Fishery Data Series No. 16-32

Salmon Escapements to the Norton Sound-Port Clarence Area, 2008–2012

by

Justin M. Leon

Scott M. Kent

and

Jenefer Bell

August 2016

Alaska Department of Fish and Game **Divisions of Sport Fish and Commercial Fisheries**

Symbols and Abbreviations

The following symbols and abbreviations, and others approved for the Système International d'Unités (SI), are used without definition in the following reports by the Divisions of Sport Fish and of Commercial Fisheries: Fishery Manuscripts, Fishery Data Series Reports, Fishery Management Reports, and Special Publications. All others, including deviations from definitions listed below, are noted in the text at first mention, as well as in the titles or footnotes of tables, and in figure or figure captions.

Weights and measures (metric)

centimeter	cm
deciliter	dL
gram	g
hectare	ha
kilogram	kg
kilometer	km
liter	L
meter	m
milliliter	mL
millimeter	mm

Weights and measures (English)

cubic feet per second	ft^3/s
foot	ft
gallon	gal
inch	in
mile	mi
nautical mile	nmi
ounce	oz
pound	lb
quart	qt
yard	yd

Time and temperature

day	d
degrees Celsius	°C
degrees Fahrenheit	°F
degrees kelvin	K
hour	h
minute	min
second	s

Physics and chemistry

all atomic symbols	
alternating current	AC
ampere	A
calorie	cal
direct current	DC
hertz	Hz
horsepower	hp
hydrogen ion activity (negative log of)	pH
parts per million	ppm
parts per thousand	ppt, ‰
volts	V
watts	W

General

Alaska Administrative Code	AAC
all commonly accepted abbreviations	e.g., Mr., Mrs., AM, PM, etc.
all commonly accepted professional titles	e.g., Dr., Ph.D., R.N., etc.
at	@
compass directions:	
east	E
north	N
south	S
west	W
copyright	©
corporate suffixes:	
Company	Co.
Corporation	Corp.
Incorporated	Inc.
Limited	Ltd.
District of Columbia	D.C.
et alii (and others)	et al.
et cetera (and so forth)	etc.
exempli gratia (for example)	e.g.
Federal Information Code	FIC
id est (that is)	i.e.
latitude or longitude	lat or long
monetary symbols (U.S.)	$, ¢
months (tables and figures): first three letters	Jan,...,Dec
registered trademark	®
trademark	™
United States (adjective)	U.S.
United States of America (noun)	USA
U.S.C.	United States Code
U.S. state	use two-letter abbreviations (e.g., AK, WA)

Mathematics, statistics

all standard mathematical signs, symbols and abbreviations	
alternate hypothesis	H_A
base of natural logarithm	e
catch per unit effort	CPUE
coefficient of variation	CV
common test statistics	(F, t, χ^2, etc.)
confidence interval	CI
correlation coefficient (multiple)	R
correlation coefficient (simple)	r
covariance	cov
degree (angular)	°
degrees of freedom	df
expected value	E
greater than	>
greater than or equal to	≥
harvest per unit effort	HPUE
less than	<
less than or equal to	≤
logarithm (natural)	ln
logarithm (base 10)	log
logarithm (specify base)	$\log_2$, etc.
minute (angular)	'
not significant	NS
null hypothesis	H_O
percent	%
probability	P
probability of a type I error (rejection of the null hypothesis when true)	α
probability of a type II error (acceptance of the null hypothesis when false)	β
second (angular)	"
standard deviation	SD
standard error	SE
variance	
population	Var
sample	var

FISHERY DATA SERIES NO. 16-32

SALMON ESCAPEMENTS TO THE NORTON SOUND-PORT CLARENCE AREA, 2008–2012

by
Justin M. Leon, Scott M. Kent, and Jenefer Bell
Alaska Department of Fish and Game, Division of Commercial Fisheries, Nome

Alaska Department of Fish and Game
Division of Sport Fish, Research and Technical Services
333 Raspberry Road, Anchorage, Alaska, 99518-1565

August 2016

ADF&G Fishery Data Series was established in 1987 for the publication of Division of Sport Fish technically oriented results for a single project or group of closely related projects, and in 2004 became a joint divisional series with the Division of Commercial Fisheries. Fishery Data Series reports are intended for fishery and other technical professionals and are available through the Alaska State Library and on the Internet: http://www.adfg.alaska.gov/sf/publications/. This publication has undergone editorial and peer review.

Justin M. Leon, Scott M. Kent, and Jenefer Bell
Alaska Department of Fish and Game, Division of Commercial Fisheries,
Box 1148, Nome, AK, 99762, USA

This document should be cited as follows:
Leon, J. M., S. M. Kent, and J. Bell. 2016. Salmon escapements to the Norton Sound-Port Clarence Area, 2008–2012. Alaska Department of Fish and Game, Fishery Data Series No. 16-32, Anchorage.

TABLE OF CONTENTS

Page

TABLE OF CONTENTS (Continued)

TABLE OF CONTENTS (Continued)

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

LIST OF APPENDICES (Continued)

LIST OF APPENDICES (Continued)

ABSTRACT

Five species of Pacific salmon (*Oncorhynchus* spp.) return to the Norton Sound-Port Clarence Area. Historically, returns of salmon to river drainages in this area have supported well established subsistence fisheries and small-scale commercial salmon fisheries forming the cornerstone of cash economies in several remote villages. The Alaska Department of Fish and Game operated 9 cooperative salmon enumeration projects with Norton Sound Economic Development Corporation, Native Village of Unalakleet, and U.S. Bureau of Land Management (BLM) during the 2008–2012 seasons. Management decisions affecting subsistence, commercial, and sport fisheries for salmon in the Norton Sound-Port Clarence Area were based largely on escapement counts obtained from these projects. This report summarizes escapement and age, sex, and length (ASL) data collected from the Kwiniuk and Niukluk river tower projects, and weir projects located on the Eldorado, Nome, Pilgrim, and Snake rivers, and Glacial Creek for the 2008–2012 seasons. Additionally, escapement and ASL data from the North River tower (2009–2012), Unalakleet River weir (2010–2012), and Inglutalik River tower (2011–2012) projects are presented.

Key words Chinook salmon, *Oncorhynchus*, age, sex, and length (ASL), sustainable escapement goal (SEG), biological escapement goal (BEG), weir, tower, resistance board weir, Unalakleet River, North River, Glacial Lake, Norton Sound-Port Clarence Area.

INTRODUCTION

Norton Sound-Port Clarence Area encompasses commercial salmon fishing districts as well as several river drainages. Historically, returns of salmon to these drainages have supported well established subsistence fisheries. Since 1961, small-scale commercial salmon fisheries have occurred in Norton Sound and form the cornerstone of cash economies in several remote villages. Most of the income generated by commercial salmon fishing is used by local residents to conduct subsistence-related activities throughout the year. Until the 1990s, subsistence and commercial salmon fisheries in the area were managed using a combination of commercial comparative catch statistics, test fishery catches, aerial surveys and escapement data from 1 counting tower project located near the village of Elim. Since the mid-1990s, the Alaska Department of Fish and Game (ADF&G) and local organizations have collaborated successfully to implement a management regime that relies more heavily on ground-based escapement data collected at 11 enumeration projects located throughout the area.

From 2008 through 2012, ADF&G operated 5 escapement projects to enumerate salmon, including weir projects located on Nome River, Snake River, and Glacial Creek in Norton Sound Subdistrict 1 (Nome Subdistrict) and Niukluk River and Kwiniuk River counting towers in Subdistricts 2 (Golovnin Bay Subdistrict) and 3 (Elim Subdistrict). In addition to these projects, ADF&G worked cooperatively with Norton Sound Economic Development Corporation (NSEDC) operating a resistance-board weir on Unalakleet River and a counting tower on North River, an important tributary of the Unalakleet River. These projects are used to monitor escapement into Subdistricts 5 (Shaktoolik Subdistrict) and 6 (Unalakleet Subdistrict). Other entities have also contributed funding to projects including Native Village of Unalakleet (NVU, North River counting tower, 2008), Bureau of Land Management (BLM, Unalakleet River, 2010–2012), and United States Fish and Wildlife Service, Office of Subsistence Management (USFWS OSM, Unalakleet River, 2010–2012). During this time NSEDC independently operated 2 escapement projects: a fixed-picket weir on Eldorado River and a resistance-board weir on the Pilgrim River, the major tributary of the Kuzitrin River draining into Port Clarence District. Obtaining timely and accurate stock assessment information (e.g., escapement counts and age, sex, and length (ASL) data) from these projects is used to make informed decisions about the management of subsistence, commercial, and sport salmon fisheries in the Norton Sound-Port

Clarence Area. This report summarizes escapement data collected from all Norton Sound-Port Clarence projects for the 2008–2012 seasons.

PROJECT BACKGROUND

Pilgrim River Weir

Pilgrim River is 1 of the 2 largest salmon producing drainages in the Port Clarence District. Salmon Lake, whose outflow begins at Pilgrim River, is an ultra-oligotrophic lake located approximately 55 km north of Nome with a surface area of 7.49 km^2 (1,851 acres), an average depth of 14.9 m, and a maximum depth of 40 m (Todd and Kyle 1997; Hamazaki et al. 2012). The northernmost sockeye salmon *Oncorhynchus nerka* run of significant size in North America returns to by Salmon Lake. Smolt size and emigration estimates, limnologic data, and other historical data collected in the mid-1990s led to the decision to fertilize Salmon Lake to enhance sockeye salmon production (Todd and Kyle 1997). Salmon Lake was fertilized from 1997 to 2001, in 2004, and from 2007 to 2012; the amount of fertilizer deposited has varied over the years and sockeye salmon smolt abundance and size data have been monitored since 1995 (Todd and Kyle 1997; Hamazaki et al. 2012). Adult sockeye salmon returning to Salmon Lake have been enumerated intermittently since 1995 on Pilgrim River. Chum (*O. keta*) and pink (*O. gorbuscha*) salmon also return to Pilgrim River, with other salmon species returning in small numbers. From 1995 to 1998, a fixed-picket weir was operated on the river and a counting tower was used from 2000 to 2002 (Waitman and Dunmall 2003). However, tower counts were not reliable due to flood conditions and inaccuracy in apportioning counts to species (Hamazaki et al. 2012). Additionally, late season aerial survey counts of sockeye salmon in Salmon Lake were often much higher than sockeye salmon passage estimates collected at the tower during these years. To obtain more reliable estimates of Pilgrim River salmon escapements, a resistance board weir was installed by ADF&G and Kawerak, Inc. in 2003 using funds from the Norton Sound Fishery Disaster Act of 1999. Kawerak, Inc. operated the weir from 2003 to 2007 (Dunmall 2008) and NSEDC has operated the weir since 2008. The weir and camp site were located roughly 10.5 km downstream of the Kougarok Highway Bridge (GPS coordinates 65°06.170 N, 164°49.450 W; Figure 1). Typically Pilgrim River weir operated from the beginning of July until the end of August.

Glacial Creek Weir

Sinuk River is an important salmon spawning tributary that originates in the western Kigluaik Mountains and flows 66 kilometers southwest to empty into the northwestern portion of the Nome Subdistrict. Near its headwaters lies Glacial Creek, a small tributary that drains Glacial Lake, an ultra-oligotrophic lake with an estimated surface area of 4 km^2, an average depth of 5.8 m, and a maximum recorded depth of 22 m (Todd and Kyle 1997). The project to enumerate sockeye salmon began as a weir in 2000, led by BLM with assistance from ADF&G and NSEDC. Sockeye salmon are the predominant salmon species returning to Glacial Creek and very few pink or chum salmon. The project documented the abundance, age and size structure, and run timing of sockeye salmon spawning escapement (2000–2005) and smolt outmigration (2003–2005); limnological data was also collected during this time and added to the existing limnological database (Parker 2008). Beginning in 2006 ADF&G became the sole operator of the project. In 2012, a video monitoring system was put in place to test the feasibility of an unstaffed escapement project. Glacial Creek weir was located on Glacial Creek just downstream of its outlet from Glacial Lake (GPS coordinates 64°50.200 N, 165°42.400 W; Figure 1). Typically the

weir was operated from the end of June until the end of July and the addition of the video monitoring system in 2012 allowed the project to operate until mid-August.

Snake River Weir

Snake River flows 27 river kilometers south from the Kigluaik Mountains and drains into Norton Sound at the Port of Nome. Chum and pink salmon are the predominant salmon species returning to Snake River; other species return in small numbers. From 1995 to 2001, Kawerak, Inc. operated a counting tower and ADF&G analyzed the data and produced project summary reports (Jones and Knuepfer 2002). In 2002 the counting tower was replaced with a fixed-picket weir and from 2002 to 2007 Kawerak, Inc. funded and operated the project, conducted data analyses, and produced annual project summary reports (Dunmall 2008). In 2008, NSEDC and ADF&G took over operation of the Snake River weir and it remained a joint project through 2012. Snake River weir was located approximately 8 km upstream from the Nome small boat harbor (GPS coordinates 64°31.180 N, 165°28.740 W; Figure 1). The Snake River weir typically operated from the end of June until mid-September.

Nome River Weir

Nome River flows approximately 53 river kilometers south from the Kigluaik Mountains and drains into Norton Sound approximately 5 kilometers east of Nome. Chum and pink salmon are the predominant salmon species returning to Nome River; other species return in small numbers. The enumeration project began as a counting tower in 1993 operated by ADF&G. In 1996, a fixed-picket weir replaced the counting tower and the project continued to be operated by ADF&G. Nome River weir was located approximately 5 river kilometers upriver from the Nome River bridge on Nome-Council Road (GPS coordinates 64°29.856 N, 165°12.980 W; Figure 1). Typically the weir operated from late June until mid-September.

Eldorado River Weir

Eldorado River is the largest tributary of the Flambeau River; it flows 45 river kilometers south from the Kigluaik Mountains and drains into Safety Sound approximately 23 kilometers east of Nome. Chum and pink salmon are the predominant salmon returning to Eldorado River with minimal returns of Chinook (*O. tshawytscha*), coho (*O. kisutch*), sockeye salmon. The enumeration project on this river began as a counting tower in 1995 as a cooperative project between Sitnasuak Native Corporation, Kawerak, Inc., and Nome Eskimo Community with data analysis and report writing conducted by ADF&G (Rob 1995). Kawerak, Inc. operated the tower project with equipment and technical assistance from ADF&G from 1996 to 2002 (Waitman and Dunmall 2003). In 2003, a fixed-picket weir replaced the counting tower and Kawerak, Inc. continued weir operations until 2007 (Dunmall 2008). In 2008, funding constraints prevented Kawerak, Inc. from continuing the project which ultimately led NSEDC and ADF&G to take over operations. NSEDC took control of the project in 2009 and remained the sole operator through 2012. Eldorado River weir was located approximately 24 km upstream from the Safety Sound Bridge on the Nome-Council Highway (GPS coordinates 64°34.410 N, 165°56.240 W; Figure 1). The weir was installed in late June and was usually dismantled in early August at the end of the chum salmon run. Weir operations were halted before coho salmon because they are not abundant in Eldorado River.

Niukluk River Tower

Niukluk River is a major salmon spawning tributary of the Fish River. Niukluk River flows 80 kilometers southeast out of the Bendeleben Mountains and enters the Fish River approximately 16 kilometers upstream from the village of White Mountain. Chum and pink salmon are the predominant salmon species returning to Niukluk River with minimal returns of Chinook, coho, and sockeye salmon. The Niukluk River counting tower was operated for approximately 3 weeks during 1979 (Schaefer 1979) and was operated by ADF&G from 1995 to 2012. From 1995 to 2006, the tower site was located 4 km upstream from the confluence of the Fish and Niukluk rivers. In 2007, the tower and field camp were moved downstream to a site approximately 1.5 km upstream from the confluence of the Fish and Niukluk rivers (GPS coordinates 64°49.058 N, 163°27.366 W; Figure 1). The weir was installed in late June and generally operated through mid-September.

Kwiniuk River Tower

The Kwiniuk River flows 62 km out of the Kwiktalik Mountains and drains into Norton Sound just east of Elim, approximately 160 kilometers east of Nome. Kwiniuk River tower has been the longest running salmon stock assessment project in the region. Since 1965, Kwiniuk River tower camp has been located approximately 6 km upstream from the mouth of the river (GPS coordinates 64°43.236 N, 162°01.004 W; Figure 1). Typically the tower operated from mid-June through mid-September to count coho salmon.

Inglutalik River Tower

In 2011, an enumeration tower project was initiated by NSEDC on the Inglutalik River to provide an index of salmon escapement to Subdistrict 4 (Norton Bay). Inglutalik River flows 153 km out of the Nulato Hills to drain in Norton Bay. Given the recent development of this project, escapement data were not yet adequate to determine dominant returning species to Inglutalik River. The counting tower and associated field camp were located on BLM land approximately 29 river kilometers upstream of the mouth (GPS coordinates 64°49.570 N, 160°39.990 W; Figure 2). In 2011 and 2012 Inglutalik tower operations focused on feasibility and no specific species were targeted for monitoring. The Inglutalik River tower operated from late June and stopped operations in mid-August in its first 2 years.

North River Tower

North River flows 104 km out of the Nulato Hills. An important spawning tributary of Unalakleet River drainage, North River enters Unalakleet River 8 kilometers above the mouth. All Pacific salmon species return to North River except sockeye salmon; sockeye salmon return infrequently or in small numbers. ADF&G operated North River tower from 1972 to 1974 and again from 1984 to 1986 (Lean 1987). From 1984 to 1986, the North River tower project was conducted at various sites upstream from the confluence of the Unalakleet River. The project was discontinued in 1987 due to lack of funding and a decline in the chum salmon commercial fishery. The project resumed operations in 1996, largely as a result of available funding and increasingly important Chinook, pink, and coho salmon commercial fisheries. Kawerak, Inc. operated the tower project from 1996 to 2001 (Kohler 2002) and NVU operated the project from 2002 to 2004 (Jones 2006). During the 2007–2009 seasons, ADF&G personnel conducted tower operations with assistance from NVU (2007–2008) and NSEDC (2009). In 2010, NSEDC became the sole operator. From 2008 to 2012 North River tower was located approximately 3

kilometers upstream from the confluence with the Unalakleet River (GPS coordinates 63°53.168 N, 160°39.484 W; Figure 2). The tower operated from mid-June through mid-September.

Unalakleet River Weir

The Unalakleet River drainage encompasses 5,400 square km and extends westward from the Nulato Hills for approximately 210 km to Norton Sound. The 2010 season marked the inception of the Unalakleet River weir, a cooperative project between ADF&G, NVU, BLM, and NSEDC. Unalakleet River weir was installed on the mainstem approximately 22 kilometers upstream from the mouth (GPS coordinates 63°53.32 N, 160°29.41 W; Figure 2). Unalakleet River weir was primarily implemented to monitor Chinook salmon, although all Pacific salmon species except sockeye salmon return to Unalakleet River. The Unalakleet River weir operated from mid to late June and stopped operations in late July to mid-August in its first 3 years.

OBJECTIVES

Enumeration projects within the Norton Sound-Port Clarence Area had the following 2 tasks:

1. to obtain daily and seasonal estimates of timing and magnitude of salmon escapements, and
2. to estimate ASL composition of the Chinook, chum, coho, and sockeye salmon escapement.

METHODS

STUDY AREA

Norton Sound District consists of all waters from the tip of Cape Douglas south to Point Romanof and has 6 commercial salmon fishing subdistricts. Port Clarence District includes all waters from Cape Prince of Wales south to the tip of Cape Douglas and has 1 commercial fishing subdistrict, Grantley Harbor Subdistrict (Figure 3). Five species of Pacific salmon (chum, pink, Chinook, sockeye, and coho salmon) return to Norton Sound-Port Clarence Area marine waters and anadromous streams (Figure 3). Other salmonids, including Arctic grayling *Thymallus arcticus*, Dolly Varden *Salvelinus malma*, and whitefish species *Coregonus* and *Prosopium* spp. also occur in most Norton Sound-Port Clarence Area drainages.

ENUMERATION TOWERS

Tower Construction and Maintenance

Towers were constructed from aluminum scaffold and placed on the river bank where observers could see the width of the river. Guy wires were staked to the ground or cabled to trees to stabilize towers.

Flash panels (usually white plastic, vinyl, or canvas) were placed perpendicular across the river bottom to provide a contrasting background to help facilitate species identification and counting. Flash panels were anchored with sand bags placed on the upstream side of panels; stakes were used on the ends to hold panels in place. Flash panels were cleaned when needed using a stiff long-handled scrub brush or broom.

Partial or diversionary weirs were used to force migrating fish over the flash panel for easier observation. Diversionary weirs extended from the river bank opposite the tower scaffolding

toward mid-channel over the flash panel end. Weirs were inspected daily and woody debris and fish carcasses removed. The North River counting project did not use a diversionary weir. Instead an orange buoy was placed mid-panel and counting was conducted from both sides of the river.

To count fish at night from late July into September, lights were placed either on the tower (Inglutalik, Kwiniuk, and Niukluk rivers) or on guy wires tied to both towers (North River). A 12-volt battery system or 120-volt generator system provided power for lighting.

Salmon Enumeration

Counting migrating salmon was completed 24 hours a day and each day was divided into three 8-hour shifts. At projects with towers on just 1 river bank (e.g., Inglutalik, Kwiniuk, and Niukluk rivers), salmon were counted, by species, for 20 min each hour; counts typically commenced at the top of the hour. At North River, where counting took place on both river banks, 10 min counting periods were scheduled twice each hour. The first 10 min count commenced at the top of the hour on the west bank and included only fish passing between the west bank and the offshore buoy. The east bank count immediately followed the west bank count and only fish passing between the east bank and the mid panel buoy were enumerated.

Passage was defined as movement across the full width of the flash panel and upstream (+) and downstream (-) passage were recorded to provide a net upstream passage during each 10 min for each channel of the river or 20 min count for the river. Carcasses as well as obviously moribund salmon passively moving downstream were not tallied as downstream passage. Hourly and daily salmon passage was determined using 3 different scenarios outlined in Perry-Plake and Antonovich (2009).

For days when all counts were conducted under excellent to poor conditions (Scenario 1), daily passage ($\hat{N}_d$) was calculated by expanding counts within a shift for day (*d*):

$$\hat{N}_d = \frac{M_d}{m_d} \sum_{j=1}^{m_d} y_{dj} \ . \tag{1}$$

Variance for each period was calculated as

$$s_d^2 = \frac{1}{2(m_d - 1)} \sum_{j=2}^{m_d} \left(y_{dj} - y_{d(j-1)} \right)^2 , \tag{2}$$

and variance for the expanded daily passage was estimated as

$$\hat{V}\left(\hat{N}_d\right) = \left(1 - \frac{m_d}{M_d}\right) M_d^2 \frac{s_d^2}{m_d} , \tag{3}$$

where

d = day;

j = 20 min counting period or paired 10 min counting period (a paired 10 min counting period consists of the two 10-min counts, 1 per channel, during a given hour);

y = observed period count (both channels combined);

m = number of 20 min counting periods or paired 10 min counting periods sampled; and

M = total number of possible 20 min counting periods or paired 10 min counting periods.

For periods with very poor or unobservable counts within a day (Scenario 2) the number of fish observed (y_{dj}) was estimated using known counts for that day and the estimated diurnal pattern. For each species, the period of peak passage was determined using the shortest, continuous period of time that accounted for 80% of the seasonal passage. If counts were conducted for a portion of the day that represents 25% or more of the expected passage for that day and if at least 25% of the periods during peak passage were successfully counted, then the channel-specific interpolated count was estimated

$$y_{dc,\text{interp}} = y_{dc,\text{actual}} \times \frac{1 - p_{edp}}{p_{edp}}, \tag{4}$$

where

$y_{dc,\text{interp}}$ = interpolated sum of counts for missing (i.e. very poor or unobservable) 10 min periods by channel;

$y_{dc,\text{actual}}$ = daily sum of successful 10 min counts by channel; and

p_{edp} = proportion of expected daily passage successfully counted.

The interpolated count was apportioned among the missing counting periods based on the diurnal pattern of the season. In Scenario 2, daily variance was adjusted by decreasing the number of counting periods (m_d) sampled each day by the proportion of the expected daily passage successfully counted on that day.

If counts were conducted for a portion of the day that represented less than 25% of the expected daily passage for that day or if less than 25% of the periods during peak passage were counted successfully (Scenario 3), then passage for the full day was estimated and the successful counts for that day were disregarded. Daily estimates were calculated using the same method for interpolating missed passage. When counts for (k) consecutive days were missed, the moving average estimate for the missing day (i) was calculated as

$$\hat{N}_i = \frac{\sum_{j=i-k}^{i+k} I(\textit{counting was successfully conducted on day } j)\hat{N}_j}{\sum_{j=i-k}^{i+k} I(\textit{counting was successfully conducted on day } j)}, \tag{5}$$

$$\text{where } \mathrm{I}(\cdot) = \begin{cases} 1 & \text{when the condition is true} \\ 0 & \text{otherwise} \end{cases} \text{ is an indicator function.} \tag{6}$$

The interpolated values were the point estimates for the daily counts and daily variance for missed days was the maximum variance for k days before and k days after the uncounted day (i). Total upstream passage and its variance combined daily passage from all 3 scenarios and were estimated as (Cochran 1977):

$$\hat{N}_{PT} = \sum_{d=1}^{D} \hat{N}_d \text{ , and} \tag{7}$$

$$\hat{V}\left(\hat{N}_{PT}\right) = \sum_{d=1}^{D} \hat{V}(\hat{N}_d), \tag{8}$$

where

D = total number of possible days.

WEIRS

Fixed-picket Weirs

Fixed-picket weirs were built across the entire river and designed to minimize unmonitored fish passage. Typically, weir sections were spanned using 3 meter long aluminum stringers supported by metal "A" frame bipods or tripods with galvanized steel or aluminum conduit pickets placed in the stringer holes. Pickets were spaced threefourths inch apart to ensure all salmon and anadromous Dolly Varden could not pass upstream undetected. Fixed-picket weirs were equipped with a gate, usually in the thalweg of the river, to allow fish to pass while being counted. Additionally, pickets could be removed to allow fish to pass. Fixed-picket weirs had boat gates, consisting of removable panels that can be moved to accommodate boat passage. Lighting systems similar to those deployed on tower projects were used to illuminate the weir area for counting fish passage at night. All weirs were monitored several times a day for breaches such as substrate scouring and pushed up pickets.

Resistance Board Weirs

Resistance board or floating weirs became increasingly important as a salmon stock assessment tool throughout western Alaska during the 2008–2012 operational periods (Bavilla et al. 2010; Stewart et al. 2010; Whitton 2003). Floating weirs comprised of a series of linked PVC pipe panels attached to a substrate rail anchored to the stream bed with rebar stakes and earth anchors. Installation of floating weirs followed Stewart's (2003) installation methods.

Similar to fixed-picket weirs, fish were funneled through a passage chute for accurate enumeration or into live traps to facilitate biological sampling. Unlike fixed-picket weirs, resistance board weirs had modified boat passage panels and tow rope systems that permitted unassisted boat traffic across the weir. Resistance board weirs also offered a flood-resistant alternative to fixed-picket weirs. When a resistant board weir was subjected to flood conditions, the panels were forced below the surface, allowing debris to pass unobstructed downstream.

Salmon Enumeration

Weirs were checked regularly throughout the day and night for milling fish and opened to allow fish to pass when necessary. Counting occurred at different times each day and night to account for changes in diurnal migratory patterns or operational constraints such as suboptimal viewing conditions. When the weir was opened, ADF&G staff monitored salmon migrating upstream. Fish were identified by species and counted on multiple tally counters for a minimum of 30 min or until fish passage diminished. Individual counts of salmon passage throughout the night and day were added together for a total daily passage by species.

Methods for Interpolating Missed Counts

Missing daily counts for weirs were interpolated using the moving average method (Equation 5) described in Perry-Plake and Antonovich (2009). Partial-count days were considered days of minimum passage therefore were not used to interpolate missed passage for days when the weir was not operational.

AGE, SEX, AND LENGTH

ASL Sample Size and Distribution

Minimum sample size targets were determined for each species of each project based on conventions described by Bromaghin (1993) to achieve 90% and 95% confidence intervals of age and sex compositions, respectively.

Sample size targets were based on assumptions that all salmon have 2 sex categories, Chinook salmon and sockeye salmon have 5 age categories, chum salmon have 4 age categories, and coho salmon have 3 age categories, with a finite or unknown population size. Minimum sample size targets were increased by 20–25% to account for unreadable scales and collection errors during weir or tower protocols (Table 1).

Different sampling strategies were implemented between 2008 and 2012. Typically, pulse sampling was employed in situations where sampling events were more costly or required multiple individuals to collect samples. For example, pulse sampling was initiated at counting tower projects because sampling required capture of salmon in beach seines at remote sites not in proximity to the counting tower. Funding constraints and limited personnel allowed for only a handful of sampling events to achieved sampling goals. Pulse sampling was scheduled to occur over a range of dates corresponding to 5-year, 10-year and/or long-term average run timing quartiles (Table 2). Pulse sampling was completed by dividing the sample goal by 4 and collecting the entire sample size within 2 days of the quartile date. The other sampling strategy was to collect ASL data evenly throughout the run following daily collection schedules (Table 3). This more systematic approach was used at weir projects because the weir trap facilitated daily capture and handling of salmon and often only required a single individual to collect ASL samples. Small adjustments were also made inseason to daily sampling targets when observed run timing deviated significantly from expected run timing.

Age and sex compositions are provided only for those species and projects where sample size allows for 90% and 95% confidence intervals, respectively, given the actual escapement abundance observed (Table 4).

ASL Sample Collection Procedures

Samples were obtained from salmon caught in fish traps at weir sites and from salmon captured in beach seines in proximity to tower locations. If salmon were not effectively captured in the weir live trap, fish were seined in proximity to the weir site, using similar methods to tower-associated seining. During seining events, the seine was incrementally worked up onto a bank or gravel bar until a net pen was created that was used to temporarily contain salmon until they could be sampled.

Weir traps consisted of an entrance gate, holding pen, and exit gate or chute. Salmon were trapped by opening the entrance gate and the exit gate remained closed. The holding pen was allowed to fill with fish until a reasonable number of salmon were available for sampling. Crew

members used a dip net to capture fish within the holding pen or net pen. To obtain length data and aid in scale collection, fish were removed from the dip net and placed into a partially submerged fish cradle outfitted with a measuring tape, or onto a polyethylene foam-covered fish measuring board that beveled towards the center. After sampling, each fish was released upstream of the weir or several meters away from the net pen during seining events. The procedure was repeated until the holding pen or net pen was emptied or the required number of salmon was sampled.

An active sampling approach was implemented at the Unalakleet River weir in order to increase the effectiveness of sampling Chinook salmon. Chinook salmon are often reluctant to enter fish traps filled with pink and chum salmon, which occurs when the exit gate is closed. Active sampling consists of capturing and sampling salmon individually or in small numbers while actively passing and counting all salmon (Linderman et al. 2002). One crew member counted fish normally at the upstream end of the trap and a second crew member sat at the back of the trap observing fish as they entered through the fyke opening. When a Chinook salmon was observed entering the trap, the crew members concurrently closed the front and rear gates to trap the fish. Active sampling was also completed by a single crew member using a short length of 2 by 4 lumber secured to a piece of rope, such that the front and back gates could be closed simultaneously.

Sex of each sampled fish was determined by visually examining external characteristics (such as body symmetry, kype development, and presence of an ovipositor) and length was measured to the nearest 0.5 cm from mideye to tail fork (METF). Scales were taken from the preferred area, cleaned and mounted on gummed cards, and impressions were made in cellulose acetate for age determination following methods described by Clutter and Whitesel (1956). Impressions were read in Nome using a microfiche reader and ages were determined from reading annuli as described by Mosher (1969). European notation was used to report ages: the first digit refers to the freshwater age not including the year spent in the gravel and the second digit refers to the ocean age (Koo 1962). Sex and length data were recorded on numbered data sheets that corresponded with numbers on the gum cards used for scale preservation. After sampling was completed, the original ASL gum cards, acetates, and ASL data forms were archived at the ADF&G office in Anchorage. In this report all collected ASL data are presented in tables; only ASL data that met minimum sample sizes are discussed.

WEATHER AND STREAM OBSERVATIONS

Stream and ambient air temperature (°C) and relative water levels were measured twice daily at all escapement projects. Other atmospheric observations (e.g., percent cloud cover, wind speed and direction, and precipitation) were also recorded daily. Water levels were monitored using a staff gauge consisting of a metal rod driven into the stream channel with a meter stick attached. Relative height of the water surface, as measured from the meter stick, represented the “stage” of the river above the original depth at which it was set. Occasionally, stream gauges needed to be re-driven in another location or lengthened when water levels either dropped below or rose above the meter stick.

RESULTS AND DISCUSSION

PILGRIM RIVER

Chum Salmon

Annual escapement of chum salmon at Pilgrim River weir ranged from 5,427 to 41,740 fish during the 2008–2012 seasons. The 2008–2012 escapements were some of the highest in 10 years of weir counts with the exception of the 2009 count, which was the lowest since the project's inception in 2003 (Table 5).

From 2008 to 2012 chum salmon were observed from the beginning of July into the beginning of September. An exception to this was 2012, when operations were ceased after 19 August because of high water. The chum salmon median passage date occurred from the end of July to the beginning of August across all years (Appendices A1–A5).

Pilgrim River chum salmon ASL sample sizes ranged from 155 to 486 fish. Chum salmon were predominantly age-0.3 and age-0.4 fish from 2008 to 2012, with an average female composition of 41%. In 2009 there was also a modest age-0.2 and age-0.5 fish component (Appendix A6).

Pink Salmon

Annual escapement of pink salmon at Pilgrim River weir ranged from 483 to 92,471 fish during the 2008–2012 seasons. The 2008 escapement was the highest in 10 years of weir counts whereas the 2009 escapement was the lowest (Table 5).

From 2008 to 2012 pink salmon were observed from the beginning of July into the beginning of September. An exception to this was 2012, when operations were ceased after 19 August because of high water. Pink salmon median passage occurred towards the end of July across all years (Appendices A1–A5).

ASL samples were not collected for pink salmon at Pilgrim River weir.

Chinook Salmon

Annual escapement of Chinook salmon at Pilgrim River weir ranged from 44 to 137 fish during the 2008–2012 seasons. The 2008–2012 seasons represent the longest consecutive record low escapements of Chinook salmon at Pilgrim River weir. The previous record low count of 216 Chinook salmon occurred in 2005 (Table 5).

From 2008 to 2012 Chinook salmon were observed from the first half of July through the end of August. An exception to this was 2010 when Chinook salmon were observed beginning the second half of July and 2012 when operations were ceased after 19 August because of high water. Chinook salmon median passage occurred towards the end of July across all years (Appendices A1–A5).

In 2008–2010 ASL data were collected yet sample sizes were insufficient for age composition estimates. In 2011–2012 ASL data were not collected (Appendix A7).

Coho Salmon

Annual escapement of coho salmon at Pilgrim River ranged from 18 to 269 fish during the 2008–2012 seasons. The 2008–2012 escapements were some of the lowest in 10 years of weir counts especially in 2009 where only 18 coho salmon were counted (Table 5).

From 2008 to 2012 coho salmon were observed from the end of July/beginning of August until operations ceased. Coho salmon median passage occurred the second half of August in most years (Appendices A1–A5).

In 2008, 87 coho salmon were sampled for ASL; sample size was insufficient for estimating age composition and female composition was 41%. ASL data were not collected in 2009–2012 (Appendix A8).

Sockeye Salmon

Annual escapement of sockeye salmon at Pilgrim River ranged from 953 to 20,452 salmon during the 2008–2012 seasons. With the exception of 2008, the 2008–2012 escapements were some of the lowest since the project's inception in 2003 (Table 5).

From 2008 to 2012, sockeye salmon were observed from the beginning of July to the end of August. An exception was 2010 where sockeye salmon were observed beginning the second half of July and 2012 when operations ceased after 19 August because of high water. Sockeye salmon median passage occurred the second half of July across all years (Appendices A1–A5).

Pilgrim River sockeye salmon ASL sample sizes ranged from 159 to 405 fish. Sockeye salmon were predominantly age-1.3 and age-2.3 fish from 2008 to 2012, with an average female composition of 52%. The exception was 2009, when sockeye salmon were half age-1.4 and the remainder were mostly age-1.3, age-2.3, and age-2.4 fish (Appendix A9).

Environmental Characteristics

From 2008 to 2011 water levels were within an acceptable range to allow for continuous weir operations (Appendix A10). In 2012 high water resulted in 1 missed counting day on 30 July and ceasing operations on 19 August, about 10 days earlier than in previous years (Figure 4).

GLACIAL CREEK

Sockeye Salmon

Annual escapement of sockeye salmon at Glacial Creek ranged from 826 to 1,794 fish during the 2008–2012 seasons. The 2009 escapement was the lowest since the project's inception in 2000 and all other escapements were within the range of escapements seen throughout the project (Table 6).

From 2008 to 2012 sockeye salmon were observed from the beginning of July until operations ceased. An exception to this was 2010 when sockeye salmon were observed at the end of June. Sockeye salmon median passage occurred the first half of July across all years, with the exception of 2012 when median passage occurred the second half of July (Appendices B1–B5).

In 2008, 152 sockeye salmon were sampled for ASL and 63% were female. The dominant age class was age-2.3 at 82% and no other age class composed more than 8.6%. In 2009, 40 sockeye salmon were sampled. In 2010, 40 scales were aged. ASL data were not collected in 2011 and 2012 (Appendix B6).

Environmental Characteristics

Water levels recorded from 2008 were missing. Despite high water levels at different times from 2009 to 2012, the project remained operational throughout (Figure 5; Appendix B7). This is

generally because the weir is located near the outlet of a lake which provided a buffer from rapidly changing water levels.

SNAKE RIVER

It is important to note that although Chinook and sockeye salmon were not present in large enough numbers to present results a few were counted at Snake River weir in most years (Table 7).

Chum Salmon

Annual escapement of chum salmon at Snake River weir ranged from 891 to 6,973 salmon during the 2008–2012 seasons. The 2008, 2009, and 2012 escapements were some of the lowest in 10 years whereas the 2010 and 2011 counts were some of the highest in 10 years (Table 7).

From 2008 to 2012 chum salmon were observed from the beginning of July to the end of August/beginning of September. An exception to this was 2012, when operations ceased after 15 August because of high water. Chum salmon median passage occurred during the second half of July across all years (Appendices C1–C5).

Snake River chum salmon ASL sample sizes ranged from 52 to 305 fish. Years that achieved minimum sample size (2009–2011) showed chum salmon were predominantly age-0.3 and age-0.4 fish, with an average female composition of 53% (2009–2012). In 2009, there was also an important age-0.2 and age-0.5 fish component (Appendix C6).

Pink Salmon

Annual escapement of pink salmon at Snake River weir ranged from 769 to 145,761 fish during the 2008–2012 seasons. The 2008 escapement was the second highest recorded escapement whereas the 2009 escapement was the second lowest recorded escapement (Table 7).

From 2008 to 2012 pink salmon were observed from the beginning of July to the end of August/beginning of September. An exception to this was 2012, when operations ceased after 15 August because of high water. Pink salmon median passage occurred during the second half of July across all years (Appendices C1–C5).

ASL samples were not collected for pink salmon at Snake River weir.

Coho Salmon

Annual escapement of coho salmon at Snake River weir ranged from 22 to 5,206 fish during the 2008–2012 seasons. The 2008 escapement was the highest count on record whereas the 2009, 2011, and 2012 escapements were some of the lowest on record and the 2010 escapement was similar to escapements from the late 1990s (Table 7).

From 2008 to 2012 coho salmon were observed from the middle of July until operations ceased. Coho salmon median passage occurred the second half of August/early September across all years (Appendices C1–C5).

In 2008, 2009, and 2012 Snake River coho salmon ASL sample sizes were insufficient for age composition escapements. Samples collected in 2010 and 2011 showed an average female composition of 47% (Appendix C7).

Environmental Conditions

From 2008 to 2010 water levels were within an acceptable range to allow for continuous weir operations (Appendix C8). During the 2011 field season there were 2 periods of high water; 12–14 August and 10–13 September. In 2012 high water resulted in 1 period where counting was suspended from 29 July to 7 August (Figure 6). Because of continual high water in 2012, Snake River weir was removed a month earlier than average on August 16.

NOME RIVER WEIR

It is important to note that although Chinook and sockeye salmon are not present in large enough numbers to present results a few were counted at Nome River weir in most years (Table 8).

Chum Salmon

Annual escapement of chum salmon at Nome River weir ranged from 1,565 to 5,877 salmon during the 2008–2012 seasons. The 2010 escapement was the second highest on record, whereas all other escapements from 2008 to 2012 were similar to those seen in previous years (Table 8).

From 2008 to 2012 chum salmon were observed from the beginning of July to the middle of September. An exception to this was 2012, when operations ceased after 15 August because of high water. Chum salmon median passage occurred late July across all years (Appendices D1–D5).

Nome River chum ASL sample sizes ranged from 84 to 122 fish. Years that achieved minimum sample size (2008–2011) showed chum salmon were predominantly age-0.3 and age-0.4 fish, with an average female composition of 54% (2008–2012). In 2008 and 2009, there were also modest age-0.2 and age-0.5 fish components (Appendix D6).

Pink Salmon

Annual escapement of pink salmon at Nome River weir ranged from 14,384 to 1,186,554 fish during the 2008–2012 seasons. The 2008 escapement was the highest recorded. Escapements from 2009 to 2012 were similar to those seen in years past for even and odd year runs (Table 8).

From 2008 to 2012 pink salmon were observed from the beginning of July to mid-September. An exception to this was 2012, when operations ceased after 15 August because of high water. Pink salmon median passage occurred during late July across all years (Appendices D1–D5).

ASL samples were not collected for pink salmon at Nome River weir.

Coho Salmon

Annual escapement of coho salmon at Nome River weir ranged from 237 to 4,605 salmon during the 2008–2012 seasons. Escapements from 2008 to 2011 were similar to previously recorded escapements, whereas the 2012 escapement was one of the lowest on record (Table 8).

From 2008 to 2012 coho salmon were observed from the middle of July until operations ceased. An exception to this was 2011, when coho salmon were observed the first half of July. Coho salmon median passage occurred in late August across all years (Appendices D1–D5).

Only 2009 Snake River coho salmon ASL sample sizes were sufficient for age composition and age-2.1 and age-1.1 fish were the dominant ages. Snake River coho salmon ASL samples from

2008 to 2011 showed an average female composition of 47% (Appendix D7). ASL data were not collected in 2012.

Environmental Conditions

From 2008 to 2010 water levels were within an acceptable range to allow for continuous weir operations (Appendix D8). During the 2011 field season there were 2 periods of high water; 16–19 July and 6–19 August. In 2012 high water resulted in 1 period where fish counting was suspended from 29 July to 7 August (Figure 7). Additionally, in 2012 Nome River weir was removed a month earlier than average on August 16 due to high water.

