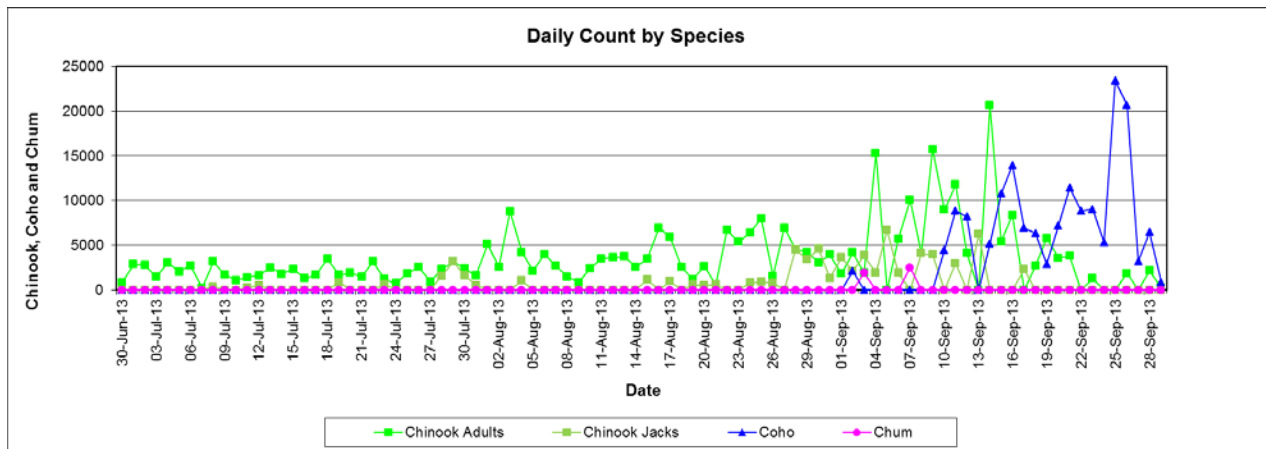


Figure 13. Daily estimates of Chinook, Coho and Chum salmon in the Fraser River at Qualark hydroacoustic site in 2013.

Precision

The error associated with counter precision was 2.32% (Table 2) and the error associated with file expansion was 3.29%. The combined error from these two sources was 4.03 %. The 95% confidence interval for the total salmon escapement was 7,918,008 to 9,274,460.

Table 2. Error and confidence limits of total salmon escapement from Qualark hydroacoustics program, 2013.

	Counter	10 Minute File Expansion	20 Minute File Expansion	Total File Expansion	Overall Total
Error	0.0232			0.0329	0.0403
SD	199,433			282,783	346,034
95% CL	390,888	248,885	305,369	554,254	678,226
95% CL	4.55%	10.00% <sup>1</sup>	5.00% <sup>1</sup>	6.45%	7.89%
Population	8,596,234	2,488,850	6,107,384	8,596,234	8,596,234
Lower Bounds					7,918,008
Upper Bounds					9,274,460

<sup>1</sup> Based on Lilja et al., 2007 estimate of confidence limits associated with 10 and 20 minute file expansions.

## DISCUSSION

The DIDSON hydroacoustic program at Qualark produces daily in-season estimates of salmon escapement in the Fraser River near Hope, BC. Daily escapement estimates at Qualark can be produced regardless of discharge and procedures do not change throughout the duration of the project. In 2013, the total salmon escapement was estimated as 8,596,234 ± 678,226.

The hydroacoustic coverage of the area of salmon migration is complete. The bottom of the ensonified area has been modified resulting in an acoustically non-reflective planar profile. There are no shelves or scalloped areas that can create acoustic shadowing that could potentially obscure salmon escapement. The -35° roll angle is utilized to maximize vertical coverage of the water column. The results of testing estimated coverage on RB to be from the substrate to 40 cm from surface and the LB to 28 cm from the surface. The measurements were conducted from the weir approximately 4 m from the DIDSON. The beam spread beyond this point will further increase coverage as distance from the DIDSON increases. On-site testing has shown that salmon rarely migrate this close to the surface. Migration occurs primarily within 5 meters of the end of the fish deflection weir due to fast, strong flow in mid-river and slower seams of water along the banks. The absence of migration beyond the area of coverage is further supported by the very minimal escapement (~0.1%) observed in the 19.17-29.17 m range bin and lack of catch in the bi-weekly offshore drifts.

The bank-oriented migratory behavior allows for the collection of high quality 5 m HF DIDSON files that contain the vast majority of the salmon migration. Milling and holding behavior is rare at the Qualark site due to the flow characteristics. The directed upstream

migratory behavior combined with the high image quality maximizes the accuracy and precision of the counts. Counting protocols address potential biases associated with fish crossing between range bins. Minimum length requirements remove smaller native fish from the counts. The two sources of error (counter precision and file expansion) are identified and quantified.

The total daily salmon escapement is proportioned by species based on the proportion of each caught in the daily test fishery. The emphasis from a management perspective is on Sockeye Salmon. The total Sockeye Salmon escapement estimate at Qualark in 2013 was 3,956,867. It was estimated that the escapement of Pink Salmon was 4,073,796. The total Chinook Salmon escapement estimate was 395,027 including 70,394 jack Chinook Salmon. The total Coho Salmon escapement estimate was 166,095. The total Chum Salmon escapement estimate was 4,449. Despite the high quality of the total salmon escapement estimate and the test fishing being conducted at the location of hydroacoustic site, the accuracy of species proportioning may contain some uncertainty, especially during high Pink Salmon escapement.

During high Pink Salmon escapement the sample size of the test fishery catch becomes very small relative to total escapement. During these periods a single Sockeye Salmon caught in the test fishery can represent large numbers of Sockeye Salmon in the escapement estimate. This could lead to the potential inflation of the daily Sockeye Salmon estimate.

The species apportionment from the test fishery at Qualark relies on the assumption that catchability of each salmon available is equivalent regardless of discharge, water clarity, temperature, species and behavior. This leads to a number of questions that need to be investigated to support the species composition estimate or develop methods of improving it.

1. Water conditions go from high, fast and turbid to low, slow and clear. Does this affect speed and efficiency of the net and net avoidance behavior?
2. Do temperature variations affect behavior and catchability?
3. Do migration patterns vary between species and does this affect their catchability? For example, do larger bodied Chinook and Sockeye Salmon migrate further offshore than smaller bodied Pink Salmon making them more susceptible to being caught?
4. Does the presence of Pink Salmon change migration patterns of all species; do other species completely mix with the Pink Salmon?
5. Does net avoidance affect the number fish available to subsequent sets? If so does the smaller mesh sizes used in the first drifts of the sequences select for smaller fish?
6. How does potential net saturation at high abundances affect catchability?

Investigation of the catch/abundance relationships throughout different temporal strata or between even and odd years may clarify some of these questions. Even if the catchability varies based on the factors above, there may be a predictable relationship between catch rates and abundance. The identification of a predictable relationship would allow for the creation of an adjustment factor that could potentially improve the species composition estimate at Qualark.

Different methods of species apportionment are under investigation and if proven to be effective may be used to supplement and improve the species composition estimate. These methods may reduce the frequency and effort of the current test fishing program leading to a

reduction of cost. One such method involves using the measurement tool on the DIDSON program coupled with size measurements from sampled fish. The lengths from sampled fish are used to determine cut-off lengths between species. A sample of fish are measured from DIDSON files then assigned to the species specific length bins to determine species apportionment. Preliminary work on 2011 and 2012 data appears to support test fishing species proportioning. A second potential method of species apportioning is being investigated by the Applied Technology Group at PBS. This involves measuring the tail-beat frequency using DIDSON files. If different species exhibit a difference in the tail-beat frequency (regardless of if they are the same physical size) this method could be used as a reliable predictor of species. A sample of salmon tail-beat frequencies from DIDSON files could be analyzed and used to apportion species.

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## APPENDICES

Appendix 1. Daily total and cumulative salmon escapement by bank, daily catch, daily species proportions and daily and cumulative escapement by species from Qualark hydroacoustic and test fishing programs in 2013.