ELDORADO RIVER

It is important to note that although Chinook, coho, and sockeye salmon were not present in large enough numbers to present results, minor runs did exist in Eldorado River (Table 9).

Chum Salmon

Annual escapement of chum salmon at Eldorado River weir ranged from 4,943 to 21,211 salmon during the 2008–2012 seasons. The 2008 and 2009 escapements were some of the lowest on record whereas the 2010–2012 counts were some of the highest since the project's inception in 1997 (Table 9).

From 2008 to 2012 chum salmon were observed from late June/early July until operations ceased. Chum salmon median passage occurred during the middle of July across all years (Appendices E1–E5).

Nome River chum salmon ASL sample sizes ranged from 128 to 539 fish. Years that achieved minimum sample size (2009–2012) showed chum salmon were predominantly age-0.3 and age-0.4 fish, with an average female composition of 42% (2008–2012). In 2009 and 2012 there were also important age-0.2 and age-0.5 fish components (Appendix E6).

Pink Salmon

Annual escapement of pink salmon at Eldorado River weir ranged from 507 to 244,641 salmon during the 2008–2012 seasons. The 2008 escapement was the highest on record whereas 2009 and 2011 escapements were some of the lowest on record. Escapements from 2010 and 2012 were similar to even year run escapements in the past (Table 9).

From 2008 to 2012 pink salmon were observed from late June/early July until operations ceased. Pink salmon median passage occurred during the middle of July across all years, except 2011 when median passage occurred at the end of July (Appendices D1–D5).

ASL samples were not collected for pink salmon at Eldorado River weir.

Environmental Conditions

From 2008 to 2010 water levels were within an acceptable range to allow for continuous weir operations (Appendix E7). During the 2011 field season there was 1 period of high water from 13 July to 14 July. High water in 2012 forced the project to terminate approximately a week earlier than average, on July 26 (Figure 8).

NIUKLUK RIVER

Chum Salmon

Annual escapement of chum salmon at Niukluk River tower ranged from 12,078 to 48,561 salmon during the 2008–2012 seasons. The 2008 and 2009 escapements were the second and third lowest on record and remaining escapements were similar to escapements from previous years (Table 10).

From 2008 to 2012 chum salmon were observed from late June/early July until operations ceased in September. An exception to this was 2012, when operations ceased after 17 August because of high water. Chum salmon median passage occurred during the middle of July across all years, except 2008 when median passage occurred at the beginning of July (Appendices F1–F5).

Niukluk River chum salmon ASL sample sizes ranged from 83 to 248 fish. Years that achieved minimum sample size (2009–2010) showed chum salmon were predominantly age-0.3 and age-0.4 fish, with an average female composition of 55% (2008–2010). In 2009 there was also an important age-0.2 and age-0.5 fish component. ASL data were not collected in 2011 and 2012 (Appendix F6).

Pink Salmon

Annual escapement of pink salmon at Niukluk River tower ranged from 15,581 to 669,234 fish during the 2008–2012 seasons. The 2008–2010 escapements were similar to escapements from previous years, whereas 2011 and 2012 escapements were the lowest on record for both odd and even year runs (Table 10).

From 2008 to 2012 pink salmon were observed from late June/early July to late August/early September. An exception to this was 2012, when operations ceased after 17 August because of high water. Pink salmon median passage occurred during the first half of July in 2008 and 2010 and during the second half of July in 2009 and 2011 (Appendices F1–F5).

ASL samples were not collected for pink salmon at Niukluk River tower.

Chinook Salmon

Annual escapement of Chinook salmon at Niukluk River tower ranged from 15 to 204 salmon during the 2008–2012 seasons. The 2008 and 2009 escapements were similar to escapements from previous years, whereas 2010–2012 escapements were the 3 lowest escapements on record (Table 10).

From 2008 to 2012 Chinook salmon were observed in July. An exception to this was 2010 when Chinook salmon were observed into the beginning of August. Chinook salmon median passage occurred the first half of July across all years (Appendices F1–F5).

ASL samples were not collected for Chinook salmon at Niukluk River tower.

Coho Salmon

Annual escapement of coho salmon at Niukluk River tower ranged from 1,716 to 13,779 fish during the 2008–2012 seasons. The 2008 escapement was the highest count on record whereas the 2012 escapement was the third lowest on record. The 2009–2011 escapements were similar to escapements from past years (Table 10).

From 2008 to 2012 coho salmon were observed from the second half of July until operations ceased. Coho salmon median passage occurred the second half of August across all years (Appendices F1–F5).

ASL samples were not collected from 2008 to 2012 for coho salmon at Niukluk River tower (Appendix F7).

Environmental Conditions

From 2008 to 2010 water levels were within an acceptable range to allow for continuous tower operations (Appendix F8). During the 2011 field season there was 1 period of high water from 18 July to 20 July. In 2012 there were 2 periods of high water: 1 day on 27 July and 30 July to 5 August that hindered operations. Continual high water in 2012 caused Niukluk River tower to be removed a week earlier than average on August 18 (Figure 9).

KWINIUK RIVER

Chum Salmon

Annual escapement of chum salmon at Kwiniuk River tower ranged from 5,577 to 71,403 salmon during the 2008–2012 seasons. The 2010 escapement was the highest on record and the 2012 escapement was the lowest on record. All other escapements from 2008 to 2012 were similar to escapements from previous years (Table 11).

From 2008 to 2012 chum salmon were observed from the second half of June to late August/mid-September. An exception to this was 2012, when operations ceased after 16 August because of high water. Chum salmon median passage occurred during the first half of July across all years (Appendices G1–G5).

Kwiniuk River chum salmon ASL sample sizes ranged from 4 to 241 fish. Years that achieved minimum sample size (2009–2011) showed chum salmon were predominantly age-0.3 and age-0.4 fish, with an average female composition of 53% (2008–2011). An exception was 2009 where chum salmon were predominantly age-0.2 and age-0.3 fish with modest age-0.4 and age-0.5 fish components (Appendix G6).

Pink Salmon

Annual escapement of pink salmon at Kwiniuk River tower ranged from 30,913 to 1,444,228 fish during the 2008–2012 seasons. The 2008–2012 escapements were similar to those seen in years past for both even- and odd-year runs (Table 11).

From 2008 to 2012 pink salmon were observed from late June to the first half of September. An exception to this was 2012, when operations ceased after 16 August because of high water. Pink salmon median passage occurred during the first half of July in 2008, 2010, and during the second half of July in 2009 and 2011 (Appendices G1–G5).

ASL samples were not collected for pink salmon at Kwiniuk River tower.

Chinook Salmon

Annual escapement of Chinook salmon at Kwiniuk River tower ranged from 57 to 444 salmon during the 2008–2012 seasons. The 2008 and 2009 escapements were similar to escapements in previous years whereas escapements from 2010 to 2012 were some of the lowest in the last 10 years (Table 11).

From 2008 to 2012 Chinook salmon were observed from late June/early July to late July/early August. Chinook salmon median passage occurred the first half of July across all years (Appendices G1–G5).

ASL samples were not collected for Chinook salmon at Kwiniuk River tower.

Coho Salmon

Annual escapement of coho salmon at Kwiniuk River tower ranged from 781 to 10,462 fish during the 2008–2012 seasons. The 2008–2010 escapements were similar to escapements from previous years whereas the escapement in 2011 was the lowest since coho salmon enumeration started in earnest in 2001. The 2012 escapement does not represent a complete season (Table 11).

From 2008 to 2012 coho salmon were observed from the second half of July until operations ceased. An exception to this was 2011, when coho salmon were observed the first half of July. Coho salmon median passage occurred the second half of August in 2008 and 2009 and the first half of August in 2012 and 2011 (Appendices G1–G5).

ASL samples were not collected from 2008 to 2012 for coho salmon at Kwiniuk River tower (Appendix G8).

Environmental Conditions

From 2008 to 2011 water levels were within an acceptable range to allow for continuous tower operations (Appendix G9). Continual high water in 2012 caused Kwiniuk River tower to be removed a week earlier than average on August 17 (Figure 10).

INGLUTALIK RIVER

It is important to note that although coho salmon are not presented in the results, they were counted in 2011 and 2012 at Inglutalik River tower, the first 2 years of operation (Table 12).

Chum Salmon

Annual escapement of chum salmon at Inglutalik River tower was 62,897 and 33,123 chum salmon during the 2011 and 2012 seasons (Table 12).

In 2011, the first chum salmon was observed at Inglutalik River tower on 25 June and the last chum salmon was counted passing the tower on 11 August. The chum salmon median passage date was 12 July in 2011. In 2012 chum salmon were observed from 2 July through the last day of operation on 23 August and median passage occurred on 13 July (Appendices H2 and H3).

In 2011, 131 chum salmon were sampled for ASL and female composition was 59%. In 2012, 56 chum salmon were sampled but sample sizes were insufficient for sex or age composition estimates (Appendix H3).

Pink Salmon

Annual escapement of pink salmon at Inglutalik River tower was 475,167 in 2011 and 90,831 in 2012 (Table 12).

In 2011, the first pink salmon was observed at Inglutalik River tower on 3 July and pink salmon were seen through the last day of operation on 12 August. The pink salmon median passage date

was 27 July in 2011. In 2012 pink salmon were observed from 2 July through the last day of operation on 23 August and median passage occurred on 16 July (Appendices H2 and H3).

ASL samples were not collected for pink salmon at Inglutalik River tower.

Chinook Salmon

Annual escapement of Chinook salmon at Inglutalik River tower was 1,469 and 1,159 Chinook salmon during the 2011 and 2012 seasons (Table 12).

In 2011, the first Chinook salmon was observed at Inglutalik River tower at the start of operations 24 June and the last Chinook salmon was counted passing the tower on 24 July. The Chinook salmon median passage date was 5 July in 2011. In 2012 Chinook salmon were observed from 28 June to 26 July and median passage occurred on 12 July (Appendices H2 and H3).

ASL samples were not collected for Chinook salmon at Inglutalik River tower.

Environmental Conditions

Water levels from 2011 and 2012 were within an acceptable range to allow for continuous tower operations (Figure 11; Appendix H4).

NORTH RIVER

Chum Salmon

Annual escapement of chum salmon at North River tower ranged from 9,120 to 21,396 salmon during the 2008–2012 seasons. The 2008, 2009, and 2012 escapements were similar to escapements in previous years whereas the 2010 and 2011 counts were the highest since the project's inception in 1972 (Table 13).

From 2008 to 2012 chum salmon were observed from the second half of June to late August/mid-September. An exception to this was 2012, when operations were ceased after 17 August because of high water. Chum salmon median passage occurred during the second half of July across all years, except 2008 where median passage occurred early August (Appendices I1–I5).

North River chum ASL samples were only collected in 2011 and 2012 and sizes were 200 and 116 fish. Years that achieved minimum sample size (2011) showed chum salmon were predominantly age-0.3 and age-0.4 fish, with an average female composition of 48% (2011–2012; Appendix I6).

Pink Salmon

Annual escapement of pink salmon at North River tower ranged from 137,012 to 241,798 salmon during the 2008–2012 seasons. All escapements were within ranges seen in even and odd year escapements since tower operations were resumed in 1996 (Table 13).

From 2008 to 2012 pink salmon were observed from the second half of June until late August/early September. An exception to this was 2012, when operations ceased after 17 August because of high water. Pink salmon median passage occurred during the middle to end of July across all years (Appendices I1–I5).

ASL samples were not collected for pink salmon at North River tower.

Chinook Salmon

Annual escapement of Chinook salmon at North River tower ranged from 841 to 2,357 fish during the 2008–2012 seasons. The 2008, 2011, and 2012 escapements were 3 of the 4 lowest escapements in the last 17 years and 2009 and 2010 escapements were similar to escapements from past years (Table 13).

From 2008 to 2012 Chinook salmon were observed from late June/early July to the first half of August. An exception to this was 2009 when Chinook salmon were observed until the second half of August. Chinook salmon median passage occurred from the middle to late July across all years (Appendices I1–I5).

ASL samples were collected for Chinook salmon at North River tower in 2011 only. A total of 142 Chinook salmon were sampled and female composition was 11%. The age composition was age-1.1 (6%), age-1.2 (69%), age-1.3 (19%), and age-1.4 (7%) Chinook salmon (Appendix I7).

Coho Salmon

Annual escapement of coho salmon at North River tower ranged from 3,258 to 22,274 fish during the 2008–2012 seasons. The 2009 escapement was the highest count on record whereas the 2008 escapement was similar to previously recorded escapements. Escapements from 2010 to 2012 were some of the lowest escapements in the last 10 years (Table 13).

From 2008 to 2012 coho salmon were observed from the middle of July until operations ceased. An exception to this was 2010, when coho salmon were observed until the beginning of September. Coho salmon median passage occurred the second half of August in 2008, 2009, and 2011 and in the first half of August in 2010 (Appendices I1–I5).

ASL samples were not collected in 2008–2011 and sample size was insufficient in 2012 (Appendix I8).

Environmental Conditions

From 2008 to 2009 water levels were within an acceptable range to allow for continuous tower operations (Figure 12 and Appendix I9). During the 2010 field season there was 1 period of high water from 13 August to 15 August. In 2011 there was a period of high water from 14 August to 21 August when counting was suspended. In 2012, North River tower was removed almost a month earlier than average on August 18 due to high water.

UNALAKLEET RIVER

It is important to note that although sockeye salmon are not present in large enough numbers to present results, minor runs did exist in Unalakleet River (Table 14).

Chum Salmon

Annual escapement of chum salmon at Unalakleet River weir ranged from 70,811 to 104,050 fish during the 2010–2012 seasons (Table 14). The 2010–2012 escapements were the first 3 escapements at Unalakleet River weir.

From 2010 to 2012 chum salmon were observed from the second half of June until operations ceased. Chum salmon median passage occurred during the middle of July across all years (Appendices J1–J3).

Unalakleet River chum salmon ASL sample sizes ranged from 199 to 247 fish. Chum salmon were predominantly age-0.3 and age-0.4 fish from 2010 to 2012, with an average female composition of 53% (Appendix J4).

Pink Salmon

Annual escapement of pink salmon at Unalakleet River weir ranged from 354,361 to 832,904 salmon during the 2010–2012 seasons (Table 14). The 2010–2012 escapements were the first 3 escapements at Unalakleet River weir.

From 2010 to 2012 pink salmon were observed from the second half of June until operations ceased. Pink salmon median passage occurred in mid-July in 2010 and 2012 and during the second half of July in 2011 (Appendices J1–J3).

ASL samples were not collected for pink salmon at Unalakleet River weir.

Chinook Salmon

Annual escapement of Chinook salmon at Unalakleet River weir ranged from 823 to 1030 salmon during the 2010–2012 seasons (Table 14). The 2010–2012 escapements were the first 3 escapements at Unalakleet River weir.

From 2010 to 2012 Chinook salmon were observed from the second half of June until operations ceased. Chinook salmon median passage occurred the second half of July across all years (Appendices J1–J3).

Unalakleet River Chinook ASL sample sizes ranged from 23 to 208 fish. Years that achieved minimum sample size (2011–2012) showed Chinook salmon were predominantly age-1.2 and age-1.3 fish, with an average female composition of 31% (2011–2012). In 2011 and 2012, there was also a modest age-1.4 fish component (Appendix J5).

Coho Salmon

Annual escapement of coho salmon at Unalakleet River weir ranged from 5,382 to 17,548 fish during the 2010–2012 seasons (Table 14). The 2010–2012 escapements were the first 3 escapements recorded at Unalakleet River weir.

From 2010 to 2012 coho salmon were observed from the second half of July until operations ceased (Appendices J1–J3).

ASL samples were not collected for coho salmon at Unalakleet River weir.

Environmental Conditions

From 2010 to 2012 water levels were within an acceptable range to allow for continuous weir operations (Appendix J6). Water level records from 2010 to 2012 were the first recorded at Unalakleet River weir (Figure 13).

ACKNOWLEDGEMENTS

Special thanks to the organizations that helped make escapement projects possible, including NSEDC and NVU. Thanks to ADF&G field staff, camp and sampling coordinators, and other personnel who contributed to making the projects successful. The authors extend a special thank

you to all who reviewed drafts of this report, especially Kathrine Howard. The authors also thank an anonymous peer reviewer whose comments and edits improved this report.

REFERENCES CITED

Bavilla, J., D. Bue, H. Carroll, T. Elison, D. Taylor, J. Estensen, and C. Brazil. 2010. 2009 Kuskokwim area management report. Alaska Department of Fish and Game, Fishery Management Report No. 10-56, Anchorage.

Bromaghin, J. F. 1993. Sample size determination for interval estimation of multinomial probabilities. American Statistics 47(3): 203–206.

Clutter, R., and L. Whitesel. 1956. Collection and interpretation of sockeye salmon scales. Bulletin of International Pacific Salmon Fisheries Commission No. 9. Vancouver, British Columbia.

Cochran, W. G. 1977. Sampling techniques, third edition. John Wiley, New York.

Dunmall, K. 2008. Kawerak, Inc. Norton Sound salmon escapement projects: Summary of Snake River 1995-2007, Eldorado River 1997-2007, and Pilgrim River 2003-2007. Kawerak, Inc., Fisheries Department, Nome, Alaska.

Hamazaki, T., L. I. Wilson, and G. Todd. 2012. Sockeye salmon studies in Salmon Lake; limnology and fishery investigations relative to a nutrient addition program, 1994–2008. Alaska Department of Fish and Game, Fishery Data Series No. 12-28, Anchorage.

Jones, W. W., and G. Knuepfer. 2002. Niukluk River salmon counting tower project 2001. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 3A02-46, Anchorage.

Jones, W. W. 2006. North River salmon counting tower project, 2002-2004. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 3A06-04, Anchorage.

Kohler, T. 2002. Eldorado River salmon counting tower project summary report, 2001. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 3A02-14, Anchorage.

Koo, T. S. Y. 1962. Age designation on salmon. Pages 37-48 [*In*]: T.S.Y. Koo, editor, Studies of Alaska red salmon. University of Washington Publications in Fisheries, New Series, Volume I, Seattle.

Lean, C. 1987. Norton Sound-Kotzebue Escapement Report #47. Alaska Department of Fish and Game, Division of Commercial Fisheries, NSK Report No. 47, Anchorage.

Linderman, J. C., D. B. Molyneaux, L. DuBois, and W. Morgan. 2002. Tatlawiksuk River weir salmon studies 1998-2001. Alaska Department of Fish and Game, Regional Information Report 3A02-11, Anchorage.

Mosher, K. H. 1969. Identification of Pacific salmon and steelhead trout by scale characteristics. United States Department of the Interior, U.S. Fish and Wildlife Service, Bureau of Commercial Fisheries, Washington D.C., Circular 317.

Parker, D. 2008. Open File Report 110. Glacial Lake sockeye salmon restoration project, 2000 to 2005. Bureau of Land Management.

Perry-Plake, L. J. and A. B. Antonovich. 2009. Chinook salmon escapement in the Gulkana River, 2007–2008. Alaska Department of Fish and Game, Fishery Data Series 09-35, Anchorage.

Rob, P. J. 1995. Eldorado River counting tower. A cooperative project funded by Sitnasuak Native Corporation. Project Summary Report, 1995. Alaska Department of Fish and Game, Commercial Fisheries Management and Development, Nome.

Schaefer, G. 1979. Niukluk River counting tower project. Alaska Department of Fish and Game, Division of Commercial Fisheries, Norton Sound Escapement Report 21, Nome.

Stewart, R. 2003. Techniques for installing a resistance board fish weir. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 3A03-26, Anchorage.

Stewart, R., C. Goods, and C. A. Shelden. 2010. Takotna River salmon studies, 2009. Alaska Department of Fish and Game, Fishery Data Series No. 10-52, Anchorage.

REFERENCES CITED (Continued)

Todd, G. L., and G. B. Kyle. 1997. Limnological and sockeye salmon productivity investigations in salmon and glacial lakes: project completion report. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 5J97-05, Juneau.

Waitman, S., and K. Dunmall. 2003. The Snake River, Eldorado River, and Pilgrim River salmon escapement enumeration and sampling project summary report, 2002. A report prepared for the Norton Sound Initiative.

Whitton, K. S. 2003. Abundance and run timing of adult Pacific salmon in Big Creek, Becharof National Wildlife Refuge, Alaska, 2000–2002. U.S. Fish and Wildlife Service, King Salmon Fish and Wildlife Field Office, Alaska Fisheries Technical Report Number 65, King Salmon, Alaska.

TABLES AND FIGURES

Table 1.–Target age, sex, and length (ASL) sample sizes for Norton Sound escapement projects.

Escapement project	Species	Sample size
Pilgrim weir	Chum	220
	Sockeye	230
Glacial weir	Sockeye	210
Snake weir	Chum	210
	Coho	190
Nome weir	Chum	210
	Coho	190
Eldorado weir	Chum	220
Niukluk tower	Chum	215
Kwiniuk tower	Chum	220
Inglutalik tower	Chinook	230
	Chum	220
	Coho	200
North tower	Chinook	100
	Chum	215
	Coho	200
Unalakleet weir	Chinook	230
	Chum	215

Note: Sample sizes include a 20% buffer to account for unreadable scales.

Table 2.–Example of pulse sampling for chum salmon, Kwiniuk River tower, Norton Sound, 2009.

	Quartile date	Sampling period dates	Pulse sample size	Cumulative sample total
Quarter point	7/3	6/26–7/3	60	60
Midpoint	7/6	7/4–7/6	60	120
Three-quarter point	7/13	7/9–7/13	60	180
~95% point	7/24	7/19–7/24	60	240

Table 3.–Example of daily sampling goals for coho salmon, Snake River weir, Norton Sound, 2009.

	Quartile date	Sampling period dates	Number of samples collected/day	Cumulative sample total
Quarter point	8/21	8/1–8/21	3	50
Midpoint	8/27	8/22–8/27	8	100
Three-quarter point	9/1	8/28–9/1	10	150
~95% point	9/6	9/2–9/6	10	200

Table 4.–Age and sex minimum sample sizes for Norton Sound escapement projects required for age and sex composition estimates with 90% and 95% confidence intervals, respectively.

		Year				
Escapement project	Species	2008	2009	2010	2011	2012
Pilgrim weir	Chum	151/73	147/72	151/73	151/73	151/73
	Sockeye	160/73	137/68	146/70	157/72	157/72
Glacial weir	Sockeye	147/70	134/67	139/68	146/70	146/70
Snake weir	Chum	135/69	129/68	148/72	146/72	123*/66
	Coho	135/72	37/30	131*/71	99*/60	13/12
Nome weir	Chum	143/71	138/70	147/72	145/72	140*/70
	Coho	135*/72	126/69	134*/72	128*/70	87/56
Eldorado weir	Chum	147*/72	146/72	151/73	151/73	151/73
Niukluk tower	Chum	151*/73	151/73	151/73	151/73	151/73
Kwiniuk tower	Chum	148*/72	148/72	151/73	151/73	147/72
Inglutalik tower	Chinook				147/70	141/69
	Chum				151*/73	151/73
	Coho				120/67	126/69
North tower	Chinook	136/68	150/71	142/69	135/67	138/68
	Chum	148/72	148/72	151/73	151/73	148*/72
	Coho	139/73	139/73	136/72	133/72	133/71
Unalakleet weir	Chinook			139/68	140/69	134/67
	Chum			151/73	151/73	151/73

Note: Age minimum sample sizes are to the left of each common slash and sex minimum sample sizes are to the right of each common slash. Asterisk indicates that the minimum age sample size was not achieved. Boxes indicate both age and sex minimum sample sizes were not achieved.

Table 5.–Historical salmon escapements and median passage (Med. pass.) dates, Pilgrim River weir, Port Clarence, 2003–2012.

		Chum salmon		Pink salmon		Chinook salmon		Coho salmon		Sockeye salmon	
Year	Operating period	Number	Med. pass	Number	Med. pass.	Number	Med. pass.	Number	Med. pass.	Number	Med. pass.
2003	Jun 21–Sep 14	15,200	8/3	14,100	7/24	1,016	7/13	677	8/26	42,729	7/17
2004	Jun 21–Sep 14	10,239	7/23	50,760	7/14	925	7/9	1,573[a]	8/22	85,417	7/11
2005	Jun 24–Sep 05	9,685	7/30	13,218	7/18	216	7/13	304	8/25	55,951	7/14
2006	Jun 30–Sep 09	45,361	8/2	17,701	7/23	275	7/22	973	9/3	52,323	7/19
2007	Jun 29–Sep 10	35,334	7/31	3,616	7/22	501	7/13	605	8/20	43,432	7/15
2008	Jun 25–Sep 01	24,550	8/2	92,471	7/22	137	7/19	260	8/21	20,452	7/17
2009	Jun 26–Aug 31	5,427	8/2	483	7/28	52	7/28	18	–	953	7/22
2010	Jun 24–Sep 01	25,379	8/4	29,239	7/22	44	7/28	272	8/21	1,654	7/25
2011	Jun 28–Sep 01	41,740	7/30	3,364	7/31	44	7/20	269	8/27	8,449	7/19
2012 [b]	Jun 26–Aug 19	25,733		46,201		65		95		7,090	

Note: En dash means that the median passage not calculated for less than 20 fish.

[a] Coho salmon count is unreliable because of misidentification; approximately 30% of scale samples were sockeye salmon.

[b] Median passage dates are not shown because target operational period for project was not fully monitored.

Table 6.–Historical salmon escapements and median passage (Med. pass.) dates at Glacial Creek weir, Norton Sound, 2000–2012.

		Sockeye salmon	
Year	Operating period	Number	Med. pass
2000	Jul 12–Jul 30	884	7/21
2001	Jul 02–Jul 28	2,487	7/12
2002	Jun 25–Jul 26	1,047	7/11
2003	Jun 24–Jul 28	2,004	7/8
2004	Jun 18–Jul 25	8,115	7/2
2005	Jun 20–Jul 25	11,135	6/30
2006	Jul 04–Jul 18	6,849	7/12
2007	Jul 05–Jul 20	4,533	7/10
2008	Jun 27–Jul 28	1,794	7/8
2009	Jun 20–Jul 27	826	7/12
2010	Jun 26–Jul 28	1,047	7/13
2011	Jun 28–Jul 26	1,697	7/9
2012	Jul 02–Jul 31	1,602	7/17

Table 7.–Historical salmon escapements, standard errors (SE), and median passage (Med. pass.) dates at Snake River counting tower (1995–2002) and weir (2003–2012), Norton Sound.

		Chum salmon			Pink salmon			Chinook salmon			Coho salmon			Sockeye salmon	
Year	Operating period	Number	SE	Med. pass.	Number	SE	Med. pass.	Number	SE	Med. pass.	Number	SE	Med. pass.	Number	Med. pass.
1995	Jul 01–Aug 18	4,393	[a]	7/22	917	[a]	7/30	0	[a]	–	856	[a]	8/13	–	–
1996	Jul 03–Aug 22	2,772	[a]	7/11	44,558	[a]	7/19	5	[a]	7/11	1,638	[a]	8/7	–	–
1997	Jul 07–Aug 18	6,184	[a]	7/23	6,742	[a]	7/28	12	[a]	7/12	1,157	[a]	8/13	–	–
1998	Jul 01–Aug 11	11,067	[a]	7/17	219,679	[a]	7/18	0	[a]		178	[a]	8/8	–	–
1999	Jul 01–Aug 14	484	[a]	7/30	116	[a]	8/7	20	[a]	8/10	90	[a]	8/10	–	–
2000	Jun 29–Aug 25	1,911	[a]	7/15	4,723	[a]	7/22	28	[a]	8/9	406	[a]	8/11	–	–
2001	Jul 08–Sep 05	2,182	[a]	7/20	1,295	[a]	8/3	33	[a]	8/18	1,335	[a]	8/24	–	–
2002	Jun 28–Sep 16	2,776	[a]	7/15	4,103	[a]	7/16	9	[a]	7/29	851	[a]	9/2	8[b]	8/5
2003	Jun 26–Sep 11	2,201	NA	7/25	2,856	NA	7/30	50	NA	8/9	489	NA	8/23	84	8/11
2004	Jun 23–Sep 03	2,146	NA	7/13	126,917	NA	7/17	17	NA	8/24	474[c]	NA	8/21	22	8/20
2005	Jun 27–Sep 11	2,967	NA	7/18	13,813	NA	7/23	31	NA	8/11	2,948	NA	8/28	275	8/15
2006	Jul 01–Sep 11	4,160	NA	7/19	74,028	NA	7/21	32	NA	8/16	4,776	NA	8/24	302	8/20
2007	Jul 01–Sep 11	8,147	NA	7/23	4,634	NA	7/25	61	NA	8/20	1,781	NA	8/26	1,354	9/2
2008	Jul 06–Sep 06	1,244	NA	7/26	145,761	NA	7/23	13	NA	8/29	5,206	NA	8/31	143	8/30
2009	Jul 08–Aug 30	891	NA	7/25	769	NA	7/25	6	NA	–	50[c]	NA	–	2	–
2010	Jul 03–Sep 11	6,973	NA	7/24	51,099	NA	7/23	43	NA	8/15	2,243	NA	9/3	124	8/26
2011	Jul 09–Sep 11	4,352	NA	7/20	7,090	NA	7/25	1	NA	–	343	NA	8/29	14	–
2012 [d]	Jul 06–Aug 15	978	NA	–	8,601	NA	–	1	NA	–	22	NA	–	3	–

Note: En dash means that the median passage was not calculated for less than 20 fish.

[a] Standard errors on tower counts (1995–2002) are being recovered.

[b] Enumeration of sockeye salmon began in mid-July 2002, after a fixed picket weir replaced the counting tower.

[c] Aerial survey estimates were 1,916 coho salmon in 2004 and 700 coho salmon in 2009. These surveys were flown under excellent viewing conditions. Weir counts of coho salmon were lower in these years because pickets were pulled to relieve pressure on the weir during flood conditions and the majority of coho salmon escaped without being enumerated.

[d] Median passage dates are not shown because target operational period for the project was not fully monitored.

Table 8.–Historical salmon escapements, standard errors (SE), and median passage (Med. pass.) dates at Nome River counting tower (1993–1995) and weir (1996–2012), Norton Sound.

		Chum salmon			Pink salmon			Chinook salmon			Coho salmon			Sockeye salmon	
Year	Operating period	Number	SE	Med. pass.	Number	SE	Med. pass.	Number	SE	Med. pass.	Number	SE	Med. pass.	Number	Med. pass.
1993 [b]	Jul 25–Aug 28	1,859	[a]	–	13,036	[a]	–	63	[a]	–	4,349	[a]		–	–
1994	Jun 24–Aug 15	2,969	[a]	7/15	142,604	[a]	7/23	54	[a]	7/19	726	[a]	8/4	–	–
1995	Jun 22–Sep 06	5,093	[a]	7/20	13,893	[a]	7/30	5	[a]	7/9	1,650	[a]	8/22	–	–
1996 [b]	Jun 26–Jul 23	3,339	NA	–	95,681	NA	–	5	NA	–	66	NA		–	–
1997	Jun 27–Aug 27	5,147	NA	7/19	8,035	NA	7/29	22	NA	7/18	321	NA	8/13	–	–
1998 [b]	Jul 01–Aug 11	1,930	NA	–	359,469	NA	–	70	NA	–	96	NA		–	–
1999	Jul 02–Aug 25	1,048	NA	7/31	2,033	NA	8/7	3	NA	–	417	NA	8/19	6	–
2000	Jun 29–Aug 25	4,056	NA	7/18	41,673	NA	7/23	25	NA	8/16	698	NA	8/20	19	–
2001	Jul 08–Sep 11	2,859	NA	7/21	3,138	NA	8/4	7	NA	–	2,418	NA	8/27	55	8/4
2002	Jun 29–Sep 11	1,720	NA	7/17	35,057	NA	7/17	7	NA	–	3,418	NA	8/30	29	8/4
2003	Jul 05–Sep 10	1,957	NA	7/26	11,402	NA	7/30	12	NA	–	548	NA	8/28	47	8/11
2004	Jun 25–Sep 08	3,903	NA	7/16	1,051,146	NA	7/15	51	NA	7/27	2,283	NA	8/27	114	8/21
2005	Jun 27–Sep 11	5,584	NA	7/18	285,759	NA	7/21	69	NA	8/9	5,848	NA	8/28	381	8/25
2006	Jul 02–Sep 07	5,677	NA	7/14	578,555	NA	7/14	43	NA	8/13	8,308	NA	8/26	196	7/17
2007	Jul 04–Sep 16	7,034	NA	7/23	24,395	NA	7/29	13	NA	–	2,437	NA	8/23	534	9/1
2008	Jul 02–Sep 17	2,607	NA	7/26	1,186,554	NA	7/24	28	NA	7/13	4,605	NA	8/30	90	8/12
2009	Jul 03–Sep 20	1,565	NA	7/28	16,490	NA	7/26	10	NA	–	1,370	NA	8/28	103	7/29
2010	Jun 30–Sep 16	5,877	NA	7/24	165,934	NA	7/22	9	NA	–	4,114	NA	8/30	43	8/11
2011	Jul 06–Sep 12	3,578	NA	7/21	14,384	NA	7/29	12	NA	–	1,831	NA	8/30	22	9/6
2012 [b]	Jul 05–Aug 15	2,028	NA	–	151,791	NA	–	6	NA	–	237	NA	–	48	–

Note: En dash means that the median passage was not calculated for less than 20 fish.

[a] Standard errors for tower counts (1993–1995) are being recovered.

[b] Median passage dates are not shown because target operational period for project was not fully monitored.

Table 9.–Historical salmon escapements, standard errors (SE), and median passage (Med. pass.) dates at Eldorado River counting tower (1997–2002) and weir (2003–2012), Norton Sound.

		Chum salmon			Pink salmon			Chinook salmon			Coho salmon			Sockeye salmon	
Year	Operating period	Number	SE	Med. pass.	Number	SE	Med. pass.	Number	SE	Med. pass.	Number	SE	Med. pass.	Number	Med. pass.
1997	Jun 29–Aug 19	14,302	[a]	7/15	1,022	[a]	8/9	98	[a]	7/16	194	[a]	8/9	–	–
1998	Jun 29–Aug 12	13,808	[a]	7/12	137,283	[a]	7/13	8 [b]	[a]	–	21	[a]	8/9	–	–
1999	Jul 10–Sep 01	4,218	[a]	7/19	977	[a]	8/9	28	[a]	7/21	510	[a]	8/25	–	–
2000	Jun 29–Aug 25	11,617	[a]	7/10	55,992	[a]	7/12	33	[a]	7/9	192	[a]	8/19	–	–
2001	Jul 08–Sep 13	11,635	[a]	7/14	488	[a]	8/7	50	[a]	7/19	1,509	[a]	9/2	–	–
2002	Jun 24–Sep 10	10,215	[a]	7/10	119,098	[a]	7/10	26	[a]	7/8	540	[a]	9/6	10	–
2003	Jun 21–Sep 08	3,591	NA	7/17	173	NA	7/24	29	NA	7/18	115	NA	8/26	0	–
2004	Jun 22–Sep 09	3,277	NA	7/9	60,866	NA	7/11	25	NA	7/15	1,151	NA	9/1	57	8/27
2005	Jun 23–Sep 02	10,369	NA	7/15	12,356	NA	7/22	32	NA	8/10	689	NA	8/28	10	–
2006	Jun 26–Aug 03	42,105	NA	7/15	222,348	NA	7/17	41	NA	7/12	55	NA	7/29	1	–
2007	Jun 26–Aug 03	21,312	NA	7/14	833	NA	7/21	14	NA	–	2	NA	–	22	7/31
2008	Jun 27–Jul 31	6,746	NA	7/13	244,641	NA	7/19	36	NA	7/13	38	NA	7/27	3	–
2009	Jul 02–Aug 03	4,943	NA	7/18	1,119	NA	7/23	31	NA	7/23	2	NA	–	0	–
2010 [c]	Jun 30–Jul 24	21,211	NA	–	48,136	NA	–	23	NA	–	2	NA	–	8	
2011	Jul 01–Aug 03	16,273	NA	7/12	507	NA	7/31	3	NA	–	1	NA	–	0	–
2012 [c]	Jul 02–Jul 25	13,348	NA	–	59,318	NA	–	0	NA	–	1	NA	–	0	–

Note: En dash means that the median passage was not calculated for less than 20 fish.

[a] Standard errors for tower counts (1993–1995) are being recovered.

[b] 1998 Eldorado River Chinook salmon count of 446 fish was not considered reliable and was replaced with the July 17, 1998 aerial survey total of 8 fish.

[c] Median passage dates are not shown because target operational period for project was not fully monitored.

Table 10.–Historical salmon escapements, standard errors (SE), and median passage (Med. pass.) dates at the Niukluk River counting tower, Norton Sound, 1995–2012.

		Chum salmon			Pink salmon			Chinook salmon			Coho salmon		
Year	Operating period	Number	SE	Med. pass.	Number	SE	Med. pass.	Number	SE	Med. pass.	Number	SE	Med. pass.
1995	Jun 29–Sep 12	86,332	[a]	7/15	17,088	[a]	7/22	123	[a]	7/12	4,713	[a]	8/22
1996	Jun 23–Sep 12	80,178	[a]	7/9	1,154,922	[a]	7/14	243	[a]	7/6	12,781	[a]	8/16
1997	Jun 28–Sep 09	57,305	[a]	7/14	10,468	[a]	7/26	259	[a]	7/4	3,994	[a]	8/27
1998	Jul 04–Aug 09	45,588	[a]	7/13	1,624,438	[a]	7/17	260	[a]	7/7	840	[a]	8/9
1999	Jul 04–Sep 04	35,239	[a]	7/25	20,351	[a]	8/4	40	[a]	7/25	4,260	[a]	8/26
2000	Jul 04–Aug–27	29,573	[a]	7/13	961,603	[a]	7/13	48	[a]	7/11	11,382	[a]	8/19
2001	Jul 10–Sep 08	30,662	[a]	7/18	41,625	[a]	7/31	30	[a]	7/14	3,468	[a]	8/21
2002	Jun 25–Sep 10	35,307	[a]	7/14	645,141	[a]	7/12	621	[a]	7/4	7,391	[a]	8/24
2003	Jun 25–Sep 10	20,018	[a]	7/18	75,855	[a]	7/24	179	[a]	7/10	1,282	[a]	8/21
2004	Jun 25–Sep 08	10,770	[a]	7/7	975,895	[a]	7/12	141	[a]	7/1	2,064	[a]	8/22
2005	Jun 28–Sep 09	25,598	[a]	7/15	270,424	[a]	7/23	41	[a]	6/30	2,727	[a]	8/20
2006	Jun 28–Sep 08	29,199	[a]	7/10	1,371,919	[a]	7/12	39	[a]	7/5	11,169	[a]	8/24
2007	Jul 01–Sep 04	50,994	[a]	7/14	43,617	[a]	7/20	30	[a]	7/10	3,498	[a]	8/15
2008	Jul 01–Sep 06	12,078	337	7/5	669,234	19,171	7/6	33	14	7/7	13,779	326	8/22
2009	Jul 03–Sep 02	15,879	716	7/18	24,204	1,018	7/21	204	39	7/12	6,861	317	8/22
2010	Jul 01–Sep 01	48,561	1,004	7/15	434,205	13,901	7/10	15	13	–	9,042	231	8/20
2011	Jun 28–Sep 06	25,032	901	7/15	15,581	2,186	7/27	19	11	–	2,563	131	8/17
2012 [b]	Jul 04–Aug 17	20,745	749	–	263,541	7,814	–	23	8	–	1,716	78	–

Note: En dash means that the median passage was not calculated for less than 20 fish.

[a] Standard errors prior to 2008 are being recovered.

[b] Median passage dates are not shown because target operational period for project was not fully monitored.

Table 11.–Historical salmon escapements, standard errors (SE), and median passage (Med. pass.) dates at Kwiniuk River counting tower, Norton Sound, 1965–2012.

		Chum salmon			Pink salmon			Chinook salmon			Coho salmon		
Year	Operating period	Number	SE	Med. pass.	Number	SE	Med. pass.	Number[b]	SE	Med. pass.	Number	SE	Med. pass.
1965	Jun 18–Jul 19	32,861	[a]	–	8,668	[a]	–	19	[a]	–	–	[a]	–
1966	Jun 19–Jul 28	32,786	[a]	–	10,629	[a]	–	7	[a]	–	–	[a]	–
1967	Jun 18–Jul 28	26,661	[a]	–	3,587	[a]	–	13	[a]	–	–	[a]	–
1968	Jun 18–Jul 24	19,976	[a]	–	129,052	[a]	–	27	[a]	–	–	[a]	–
1969	Jun 26–Jul 26	19,687	[a]	–	56,683	[a]	–	12	[a]	–	–	[a]	–
1970	Jun 25–Jul 29	66,604	[a]	–	226,831	[a]	–	–	[a]	–	–	[a]	–
1971	Jun 29–Jul 29	38,679	[a]	–	16,634	[a]	–	–	[a]	–	–	[a]	–
1972	Jun 28–Jul 27	30,686	[a]	–	62,461	[a]	–	65	[a]	–	–	[a]	–
1973	Jun 25–Jul 25	28,029	[a]	–	37,070	[a]	–	57	[a]	–	–	[a]	–
1974	Jun 20–Jul 26	35,161	[a]	–	39,375	[a]	–	62	[a]	–	–	[a]	–
1975	July 04–Jul 26	14,049	[a]	–	55,293	[a]	–	44	[a]	–	–	[a]	–
1976	July 04–Jul 25	8,508	[a]	–	35,226	[a]	–	12	[a]	–	–	[a]	–
1977	Jun 26–Jul 25	21,798	[a]	–	47,934	[a]	–	–	[a]	–	–	[a]	–
1978	Jul 04–Jul 22	11,049	[a]	–	70,148	[a]	–	–	[a]	–	–	[a]	–
1979	Jun 28–Jul 25	12,355	[a]	–	167,492	[a]	–	107	[a]	–	–	[a]	–
1980	Jun 22–Jul 28	19,374	[a]	–	319,363	[a]	–	177	[a]	–	–	[a]	–
1981	Jun 19–Aug 02	34,565	[a]	7/9	566,534	[a]	7/21	136	[a]	7/4	–	[a]	–
1982	Jun 21–Jul 26	44,099	[a]	7/5	469,674	[a]	7/8	138	[a]	7/7	–	[a]	–
1983	Jun 19–Jul 27	56,907	[a]	7/5	251,965	[a]	7/19	267	[a]	7/3	–	[a]	–
1984	Jun 19–Jul 25	54,043	[a]	7/3	736,544	[a]	7/10	736	[a]	7/11	–	[a]	–
1985	Jun 26–Jul 28	9,013	[a]	7/13	18,237	[a]	7/16	955	[a]	7/20	–	[a]	–
1986	Jun 19–Jul 26	24,700	[a]	7/5	241,446	[a]	7/8	654	[a]	7/5	–	[a]	–
1987	Jun 25–Jul 23	16,133	[a]	7/6	5,566	[a]	7/17	317	[a]	7/13	–	[a]	–
1988	Jun18–Jul 26	13,303	[a]	6/30	187,907	[a]	7/11	321	[a]	7/10	–	[a]	–

-continued-

Table 11.–Page 2 of 2.