Date	Total Expanded Daily Count			Cumulative Daily Count			Daily Catch							Species Proportion							Daily Species Count							Cumulative Species Count						
	RB	LB	RB + LB	RB	LB	RB + LB	Sockeye	Chinook	Chinook Jacks	Pink	Coho	Chum	Total	Sockeye	Chinook Adults	Chinook Jacks	Pink	Coho	Chum	Sockeye	Chinook Adults	Chinook Jacks	Pink	Coho	Chum	Sockeye	Chinook Adults	Chinook Jacks	Pink	Coho	Chum			
30-Jun-13	758	758	1515	758	758	1515	6	7	0	0	0	0	13	0.46	0.54	0.00	0.00	0.00	0.00	699	816	0	0	0	0	699	816	0	0	0	0			
01-Jul-13	2659	2659	5318	3416	3416	6833	6	7	0	0	0	0	13	0.46	0.54	0.00	0.00	0.00	0.00	2454	2863	0	0	0	0	3153	3679	0	0	0	0			
02-Jul-13	3522	3522	7044	6938	6938	13877	6	4	0	0	0	0	10	0.60	0.40	0.00	0.00	0.00	0.00	4226	2818	0	0	0	0	7380	6497	0	0	0	0			
03-Jul-13	3923	3923	7845	10861	10861	21722	9	2	0	0	0	0	11	0.82	0.18	0.00	0.00	0.00	0.00	6419	1426	0	0	0	0	13798	7923	0	0	0	0			
04-Jul-13	3054	3054	6108	13915	13915	27830	8	8	0	0	0	0	16	0.50	0.50	0.00	0.00	0.00	0.00	3054	3054	0	0	0	0	16852	10977	0	0	0	0			
05-Jul-13	2698	2698	5396	16613	16613	33225	5	3	0	0	0	0	8	0.63	0.38	0.00	0.00	0.00	0.00	3372	2023	0	0	0	0	20225	13000	0	0	0	0			
06-Jul-13	2322	2322	4644	18935	18935	37869	7	10	0	0	0	0	17	0.41	0.59	0.00	0.00	0.00	0.00	1912	2732	0	0	0	0	22137	15732	0	0	0	0			
07-Jul-13	4350	4350	8700	23285	23285	46569	37	1	0	0	0	0	38	0.97	0.03	0.00	0.00	0.00	0.00	8471	229	0	0	0	0	30608	15961	0	0	0	0			
08-Jul-13	6326	6326	12651	29610	29610	59220	23	8	1	0	0	0	32	0.72	0.25	0.03	0.00	0.00	0.00	9093	3163	395	0	0	0	39701	19124	395	0	0	0			
09-Jul-13	7449	7449	14898	37059	37059	74118	70	9	0	0	0	0	79	0.89	0.11	0.00	0.00	0.00	0.00	13201	1697	0	0	0	0	52902	20821	395	0	0	0			
10-Jul-13	7500	8877	16377	44559	45936	90495	71	5	0	0	0	0	76	0.93	0.07	0.00	0.00	0.00	0.00	15300	1077	0	0	0	0	68201	21898	395	0	0	0			
11-Jul-13	6920	8037	14957	51479	53973	105452	48	5	1	0	0	0	54	0.89	0.09	0.02	0.00	0.00	0.00	13295	1385	277	0	0	0	81496	23283	672	0	0	0			
12-Jul-13	5294	7230	12524	56772	61203	117975	19	3	1	0	0	0	23	0.83	0.13	0.04	0.00	0.00	0.00	10346	1634	545	0	0	0	91841	24917	1217	0	0	0			
13-Jul-13	5462	10260	15722	62234	71463	133697	21	4	0	0	0	0	25	0.84	0.16	0.00	0.00	0.00	0.00	13206	2515	0	0	0	0	105047	27432	1217	0	0	0			
14-Jul-13	5955	6945	12900	68189	78408	146597	25	4	0	0	0	0	29	0.86	0.14	0.00	0.00	0.00	0.00	11121	1779	0	0	0	0	116168	29212	1217	0	0	0			
15-Jul-13	5916	5579	11495	74105	83987	158091	31	8	0	0	0	0	39	0.79	0.21	0.00	0.00	0.00	0.00	9137	2358	0	0	0	0	125305	31569	1217	0	0	0			
16-Jul-13	4050	4253	8303	78155	88239	166394	43	8	0	0	0	0	51	0.84	0.16	0.00	0.00	0.00	0.00	7000	1302	0	0	0	0	132305	32872	1217	0	0	0			
17-Jul-13	4112	3548	7659	82266	91787	174053	14	4	0	0	0	0	18	0.78	0.22	0.00	0.00	0.00	0.00	5957	1702	0	0	0	0	138262	34574	1217	0	0	0			
18-Jul-13	4367	4059	8426	86633	95846	182478	10	7	0	0	0	0	17	0.59	0.41	0.00	0.00	0.00	0.00	4956	3469	0	0	0	0	143218	38043	1217	0	0	0			
19-Jul-13	4239	4937	9176	90872	100782	191654	8	2	1	0	0	0	11	0.73	0.18	0.09	0.00	0.00	0.00	6673	1668	834	0	0	0	149891	39711	2051	0	0	0			
20-Jul-13	4605	4874	9479	95477	105656	201132	12	3	0	0	0	0	15	0.80	0.20	0.00	0.00	0.00	0.00	7583	1896	0	0	0	0	157474	41607	2051	0	0	0			
21-Jul-13	4193	3249	7442	99669	108905	208574	20	5	0	0	0	0	25	0.80	0.20	0.00	0.00	0.00	0.00	5953	1488	0	0	0	0	163427	43095	2051	0	0	0			
22-Jul-13	4715	3746	8460	104384	112650	217034	10	6	0	0	0	0	16	0.63	0.38	0.00	0.00	0.00	0.00	5288	3173	0	0	0	0	168715	46268	2051	0	0	0			
23-Jul-13	5466	3710	9176	109850	116360	226209	24	4	2	0	0	0	30	0.80	0.13	0.07	0.00	0.00	0.00	7340	1223	612	0	0	0	176055	47491	2663	0	0	0			
24-Jul-13	5871	4335	10206	115721	120695	236415	13	1	0	0	0	0	14	0.93	0.07	0.00	0.00	0.00	0.00	9477	729	0	0	0	0	185532	48220	2663	0	0	0			
25-Jul-13	5939	6152	12090	121659	126846	248505	22	4	0	0	0	0	26	0.85	0.15	0.00	0.00	0.00	0.00	10230	1860	0	0	0	0	195762	50080	2663	0	0	0			
26-Jul-13	6869	5369	12237	128528	132215	260742	23	6	0	0	0	0	29	0.79	0.21	0.00	0.00	0.00	0.00	9705	2532	0	0	0	0	205467	52612	2663	0	0	0			
27-Jul-13	4419	4986	9405	132947	137201	270147	18	2	0	0	0	0	20	0.90	0.10	0.00	0.00	0.00	0.00	8465	941	0	0	0	0	213932	53553	2663	0	0	0			
28-Jul-13	7899	7541	15440	140846	144742	285587	15	3	2	0	0	0	20	0.75	0.15	0.10	0.00	0.00	0.00	11580	2316	1544	0	0	0	225512	55869	4207	0	0	0			
29-Jul-13	11628	8363	19990	152473	153104	305578	13	3	3	0	0	0	19	0.68	0.16	0.16	0.00	0.00	0.00	13678	3156	3156	0	0	0	239190	59025	7363	0	0	0			
30-Jul-13	11364	11385	22749	163837	164489	328327	23	3	2	0	0	0	28	0.82	0.11	0.07	0.00	0.00	0.00	18687	2437	1625	0	0	0	257876	61462	8988	0	0	0			
31-Jul-13	16226	11555	27780	180063	176044	356107	48	3	1	0	0	0	52	0.92	0.06	0.02	0.00	0.00	0.00	25643	1603	534	0	0	0	283519	63065	9522	0	0	0			
01-Aug-13	23270	18888	42158	203332	194932	398264	29	4	0	0	0	0	33	0.88	0.12	0.00	0.00	0.00	0.00	37048	5110	0	0	0	0	320567	68175	9522	0	0	0			
02-Aug-13	31245	16605	47850	234577	211537	446114	53	3	0	0	0	0	56	0.95	0.05	0.00	0.00	0.00	0.00	45287	2563	0	0	0	0	365853	70738	9522	0	0	0			
03-Aug-13	13578	21579	35157	248155	233116	481271	6	2	0	0	0	0	8	0.75	0.25	0.00	0.00	0.00	0.00	26368	8789	0	0	0	0	392221	79528	9522	0	0	0			
04-Aug-13	17106	14529	31635	265261	247645	512906	25	4	1	0	0	0	30	0.83	0.13	0.03	0.00	0.00	0.00	26363	4218	1055	0	0	0	418584	83746	10577	0	0	0			
05-Aug-13	19406	29466	48872	284667	277111	561778	44	2	0	0	0	0	46	0.96	0.04	0.00	0.00	0.00	0.00	46747	2125	0	0	0	0	465330	85871	10577	0	0	0			
06-Aug-13	16497	19353	35850	301164	296464	597628	16	2	0	0	0	0	18	0.89	0.11	0.00	0.00	0.00	0.00	31867	3983	0	0	0	0	497197	89854	10577	0	0	0			
07-Aug-13	13698	13323	27021	314862	309787	624649	18	2	0	0	0	0	20	0.90	0.10	0.00	0.00	0.00	0.00	24319	2702	0	0	0	0	521516	92556	10577	0	0	0			
08-Aug-13	18291	23865	42156	333153	333852	666805	55	2	0	0	0	0	57	0.96	0.04	0.00	0.00	0.00	0.00	40677	1479	0	0	0	0	562193	94035	10577	0	0	0			
09-Aug-13	22023	31367	53390	355176	365018	720194	61	1	0	0	0	0	62	0.98	0.02	0.00	0.00	0.00	0.00	52528	861	0	0	0	0	614721	94896	10577	0	0	0			
10-Aug-13	26364	27204	53568	381540	392222	773762	41	2	0	1	0	0	44	0.93	0.05	0.00	0.02	0.00	0.00	49916	2435	0	1217	0	0	664637	97331	10577	1217	0	0			
11-Aug-13	26700	40863	67563	408240	433085	841325	73	4	0	0	0	0	77	0.95	0.05	0.00	0.00	0.00	0.00	64053	3510	0	0	0	0	728690	100841	10577	1217	0	0			
12-Aug-13	26421	38831	65252	434661	471916	906577	34	2	0	0	0	0	36	0.94	0.06	0.00	0.00	0.00	0.00	61626	3625	0	0	0	0	790316	104466	10577	1217	0	0			
13-Aug-13	23954	36681	60635	458614	508597	967211	45	3	0	1	0	0	49	0.92	0.06	0.00	0.02	0.00	0.00	55685														

Appendix 1 cont.

Date	Total Expanded Daily Count			Cumulative Daily Count			Daily Catch							Species Proportion						Daily Species Count						Cumulative Species Count					
	RB	LB	RB+LB	RB	LB	RB+LB	Sockeye	Chinook	Chinook Jacks	Pink	Coho	Chum	Total	Sockeye	Chinook Adults	Chinook Jacks	Pink	Coho	Chum	Sockeye	Chinook Adults	Chinook Jacks	Pink	Coho	Chum	Sockeye	Chinook Adults	Chinook Jacks	Pink	Coho	Chum
16-Aug-13	33512	73151	106662	555867	663631	1219498	100	7	0	0	0	0	107	0.93	0.07	0.00	0.00	0.00	0.00	99684	6978	0	0	0	0	1081655	121207	11734	4902	0	0
17-Aug-13	51647	63848	115494	607513	727478	1334992	109	6	1	1	0	0	117	0.93	0.05	0.01	0.01	0.00	0.00	107597	5923	987	987	0	0	1189252	127130	12721	5889	0	0
18-Aug-13	50234	51605	101838	657747	779083	1436830	115	3	0	0	0	0	118	0.97	0.03	0.00	0.00	0.00	0.00	99249	2589	0	0	0	0	1288501	129719	12721	5889	0	0
19-Aug-13	37937	38805	76742	695683	817888	1513571	127	2	1	0	0	0	130	0.98	0.02	0.01	0.00	0.00	0.00	74971	1181	590	0	0	0	1363471	130900	13311	5889	0	0
20-Aug-13	40358	38541	78899	736041	856429	1592470	138	5	1	5	0	0	149	0.93	0.03	0.01	0.03	0.00	0.00	73074	2648	530	2648	0	0	1436545	133547	13841	8537	0	0
21-Aug-13	41084	49940	91023	777124	906368	1683493	154	1	1	4	0	0	160	0.96	0.01	0.01	0.03	0.00	0.00	87610	569	569	2276	0	0	1524154	134116	14410	10812	0	0
22-Aug-13	42543	47126	89669	819667	953494	1773161	96	8	0	3	0	0	107	0.90	0.07	0.00	0.03	0.00	0.00	80450	6704	0	2514	0	0	1604605	140820	14410	13326	0	0
23-Aug-13	38574	50667	89241	858241	1004161	1862402	71	5	0	7	0	0	83	0.86	0.06	0.00	0.08	0.00	0.00	76339	5376	0	7526	0	0	1680943	146196	14410	20853	0	0
24-Aug-13	39198	61638	100836	897439	1065799	1963238	102	8	1	15	0	0	126	0.81	0.06	0.01	0.12	0.00	0.00	81629	6402	800	12004	0	0	1762573	152599	15210	32857	0	0
25-Aug-13	48741	65148	113889	946180	1130947	2077127	97	9	1	21	0	0	128	0.76	0.07	0.01	0.16	0.00	0.00	86307	8008	890	18685	0	0	1848879	160607	16100	51542	0	0
26-Aug-13	56316	63278	119594	1002496	1194224	2196721	131	2	1	19	0	0	153	0.86	0.01	0.01	0.12	0.00	0.00	102397	1563	782	14851	0	0	1951276	162170	16881	66393	0	0
27-Aug-13	68459	72687	141146	1070955	1266911	2337866	77	5	0	19	0	0	101	0.76	0.05	0.00	0.19	0.00	0.00	107606	6987	0	26552	0	0	2058882	169157	16881	92945	0	0
28-Aug-13	57486	69215	126701	1128441	1336126	2464567	54	3	3	24	0	0	84	0.64	0.04	0.04	0.29	0.00	0.00	81450	4525	4525	36200	0	0	2140332	173682	21406	129146	0	0
29-Aug-13	81753	55778	137531	1210194	1391903	2602097	103	5	4	50	0	0	162	0.64	0.03	0.02	0.31	0.00	0.00	87442	4245	3396	42448	0	0	2227775	17927	24802	171593	0	0
30-Aug-13	72620	56210	128829	1282813	1448113	2730926	53	2	3	26	0	0	84	0.63	0.02	0.04	0.31	0.00	0.00	81285	3067	4601	39876	0	0	2309060	180994	29403	211469	0	0
31-Aug-13	73097	49994	123090	1355910	1498106	2854016	62	3	1	27	0	0	93	0.67	0.03	0.01	0.29	0.00	0.00	82060	3971	1324	35736	0	0	2391120	184965	30727	247205	0	0
01-Sep-13	57633	62875	120508	1413543	1560981	2974524	35	1	2	28	0	0	66	0.53	0.02	0.03	0.42	0.00	0.00	63906	1826	3652	51125	0	0	2455020	186791	34378	298329	0	0
02-Sep-13	117150	56810	173960	1530693	1617791	3148483	38	2	1	41	1	0	83	0.46	0.02	0.01	0.49	0.01	0.00	79644	4192	2096	85932	2096	0	2534669	190983	36474	384261	2096	0
03-Sep-13	119246	98936	218181	1649938	1716726	3366664	58	1	2	51	0	1	113	0.51	0.01	0.02	0.45	0.00	0.01	111987	1931	3862	98471	0	1931	2646656	192914	40336	482732	2096	1931
04-Sep-13	114964	118151	233115	1764902	1834877	3599779	63	8	1	50	0	0	122	0.52	0.07	0.01	0.41	0.00	0.00	120379	15286	1911	95539	0	0	2767035	208200	42247	578271	2096	1931
05-Sep-13	185586	69494	255080	1950488	1904370	3854858	62	0	3	49	0	0	114	0.54	0.00	0.03	0.43	0.00	0.00	138727	0	6713	109639	0	0	2905762	208200	48959	687910	2096	1931
06-Sep-13	167111	105207	272318	2117599	2009577	4127176	51	3	1	88	0	0	143	0.36	0.02	0.01	0.62	0.00	0.00	97120	5713	1904	167580	0	0	3002883	213913	50864	855490	2096	1931
07-Sep-13	133805	135686	269490	2251403	2145263	4396666	69	4	0	33	0	1	107	0.64	0.04	0.00	0.31	0.00	0.01	173783	10074	0	83114	0	2519	3176666	223987	50864	938604	2096	4449
08-Sep-13	131970	120110	252080	2383373	2265372	4648745	67	2	2	52	0	0	123	0.54	0.02	0.02	0.42	0.00	0.00	137312	4099	4099	106570	0	0	3313977	228086	54963	1045174	2096	4449
09-Sep-13	155930	115854	271784	2539303	2381226	4920529	23	4	1	41	0	0	69	0.33	0.06	0.01	0.59	0.00	0.00	90595	15756	3939	161495	0	0	3404572	243841	58901	1206669	2096	4449
10-Sep-13	159285	140730	300015	2698588	2521956	5220544	30	2	0	34	1	0	67	0.45	0.03	0.00	0.51	0.01	0.00	134335	8956	0	152246	4478	0	3538907	252797	58901	1358915	6574	4449
11-Sep-13	180969	167361	348330	2879557	2689317	5568874	21	4	1	89	3	0	118	0.18	0.03	0.01	0.75	0.03	0.00	61991	11808	2952	262723	8856	0	3600898	264605	61853	1621638	15430	4449
12-Sep-13	203919	138338	342257	3083476	2827654	5911130	24	2	0	137	4	0	167	0.14	0.01	0.00	0.82	0.02	0.00	49187	4099	0	280773	8198	0	3650084	268704	61853	1902412	23627	4449
13-Sep-13	153983	154581	308564	3237458	2982235	6219694	18	0	2	79	0	0	99	0.18	0.00	0.02	0.80	0.00	0.00	56102	0	6234	246227	0	0	3706187	268704	68087	2148639	23627	4449
14-Sep-13	131786	146865	278651	3369244	3129100	6498344	14	4	0	35	1	0	54	0.26	0.07	0.00	0.65	0.02	0.00	72243	20641	0	180607	5160	0	3778430	289345	68087	2329246	28788	4449
15-Sep-13	96290	105935	202224	3465533	3235035	6700568	10	2	0	59	4	0	75	0.13	0.03	0.00	0.79	0.05	0.00	26963	5393	0	159083	10785	0	3805393	294737	68087	2488329	39573	4449
16-Sep-13	106119	64046	170165	3571652	3299080	6870733	9	3	0	44	5	0	61	0.15	0.05	0.00	0.72	0.08	0.00	25106	8369	0	122742	13948	0	3830499	303106	68087	2611070	53521	4449
17-Sep-13	52709	39582	92291	3624361	3338662	6963023	8	0	1	28	3	0	40	0.20	0.00	0.03	0.70	0.08	0.00	18458	0	2307	64603	6922	0	3848957	303106	70394	2675674	60443	4449
18-Sep-13	31430	22803	54233	3655790	3361465	7017256	6	3	0	44	7	0	60	0.10	0.05	0.00	0.73	0.12	0.00	5423	2712	0	39771	6327	0	3854380	305818	70394	2715444	66770	4449
19-Sep-13	49536	31644	81180	3705326	3393109	7098436	5	2	0	20	1	0	28	0.18	0.07	0.00	0.71	0.04	0.00	14496	5799	0	57986	2899	0	3868877	311616	70394	2773430	69669	4449
20-Sep-13	71054	54797	125850	3776380	3447906	7224286	4	1	0	28	2	0	35	0.11	0.03	0.00	0.80	0.06	0.00	14383	3596	0	100680	7191	0	3883260	315212	70394	2874110	78680	4449
21-Sep-13	91433	72294	163727	3867812	3520200	7388012	2	1	0	37	3	0	43	0.05	0.02	0.00	0.86	0.07	0.00	7615	3808	0	140881	11423	0	3890875	319019	70394	3014991	88283	4449
22-Sep-13	118124	74402	192525	3985936	3594601	7580537	8	0	0	75	4	0	87	0.09	0.00	0.00	0.86	0.05	0.00	17703	0	0	165970	8852	0	3908578	319019	70394	3180961	97135	4449
23-Sep-13	28856	119325	148181	4014791	3713926	7728718	7	1	0	100	7	0	115	0.06	0.01	0.00	0.87	0.06	0.00	9020	1289	0	128853	9020	0	3917598	320308	70394	3309813	106155	4449
24-Sep-13	112742	84051	196793	4127533	3797977	7925510	6	0	0	102	3	0	111	0.05	0.00	0.00	0.92	0.03	0.00	10637	0	0	180836	5319	0	3928235	320308	70394	3490650	111473	4449
25-Sep-13	123884	74889	198773	4251416	3872866	8124283	6	0	0	54	8	0	68	0.09	0.00	0.00	0.79	0.12	0.00	17539	0	0	157849</								