Year	Operating period	Chum salmon			Pink salmon			Chinook salmon			Coho salmon		
		Number	SE	Med. pass.	Number	SE	Med. pass.	Number[b]	SE[a]	Med. pass.	Number	SE[a]	Med. pass.
1989	Jun 27–Jul 27	14,529	[a]	7/3	27,488	[a]	7/16	248	[a]	7/7	–	[a]	–
1990	Jun 21–Jul 25	13,957	[a]	7/4	416,512	[a]	7/8	900	[a]	7/2	–	[a]	–
1991	Jun 18–Jul 27	19,801	[a]	7/12	53,499	[a]	7/23	708	[a]	7/3	–	[a]	–
1992	Jun 27–Jul 28	12,077	[a]	7/8	1,464,716	[a]	7/17	479	[a]	7/16	–	[a]	–
1993	Jun 27–Jul 27	15,824	[a]	7/11	43,063	[a]	7/20	600	[a]	7/9	–	[a]	–
1994	Jun 23–Aug 09	33,012	[a]	7/5	2,303,114	[a]	7/16	625	[a]	7/12	2,547	[a]	8/5
1995	Jun 21–Jul 26	42,500	[a]	7/6	17,511	[a]	7/18	498	[a]	7/8	114	[a]	7/26
1996	Jun 20–Jul 25	28,493	[a]	6/30	907,893	[a]	7/10	577	[a]	7/6	461	[a]	7/21
1997	Jun 18–Jul 27	20,119	[a]	7/6	9,535	[a]	7/22	974	[a]	7/3	–	[a]	–
1998	Jun 18–Jul 27	24,247	[a]	7/7	655,934	[a]	7/22	303	[a]	7/9	–	[a]	–
1999	Jun 25–Jul 28	8,763	[a]	7/11	607	[a]	7/20	116	[a]	7/14	–	[a]	–
2000	Jun 22–Jul 27	12,879	[a]	7/5	750,173	[a]	7/10	144	[a]	7/7	2	[a]	–
2001	Jun 27–Sep 15	16,598	[a]	7/4	8,423	[a]	7/23	261	[a]	7/15	9,532	[a]	8/25
2002	Jun 17–Sep 11	37,995	[a]	7/6	1,114,410	[a]	7/10	778	[a]	7/5	6,459	[a]	8/23
2003	Jun 15–Sep 15	12,123	[a]	7/8	22,329	[a]	7/21	744	[a]	7/13	5,490	[a]	8/21
2004	Jun 16–Sep 14	10,362	[a]	6/30	3,054,684	[a]	7/10	663	[a]	7/6	11,240	[a]	8/25
2005	Jun 18–Sep 12	12,083	[a]	7/4	341,048	[a]	7/20	342	[a]	7/6	12,950	[a]	8/22
2006	Jun 22–Sep 12	39,519	[a]	7/6	1,347,090	[a]	7/11	195	[a]	7/10	22,341	[a]	8/19
2007	Jun 21–Sep 10	27,756	[a]	7/6	54,255	[a]	7/21	258	[a]	7/8	9,429	[a]	8/15
2008	Jun 23–Sep 07	9,483	394	7/4	1,444,228	60,502	7/7	237	29	7/7	10,462	431	8/18
2009	Jun 24–Sep 13	8,739	580	7/12	42,963	2,440	7/22	444	38	7/13	8,705	478	8/21
2010	Jun 25–Sep 08	71,403	9,322	7/5	634,169	86,381	7/10	138	26	7/8	8,058	984	8/13
2011	Jun 20–Sep 11	32,239	4,480	7/8	30,913	3,904	7/28	57	19	7/9	3,290	406	8/13
2012 [c]	Jun 23–Aug 16	5,577	364	–	393,030	21,073	–	60	18	–	781	63	–

Note: En dash means that the median passage was not calculated from 1965 to 1980 or for less than 20 fish after 1980.

[a] Standard errors prior to 2008 are being recovered.

[b] Chinook salmon counts from 1965 to 1984 not expanded but in 1985 and after, counts were expanded.

[c] Median passage dates are not shown because target operational period for project was not fully monitored.

Table 12.–Historical salmon escapements, standard errors (SE), and median passage (Med. pass.) dates at the Inglutalik River tower, Norton Sound, 2011–2012.

		Chum salmon			Pink salmon			Chinook salmon			Coho salmon		
Year	Operating period	Number	SE	Med. pass.	Number	SE	Med. pass.	Number	SE	Med. pass.	Number	SE	Med. pass.
2011	Jun 24–Aug 12	62,897	3,434	7/12	475,167	26,650	7/27	1,469	134	7/5	862	82	[a]
2012	Jun 21–Aug 23	33,123	1,535	7/13	90,831	3,246	7/16	1,159	73	7/12	1,431	69	8/10

[a] The median passage dates for coho salmon are not shown because the entire run was not counted.

Table 13.–Historical salmon escapements, standard errors (SE), and median passage (Med. pass.) dates at North River tower, Norton Sound, 1972–1974, 1984–1986, and 1996–2012.

		Chum salmon			Pink salmon			Chinook salmon			Coho salmon		
Year	Operating period	Number	SE	Med. pass.	Number	SE	Med. pass.	Number	SE	Med. pass.	Number	SE	Med. pass.
1972	Jul 07–Jul 28	2,332	[a]	–	54,934	[a]	–	561	[a]	–	–	[a]	–
1973	Jun 29–Jul 23	4,334	[a]	–	26,542	[a]	–	298	[a]	–	–	[a]	–
1974	Jun 25–Jul 17	826	[a]	–	143,789	[a]	–	196	[a]	–	–	[a]	–
			[a]	–	–	[a]	–	–	[a]	–	–	[a]	–
1984	Jun 25–Jul 28	2,915	[a]	–	458,387	[a]	–	2,844	[a]	–	–	[a]	–
1985	Jun 27–Aug 31	4,567	[a]	–	4,360	[a]	–	1,426	[a]	–	2,045	[a]	–
1986	Jun 25–Jul 18	3,738	[a]	–	236,487	[a]	–	1,613	[a]	–	–	[a]	–
			[a]	–	–	[a]	–	–	[a]	–	–	[a]	–
1996	Jun 16–Jul 25	9,789	[a]	7/8	332,539	[a]	7/8	1,197	[a]	7/8	1,229	[a]	7/22
1997	Jun 16–Aug 21	6,904	[a]	7/19	127,926	[a]	7/21	4,185	[a]	7/1	5,768	[a]	8/12
1998	Jun 15–Aug 12	1,526	[a]	7/18	74,045	[a]	7/10	2,100	[a]	7/13	3,361	[a]	8/5
1999 [b]	Jun 30–Aug 31	5,600	[a]	–	48,993	[a]	–	1,639	[a]	–	4,792	[a]	–
2000	Jun 17–Aug 12	4,971	[a]	7/11	69,703	[a]	7/4	1,046	[a]	7/8	6,961	[a]	8/5
2001 [b]	Jul 05–Sep 15	6,515	[a]	–	24,737	[a]	–	1,337	[a]		12,383	[a]	–
2002	Jun 19–Aug 29	6,143	[a]	7/21	324,595	[a]	7/3	1,484	[a]	7/6	3,210	[a]	8/16
2003	Jun 15–Sep 13	9,859	[a]	7/26	280,212	[a]	7/19	1,452	[a]	7/12	5,837	[a]	8/10
2004	Jun 15–Sep 14	10,036	[a]	7/20	1,162,978	[a]	7/11	1,125	[a]	7/8	11,187	[a]	8/12
2005	Jun 15–Sep 15	11,984	[a]	7/16	1,670,934	[a]	7/15	1,015	[a]	7/6	19,189	[a]	8/17
2006	Jun 18–Sep 11	5,385	[a]	7/12	2,169,890	[a]	7/8	906	[a]	7/9	9,835	[a]	8/15
2007	Jun 16–Sep 05	8,046	[a]	7/25	583,320	[a]	7/22	1,948	[a]	7/12	19,944	[a]	8/6
2008	Jun 19–Sep 13	9,502	349	8/7	241,798	6,314	7/12	905	100	7/15	15,648	848	8/15
2009	Jun 19–Sep 11	9,795	413	7/22	190,289	6,741	7/21	2,357	185	7/13	22,274	923	8/21
2010	Jun 19–Sep 07	16,215	499	7/20	150,688	5,070	7/13	1,256	91	7/23	7,723	305	8/9
2011	Jun 23–Sep 08	21,396	3,124	7/15	138,542	4,195	7/26	841	104	7/12	4,975	229	8/21
2012 [b]	Jun 26–Aug 19	9,120	311	–	137,012	3,319	–	972	97	–	3,258	156	–

Note: En dash means that the median passage was not calculated from 1972 to 1974 or 1984 to 1986.

[a] Standard errors prior to 2008 are being recovered.

[b] After 1996, median passage dates are not shown because target operational period for project was not fully monitored.

Table 14.–Historical salmon escapements, standard errors (SE), and median passage (Med. pass.) dates at the Unalakleet River weir, Norton Sound, 2010–2012.

		Chum salmon		Pink salmon		Chinook salmon		Coho salmon		Sockeye salmon	
Year	Operating period	Number	Med. pass	Number	Med. pass.	Number	Med. pass.	Number	Med. pass.	Number	Med. pass.
2010	Jun 23–Jul 31	70,811	7/16	832,904	7/14	1,021	7/16	5,382	[a]	130	7/8
2011	Jun 17–Aug 07	104,050	7/16	354,361	7/28	1,030	7/18	10,231	[a]	181	7/15
2012	Jun 24–Aug 15	70,859	7/21	674,250	7/16	823	7/22	17,548	[a]	237	7/17

[a] The median passage dates for coho salmon are not shown because the entire run was not counted.

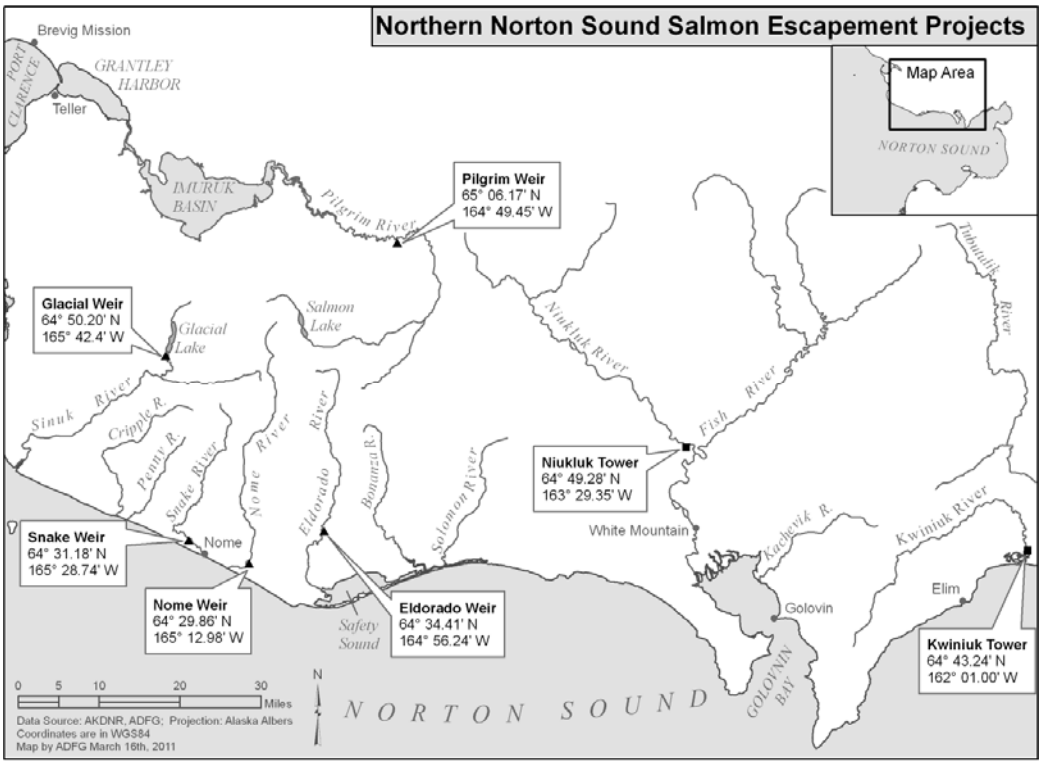

Figure 1.–Enumeration projects operating in northern Norton Sound-Port Clarence Area, 2008–2012.

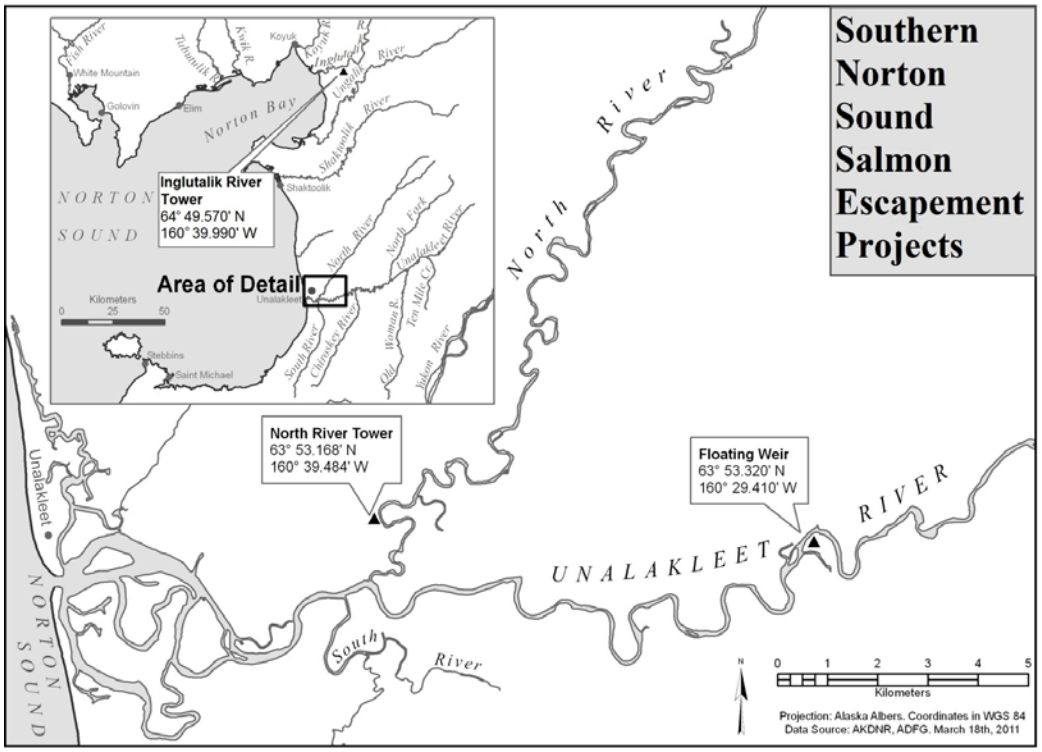

Figure 2.–Enumeration projects operating in southern Norton Sound Area, 2008–2012.

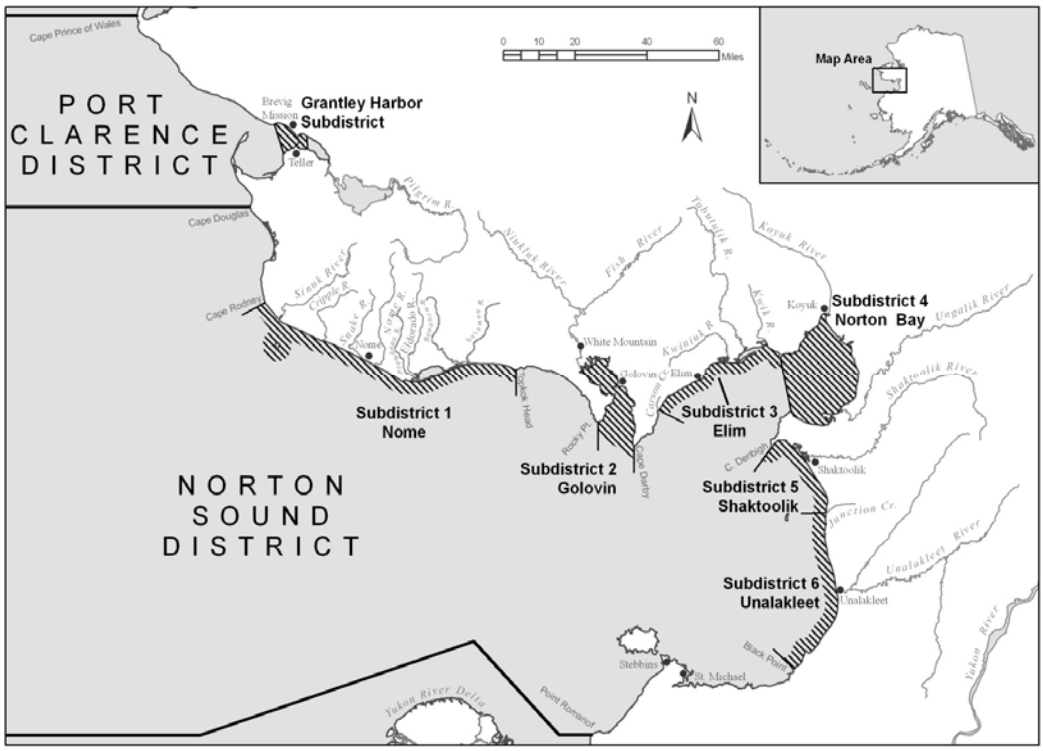

Figure 3.–Commercial salmon fishing districts and subdistricts and major salmon-producing drainages in the Norton Sound-Port Clarence Area.

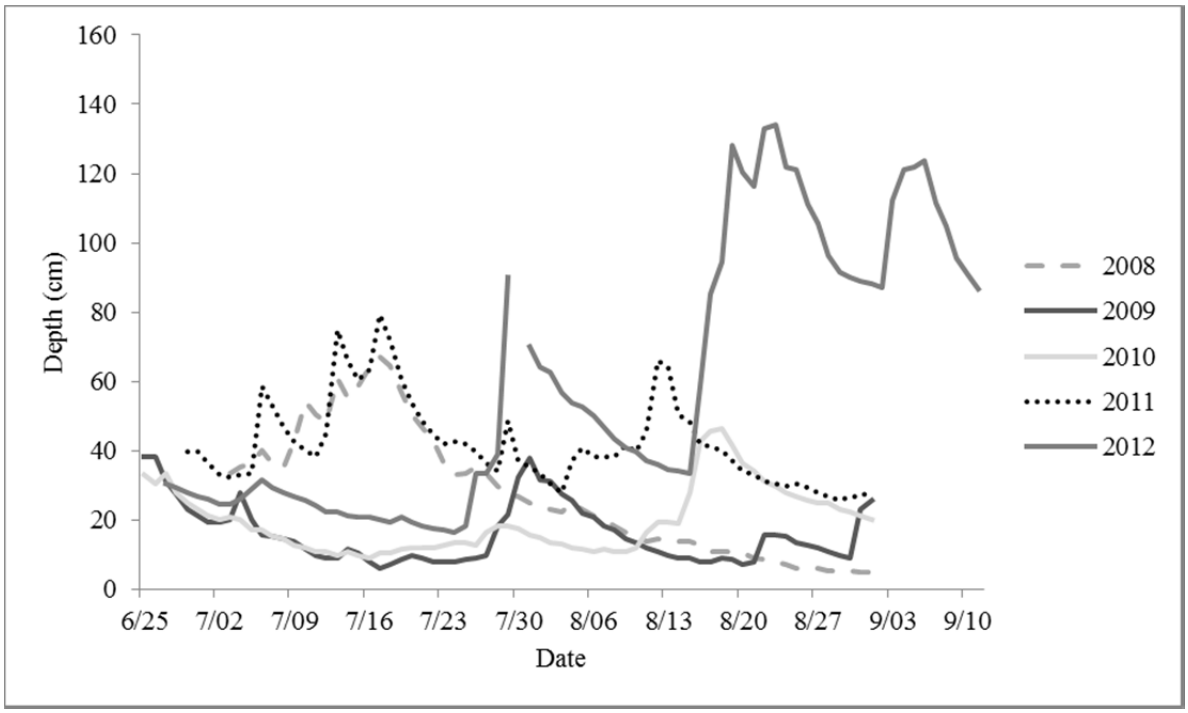

Figure 4.–Daily relative water level at Pilgrim River weir, 2008–2012.

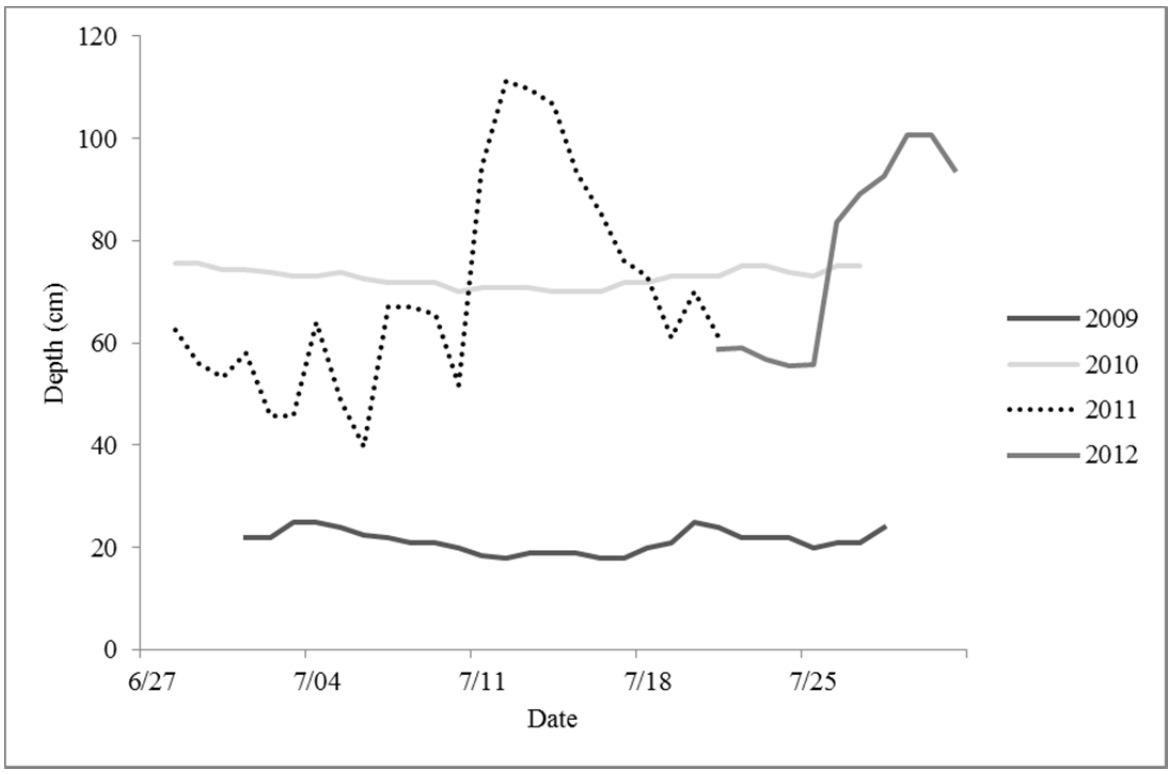

Figure 5.–Daily relative water level at Glacial Creek weir, 2009–2012.

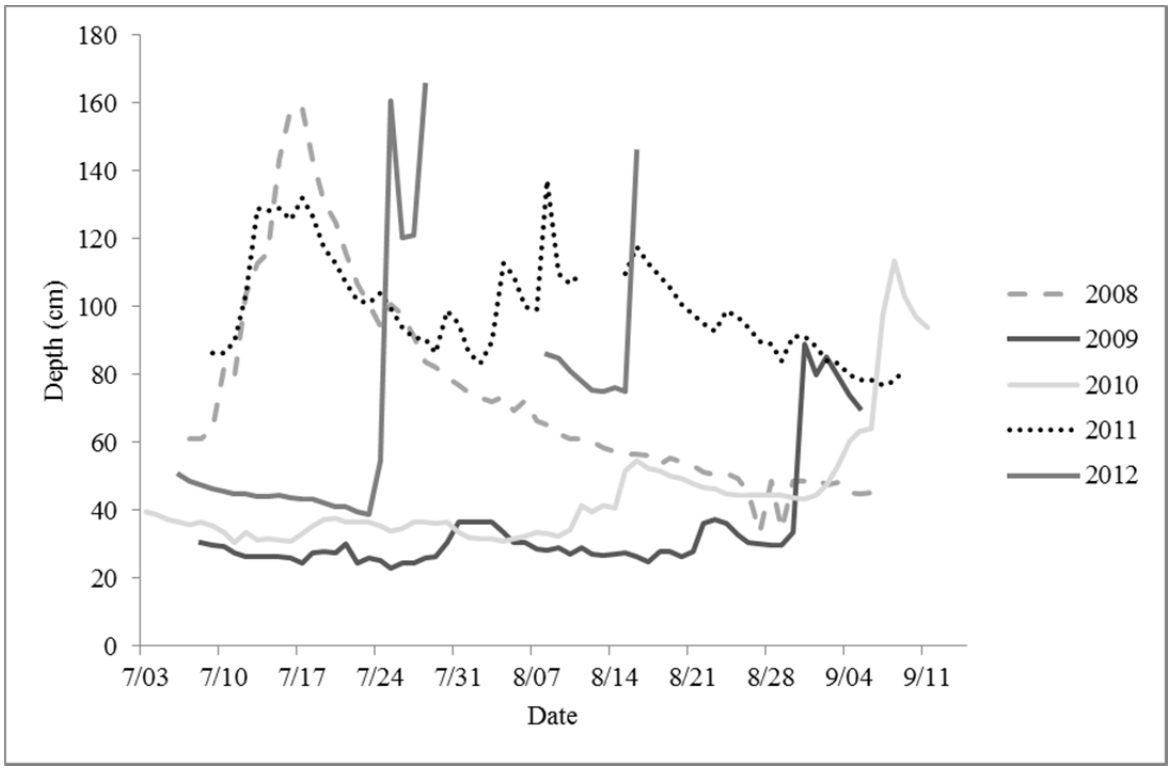

Figure 6.–Daily relative water level at Snake River weir, 2008–2012.

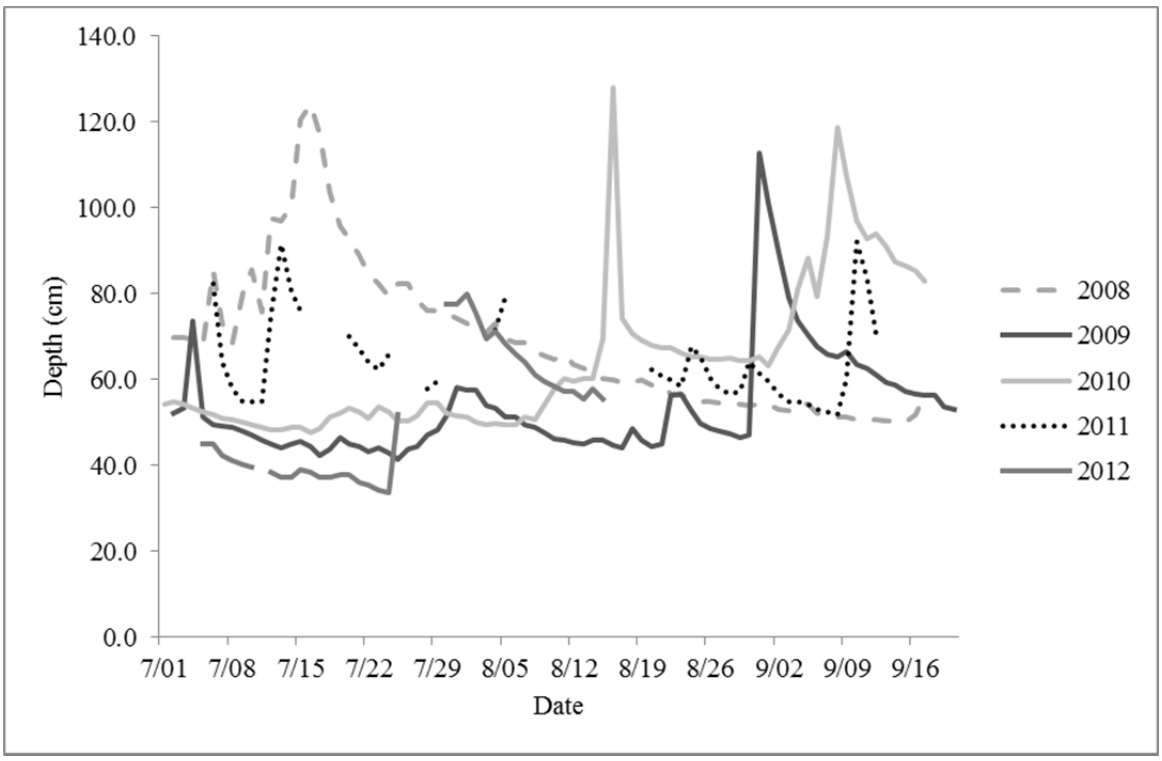

Figure 7.–Daily relative water level at Nome River weir, 2008–2012.

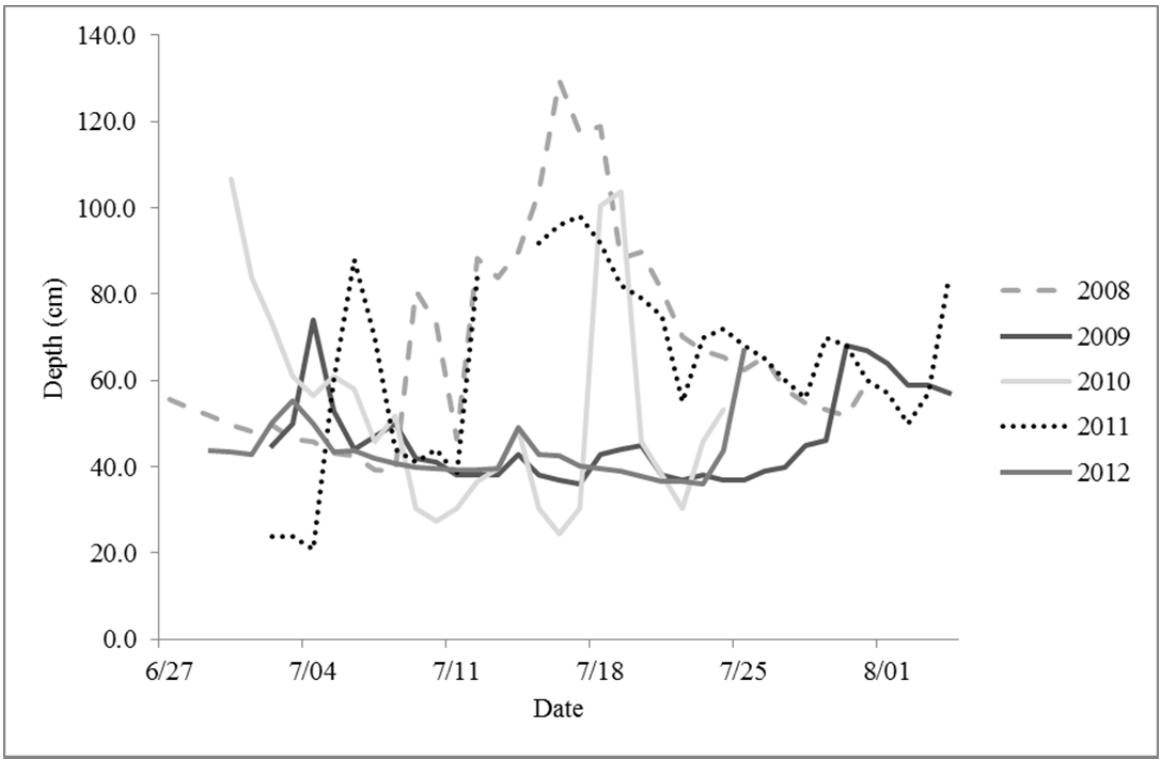

Figure 8.–Daily relative water level at Eldorado River weir, 2008–2012.

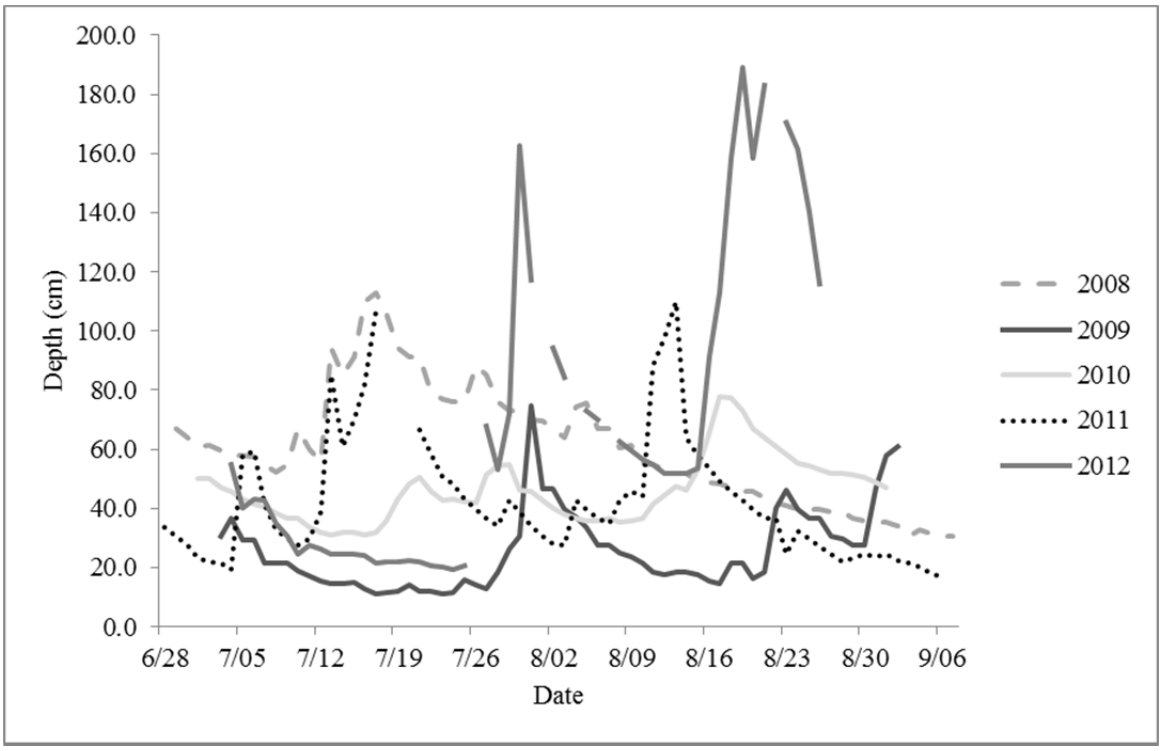

Figure 9.–Daily relative water level at Niukluk River tower, 2008–2012.

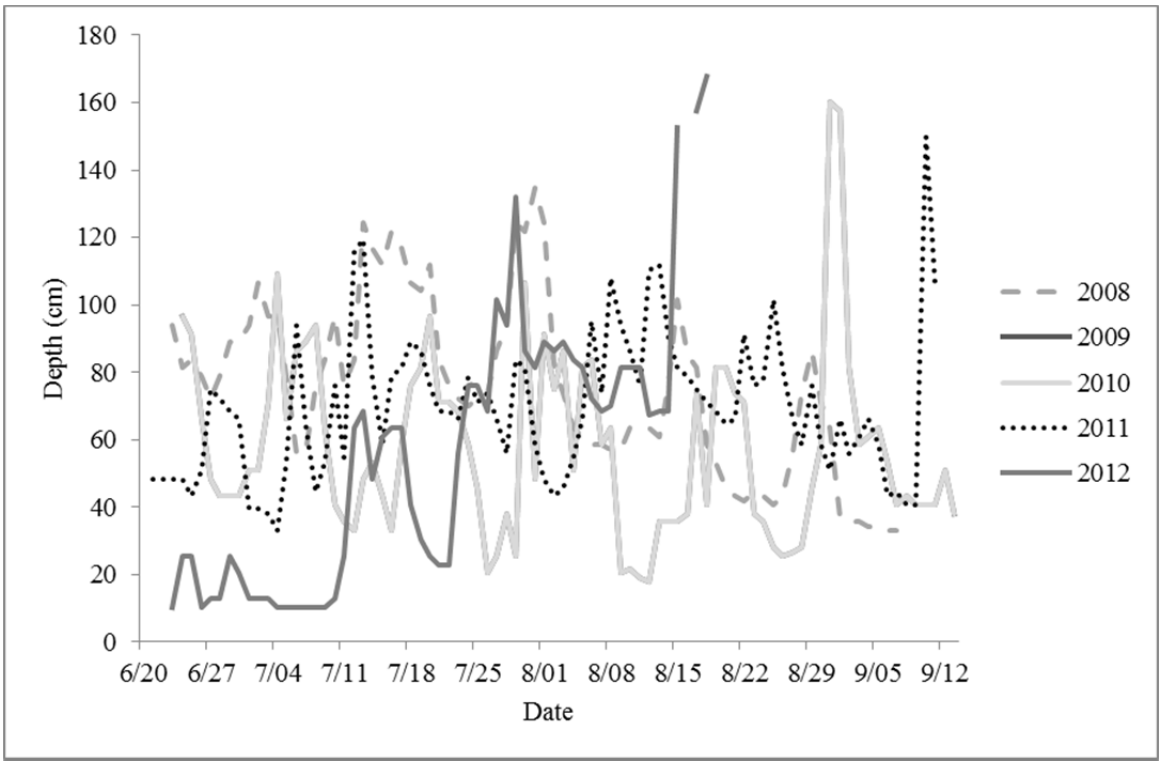

Figure 10.–Daily relative water level at Kwiniuk River tower, 2008–2012.

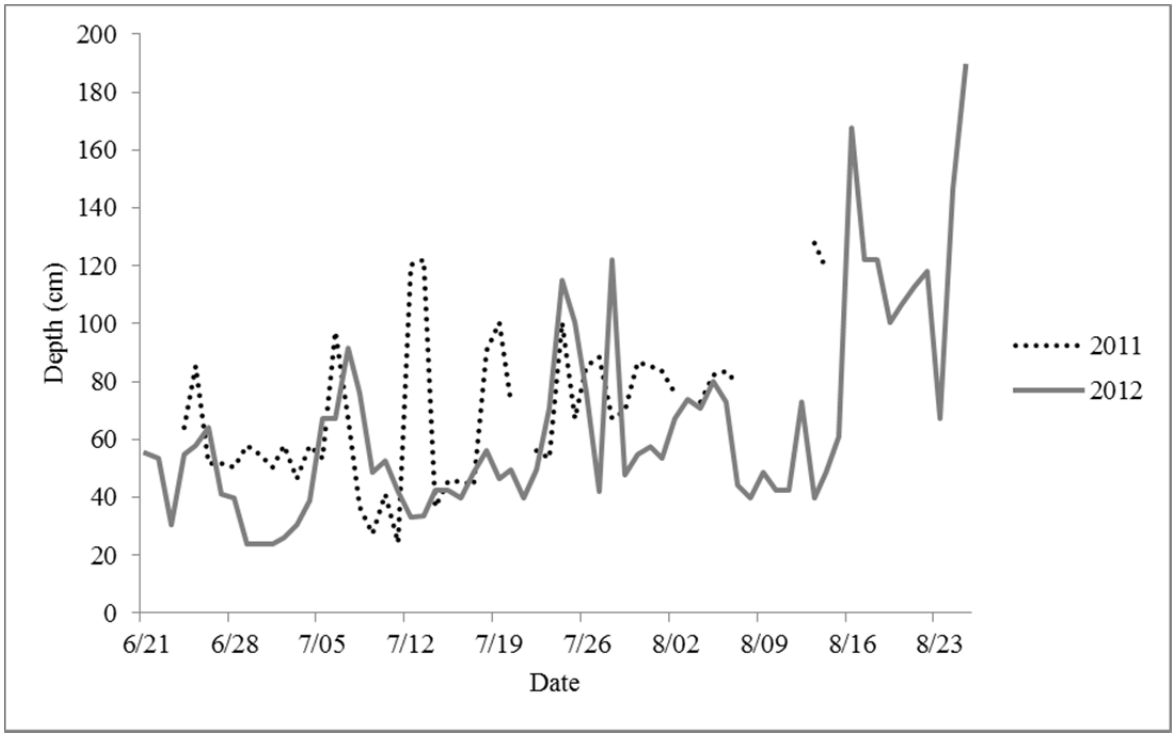

Figure 11.–Daily relative water level at Inglutalik River tower, 2011–2012

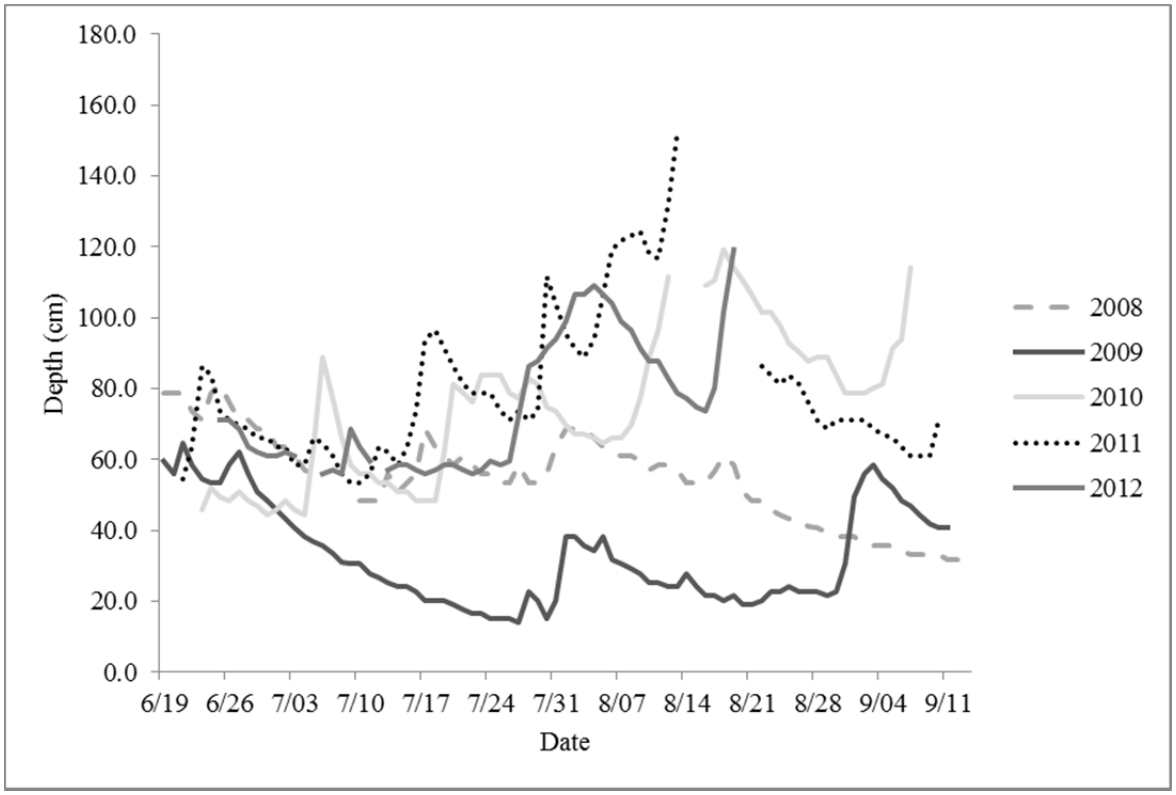

Figure 12.–Daily relative water level at North River tower, 2008–2012.

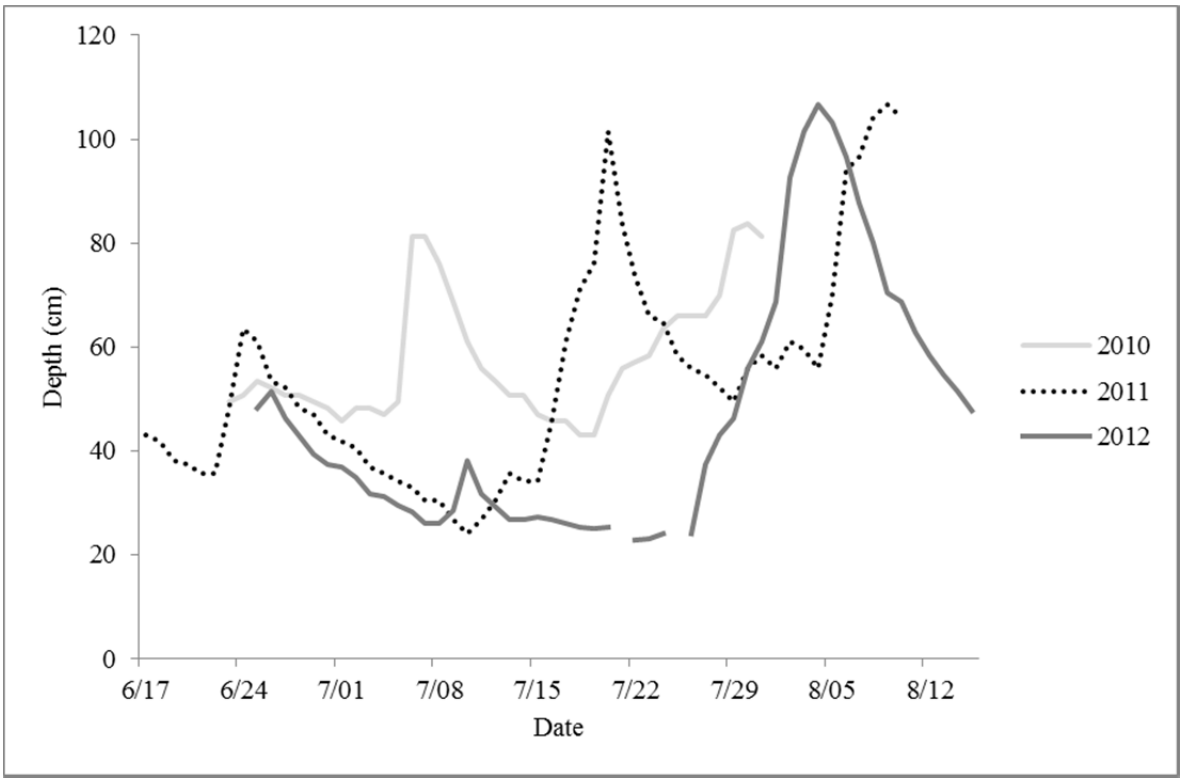

Figure 13.–Daily relative water level at Unalakleet River weir, 2010–2012.

APPENDIX A: PILGRIM RIVER WEIR

Appendix A1.–Daily and cumulative (Cum.) migration of all salmonid species past Pilgrim River weir, Port Clarence 2008.

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho	Daily Sockeye	Cum. Sockeye
6/25	0	0	0	0	0	0	0	0	0	0
6/26	0	0	0	0	0	0	0	0	0	0
6/27	0	0	0	0	0	0	0	0	0	0
6/28	0	0	0	0	0	0	0	0	0	0
6/29	0	0	0	0	0	0	0	0	0	0
6/30	0	0	0	0	0	0	0	0	0	0
7/01	0	0	0	0	0	0	0	0	0	0
7/02	0	0	0	0	0	0	0	0	0	0
7/03	0	0	9	9	0	0	0	0	26	26
7/04	15	15	41	50	0	0	0	0	54	80
7/05	140	155	257	307	1	1	0	0	1,473	1,553
7/06	147	302	300	607	0	1	0	0	831	2,384
7/07	219	521	449	1,056	3	4	0	0	991	3,375
7/08	51	572	572	1,628	0	4	0	0	320	3,695
7/09	63	635	284	1,912	2	6	0	0	292	3,987
7/10	81	716	420	2,332	2	8	0	0	943	4,930
7/11	57	773	180	2,512	2	10	0	0	426	5,356
7/12	62	835	429	2,941	2	12	0	0	446	5,802
7/13	418	1,253	1,719	4,660	11	23	0	0	938	6,740
7/14	280	1,533	2,419	7,079	2	25	0	0	1,083	7,823
7/15	345	1,878	2,124	9,203	3	28	0	0	883	8,706
7/16	677	2,555	5,321	14,524	15	43	0	0	1,188	9,894
7/17	735	3,290	6,692	21,216	10	53	0	0	1,005	10,899
7/18	548	3,838	5,095	26,311	9	62	0	0	1,076	11,975
7/19	671	4,509	8,074	34,385	9	71	0	0	925	12,900
7/20	333	4,842	6,354	40,739	2	73	0	0	684	13,584
7/21	160	5,002	2,351	43,090	0	73	0	0	275	13,859
7/22	574	5,576	6,906	49,996	5	78	0	0	859	14,718
7/23	739	6,315	6,998	56,994	5	83	0	0	615	15,333
7/24	824	7,139	5,346	62,340	4	87	0	0	352	15,685
7/25	640	7,779	5,084	67,424	6	93	0	0	438	16,123
7/26	634	8,413	3,759	71,183	5	98	0	0	476	16,599
7/27	852	9,265	3,877	75,060	18	116	0	0	691	17,290
7/28	593	9,858	2,287	77,347	5	121	0	0	219	17,509
7/29	318	10,176	1,338	78,685	0	121	0	0	169	17,678
7/30	528	10,704	1,315	80,000	1	122	1	1	259	17,937
7/31	567	11,271	1,844	81,844	3	125	0	1	248	18,185
8/01	836	12,107	2,294	84,138	2	127	1	2	342	18,527
8/02	356	12,463	876	85,014	0	127	0	2	110	18,637
8/03	878	13,341	1,825	86,839	0	127	0	2	241	18,878
8/04	273	13,614	965	87,804	0	127	0	2	129	19,007
8/05	711	14,325	983	88,787	4	131	0	2	148	19,155
8/06	703	15,028	1,060	89,847	1	132	0	2	180	19,335
8/07	290	15,318	440	90,287	0	132	0	2	76	19,411
8/08	643	15,961	678	90,965	0	132	0	2	156	19,567
8/09	860	16,821	635	91,600	0	132	1	3	167	19,734
8/10	522	17,343	320	91,920	0	132	5	8	136	19,870

-continued-

Appendix A1.–Page 2 of 2.

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho	Daily Sockeye	Cum. Sockeye
8/11	326	17,669	126	92,046	0	132	8	16	92	19,962
8/12	424	18,093	86	92,132	1	133	0	16	88	20,050
8/13	633	18,726	106	92,238	0	133	2	18	111	20,161
8/14	679	19,405	76	92,314	0	133	5	23	77	20,238
8/15	813	20,218	50	92,364	0	133	6	29	48	20,286
8/16	566	20,784	33	92,397	1	134	2	31	27	20,313
8/17	495	21,279	29	92,426	0	134	9	40	17	20,330
8/18	613	21,892	20	92,446	0	134	5	45	27	20,357
8/19	624	22,516	16	92,462	0	134	28	73	21	20,378
8/20	453	22,969	2	92,464	1	135	28	101	14	20,392
8/21	337	23,306	6	92,470	1	136	33	134	17	20,409
8/22	162	23,468	0	92,470	0	136	9	143	8	20,417
8/23	306	23,774	1	92,471	0	136	17	160	13	20,430
8/24	251	24,025	0	92,471	0	136	25	185	15	20,445
8/25	120	24,145	0	92,471	1	137	9	194	5	20,450
8/26	33	24,178	0	92,471	0	137	4	198	1	20,451
8/27	59	24,237	0	92,471	0	137	2	200	1	20,452
8/28	93	24,330	0	92,471	0	137	3	203	0	20,452
8/29	72	24,402	0	92,471	0	137	4	207	0	20,452
8/30	40	24,442	0	92,471	0	137	8	215	0	20,452
8/31	57	24,499	0	92,471	0	137	26	241	0	20,452
9/01	48	24,547	0	92,471	0	137	19	260	0	20,452
9/02	3	24,550	0	92,471	0	137	0	260	0	20,452
Total	24,550		92,471		137		260		20,452	

Note: The inside box in the cumulative column is the midpoint of the total; the outside box starts on the first quartile and ends on the third quartile.

Appendix A2.–Daily and cumulative (Cum.) migration of all salmonid species past Pilgrim River weir, Port Clarence, 2009.

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho	Daily Sockeye	Cum. Sockeye
6/26	0	0	0	0	0	0	0	0	0	0
6/27	0	0	0	0	0	0	0	0	0	0
6/28	0	0	0	0	0	0	0	0	0	0
6/29	0	0	0	0	0	0	0	0	0	0
6/30	0	0	0	0	0	0	0	0	0	0
7/01	0	0	0	0	0	0	0	0	0	0
7/02	1	1	0	0	0	0	0	0	0	0
7/03	1	2	1	1	0	0	0	0	0	0
7/04	0	2	0	1	0	0	0	0	0	0
7/05	1	3	0	1	0	0	0	0	0	0
7/06	2	5	1	2	0	0	0	0	4	4
7/07	3	8	0	2	0	0	0	0	0	4
7/08	3	11	0	2	0	0	0	0	2	6
7/09	0	11	0	2	0	0	0	0	2	8
7/10	2	13	0	2	0	0	0	0	14	22
7/11	27	40	7	9	0	0	0	0	58	80
7/12	119	159	7	16	1	1	0	0	58	138
7/13	102	261	9	25	2	3	0	0	82	220
7/14	24	285	6	31	4	7	0	0	35	255
7/15	33	318	5	36	1	8	0	0	7	262
7/16	5	323	0	36	0	8	0	0	9	271
7/17	31	354	4	40	1	9	0	0	22	293
7/18	200	554	27	67	6	15	0	0	38	331
7/19	213	767	34	101	1	16	0	0	44	375
7/20	105	872	19	120	3	19	0	0	21	396
7/21	119	991	11	131	0	19	0	0	55	451
7/22	228	1,219	23	154	2	21	0	0	30	481
7/23	161	1,380	6	160	0	21	0	0	34	515
7/24	72	1,452	9	169	0	21	0	0	5	520
7/25	172	1,624	14	183	2	23	0	0	46	566
7/26	121	1,745	21	204	2	25	0	0	6	572
7/27	108	1,853	18	222	0	25	0	0	24	596
7/28	220	2,073	44	266	1	26	0	0	75	671
7/29	83	2,156	18	284	3	29	0	0	40	711
7/30	95	2,251	11	295	7	36	3	3	42	753
7/31	61	2,312	14	309	0	36	0	3	8	761
8/01	137	2,449	18	327	1	37	0	3	17	778
8/02	272	2,721	50	377	0	37	0	3	20	798
8/03	133	2,854	14	391	3	40	0	3	21	819
8/04	142	2,996	14	405	1	41	0	3	16	835
8/05	188	3,184	10	415	0	41	1	4	6	841
8/06	67	3,251	3	418	1	42	2	6	16	857
8/07	110	3,361	12	430	2	44	1	7	21	878
8/08	223	3,584	7	437	0	44	1	8	20	898
8/09	149	3,733	14	451	0	44	0	8	5	903
8/10	90	3,823	7	458	0	44	1	9	20	923
8/11	72	3,895	2	460	0	44	0	9	5	928

-continued-

Appendix A2.–Page 2 of 2.

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho	Daily Sockeye	Cum. Sockeye
8/12	107	4,002	1	461	0	44	1	10	8	936
8/13	130	4,132	1	462	0	44	1	11	0	936
8/14	141	4,273	5	467	1	45	2	13	1	937
8/15	97	4,370	5	472	0	45	1	14	2	939
8/16	133	4,503	4	476	0	45	0	14	4	943
8/17	62	4,565	0	476	1	46	1	15	0	943
8/18	3	4,568	0	476	0	46	0	15	0	943
8/19	51	4,619	1	477	0	46	0	15	1	944
8/20	39	4,658	2	479	0	46	0	15	2	946
8/21	39	4,697	1	480	0	46	0	15	0	946
8/22	119	4,816	2	482	2	48	0	15	2	948
8/23	46	4,862	0	482	0	48	0	15	0	948
8/24	58	4,920	0	482	0	48	0	15	0	948
8/25	54	4,974	0	482	2	50	0	15	0	948
8/26	60	5,034	0	482	0	50	0	15	0	948
8/27	70	5,104	1	483	2	52	0	15	1	949
8/28	59	5,163	0	483	0	52	0	15	1	950
8/29	84	5,247	0	483	0	52	0	15	0	950
8/30	101	5,348	0	483	0	52	1	16	2	952
8/31	79	5,427	0	483	0	52	2	18	1	953
Total	5,427		483		52		18		953	

Note: The inside box in the cumulative column is the midpoint of the total; the outside box starts on the first quartile and ends on the third quartile.

Appendix A3.–Daily and cumulative (Cum.) migration of all salmonid species past Pilgrim River weir, Port Clarence, 2010.

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho	Daily Sockeye	Cum. Sockeye
6/24	0	0	0	0	0	0	0	0	0	0
6/25	0	0	0	0	0	0	0	0	0	0
6/26	0	0	0	0	0	0	0	0	0	0
6/27	0	0	0	0	0	0	0	0	0	0
6/28	0	0	0	0	0	0	0	0	2	2
6/29	0	0	0	0	0	0	0	0	0	2
6/30	0	0	0	0	0	0	0	0	0	2
7/01	0	0	0	0	0	0	0	0	0	2
7/02	0	0	0	0	0	0	0	0	0	2
7/03	0	0	1	1	0	0	0	0	0	2
7/04	0	0	7	8	0	0	0	0	2	4
7/05	0	0	0	8	0	0	0	0	0	4
7/06	0	0	1	9	0	0	0	0	4	8
7/07	0	0	0	9	0	0	0	0	0	8
7/08	2	2	8	17	0	0	0	0	15	23
7/09	9	11	221	238	0	0	0	0	4	27
7/10	4	15	280	518	0	0	0	0	4	31
7/11	0	15	103	621	0	0	0	0	2	33
7/12	0	15	7	628	0	0	0	0	1	34
7/13	6	21	29	657	0	0	0	0	5	39
7/14	144	165	158	815	0	0	0	0	48	87
7/15	436	601	1,418	2,233	0	0	0	0	150	237
7/16	340	941	1,205	3,438	0	0	0	0	60	297
7/17	271	1,212	1,550	4,988	0	0	0	0	36	333
7/18	378	1,590	2,694	7,682	0	0	0	0	48	381
7/19	398	1,988	2,715	10,397	0	0	0	0	68	449
7/20	379	2,367	1,696	12,093	3	3	0	0	60	509
7/21	814	3,181	2,165	14,258	1	4	0	0	41	550
7/22	163	3,344	524	14,782	0	4	0	0	17	567
7/23	329	3,673	1,931	16,713	1	5	0	0	105	672
7/24	752	4,425	2,689	19,402	5	10	0	0	106	778
7/25	658	5,083	1,612	21,014	1	11	0	0	62	840
7/26	956	6,039	1,326	22,340	1	12	0	0	111	951
7/27	608	6,647	940	23,280	2	14	0	0	56	1,007
7/28	457	7,104	563	23,843	8	22	0	0	103	1,110
7/29	711	7,815	811	24,654	2	24	0	0	94	1,204
7/30	1,082	8,897	1,249	25,903	3	27	0	0	123	1,327
7/31	774	9,671	566	26,469	2	29	0	0	48	1,375
8/01	781	10,452	308	26,777	0	29	0	0	48	1,423
8/02	1,317	11,769	559	27,336	1	30	0	0	84	1,507
8/03	508	12,277	286	27,622	1	31	0	0	21	1,528
8/04	1,087	13,364	467	28,089	0	31	0	0	20	1,548
8/05	839	14,203	372	28,461	1	32	1	1	12	1,560
8/06	489	14,692	363	28,824	0	32	3	4	5	1,565
8/07	755	15,447	75	28,899	0	32	1	5	10	1,575
8/08	862	16,309	41	28,940	0	32	1	6	12	1,587
8/09	369	16,678	45	28,985	0	32	1	7	6	1,593

-continued-

Appendix A3.–Page 2 of 2.

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho	Daily Sockeye	Cum. Sockeye
8/10	164	16,842	12	28,997	0	32	0	7	9	1,602
8/11	533	17,375	57	29,054	1	33	8	15	12	1,614
8/12	267	17,642	33	29,087	0	33	5	20	5	1,619
8/13	340	17,982	17	29,104	0	33	1	21	4	1,623
8/14	344	18,326	19	29,123	2	35	0	21	5	1,628
8/15	412	18,738	10	29,133	2	37	26	47	1	1,629
8/16	437	19,175	21	29,154	2	39	49	96	0	1,629
8/17	557	19,732	8	29,162	0	39	20	116	0	1,629
8/18	370	20,102	7	29,169	0	39	2	118	0	1,629
8/19	741	20,843	15	29,184	0	39	5	123	4	1,633
8/20	983	21,826	12	29,196	3	42	12	135	4	1,637
8/21	794	22,620	11	29,207	0	42	13	148	5	1,642
8/22	404	23,024	12	29,219	1	43	21	169	5	1,647
8/23	404	23,428	0	29,219	1	44	36	205	0	1,647
8/24	377	23,805	4	29,223	0	44	4	209	0	1,647
8/25	218	24,023	6	29,229	0	44	2	211	1	1,648
8/26	283	24,306	3	29,232	0	44	5	216	2	1,650
8/27	284	24,590	0	29,232	0	44	11	227	1	1,651
8/28	258	24,848	2	29,234	0	44	10	237	0	1,651
8/29	190	25,038	0	29,234	0	44	15	252	0	1,651
8/30	163	25,201	3	29,237	0	44	9	261	1	1,652
8/31	127	25,328	1	29,238	0	44	11	272	2	1,654
9/01	51	25,379	1	29,239	0	44	0	272	0	1,654
Total	25,379		29,239		44		272		1,654	

Note: The inside box in the cumulative column is the midpoint of the total; the outside box starts on the first quartile and ends on the third quartile.

Appendix A4.–Daily and cumulative (Cum.) migration of all salmonid species past Pilgrim River weir, Port Clarence, 2011.

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho	Daily Sockeye	Cum. Sockeye
6/28	0	0	0	0	0	0	0	0	0	0
6/29	0	0	0	0	0	0	0	0	0	0
6/30	0	0	0	0	0	0	0	0	0	0
7/01	0	0	0	0	0	0	0	0	0	0
7/02	0	0	0	0	0	0	0	0	0	0
7/03	1	1	0	0	0	0	0	0	2	2
7/04	0	1	0	0	0	0	0	0	0	2
7/05	0	1	0	0	0	0	0	0	0	2
7/06	104	105	0	0	1	1	0	0	5	7
7/07	136	241	0	0	0	1	0	0	14	21
7/08	116	357	2	2	0	1	0	0	25	46
7/09	98	455	0	2	1	2	0	0	26	72
7/10	150	605	3	5	1	3	0	0	150	222
7/11	386	991	0	5	2	5	0	0	366	588
7/12	460	1,451	0	5	1	6	0	0	378	966
7/13	353	1,804	8	13	7	13	0	0	1,022	1,988
7/14	899	2,703	2	15	3	16	0	0	630	2,618
7/15	506	3,209	0	15	0	16	0	0	274	2,892
7/16	958	4,167	3	18	2	18	0	0	495	3,387
7/17	852	5,019	3	21	4	22	0	0	677	4,064
7/18	245	5,264	5	26	0	22	0	0	155	4,219
7/19	725	5,989	23	49	0	22	0	0	327	4,546
7/20	707	6,696	38	87	1	23	0	0	319	4,865
7/21	1,872	8,568	95	182	1	24	0	0	381	5,246
7/22	3,092	11,660	230	412	0	24	0	0	605	5,851
7/23	2,080	13,740	153	565	2	26	0	0	400	6,251
7/24	1,697	15,437	180	745	1	27	0	0	466	6,717
7/25	163	15,600	65	810	0	27	0	0	79	6,796
7/26	1,042	16,642	72	882	0	27	0	0	180	6,976
7/27	1,454	18,096	135	1,017	0	27	0	0	172	7,148
7/28	1,702	19,798	186	1,203	0	27	0	0	160	7,308
7/29	331	20,129	28	1,231	0	27	0	0	19	7,327
7/30	1,491	21,620	346	1,577	1	28	0	0	88	7,415
7/31	955	22,575	141	1,718	0	28	0	0	71	7,486
8/01	466	23,041	45	1,763	0	28	0	0	43	7,529
8/02	954	23,995	270	2,033	0	28	0	0	95	7,624
8/03	762	24,757	94	2,127	0	28	0	0	49	7,673
8/04	787	25,544	176	2,303	2	30	0	0	65	7,738
8/05	737	26,281	116	2,419	0	30	0	0	48	7,786
8/06	1,170	27,451	131	2,550	0	30	0	0	34	7,820
8/07	1,071	28,522	74	2,624	0	30	0	0	28	7,848
8/08	1,177	29,699	159	2,783	0	30	0	0	97	7,945
8/09	1,166	30,865	136	2,919	1	31	0	0	92	8,037
8/10	1,190	32,055	100	3,019	2	33	0	0	79	8,116
8/11	462	32,517	57	3,076	0	33	0	0	35	8,151
8/12	453	32,970	45	3,121	0	33	2	2	32	8,183
8/13	443	33,413	32	3,153	0	33	4	6	29	8,212

-continued-

Appendix A4.–Page 2 of 2.

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho	Daily Sockeye	Cum. Sockeye
8/14	776	34,189	64	3,217	2	35	0	6	51	8,263
8/15	642	34,831	35	3,252	0	35	0	6	24	8,287
8/16	591	35,422	15	3,267	1	36	0	6	12	8,299
8/17	672	36,094	10	3,277	1	37	2	8	22	8,321
8/18	531	36,625	11	3,288	1	38	2	10	20	8,341
8/19	512	37,137	19	3,307	1	39	3	13	15	8,356
8/20	603	37,740	15	3,322	0	39	2	15	9	8,365
8/21	328	38,068	9	3,331	1	40	9	24	14	8,379
8/22	351	38,419	6	3,337	0	40	8	32	12	8,391
8/23	544	38,963	9	3,346	0	40	7	39	13	8,404
8/24	487	39,450	0	3,346	0	40	20	59	11	8,415
8/25	461	39,911	2	3,348	0	40	42	101	8	8,423
8/26	366	40,277	5	3,353	0	40	22	123	5	8,428
8/27	475	40,752	4	3,357	0	40	33	156	10	8,438
8/28	210	40,962	2	3,359	3	43	22	178	0	8,438
8/29	244	41,206	0	3,359	0	43	6	184	4	8,442
8/30	240	41,446	2	3,361	0	43	16	200	1	8,443
8/31	150	41,596	0	3,361	1	44	33	233	6	8,449
9/01	144	41,740	3	3,364	0	44	36	269	0	8,449
Total	41,740		3,364		44		269		8,449	

Note: The inside box in the cumulative column is the midpoint of the total; the outside box starts on the first quartile and ends on the third quartile. Some portion of the August 12 count was interpolated.

Appendix A5.–Daily and cumulative (Cum.) migration of all salmonid species past Pilgrim River weir, Port Clarence, 2012.

Date		Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho	Daily Sockeye	Cum. Sockeye
6/26		0	0	0	0	0	0	0	0	0	0
6/27		0	0	0	0	0	0	0	0	0	0
6/28		0	0	0	0	0	0	0	0	0	0
6/29		0	0	0	0	0	0	0	0	0	0
6/30		0	0	0	0	0	0	0	0	0	0
7/01		0	0	0	0	0	0	0	0	0	0
7/02		0	0	0	0	0	0	0	0	0	0
7/03		0	0	0	0	0	0	0	0	0	0
7/04		0	0	0	0	0	0	0	0	0	0
7/05		0	0	0	0	0	0	0	0	0	0
7/06		0	0	0	0	0	0	0	0	0	0
7/07		0	0	0	0	0	0	0	0	1	1
7/08		18	18	6	6	0	0	0	0	16	17
7/09		39	57	9	15	0	0	0	0	7	24
7/10		39	96	10	25	0	0	0	0	92	116
7/11		225	321	39	64	0	0	0	0	681	797
7/12		984	1,305	860	924	2	2	0	0	762	1,559
7/13		726	2,031	3,033	3,957	1	3	0	0	428	1,987
7/14		672	2,703	2,807	6,764	0	3	0	0	184	2,171
7/15		817	3,520	2,486	9,250	1	4	0	0	127	2,298
7/16		341	3,861	1,219	10,469	0	4	0	0	96	2,394
7/17		1,018	4,879	3,163	13,632	0	4	0	0	140	2,534
7/18		727	5,606	4,573	18,205	0	4	0	0	162	2,696
7/19		668	6,274	2,512	20,717	0	4	0	0	276	2,972
7/20		1,155	7,429	4,297	25,014	3	7	0	0	283	3,255
7/21		776	8,205	4,107	29,121	0	7	0	0	324	3,579
7/22		1,214	9,419	4,249	33,370	6	13	0	0	501	4,080
7/23		1,360	10,779	3,695	37,065	3	16	0	0	497	4,577
7/24		366	11,145	1,600	38,665	2	18	0	0	269	4,846
7/25		146	11,291	424	39,089	3	21	0	0	220	5,066
7/26		965	12,256	2,056	41,145	13	34	0	0	267	5,333
7/27		288	12,544	239	41,384	0	34	0	0	55	5,388
7/28		453	12,997	376	41,760	4	38	0	0	92	5,480
7/29		789	13,786	1,526	43,286	5	43	0	0	462	5,942
7/30		716	14,502	910	44,196	4	47	0	0	245	6,187
7/31	[a]	234	14,736	161	44,357	0	47	0	0	18	6,205
8/01	[a]	219	14,955	108	44,465	0	47	0	0	29	6,234
8/02	[a]	232	15,187	81	44,546	0	47	0	0	48	6,282
8/03	[a]	418	15,605	149	44,695	0	47	0	0	45	6,327
8/04	[a]	509	16,114	162	44,857	1	48	0	0	44	6,371
8/05		642	16,756	294	45,151	2	50	0	0	27	6,398
8/06		308	17,064	117	45,268	1	51	0	0	12	6,410
8/07		595	17,659	212	45,480	0	51	3	3	67	6,477
8/08		862	18,521	195	45,675	1	52	2	5	124	6,601
8/09		748	19,269	116	45,791	0	52	0	5	66	6,667
8/10		850	20,119	109	45,900	0	52	4	9	95	6,762
8/11		1,320	21,439	142	46,042	1	53	8	17	60	6,822

-continued-

Appendix A5.–Page 2 of 2.

Date		Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho	Daily Sockeye	Cum. Sockeye
8/12		458	21,897	41	46,083	1	54	0	17	75	6,897
8/13		502	22,399	22	46,105	1	55	1	18	37	6,934
8/14		436	22,835	21	46,126	0	55	5	23	50	6,984
8/15		496	23,331	27	46,153	1	56	2	25	15	6,999
8/16		952	24,283	25	46,178	3	59	28	53	50	7,049
8/17		932	25,215	16	46,194	3	62	39	92	27	7,076
8/18	[a]	510	25,725	6	46,200	3	65	3	95	14	7,090
8/19	[a]	8	25,733	1	46,201	0	65	0	95	0	7,090
Total		25,733		46,201		65		95		7,090	

Note: Quartiles are not shown because the target operational period of the project was not fully monitored. Some portion of the July 30 count was interpolated.

[a] Partial count so total escapement should be considered a minimum value.

Appendix A6.–Age and sex compositions by year for Pilgrim River chum salmon ASL samples, 2001–2012.

Year	Sampling dates	Number of samples	Percent by sex		Percent (Age Group)						
			Male	Female	(0.1)	(0.2)	(0.3)	(0.4)	(0.5)	(0.6)	(0.7)
2001	No data collected										
2002	7/20–8/06	471	59.0	41.0	0.0	0.2	80.5	14.0	5.3	0.0	0.0
2003	7/03–7/30	235	54.5	45.5	0.0	0.0	50.6	47.7	1.7	0.0	0.0
2004	6/26–9/14	381	52.2	47.8	0.0	6.8	37.5	54.9	0.8	0.0	0.0
2005	6/29–9/04	528	52.1	47.9	0.0	0.6	83.9	14.4	1.1	0.0	0.0
2006	7/08–9/08	611	46.5	53.5	0.0	2.1	50.7	47.0	0.2	0.0	0.0
2007	7/03–9/06	506	50.2	49.8	0.0	0.6	45.0	48.7	5.7	0.0	0.0
2008	7/06–8/28	486	68.3	31.7	0.0	0.0	7.6	82.5	9.5	0.4	0.0
2009	7/02–8/20	424	58.7	41.3	0.0	14.2	30.9	30.2	23.8	0.9	0.0
2010	7/08–8/27	215	62.3	37.7	0.0	0.9	87.9	11.2	0.0	0.0	0.0
2011	7/15–9/05	185	48.2	51.8	0.0	0.0	31.4	68.6	0.0	0.0	0.0
2012	7/08–8/16	155	56.1	43.9	0.0	0.6	54.4	38.3	6.7	0.0	0.0

Appendix A7.–Age and sex compositions by year for Pilgrim River Chinook salmon ASL samples, 2001–2012.

Year	Sampling dates	Number of samples	Percent by Sex		Percent by (Age Group)						
			Male	Female	(1.1)	(1.2)	(1.3)	(1.4)	(2.3)	(1.5)	(2.4)
2001			No data collected								
2002	7/20	4 [a]									
2003	7/05–7/31	10 [a]									
2004			No data collected								
2005	7/07–8/26	12 [a]									
2006	7/11–9/02	43 [a]									
2007			No data collected								
2008	7/27–8/12	2 [a]									
2009	7/12–8/27	37 [a]	48.6	51.4							
2010	7/20–8/31	9 [a]									
2011			No data collected								
2012			No data collected								

[a] Sample size insufficient for sex composition analysis.

Appendix A8.–Age and sex compositions by year for Pilgrim River coho salmon ASL samples, 2001-2012.

Year	Sampling dates	Number of samples	Percent by sex		Percent (Age Group)				
			Male	Female	(1.1)	(2.1)	(2.2)	(3.1)	(4.1)
2001			No data collected						
2002			No data collected						
2003	8/29–9/07	23 [a]							
2004	8/07–9/14	143	54.5	45.5	7.7	89.5	0.0	2.8	0.0
2005	8/05–9/04	90 [a]	56.7	43.3					
2006	7/22–9/08	217	58.1	41.9	21.7	77.0	0.0	1.4	0.0
2007	8/09–9/09	57 [a]							
2008	8/11–9/01	86 [a]	59.3	40.7					
2009			No data collected						
2010			No data collected						
2011			No data collected						
2012			No data collected						

[a] Sample size insufficient for sex composition analysis.

Appendix A9.–Age and sex compositions by year for Pilgrim River sockeye salmon ASL samples, 2001–2012.

Year	Sampling dates	Number of samples	Percent by sex		Percent by (age group)											
			Male	Female	(0.2)	(0.3)	(1.2)	(2.1)	(1.3)	(2.2)	(3.1)	(1.4)	(2.3)	(3.2)	(2.4)	(3.3)
2001	8/10–9/13	278[a]	42.4	57.6	0.0	0.0	0.4	0.0	15.8	1.8	0.0	0.0	81.7	0.0	0.4	0.0
2002	7/20–8/13	198[a]	42.4	57.6	0.0	0.0	1.0	0.0	2.0	74.2	0.5	0.0	18.2	3.0	1.0	0.0
2003	7/01–8/29	248	39.1	60.9	0.0	0.0	3.6	0.0	5.2	61.3	0.0	0.0	29.4	0.0	0.4	0.0
2004	6/25–9/14	605	38.7	61.3	0.0	0.2	5.6	0.2	15.7	43.6	0.0	0.5	34.0	0.0	0.3	0.0
2005	6/29–7/02	705	43.7	56.3	0.0	0.1	6.0	0.0	13.3	44.8	0.0	0.0	35.3	0.0	0.4	0.0
2006	7/08–9/05	706	49.2	50.8	0.1	0.0	14.5	0.0	28.8	10.6	0.0	0.0	45.8	0.0	0.1	0.0
2007	7/03–9/03	428	48.6	51.4	0.0	0.0	4.2	0.0	73.1	4.4	0.0	0.0	18.0	0.0	0.2	0.0
2008	7/06–8/22	332	55.4	44.6	0.0	0.0	0.0	0.0	48.2	0.9	0.0	0.6	50.0	0.0	0.3	0.0
2009	7/06–8/10	159	66.7	33.3	0.0	0.0	0.6	0.0	18.2	0.6	0.0	47.8	13.8	0.0	18.9	0.0
2010	7/04–8/09	405	44.0	56.0	0.0	0.0	5.9	0.2	3.2	6.7	0.0	0.0	82.5	0.0	1.5	0.0
2011	7/03–8/08	221	39.8	60.2	0.0	0.0	1.8	0.0	92.8	0.0	0.0	0.5	5.0	0.0	0.0	0.0
2012	7/08–8/07	231	34.9	65.1	0.0	0.0	4.1	0.0	15.4	26.1	0.0	12.0	37.8	0.0	4.6	0.0

[a] Age, sex, and length data collected near outlet of Salmon Lake.

Appendix A10.–Pilgrim River weir water temperature and stream stage observations, Port Clarence 2008–2012.

	2008		2009		2010		2011		2012	
Date	Temp. (°C)	Depth (cm)	Temp. (°C)	Depth (cm)	Temp. (°C)	Depth (cm)	Temp. (°C)	Depth (cm)	Temp. (°C)	Depth (cm)
6/25			12.0	38.4	15.0	33.2				
6/26			9.0	38.4	10.0	30.5				
6/27			8.0	31.4	9.5	33.5			10.0	30.5
6/28			8.0	27.4	10.0	28.0			9.0	29.3
6/29			7.0	23.2	11.0	25.0	11.0	39.6	10.0	28.0
6/30			9.0	21.3	12.0	23.2	10.0	39.6	10.0	26.8
7/01			9.0	19.5	11.0	21.3	10.0	36.6	10.0	26.2
7/02			11.0	19.5	11.0	20.1	10.0	32.9	10.0	24.7
7/03	8.0	33.5	12.0	20.1	11.0	20.7	10.0	32.3	9.0	24.7
7/04	11.0	35.4	10.0	28.0	12.0	20.1	8.0	32.9	14.0	25.9
7/05	12.0	36.6	9.0	20.1	11.0	17.1	8.0	33.5	11.0	29.0
7/06	11.0	40.2	10.0	15.8	9.0	17.1	10.0	58.5	12.0	31.7
7/07	12.0	36.6	12.0	15.2	10.0	15.2	9.0	53.0	11.0	29.3
7/08	10.0	35.4	11.0	14.6	11.0	14.6	10.0	46.9	9.0	28.0
7/09	10.0	42.7	9.0	14.0	12.0	12.8	10.0	42.7	9.0	26.8
7/10	9.0	54.3	11.0	11.6	13.0	12.2	10.0	40.2	10.0	25.6
7/11	9.0	50.6	11.0	9.8	NA	11.0	10.0	38.4	14.0	24.4
7/12	8.0	48.2	12.0	9.1	NA	11.0	10.0	45.1	14.0	22.6
7/13	8.0	61.0	13.0	9.1	14.0	9.8	10.0	75.0	14.0	22.6
7/14	8.0	55.5	12.0	11.6	11.0	11.0	9.0	65.8	12.0	21.3
7/15	8.0	58.5	10.0	10.4	14.0	9.8	8.0	60.4	12.0	21.0
7/16	8.0	64.0	10.0	7.9	10.0	9.1	8.0	63.4	12.0	20.7
7/17	9.0	67.1	11.0	6.1	10.0	10.4	8.0	79.2	10.0	20.1
7/18	8.0	64.6	12.0	7.3	9.0	10.4	8.0	71.9	10.0	19.5
7/19	9.0	56.7	12.0	8.5	9.0	11.6	10.0	60.4	10.0	20.7
7/20	9.0	50.6	12.0	9.8	10.0	12.2	8.0	53.6	10.0	19.5
7/21	7.0	46.9	11.0	9.1	11.0	12.2	10.0	48.8	10.0	18.3
7/22	8.0	42.7	13.0	7.9	10.0	12.2	11.0	44.5	10.0	17.7
7/23	8.0	36.6	13.0	7.9	7.0	12.8	13.0	42.1	10.0	17.1
7/24	8.0	32.9	12.0	7.9	8.0	13.4	12.0	42.7	10.0	16.5
7/25	8.0	33.5	11.0	8.5	11.0	13.4	12.0	42.1	10.0	18.3
7/26	8.0	35.4	12.0	9.1	11.0	12.8	12.0	39.6	10.0	33.5
7/27[a]	7.0	33.5	11.0	9.8	11.0	16.5	14.0	36.6	10.0	33.5
7/28	9.0	29.9	11.0	18.3	11.0	18.3	14.0	34.1	9.0	39.0
7/29	9.0	27.4	12.0	21.6	12.0	18.3	10.0	48.8	10.0	90.2
7/30	8.0	26.8	11.0	32.3	12.0	17.7	10.0	37.2	NA	NA
7/31	8.0	25.0	10.0	37.8	12.0	15.8	10.0	35.4	8.0	70.1

-continued-

Appendix A10.–Page 2 of 2.

	2008		2009		2010		2011		2012	
	Temp.	Depth	Temp.	Depth	Temp.	Depth	Temp.	Depth	Temp.	Depth
Date	(°C)	(cm)	(°C)	(cm)	(°C)	(cm)	(°C)	(cm)	(°C)	(cm)
8/01	8.0	23.8	10.0	31.7	13.0	14.9	10.0	33.5	10.0	64.0
8/02	8.0	23.2	9.0	31.1	13.0	13.4	10.0	30.5	10.0	62.8
8/03	8.0	22.6	10.0	27.4	12.0	13.1	10.0	28.0	10.0	56.7
8/04	6.0	25.0	10.0	25.6	13.0	12.2	10.0	37.2	10.0	53.6
8/05	7.0	23.2	13.0	21.9	13.0	11.6	10.0	40.8	10.0	52.7
8/06	9.0	21.3	10.0	20.7	12.0	11.0	6.0	38.1	10.0	50.0
8/07	8.0	20.1	10.0	18.3	13.0	11.6	6.0	38.4	10.0	46.9
8/08	9.0	18.3	11.0	17.1	12.0	11.0	10.0	38.4	9.0	43.3
8/09	9.0	16.5	11.0	14.6	12.0	11.0	8.0	41.5	9.0	40.8
8/10	9.0	15.8	11.0	13.4	13.0	12.2	8.0	39.6	10.0	39.6
8/11	10.0	14.0	10.0	12.2	13.0	16.5	10.0	45.7	12.0	37.2
8/12	9.0	14.6	10.0	11.0	12.0	19.5	8.0	65.8	9.0	36.0
8/13	9.0	14.0	11.0	9.8	11.0	19.5	8.0	64.0	12.0	34.7
8/14	10.0	14.0	10.0	9.1	10.0	18.9	6.0	50.6	10.0	34.1
8/15	11.0	14.0	11.0	9.1	11.0	28.0	6.0	48.2	10.0	33.5
8/16	10.0	12.8	10.0	7.9	10.0	42.7	6.0	42.1	10.0	58.5
8/17	10.0	11.0	10.0	7.9	10.0	45.7	9.0	41.1	9.0	85.3
8/18	10.0	11.0	8.0	9.1	9.0	46.3	10.0	40.2	9.0	94.5
8/19	10.0	11.0	8.0	8.5	10.0	41.5	10.0	37.2	9.0	128.0
8/20	10.0	10.4	9.0	7.3	10.0	36.6	8.0	34.1	10.0	120.4
8/21	9.0	9.1	8.0	7.9	10.0	34.1	6.0	32.9	9.0	116.4
8/22	9.0	8.5	8.0	15.8	10.0	31.1	6.0	31.1	8.0	132.9
8/23	9.0	7.9	8.0	15.8	10.0	29.9	6.0	30.5	8.0	134.1
8/24	9.0	7.3	8.0	15.2	11.0	28.0	6.0	29.9	9.0	121.9
8/25	9.0	6.1	7.0	13.4	10.0	26.8	4.0	30.5	6.0	121.3
8/26	7.0	6.1	6.0	12.8	10.0	25.6	6.0	29.3	10.0	111.3
8/27	6.0	6.1	7.0	12.2	11.0	25.0	8.0	28.0	9.0	105.5
8/28	6.0	5.5	7.0	11.0	11.0	25.0	4.0	26.8	10.0	96.3
8/29	5.0	5.5	8.0	9.8	11.0	23.2	6.0	25.6	10.0	91.4
8/30	5.0	5.5	9.0	9.1	11.0	22.6	10.0	26.8	10.0	90.2
8/31	8.0	4.9	8.0	23.2	10.0	21.3	6.0	26.8	10.0	89.0
9/01	7.0	4.9	8.0	25.6	10.0	20.1	10.0	28.7	7.0	88.4
9/02	7.0	3.7							8.0	87.2
9/03									NA	112.2
9/04									6.0	121.3
9/05									6.0	121.9
9/06									6.0	123.7
9/07									5.0	111.6
9/08									NA	104.9
9/09									5.0	95.7
9/10									4.0	90.8
9/11									4.0	86.6

Note: Recorded water temperatures are morning water temperatures, except where morning temperatures were not available. Recorded water depths are highest recorded daily water depth.