## Appendix 2 cont.

Date	Drift	Location	Time			Mesh Size	Caught						Total	Comments
			Start	End	Duration		Sockeye	Chinook	Chin. Jacks	Pinks	Coho	Chum		
9/7/13	1	near	07:00	07:04	04:00	4.00	4	2	0	0	0	0	6	Incomplete drift, net into shore.
9/7/13	2	near	07:20	07:25	05:00	5.25	30	5	0	0	0	0	35	
9/7/13	3	near	07:40	07:46	06:00	6.75	0	0	0	0	0	0	0	Good drift.
9/7/13	1	near	19:02	19:07	05:00	4.75	34	0	0	0	0	0	34	
9/7/13	2	near	19:20	19:25	05:00	5.75	0	1	0	0	0	0	1	
9/7/13	3	near	19:40	19:45	05:00	8.00	2	1	0	0	0	0	3	
10/7/13	1	near	07:00	07:05	05:00	4.75	44	0	0	0	0	0	44	
10/7/13	2	near	07:20	07:26	06:00	5.75	3	0	0	0	0	0	3	Good drift, beaver swimming with drift.
10/7/13	3	near	07:40	07:45	05:00	8.00	7	0	0	0	0	0	7	
10/7/13	1	near	19:00	19:05	05:00	4.00	5	0	0	0	0	0	5	
10/7/13	2	near	19:20	19:26	06:00	5.25	11	3	0	0	0	0	14	
10/7/13	3	near	19:41	19:48	07:00	6.75	1	2	0	0	0	0	3	
11/7/13	1	near	07:00	07:05	05:00	4.00	11	3	1	0	0	0	15	Incomplete drift.
11/7/13	2	near	07:20	07:27	07:00	5.25	15	0	0	0	0	0	15	
11/7/13	3	near	07:40	07:47	07:00	6.75	3	2	0	0	0	0	5	
11/7/13	4	offshore	07:50	07:53	03:00	5.25	0	0	0	0	0	0	0	
11/7/13	1	near	19:00	19:06	06:00	4.75	16	0	0	0	0	0	16	
11/7/13	2	near	19:22	19:27	05:00	5.75	0	0	0	0	0	0	0	
11/7/13	3	near	19:42	19:47	05:00	8.00	3	0	0	0	0	0	3	Hung up. Reset drift.
12/7/13	1	near	07:00	07:03	03:00	4.75	3	0	1	0	0	0	4	Hung up bad above weir, jack DOA, net ripped face off.
12/7/13	2	near	07:21	07:26	05:00	5.75	4	0	0	0	0	0	4	Good drift, one pike minnow caught & released.
12/7/13	3	near	07:40	07:45	05:00	8.00	3	1	0	0	0	0	4	
12/7/13	1	near	19:05	19:11	06:00	4.00	6	0	0	0	0	0	6	
12/7/13	2	near	19:25	19:30	05:00	5.25	1	0	0	0	0	0	1	
12/7/13	3	near	19:45	19:50	05:00	6.75	2	2	0	0	0	0	4	
13/7/13	1	near	07:01	07:07	06:00	4.00	5	0	0	0	0	0	5	
13/7/13	2	near	07:20	07:26	06:00	5.25	13	2	0	0	0	0	15	
13/7/13	3	near	07:40	07:46	06:00	6.75	1	2	0	0	0	0	3	
13/7/13	1	near	19:00	19:06	06:00	4.75	1	0	0	0	0	0	1	
13/7/13	2	near	19:21	19:27	06:00	5.75	0	0	0	0	0	0	0	
13/7/13	3	near	19:42	19:47	05:00	8.00	1	0	0	0	0	0	1	
14/7/13	1	near	07:00	07:03	03:00	4.75	3	0	0	0	0	0	3	Incomplete drift, hung up at weir.
14/7/13	2	near	07:20	07:26	06:00	5.75	5	1	0	0	0	0	6	
14/7/13	3	near	07:41	07:46	05:00	8.00	1	0	0	0	0	0	1	
14/7/13	1	near	19:00	19:06	06:00	4.00	7	2	0	0	0	0	9	
14/7/13	2	near	19:21	19:28	07:00	5.25	6	1	0	0	0	0	7	
14/7/13	3	near				6.75	3	0	0	0	0	0	3	One sockeye fell off while pulling. Start/end times not recorded.
15/7/13	1	near	07:00	07:06	06:00	4.00	10	1	0	0	0	0	11	
15/7/13	2	near	07:21	07:27	06:00	5.25	8	0	0	0	0	0	8	
15/7/13	3	near	07:41	07:47	06:00	6.75	0	1	0	0	0	0	1	Good drift, one chinook went through net
15/7/13	4	offshore	07:50	07:53	03:00	5.25	0	0	0	0	0	0	0	
15/7/13	1	near	19:00	19:05	05:00	4.75	11	2	0	0	0	0	13	
15/7/13	2	near	19:20	19:26	06:00	5.75	0	0	0	0	0	0	0	
15/7/13	3	near	19:40	19:46	06:00	8.00	2	4	0	0	0	0	6	
16/7/13	1	near	07:03	07:09	06:00	4.75	17	3	0	0	0	0	20	
16/7/13	2	near	07:20	07:26	06:00	5.75	5	2	0	0	0	0	7	
16/7/13	3	near	07:40	07:45	05:00	8.00	4	1	0	0	0	0	5	Net stalled, had to reset.
16/7/13	1	near	19:05	19:10	05:00	4.00	0	0	0	0	0	0	0	
16/7/13	2	near	19:20	19:26	06:00	5.25	17	1	0	0	0	0	18	
16/7/13	3	near	19:45	19:50	05:00	6.75	0	1	0	0	0	0	1	



## Appendix 2 cont.

Date	Drift	Location	Time			Mesh Size	Caught						Comments	
			Start	End	Duration		Sockeye	Chinook	Chin. Jacks	Pinks	Coho	Chum		Total
25/7/13	1	near	07:00	07:06	06:00	4.00	7	1	0	0	0	0	8	
25/7/13	2	near	07:20	07:26	06:00	5.25	2	0	0	0	0	0	2	
25/7/13	3	near	07:40	07:46	06:00	6.75	2	2	0	0	0	0	4	Good drift, one jack sockeye, chinooks DOA.
25/7/13	4	offshore	07:56	07:59	03:00	5.25	0	0	0	0	0	0	0	
25/7/13	1	near	19:00	19:06	06:00	4.75	5	0	0	0	0	0	5	Good drift, fish caught close to shore.
25/7/13	2	near	19:23	19:29	06:00	5.75	5	1	0	0	0	0	6	
25/7/13	3	near	19:45	19:51	06:00	8.00	1	0	0	0	0	0	1	
26/7/13	1	near	07:00	07:06	06:00	4.75	5	2	0	0	0	0	7	
26/7/13	2	near	07:21	07:28	07:00	5.75	7	4	0	0	0	0	11	All Chinook caught at tip of net.
26/7/13	3	near	07:40	07:46	06:00	8.00	0	0	0	0	8.00	0	0	
26/7/13	1	near	19:06	19:13	07:00	4.00	5	0	0	0	0	0	5	Good drift. FN fish opening tonight at 7pm
26/7/13	2	near	19:21	19:28	07:00	5.25	6	0	0	0	0	0	6	
26/7/13	3	near	19:40	19:45	05:00	6.75	0	0	0	0	0	0	0	
27/7/13	1	near	07:00	07:04	04:00	4.00	1	0	0	0	4.00	0	1	Incomplete drift, net stalled.
27/7/13	2	near	07:20	07:26	06:00	5.25	10	1	0	0	0	0	11	
27/7/13	3	near	07:41	07:48	07:00	6.75	0	0	0	0	0	0	0	
27/7/13	1	near	19:02	19:06	04:00	4.75	7	1	0	0	0	0	8	Incomplete drift, one clipped chinook.
27/7/13	2	near	19:20	19:27	07:00	5.75	0	0	0	0	0	0	0	
27/7/13	3	near	19:40	19:43	03:00	8.00	0	0	0	0	0	0	0	Hung up bad just past weir.
28/7/13	1	near	07:00	07:06	06:00	4.75	9	3	0	0	0	0	12	
28/7/13	2	near	07:20	07:26	06:00	5.75	0	0	0	0	0	0	0	
28/7/13	3	near	07:41	07:46	05:00	8.00	0	0	0	0	0	0	0	Incomplete drift, net drifted into shore.
28/7/13	1	near	19:00	19:07	07:00	4.00	5	0	2	0	0	0	7	Good drift, two jack Chinook, one jack sockeye.
28/7/13	2	near	19:20	19:27	07:00	5.25	1	0	0	0	0	0	1	
28/7/13	3	near	19:41	19:44	03:00	6.75	0	0	0	0	0	0	0	Incomplete drift, net drifted into shore.
29/7/13	1	near	07:00	07:06	06:00	4.00	8	0	2	0	0	0	10	
29/7/13	2	near	07:20	07:26	06:00	5.25	1	0	0	0	0	0	1	
29/7/13	3	near	07:40	07:46	06:00	6.75	2	1	0	0	0	0	3	
29/7/13	4	offshore	07:48	07:52	04:00	5.25	0	0	0	0	0	0	0	
29/7/13	1	near	19:00	19:06	06:00	4.75	1	1	1	0	0	0	3	
29/7/13	2	near	19:20	19:26	06:00	5.75	0	0	0	0	0	0	0	Huge hit at end of drift, possible sturgeon.
29/7/13	3	near	19:40	19:46	06:00	8.00	1	1	0	0	0	0	2	
30/7/13	1	near	07:01	07:07	06:00	4.75	14	0	2	0	0	0	16	
30/7/13	2	near	07:21	07:26	05:00	5.75	0	0	0	0	0	0	0	
30/7/13	3	near	07:40	07:46	06:00	8.00	1	0	0	0	0	0	1	
30/7/13	1	near	19:00	19:04	04:00	4.00	5	0	0	0	0	0	5	Incomplete drift. Net drifted into shore.
30/7/13	2	near	19:20	19:26	06:00	5.25	1	0	0	0	0	0	1	
30/7/13	3	near	19:40	19:47	07:00	6.75	2	3	0	0	0	0	5	
31/7/13	1	near	07:00	07:07	07:00	4.00	24	0	1	0	0	0	25	Good drift. Fish caught throughout net.
31/7/13	2	near	07:20	07:26	06:00	5.25	6	1	0	0	0	0	7	
31/7/13	3	near	07:40	07:46	06:00	6.75	0	0	0	0	0	0	0	
31/7/13	1	near	19:00	19:06	06:00	4.75	18	0	0	0	0	0	18	Good drift. All fish caught in first half of net.
31/7/13	2	near	19:20	19:26	06:00	5.75	0	0	0	0	0	0	0	
31/7/13	3	near	19:40	19:44	04:00	8.00	0	2	0	0	0	0	2	Incomplete drift.
1/8/13	1	near	07:00	07:07	07:00	4.75	9	0	0	0	0	0	9	
1/8/13	2	near	07:20	07:24	04:00	5.75	1	0	0	0	0	0	1	Incomplete, net hit bottom a few times.
1/8/13	3	near	07:40	07:47	07:00	8.00	6	0	0	0	0	0	6	
1/8/13	4	offshore	07:44	07:52	08:00	5.25	0	0	0	0	0	0	0	
1/8/13	1	near	19:00	19:06	06:00	4.00	5	1	0	0	0	0	6	
1/8/13	2	near	19:20	19:26	06:00	5.25	1	0	0	0	0	0	1	
1/8/13	3	near	19:40	19:46	06:00	6.75	7	3	0	0	0	0	10	