[a] In 2009 depth gauge was knocked over on July 27 and in 2012 depth gauge was moved on July 30.

APPENDIX B: GLACIAL LAKE WEIR

Appendix B1.–Daily and cumulative (Cum.) sockeye salmon migration past Glacial Lake weir, Norton Sound, 2008.

Date	Daily Sockeye Salmon	Cum. Sockeye Salmon
6/27	0	0
6/28	0	0
6/29	0	0
6/30	0	0
7/01	0	0
7/02	18	18
7/03	35	53
7/04	4	57
7/05	368	425
7/06	97	522
7/07	164	686
7/08	255	941
7/09	6	947
7/10	0	947
7/11	1	948
7/12	20	968
7/13	73	1,041
7/14	34	1,075
7/15	47	1,122
7/16	15	1,137
7/17	21	1,158
7/18	207	1,365
7/19	20	1,385
7/20	203	1,588
7/21	33	1,621
7/22	45	1,666
7/23	54	1,720
7/24	13	1,733
7/25	47	1,780
7/26	5	1,785
7/27	1	1,786
7/28	8	1,794
Total	1,794	

Note: The inside box in the cumulative column is the day when the midpoint of the total was reached. The outside box is from the day the first quartile was reached to the day the third quartile was reached.

Appendix B2.–Daily and cumulative (Cum.) sockeye salmon migration past Glacial Lake weir, Sinuk River drainage, Norton Sound, 2009.

Date	Daily Sockeye Salmon	Cum. Sockeye Salmon
6/20	0	0
6/21	0	0
6/22	0	0
6/23	0	0
6/24	0	0
6/25	0	0
6/26	0	0
6/27	0	0
6/28	0	0
6/29	0	0
6/30	0	0
7/01	4	4
7/02	1	5
7/03	1	6
7/04	9	15
7/05	12	27
7/06	33	60
7/07	62	122
7/08	9	131
7/09	134	265
7/10	8	273
7/11	123	396
7/12	85	481
7/13	46	527
7/14	65	592
7/15	15	607
7/16	2	609
7/17	76	685
7/18	8	693
7/19	33	726
7/20	36	762
7/21	25	787
7/22	1	788
7/23	17	805
7/24	7	812
7/25	3	815
7/26	1	816
7/27	10	826
Total	826	

Note: The inside box in the cumulative column is the day when the midpoint of the total was reached. The outside box is from the day the first quartile was reached to the day the third quartile was reached.

Appendix B3.–Daily and cumulative (Cum.) sockeye salmon migration past Glacial Lake weir, Norton Sound, 2010.

Date	Daily Sockeye Salmon	Cum. Sockeye Salmon
6/26	0	0
6/27	0	0
6/28	2	2
6/29	0	2
6/30	27	29
7/01	14	43
7/02	14	57
7/03	23	80
7/04	2	82
7/05	0	82
7/06	18	100
7/07	128	228
7/08	4	232
7/09	14	246
7/10	81	327
7/11	65	392
7/12	17	409
7/13	200	609
7/14	85	694
7/15	35	729
7/16	27	756
7/17	0	756
7/18	35	791
7/19	11	802
7/20	67	869
7/21	0	869
7/22	106	975
7/23	0	975
7/24	19	994
7/25	0	994
7/26	25	1,019
7/27	0	1,019
7/28	28	1,047
Total	1,047	

Note: The inside box in the cumulative column is the day when the midpoint of the total was reached. The outside box is from the day the first quartile was reached to the day the third quartile was reached.

Appendix B4.–Daily and cumulative (Cum.) sockeye salmon migration past Glacial Lake weir, Norton Sound, 2011.

Date	Daily Sockeye Salmon	Cum. Sockeye Salmon
7/01	125	125
7/02	72	197
7/03	9	206
7/04	16	222
7/05	7	229
7/06	194	423
7/07	128	551
7/08	75	626
7/09	265	891
7/10	176	1,067
7/11	64	1,131
7/12	48	1,179
7/13	222	1,401
7/14	47	1,448
7/15	16	1,464
7/16	12	1,476
7/17	55	1,531
7/18	60	1,591
7/19	21	1,612
7/20	11	1,623
7/21	25	1,648
7/22	7	1,655
7/23	35	1,690
7/24	1	1,691
7/25	3	1,694
7/26	3	1,697
Total	1,697	

Note: The inside box in the cumulative column is the day when the midpoint of the total was reached. The outside box is from the day the first quartile was reached to the day the third quartile was reached.

Appendix B5.–Daily and cumulative (Cum.) sockeye salmon migration past Glacial Lake weir, Norton Sound, 2012.

Date	Daily Sockeye Salmon	Cum. Sockeye Salmon
7/02	0	0
7/03	13	13
7/04	0	13
7/05	0	13
7/06	11	24
7/07	9	33
7/08	20	53
7/09	3	56
7/10	409	465
7/11	35	500
7/12	11	511
7/13	0	511
7/14	0	511
7/15	119	630
7/16	151	781
7/17	45	826
7/18	298	1,124
7/19	19	1,143
7/20	66	1,209
7/21	127	1,336
7/22	77	1,413
7/23	11	1,424
7/24	48	1,472
7/25	13	1,485
7/26	28	1,513
7/27	56	1,569
7/28	17	1,586
7/29	9	1,595
7/30	7	1,602
7/31	0	1,602
Total	1,602	

Note: The inside box in the cumulative column is the day when the midpoint of the total was reached. The outside box is from the day the first quartile was reached to the day the third quartile was reached.

Appendix B6.–Age and sex compositions by year for Glacial Lake sockeye salmon ASL samples, 2001–2012.

Year	Sampling dates	Number of samples	Percent by sex		Percent by (Age Group)											
			Male	Female	(0.2)	(0.3)	(1.2)	(2.1)	(1.3)	(2.2)	(3.1)	(1.4)	(2.3)	(3.2)	(2.4)	(3.3)
2001					No data collected											
2002					No data collected											
2003					No data collected											
2004					No data collected											
2005					No data collected											
2006	7/05–7/15	248	52.8	47.2	0.0	0.0	0.0	0.0	0.0	20.6	0.0	0.0	79.0	0.0	0.4	0.0
2007	7/06–7/21	122	44.3	55.7												
2008	7/02–7/28	152	36.8	63.2	0.0	0.0	1.3	0.0	2.6	8.6	0.0	0.7	82.2	0.0	4.6	0.0
2009	7/02–7/27	40														
2010	7/10–7/12	40														
2011					No data collected											
2012					No data collected											

Appendix B7.–Glacial Creek weir water temperature (Temp.) and stream stage (Depth) observations, Norton Sound 2008–2012.

	2008		2009		2010		2011		2012	
	Temp.	Depth	Temp.	Depth	Temp.	Depth	Temp.	Depth	Temp.	Depth
Date	(°C)	(cm)	(°C)	(cm)	(°C)	(cm)	(°C)	(cm)	(°C)	(cm)
6/27	NA	NA								
6/28	NA	NA			14.0	75.6	10.5	62.5		
6/29	NA	NA			14.0	75.6	8.0	56.1		
6/30	NA	NA			14.0	74.4	10.0	53.3		
7/01	NA	NA	13.0	22.0	14.0	74.4	5.0	57.9		
7/02	NA	NA	14.0	22.0	14.0	73.8	6.0	45.7		
7/03	NA	NA	12.0	25.0	15.0	73.2	8.0	45.7		
7/04	NA	NA	12.0	25.0	13.0	73.2	6.0	64.0		
7/05	NA	NA	12.0	24.0	13.0	73.8	8.0	48.8		
7/06	NA	NA	14.0	22.5	13.0	72.5	8.0	39.6		
7/07	NA	NA	12.0	22.0	13.0	71.9	9.5	67.1		
7/08	NA	NA	10.0	21.0	15.0	71.9	9.0	67.1		
7/09	NA	NA	10.0	21.0	15.0	71.9	9.0	65.5		
7/10	NA	NA	13.0	20.0	15.0	70.1	9.0	51.8		
7/11	NA	NA	14.0	18.5	14.0	70.7	5.0	94.5		
7/12	NA	NA	11.0	18.0	12.0	70.7	5.0	111.3		
7/13	NA	NA	12.0	19.0	13.0	70.7	5.0	109.7		
7/14	NA	NA	12.0	19.0	12.0	70.1	5.0	106.7		
7/15	NA	NA	11.0	19.0	12.0	70.1	5.0	93.3		
7/16	NA	NA	12.0	18.0	10.0	70.1	7.0	85.3		
7/17	NA	NA	12.0	18.0	10.0	71.9	9.0	76.2		
7/18	NA	NA	12.0	20.0	10.0	71.9	8.0	73.2		
7/19	NA	NA	11.0	21.0	10.0	73.2	9.0	61.0		
7/20	NA	NA	12.0	25.0	10.0	73.2	10.0	70.1		
7/21	NA	NA	14.0	24.0	9.0	73.2	11.0	61.0	NA	58.8
7/22	NA	NA	14.0	22.0	9.0	75.0			14.0	59.1
7/23	NA	NA	14.0	22.0	10.0	75.0			16.0	56.7
7/24	NA	NA	14.0	22.0	10.0	73.8			15.5	55.5
7/25	NA	NA	13.0	20.0	11.0	73.2			13.5	55.8
7/26	NA	NA	12.0	21.0	12.0	75.0			12.0	83.5
7/27	NA	NA	12.0	21.0	12.0	75.0			12.0	89.0
7/28	NA	NA	11.0	24.0	12.0	NA			11.0	92.7
7/29									10.5	100.6
7/30									9.5	100.6
7/31									10.5	93.9

Note: Recorded water temperatures are morning water temperatures, except where morning temperatures were not available. Recorded water depths are highest recorded daily water depth.

APPENDIX C: SNAKE RIVER WEIR

Appendix C1.–Daily and cumulative (Cum.) passage of all salmonid species at Snake River weir, Norton Sound, 2008.

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho	Daily Sockeye	Cum. Sockeye
7/06 [a]	0	0	25,000	25,000	0	0	0	0	0	0
7/07	0	0	103	25,103	0	0	0	0	0	0
7/08	1	1	106	25,209	0	0	0	0	0	0
7/09	0	1	0	25,209	0	0	0	0	0	0
7/10	0	1	81	25,290	0	0	0	0	0	0
7/11	6	7	140	25,430	0	0	0	0	0	0
7/12	11	18	75	25,505	1	1	0	0	0	0
7/13	0	18	0	25,505	0	1	0	0	0	0
7/14	23	41	1,547	27,052	0	1	1	1	0	0
7/15	135	176	4,585	31,637	0	1	0	1	0	0
7/16	0	176	0	31,637	0	1	0	1	0	0
7/17	9	185	624	32,261	0	1	0	1	0	0
7/18	6	191	975	33,236	0	1	0	1	0	0
7/19	16	207	6,220	39,456	0	1	1	2	0	0
7/20	51	258	7,084	46,540	0	1	0	2	0	0
7/21	151	409	12,409	58,949	0	1	0	2	0	0
7/22	54	463	10,967	69,916	0	1	2	4	0	0
7/23	41	504	7,684	77,600	0	1	11	15	0	0
7/24	43	547	4,109	81,709	0	1	19	34	0	0
7/25	10	557	3,022	84,731	0	1	5	39	0	0
7/26	65	622	10,065	94,796	0	1	39	78	0	0
7/27	56	678	13,881	108,677	0	1	25	103	0	0
7/28	39	717	7,920	116,597	0	1	16	119	0	0
7/29	12	729	1,293	117,890	0	1	7	126	0	0
7/30	19	748	3,581	121,471	0	1	25	151	0	0
7/31	34	782	6,083	127,554	0	1	31	182	0	0
8/01	63	845	6,242	133,796	0	1	61	243	0	0
8/02	16	861	2,177	135,973	0	1	30	273	0	0
8/03	60	921	1,706	137,679	0	1	54	327	0	0
8/04	11	932	917	138,596	0	1	9	336	0	0
8/05	14	946	1,338	139,934	0	1	53	389	0	0
8/06	10	956	1,131	141,065	0	1	37	426	2	2
8/07	10	966	645	141,710	0	1	21	447	1	3
8/08	8	974	477	142,187	0	1	12	459	0	3
8/09	8	982	636	142,823	0	1	27	486	0	3
8/10	7	989	743	143,566	0	1	32	518	0	3
8/11	0	989	57	143,623	0	1	2	520	0	3
8/12	10	999	393	144,016	0	1	17	537	0	3
8/13	20	1,019	395	144,411	0	1	16	553	0	3
8/14	38	1,057	219	144,630	1	2	54	607	11	14
8/15	19	1,076	118	144,748	0	2	9	616	0	14
8/16	8	1,084	180	144,928	0	2	11	627	0	14
8/17	12	1,096	105	145,033	0	2	15	642	2	16
8/18	7	1,103	92	145,125	0	2	5	647	0	16

-continued-

Appendix C1.–Page 2 of 2.

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho	Daily Sockeye	Cum. Sockeye
8/19	4	1,107	89	145,214	0	2	9	656	2	18
8/20	6	1,113	86	145,300	0	2	12	668	0	18
8/21	6	1,119	41	145,341	0	2	22	690	0	18
8/22	4	1,123	16	145,357	0	2	12	702	0	18
8/23	7	1,130	9	145,366	0	2	11	713	0	18
8/24	1	1,131	9	145,375	0	2	42	755	0	18
8/25	8	1,139	15	145,390	0	2	8	763	3	21
8/26	4	1,143	23	145,413	0	2	78	841	11	32
8/27	6	1,149	23	145,436	1	3	171	1,012	6	38
8/28	18	1,167	24	145,460	2	5	318	1,330	12	50
8/29	23	1,190	27	145,487	2	7	586	1,916	18	68
8/30	7	1,197	15	145,502	0	7	114	2,030	8	76
8/31	20	1,217	49	145,551	4	11	1,125	3,155	23	99
9/01	12	1,229	44	145,595	0	11	626	3,781	13	112
9/02	7	1,236	31	145,626	1	12	505	4,286	11	123
9/03	1	1,237	18	145,644	0	12	178	4,464	1	124
9/04	7	1,244	32	145,676	0	12	360	4,824	11	135
9/05	0	1,244	57	145,733	1	13	265	5,089	8	143
9/06	0	1,244	28	145,761	0	13	117	5,206	0	143
Total	1,244		145,761		13		5,206		143	

Note: The inside box in the cumulative column is the day when the midpoint of the total was reached. The outside box is from the day the first quartile was reached to the day the third quartile was reached.

[a] An aerial survey on July 6 estimated 25,000 pink salmon upstream of the weir before the weir became fish tight.

Appendix C2.–Daily and cumulative (Cum.) passage of all salmonid species at Snake River weir, Norton Sound, 2009.

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho	Daily Sockeye	Cum. Sockeye
7/08	0	0	0	0	0	0	0	0	0	0
7/09	0	0	0	0	0	0	0	0	0	0
7/10	14	14	0	0	0	0	0	0	0	0
7/11	35	49	15	15	0	0	0	0	0	0
7/12	0	49	0	15	0	0	0	0	0	0
7/13	6	55	0	15	0	0	0	0	0	0
7/14	5	60	6	21	0	0	0	0	0	0
7/15	0	60	0	21	0	0	0	0	0	0
7/16	7	67	2	23	0	0	0	0	0	0
7/17	69	136	25	48	0	0	0	0	0	0
7/18	9	145	1	49	0	0	0	0	0	0
7/19	77	222	87	136	0	0	0	0	0	0
7/20	7	229	0	136	0	0	0	0	0	0
7/21	142	371	130	266	0	0	0	0	0	0
7/22	26	397	1	267	0	0	0	0	0	0
7/23	9	406	19	286	0	0	0	0	0	0
7/24	14	420	56	342	0	0	0	0	0	0
7/25	85	505	142	484	0	0	0	0	0	0
7/26	24	529	27	511	0	0	0	0	0	0
7/27	22	551	5	516	0	0	0	0	0	0
7/28	52	603	12	528	0	0	0	0	0	0
7/29	56	659	78	606	0	0	6	6	0	0
7/30	37	696	54	660	0	0	0	6	0	0
7/31	24	720	33	693	0	0	0	6	0	0
8/01	12	732	22	715	0	0	0	6	0	0
8/02	9	741	6	721	0	0	0	6	0	0
8/03	6	747	6	727	0	0	0	6	0	0
8/04	0	747	5	732	0	0	0	6	0	0
8/05	5	752	0	732	1	1	0	6	0	0
8/06	1	753	0	732	3	4	0	6	0	0
8/07	3	756	2	734	0	4	0	6	1	1
8/08	21	777	12	746	0	4	0	6	0	1
8/09	13	790	2	748	0	4	0	6	0	1
8/10	17	807	0	748	1	5	1	7	0	1
8/11	7	814	0	748	0	5	0	7	0	1
8/12	0	814	0	748	0	5	0	7	0	1
8/13	4	818	0	748	0	5	0	7	0	1
8/14	6	824	0	748	1	6	0	7	0	1
8/15	14	838	0	748	0	6	0	7	0	1
8/16	7	845	5	753	0	6	0	7	1	2
8/17	8	853	2	755	0	6	0	7	0	2
8/18	8	861	5	760	0	6	0	7	0	2

-continued-

Appendix C2.–Page 2 of 2.

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho	Daily Sockeye	Cum. Sockeye
8/19	5	866	3	763	0	6	0	7	0	2
8/20	1	867	0	763	0	6	0	7	0	2
8/21	2	869	0	763	0	6	0	7	0	2
8/22	16	885	3	766	0	6	19	26	0	2
8/23	1	886	1	767	0	6	4	30	0	2
8/24	1	887	0	748	0	5	1	31	0	2
8/25	2	889	0	748	0	5	0	31	0	2
8/26	0	889	0	767	0	6	0	31	0	2
8/27	0	889	2	769	0	6	15	46	0	2
8/28	2	891	0	769	0	6	4	50	0	2
8/29	0	891	0	769	0	6	0	50	0	2
8/30	0	891	0	769	0	6	0	50	0	2
Total	891		769		6		50[a]		2	

Note: The inside box in the cumulative column is the day when the midpoint of the total was reached. The outside box is from the day the first quartile was reached to the day the third quartile was reached.

[a] This estimate of coho salmon is unrealiable. An estimated 700 coho salmon were counted by aerial survey, flown under excellent conditions, after the weir was removed because of high water.

Appendix C3.–Daily and cumulative (Cum.) passage of all salmonid species at Snake River weir, Norton Sound, 2010.

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho	Daily Sockeye	Cum. Sockeye
7/03	0	0	0	0	0	0	0	0	0	0
7/04	0	0	0	0	0	0	0	0	0	0
7/05	7	7	11	11	0	0	0	0	0	0
7/06	0	7	0	11	0	0	0	0	0	0
7/07	12	19	23	34	0	0	0	0	0	0
7/08	305	324	548	582	1	1	0	0	0	0
7/09	817	1,141	4,902	5,484	0	1	0	0	0	0
7/10	37	1,178	430	5,914	0	1	0	0	0	0
7/11	41	1,219	503	6,417	0	1	0	0	0	0
7/12	0	1,219	20	6,437	0	1	0	0	0	0
7/13	24	1,243	59	6,496	0	1	0	0	0	0
7/14	158	1,401	1,438	7,934	0	1	0	0	0	0
7/15	21	1,422	566	8,500	0	1	0	0	0	0
7/16	179	1,601	1,429	9,929	0	1	0	0	0	0
7/17	32	1,633	364	10,293	0	1	0	0	0	0
7/18	48	1,681	1,636	11,929	0	1	0	0	0	0
7/19	329	2,010	5,551	17,480	0	1	0	0	0	0
7/20	485	2,495	4,502	21,982	0	1	0	0	0	0
7/21	392	2,887	1,917	23,899	0	1	0	0	0	0
7/22	67	2,954	610	24,509	0	1	0	0	0	0
7/23	360	3,314	3,592	28,101	0	1	0	0	0	0
7/24	262	3,576	2,903	31,004	0	1	0	0	0	0
7/25	671	4,247	2,990	33,994	0	1	0	0	0	0
7/26	178	4,425	2,043	36,037	0	1	0	0	0	0
7/27	85	4,510	1,465	37,502	0	1	0	0	0	0
7/28	84	4,594	1,743	39,245	1	2	1	1	2	2
7/29	375	4,969	2,391	41,636	0	2	12	13	14	16
7/30	211	5,180	1,777	43,413	1	3	5	18	0	16
7/31	201	5,381	1,040	44,453	0	3	1	19	0	16
8/01	143	5,524	1,345	45,798	1	4	1	20	0	16
8/02	158	5,682	957	46,755	4	8	1	21	1	17
8/03	192	5,874	712	47,467	3	11	4	25	0	17
8/04	20	5,894	344	47,811	1	12	0	25	1	18
8/05	67	5,961	335	48,146	1	13	1	26	1	19
8/06	103	6,064	372	48,518	1	14	4	30	1	20
8/07	102	6,166	394	48,912	0	14	1	31	0	20
8/08	130	6,296	401	49,313	0	14	5	36	1	21
8/09	83	6,379	239	49,552	1	15	1	37	3	24
8/10	46	6,425	181	49,733	0	15	2	39	0	24
8/11	51	6,476	173	49,906	0	15	5	44	2	26
8/12	75	6,551	163	50,069	0	15	3	47	2	28
8/13	30	6,581	87	50,156	0	15	1	48	2	30
8/14	50	6,631	122	50,278	0	15	3	51	2	32
8/15	43	6,674	61	50,339	7	22	14	65	2	34
8/16	16	6,690	77	50,416	7	29	26	91	3	37
8/17	30	6,720	50	50,466	0	29	9	100	3	40
8/18	21	6,741	32	50,498	0	29	1	101	3	43
8/19	30	6,771	47	50,545	2	31	24	125	8	51
8/20	14	6,785	41	50,586	0	31	52	177	4	55

-continued-

Appendix C3.–Page 2 of 2.

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho	Daily Sockeye	Cum. Sockeye
8/21	5	6,790	7	50,593	0	31	10	187	0	55
8/22	11	6,801	31	50,624	0	31	46	233	0	55
8/23	15	6,816	21	50,645	0	31	17	250	4	59
8/24	17	6,833	24	50,669	2	33	47	297	1	60
8/25	5	6,838	11	50,680	0	33	7	304	0	60
8/26	10	6,848	14	50,694	1	34	51	355	9	69
8/27	12	6,860	48	50,742	0	34	86	441	5	74
8/28	13	6,873	15	50,757	0	34	65	506	11	85
8/29	10	6,883	29	50,786	1	35	88	594	2	87
8/30	12	6,895	36	50,822	0	35	90	684	4	91
8/31	8	6,903	29	50,851	0	35	23	707	0	91
9/01	7	6,910	17	50,868	0	35	15	722	0	91
9/02	10	6,920	32	50,900	2	37	144	866	5	96
9/03	21	6,941	52	50,952	2	39	719	1,585	11	107
9/04	6	6,947	33	50,985	0	39	266	1,851	8	115
9/05	7	6,954	38	51,023	0	39	215	2,066	2	117
9/06	6	6,960	20	51,043	1	40	43	2,109	2	119
9/07	11	6,971	27	51,070	3	43	113	2,222	2	121
9/08	1	6,972	6	51,076	0	43	4	2,226	0	121
9/09	0	6,972	10	51,086	0	43	2	2,228	3	124
9/10	0	6,972	3	51,089	0	43	2	2,230	0	124
9/11	1	6,973	10	51,099	0	43	13	2,243	0	124
Total	6,973		51,099		43		2,243		124	

Note: The inside box in the cumulative column is the day when the midpoint of the total was reached. The outside box is from the day the first quartile was reached to the day the third quartile was reached.

Appendix C4.–Daily and cumulative (Cum.) passage of all salmonid species at Snake River weir, Norton Sound, 2011.

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho	Daily Sockeye	Cum. Sockeye
7/08	10	10	0	0	0	0	0	0	0	0
7/09	1	11	0	0	1	1	0	0	0	0
7/10	188	199	4	4	0	1	0	0	0	0
7/11	160	359	1	5	0	1	0	0	1	1
7/12	227	586	1	6	0	1	0	0	1	2
7/13	114	700	2	8	0	1	0	0	0	2
7/14	165	865	7	15	0	1	0	0	0	2
7/15	175	1,040	9	24	0	1	0	0	1	3
7/16	183	1,223	24	48	0	1	0	0	0	3
7/17	416	1,639	81	129	0	1	0	0	0	3
7/18	323	1,962	182	311	0	1	0	0	0	3
7/19	103	2,065	229	540	0	1	0	0	0	3
7/20	113	2,178	247	787	0	1	0	0	0	3
7/21	339	2,517	448	1,235	0	1	0	0	1	4
7/22	522	3,039	939	2,174	0	1	0	0	0	4
7/23	81	3,120	424	2,598	0	1	0	0	0	4
7/24	191	3,311	816	3,414	0	1	0	0	0	4
7/25	17	3,328	261	3,675	0	1	2	2	0	4
7/26	25	3,353	102	3,777	0	1	1	3	0	4
7/27	101	3,454	712	4,489	0	1	3	6	0	4
7/28	11	3,465	45	4,534	0	1	0	6	0	4
7/29	19	3,484	57	4,591	0	1	1	7	0	4
7/30	52	3,536	144	4,735	0	1	0	7	0	4
7/31	98	3,634	209	4,944	0	1	3	10	0	4
8/01	55	3,689	123	5,067	0	1	0	10	0	4
8/02	29	3,718	74	5,141	0	1	0	10	0	4
8/03	35	3,753	163	5,304	0	1	0	10	0	4
8/04	319	4,072	422	5,726	0	1	34	44	0	4
8/05	18	4,090	76	5,802	0	1	6	50	0	4
8/06	37	4,127	274	6,076	0	1	5	55	1	5
8/07	12	4,139	53	6,129	0	1	1	56	0	5
8/08	5	4,144	46	6,175	0	1	0	56	0	5
8/09	39	4,183	102	6,277	0	1	0	56	0	5
8/10	19	4,202	68	6,345	0	1	0	56	0	5
8/11	31	4,233	143	6,488	0	1	5	61	0	5
8/12 [a]	21	4,254	98	6,586	0	1	2	63	0	5
8/13 [a]	22	4,276	95	6,681	0	1	2	64	0	5
8/14 [a]	15	4,291	81	6,762	0	1	2	67	0	5
8/15 [a]	11	4,302	72	6,834	0	1	2	69	0	5
8/16	13	4,315	132	6,966	0	1	4	73	0	5
8/17	8	4,323	31	6,997	0	1	0	73	2	7
8/18	2	4,325	31	7,028	0	1	2	75	0	7

-continued-

Appendix C4.–Page 2 of 2.

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho	Daily Sockeye	Cum. Sockeye
8/19	2	4,327	22	7,050	0	1	0	75	0	7
8/20	4	4,331	20	7,070	0	1	5	80	0	7
8/21	1	4,332	0	7,070	0	1	1	81	0	7
8/22	0	4,332	2	7,072	0	1	0	81	0	7
8/23	0	4,332	4	7,076	0	1	2	83	0	7
8/24	2	4,334	2	7,078	0	1	18	101	0	7
8/25	1	4,335	0	7,078	0	1	6	107	0	7
8/26	1	4,336	0	7,078	0	1	12	119	0	7
8/27	3	4,339	2	7,080	0	1	34	153	0	7
8/28	1	4,340	0	7,080	0	1	1	154	0	7
8/29	4	4,344	1	7,081	0	1	27	181	0	7
8/30	6	4,350	0	7,081	0	1	35	216	0	7
8/31	1	4,351	4	7,085	0	1	18	234	0	7
9/01	0	4,351	0	7,085	0	1	40	274	1	8
9/02	0	4,351	2	7,087	0	1	5	279	0	8
9/03	0	4,351	0	7,087	0	1	1	280	0	8
9/04	0	4,351	2	7,089	0	1	6	286	1	9
9/05	0	4,351	1	7,090	0	1	1	287	1	10
9/06	0	4,351	0	7,090	0	1	7	294	1	11
9/07	0	4,351	0	7,090	0	1	3	297	0	11
9/08	0	4,351	0	7,090	0	1	7	304	0	11
9/09	0	4,351	0	7,090	0	1	14	318	2	13
9/10	0	4,351	0	7,090	0	1	11	329	1	14
9/11	1	4,352	0	7,090	0	1	14	343	0	14
Total	4,352		7,090		1		343		14	

Note: The inside box in the cumulative column is the day when the midpoint of the total was reached. The outside box is from the day the first quartile was reached to the day the third quartile was reached.

[a] Some portion of the count was interpolated.

Appendix C5.–Daily and cumulative (Cum.) passage of all salmonid species at Snake River weir, Norton Sound, 2012.

Date	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
7/06	0	0	2	2	0	0	0	0	0	0
7/07	2	2	6	8	0	0	0	0	0	0
7/08	1	3	8	16	0	0	0	0	0	0
7/09	1	4	4	20	0	0	0	0	0	0
7/10	0	4	5	25	0	0	0	0	0	0
7/11	55	59	286	311	0	0	0	0	0	0
7/12	5	64	23	334	0	0	0	0	0	0
7/13	3	67	15	349	0	0	0	0	0	0
7/14	19	86	153	502	0	0	1	1	0	0
7/15	27	113	387	889	0	0	0	1	0	0
7/16	24	137	26	915	0	0	0	1	0	0
7/17	9	146	199	1,114	0	0	0	1	0	0
7/18	16	162	145	1,259	0	0	0	1	0	0
7/19	63	225	631	1,890	0	0	1	2	0	0
7/20	16	241	468	2,358	0	0	2	4	1	1
7/21	116	357	1,632	3,990	0	0	2	6	0	1
7/22	80	437	270	4,260	0	0	0	6	0	1
7/23	63	500	42	4,302	0	0	1	7	0	1
7/24	29	529	200	4,502	0	0	0	7	0	1
7/25	114	643	297	4,799	0	0	0	7	0	1
7/26 [a]	42	685	331	5,130	0	0	1	8	0	1
7/27 [a]	41	726	341	5,471	0	0	1	9	0	1
7/28 [a]	40	766	344	5,815	0	0	1	10	0	1
7/29 [a]	39	805	334	6,149	0	0	1	11	0	1
7/30 [a]	38	843	342	6,491	0	0	1	12	0	1
7/31 [a]	37	880	334	6,825	0	0	1	13	0	1
8/01 [a]	36	916	331	7,156	0	0	1	14	0	1
8/02 [a]	32	948	290	7,446	0	0	1	15	0	1
8/03 [b]		948		7,446	0	0		15		1
8/04 [b]		948		7,446	0	0		15		1
8/05 [b]		948		7,446	0	0		15		1
8/06 [b]		948		7,446	0	0		15		1
8/07 [b]		948		7,446	0	0		15		1
8/08	3	951	171	7,617	0	0	0	15	0	1
8/09	1	952	153	7,770	0	0	0	15	1	2
8/10	2	954	199	7,969	0	0	2	17	0	2
8/11	8	962	245	8,214	0	0	2	19	0	2
8/12	9	971	142	8,356	1	1	2	21	1	3
8/13	1	972	83	8,439	0	1	0	21	0	3
8/14	5	977	95	8,534	0	1	1	22	0	3
8/15	1	978	67	8,601	0	1	0	22	0	3
Total	978		8,601		1		22		3	

Note: Quartiles are not shown because the target operational period for the project was not fully monitored.

[a] The weir was not operational due to high water and counts were interpolated.

[b] Weir was not operational due to high water and counts could not be interpolated because of insufficient data once operations resumed; total escapement is considered a minimum.

Appendix C6.–Age and sex compositions by year for Snake River chum salmon ASL samples, 2001-2012.

Year	Sampling dates	Number of samples		Percent by sex		Percent by (Age group)						
				Male	Female	(0.1)	(0.2)	(0.3)	(0.4)	(0.5)	(0.6)	(0.7)
2001	8/06–8/21	297		54.5	45.5	0.0	1.0	43.1	55.6	0.7	0.0	0.0
2002	7/15–8/10	475		40.8	59.2	0.0	1.3	64.0	33.5	1.3	0.0	0.0
2003	7/06–9/06	171		54.4	45.6	0.0	0.0	73.7	22.2	4.1	0.0	0.0
2004	6/29–8/03	266		51.1	48.9	0.0	3.0	45.5	51.1	0.4	0.0	0.0
2005	6/29–9/09	386		44.0	56.0	0.0	1.3	83.7	13.7	1.3	0.0	0.0
2006	7/01–9/11	537		44.1	55.9	0.0	1.5	75.0	22.3	1.1	0.0	0.0
2007	7/03–9/11	607		51.4	48.6	0.0	0.2	49.8	46.6	3.5	0.0	0.0
2008	7/11–9/01	52	[a]									
2009	7/17–8/28	260		55.4	44.6	0.0	8.5	30.0	57.7	3.5	0.4	0.0
2010	7/07–9/07	305		38.4	61.6	0.0	1.0	90.8	8.2	0.0	0.0	0.0
2011	7/21–7/31	157		42.8	57.2	0.0	0.6	15.7	83.6	0.0	0.0	0.0
2012	7/12–8/14	112	[a]	52.3	47.7							

[a] Sample size insufficient for sex composition analysis

Appendix C7.–Age and sex compositions by year for Snake River coho salmon ASL samples, 2001-2012.

Year	Sampling dates	Number of samples		Percent by sex		Percent by (Age group)				
				Male	Female	(1.1)	(2.1)	(2.2)	(3.1)	(4.1)
2001	9/07–9/11	124	[a,b]	45.2	54.8					
2002	8/26–9/04	192		55.2	44.8	2.6	87.5	0.0	9.9	0.0
2003	8/04–9/07	132		47.0	53.0	6.8	83.3	0.0	9.8	0.0
2004	7/23–8/24	131		37.4	62.6	10.7	83.2	0.0	6.1	0.0
2005	7/30–9/10	188		61.7	38.3	9.6	86.2	0.0	4.3	0.0
2006	7/14–9/11	244		49.2	50.8	6.1	91.0	0.0	2.9	0.0
2007	8/02–9/12	105	[b]	59.0	41.0					
2008	8/08–9/05	47	[b]							
2009	8/10–8/28	27	[b]							
2010	8/16–9/03	130	[b]	46.9	53.1					
2011	8/18–9/12	60	[b]	59.8	40.2					
2012	7/14–8/14	5	[b]							

[a] No age data collected.

[b] Sample size insufficient for sex composition analysis

Appendix C8.–Snake River weir water temperature (Temp.) and stream stage (Depth) observations, Norton Sound 2008–2012.

	2008		2009		2010		2011		2012	
Date	Temp. (°C)	Depth (cm)	Temp. (°C)	Depth (cm)	Temp. (°C)	Depth (cm)	Temp. (°C)	Depth (cm)	Temp. (°C)	Depth (cm)
7/03					11.0	39.6				
7/04					12.0	39.0				
7/05					12.0	37.2				
7/06					12.0	36.6			10.0	50.6
7/07	15.0	61.3			11.0	36.0			12.0	48.8
7/08	11.0	61.3	14.0	30.5	11.0	36.6			12.0	47.5
7/09	9.0	64.0	7.0	29.9	13.0	35.4	10.0	86.6	9.0	46.3
7/10	10.0	82.3	9.0	29.3	13.0	33.5	9.0	86.6	11.0	45.7
7/11	8.0	79.2	7.0	27.4	16.0	30.5	8.0	89.6	13.0	44.8
7/12	7.0	103.6	9.0	26.5	12.0	33.5	7.0	103.9	9.0	44.8
7/13	8.0	112.8	9.0	26.5	10.0	31.4	7.0	128.9	11.0	44.2
7/14	8.0	115.8	9.0	26.2	11.0	31.7	6.0	128.3	10.0	44.2
7/15	8.0	143.3	8.0	26.5	9.0	31.4	6.0	128.9	10.0	44.5
7/16	9.0	158.5	9.0	25.9	10.0	31.1	6.0	125.6	9.0	43.6
7/17	9.0	158.5	9.0	24.4	9.0	33.2	6.0	132.0	8.0	43.3
7/18	8.0	143.3	10.0	27.4	8.0	35.4	6.0	126.8	9.0	43.3
7/19	9.0	131.1	9.0	28.0	8.0	37.2	8.0	117.3	8.0	42.1
7/20	8.0	125.0	9.0	27.4	10.0	37.8	7.0	112.8	9.0	41.1
7/21	5.0	115.8	9.0	30.2	11.0	36.6	8.0	107.3	11.0	41.1
7/22	6.0	106.7	13.0	24.4	9.0	36.6	9.0	101.8	11.0	39.6
7/23	8.0	100.6	11.0	25.9	7.0	36.6	9.0	101.2	12.0	39.0
7/24	7.0	94.5	9.0	25.3	8.0	35.4	9.0	104.2	9.0	54.6
7/25	8.0	100.6	9.0	23.2	8.0	33.8	8.0	99.7	9.0	160.6
7/26	7.0	97.5	10.0	24.4	8.0	34.7	9.0	93.9	8.0	120.4
7/27	6.0	91.4	9.0	24.4	NA	36.6	9.0	90.8	8.0	121.0
7/28	8.0	83.8	10.0	25.9	10.0	36.6	9.0	90.5	8.0	165.2
7/29	7.0	82.3	9.0	26.2	8.0	36.3	9.0	86.6	8.0	NA
7/30	7.0	79.2	9.0	30.5	10.0	36.6	7.0	98.8	NA	NA
7/31	7.0	76.8	8.0	36.6	11.0	33.5	8.0	95.1	NA	NA
8/01	7.0	74.7	8.0	36.6	11.0	32.0	8.0	86.6	NA	NA
8/02	6.0	73.2	9.0	36.6	13.0	31.7	8.0	83.5	NA	NA
8/03	8.0	71.9	10.0	36.6	11.0	31.7	9.0	89.6	NA	NA
8/04	6.0	73.5	10.0	33.5	11.0	31.1	8.0	112.8	NA	NA
8/05	8.0	69.5	11.0	30.5	11.0	31.7	7.0	109.1	NA	NA
8/06	8.0	72.5	13.0	30.5	10.0	32.6	8.0	100.0	NA	NA
8/07	7.0	66.4	15.0	28.7	10.0	33.5	8.0	99.4	NA	NA
8/08	7.0	65.2	10.0	28.3	11.0	33.2	7.0	137.2	9.0	86.0
8/09	8.0	62.8	11.0	29.0	NA	32.3	8.0	109.7	5.0	84.7
8/10	8.0	61.0	11.0	27.1	NA	34.1	8.0	106.7	8.0	81.1
8/11	8.0	61.0	11.0	29.0	NA	41.5	8.0	110.3	9.0	78.0

-continued-

Appendix C8.–Page 2 of 2.

	2008		2009		2010		2011		2012	
Date	Temp. (°C)	Depth (cm)	Temp. (°C)	Depth (cm)	Temp. (°C)	Depth (cm)	Temp. (°C)	Depth (cm)	Temp. (°C)	Depth (cm)
8/12	8.0	60.4	11.0	27.1	NA	39.6	NA	NA	8.0	75.6
8/13	8.0	58.5	11.0	26.8	NA	41.5	NA	NA	9.0	75.0
8/14	10.0	57.3	10.0	27.1	NA	40.8	NA	NA	8.0	76.2
8/15	10.0	56.7	11.0	27.4	11.0	51.8	NA	109.7	9.0	75.0
8/16	8.0	56.7	10.0	26.2	9.0	54.9	11.0	117.7	9.0	145.7
8/17	6.0	56.4	9.0	25.0	8.0	52.4	8.0	112.8		
8/18	10.0	53.6	7.0	28.0	7.0	51.8	8.0	109.1		
8/19	10.0	55.5	10.0	27.7	8.0	50.0	8.0	105.5		
8/20	10.0	54.3	9.0	26.2	8.0	49.4	8.0	100.6		
8/21	9.0	53.0	9.0	28.0	8.0	47.9	7.0	97.5		
8/22	9.0	51.2	8.0	36.3	7.0	46.9	7.0	95.1		
8/23	8.0	50.6	9.0	37.2	7.0	46.3	5.0	92.7		
8/24	9.0	50.9	6.0	36.3	9.0	44.8	9.0	98.8		
8/25	6.0	49.4	7.0	32.9	8.0	44.5	6.0	96.9		
8/26	2.0	45.1	9.0	30.5	8.0	44.5	6.0	93.9		
8/27	2.0	33.5	7.0	30.2	9.0	44.5	7.0	89.9		
8/28	3.0	48.8	7.0	29.9	8.0	44.5	6.0	89.0		
8/29	2.0	34.1	9.0	29.9	8.0	44.5	7.0	84.1		
8/30	5.0	48.8	8.0	33.5	8.0	43.9	6.0	91.4		
8/31	-1.0	48.8	8.0	89.0	7.0	43.3	7.0	91.4		
9/01	6.0	49.4	7.0	79.9	7.0	44.5	7.0	88.4		
9/02	5.0	47.5	7.0	85.3	7.0	47.5	8.0	84.1		
9/03	4.0	48.2	6.0	79.6	7.0	53.0	10.0	83.5		
9/04	7.0	45.1	6.0	73.8	7.0	60.4	10.0	79.9		
9/05	5.0	44.8	6.0	70.1	8.0	63.4	7.0	78.6		
9/06	3.0	45.1			8.0	64.0	7.0	78.6		
9/07					8.0	97.5	9.0	76.8		
9/08					8.0	113.4	3.0	78.0		
9/09					7.0	103.0	5.0	81.7		
9/10					7.0	96.9	NA	NA		
9/11					7.0	93.9	NA	NA		
9/12							NA	NA		
9/13							NA	NA		
9/14							7.0	88.4		

Note: Recorded water temperatures are morning water temperatures, except where morning temperatures were not available. Recorded water depths are highest recorded daily water depth.

APPENDIX D: NOME RIVER WEIR

Appendix D1.–Daily and cumulative (Cum.) passage of all salmonid species at Nome River weir, Norton Sound, 2008.

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho	Daily Sockeye	Cum. Sockeye
7/02	0	0	4	4	0	0	0	0	0	0
7/03	1	1	4,710	4,714	0	0	0	0	0	0
7/04	24	25	11,874	16,588	1	1	0	0	0	0
7/05	71	96	50,889	67,477	3	4	0	0	1	1
7/06	113	209	58,752	126,229	2	6	0	0	0	1
7/07	123	332	54,675	180,904	0	6	0	0	0	1
7/08	14	346	8,207	189,111	0	6	0	0	0	1
7/09	16	362	4,071	193,182	0	6	0	0	0	1
7/10	23	385	2,200	195,382	0	6	0	0	1	2
7/11	8	393	1,872	197,254	0	6	0	0	0	2
7/12	106	499	6,016	203,270	0	6	0	0	0	2
7/13	210	709	20,350	223,620	12	18	0	0	4	6
7/14	122	831	19,584	243,204	0	18	0	0	0	6
7/15	63	894	10,110	253,314	0	18	0	0	0	6
7/16	103	997	16,558	269,872	0	18	0	0	0	6
7/17	65	1,062	15,617	285,489	1	19	0	0	0	6
7/18	11	1,073	19,955	305,444	0	19	0	0	0	6
7/19	26	1,099	69,658	375,102	1	20	0	0	6	12
7/20	39	1,138	64,300	439,402	2	22	1	1	7	19
7/21	25	1,163	33,588	472,990	0	22	0	1	0	19
7/22	17	1,180	35,883	508,873	0	22	0	1	2	21
7/23	28	1,208	43,336	552,209	1	23	2	3	6	27
7/24	57	1,265	71,571	623,780	0	23	1	4	3	30
7/25	35	1,300	80,765	704,545	0	23	5	9	1	31
7/26	38	1,338	49,857	754,402	0	23	20	29	0	31
7/27	101	1,439	119,712	874,114	0	23	31	60	0	31
7/28	29	1,468	35,276	909,390	0	23	8	68	0	31
7/29	16	1,484	26,424	935,814	0	23	5	73	0	31
7/30	54	1,538	37,454	973,268	0	23	63	136	0	31
7/31	50	1,588	32,303	1,005,571	1	24	31	167	1	32
8/01	61	1,649	43,522	1,049,093	1	25	42	209	0	32
8/02	38	1,687	23,700	1,072,793	0	25	13	222	0	32
8/03	30	1,717	24,636	1,097,429	0	25	7	229	0	32
8/04	33	1,750	13,255	1,110,684	0	25	35	264	0	32
8/05	87	1,837	22,525	1,133,209	1	26	88	352	1	33
8/06	16	1,853	8,489	1,141,698	0	26	38	390	1	34
8/07	73	1,926	11,272	1,152,970	0	26	62	452	0	34
8/08	55	1,981	8,333	1,161,303	0	26	30	482	4	38
8/09	35	2,016	6,820	1,168,123	0	26	61	543	5	43
8/10	85	2,101	7,659	1,175,782	1	27	71	614	0	43
8/11	47	2,148	2,017	1,177,799	0	27	69	683	1	44
8/12	25	2,173	2,000	1,179,799	0	27	65	748	1	45
8/13	65	2,238	2,240	1,182,039	0	27	62	810	2	47

-continued-

Appendix D1.–Page 2 of 2.

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho	Daily Sockeye	Cum. Sockeye
8/14	41	2,279	1,394	1,183,433	0	27	51	861	3	50
8/15	31	2,310	828	1,184,261	0	27	55	916	5	55
8/16	28	2,338	562	1,184,823	0	27	58	974	0	55
8/17	30	2,368	379	1,185,202	0	27	69	1,043	0	55
8/18	47	2,415	334	1,185,536	0	27	119	1,162	6	61
8/19	33	2,448	339	1,185,875	0	27	84	1,246	0	61
8/20	16	2,464	141	1,186,016	0	27	51	1,297	3	64
8/21	9	2,473	83	1,186,099	0	27	18	1,315	0	64
8/22	11	2,484	64	1,186,163	0	27	58	1,373	0	64
8/23	7	2,491	21	1,186,184	0	27	23	1,396	2	66
8/24	21	2,512	53	1,186,237	0	27	38	1,434	0	66
8/25	9	2,521	26	1,186,263	0	27	25	1,459	2	68
8/26	5	2,526	16	1,186,279	1	28	20	1,479	3	71
8/27	11	2,537	39	1,186,318	0	28	229	1,708	3	74
8/28	3	2,540	18	1,186,336	0	28	67	1,775	0	74
8/29	11	2,551	25	1,186,361	0	28	385	2,160	3	77
8/30	5	2,556	18	1,186,379	0	28	205	2,365	2	79
8/31	8	2,564	44	1,186,423	0	28	353	2,718	0	79
9/01	5	2,569	44	1,186,467	0	28	320	3,038	1	80
9/02	2	2,571	15	1,186,482	0	28	32	3,070	2	82
9/03	4	2,575	11	1,186,493	0	28	102	3,172	1	83
9/04	4	2,579	12	1,186,505	0	28	210	3,382	1	84
9/05	1	2,580	1	1,186,506	0	28	23	3,405	0	84
9/06	0	2,580	7	1,186,513	0	28	19	3,424	0	84
9/07	2	2,582	5	1,186,518	0	28	174	3,598	4	88
9/08	0	2,582	5	1,186,523	0	28	19	3,617	0	88
9/09	5	2,587	13	1,186,536	0	28	252	3,869	0	88
9/10	3	2,590	4	1,186,540	0	28	6	3,875	0	88
9/11	1	2,591	0	1,186,540	0	28	36	3,911	1	89
9/12	0	2,591	0	1,186,540	0	28	2	3,913	1	90
9/13	0	2,591	0	1,186,540	0	28	2	3,915	0	90
9/14	5	2,596	5	1,186,545	0	28	250	4,165	0	90
9/15	5	2,601	4	1,186,549	0	28	101	4,266	0	90
9/16	2	2,603	4	1,186,553	0	28	161	4,427	0	90
9/17	4	2,607	1	1,186,554	0	28	178	4,605	0	90
Total	2,607		1,186,554		28		4,605		90	

Note: The inside box in the cumulative column is the day when the midpoint of the total was reached. The outside box is from the day the first quartile was reached to the day the third quartile was reached.

Appendix D2.–Daily and cumulative (Cum.) passage of all salmonid species at Nome River weir, Norton Sound, 2009.

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho	Daily Sockeye	Cum. Sockeye
7/03	5	5	1	1	0	0	0	0	0	0
7/04	1	6	0	1	0	0	0	0	0	0
7/05	0	6	0	1	0	0	0	0	0	0
7/06	0	6	2	3	0	0	0	0	1	1
7/07	1	7	2	5	0	0	0	0	0	1
7/08	4	11	1	6	0	0	0	0	0	1
7/09	10	21	0	6	0	0	0	0	0	1
7/10	15	36	1	7	0	0	0	0	0	1
7/11	29	65	5	12	0	0	0	0	0	1
7/12	18	83	21	33	0	0	0	0	0	1
7/13	18	101	80	113	0	0	0	0	0	1
7/14	5	106	7	120	0	0	0	0	0	1
7/15	1	107	11	131	0	0	0	0	0	1
7/16	15	122	21	152	0	0	0	0	0	1
7/17	122	244	262	414	0	0	0	0	2	3
7/18	31	275	68	482	0	0	0	0	0	3
7/19	75	350	256	738	0	0	0	0	3	6
7/20	10	360	18	756	0	0	0	0	0	6
7/21	104	464	981	1,737	1	1	0	0	5	11
7/22	77	541	1,180	2,917	1	2	0	0	5	16
7/23	0	541	49	2,966	0	2	0	0	0	16
7/24	29	570	1,198	4,164	0	2	0	0	1	17
7/25	102	672	2,841	7,005	3	5	2	2	5	22
7/26	60	732	1,756	8,761	0	5	1	3	0	22
7/27	3	735	148	8,909	0	5	0	3	0	22
7/28	83	818	2,021	10,930	0	5	2	5	2	24
7/29	13	831	371	11,301	0	5	0	5	2	26
7/30	43	874	514	11,815	1	6	0	5	1	27
7/31	8	882	130	11,945	0	6	0	5	0	27
8/01	14	896	497	12,442	0	6	0	5	0	27
8/02	26	922	559	13,001	0	6	0	5	1	28
8/03	21	943	448	13,449	0	6	0	5	0	28
8/04	28	971	390	13,839	0	6	0	5	1	29
8/05	38	1,009	467	14,306	0	6	1	6	2	31
8/06	51	1,060	417	14,723	1	7	3	9	10	41
8/07	15	1,075	133	14,856	0	7	0	9	2	43
8/08	32	1,107	300	15,156	0	7	1	10	3	46
8/09	21	1,128	277	15,433	0	7	2	12	5	51
8/10	62	1,190	200	15,633	1	8	2	14	2	53
8/11	27	1,217	119	15,752	0	8	2	16	3	56
8/12	19	1,236	123	15,875	0	8	1	17	1	57
8/13	6	1,242	36	15,911	0	8	0	17	0	57

-continued-

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho	Daily Sockeye	Cum. Sockeye
8/14	54	1,296	218	16,129	0	8	23	40	4	61
8/15	24	1,320	91	16,220	0	8	11	51	0	61
8/16	13	1,333	28	16,248	0	8	4	55	2	63
8/17	17	1,350	47	16,295	0	8	11	66	0	63
8/18	19	1,369	41	16,336	0	8	27	93	1	64
8/19	1	1,370	19	16,355	1	9	8	101	2	66
8/20	6	1,376	13	16,368	0	9	2	103	0	66
8/21	25	1,401	30	16,398	0	9	62	165	1	67
8/22	23	1,424	16	16,414	0	9	113	278	10	77
8/23	5	1,429	10	16,424	0	9	11	289	5	82
8/24	5	1,434	10	16,434	0	9	6	295	0	82
8/25	2	1,436	7	16,441	0	9	0	295	0	82
8/26	3	1,439	9	16,450	0	9	8	303	2	84
8/27	3	1,442	0	16,450	0	9	16	319	2	86
8/28	25	1,467	7	16,457	1	10	462	781	7	93
8/29	3	1,470	4	16,461	0	10	0	781	1	94
8/30	3	1,473	4	16,465	0	10	39	820	0	94
8/31	0	1,473	0	16,465	0	10	0	820	0	94
9/01	4	1,477	3	16,468	0	10	98	918	0	94
9/02	6	1,483	5	16,473	0	10	78	996	1	95
9/03	4	1,487	4	16,477	0	10	12	1,008	0	95
9/04	2	1,489	1	16,478	0	10	1	1,009	0	95
9/05	2	1,491	4	16,482	0	10	14	1,023	3	98
9/06	3	1,494	2	16,484	0	10	2	1,025	0	98
9/07	1	1,495	2	16,486	0	10	2	1,027	0	98
9/08	4	1,499	0	16,486	0	10	5	1,032	0	98
9/09	13	1,512	2	16,488	0	10	261	1,293	3	101
9/10	5	1,517	1	16,489	0	10	8	1,301	0	101
9/11	8	1,525	0	16,489	0	10	5	1,306	0	101
9/12	6	1,531	0	16,489	0	10	3	1,309	0	101
9/13	6	1,537	0	16,489	0	10	2	1,311	0	101
9/14	1	1,538	0	16,489	0	10	0	1,311	0	101
9/15	4	1,542	0	16,489	0	10	5	1,316	0	101
9/16	9	1,551	1	16,490	0	10	17	1,333	1	102
9/17	4	1,555	0	16,490	0	10	3	1,336	0	102
9/18	0	1,555	0	16,490	0	10	5	1,341	0	102
9/19	9	1,564	0	16,490	0	10	24	1,365	0	102
9/20	1	1,565	0	16,490	0	10	5	1,370	1	103
Total	1,565		16,490		10		1,370		103	

Note: The inside box in the cumulative column is the day when the midpoint of the total was reached. The outside box is from the day the first quartile was reached to the day the third quartile was reached.

Appendix D3.–Daily and cumulative (Cum.) passage of all salmonid species at Nome River weir, Norton Sound, 2010.

Date	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
6/30	0	0	0	0	0	0	0	0	0	0
7/01	0	0	0	0	0	0	0	0	0	0
7/02	0	0	0	0	0	0	0	0	0	0
7/03	0	0	0	0	0	0	0	0	0	0
7/04	0	0	0	0	0	0	0	0	0	0
7/05	11	11	38	38	0	0	0	0	0	0
7/06	47	58	552	590	0	0	0	0	0	0
7/07	56	114	885	1,475	0	0	0	0	3	3
7/08 [a]	144	258	6,050	7,525	0	0	0	0	0	3
7/09	468	726	33,831	41,356	0	0	0	0	0	3
7/10	120	846	12,235	53,591	0	0	0	0	0	3
7/11	93	939	2,566	56,157	0	0	0	0	0	3
7/12	62	1,001	1,183	57,340	0	0	0	0	0	3
7/13	18	1,019	355	57,695	0	0	0	0	0	3
7/14	19	1,038	186	57,881	0	0	0	0	0	3
7/15	114	1,152	1,420	59,301	0	0	0	0	0	3
7/16	164	1,316	3,169	62,470	0	0	0	0	0	3
7/17	13	1,329	687	63,157	0	0	0	0	0	3
7/18	81	1,410	2,385	65,542	0	0	0	0	0	3
7/19	183	1,593	4,468	70,010	0	0	0	0	1	4
7/20	217	1,810	5,095	75,105	0	0	0	0	2	6
7/21	110	1,920	4,687	79,792	0	0	0	0	0	6
7/22	133	2,053	4,079	83,871	0	0	0	0	0	6
7/23	263	2,316	6,264	90,135	0	0	0	0	0	6
7/24	677	2,993	9,042	99,177	0	0	1	1	0	6
7/25	324	3,317	12,118	111,295	0	0	0	1	0	6
7/26	92	3,409	5,237	116,532	0	0	0	1	1	7
7/27	179	3,588	16,897	133,429	0	0	0	1	0	7
7/28	49	3,637	2,536	135,965	0	0	0	1	0	7
7/29	130	3,767	4,116	140,081	0	0	0	1	0	7
7/30	282	4,049	4,641	144,722	0	0	0	1	0	7
7/31	255	4,304	5,353	150,075	0	0	5	6	2	9
8/01	145	4,449	4,380	154,455	3	3	26	32	1	10
8/02	85	4,534	3,088	157,543	1	4	15	47	0	10
8/03	23	4,557	839	158,382	0	4	4	51	0	10
8/04	62	4,619	875	159,257	0	4	11	62	2	12
8/05	81	4,700	1,205	160,462	0	4	10	72	3	15
8/06	96	4,796	1,222	161,684	0	4	20	92	1	16
8/07	157	4,953	706	162,390	0	4	10	102	1	17
8/08	112	5,065	906	163,296	0	4	21	123	1	18
8/09	31	5,096	400	163,696	0	4	11	134	0	18
8/10	51	5,147	516	164,212	0	4	42	176	3	21
8/11	72	5,219	397	164,609	2	6	43	219	1	22
8/12	32	5,251	171	164,780	1	7	10	229	0	22
8/13	52	5,303	162	164,942	0	7	13	242	3	25

-continued-

Appendix D3.–Page 2 of 2.

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho	Daily Sockeye	Cum. Sockeye
8/14	35	5,338	122	165,064	0	7	5	247	0	25
8/15	119	5,457	106	165,170	0	7	290	537	0	25
8/16	12	5,469	64	165,234	0	7	170	707	0	25
8/17	10	5,479	30	165,264	0	7	35	742	1	26
8/18	9	5,488	23	165,287	0	7	6	748	0	26
8/19	21	5,509	30	165,317	0	7	6	754	0	26
8/20	20	5,529	27	165,344	0	7	113	867	1	27
8/21	15	5,544	34	165,378	0	7	157	1,024	0	27
8/22	7	5,551	29	165,407	0	7	77	1,101	1	28
8/23	16	5,567	20	165,427	0	7	141	1,242	1	29
8/24	10	5,577	18	165,445	0	7	49	1,291	3	32
8/25	11	5,588	35	165,480	0	7	73	1,364	0	32
8/26	18	5,606	32	165,512	0	7	289	1,653	5	37
8/27	18	5,624	38	165,550	2	9	296	1,949	2	39
8/28	12	5,636	16	165,566	0	9	33	1,982	0	39
8/29	4	5,640	21	165,587	0	9	12	1,994	0	39
8/30	40	5,680	53	165,640	0	9	333	2,327	0	39
8/31	7	5,687	14	165,654	0	9	28	2,355	0	39
9/01	13	5,700	12	165,666	0	9	34	2,389	0	39
9/02	20	5,720	47	165,713	0	9	387	2,776	1	40
9/03	58	5,778	71	165,784	0	9	604	3,380	2	42
9/04	17	5,795	56	165,840	0	9	288	3,668	0	42
9/05	13	5,808	22	165,862	0	9	83	3,751	1	43
9/06	6	5,814	18	165,880	0	9	86	3,837	0	43
9/07	22	5,836	28	165,908	0	9	219	4,056	0	43
9/08	0	5,836	3	165,911	0	9	9	4,065	0	43
9/09	4	5,840	1	165,912	0	9	6	4,071	0	43
9/10	1	5,841	2	165,914	0	9	3	4,074	0	43
9/11	4	5,845	4	165,918	0	9	9	4,083	0	43
9/12	6	5,851	2	165,920	0	9	4	4,087	0	43
9/13	3	5,854	6	165,926	0	9	7	4,094	0	43
9/14	4	5,858	0	165,926	0	9	6	4,100	0	43
9/15	3	5,861	2	165,928	0	9	10	4,110	0	43
9/16	16	5,877	6	165,934	0	9	4	4,114	0	43
Total	5,877		165,934		9		4,114		43	

Note: The inside box in the cumulative column is the day when the midpoint of the total was reached. The outside box is from the day the first quartile was reached to the day the third quartile was reached.

[a] Partial count because of breach in weir; total escapement should be considered a minimum value.

Appendix D4.–Daily and cumulative (Cum.) passage of all salmonid species at Nome River weir, Norton Sound, 2011.

Date	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
7/01	0	0	0	0	0	0	0	0	0	0
7/02	0	0	0	0	0	0	0	0	0	0
7/03	0	0	0	0	0	0	0	0	0	0
7/04	0	0	0	0	0	0	0	0	0	0
7/05	0	0	0	0	0	0	0	0	0	0
7/06	81	81	0	0	0	0	0	0	0	0
7/07	11	92	3	3	0	0	0	0	0	0
7/08	1	93	2	5	0	0	0	0	0	0
7/09	3	96	1	6	1	1	0	0	0	0
7/10	8	104	2	8	0	1	0	0	1	1
7/11	140	244	13	21	0	1	0	0	0	1
7/12	158	402	15	36	0	1	0	0	0	1
7/13	181	583	12	48	2	3	0	0	0	1
7/14	67	650	7	55	0	3	0	0	0	1
7/15	179	829	19	74	0	3	0	0	0	1
7/16	165	994	60	134	0	3	0	0	0	1
7/17	184	1,178	64	198	0	3	0	0	0	1
7/18	228	1,406	276	474	1	4	0	0	0	1
7/19	8	1,414	24	498	0	4	0	0	0	1
7/20	86	1,500	131	629	0	4	0	0	0	1
7/21	170	1,670	361	990	0	4	0	0	0	1
7/22	293	1,963	1,205	2,195	0	4	0	0	0	1
7/23	56	2,019	504	2,699	2	6	0	0	0	1
7/24	333	2,352	1,159	3,858	0	6	0	0	0	1
7/25	328	2,680	2,305	6,163	0	6	0	0	0	1
7/26	26	2,706	489	6,652	1	7	0	0	0	1
7/27	24	2,730	167	6,819	0	7	9	9	0	1
7/28	8	2,738	192	7,011	0	7	1	10	0	1
7/29	5	2,743	181	7,192	0	7	0	10	0	1
7/30	44	2,787	347	7,539	0	7	7	17	0	1
7/31	67	2,854	798	8,337	0	7	9	26	0	1
8/01	16	2,870	443	8,780	0	7	19	45	0	1
8/02	113	2,983	610	9,390	0	7	67	112	0	1
8/03	26	3,009	233	9,623	0	7	21	133	0	1
8/04	14	3,023	35	9,658	0	7	0	133	0	1
8/05	31	3,054	1,088	10,746	0	7	10	143	0	1
8/06	13	3,067	735	11,481	0	7	1	144	0	1
8/07	3	3,070	150	11,631	0	7	3	147	0	1
8/08	98	3,168	802	12,433	0	7	42	189	0	1
8/09	43	3,211	536	12,969	0	7	18	207	0	1
8/10	20	3,231	345	13,314	0	7	8	215	0	1
8/11	53	3,284	248	13,562	0	7	73	288	0	1
8/12 [a]	29	3,313	283	13,845	0	7	25	313	0	1
8/13 [a]	22	3,335	158	14,003	0	7	25	338	0	1
8/14 [a]	20	3,355	80	14,083	0	7	26	364	0	1

-continued-

Appendix D4.–Page 2 of 2.

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho	Daily Sockeye	Cum. Sockeye
8/15	0	3,355	3	14,086	0	7	0	364	0	1
8/16	14	3,369	37	14,123	0	7	19	383	0	1
8/17	11	3,380	30	14,153	0	7	12	395	0	1
8/18	10	3,390	32	14,185	0	7	10	405	0	1
8/19	15	3,405	63	14,248	1	8	6	411	0	1
8/20	11	3,416	10	14,258	0	8	7	418	0	1
8/21	15	3,431	27	14,285	0	8	28	446	0	1
8/22	3	3,434	7	14,292	0	8	0	446	0	1
8/23	4	3,438	1	14,293	0	8	1	447	0	1
8/24	30	3,468	25	14,318	0	8	87	534	0	1
8/25	6	3,474	6	14,324	0	8	31	565	0	1
8/26	23	3,497	13	14,337	0	8	121	686	2	3
8/27	7	3,504	19	14,356	0	8	29	715	0	3
8/28	2	3,506	3	14,359	0	8	1	716	0	3
8/29	2	3,508	2	14,361	0	8	3	719	1	4
8/30	30	3,538	7	14,368	0	8	181	900	1	5
8/31	8	3,546	1	14,369	0	8	86	986	1	6
9/01	2	3,548	0	14,369	1	9	31	1,017	0	6
9/02	2	3,550	2	14,371	0	9	21	1,038	1	7
9/03	0	3,550	1	14,372	0	9	0	1,038	0	7
9/04	5	3,555	2	14,374	1	10	7	1,045	0	7
9/05	8	3,563	0	14,374	1	11	86	1,131	3	10
9/06	2	3,565	1	14,375	0	11	41	1,172	2	12
9/07	2	3,567	0	14,375	0	11	25	1,197	1	13
9/08	2	3,569	0	14,375	0	11	31	1,228	0	13
9/09	3	3,572	1	14,376	0	11	36	1,264	3	16
9/10	2	3,574	5	14,381	0	11	325	1,589	6	22
9/11	4	3,578	3	14,384	1	12	233	1,822	0	22
9/12	0	3,578	0	14,384	0	12	9	1,831	0	22
Total	3,578		14,384		12		1,831		22	

Note: The inside box in the cumulative column is the day when the midpoint of the total was reached. The outside box is from the day the first quartile was reached to the day the third quartile was reached.

[a] Some portion of the count was interpolated.

Appendix D5.–Daily and cumulative (Cum.) passage of all salmonid species at Nome River weir, Norton Sound, 2012.

Date		Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho	Daily Sockeye	Cum. Sockeye
7/04		0	0	2	2	0	0	0	0	1	1
7/05		6	6	89	91	0	0	0	0	0	1
7/06		0	6	14	105	0	0	0	0	0	1
7/07		13	19	116	221	0	0	0	0	0	1
7/08		1	20	36	257	0	0	0	0	1	2
7/09		5	25	205	462	0	0	0	0	0	2
7/10		11	36	650	1,112	1	1	0	0	0	2
7/11		117	153	3,761	4,873	0	1	0	0	0	2
7/12		163	316	5,687	10,560	0	1	0	0	0	2
7/13		76	392	5,132	15,692	0	1	0	0	1	3
7/14		26	418	3,395	19,087	0	1	0	0	4	7
7/15		10	428	702	19,789	0	1	0	0	2	9
7/16		103	531	3,401	23,190	0	1	0	0	3	12
7/17		17	548	2,585	25,775	0	1	0	0	2	14
7/18		3	551	1,875	27,650	0	1	0	0	3	17
7/19		158	709	4,311	31,961	0	1	0	0	8	25
7/20		168	877	6,800	38,761	0	1	0	0	3	28
7/21		70	947	7,716	46,477	0	1	0	0	1	29
7/22		72	1,019	7,819	54,296	1	2	0	0	0	29
7/23		226	1,245	25,173	79,469	1	3	0	0	8	37
7/24		34	1,279	8,045	87,514	0	3	0	0	1	38
7/25		43	1,322	1,554	89,068	0	3	0	0	1	39
7/26	[a]	77	1,399	8,625	97,693	0	3	2	2	2	41
7/27	[a]	67	1,466	7,640	105,332	0	4	4	5	2	43
7/28	[a]	58	1,523	7,026	112,359	0	4	6	11	2	45
7/29	[a]	29	1,552	3,932	116,290	0	4	12	23	1	45
7/30	[a]	26	1,578	3,010	119,300	0	4	15	37	0	45
7/31		7	1,585	94	119,394	0	4	1	38	0	45
8/01		14	1,599	1,441	120,835	0	4	10	48	0	45
8/02		13	1,612	1,805	122,640	0	4	11	59	1	46
8/03		17	1,629	4,140	126,780	0	4	14	73	0	46
8/04		51	1,680	6,605	133,385	0	4	35	108	0	46
8/05		15	1,695	2,516	135,901	0	4	17	125	0	46
8/06		17	1,712	1,487	137,388	0	4	18	143	0	46
8/07		45	1,757	3,679	141,067	0	4	13	156	0	46
8/08		27	1,784	2,116	143,183	0	4	15	171	0	46
8/09		24	1,808	2,201	145,384	0	4	13	184	0	46
8/10		68	1,876	2,129	147,513	1	5	14	198	0	46
8/11		22	1,898	1,141	148,654	0	5	10	208	0	46
8/12		37	1,935	1,315	149,969	0	5	13	221	1	47
8/13		26	1,961	792	150,761	1	6	5	226	0	47
8/14		19	1,980	530	151,291	0	6	5	231	0	47
8/15		20	2,000	500	151,791	0	6	6	237	1	48
8/16	[b]	28	2,028	0	151,791	0	6	0	237	0	48
Total		2,028		151,791		6		237		48	

Note: Quartiles are not shown because the target operational period of the project was not fully monitored.

[a] Some portion of the count was interpolated.

[b] Partial count before weir was pulled because of high water.

Appendix D6.–Age and sex compositions by year for Nome River chum salmon ASL samples, 1995–2012.

Year	Sampling dates	Number of samples	Percent by sex		Percent by (Age group)						
			Male	Female	(0.1)	(0.2)	(0.3)	(0.4)	(0.5)	(0.6)	(0.7)
1995	7/20–8/29	1,272	49.0	51.0	0.0	2.0	56.0	40.0	2.0	0.0	0.0
1996	No data collected										
1997	7/25–7/31	173	46.0	53.0	0.0	1.0	36.0	61.0	2.0	0.0	0.0
1998	No data collected										
1999	No data collected										
2000	No data collected										
2001	7/24–8/03	234	45.7	54.3	0.0	1.3	12.8	85.9	0.0	0.0	0.0
2002	7/04–8/10	438	46.1	53.9	0.0	0.7	64.6	29.5	5.3	0.0	0.0
2003	7/07–8/23	158	54.3	45.7	0.0	0.0	82.9	15.2	1.9	0.0	0.0
2004	7/1–/8/06	157	42.7	57.3	0.0	7.0	49.7	43.3	0.0	0.0	0.0
2005	7/03–9/04	326	38.0	62.0	0.0	1.2	89.6	7.4	1.8	0.0	0.0
2006	7/06–8/10	458	47.4	52.6	0.0	1.7	52.8	45.4	0.0	0.0	0.0
2007	7/06–9/06	678	45.4	54.6	0.0	0.0	58.0	38.1	4.0	0.0	0.0
2008	7/23–9/06	222	52.3	47.7	0.0	0.5	43.2	47.3	8.6	0.5	0.0
2009	7/12–8/11	223	39.0	61.0	0.0	17.0	23.3	54.7	4.9	0.0	0.0
2010	7/10–8/11	240	60.0	40.0	0.0	1.7	94.6	3.8	0.0	0.0	0.0
2011	7/21–9/08	146	39.2	60.8	0.0	0.0	15.8	84.2	0.0	0.0	0.0
2012	7/07–8/15	126 [a]	38.7	61.3							

[a] Sample size insufficient for age composition analysis.

Appendix D7.–Age and sex compositions by year for Nome River coho salmon ASL samples, 2001–2012.

Year	Sampling dates	Number of samples	Percent by sex		Percent by (Age group)				
			Male	Female	(1.1)	(2.1)	(2.2)	(3.1)	(4.1)
2001	8/10–9/10	445	51.2	48.8	10.1	89.2	0.0	0.7	0.0
2002	8/11–8/28	139	51.1	48.9	1.4	80.6	0.0	16.5	1.4
2003	8/20–9/05	144	55.6	44.4	14.6	78.5	0.7	6.3	0.0
2004	8/23–8/27	150	66.0	34.0	23.3	72.7	0.0	4.0	0.0
2005	6/26–9/04	158	44.9	55.1	8.2	90.5	0.0	1.3	0.0
2006	7/24–9/02	191	39.3	60.7	8.9	87.0	0.0	4.2	0.0
2007	7/31–9/12	104 [a]	48.1	51.9					
2008	8/08–9/09	122 [a]	45.9	54.1					
2009	8/28–9/09	130	54.6	45.4	13.8	78.5	0.0	7.7	0.0
2010	8/20–9/06	116 [a]	54.3	45.7					
2011	7/21–8/06	84 [a]	56.1	43.9					
2012	No data collected								

[a] Sample size insufficient for age composition analysis.

Appendix D8.–Nome River weir water temperature (Temp.) and stream stage (Depth) observations, Norton Sound 2008–2012.

	2008		2009		2010		2011		2012	
	Temp.	Depth	Temp.	Depth	Temp.	Depth	Temp.	Depth	Temp.	Depth
Date	(°C)	(cm)	(°C)	(cm)	(°C)	(cm)	(°C)	(cm)	(°C)	(cm)
7/01			NA	NA	10.0	54.3				
7/02	11.0	69.8	16.0	52.1	9.0	54.9				
7/03	9.5	69.8	13.0	53.3	11.0	54.3				
7/04	12.0	69.5	9.0	73.8	11.8	53.3			NA	NA
7/05	14.0	68.3	9.0	51.2	12.0	52.4			12.0	45.1
7/06	14.0	85.3	11.0	49.4	11.5	51.8	9.0	82.3	8.0	45.1
7/07	13.0	73.2	13.0	49.1	10.5	50.9	8.5	64.0	10.0	42.4
7/08	12.0	68.6	11.0	48.8	12.0	50.6	10.0	57.9	10.5	41.1
7/09	11.0	79.9	9.0	47.9	13.0	50.0	10.0	54.9	11.0	40.2
7/10	10.0	85.6	9.0	46.9	13.0	49.4	10.0	54.9	8.5	39.6
7/11	9.0	75.9	11.0	46.0	13.0	48.8	9.0	54.9	11.0	NA
7/12	9.0	97.5	12.0	45.1	12.0	48.2	7.5	75.0	9.5	38.4
7/13	9.0	96.9	14.0	44.2	10.0	48.2	6.0	91.4	11.0	37.2
7/14	9.0	100.6	13.0	45.1	10.0	48.8	6.5	80.5	11.0	37.2
7/15	9.0	120.7	10.0	45.7	9.0	48.8	6.0	76.2	10.0	39.0
7/16	9.0	124.1	9.5	44.5	10.0	47.5	NA	NA	10.0	38.4
7/17	9.0	117.3	11.5	42.4	8.0	48.5	NA	NA	9.0	37.2
7/18	8.0	103.6	11.0	43.9	7.5	51.2	NA	NA	8.0	37.2
7/19	9.0	95.7	11.0	46.6	8.0	52.1	NA	NA	9.0	37.8
7/20	9.0	92.7	12.5	45.1	8.5	53.3	7.0	70.1	9.0	37.8
7/21	7.0	89.0	11.0	44.5	10.0	52.4	8.0	67.1	9.0	36.0
7/22	8.0	84.7	13.0	43.3	8.0	50.9	10.0	64.0	9.0	35.4
7/23	9.0	82.3	13.0	44.2	7.0	53.6	10.0	62.2	11.0	34.1
7/24	9.0	79.2	12.0	43.0	8.0	52.4	8.0	65.8	11.0	33.5
7/25	9.0	82.3	12.0	41.5	13.0	50.3	NA	NA	9.0	51.8
7/26	9.0	82.3	13.0	43.9	10.0	50.3	NA	NA	NA	NA
7/27	8.0	78.3	12.0	44.5	10.0	51.5	NA	NA	8.0	88.4
7/28	10.0	76.2	12.0	46.9	9.0	54.6	10.0	57.9	NA	NA
7/29	8.0	76.2	12.0	48.2	9.0	54.6	9.0	59.7	NA	NA
7/30	8.0	75.6	11.0	51.5	10.5	52.1	NA	NA	7.0	77.4
7/31	7.0	74.4	10.0	58.2	11.0	51.5	NA	NA	7.0	77.4
8/01	7.0	73.2	9.0	57.6	12.0	51.2	NA	NA	7.0	79.9
8/02	7.0	71.6	9.0	57.6	14.0	50.0	NA	NA	8.0	75.6
8/03	9.0	71.0	11.0	53.9	11.0	49.4	NA	NA	8.0	69.5
8/04	7.0	73.2	10.0	53.3	12.0	49.7	8.0	71.6	8.0	71.3
8/05	8.0	69.5	13.0	51.2	12.0	49.4	8.0	79.2	7.0	68.3
8/06	10.0	68.6	10.0	51.2	11.0	49.4	NA	NA	7.0	65.8
8/07	9.0	68.6	12.0	49.4	11.0	51.2	NA	NA	6.0	64.0
8/08	9.0	66.4	11.0	48.8	12.0	50.6	NA	NA	7.0	61.3
8/09	10.0	65.5	12.0	47.5	11.0	53.9	NA	NA	7.0	59.7

-continued-

	2008		2009		2010		2011		2012	
Date	Temp. (°C)	Depth (cm)	Temp. (°C)	Depth (cm)	Temp. (°C)	Depth (cm)	Temp. (°C)	Depth (cm)	Temp. (°C)	Depth (cm)
8/10	10.0	64.6	11.0	46.3	10.0	57.9	NA	NA	8.0	58.5
8/11	11.0	65.8	12.0	46.0	10.0	60.4	NA	NA	9.0	57.3
8/12	10.0	63.4	12.0	45.4	10.0	59.7	NA	NA	9.0	57.3
8/13	9.0	62.5	11.0	45.1	10.0	60.4	NA	NA	10.0	55.5
8/14	11.0	61.6	11.0	46.0	9.0	60.4	NA	NA	8.0	57.9
8/15	12.0	60.4	12.0	46.0	11.0	69.5	NA	NA	8.0	55.5
8/16	10.0	60.0	10.0	44.8	9.0	128.0	NA	NA		
8/17	11.0	59.4	10.0	44.2	8.0	74.4	NA	NA		
8/18	12.0	59.4	8.0	48.5	7.0	70.7	NA	NA		
8/19	12.0	60.0	9.0	46.0	7.0	69.2	NA	NA		
8/20	11.0	58.8	11.0	44.5	9.0	68.0	8.0	62.2		
8/21	11.0	58.8	10.0	45.1	9.0	67.4	7.0	61.0		
8/22	10.5	56.7	9.0	56.4	8.0	67.4	7.0	60.0		
8/23	10.5	56.4	9.0	56.7	8.0	66.1	6.0	58.5		
8/24	10.0	55.5	8.0	52.7	9.0	65.2	6.0	67.7		
8/25	10.0	54.9	8.0	49.7	8.0	65.2	6.0	65.2		
8/26	7.0	54.9	7.0	48.5	9.0	64.6	6.0	60.4		
8/27	6.0	54.6	8.0	47.9	10.0	64.6	7.0	57.9		
8/28	6.0	54.6	7.0	47.2	9.0	64.9	5.0	56.7		
8/29	6.0	54.3	9.0	46.6	10.0	64.3	6.0	57.3		
8/30	7.0	53.9	9.0	46.9	10.0	64.3	7.0	64.0		
8/31	9.0	54.3	8.0	112.8	8.0	65.2	7.0	61.6		
9/01	9.0	54.3	8.0	101.2	8.0	63.1	7.0	59.7		
9/02	9.0	53.0	8.0	89.9	8.0	67.7	7.0	56.7		
9/03	10.0	52.7	8.0	78.9	9.0	71.6	7.0	54.9		
9/04	10.0	54.6	8.0	73.8	8.0	81.1	7.0	54.9		
9/05	9.0	54.3	8.0	70.4	9.0	88.4	6.0	54.3		
9/06	9.0	52.1	8.0	67.7	9.0	79.2	5.0	53.0		
9/07	10.0	51.8	7.0	65.8	10.0	93.3	5.0	52.4		
9/08	9.0	51.2	7.0	65.2	8.0	118.9	3.0	51.8		
9/09	9.0	51.2	7.0	66.4	8.0	107.3	5.0	60.4		
9/10	8.0	50.6	9.0	63.4	8.0	96.9	5.0	92.0		
9/11	7.0	50.6	9.0	62.5	8.0	92.7	6.0	83.5		
9/12	6.0	50.6	8.0	61.3	8.0	93.9	6.0	70.7		
9/13	5.0	50.3	7.0	59.4	8.0	91.1				
9/14	8.0	50.3	6.0	58.8	7.0	87.5				
9/15	8.0	50.0	6.0	57.3	7.0	86.6				
9/16	8.0	51.8	7.0	56.7	7.0	85.3				
9/17	9.5	56.7	8.0	56.4	6.0	82.9				
9/18			8.0	56.4						
9/19			10.0	53.6						
9/20			8.0	53.0						

Note: Recorded water temperatures are morning water temperatures, except where morning temperatures were not available. Recorded water depths are highest recorded daily water depth.

APPENDIX E: ELDORADO RIVER WEIR

Appendix E1.–Daily and cumulative (Cum.) passage of all salmonid species at Eldorado River weir, Norton Sound, 2008.

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho	Daily Sockeye	Cum. Sockeye
6/28	0	0	1	1	0	0	0	0	1	1
6/29	1	1	4	5	0	0	0	0	0	1
6/30	0	1	164	169	0	0	0	0	0	1
7/01	4	5	382	551	0	0	0	0	0	1
7/02	179	184	2,464	3,015	0	0	0	0	0	1
7/03	417	601	7,927	10,942	0	0	0	0	0	1
7/04	239	840	11,141	22,083	0	0	0	0	0	1
7/05	804	1,644	31,889	53,972	0	0	0	0	2	3
7/06	266	1,910	26,833	80,805	1	1	0	0	0	3
7/07	111	2,021	8,198	89,003	0	1	0	0	0	3
7/08	30	2,051	675	89,678	4	5	0	0	0	3
7/09	107	2,158	1,582	91,260	0	5	0	0	0	3
7/10	99	2,257	367	91,627	0	5	0	0	0	3
7/11	28	2,285	175	91,802	0	5	0	0	0	3
7/12	211	2,496	603	92,405	0	5	0	0	0	3
7/13	1410	3,906	10,171	102,576	14	19	0	0	0	3
7/14	320	4,226	6,515	109,091	2	21	0	0	0	3
7/15	169	4,395	3,302	112,393	1	22	0	0	0	3
7/16	18	4,413	88	112,481	0	22	0	0	0	3
7/17	43	4,456	334	112,815	0	22	0	0	0	3
7/18	71	4,527	2,345	115,160	0	22	0	0	0	3
7/19	327	4,854	11,309	126,469	6	28	0	0	0	3
7/20	223	5,077	8,293	134,762	0	28	0	0	0	3
7/21	187	5,264	8,419	143,181	4	32	0	0	0	3
7/22	417	5,681	8,712	151,893	0	32	0	0	0	3
7/23	231	5,912	14,869	166,762	1	33	2	2	0	3
7/24	172	6,084	5,068	171,830	1	34	3	5	0	3
7/25	74	6,158	2,771	174,601	0	34	1	6	0	3
7/26	174	6,332	10,730	185,331	0	34	7	13	0	3
7/27	220	6,552	38,541	223,872	2	36	7	20	0	3
7/28	14	6,566	572	224,444	0	36	1	21	0	3
7/29	80	6,646	11,056	235,500	0	36	0	21	0	3
7/30	70	6,716	6,338	241,838	0	36	16	37	0	3
7/31	30	6,746	2,803	244,641	0	36	1	38	0	3
Total	6,746		244,641		36		38		3	

Note: The inside box in the cumulative column is the day when the midpoint of the total was reached. The outside box is from the day the first quartile was reached to the day the third quartile was reached.

Appendix E2.–Daily and cumulative (Cum.) passage of all salmonid species at Eldorado River weir, Norton Sound, 2009.

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho	Daily Sockeye	Cum. Sockeye
7/02	7	7	0	0	0	0	0	0	0	0
7/03	115	122	0	0	0	0	0	0	0	0
7/04	6	128	0	0	0	0	0	0	0	0
7/05	4	132	0	0	0	0	0	0	0	0
7/06	29	161	0	0	0	0	0	0	0	0
7/07	319	480	0	0	0	0	0	0	0	0
7/08	60	540	0	0	0	0	0	0	0	0
7/09	109	649	0	0	0	0	0	0	0	0
7/10	205	854	1	1	0	0	0	0	0	0
7/11	505	1,359	22	23	3	3	0	0	0	0
7/12	152	1,511	13	36	1	4	0	0	0	0
7/13	217	1,728	58	94	0	4	0	0	0	0
7/14	31	1,759	0	94	0	4	0	0	0	0
7/15	0	1,759	0	94	0	4	0	0	0	0
7/16	183	1,942	5	99	0	4	0	0	0	0
7/17	256	2,198	16	115	0	4	0	0	0	0
7/18	623	2,821	29	144	0	4	0	0	0	0
7/19	367	3,188	94	238	3	7	0	0	0	0
7/20	215	3,403	114	352	3	10	0	0	0	0
7/21	309	3,712	136	488	3	13	0	0	0	0
7/22	215	3,927	68	556	2	15	0	0	0	0
7/23	206	4,133	181	737	9	24	0	0	0	0
7/24	151	4,284	165	902	2	26	0	0	0	0
7/25	84	4,368	40	942	0	26	0	0	0	0
7/26	183	4,551	69	1,011	3	29	0	0	0	0
7/27	32	4,583	3	1,014	0	29	0	0	0	0
7/28	156	4,739	28	1,042	1	30	1	1	0	0
7/29	72	4,811	49	1,091	1	31	1	2	0	0
7/30	74	4,885	23	1,114	0	31	0	2	0	0
7/31	17	4,902	4	1,118	0	31	0	2	0	0
8/01	9	4,911	0	1,118	0	31	0	2	0	0
8/02	16	4,927	1	1,119	0	31	0	2	0	0
8/03	16	4,943	0	1,119	0	31	0	2	0	0
Total	4,943		1,119		31		2		0	

Note: The inside box in the cumulative column is the day when the midpoint of the total was reached. The outside box is from the day the first quartile was reached to the day the third quartile was reached.