## Appendix 2 cont.

Date	Drift	Location	Time			Mesh Size	Caught							Comments
			Start	End	Duration		Sockeye	Chinook	Chin. Jacks	Pinks	Coho	Chum	Total	
2/8/13	1	near	07:00	07:06	06:00	4.00	24	0	0	0	0	0	24	
2/8/13	2	near	07:20	07:27	07:00	5.25	15	1	0	0	0	0	16	
2/8/13	3	near	07:40	07:47	07:00	6.75	2	0	0	0	0	0	2	
2/8/13	1	near	19:00	19:07	07:00	4.75	10	0	0	0	0	0	10	
2/8/13	2	near	19:22	19:28	06:00	5.75	0	1	0	0	0	0	1	
2/8/13	3	near	19:42	19:49	07:00	8.00	2	1	0	0	0	0	3	
3/8/13	1	near	07:00	07:03	03:00	4.75	1	0	0	0	0	0	1	Hung up at the weir. Couldn't reset.
3/8/13	2	near	07:20	07:26	06:00	5.75	2	1	0	0	0	0	3	One Chinook fell out of net. Adipose clip status unknown.
3/8/13	3	near	07:40	07:44	04:00	8.00	0	0	0	0	0	0	0	Incomplete drift. Net hung up.
3/8/13	1	near	19:00	19:06	06:00	4.00	3	0	0	0	0	0	3	
3/8/13	2	near	19:20	19:24	04:00	5.25	0	0	0	0	0	0	0	Hung up at the weir.
3/8/13	3	near	19:40	19:47	07:00	6.75	0	1	0	0	0	0	1	
4/8/13	1	near	07:00	07:06	06:00	4.00	14	1	0	0	0	0	15	
4/8/13	2	near	07:20	07:26	06:00	5.25	6	1	0	0	0	0	7	
4/8/13	3	near	07:40	07:44	04:00	6.75	1	0	1	0	0	0	2	3/4 drift.
4/8/13	1	near	19:00	19:06	06:00	4.75	2	1	0	0	0	0	3	
4/8/13	2	near	19:20	19:26	06:00	5.75	2	1	0	0	0	0	3	
4/8/13	3	near				8.00	0	0	0	0	0	0	0	Incomplete drift. Start/end times not recorded.
5/8/13	1	near	07:00	07:07	07:00	4.75	15	1	0	0	0	0	16	
5/8/13	2	near	07:20	07:24	04:00	5.75	4	0	0	0	0	0	4	Incomplete drift.
5/8/13	3	near	07:40	07:46	06:00	8.00	1	0	0	0	0	0	1	Net stalled. 3/4 drift.
5/8/13	4	offshore	07:55	07:59	04:00	5.25	0	0	0	0	0	0	0	
5/8/13	1	near	19:00	19:07	07:00	4.00	14	0	0	0	0	0	14	
5/8/13	2	near	19:20	19:26	06:00	5.25	10	0	0	0	0	0	10	
5/8/13	3	near	19:40	19:45	05:00	6.75	0	1	0	0	0	0	1	
6/8/13	1	near	07:00	07:07	07:00	4.00	10	0	0	0	0	0	10	
6/8/13	2	near	07:20	07:26	06:00	5.25	3	0	0	0	0	0	3	
6/8/13	3	near	07:40	07:47	07:00	6.75	0	0	0	0	0	0	0	
6/8/13	1	near	19:00	19:06	06:00	4.75	1	0	0	0	0	0	1	
6/8/13	2	near	19:21	19:27	06:00	5.75	2	0	0	0	0	0	2	
6/8/13	3	near	19:40	19:47	07:00	8.00	0	2	0	0	0	0	2	
7/8/13	1	near	07:00	07:06	06:00	4.75	12	0	0	0	0	0	12	
7/8/13	2	near	07:20	07:27	07:00	5.75	0	0	0	0	0	0	0	
7/8/13	3	near	07:40	07:46	06:00	8.00	1	0	0	0	0	0	1	
7/8/13	1	near	19:05	19:12	07:00	4.00	2	0	0	0	0	0	2	
7/8/13	2	near	19:22	19:26	04:00	5.25	2	0	0	0	0	0	2	Incomplete drift. Net hung up.
7/8/13	3	near	19:40	19:47	07:00	6.75	1	2	0	0	0	0	3	
8/8/13	1	near	07:00	07:07	07:00	4.00	25	0	0	0	0	0	25	
8/8/13	2	near	07:20	07:26	06:00	5.25	0	0	0	0	0	0	0	
8/8/13	3	near	07:40	07:47	07:00	6.75	5	2	0	0	0	0	7	
8/8/13	4	offshore	07:49	07:52	03:00	5.25	0	0	0	0	0	0	0	
8/8/13	1	near	19:00	19:06	06:00	4.75	23	0	0	0	0	0	23	
8/8/13	2	near	19:20	19:26	06:00	5.75	0	0	0	0	0	0	0	
8/8/13	3	near	19:40	19:46	06:00	8.00	2	0	0	0	0	0	2	
9/8/13	1	near	07:00	07:07	07:00	4.75	33	0	0	0	0	0	33	
9/8/13	2	near	07:20	07:26	06:00	5.75	2	0	0	0	0	0	2	
9/8/13	3	near	07:42	07:49	07:00	8.00	11	0	0	0	0	0	11	
9/8/13	1	near	19:00	19:06	06:00	4.00	4	0	0	0	0	0	4	
9/8/13	2	near	19:20	19:23	03:00	5.25	6	0	0	0	0	0	6	Net hung up, incomplete drift.
9/8/13	3	near	19:40	19:47	07:00	6.75	5	1	0	0	0	0	6	

## Appendix 2 cont.

Date	Drift	Location	Time			Mesh Size	Caught						Comments	
			Start	End	Duration		Sockeye	Chinook	Chin. Jacks	Pinks	Coho	Chum		Total
10/8/13	1	near	07:00	07:07	07:00	4.00	27	1	0	0	0	0	28	Good drift, fish caught throughout net.
10/8/13	2	near	07:20	07:27	07:00	5.25	3	0	0	1	0	0	4	Good drift, first pink of the year.
10/8/13	3	near	07:40	07:43	03:00	6.75	0	0	0	0	0	0	0	Incomplete drift, net drifted into shore.
10/8/13	1	near	19:00	19:06	06:00	4.75	10	0	0	0	0	0	10	
10/8/13	2	near	19:20	19:26	06:00	5.75	1	1	0	0	0	0	2	
10/8/13	3	near	19:40	19:46	06:00	8.00	0	0	0	0	0	0	0	
11/8/13	1	near	07:00	07:07	07:00	4.75	51	1	0	0	0	0	52	
11/8/13	2	near	07:20	07:23	03:00	5.75	0	1	0	0	0	0	1	Incomplete, net hung up just passed weir.
11/8/13	3	near	07:40	07:42	02:00	8.00	0	0	0	0	0	0	0	Incomplete drift caught seven foot sturgeon in net. Released.
11/8/13	1	near	19:00	19:03	03:00	4.00	18	0	0	0	0	0	18	Net hung up.
11/8/13	2	near	19:20	19:27	07:00	5.25	3	2	0	0	0	0	5	
11/8/13	3	near	19:40	19:45	05:00	6.75	1	0	0	0	0	0	1	Incomplete drift, net stalled.
12/8/13	1	near	07:00	07:07	07:00	4.00	22	0	0	0	0	0	22	One sucker caught in net. Only one morning drift, boat troubles.
12/8/13	1	near	19:00	19:04	04:00	4.75	8	0	0	0	0	0	8	Net hung up just past weir.
12/8/13	2	near	19:20	19:27	07:00	5.75	3	2	0	0	0	0	5	
12/8/13	3	near	19:40	19:46	06:00	8.00	1	0	0	0	0	0	1	Net hit bottom a couple times.
13/8/13	1	near	07:00	07:06	06:00	4.75	24	0	0	1	0	0	25	
13/8/13	2	near	07:20	07:26	06:00	5.75	3	0	0	0	0	0	3	One sturgeon in net near end of drift (released itself).
13/8/13	3	near				8.00	1	0	0	0	0	0	1	Incomplete drift. Start/end times not recorded.
13/8/13	1	near	19:00	19:07	07:00	4.00	12	1	0	0	0	0	13	
13/8/13	2	near	19:20	19:27	07:00	5.25	5	1	0	0	0	0	6	
13/8/13	3	near	19:40	19:47	07:00	6.75	0	1	0	0	0	0	1	
14/8/13	1	near	07:00	07:07	07:00	4.00	22	1	0	1	0	0	24	
14/8/13	2	near	07:20	07:27	07:00	5.25	5	0	0	0	0	0	5	
14/8/13	3	near	07:40	07:45	05:00	6.75	3	0	0	0	0	0	3	Incomplete drift. Net drifted into shore.
14/8/13	1	near	19:00	19:05	05:00	4.75	13	1	0	0	0	0	14	Incomplete drift. Net stalled.
14/8/13	2	near	19:20	19:25	05:00	5.75	2	0	0	0	0	0	2	Net hung up bad.
14/8/13	3	near	19:40	19:46	06:00	8.00	3	0	0	0	0	0	3	
15/8/13	1	near	07:00	07:06	06:00	4.75	11	0	0	0	0	0	11	
15/8/13	2	near	07:21	07:28	07:00	5.75	12	1	0	0	0	0	13	
15/8/13	3	near	07:45	07:51	06:00	8.00	0	0	0	0	0	0	0	
15/8/13	4	offshore	07:55	07:59	04:00	5.25	0	0	0	0	0	0	0	
15/8/13	1	near	19:00	19:06	06:00	4.00	39	1	1	1	0	0	42	
15/8/13	2	near	19:20	19:26	06:00	5.25	2	1	0	0	0	0	3	
15/8/13	3	near	19:40	19:46	06:00	6.75	0	0	0	0	0	0	0	
16/8/13	1	near	07:00	07:07	07:00	4.00	52	0	0	0	0	0	52	Good drift. Fish caught throughout the net.
16/8/13	2	near	07:20	07:26	06:00	5.25	2	0	0	0	0	0	2	
16/8/13	3	near	07:40	07:46	06:00	6.75	6	3	0	0	0	0	9	
16/8/13	1	near	19:00	19:06	06:00	4.75	30	1	0	0	0	0	31	
16/8/13	2	near	19:21	19:27	06:00	5.75	1	0	0	0	0	0	1	
16/8/13	3	near	19:47	19:53	06:00	8.00	9	3	0	0	0	0	12	
17/8/13	1	near	07:00	07:07	07:00	4.75	79	2	0	1	0	0	82	Good drift. Fish everywhere.
17/8/13	2	near	07:20	07:24	04:00	5.75	0	0	0	0	0	0	0	
17/8/13	3	near	07:40	07:46	06:00	8.00	13	1	0	0	0	0	14	
17/8/13	1	near				4.00	4	1	1	0	0	0	6	Incomplete drift, net hit bottom. Start/end times not recorded.
17/8/13	2	near	19:20	19:26	06:00	5.25	11	1	0	0	0	0	12	
17/8/13	3	near	19:40	19:47	07:00	6.75	2	1	0	0	0	0	3	