Appendix E3.–Daily and cumulative (Cum.) passage of all salmonid species at Eldorado River weir, Norton Sound, 2010.

Date		Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho	Daily Sockeye	Cum. Sockeye
6/30		0	0	16	16	0	0	0	0	0	0
7/01		0	0	2	18	0	0	0	0	0	0
7/02		0	0	9	27	0	0	0	0	0	0
7/03		15	15	256	283	0	0	0	0	0	0
7/04		474	489	1,174	1,457	0	0	0	0	0	0
7/05		1,160	1,649	3,105	4,562	0	0	0	0	0	0
7/06		336	1,985	547	5,109	0	0	0	0	0	0
7/07		1,246	3,231	2,275	7,384	2	2	0	0	0	0
7/08		1,192	4,423	3,904	11,288	5	7	0	0	0	0
7/09		2,193	6,616	11,787	23,075	3	10	0	0	0	0
7/10	[a]	873	7,489	3,866	26,941	1	11	0	0	0	0
7/11	[a]	2,502	9,991	6,009	32,950	9	20	0	0	4	4
7/12	[a]	881	10,872	3,852	36,802	0	20	0	0	0	4
7/13	[a]	56	10,928	101	36,903	0	20	0	0	0	4
7/14	[a]	1,385	12,313	489	37,392	0	20	0	0	0	4
7/15	[a]	945	13,258	462	37,854	0	20	0	0	0	4
7/16	[a]	599	13,857	706	38,560	0	20	0	0	0	4
7/17	[a]	246	14,103	132	38,692	0	20	0	0	0	4
7/18	[a]	2,971	17,074	2,790	41,482	1	21	0	0	2	6
7/19		826	17,900	1,250	42,732	0	21	0	0	0	6
7/20		429	18,329	602	43,334	1	22	2	2	0	6
7/21		206	18,535	184	43,518	0	22	0	2	0	6
7/22		163	18,698	450	43,968	0	22	0	2	0	6
7/23		323	19,021	656	44,624	0	22	0	2	1	7
7/24		2,190	21,211	3,512	48,136	1	23	0	2	1	8
Total		21,211		48,136		23		2		8	

Note: Quartiles are not shown because the target operational period of the project was not fully monitored.

[a] Partial count because the weir was incorrectly installed and several breaches allowed fish to pass unmonitored.

Appendix E4.–Daily and cumulative (Cum.) passage of all salmonid species at Eldorado River weir, Norton Sound, 2011.

Date		Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho	Daily Sockeye	Cum. Sockeye
6/30		0	0	0	0						
7/01		0	0	0	0	0	0	0	0	0	0
7/02		10	10	0	0	0	0	0	0	0	0
7/03		370	380	1	1	0	0	0	0	0	0
7/04		278	658	2	3	1	1	0	0	0	0
7/05		1747	2,405	0	3	2	3	0	0	0	0
7/06		2578	4,983	0	3	0	3	0	0	0	0
7/07		382	5,365	0	3	0	3	0	0	0	0
7/08		259	5,624	0	3	0	3	0	0	0	0
7/09		299	5,923	0	3	0	3	0	0	0	0
7/10		457	6,380	0	3	0	3	0	0	0	0
7/11		715	7,095	0	3	0	3	0	0	0	0
7/12		1325	8,420	0	3	0	3	0	0	0	0
7/13	[a]	261	8,681	0	3	0	3	0	0	0	0
7/14	[b]	546	9,227	0	3	0	3	0	0	0	0
7/15	[b]	599	9,826	0	3	0	3	0	0	0	0
7/16	[b]	619	10,445	2	5	0	3	0	0	0	0
7/17	[b]	622	11,067	4	9	0	3	0	0	0	0
7/18	[b]	617	11,684	5	14	0	3	0	0	0	0
7/19	[b]	574	12,258	7	21	0	3	0	0	0	0
7/20		384	12,642	0	21	0	3	0	0	0	0
7/21		754	13,396	2	23	0	3	0	0	0	0
7/22		397	13,793	11	34	0	3	0	0	0	0
7/23		320	14,113	12	46	0	3	1	1	0	0
7/24		421	14,534	11	57	0	3	0	1	0	0
7/25		414	14,948	11	68	0	3	0	1	0	0
7/26		76	15,024	2	70	0	3	0	1	0	0
7/27		105	15,129	57	127	0	3	0	1	0	0
7/28		151	15,280	6	133	0	3	0	1	0	0
7/29		37	15,317	6	139	0	3	0	1	0	0
7/30		141	15,458	13	152	0	3	0	1	0	0
7/31		438	15,896	100	252	0	3	0	1	0	0
8/01		131	16,027	16	268	0	3	0	1	0	0
8/02		158	16,185	165	433	0	3	0	1	0	0
8/03		88	16,273	74	507	0	3	0	1	0	0
Total		16,273		507		3		1		0	

Note: The inside box in the cumulative column is the day when the midpoint of the total was reached. The outside box is from the day the first quartile was reached to the day the third quartile was reached.

[a] Some portion of the count was interpolated.

[b] Partial count before the weir become inoperable because of high water.

Appendix E5.–Daily and cumulative (Cum.) passage of all salmonid species at Eldorado River weir, Norton Sound, 2012.

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho	Daily Sockeye	Cum. Sockeye
7/02	0	0	1	1	0	0	0	0	0	0
7/03	1	1	0	1	0	0	0	0	0	0
7/04	2	3	1	2	0	0	0	0	0	0
7/05	0	3	1	3	0	0	0	0	0	0
7/06	3	6	1	4	0	0	0	0	0	0
7/07	9	15	12	16	0	0	0	0	0	0
7/08	10	25	36	52	0	0	0	0	0	0
7/09	27	52	118	170	0	0	0	0	0	0
7/10	52	104	32	202	0	0	0	0	0	0
7/11	1,132	1,236	2,182	2,384	0	0	0	0	0	0
7/12	1,352	2,588	9,232	11,616	0	0	0	0	0	0
7/13	190	2,778	2,679	14,295	0	0	0	0	0	0
7/14	1,622	4,400	5,604	19,899	0	0	0	0	0	0
7/15	464	4,864	2,119	22,018	0	0	0	0	0	0
7/16	5,602	10,466	4,358	26,376	0	0	0	0	0	0
7/17	127	10,593	2,325	28,701	0	0	0	0	0	0
7/18	433	11,026	5,387	34,088	0	0	0	0	0	0
7/19	611	11,637	6,388	40,476	0	0	0	0	0	0
7/20	526	12,163	6,193	46,669	0	0	0	0	0	0
7/21	100	12,263	2,669	49,338	0	0	0	0	0	0
7/22	444	12,707	5,091	54,429	0	0	0	0	0	0
7/23	320	13,027	2,179	56,608	0	0	1	1	0	0
7/24	149	13,176	1,564	58,172	0	0	0	1	0	0
7/25 [a]	172	13,348	1,146	59,318	0	0	0	1	0	0
Total	13,348		59,318		0		1		0	

Note: Quartiles are not shown because the target operational period of the project was not fully monitored.

[a] Partial count before the weir become inoperable because of high water.

Appendix E6.–Age and sex compositions by year for Eldorado River chum salmon ASL samples, 2001–2012.

Year	Sampling dates	Number of samples	Percent by sex		Percent by (Age Group)						
			Male	Female	(0.1)	(0.2)	(0.3)	(0.4)	(0.5)	(0.6)	(0.7)
2001	7/22–8/16	586	58.4	41.6	0.0	0.5	4.5	94.4	0.6	0.0	0.0
2002	7/04–9/03	367	49.0	51.0	0.0	1.6	88.3	6.5	3.5	0.0	0.0
2003	7/05–7/24	301	62.8	37.2	0.0	0.0	53.8	45.5	0.7	0.0	0.0
2004	6/23–9/09	272	50.7	49.3	0.0	4.0	48.9	46.0	1.1	0.0	0.0
2005	6/28–8/28	548	42.3	57.7	0.0	1.6	84.9	13.1	0.4	0.0	0.0
2006	6/29–7/30	459	46.4	53.6	0.0	0.4	57.5	41.0	1.0	0.0	0.0
2007	6/29–8/01	443	54.9	45.1	0.0	0.5	47.0	49.0	3.6	0.0	0.0
2008	6/29–7/24	128 [a]	62.5	37.5							
2009	7/02–8/03	539	55.5	44.5	0.0	15.2	41.3	34.9	8.2	0.4	0.0
2010	7/03–7/23	240	49.2	50.8	0.0	0.4	94.6	4.6	0.4	0.0	0.0
2011	7/02–7/30	210	62.9	37.1	0.0	0.0	3.1	96.4	0.4	0.0	0.0
2012	7/03–7/22	157	61.3	38.7	0.0	1.1	71.5	21.0	6.5	0.0	0.0

[a] Sample size insufficient for age composition analysis

Appendix E7.–Eldorado River weir water temperature (Temp.) and stream stage (Depth) observations, Norton Sound 2008–2012.

	2008		2009		2010		2011		2012	
	Temp.	Depth	Temp.	Depth	Temp.	Depth	Temp.	Depth	Temp.	Depth
Date	(°C)	(cm)	(°C)	(cm)	(°C)	(cm)	(°C)	(cm)	(°C)	(cm)
6/27	10.0	55.8								
6/28	10.0	53.6								
6/29	8.0	51.8							14.0	43.9
6/30	9.0	49.7			11.0	106.7			10.0	43.6
7/01	8.0	48.2			11.0	83.8			9.0	43.0
7/02	10.0	49.7	17.0	45.0	11.0	73.2	10.0	24.0	10.0	50.3
7/03	10.0	46.3	12.0	50.0	13.0	61.0	10.0	24.0	10.0	55.5
7/04	12.0	45.7	11.0	74.0	13.0	56.4	10.0	21.0	10.0	50.0
7/05	13.0	43.3	10.0	53.0	10.0	61.0	9.0	60.0	10.0	43.6
7/06	13.0	42.7	12.0	44.0	9.0	57.9	8.0	88.0	9.0	43.9
7/07	14.0	39.3	12.0	47.0	11.0	45.7	10.0	70.0	12.0	42.1
7/08	13.0	39.0	12.0	50.0	10.0	51.8	11.0	44.0	12.0	40.8
7/09	10.0	80.8	9.0	42.0	14.0	30.5	8.0	41.0	12.5	39.9
7/10	10.0	73.2	9.0	41.0	13.0	27.4	8.0	44.0	9.0	39.6
7/11	10.0	46.3	12.0	38.0	12.0	30.5	NA	38.0	12.0	39.3
7/12	9.0	88.4	12.0	38.0	9.0	36.6	NA	84.0	14.0	39.3
7/13	9.0	83.8	13.0	38.0	14.0	39.6	NA	> 95	9.0	39.6
7/14	7.0	89.9	12.0	43.0	13.0	48.8	NA	> 95	12.0	49.1
7/15	8.0	103.6	10.0	38.0	14.0	30.5	NA	92.0	10.0	43.0
7/16	9.0	129.5	9.0	37.0	12.0	24.4	6.0	96.0	10.0	42.7
7/17	9.0	117.3	11.0	36.0	10.0	30.5	6.0	98.0	9.0	40.2
7/18	10.0	118.9	11.0	43.0	9.0	100.6	7.0	92.0	9.0	39.6
7/19	7.0	88.4	11.0	44.0	11.0	103.6	10.0	82.0	10.0	39.0
7/20	8.0	89.9	12.0	45.0	10.0	45.7	8.0	79.0	9.0	37.8
7/21	7.0	80.8	11.0	38.0	10.0	38.1	8.0	75.0	10.0	36.6
7/22	6.0	70.1	13.0	37.0	9.0	30.5	8.0	55.0	10.0	36.6
7/23	7.0	67.1	12.0	38.0	9.0	45.7	8.0	70.0	13.0	36.0
7/24	6.0	65.5	12.0	37.0	11.0	53.3	9.0	72.0	12.0	43.9
7/25	8.0	62.5	12.0	37.0			11.0	68.0	10.0	67.1
7/26	6.0	65.5	12.0	39.0			8.0	65.0		
7/27	7.0	57.9	12.0	40.0			5.0	60.0		
7/28	8.0	54.9	11.0	45.0			9.0	56.0		
7/29	7.0	53.3	11.0	46.0			9.0	70.0		
7/30	8.0	51.8	11.0	68.0			11.0	68.0		
7/31	9.0	59.4	10.0	67.0			8.0	60.0		
8/01			9.0	64.0			8.0	57.0		
8/02			9.0	59.0			9.0	50.0		
8/03			11.0	59.0			8.0	57.0		
8/04			10.0	57.0			NA	84.0		

Note: Recorded water temperatures are morning water temperatures, except where morning temperatures were not available. Recorded water depths are highest recorded daily water depth.

APPENDIX F: NIUKLUK RIVER TOWER

Appendix F1.–Expanded daily and cumulative (Cum.) migration of all salmonid species past Niukluk River counting tower, Norton Sound, 2008.

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho
7/01	111	111	5,691	5,691	0	0	0	0
7/02	435	546	14,610	20,301	0	0	0	0
7/03	1,134	1,680	41,706	62,007	0	0	0	0
7/04	1,647	3,327	88,332	150,339	3	3	0	0
7/05	2,778	6,105	143,025	293,364	6	9	0	0
7/06	1,443	7,548	130,044	423,408	0	9	0	0
7/07	1,575	9,123	131,337	554,745	21	30	0	0
7/08	522	9,645	61,119	615,864	3	33	0	0
7/09	-15	9,630	-7,062	608,802	-3	30	0	0
7/10	-132	9,498	-18,852	589,950	-3	27	0	0
7/11	84	9,582	5,643	595,593	3	30	0	0
7/12	144	9,726	3,933	599,526	3	33	0	0
7/13	249	9,975	15,177	614,703	-3	30	0	0
7/14	132	10,107	4,836	619,539	3	33	0	0
7/15	147	10,254	8,250	627,789	0	33	0	0
7/16	102	10,356	8,136	635,925	-3	30	0	0
7/17	6	10,362	2,571	638,496	0	30	0	0
7/18	-45	10,317	-2,943	635,553	0	30	0	0
7/19	99	10,416	6,426	641,979	0	30	3	3
7/20	96	10,512	4,836	646,815	0	30	3	6
7/21	39	10,551	1,488	648,303	0	30	6	12
7/22	48	10,599	2,151	650,454	0	30	15	27
7/23	123	10,722	3,078	653,532	0	30	12	39
7/24	87	10,809	2,916	656,448	0	30	48	87
7/25	99	10,908	3,696	660,144	0	30	27	114
7/26	27	10,935	2,268	662,412	0	30	9	123
7/27	45	10,980	1,176	663,588	0	30	9	132
7/28	24	11,004	1,002	664,590	0	30	24	156
7/29	12	11,016	753	665,343	0	30	12	168
7/30	18	11,034	786	666,129	3	33	63	231
7/31	39	11,073	714	666,843	0	33	81	312
8/01	45	11,118	420	667,263	0	33	147	459
8/02	42	11,160	243	667,506	0	33	96	555
8/03	24	11,184	222	667,728	0	33	111	666
8/04	57	11,241	78	667,806	0	33	96	762
8/05	66	11,307	81	667,887	0	33	129	891
8/06	39	11,346	162	668,049	0	33	162	1,053
8/07	27	11,373	42	668,091	0	33	102	1,155
8/08	48	11,421	45	668,136	0	33	165	1,320
8/09	78	11,499	39	668,175	0	33	189	1,509
8/10	63	11,562	39	668,214	0	33	228	1,737
8/11	66	11,628	48	668,262	0	33	183	1,920
8/12	81	11,709	33	668,295	0	33	204	2,124
8/13	57	11,766	15	668,310	0	33	261	2,385
8/14	99	11,865	57	668,367	0	33	588	2,973
8/15	66	11,931	222	668,589	0	33	627	3,600
8/16	12	11,943	24	668,613	0	33	405	4,005
8/17	12	11,955	33	668,646	0	33	366	4,371

-continued-

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho
8/18	30	11,985	420	669,066	0	33	573	4,944
8/19	27	12,012	24	669,090	0	33	543	5,487
8/20	18	12,030	66	669,156	0	33	483	5,970
8/21	9	12,039	27	669,183	0	33	543	6,513
8/22	0	12,039	15	669,198	0	33	435	6,948
8/23	12	12,051	0	669,198	0	33	852	7,800
8/24	9	12,060	9	669,207	0	33	975	8,775
8/25	0	12,060	3	669,210	0	33	639	9,414
8/26	6	12,066	6	669,216	0	33	138	9,552
8/27	0	12,066	0	669,216	0	33	72	9,624
8/28	6	12,072	0	669,216	0	33	273	9,897
8/29	0	12,072	6	669,222	0	33	819	10,716
8/30	3	12,075	0	669,222	0	33	732	11,448
8/31	0	12,075	9	669,231	0	33	993	12,441
9/01	0	12,075	0	669,231	0	33	753	13,194
9/02	0	12,075	0	669,231	0	33	231	13,425
9/03	0	12,075	0	669,231	0	33	162	13,587
9/04	3	12,078	3	669,234	0	33	123	13,710
9/05	0	12,078	0	669,234	0	33	60	13,770
9/06	0	12,078	0	669,234	0	33	9	13,779
Total	12,078		669,234		33		13,779	

Note: The inside box in the cumulative column is the day when the midpoint of the total was reached. The outside box is from the day the first quartile was reached to the day the third quartile was reached.

Appendix F2.–Expanded daily and cumulative (Cum.) migration of all salmonid species past Niukluk River counting tower, Norton Sound, 2009.

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho
7/03	108	108	1,980	1,980	0	0	0	0
7/04	120	228	987	2,967	-6	-6	0	0
7/05	-24	204	108	3,075	-15	-21	0	0
7/06	276	480	96	3,171	0	-21	0	0
7/07	819	1,299	501	3,672	18	-3	0	0
7/08	162	1,461	462	4,134	54	51	0	0
7/09	306	1,767	72	4,206	-27	24	0	0
7/10	768	2,535	72	4,278	12	36	0	0
7/11	837	3,372	318	4,596	21	57	0	0
7/12	927	4,299	795	5,391	57	114	0	0
7/13	999	5,298	2,610	8,001	48	162	0	0
7/14	303	5,601	543	8,544	6	168	0	0
7/15	174	5,775	210	8,754	0	168	0	0
7/16	723	6,498	180	8,934	-3	165	0	0
7/17	1,263	7,761	513	9,447	3	168	0	0
7/18	759	8,520	279	9,726	6	174	0	0
7/19	618	9,138	297	10,023	0	174	3	3
7/20	873	10,011	993	11,016	9	183	0	3
7/21	855	10,866	1,968	12,984	3	186	0	3
7/22	561	11,427	1,650	14,634	9	195	3	6
7/23	888	12,315	2,742	17,376	3	198	12	18
7/24	495	12,810	1,014	18,390	0	198	24	42
7/25	228	13,038	756	19,146	0	198	9	51
7/26	213	13,251	663	19,809	0	198	12	63
7/27	219	13,470	429	20,238	6	204	0	63
7/28	432	13,902	834	21,072	6	210	18	81
7/29	222	14,124	270	21,342	3	213	30	111
7/30	264	14,388	507	21,849	-3	210	63	174
7/31	171	14,559	420	22,269	-6	204	33	207
8/01	135	14,694	198	22,467	0	204	21	228
8/02	186	14,880	222	22,689	0	204	36	264
8/03	111	14,991	363	23,052	0	204	21	285
8/04	105	15,096	261	23,313	0	204	30	315
8/05	150	15,246	228	23,541	0	204	141	456
8/06	84	15,330	111	23,652	0	204	144	600
8/07	45	15,375	48	23,700	0	204	99	699
8/08	57	15,432	66	23,766	0	204	108	807
8/09	93	15,525	123	23,889	0	204	264	1,071
8/10	123	15,648	33	23,922	0	204	147	1,218
8/11	18	15,666	42	23,964	0	204	105	1,323
8/12	33	15,699	42	24,006	0	204	153	1,476
8/13	27	15,726	18	24,024	0	204	132	1,608
8/14	27	15,753	18	24,042	0	204	189	1,797
8/15	24	15,777	18	24,060	0	204	525	2,322
8/16	-21	15,756	36	24,096	0	204	264	2,586
8/17	21	15,777	18	24,114	0	204	174	2,760
8/18	15	15,792	18	24,132	0	204	132	2,892
8/19	15	15,807	15	24,147	0	204	54	2,946

-continued-

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho
8/20	24	15,831	18	24,165	0	204	72	3,018
8/21	24	15,855	9	24,174	0	204	342	3,360
8/22	0	15,855	18	24,192	0	204	1,227	4,587
8/23	0	15,855	0	24,192	0	204	822	5,409
8/24	3	15,858	3	24,195	0	204	132	5,541
8/25	3	15,861	3	24,198	0	204	63	5,604
8/26	3	15,864	3	24,201	0	204	102	5,706
8/27	6	15,870	0	24,201	0	204	144	5,850
8/28	0	15,870	3	24,204	0	204	207	6,057
8/29	3	15,873	0	24,204	0	204	180	6,237
8/30	0	15,873	0	24,204	0	204	327	6,564
8/31	3	15,876	0	24,204	0	204	246	6,810
9/01	3	15,879	0	24,204	0	204	45	6,855
9/02	0	15,879	0	24,204	0	204	6	6,861
Total	15,879		24,204		204		6,861	

Note: The inside box in the cumulative column is the day when the midpoint of the total was reached. The outside box is from the day the first quartile was reached to the day the third quartile was reached.

Appendix F3.–Expanded daily and cumulative (Cum.) migration of all salmonid species past Niukluk River counting tower, Norton Sound, 2010.

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho
7/01	6	6	546	546	0	0	0	0
7/02	87	93	6,786	7,332	0	0	0	0
7/03	1,413	1,506	25,773	33,105	0	0	0	0
7/04	2,196	3,702	47,397	80,502	9	9	0	0
7/05	837	4,539	-1,182	79,320	-9	0	0	0
7/06	-204	4,335	-11,958	67,362	0	0	0	0
7/07	1,119	5,454	5,679	73,041	0	0	0	0
7/08	3,243	8,697	21,192	94,233	3	3	0	0
7/09	4,032	12,729	73,824	168,057	6	9	0	0
7/10	2,766	15,495	59,538	227,595	3	12	0	0
7/11	3,507	19,002	53,574	281,169	3	15	0	0
7/12	1,869	20,871	29,523	310,692	0	15	0	0
7/13	1,029	21,900	3,837	314,529	-6	9	0	0
7/14	1,590	23,490	12,051	326,580	3	12	0	0
7/15	1,428	24,918	2,841	329,421	6	18	0	0
7/16	2,862	27,780	15,927	345,348	-3	15	0	0
7/17	-57	27,723	450	345,798	-9	6	0	0
7/18	933	28,656	5,862	351,660	0	6	0	0
7/19	2,457	31,113	17,724	369,384	6	12	0	0
7/20	2,526	33,639	13,794	383,178	3	15	0	0
7/21	1,098	34,737	7,650	390,828	0	15	0	0
7/22	240	34,977	1,839	392,667	0	15	0	0
7/23	315	35,292	3,438	396,105	0	15	0	0
7/24	2,202	37,494	9,399	405,504	0	15	0	0
7/25	1,857	39,351	8,421	413,925	0	15	3	3
7/26	1,320	40,671	5,271	419,196	0	15	24	27
7/27	1,122	41,793	3,744	422,940	0	15	30	57
7/28	1,110	42,903	2,319	425,259	0	15	45	102
7/29	1,578	44,481	4,548	429,807	0	15	96	198
7/30	699	45,180	1,329	431,136	0	15	48	246
7/31	513	45,693	804	431,940	0	15	96	342
8/01	675	46,368	888	432,828	0	15	99	441
8/02	282	46,650	753	433,581	0	15	120	561
8/03	144	46,794	279	433,860	0	15	87	648
8/04	312	47,106	165	434,025	0	15	126	774
8/05	321	47,427	54	434,079	0	15	132	906
8/06	255	47,682	21	434,100	0	15	126	1,032
8/07	204	47,886	9	434,109	0	15	198	1,230
8/08	177	48,063	6	434,115	0	15	159	1,389
8/09	114	48,177	6	434,121	0	15	135	1,524
8/10	99	48,276	9	434,130	0	15	156	1,680
8/11	105	48,381	42	434,172	0	15	201	1,881
8/12	48	48,429	0	434,172	0	15	309	2,190
8/13	15	48,444	0	434,172	0	15	207	2,397
8/14	6	48,450	0	434,172	0	15	441	2,838
8/15	0	48,450	0	434,172	0	15	609	3,447
8/16	0	48,450	0	434,172	0	15	528	3,975
8/17	0	48,450	0	434,172	0	15	285	4,260

-continued-

Appendix F3.–Page 2 of 2.

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho
8/18	3	48,453	3	434,175	0	15	21	4,281
8/19	24	48,477	0	434,175	0	15	198	4,479
8/20	21	48,498	3	434,178	0	15	327	4,806
8/21	6	48,504	6	434,184	0	15	384	5,190
8/22	12	48,516	0	434,184	0	15	504	5,694
8/23	0	48,516	0	434,184	0	15	549	6,243
8/24	12	48,528	0	434,184	0	15	717	6,960
8/25	0	48,528	3	434,187	0	15	156	7,116
8/26	0	48,528	0	434,187	0	15	192	7,308
8/27	3	48,531	3	434,190	0	15	492	7,800
8/28	15	48,546	0	434,190	0	15	441	8,241
8/29	15	48,561	9	434,199	0	15	402	8,643
8/30	0	48,561	0	434,199	0	15	111	8,754
8/31	3	48,564	6	434,205	0	15	165	8,919
9/01	-3	48,561	0	434,205	0	15	123	9,042
Total	48,561		434,205		15		9,042	

Note: The inside box in the cumulative column is the day when the midpoint of the total was reached. The outside box is from the day the first quartile was reached to the day the third quartile was reached.

Appendix F4.–Expanded daily and cumulative (Cum.) migration of all salmonid species past Niukluk River counting tower, Norton Sound, 2011.

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho
6/28	183	432	213	213	0	0	0	0
6/29	249	720	342	555	0	0	0	0
6/30	288	999	327	882	0	0	0	0
7/01	279	1,119	123	1,005	0	0	0	0
7/02	120	1,323	135	1,140	0	0	0	0
7/03	204	2,661	66	1,206	3	3	0	0
7/04	1,338	2,994	99	1,305	-3	0	0	0
7/05	333	4,620	51	1,356	0	0	0	0
7/06	1,626	5,373	87	1,443	3	3	0	0
7/07	753	6,936	54	1,497	0	3	0	0
7/08	1,563	7,542	168	1,665	3	6	0	0
7/09	606	8,463	258	1,923	0	6	0	0
7/10	921	9,465	87	2,010	0	6	0	0
7/11	1,002	10,848	63	2,073	3	9	0	0
7/12	1,383	11,541	45	2,118	6	15	0	0
7/13	693	12,192	27	2,145	0	15	0	0
7/14	651	12,624	30	2,175	0	15	0	0
7/15	432	12,810	51	2,226	-3	12	0	0
7/16	186	13,823	12	2,238	3	15	0	0
7/17 [a]	1,013	14,378	49	2,287	0	15	0	0
7/18 [a]	555	15,025	146	2,433	0	15	0	0
7/19 [a]	647	15,716	225	2,658	1	16	3	3
7/20 [a]	692	16,307	313	2,972	0	16	4	7
7/21 [a]	590	17,105	472	3,443	0	16	0	7
7/22	798	17,471	369	3,812	0	16	12	19
7/23	366	17,870	363	4,175	0	16	3	22
7/24	399	18,452	336	4,511	0	16	3	25
7/25	582	19,511	459	4,970	0	16	12	37
7/26	1,059	20,693	921	5,891	0	16	0	37
7/27	1,182	21,473	1,572	7,463	0	16	0	37
7/28	780	21,590	1,620	9,083	0	16	0	37
7/29	117	21,902	330	9,413	0	16	6	43
7/30	312	22,304	2,091	11,504	0	16	3	46
7/31	402	22,619	1,380	12,884	0	16	18	64
8/01	315	22,823	810	13,694	0	16	27	91
8/02	204	23,051	150	13,844	0	16	21	112
8/03	228	23,342	-27	13,817	0	16	36	148
8/04	291	23,651	153	13,970	0	16	36	184
8/05	309	23,897	268	14,238	0	16	63	247
8/06	246	23,978	213	14,451	0	16	144	391
8/07	81	24,164	108	14,559	0	16	45	436
8/08	186	24,323	240	14,799	0	16	84	520
8/09	159	24,410	216	15,015	3	19	126	646
8/10	87	24,539	180	15,195	0	19	111	757
8/11	129	24,635	54	15,249	0	19	123	880
8/12 [a]	96	24,710	49	15,298	0	19	77	957
8/13 [a]	75	24,765	33	15,331	0	19	97	1,054
8/14 [a]	55	24,819	16	15,347	0	19	117	1,171

-continued-

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho
8/15	54	24,828	27	15,374	0	19	54	1,225
8/16	9	24,864	15	15,389	0	19	36	1,261
8/17	36	24,897	3	15,392	0	19	27	1,288
8/18	33	24,906	0	15,392	0	19	57	1,345
8/19	9	24,915	15	15,407	0	19	54	1,399
8/20	9	24,918	24	15,431	0	19	72	1,471
8/21	3	24,921	24	15,455	0	19	102	1,573
8/22	3	24,930	15	15,470	0	19	93	1,666
8/23	9	24,945	21	15,491	0	19	33	1,699
8/24	15	24,951	24	15,515	0	19	111	1,810
8/25	6	24,957	9	15,524	0	19	117	1,927
8/26	6	24,993	15	15,539	0	19	72	1,999
8/27	36	25,002	18	15,557	0	19	99	2,098
8/28	9	25,005	0	15,557	0	19	42	2,140
8/29	3	25,008	6	15,563	0	19	51	2,191
8/30	3	25,011	3	15,566	0	19	111	2,302
8/31	3	25,017	0	15,566	0	19	63	2,365
9/01	6	25,026	0	15,566	0	19	48	2,413
9/02	9	25,023	6	15,572	0	19	45	2,458
9/03	-3	25,026	3	15,575	0	19	24	2,482
9/04	3	25,026	3	15,578	0	19	27	2,509
9/05	0	25,032	3	15,581	0	19	24	2,533
9/06	6	25,032	0	15,581	0	19	30	2,563
Total	25,032		15,581		19		2,563	

Note: The inside box in the cumulative column is the day when the midpoint of the total was reached. The outside box is from the day the first quartile was reached to the day the third quartile was reached.

[a] Some portion of the count was interpolated.

Appendix F5.–Expanded daily and cumulative (Cum.) migration of all salmonid species past Niukluk River counting tower, Norton Sound, 2012.

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho
7/04	0	0	12	12	0	0	0	0
7/05	6	6	33	45	0	0	0	0
7/06	258	264	315	360	0	0	0	0
7/07	540	804	2,115	2,475	0	0	0	0
7/08	1,776	2,580	9,237	11,712	0	0	0	0
7/09	2,406	4,986	11,364	23,076	0	0	0	0
7/10	30	5,016	-4,158	18,918	0	0	0	0
7/11	1,176	6,192	10,494	29,412	0	0	0	0
7/12	1,308	7,500	29,610	59,022	9	9	0	0
7/13	462	7,962	13,413	72,435	6	15	0	0
7/14	492	8,454	7,788	80,223	0	15	0	0
7/15	834	9,288	8,172	88,395	0	15	0	0
7/16	1,321	10,609	12,306	100,701	0	15	0	0
7/17	960	11,569	15,303	116,004	0	15	0	0
7/18	756	12,325	23,451	139,455	0	15	0	0
7/19	1,236	13,561	33,471	172,926	0	15	9	9
7/20	1,095	14,656	15,729	188,655	0	15	24	33
7/21	840	15,496	9,546	198,201	0	15	9	42
7/22	1,074	16,570	10,914	209,115	6	21	6	48
7/23	597	17,167	8,868	217,983	0	21	3	51
7/24	288	17,455	4,188	222,171	0	21	15	66
7/25	93	17,548	2,430	224,601	0	21	6	72
7/26 [a]	742	18,290	8,885	233,486	0	21	47	119
7/27 [a]	452	18,742	6,286	239,772	0	21	31	150
7/28 [a]	162	18,904	3,687	243,459	0	21	14	164
7/29 [a]	212	19,116	2,047	245,506	0	21	15	179
7/30 [a]	324	19,440	4,575	250,081	0	21	20	199
7/31 [a]	255	19,695	3,485	253,566	0	21	28	227
8/01 [a]	226	19,921	2,995	256,561	0	21	37	264
8/02 [a]	220	20,141	2,704	259,265	0	21	45	309
8/03 [a]	133	20,274	1,606	260,871	0	21	49	358
8/04 [a]	80	20,354	842	261,713	0	21	56	414
8/05 [a]	64	20,418	403	262,116	0	21	64	478
8/06	45	20,463	207	262,323	0	21	27	505
8/07	48	20,511	153	262,476	0	21	69	574
8/08	57	20,568	267	262,743	0	21	87	661
8/09	45	20,613	99	262,842	0	21	69	730
8/10	45	20,658	105	262,947	2	23	81	811
8/11	27	20,685	168	263,115	0	23	84	895
8/12	33	20,718	180	263,295	0	23	84	979
8/13	9	20,727	120	263,415	0	23	114	1,093
8/14	6	20,733	27	263,442	0	23	90	1,183
8/15	9	20,742	36	263,478	0	23	168	1,351
8/16	3	20,745	63	263,541	0	23	291	1,642
8/17	0	20,745	0	263,541	0	23	74	1,716
Total	20,745		263,541		23		1,716	

Note: Quartiles are not shown because the target operational period of the project was not fully monitored.

[a] Some portion of the count was interpolated.

Appendix F6.–Age and sex compositions by year for Niukluk River chum salmon ASL samples, 1995–2012.

Year	Sampling dates	Number of samples	Percent by sex		Percent by (Age Group)						
			Male	Female	(0.1)	(0.2)	(0.3)	(0.4)	(0.5)	(0.6)	(0.7)
1995	7/05–8/10	770	58.0	42.0	0.0	1.0	51.0	42.0	6.0	0.0	0.0
1996	7/14–9/10	352	46.0	54.0	0.0	1.0	34.0	52.0	13.0	0.0	0.0
1997	7/05–8/29	628	50.0	50.0	0.0	3.0	55.0	41.0	1.0	0.0	0.0
1998	7/04–7/20	138 [a]	44.0	57.0							
1999	7/19–8/29	350	47.0	53.0	0.0	1.0	67.0	31.0	0.0	0.0	0.0
2000	7/09–8/26	154	49.0	51.0	0.0	4.0	79.0	17.0	0.0	0.0	0.0
2001	7/10–7/30	695	62.0	38.0	0.0	1.0	16.0	82.0	1.0	0.0	0.0
2002	7/03–7/26	446	55.0	46.0	0.0	0.0	76.0	17.0	7.0	0.0	0.0
2003	7/05–8/01	417	59.0	42.0	0.0	0.0	51.0	48.0	1.0	0.0	0.0
2004	7/05–7/26	373	52.0	48.0	0.0	9.0	40.0	50.0	1.0	0.0	0.0
2005	7/07–7/30	625	50.0	50.0	0.0	2.0	90.0	7.0	1.0	0.0	0.0
2006	7/05–7/20	425	47.0	53.0	0.0	0.0	45.0	54.0	1.0	0.0	0.0
2007	7/07–7/21	571	55.0	45.0	0.0	0.0	54.0	41.0	5.0	0.0	0.0
2008	7/08	83 [a]	34.0	66.0							
2009	7/10–7/29	237	52.0	48.0	0.0	15.0	32.0	45.0	8.0	0.0	0.0
2010	7/07–8/01	248	48.0	52.0	0.0	1.0	92.0	5.0	1.0	0.0	0.0
2011				No data collected							
2012				No data collected							

[a] Sample size insufficient for age composition analysis

Appendix F7.–Age and sex compositions by year for Niukluk River coho salmon ASL samples, 2001–2012.

Year	Sampling dates	Number of samples		Percent by sex		Percent by (Age Group)				
				Male	Female	(1.1)	(2.1)	(2.2)	(3.1)	(4.1)
2001	8/29	15	[a]							
2002	8/13–9/08	143		56.6	43.4	0.7	93.7	0.0	5.6	0.0
2003				No data collected						
2004	7/29	11	[a]							
2005	7/27–8/26	72	[a]	52.8	47.2					
2006	7/20–8/12	121	[a]	62.0	38.0					
2007				No data collected						
2008				No data collected						
2009				No data collected						
2010				No data collected						
2011				No data collected						
2012				No data collected						

[a] Sample size insufficient for age composition analysis

Appendix F8.–Niukluk River counting tower water temperature (Temp.) and stream stage (Depth) observations, Norton Sound 2008–2012.

	2008		2009		2010		2011		2012	
Date	Temp. (°C)	Depth (cm)	Temp. (°C)	Depth (cm)	Temp. (°C)	Depth (cm)	Temp. (°C)	Depth (cm)	Temp. (°C)	Depth (cm)
6/30	10.0	64.0					NA	27.4		
7/01	10.0	61.0			14.0	50.0	NA	23.2		
7/02	11.0	61.6			13.0	50.0	NA	21.9		
7/03	10.0	59.7	11.0	30.5	13.0	46.9	NA	21.3		
7/04	13.0	57.9	12.5	36.6	14.0	45.7	NA	19.5	11.0	54.9
7/05	15.0	57.9	7.0	29.3	14.0	43.0	NA	58.5	10.0	40.2
7/06	14.0	57.3	11.0	29.3	11.0	41.5	NA	59.1	12.0	43.3
7/07	15.0	54.9	12.0	21.3	12.0	40.5	NA	41.5	12.0	42.7
7/08	12.0	52.4	14.0	21.3	13.0	38.4	NA	32.9	13.0	34.7
7/09	12.0	54.9	11.0	21.3	15.0	36.9	NA	29.9	14.0	30.5
7/10	11.0	67.1	12.0	18.9	14.0	36.9	NA	27.4	10.0	24.4
7/11	11.0	60.0	12.0	17.1	12.0	33.5	NA	29.9	12.0	27.4
7/12	9.0	55.8	13.0	15.2	15.0	31.7	NA	39.0	14.0	26.2
7/13	9.0	94.5	15.0	14.6	13.0	31.1	NA	85.3	12.0	24.4
7/14	10.0	85.3	15.0	14.6	13.0	31.7	NA	61.0	12.0	24.4
7/15	9.0	91.4	12.0	14.9	10.0	31.7	NA	70.1	11.0	24.4
7/16	10.0	109.7	12.0	12.8	12.0	31.1	NA	81.7	7.0	24.1
7/17	10.0	112.8	13.0	11.0	10.0	32.0	NA	106.7	11.0	21.6
7/18	8.0	106.1	13.0	11.6	9.0	36.0	NA	NA	10.0	21.9
7/19	9.0	94.5	13.0	12.2	10.0	43.0	NA	NA	10.0	21.9
7/20	10.0	91.4	13.0	14.0	10.5	48.2	NA	NA	12.0	22.6
7/21	8.0	91.4	13.0	12.2	12.0	50.6	NA	66.4	11.0	21.9
7/22	9.0	79.2	14.0	12.2	11.0	45.7	NA	58.5	12.0	20.7
7/23	10.0	76.8	14.0	11.0	8.0	42.7	NA	50.6	14.0	20.1
7/24	9.0	76.2	13.0	11.6	10.0	43.3	NA	48.2	14.0	19.5
7/25	10.0	76.2	13.0	15.8	11.0	42.4	NA	43.3	11.0	20.7
7/26	8.0	88.4	13.0	14.0	11.0	42.1	NA	39.6	11.0	NA
7/27	8.0	85.3	12.0	12.8	12.0	51.2	NA	36.6	10.0	67.7
7/28	10.0	76.2	12.0	18.3	11.0	54.3	NA	34.1	9.0	53.3
7/29	10.0	73.2	13.0	26.2	10.0	54.9	NA	42.7	10.0	72.2
7/30	9.0	73.2	12.0	30.5	12.0	46.3	NA	39.0	NA	162.8
7/31	8.0	70.1	10.0	74.7	12.0	45.7	NA	34.1	NA	117.0
8/01	9.0	69.5	9.0	46.6	14.0	42.7	NA	30.5	NA	NA
8/02	8.0	67.1	10.0	46.6	16.0	40.2	NA	28.0	9.0	94.5
8/03	9.0	64.0	10.0	39.6	14.0	38.1	NA	27.4	9.0	84.1
8/04	8.0	74.4	11.0	37.2	14.0	36.6	NA	42.7	NA	NA
8/05	7.0	75.6	13.0	33.5	14.0	36.0	NA	39.6	9.0	73.2
8/06	9.0	67.1	11.0	27.4	14.0	36.0	NA	36.6	8.0	70.1
8/07	8.0	67.1	11.0	27.4	13.0	36.6	NA	35.1	9.0	NA
8/08	8.5	60.4	10.0	25.0	13.0	35.4	NA	42.7	8.0	62.5

-continued-

	2008		2009		2010		2011		2012	
Date	Temp. (°C)	Depth (cm)	Temp. (°C)	Depth (cm)	Temp. (°C)	Depth (cm)	Temp. (°C)	Depth (cm)	Temp. (°C)	Depth (cm)
8/09	10.0	61.6	11.0	23.8	13.0	36.0	NA	45.7	9.0	59.4
8/10	10.0	55.2	11.0	21.3	12.0	36.6	NA	44.2	10.0	56.4
8/11	10.5	54.9	11.0	18.3	12.0	41.5	NA	88.4	10.0	54.9
8/12	9.5	53.3	12.0	17.7	12.0	44.5	NA	97.5	12.0	51.8
8/13	9.0	51.8	11.0	18.3	12.0	47.5	NA	109.7	12.0	51.8
8/14	10.5	51.8	11.0	18.3	11.0	46.3	NA	64.0	10.0	51.8
8/15	12.0	49.1	12.0	17.7	12.0	53.0	NA	57.9	10.0	53.6
8/16	10.5	48.8	10.0	15.2	11.0	65.8	NA	53.6	10.0	91.4
8/17	10.0	48.2	10.0	14.6	10.0	78.0	NA	49.4	10.0	112.8
8/18	12.0	47.2	8.0	21.3	8.0	77.4	NA	45.7	10.0	158.5
8/19	11.0	45.7	8.0	21.3	9.0	73.2	NA	42.7	NA	189.0
8/20	10.0	45.7	9.0	16.5	9.0	67.1	NA	39.6	9.0	158.5
8/21	10.0	43.6	9.0	18.3	9.0	64.0	NA	36.6	NA	182.9
8/22	10.0	42.1	9.0	40.2	9.0	61.0	NA	36.6	NA	NA
8/23	10.0	41.1	9.0	46.3	9.0	58.5	NA	24.4	9.0	170.7
8/24	10.0	39.6	8.0	39.6	10.0	55.5	NA	32.3	NA	161.5
8/25	9.0	39.6	7.0	36.6	9.0	54.3	NA	29.9	8.0	140.2
8/26	7.0	39.6	6.0	36.6	9.0	53.0	NA	27.1	NA	115.8
8/27	7.0	39.0	7.0	30.5	10.0	51.8	NA	24.4		
8/28	7.0	39.0	7.0	29.9	10.0	51.8	NA	21.9		
8/29	7.0	36.6	8.0	27.4	10.0	51.2	NA	23.2		
8/30	8.0	36.0	8.0	27.4	10.0	50.6	NA	24.4		
8/31	9.0	35.4	8.0	46.9	9.0	48.8	NA	23.8		
9/01	9.0	35.4	8.0	57.9	10.0	46.9	NA	24.7		
9/02	9.0	34.1	8.0	61.0			NA	22.6		
9/03	9.0	30.5					NA	21.3		
9/04	9.0	32.9					NA	20.1		
9/05	8.0	31.4					NA	18.0		
9/06	8.0	30.5					NA	16.8		
9/07	9.0	30.5								

Note: Recorded water temperatures are morning water temperatures, except where morning temperatures were not available. Recorded water depths are highest recorded daily water depth.