## Appendix 2 cont.

Date	Drift	Location	Time			Mesh Size	Caught						Comments	
			Start	End	Duration		Sockeye	Chinook	Chin. Jacks	Pinks	Coho	Chum		Total
18/8/13	1	near	07:00	07:07	07:00	4.00	45	0	0	0	0	0	45	Incomplete drift. Net hung up past weir.
18/8/13	2	near	07:20	07:24	04:00	5.25	5	0	0	0	0	0	5	
18/8/13	3	near	07:44	07:51	07:00	6.75	2	2	0	0	0	0	4	
18/8/13	1	near	19:00	19:07	07:00	4.75	58	1	0	0	0	0	59	
18/8/13	2	near	19:20	19:27	07:00	5.75	4	0	0	0	0	0	4	
18/8/13	3	near	19:46	19:51	05:00	8.00	1	0	0	0	0	0	1	
19/8/13	1	near	07:00	07:07	07:00	4.75	72	1	0	0	0	0	73	
19/8/13	2	near	07:20	07:26	06:00	5.75	1	1	0	0	0	0	2	
19/8/13	3	near	07:40	07:47	07:00	8.00	11	0	0	0	0	0	11	
19/8/13	4	offshore	07:50	07:54	04:00	5.25	0	0	0	0	0	0	0	
19/8/13	1	near	19:00	19:07	07:00	4.00	38	0	1	0	0	0	39	
19/8/13	2	near	19:21	19:28	07:00	5.25	5	0	0	0	0	0	5	
19/8/13	3	near	19:40	19:46	06:00	6.75	0	0	0	0	0	0	0	
20/8/13	1	near	07:00	07:06	06:00	4.00	64	0	1	2	0	0	67	
20/8/13	2	near	07:20	07:23	03:00	5.25	0	0	0	0	0	0	0	Hung up at weir.
20/8/13	3	near	07:40	07:47	07:00	6.75	17	3	0	2	0	0	22	
20/8/13	1	near	19:02	19:09	07:00	4.75	56	2	0	1	0	0	59	
20/8/13	2	near	19:20	19:26	06:00	5.75	0	0	0	0	0	0	0	
20/8/13	3	near	19:42	19:48	06:00	8.00	1	0	0	0	0	0	1	
21/8/13	1	near	07:00	07:07	07:00	4.75	78	0	0	2	0	0	80	
21/8/13	2	near	07:20	07:26	06:00	5.75	5	0	0	1	0	0	6	
21/8/13	3	near	07:40	07:44	04:00	8.00	0	0	0	0	0	0	0	Hung up at weir.
21/8/13	1	near				4.00	71	0	1	1	0	0	73	
21/8/13	2	near	07:20	07:26	06:00	5.25	0	0	0	0	0	0	0	
21/8/13	3	near	07:40	07:43	03:00	6.75	0	1	0	0	0	0	1	Hung up badly at weir.
22/8/13	1	near	07:00	07:06	06:00	4.00	58	4	0	1	0	0	63	
22/8/13	2	near	07:20	07:26	06:00	5.25	1	0	0	0	0	0	1	
22/8/13	3	near	07:42	07:48	06:00	6.75	2	0	0	0	0	0	2	
22/8/13	4	offshore	07:49	07:53	04:00	5.25	0	0	0	0	0	0	0	
22/8/13	1	near	19:00	19:07	07:00	4.75	29	2	0	1	0	0	32	
22/8/13	2	near	19:20	19:24	04:00	5.75	0	0	0	0	0	0	0	Hung up at weir. Incomplete drift.
22/8/13	3	near	19:40	19:46	06:00	8.00	6	2	0	1	0	0	9	
23/8/13	1	near	07:00	07:06	06:00	4.75	40	1	0	3	0	0	44	One chinook released itself while pulling net. AFC unknown.
23/8/13	2	near	07:27	07:33	06:00	5.75	0	0	0	0	0	0	0	
23/8/13	3	near	07:42	07:48	06:00	8.00	3	1	0	0	0	0	4	
23/8/13	1	near	07:00	07:07	07:00	4.00	18	1	0	4	0	0	23	
23/8/13	2	near	07:20	07:24	04:00	5.25	0	0	0	0	0	0	0	Hung up, incomplete drift.
23/8/13	3	near	07:40	07:46	06:00	6.75	10	2	0	0	0	0	12	
24/8/13	1	near	07:00	07:07	07:00	4.00	47	1	1	8	0	0	57	
24/8/13	2	near	07:20	07:26	06:00	5.25	1	0	0	0	0	0	1	
24/8/13	3	near	07:42	07:48	06:00	6.75	15	2	0	3	0	0	20	
24/8/13	1	near	19:00	19:07	07:00	4.75	35	4	0	4	0	0	43	
24/8/13	2	near	19:20	19:24	04:00	5.75	0	0	0	0	0	0	0	Net stalled incomplete drift.
24/8/13	3	near	19:40	19:46	06:00	8.00	4	1	0	0	0	0	5	
25/8/13	1	near	07:00	07:06	06:00	4.75	46	3	0	6	0	0	55	
25/8/13	2	near	07:21	07:27	06:00	5.75	0	4	0	6	0	0	10	
25/8/13	3	near	07:40	07:46	06:00	8.00	3	1	0	2	0	0	6	
25/8/13	1	near	19:00	19:07	07:00	4.00	47	0	1	3	0	0	51	
25/8/13	2	near	19:20	19:25	05:00	5.25	0	0	0	2	0	0	2	Hung up past weir. Incomplete drift.
25/8/13	3	near	19:40	19:47	07:00	6.75	1	1	0	2	0	0	4	

## Appendix 2 cont.

Date	Drift	Location	Time			Mesh Size	Caught						Comments	
			Start	End	Duration		Sockeye	Chinook	Chin. Jacks	Pinks	Coho	Chum		Total
26/8/13	1	near	07:00	07:07	07:00	4.00	58	0	1	5	0	0	64	
26/8/13	2	near	07:20	07:26	06:00	5.25	0	1	0	3	0	0	4	
26/8/13	3	near	07:42	07:48	06:00	6.75	10	0	0	1	0	0	11	
26/8/13	4	offshore	07:50	07:54	04:00	5.25	0	0	0	0	0	0	0	
26/8/13	1	near	19:00	19:07	07:00	4.75	56	0	0	8	0	0	64	
26/8/13	2	near	19:25	19:31	06:00	5.75	0	1	0	0	0	0	1	
26/8/13	3	near	19:40	19:47	07:00	8.00	7	0	0	2	0	0	9	
27/8/13	1	near	07:00	07:07	07:00	4.75	55	2	0	7	0	0	64	
27/8/13	2	near	07:20	07:26	06:00	5.75	1	1	0	5	0	0	7	
27/8/13	3	near	07:42	07:49	07:00	8.00	1	0	0	2	0	0	3	
27/8/13	1	near	19:00			4.00	4	1	0	0	0	0	5	Incomplete drift. Net hung up badly. End time not recorded.
27/8/13	2	near	19:22	19:28	06:00	5.25	16	0	0	5	0	0	21	
27/8/13	3	near	19:42	19:48	06:00	6.75	0	1	0	0	0	0	1	
28/8/13	1	near	07:00	07:07	07:00	4.00	16	2	2	1	0	0	21	
28/8/13	2	near	07:21	07:27	06:00	5.25	0	1	0	3	0	0	4	Net hit bottom a couple times.
28/8/13	3	near	07:42	07:49	07:00	6.75	10	0	1	7	0	0	18	
28/8/13	1	near	19:03	19:10	07:00	4.75	27	0	0	12	0	0	39	
28/8/13	2	near	19:32	19:38	06:00	5.75	1	0	0	0	0	0	1	
28/8/13	3	near	19:48	19:54	06:00	8.00	0	0	0	1	0	0	1	
29/8/13	1	near	07:00	07:06	06:00	4.75	64	3	0	21	0	0	88	
29/8/13	2	near	07:20	07:27	07:00	5.75	3	0	0	3	0	0	6	
29/8/13	3	near	07:41	07:47	06:00	8.00	2	2	1	5	0	0	10	
29/8/13	4	offshore	07:49	07:53	04:00	5.25	0	0	0	0	0	0	0	
29/8/13	1	near	19:00	19:07	07:00	4.00	29	0	3	4	0	0	36	
29/8/13	2	near	19:20	19:26	06:00	5.25	2	0	0	6	0	0	8	
29/8/13	3	near	19:40	19:46	06:00	6.75	3	0	0	11	0	0	14	
30/8/13	1	near	07:00	07:07	07:00	4.00	31	1	3	1	0	0	36	
30/8/13	2	near	07:20	07:26	06:00	5.25	2	0	0	1	0	0	3	
30/8/13	3	near	07:42	07:46	04:00	6.75	0	0	0	0	0	0	0	Net stalled. Incomplete drift.
30/8/13	1	near	19:00	19:07	07:00	4.75	16	1	0	23	0	0	40	
30/8/13	2	near	19:20	19:27	07:00	5.75	2	0	0	0	0	0	2	
30/8/13	3	near	19:42	19:48	06:00	8.00	2	0	0	1	0	0	3	Sturgeon hit net but released while pulling net in.
31/8/13	1	near	07:00	07:07	07:00	4.75	42	3	0	14	0	0	59	
31/8/13	2	near	07:20	07:27	07:00	5.75	6	0	0	2	0	0	8	
31/8/13	3	near	07:42	07:48	06:00	8.00	1	0	0	0	0	0	1	
31/8/13	1	near	18:00	18:07	07:00	4.00	7	0	1	1	0	0	9	Good drift. Started an hour earlier on the PM drifts.
31/8/13	2	near	18:23	18:30	07:00	5.25	6	0	0	9	0	0	15	
31/8/13	3	near	18:43	18:49	06:00	6.75	0	0	0	1	0	0	1	
1/9/13	1	near	07:00	07:06	06:00	4.00	21	0	2	11	0	0	34	
1/9/13	2	near	07:20	07:27	07:00	5.25	1	0	0	1	0	0	2	
1/9/13	3	near	07:42	07:48	06:00	6.75	3	0	0	6	0	0	9	
1/9/13	1	near	18:00	18:07	07:00	4.75	9	0	0	5	0	0	14	
1/9/13	2	near	18:20	18:26	06:00	5.75	1	1	0	5	0	0	7	
1/9/13	3	near	18:40	18:43	03:00	8.00	0	0	0	0	0	0	0	Incomplete drift, hung up at weir.
2/9/13	1	near	07:00	07:07	07:00	4.75	28	1	0	13	1	0	43	
2/9/13	2	near	07:20	07:26	06:00	5.75	0	1	0	3	0	0	4	
2/9/13	3	near	07:42	07:49	07:00	8.00	0	0	0	0	0	0	0	
2/9/13	4	offshore	07:51	07:54	03:00	5.25	0	0	0	0	0	0	0	
2/9/13	1	near	18:00	18:07	07:00	4.00	9	0	1	11	0	0	21	
2/9/13	2	near	18:21	18:28	07:00	5.25	1	0	0	5	0	0	6	
2/9/13	3	near	18:40	18:47	07:00	6.75	0	0	0	9	0	0	9	

## Appendix 2 cont.

Date	Drift	Location	Time			Mesh Size	Caught						Comments	
			Start	End	Duration		Sockeye	Chinook	Chin. Jacks	Pinks	Coho	Chum		Total
3/9/13	1	near	07:00	07:07	07:00	4.00	23	1	1	10	0	0	35	
3/9/13	2	near	07:21	07:27	06:00	5.25	2	0	1	8	0	1	12	
3/9/13	3	near	07:40	07:46	06:00	6.75	4	0	0	8	0	0	12	
3/9/13	1	near	18:00	18:06	06:00	4.75	26	0	0	17	0	0	43	
3/9/13	2	near	18:20	18:26	06:00	5.75	0	0	0	3	0	0	3	
3/9/13	3	near	18:40	18:47	07:00	8.00	3	0	0	5	0	0	8	
4/9/13	1	near	07:06	07:13	07:00	4.75	28	2	0	12	0	0	42	
4/9/13	2	near	07:36	07:43	07:00	5.75	6	0	0	18	0	0	24	
4/9/13	3	near	07:48	07:53	05:00	8.00	0	0	0	0	0	0	0	Incomplete drift. Hung up 3/4 way through drift.
4/9/13	1	near	18:03	18:10	07:00	4.00	25	2	1	11	0	0	39	
4/9/13	2	near	18:24	18:31	07:00	5.25	3	1	0	4	0	0	8	
4/9/13	3	near	18:42	18:48	06:00	6.75	1	3	0	5	0	0	9	
5/9/13	1	near	07:00	07:07	07:00	4.00	24	0	3	11	0	0	38	
5/9/13	2	near	07:21	07:28	07:00	5.25	12	0	0	13	0	0	25	
5/9/13	3	near	07:46	07:52	06:00	6.75	1	0	0	8	0	0	9	
5/9/13	4	offshore	07:55	07:59	04:00	5.25	0	0	0	0	0	0	0	
5/9/13	1	near	18:00	18:07	07:00	4.75	22	0	0	8	0	0	30	
5/9/13	2	near	18:20	18:26	06:00	5.75	2	0	0	9	0	0	11	
5/9/13	3	near	18:41	18:45	04:00	8.00	1	0	0	0	0	0	1	Incomplete drift. Net hit bottom then drifted into shore.
6/9/13	1	near	07:01	07:08	07:00	4.75	31	2	0	38	0	0	71	
6/9/13	2	near	07:20	07:26	06:00	5.75	1	0	0	12	0	0	13	
6/9/13	3	near	07:41	07:47	06:00	8.00	4	0	0	6	0	0	10	
6/9/13	1	near	18:00	18:07	07:00	4.00	13	1	1	10	0	0	25	
6/9/13	2	near	18:20	18:27	07:00	5.25	1	0	0	16	0	0	17	
6/9/13	3	near	18:42	18:48	06:00	6.75	1	0	0	6	0	0	7	
7/9/13	1	near	07:36	07:42	06:00	4.00	23	2	0	2	0	0	27	Good drift, late start, had boat troubles.
7/9/13	2	near	07:52	07:59	07:00	5.25	1	0	0	0	0	0	1	
7/9/13	3	near	08:10	08:16	06:00	6.75	0	0	0	0	0	0	0	
7/9/13	1	near	18:00	18:07	07:00	4.75	44	1	0	26	0	0	71	
7/9/13	2	near	18:20	18:26	06:00	5.75	1	0	0	2	0	1	4	
7/9/13	3	near	18:42	18:48	06:00	8.00	0	1	0	3	0	0	4	
8/9/13	1	near	07:01	07:08	07:00	4.75	52	0	0	28	0	0	80	
8/9/13	2	near	07:20	07:26	06:00	5.75	1	0	0	4	0	0	5	
8/9/13	3	near	07:44	07:46	02:00	8.00	0	0	0	0	0	0	0	Hung up. Incomplete drift.
8/9/13	1	near	18:00	18:08	08:00	4.00	13	0	2	15	0	0	30	Good drift. One pikeminnow about 2 inches long release.
8/9/13	2	near	18:20	18:23	03:00	5.25	0	0	0	0	0	0	0	Hung up. Incomplete drift.
8/9/13	3	near	18:42	18:48	06:00	6.75	1	2	0	5	0	0	8	
9/9/13	1	near	07:00	07:03	03:00	4.00	3	2	1	2	0	0	8	Incomplete drift. Hung up at weir.
9/9/13	2	near	07:21	07:26	05:00	5.25	6	1	0	4	0	0	11	
9/9/13	3	near	07:36	07:42	06:00	6.75	2	0	0	5	0	0	7	
9/9/13	4	offshore	07:48	07:52	04:00	5.25	0	0	0	0	0	0	0	
9/9/13	1	near	18:00	18:06	06:00	4.75	11	0	0	15	0	0	26	
9/9/13	2	near	18:20	18:26	06:00	5.75	1	1	0	14	0	0	16	
9/9/13	3	near	18:40	18:46	06:00	8.00	0	0	0	1	0	0	1	
10/9/13	1	near	07:02	07:08	06:00	4.75	11	1	0	13	1	0	26	
10/9/13	2	near	07:22	07:28	06:00	5.75	8	0	0	4	0	0	12	
10/9/13	3	near	07:42	07:48	06:00	8.00	1	0	0	3	0	0	4	
10/9/13	1	near	18:00	18:07	07:00	4.00	4	1	0	5	0	0	10	
10/9/13	2	near	18:25	18:30	05:00	5.25	4	0	0	2	0	0	6	
10/9/13	3	near	18:40	18:47	07:00	6.75	2	0	0	7	0	0	9	

## Appendix 2 cont.

Date	Drift	Location	Time			Mesh Size	Caught						Comments	
			Start	End	Duration		Sockeye	Chinook	Chin. Jacks	Pinks	Coho	Chum		Total
11/9/13	1	near	07:00	07:06	06:00	4.00	5	2	1	9	2	0	19	
11/9/13	2	near	07:22	07:28	06:00	5.25	7	0	0	23	0	0	30	
11/9/13	3	near	07:42	07:48	06:00	6.75	2	0	0	7	0	0	9	
11/9/13	1	near	18:00	18:07	07:00	4.75	6	1	0	11	1	0	19	
11/9/13	2	near	18:20	18:27	07:00	5.75	1	1	0	21	0	0	23	
11/9/13	3	near	18:40	18:46	06:00	8.00	0	0	0	18	0	0	18	
12/9/13	1	near	07:00	07:08	08:00	4.75	10	1	0	62	4	0	77	
12/9/13	2	near	07:20	07:27	07:00	5.75	4	1	0	16	0	0	21	
12/9/13	3	near	07:42	07:48	06:00	8.00	2	0	0	6	0	0	8	
12/9/13	4	offshore	07:51	07:55	04:00	5.25	0	0	0	0	0	0	0	Good drift, one fish hit net, species unknown.
12/9/13	1	near	18:00	18:07	07:00	4.00	5	0	0	22	0	0	27	
12/9/13	2	near	18:22	18:28	06:00	5.25	3	0	0	18	0	0	21	
12/9/13	3	near	18:43	18:50	07:00	6.75	0	0	0	13	0	0	13	
13/9/13	1	near	07:00	07:06	06:00	4.00	11	0	2	31	0	0	44	
13/9/13	2	near	07:21	07:28	07:00	5.25	1	0	0	11	0	0	12	
13/9/13	3	near	07:43	07:49	06:00	6.75	1	0	0	13	0	0	14	
13/9/13	1	near	18:00	18:06	06:00	4.75	3	0	0	8	0	0	11	
13/9/13	2	near	18:20	18:27	07:00	5.75	2	0	0	16	0	0	18	
13/9/13	3	near	18:40	18:43	03:00	8.00	0	0	0	0	0	0	0	Hung up at weir.
14/9/13	1	near	07:00	07:07	07:00	4.75	11	2	0	8	0	0	21	
14/9/13	2	near	07:21	07:27	06:00	5.75	2	2	0	9	1	0	14	
14/9/13	3	near	07:40	07:47	07:00	8.00	1	0	0	8	0	0	9	
14/9/13	1	near	18:00	18:03	03:00	4.00	0	0	0	0	0	0	0	Hung up at weir badly.
14/9/13	2	near	18:20	18:23	03:00	5.25	0	0	0	5	0	0	5	Hung up again at weir.
14/9/13	3	near	18:32	18:38	06:00	6.75	0	0	0	5	0	0	5	
15/9/13	1	near	07:00	07:02	02:00	4.00	0	0	0	0	0	0	0	Hung up badly, just before weir. One pikeminnow released.
15/9/13	2	near	07:20	07:26	06:00	5.25	4	0	0	8	0	0	12	
15/9/13	3	near	07:40	07:46	06:00	6.75	0	0	0	18	1	0	19	
15/9/13	1	near	18:00	18:07	07:00	4.75	5	1	0	23	2	0	31	
15/9/13	2	near	18:20	18:26	06:00	5.75	1	1	0	10	1	0	13	
15/9/13	3	near	18:40	18:43	03:00	8.00	0	0	0	0	0	0	0	Hung up badly before the weir.
16/9/13	1	near	07:00	07:07	07:00	4.75	5	0	0	15	2	0	22	
16/9/13	2	near	07:22	07:29	07:00	5.75	1	1	0	12	1	0	15	
16/9/13	3	near	07:41	07:47	06:00	8.00	0	0	0	7	0	0	7	
16/9/13	4	offshore	07:52	07:56	04:00	5.25	0	0	0	0	0	0	0	
16/9/13	1	near	18:00	18:06	06:00	4.00	2	0	0	5	2	0	9	
16/9/13	2	near	18:20	18:26	06:00	5.25	1	0	0	5	0	0	6	Hit bottom multiple times.
16/9/13	3	near	18:42	18:48	06:00	6.75	0	2	0	0	0	0	2	
17/9/13	1	near	07:00	07:06	06:00	4.00	2	0	1	2	1	0	6	Hung up at end of drift, one coho male unable to revive.
17/9/13	2	near	07:21	07:27	06:00	5.25	6	0	0	12	1	0	19	
17/9/13	3	near	07:40	07:46	06:00	6.75	0	0	0	0	1	0	1	
17/9/13	1	near	18:00	18:07	07:00	4.75	0	0	0	6	0	0	6	
17/9/13	2	near	18:22	18:29	07:00	5.75	0	0	0	7	0	0	7	
17/9/13	3	near	18:42	18:48	06:00	8.00	0	0	0	1	0	0	1	
18/9/13	1	near	07:00	07:07	07:00	4.75	1	1	0	10	1	0	13	
18/9/13	2	near	07:20	07:26	06:00	5.75	0	0	0	5	0	0	5	
18/9/13	3	near	07:41	07:45	04:00	8.00	0	0	0	2	0	0	2	Hung up just past weir.
18/9/13	1	near	18:00	18:07	07:00	4.00	4	2	0	8	4	0	18	
18/9/13	2	near	18:20	18:26	06:00	5.25	1	0	0	10	2	0	13	
18/9/13	3	near	18:40	18:46	06:00	6.75	0	0	0	9	0	0	9	

## Appendix 2 cont.

Date	Drift	Location	Time			Mesh Size	Caught						Comments	
			Start	End	Duration		Sockeye	Chinook	Chin. Jacks	Pinks	Coho	Chum		Total
19/9/13	1	near	07:00	07:03	03:00	4.00	0	0	0	0	0	0	0	Hung up bad, trashed the net.
19/9/13	2	near	07:20	07:26	06:00	5.25	2	1	0	9	0	0	12	
19/9/13	3	near	07:33	07:39	06:00	6.75	0	1	0	0	0	0	1	
19/9/13	4	offshore	07:42	07:46	04:00	5.25	0	0	0	0	0	0	0	
19/9/13	1	near	18:02	18:08	06:00	4.75	2	0	0	7	1	0	10	
19/9/13	2	near	18:21	18:27	06:00	5.75	1	0	0	4	0	0	5	
19/9/13	3	near	18:40	18:47	07:00	8.00	0	0	0	0	0	0	0	
20/9/13	1	near	07:00	07:06	06:00	4.75	3	1	0	6	1	0	11	
20/9/13	2	near	07:20	07:26	06:00	5.75	1	0	0	14	1	0	16	
20/9/13	3	near	07:42	07:47	05:00	8.00	0	0	0	0	0	0	0	
20/9/13	1	near	18:00	18:06	06:00	4.00	0	0	0	0	0	0	0	
20/9/13	2	near	18:19	18:25	06:00	5.25	0	0	0	3	0	0	3	
20/9/13	3	near	18:40	18:46	06:00	6.75	0	0	0	5	0	0	5	Good drift. Huge 10' sturgeon caught and released.
21/9/13	1	near	07:00	07:06	06:00	4.00	0	0	0	4	0	0	4	
21/9/13	2	near	07:21	07:27	06:00	5.25	0	0	0	6	0	0	6	
21/9/13	3	near	07:40	07:46	06:00	6.75	0	0	0	6	0	0	6	
21/9/13	1	near	18:00	18:06	06:00	4.75	1	0	0	9	2	0	12	
21/9/13	2	near	18:20	18:26	06:00	5.75	0	1	0	9	1	0	11	
21/9/13	3	near	18:40	18:46	06:00	8.00	1	0	0	3	0	0	4	
22/9/13	1	near	07:04	07:10	06:00	4.75	3	0	0	12	2	0	17	
22/9/13	2	near	07:21	07:24	03:00	5.75	0	0	0	3	0	0	3	
22/9/13	3	near	07:41	07:46	05:00	8.00	0	0	0	2	0	0	2	
22/9/13	1	near	18:02	18:08	06:00	4.00	3	0	0	10	1	0	14	
22/9/13	2	near	18:22	18:28	06:00	5.25	2	0	0	23	0	0	25	
22/9/13	3	near	18:42	18:48	06:00	6.75	0	0	0	25	1	0	26	
23/9/13	1	near	07:00	07:06	06:00	4.00	5	0	0	14	2	0	21	
23/9/13	2	near	07:20	07:26	06:00	5.25	0	0	0	32	2	0	34	
23/9/13	3	near	07:39	07:45	06:00	6.75	1	0	0	4	0	0	5	
23/9/13	4	offshore	07:46	07:50	04:00	5.25	0	0	0	0	0	0	0	
23/9/13	1	near	18:00	18:07	07:00	4.75	1	0	0	14	1	0	16	
23/9/13	2	near	18:20	18:26	06:00	5.75	0	1	0	20	2	0	23	
23/9/13	3	near	18:42	18:48	06:00	8.00	0	0	0	16	0	0	16	
24/9/13	1	near	07:00	07:07	07:00	4.75	3	0	0	36	1	0	40	
24/9/13	2	near	07:21	07:27	06:00	5.75	0	0	0	9	0	0	9	
24/9/13	3	near	07:41	07:43	02:00	8.00	0	0	0	1	0	0	1	
24/9/13	1	near	18:02	18:08	06:00	4.00	3	0	0	16	2	0	21	
24/9/13	2	near	18:21	18:28	07:00	5.25	0	0	0	18	0	0	18	
24/9/13	3	near	18:40	18:46	06:00	6.75	0	0	0	22	0	0	22	
25/9/13	1	near	07:00	07:07	07:00	4.00	1	0	0	1	1	0	3	
25/9/13	2	near	07:20	07:26	06:00	5.25	2	0	0	7	2	0	11	
25/9/13	3	near	07:40	07:46	06:00	6.75	0	0	0	12	2	0	14	
25/9/13	1	near	18:00	18:07	07:00	4.75	3	0	0	17	1	0	21	
25/9/13	2	near	18:20	18:26	06:00	5.75	0	0	0	7	2	0	9	
25/9/13	3	near	18:42	18:48	06:00	8.00	0	0	0	10	0	0	10	
26/9/13	1	near	07:00	07:06	06:00	4.75	1	0	0	25	3	0	29	
26/9/13	2	near	07:21	07:28	07:00	5.75	0	0	0	14	2	0	16	
26/9/13	3	near	07:40	07:46	06:00	8.00	1	0	0	7	0	0	8	
26/9/13	4	offshore	07:49	07:53	04:00	5.25	0	0	0	0	0	0	0	
26/9/13	1	near	18:10	18:16	06:00	4.00	0	1	0	10	2	0	13	
26/9/13	2	near	18:20	18:27	07:00	5.25	0	0	0	33	2	0	35	
26/9/13	3	near	18:42	18:48	06:00	6.75	0	0	0	30	2	0	32	

## Appendix 2 cont.

Date	Drift	Location	Time			Mesh Size	Caught							Comments
			Start	End	Duration		Sockeye	Chinook	Chin. Jacks	Pinks	Coho	Chum	Total	
27/9/13	1	near	07:00	07:06	06:00	4.00	0	0	0	11	0	0	11	
27/9/13	2	near	07:22	07:29	07:00	5.25	0	0	0	25	2	0	27	
27/9/13	3	near	07:40	07:46	06:00	6.75	0	0	0	14	0	0	14	
27/9/13	1	near	18:00	18:07	07:00	4.75	0	0	0	1	0	0	1	
27/9/13	2	near	18:20	18:25	05:00	5.75	0	0	0	31	0	0	31	
27/9/13	3	near	18:42	18:46	04:00	8.00	0	0	0	1	0	0	1	Hung up just after weir.
28/9/13	1	near	08:01	08:07	06:00	4.75	2	1	0	9	3	0	15	Late start, train blocking crossings.
28/9/13	2	near	08:19	08:26	07:00	5.75	0	0	0	4	0	0	4	
28/9/13	3	near	08:40	08:46	06:00	8.00	1	0	0	5	0	0	6	
28/9/13	1	near	18:00	18:05	05:00	4.00	0	0	0	0	0	0	0	
28/9/13	2	near	18:21	18:27	06:00	5.25	0	0	0	9	0	0	9	
28/9/13	3	near	18:40	18:44	04:00	6.75	0	0	0	1	0	0	1	Incomplete drift, one sturgeon in net.