APPENDIX G: KWINIUK RIVER TOWER

Appendix G1.–Expanded daily and cumulative (Cum.) migration of all salmonid species past Kwiniuk River counting tower, Norton Sound, 2008.

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho
6/23	0	0	0	0	0	0	0	0
6/24	3	3	-42	-42	0	0	0	0
6/25	0	3	24	-18	0	0	0	0
6/26	6	9	207	189	0	0	0	0
6/27	45	54	579	768	0	0	0	0
6/28	183	237	21,690	22,458	0	0	0	0
6/29	603	840	44,493	66,951	6	6	0	0
6/30	123	963	28,422	95,373	0	6	0	0
7/01	366	1,329	46,263	141,636	0	6	0	0
7/02	510	1,839	18,657	160,293	6	12	0	0
7/03	1,557	3,396	84,126	244,419	0	12	0	0
7/04	1,821	5,217	211,617	456,036	15	27	0	0
7/05	984	6,201	91,758	547,794	39	66	0	0
7/06	690	6,891	171,564	719,358	27	93	0	0
7/07	561	7,452	119,577	838,935	33	126	0	0
7/08	495	7,947	120,597	959,532	27	153	0	0
7/09	15	7,962	-17,631	941,901	9	162	0	0
7/10	51	8,013	-9,981	931,920	-3	159	0	0
7/11	81	8,094	5,376	937,296	0	159	0	0
7/12	201	8,295	7,296	944,592	12	171	9	9
7/13 [a]	276	8,571	6,487	951,079	12	183	10	19
7/14	105	8,676	15,384	966,463	3	186	0	19
7/15	-30	8,646	18,141	984,604	-6	180	3	22
7/16	114	8,760	25,389	1,009,993	3	183	18	40
7/17	33	8,793	17,673	1,027,666	3	186	0	40
7/18	3	8,796	17,469	1,045,135	9	195	0	40
7/19	171	8,967	152,943	1,198,078	9	204	9	49
7/20	3	8,970	-4,026	1,194,052	3	207	0	49
7/21	-42	8,928	-24,744	1,169,308	-3	204	-9	40
7/22	60	8,988	17,604	1,186,912	6	210	48	88
7/23	165	9,153	40,377	1,227,289	3	213	123	211
7/24	123	9,276	53,778	1,281,067	9	222	75	286
7/25	72	9,348	78,831	1,359,898	9	231	39	325
7/26	21	9,369	12,675	1,372,573	0	231	36	361
7/27	15	9,384	9,846	1,382,419	6	237	0	361
7/28	54	9,438	17,907	1,400,326	0	237	93	454
7/29	-9	9,429	12,684	1,413,010	-6	231	6	460
7/30	6	9,435	1,881	1,414,891	0	231	30	490
7/31	-3	9,432	1,701	1,416,592	3	234	72	562
8/01	0	9,432	975	1,417,567	0	234	-18	544
8/02	9	9,441	4,773	1,422,340	0	234	72	616
8/03	-3	9,438	5,379	1,427,719	0	234	69	685
8/04	12	9,450	2,217	1,429,936	0	234	15	700
8/05	3	9,453	2,709	1,432,645	0	234	93	793
8/06	3	9,456	2,649	1,435,294	3	237	162	955
8/07	0	9,456	2,097	1,437,391	0	237	36	991
8/08	0	9,456	1,848	1,439,239	0	237	-21	970
8/09	0	9,456	1,146	1,440,385	0	237	-6	964

-continued-

Appendix G1.–Page 2 of 2.

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho
8/10	0	9,456	984	1,441,369	0	237	81	1,045
8/11	0	9,456	1,143	1,442,512	0	237	387	1,432
8/12	3	9,459	540	1,443,052	0	237	117	1,549
8/13	6	9,465	417	1,443,469	0	237	240	1,789
8/14	0	9,465	294	1,443,763	0	237	1,050	2,839
8/15	3	9,468	171	1,443,934	0	237	1,347	4,186
8/16	0	9,468	24	1,443,958	0	237	105	4,291
8/17	0	9,468	36	1,443,994	0	237	345	4,636
8/18	0	9,468	48	1,444,042	0	237	1,224	5,860
8/19	3	9,471	33	1,444,075	0	237	243	6,103
8/20	0	9,471	15	1,444,090	0	237	51	6,154
8/21	0	9,471	6	1,444,096	0	237	69	6,223
8/22	0	9,471	15	1,444,111	0	237	666	6,889
8/23	0	9,471	6	1,444,117	0	237	729	7,618
8/24	3	9,474	21	1,444,138	0	237	462	8,080
8/25	0	9,474	9	1,444,147	0	237	147	8,227
8/26	0	9,474	9	1,444,156	0	237	-39	8,188
8/27	3	9,477	6	1,444,162	0	237	15	8,203
8/28	0	9,477	9	1,444,171	0	237	486	8,689
8/29	3	9,480	6	1,444,177	0	237	477	9,166
8/30	3	9,483	6	1,444,183	0	237	261	9,427
8/31	0	9,483	12	1,444,195	0	237	330	9,757
9/01	0	9,483	3	1,444,198	0	237	330	10,087
9/02	0	9,483	3	1,444,201	0	237	54	10,141
9/03	0	9,483	9	1,444,210	0	237	81	10,222
9/04	0	9,483	9	1,444,219	0	237	96	10,318
9/05	0	9,483	3	1,444,222	0	237	63	10,381
9/06	0	9,483	3	1,444,225	0	237	30	10,411
9/07	0	9,483	3	1,444,228	0	237	51	10,462
Total	9,483		144,228		237		10,462	

Note: The inside box in the cumulative column is the day when the midpoint of the total was reached. The outside box is from the day the first quartile was reached to the day the third quartile was reached.

[a] Some portion of the count was interpolated.

Appendix G2.–Expanded daily and cumulative (Cum.) migration of all salmonid species past Kwiniuk River counting tower, Norton Sound, 2009.

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho
6/24	-6	-6	3	3	0	0	0	0
6/25	3	-3	0	3	0	0	0	0
6/26	6	3	0	3	0	0	0	0
6/27	6	9	3	6	0	0	0	0
6/28	51	60	0	6	0	0	0	0
6/29	0	60	3	9	0	0	0	0
6/30	9	69	0	9	0	0	0	0
7/01	102	171	6	15	0	0	0	0
7/02	165	336	60	75	15	15	0	0
7/03	495	831	27	102	12	27	0	0
7/04	222	1,053	36	138	33	60	0	0
7/05	639	1,692	99	237	3	63	0	0
7/06	132	1,824	36	273	9	72	0	0
7/07	993	2,817	132	405	27	99	0	0
7/08	282	3,099	147	552	15	114	0	0
7/09	51	3,150	198	750	-3	111	0	0
7/10	369	3,519	1,530	2,280	0	111	0	0
7/11	357	3,876	696	2,976	24	135	0	0
7/12	972	4,848	1,650	4,626	39	174	0	0
7/13	825	5,673	2,436	7,062	69	243	0	0
7/14	255	5,928	2,595	9,657	39	282	0	0
7/15	12	5,940	150	9,807	-3	279	0	0
7/16	279	6,219	1,635	11,442	21	300	0	0
7/17	369	6,588	2,124	13,566	9	309	3	3
7/18	411	6,999	4,287	17,853	24	333	3	6
7/19	24	7,023	489	18,342	9	342	0	6
7/20	33	7,056	285	18,627	12	354	3	9
7/21	138	7,194	1,326	19,953	0	354	3	12
7/22	300	7,494	4,224	24,177	33	387	3	15
7/23	69	7,563	885	25,062	9	396	3	18
7/24	66	7,629	972	26,034	6	402	9	27
7/25	138	7,767	2,940	28,974	3	405	12	39
7/26	159	7,926	2,628	31,602	0	405	27	66
7/27	141	8,067	2,541	34,143	3	408	3	69
7/28	87	8,154	1,347	35,490	3	411	12	81
7/29	114	8,268	1,917	37,407	3	414	12	93
7/30	102	8,370	1,986	39,393	3	417	18	111
7/31	21	8,391	516	39,909	0	417	9	120
8/01	9	8,400	534	40,443	6	423	12	132
8/02	36	8,436	594	41,037	6	429	27	159
8/03	30	8,466	387	41,424	6	435	120	279
8/04	36	8,502	441	41,865	6	441	21	300
8/05	84	8,586	285	42,150	3	444	165	465
8/06	9	8,595	237	42,387	0	444	51	516
8/07	36	8,631	201	42,588	0	444	66	582
8/08	36	8,667	84	42,672	0	444	219	801
8/09	21	8,688	45	42,717	0	444	174	975
8/10	3	8,691	45	42,762	0	444	72	1,047

-continued-

Appendix G2.–Page 2 of 2.

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho
8/11	12	8,703	30	42,792	0	444	138	1,185
8/12	6	8,709	3	42,795	0	444	564	1,749
8/13	9	8,718	48	42,843	0	444	573	2,322
8/14	0	8,718	18	42,861	0	444	435	2,757
8/15	0	8,718	3	42,864	0	444	189	2,946
8/16	0	8,718	3	42,867	0	444	78	3,024
8/17	3	8,721	12	42,879	0	444	330	3,354
8/18	6	8,727	3	42,882	0	444	231	3,585
8/19	0	8,727	6	42,888	0	444	135	3,720
8/20	0	8,727	0	42,888	0	444	117	3,837
8/21	0	8,727	3	42,891	0	444	171	4,008
8/22	3	8,730	6	42,897	0	444	2,016	6,024
8/23	3	8,733	3	42,900	0	444	270	6,294
8/24	0	8,733	12	42,912	0	444	-204	6,090
8/25	0	8,733	3	42,915	0	444	-30	6,060
8/26	3	8,736	6	42,921	0	444	-48	6,012
8/27	0	8,736	0	42,921	0	444	45	6,057
8/28	0	8,736	0	42,921	0	444	90	6,147
8/29	0	8,736	3	42,924	0	444	69	6,216
8/30	0	8,736	3	42,927	0	444	189	6,405
8/31 [a]	0	8,736	0	42,927	0	444	1,268	7,673
9/01 [a]	0	8,736	6	42,933	0	444	51	7,724
9/02	0	8,736	6	42,939	0	444	18	7,742
9/03	0	8,736	3	42,942	0	444	6	7,748
9/04	0	8,736	0	42,942	0	444	-15	7,733
9/05	0	8,736	3	42,945	0	444	15	7,748
9/06	0	8,736	0	42,945	0	444	72	7,820
9/07	0	8,736	3	42,948	0	444	69	7,889
9/08	0	8,736	3	42,951	0	444	39	7,928
9/09	0	8,736	0	42,951	0	444	204	8,132
9/10	0	8,736	0	42,951	0	444	267	8,399
9/11	3	8,739	0	42,951	0	444	105	8,504
9/12	0	8,739	3	42,954	0	444	36	8,540
9/13	0	8,739	9	42,963	0	444	165	8,705
Total	8,739		42,963		444		8,705	

Note: The inside box in the cumulative column is the day when the midpoint of the total was reached. The outside box is from the day the first quartile was reached to the day the third quartile was reached.

[a] Some portion of the count was interpolated.

Appendix G3.–Expanded daily and cumulative (Cum.) migration of all salmonid species past Kwiniuk River counting tower, Norton Sound, 2010.

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho
6/25	3	3	12	12	0	0	0	0
6/26	99	102	276	288	0	0	0	0
6/27	2,706	2,808	1,485	1,773	3	3	0	0
6/28	5,610	8,418	1,521	3,294	6	9	0	0
6/29	2,067	10,485	2,769	6,063	0	9	0	0
6/30	2,736	13,221	8,706	14,769	12	21	0	0
7/01	3,951	17,172	14,457	29,226	9	30	0	0
7/02	1,014	18,186	6,627	35,853	0	30	0	0
7/03	5,925	24,111	23,472	59,325	3	33	0	0
7/04	6,360	30,471	35,805	95,130	18	51	0	0
7/05	5,469	35,940	44,820	139,950	12	63	0	0
7/06	366	36,306	270	140,220	0	63	0	0
7/07	1,926	38,232	6,807	147,027	3	66	0	0
7/08	2,424	40,656	29,685	176,712	6	72	0	0
7/09	5,670	46,326	55,794	232,506	3	75	0	0
7/10	3,360	49,686	84,420	316,926	12	87	0	0
7/11	1,677	51,363	31,239	348,165	6	93	0	0
7/12	1,356	52,719	27,209	375,374	6	99	0	0
7/13	399	53,118	6,168	381,542	0	99	0	0
7/14	2,103	55,221	9,726	391,268	6	105	0	0
7/15	171	55,392	1,449	392,717	0	105	0	0
7/16	828	56,220	7,698	400,415	3	108	0	0
7/17	351	56,571	3,378	403,793	0	108	0	0
7/18	933	57,504	10,608	414,401	0	108	3	3
7/19	1,257	58,761	18,276	432,677	0	108	0	3
7/20	3,357	62,118	17,088	449,765	0	108	6	9
7/21	3,387	65,505	49,134	498,899	12	120	9	18
7/22	366	65,871	20,961	519,860	0	120	15	33
7/23	135	66,006	3,882	523,742	0	120	21	54
7/24	285	66,291	7,962	531,704	3	123	9	63
7/25	1,308	67,599	22,770	554,474	3	126	24	87
7/26	384	67,983	17,694	572,168	3	129	48	135
7/27	399	68,382	17,583	589,751	3	132	30	165
7/28	882	69,264	12,729	602,480	6	138	51	216
7/29	213	69,477	5,667	608,147	0	138	21	237
7/30	282	69,759	4,584	612,731	0	138	15	252
7/31	513	70,272	7,113	619,844	0	138	96	348
8/01	507	70,779	5,076	624,920	0	138	222	570
8/02	198	70,977	1,794	626,714	0	138	147	717
8/03	90	71,067	1,026	627,740	0	138	129	846
8/04	63	71,130	906	628,646	0	138	102	948
8/05	69	71,199	1,077	629,723	0	138	288	1,236
8/06	51	71,250	759	630,482	0	138	171	1,407
8/07	3	71,253	690	631,172	0	138	162	1,569
8/08	0	71,253	624	631,796	0	138	189	1,758
8/09	24	71,277	588	632,384	0	138	600	2,358
8/10	57	71,334	423	632,807	0	138	363	2,721
8/11	12	71,346	351	633,158	0	138	870	3,591

-continued-

Appendix G3.–Page 2 of 2.

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho
8/12	12	71,358	234	633,392	0	138	303	3,894
8/13	3	71,361	243	633,635	0	138	126	4,020
8/14	6	71,367	162	633,797	0	138	99	4,119
8/15	3	71,370	117	633,914	0	138	228	4,347
8/16	0	71,370	66	633,980	0	138	-63	4,284
8/17	0	71,370	42	634,022	0	138	-96	4,188
8/18	3	71,373	27	634,049	0	138	-81	4,107
8/19	9	71,382	30	634,079	0	138	135	4,242
8/20	0	71,382	30	634,109	0	138	126	4,368
8/21	3	71,385	6	634,115	0	138	153	4,521
8/22	0	71,385	12	634,127	0	138	231	4,752
8/23	0	71,385	0	634,127	0	138	261	5,013
8/24	0	71,385	0	634,127	0	138	123	5,136
8/25	3	71,388	0	634,127	0	138	237	5,373
8/26	0	71,388	9	634,136	0	138	114	5,487
8/27	6	71,394	18	634,154	0	138	300	5,787
8/28	0	71,394	6	634,160	0	138	384	6,171
8/29	6	71,400	0	634,160	0	138	219	6,390
8/30	0	71,400	3	634,163	0	138	102	6,492
8/31	3	71,403	0	634,163	0	138	72	6,564
9/01	0	71,403	3	634,166	0	138	15	6,579
9/02	0	71,403	0	634,166	0	138	288	6,867
9/03	0	71,403	3	634,169	0	138	543	7,410
9/04	0	71,403	0	634,169	0	138	318	7,728
9/05	0	71,403	0	634,169	0	138	216	7,944
9/06	0	71,403	0	634,169	0	138	102	8,046
9/07	0	71,403	0	634,169	0	138	12	8,058
Total	71,403		634,169		138		8,058	

Note: The inside box in the cumulative column is the day when the midpoint of the total was reached. The outside box is from the day the first quartile was reached to the day the third quartile was reached.

Appendix G4.–Expanded daily and cumulative (Cum.) migration of all salmonid species past Kwiniuk River counting tower, Norton Sound, 2011.

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho
6/20	0	0	0	0	0	0	0	0
6/21	48	48	60	60	0	0	0	0
6/22	33	81	24	84	0	0	0	0
6/23	384	465	6	90	0	0	0	0
6/24	-96	369	0	90	0	0	0	0
6/25	1,077	1,446	24	114	0	0	0	0
6/26	135	1,581	24	138	0	0	0	0
6/27	2,724	4,305	249	387	6	6	0	0
6/28	132	4,437	0	387	3	9	0	0
6/29	2,133	6,570	6	393	3	12	0	0
6/30	525	7,095	0	393	6	18	0	0
7/01	33	7,128	0	393	3	21	0	0
7/02	2,649	9,777	3	396	3	24	0	0
7/03	45	9,822	0	396	-3	21	0	0
7/04	3,279	13,101	6	402	3	24	0	0
7/05	1,038	14,139	9	411	0	24	0	0
7/06	798	14,937	3	414	0	24	0	0
7/07	579	15,516	6	420	0	24	0	0
7/08	1,362	16,878	6	426	3	27	0	0
7/09	444	17,322	3	429	3	30	0	0
7/10	1,392	18,714	12	441	0	30	0	0
7/11	1,929	20,643	39	480	0	30	0	0
7/12	2,412	23,055	48	528	-3	27	0	0
7/13	1,110	24,165	93	621	9	36	0	0
7/14	351	24,516	63	684	3	39	0	0
7/15	780	25,296	123	807	3	42	0	0
7/16	609	25,905	183	990	0	42	0	0
7/17	183	26,088	123	1,113	3	45	0	0
7/18	174	26,262	129	1,242	-6	39	0	0
7/19	171	26,433	240	1,482	0	39	0	0
7/20	855	27,288	477	1,959	-3	36	0	0
7/21	1,149	28,437	1,332	3,291	0	36	0	0
7/22	555	28,992	984	4,275	6	42	0	0
7/23	633	29,625	1,956	6,231	3	45	0	0
7/24	324	29,949	711	6,942	3	48	0	0
7/25	348	30,297	1,239	8,181	3	51	0	0
7/26	498	30,795	3,252	11,433	0	51	0	0
7/27	195	30,990	2,097	13,530	3	54	0	0
7/28	144	31,134	2,685	16,215	0	54	36	36
7/29	195	31,329	2,391	18,606	0	54	21	57
7/30	147	31,476	1,962	20,568	0	54	66	123
7/31	153	31,629	2,370	22,938	0	54	48	171
8/01	84	31,713	714	23,652	0	54	33	204
8/02	24	31,737	462	24,114	0	54	18	222
8/03 [a]	82	31,819	1,174	25,288	0	54	41	263
8/04	123	31,942	972	26,260	0	54	63	326
8/05	48	31,990	762	27,022	0	54	180	506
8/06	90	32,080	591	27,613	0	54	225	731

-continued-

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho
8/07	12	32,092	477	28,090	0	54	12	743
8/08	45	32,137	696	28,786	0	54	150	893
8/09	21	32,158	507	29,293	0	54	222	1,115
8/10	18	32,176	516	29,809	0	54	189	1,304
8/11	21	32,197	456	30,265	3	57	180	1,484
8/12	15	32,212	99	30,364	0	57	33	1,517
8/13	3	32,215	252	30,616	0	57	138	1,655
8/14	12	32,227	63	30,679	0	57	39	1,694
8/15	-3	32,224	60	30,739	0	57	-9	1,685
8/16	0	32,224	27	30,766	0	57	9	1,694
8/17	-3	32,221	54	30,820	0	57	36	1,730
8/18	-12	32,209	-24	30,796	0	57	75	1,805
8/19	6	32,215	-9	30,787	0	57	90	1,895
8/20	0	32,215	18	30,805	0	57	66	1,961
8/21	0	32,215	18	30,823	0	57	78	2,039
8/22	0	32,215	0	30,823	0	57	129	2,168
8/23	9	32,224	3	30,826	0	57	12	2,180
8/24	3	32,227	12	30,838	0	57	57	2,237
8/25	0	32,227	6	30,844	0	57	93	2,330
8/26	3	32,230	12	30,856	0	57	72	2,402
8/27	-3	32,227	18	30,874	0	57	21	2,423
8/28	0	32,227	3	30,877	0	57	3	2,426
8/29	0	32,227	3	30,880	0	57	18	2,444
8/30	3	32,230	3	30,883	0	57	78	2,522
8/31	3	32,233	3	30,886	0	57	30	2,552
9/01	3	32,236	6	30,892	0	57	48	2,600
9/02	0	32,236	3	30,895	0	57	15	2,615
9/03	0	32,236	0	30,895	0	57	27	2,642
9/04	-3	32,233	0	30,895	0	57	-3	2,639
9/05	6	32,239	0	30,895	0	57	51	2,690
9/06	0	32,239	12	30,907	0	57	114	2,804
9/07	-3	32,236	3	30,910	0	57	33	2,837
9/08	0	32,236	0	30,910	0	57	15	2,852
9/09	3	32,239	3	30,913	0	57	129	2,981
9/10	0	32,239	0	30,913	0	57	276	3,257
9/11	0	32,239	0	30,913	0	57	33	3,290
Total	32,239		30,913		57		3,290	

Note: The inside box in the cumulative column is the day when the midpoint of the total was reached. The outside box is from the day the first quartile was reached to the day the third quartile was reached.

[a] Some portion of the count was interpolated.

Appendix G5.–Expanded daily and cumulative (Cum.) migration of all salmonid species past Kwiniuk River counting tower, Norton Sound, 2012.

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho
6/23	0	0	0	0	0	0	0	0
6/24	0	0	0	0	0	0	0	0
6/25	0	0	0	0	0	0	0	0
6/26	0	0	0	0	0	0	0	0
6/27	0	0	0	0	0	0	0	0
6/28	0	0	9	9	0	0	0	0
6/29	0	0	9	18	0	0	0	0
6/30	45	45	135	153	0	0	0	0
7/01	6	51	111	264	0	0	0	0
7/02	39	90	354	618	0	0	0	0
7/03	0	90	93	711	0	0	0	0
7/04	90	180	270	981	0	0	0	0
7/05	321	501	1,725	2,706	0	0	0	0
7/06	21	522	258	2,964	0	0	0	0
7/07	387	909	3,183	6,147	0	0	0	0
7/08	1,674	2,583	44,037	50,184	3	3	0	0
7/09	174	2,757	18,189	68,373	0	3	0	0
7/10	21	2,778	861	69,234	0	3	0	0
7/11	558	3,336	34,302	103,536	3	6	0	0
7/12	522	3,858	72,051	175,587	6	12	0	0
7/13	60	3,918	5,541	181,128	0	12	0	0
7/14	264	4,182	21,189	202,317	3	15	0	0
7/15	45	4,227	4,188	206,505	0	15	0	0
7/16	123	4,350	16,800	223,305	0	15	0	0
7/17 [a]	-12	4,338	-748	222,557	0	15	0	0
7/18	72	4,410	7,749	230,306	3	18	0	0
7/19	306	4,716	13,677	243,983	21	39	0	0
7/20	186	4,902	20,196	264,179	3	42	0	0
7/21	162	5,064	32,085	296,264	9	51	0	0
7/22	84	5,148	27,801	324,065	9	60	0	0
7/23	273	5,421	33,009	357,074	-3	57	0	0
7/24	33	5,454	12,612	369,686	3	60	0	0
7/25	21	5,475	1,740	371,426	0	60	6	6
7/26	30	5,505	6,507	377,933	0	60	3	9
7/27	24	5,529	3,375	381,308	0	60	3	12
7/28	3	5,532	3,441	384,749	0	60	30	42
7/29	12	5,544	1,623	386,372	0	60	9	51
7/30 [a]	6	5,550	1,112	387,484	0	60	9	60
7/31	0	5,550	600	388,084	0	60	9	69
8/01	0	5,550	1,032	389,116	0	60	57	126
8/02 [a]	0	5,550	1,010	390,126	0	60	40	166
8/03	6	5,556	705	390,831	0	60	27	193
8/04	0	5,556	486	391,317	0	60	24	217
8/05	3	5,559	309	391,626	0	60	27	244
8/06	0	5,559	132	391,758	0	60	0	244
8/07	3	5,562	126	391,884	0	60	9	253
8/08	9	5,571	450	392,334	0	60	21	274
8/09	0	5,571	90	392,424	0	60	12	286
8/10	3	5,574	144	392,568	0	60	54	340

-continued-

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho
8/10	3	5,574	144	392,568	0	60	54	340
8/11	0	5,574	144	392,712	0	60	147	487
8/12	0	5,574	60	392,772	0	60	66	553
8/13	3	5,577	96	392,868	0	60	48	601
8/14	0	5,577	54	392,922	0	60	42	643
8/15	0	5,577	87	393,009	0	60	102	745
8/16	0	5,577	21	393,030	0	60	36	781
Total	5,577		393,030		60		781	

Note: The inside box in the cumulative column is the day when the midpoint of the total was reached. The outside box is from the day the first quartile was reached to the day the third quartile was reached.

[a] Some portion of the count was interpolated.

Appendix G6.–Age and sex compositions by year for Kwiniuk River chum salmon ASL samples, 1995–2012.

Year	Sampling dates	Number of samples		Percent by sex		Percent by (Age Group)						
				Male	Female	(0.1)	(0.2)	(0.3)	(0.4)	(0.5)	(0.6)	(0.7)
1995	6/30–7/25	341		52.0	48.0	0.0	0.0	56.0	40.0	4.0	0.0	0.0
1996	7/03–7/13	57	[a]									
1997	7/04–7/24	409		41.0	59.0	0.0	0.0	53.0	46.0	1.0	0.0	0.0
1998	6/26–7/24	499		52.0	48.0	0.0	1.0	80.0	19.0	1.0	0.0	0.0
1999	7/01–7/23	247		49.0	51.0	0.0	0.0	47.0	52.0	1.0	0.0	0.0
2000	6/28–7/27	308		43.0	57.0	0.0	0.0	87.0	13.0	0.0	0.0	0.0
2001	6/30–8/14	763		46.0	54.0	0.0	4.0	9.0	86.0	1.0	0.0	0.0
2002	6/19–7/21	484		43.0	57.0	0.0	0.0	92.0	7.0	1.0	0.0	0.0
2003	6/25–7/24	473		47.0	54.0	0.0	1.0	34.0	64.0	1.0	0.0	0.0
2004	6/23–8/02	302		43.0	57.0	0.0	4.0	65.0	29.0	2.0	0.0	0.0
2005	6/29–7/27	434		43.0	57.0	0.0	4.0	65.0	29.0	2.0	0.0	0.0
2006	6/28–7/14	474		51.0	49.0	0.0	0.5	75.0	24.0	0.5	0.0	0.0
2007	6/26–7/23	506		46.0	54.0	0.0	0.0	40.0	58.0	3.0	0.0	0.0
2008	7/01–7/10	86	[a]	60.0	40.0							
2009	7/05–7/27	214		44.0	56.0	0.0	58.0	18.0	13.0	11.0	0.0	0.0
2010	6/28–7/22	241		42.0	58.0	0.0	1.0	97.0	2.0	0.0	0.0	0.0
2011	6/24–7/23	236		42.8	57.2	0.0	0.4	33.2	66.0	0.0	0.4	0.0
2012	7/10–7/13	4	[a]									

[a] Sample size insufficient for age composition analysis

Appendix G7.–Age and sex compositions by year for Kwiniuk River Chinook salmon ASL samples, 2001–2012.

Year	Sampling dates	Number of samples		Percent by sex		Percent by (Age Group)						
				Male	Female	(1.1)	(1.2)	(1.3)	(1.4)	(2.3)	(1.5)	(2.4)
2001				No data collected								
2002				No data collected								
2003				No data collected								
2004	8/04	5	[a]									
2005	7/08	4	[a]									
2006				No data collected								
2007				No data collected								
2008				No data collected								
2009				No data collected								
2010				No data collected								
2011				No data collected								
2012				No data collected								

[a] Sample size insufficient for age composition analysis

Appendix G8.–Age and sex compositions by year for Kwiniuk River coho salmon ASL samples, 2001–2012.

Year	Sampling Dates	Number of samples	Percent by sex		Percent by (Age Group)				
			Male	Female	(1.1)	(2.1)	(2.2)	(3.1)	(4.1)
2001			No data collected						
2002	8/03–8/23	157	60.5	39.5	7.6	86.6	1.3	3.8	0.6
2003	7/21–9/08	424	50.2	49.8	24.1	64.9	0.0	11.1	0.0
2004	7/26–8/10	152	53.9	46.1	11.8	88.2	0.0	0.0	0.0
2005	7/20–8/20	154	38.3	61.7	19.5	79.9	0.0	0.6	0.0
2006	8/13–8/26	182	43.4	56.6	22.5	74.7	0.0	2.7	0.0
2007	8/15–8/23	106 [a]	54.7	45.3					
2008			No data collected						
2009			No data collected						
2010			No data collected						
2011			No data collected						
2012			No data collected						

[a] Sample size insufficient for age composition analysis

Appendix G9.–Kwiniuk River counting tower water temperature (Temp.) and stream stage (Depth) observations, Norton Sound 2008–2012.

	2008		2009		2010		2011		2012	
Date	Temp. (°C)	Depth (cm)	Temp. (°C)	Depth (cm)	Temp. (°C)	Depth (cm)	Temp. (°C)	Depth (cm)	Temp. (°C)	Depth (cm)
6/20							10.0	NA		
6/21							11.0	48.3		
6/22							8.0	48.3		
6/23	10.0	94.0					9.0	48.3	10.0	10.2
6/24	9.5	81.3	8.5	96.5	8.5	96.5	4.0	48.3	10.0	25.4
6/25	8.0	83.8	8.5	91.4	8.5	91.4	9.0	43.2	10.0	25.4
6/26	9.5	78.7	8.0	66.0	8.0	66.0	9.5	50.8	10.0	10.2
6/27	9.5	72.4	7.0	48.3	7.0	48.3	10.5	74.9	11.0	12.7
6/28	10.0	78.7	8.0	43.2	8.0	43.2	10.5	72.4	10.0	12.7
6/29	10.5	88.9	8.0	43.2	8.0	43.2	11.0	68.6	11.0	25.4
6/30	11.0	88.9	8.5	43.2	8.5	43.2	11.0	66.0	12.0	20.3
7/01	11.0	94.0	10.5	50.8	10.5	50.8	9.0	39.4	12.0	12.7
7/02	11.0	106.7	13.0	50.8	13.0	50.8	8.0	39.4	12.0	12.7
7/03	11.5	96.5	14.0	71.1	14.0	71.1	10.0	38.1	12.0	12.7
7/04	12.5	96.5	14.0	109.2	14.0	109.2	7.0	33.0	11.0	10.2
7/05	13.5	78.7	12.0	66.0	12.0	66.0	8.5	53.3	11.0	10.2
7/06	14.0	55.9	13.0	86.4	13.0	86.4	7.3	94.0	12.0	10.2
7/07	14.5	55.9	15.0	88.9	15.0	88.9	7.5	64.8	14.0	10.2
7/08	13.5	76.2	14.0	94.0	14.0	94.0	10.3	44.5	14.0	10.2
7/09	12.5	83.8	13.0	63.5	13.0	63.5	11.0	53.3	11.0	10.2
7/10	9.5	96.5	12.5	40.6	12.5	40.6	10.0	76.2	12.0	12.7
7/11	10.0	76.2	14.0	35.6	14.0	35.6	10.0	54.6	13.0	25.4
7/12	9.0	83.8	15.0	33.0	15.0	33.0	8.0	115.6	13.0	63.5
7/13	8.0	124.5	15.5	48.3	15.5	48.3	8.0	119.4	12.0	68.6
7/14	8.0	116.8	15.0	53.3	15.0	53.3	8.0	78.7	11.0	48.3
7/15	8.0	111.8	13.5	43.2	13.5	43.2	6.0	58.4	11.0	61.0
7/16	8.5	121.9	13.0	33.0	13.0	33.0	8.5	78.7	10.0	63.5
7/17	9.0	116.8	14.0	58.4	14.0	58.4	8.5	81.3	10.0	63.5
7/18	9.0	106.7	14.0	76.2	14.0	76.2	8.0	88.9	10.0	40.6
7/19	9.0	104.1	13.0	81.3	13.0	81.3	8.0	86.4	10.0	30.5
7/20	9.0	111.8	13.5	96.5	13.5	96.5	8.5	76.2	10.0	25.4
7/21	8.0	83.8	13.5	71.1	13.5	71.1	11.0	68.6	11.0	22.9
7/22	6.0	76.2	14.0	71.1	14.0	71.1	10.0	68.6	13.0	22.9
7/23	9.0	72.4	14.0	68.6	14.0	68.6	12.0	66.0	13.0	55.9
7/24	8.0	69.9	13.5	58.4	13.5	58.4	10.0	78.7	11.0	76.2
7/25	8.0	72.4	14.0	45.7	14.0	45.7	9.0	71.1	10.0	76.2
7/26	7.0	73.7	13.0	20.3	13.0	20.3	11.0	73.7	10.0	68.6
7/27	7.5	86.4	12.0	25.4	12.0	25.4	10.0	66.0	10.0	101.6
7/28	9.0	94.0	11.5	38.1	11.5	38.1	12.0	55.9	10.0	94.0
7/29	9.0	124.5	12.0	25.4	12.0	25.4	11.0	83.8	10.0	132.1

-continued-

Appendix G9.–Page 2 of 2.

	2008		2009		2010		2011		2012	
Date	Temp. (°C)	Depth (cm)	Temp. (°C)	Depth (cm)	Temp. (°C)	Depth (cm)	Temp. (°C)	Depth (cm)	Temp. (°C)	Depth (cm)
7/30	7.5	121.9	11.0	106.7	11.0	106.7	8.0	81.3	9.0	86.4
7/31	8.0	134.6	11.0	48.3	11.0	48.3	9.0	58.4	10.0	81.3
8/01	7.5	124.5	10.0	91.4	10.0	91.4	9.0	48.3	9.0	88.9
8/02	7.0	81.3	10.5	74.9	10.5	74.9	8.0	43.2	9.5	86.4
8/03	8.0	73.7	12.0	86.4	12.0	86.4	7.0	45.7	8.0	88.9
8/04	7.5	63.5	12.5	50.8	12.5	50.8	8.0	54.6	8.5	83.8
8/05	8.0	61.0	12.5	81.3	12.5	81.3	9.0	66.0	8.0	81.3
8/06	9.0	58.4	12.0	83.8	12.0	83.8	9.0	95.3	7.5	72.4
8/07	9.0	58.4	10.0	58.4	10.0	58.4	9.0	73.7	8.5	68.6
8/08	11.0	57.2	11.0	63.5	11.0	63.5	9.0	108.0	8.5	69.9
8/09	10.0	57.2	10.5	20.3	10.5	20.3	9.0	94.0	9.0	81.3
8/10	9.0	63.5	12.0	21.6	12.0	21.6	10.0	86.4	10.0	81.3
8/11	10.5	63.5	12.0	19.1	12.0	19.1	10.0	76.2	10.5	81.3
8/12	10.5	63.5	11.0	17.8	11.0	17.8	10.0	110.5	11.5	67.3
8/13	10.0	61.0	10.5	35.6	10.5	35.6	11.0	111.8	10.5	68.6
8/14	10.0	76.2	11.0	35.6	11.0	35.6	11.0	90.4	11.5	68.6
8/15	11.0	101.6	10.5	35.6	10.5	35.6	9.0	81.3	10.5	152.4
8/16	11.0	85.1	10.0	38.1	10.0	38.1	9.0	78.7	9.0	> 152
8/17	11.0	81.3	10.5	73.7	10.5	73.7	9.5	74.9	10.0	157.5
8/18	11.5	58.4	10.0	40.6	10.0	40.6	9.0	71.1	9.0	167.6
8/19	11.0	53.3	9.0	81.3	9.0	81.3	10.0	68.6		
8/20	10.5	45.7	9.5	81.3	9.5	81.3	9.5	64.8		
8/21	10.0	43.2	9.0	73.7	9.0	73.7	9.0	66.0		
8/22	10.0	41.9	10.0	71.1	10.0	71.1	9.0	91.4		
8/23	10.5	44.5	9.0	38.1	9.0	38.1	7.0	76.2		
8/24	10.0	43.2	6.0	35.6	6.0	35.6	8.0	77.5		
8/25	8.5	40.6	6.0	27.9	6.0	27.9	8.0	101.6		
8/26	8.0	43.2	5.0	25.4	5.0	25.4	8.0	81.3		
8/27	7.0	55.9	5.5	26.7	5.5	26.7	8.0	66.0		
8/28	6.0	73.7	5.0	27.9	5.0	27.9	8.0	58.4		
8/29	6.0	86.4	4.0	45.7	4.0	45.7	6.0	76.2		
8/30	6.0	71.1	4.5	58.4	4.5	58.4	10.0	58.4		
8/31	7.0	63.5	5.0	160.0	5.0	160.0	8.0	50.8		
9/01	8.0	36.8	6.0	157.5	6.0	157.5	9.0	66.0		
9/02	8.0	35.6	6.0	81.3	6.0	81.3	9.0	55.9		
9/03	9.0	35.6	7.0	58.4	7.0	58.4	8.0	61.0		
9/04	8.5	34.3	8.0	61.0	8.0	61.0	8.0	66.0		
9/05	8.0	34.3	6.0	63.5	6.0	63.5	9.0	58.4		
9/06	8.0	33.0	5.0	53.3	5.0	53.3	8.0	43.2		
9/07	8.0	33.0	4.0	40.6	4.0	40.6	7.0	44.5		
9/08			4.0	43.2	4.0	43.2	7.0	40.6		
9/09			7.0	40.6	7.0	40.6	7.0	40.6		
9/10			7.0	40.6	7.0	40.6	7.0	149.9		
9/11			7.0	40.6	7.0	40.6	8.0	106.7		
9/12			6.0	50.8	6.0	50.8				
9/13			6.0	38.1	6.0	38.1				

Note: Recorded water temperatures are morning water temperatures, except where morning temperatures were not available. Recorded water depths are highest recorded daily water depth.

APPENDIX H: INGLUTALIK RIVER TOWER

Appendix H1.–Expanded daily and cumulative (Cum.) migration of all salmonid species past Inglutalik River counting tower, Norton Sound, 2011.

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho
6/24	0	0	0	0	-3	-3	0	0
6/25	99	99	0	0	165	162	0	0
6/26	219	318	0	0	48	210	0	0
6/27	684	1,002	0	0	48	258	0	0
6/28	258	1,260	0	0	48	306	0	0
6/29	729	1,989	0	0	102	408	0	0
6/30	267	2,256	0	0	15	423	0	0
7/01	-216	2,040	0	0	-9	414	0	0
7/02	3,174	5,214	0	0	156	570	0	0
7/03	252	5,466	12	12	-9	561	0	0
7/04	1,338	6,804	0	12	36	597	0	0
7/05	5,436	12,240	27	39	132	729	15	15
7/06	3,720	15,960	33	72	84	813	6	21
7/07	3,615	19,575	42	114	39	852	0	21
7/08	984	20,559	234	348	30	882	6	27
7/09	5,562	26,121	552	900	63	945	0	27
7/10	1,839	27,960	711	1,611	18	963	0	27
7/11	915	28,875	375	1,986	9	972	0	27
7/12	3,444	32,319	1,617	3,603	69	1,041	0	27
7/13	-1,671	30,648	-846	2,757	75	1,116	0	27
7/14	1,230	31,878	198	2,955	102	1,218	0	27
7/15	3,237	35,115	174	3,129	114	1,332	0	27
7/16	3,411	38,526	642	3,771	72	1,404	0	27
7/17	1,548	40,074	333	4,104	12	1,416	0	27
7/18	2,652	42,726	1,029	5,133	21	1,437	0	27
7/19	441	43,167	576	5,709	14	1,451	0	27
7/20 [a]	624	43,791	1,831	7,540	3	1,454	5	32
7/21	2,805	46,596	13,887	21,427	12	1,466	3	35
7/22	4,740	51,336	44,016	65,443	0	1,466	0	35
7/23	3,780	55,116	14,022	79,465	0	1,466	0	35
7/24 [a]	676	55,792	6,214	85,679	3	1,469	0	35
7/25 [a]	1,341	57,133	11,937	97,616	0	1,469	0	35
7/26 [a]	2,496	59,629	33,673	131,289	0	1,469	0	35
7/27 [a]	2,191	61,820	132,441	263,730	0	1,469	0	35
7/28	201	62,021	122,826	386,556	0	1,469	0	35
7/29 [a]	0	62,021	1,024	387,580	0	1,469	0	35
7/30 [a]	136	62,157	5,867	393,447	0	1,469	3	38
7/31 [a]	74	62,231	10,710	404,157	0	1,469	3	41
8/01 [a]	207	62,438	11,527	415,684	0	1,469	9	50
8/02 [a]	15	62,453	8,237	423,921	0	1,469	0	50
8/03 [a]	83	62,536	23,295	447,216	0	1,469	0	50
8/04 [a]	55	62,591	4,833	452,049	0	1,469	0	50
8/05	105	62,696	1,293	453,342	0	1,469	0	50
8/06 [a]	98	62,794	13,744	467,086	0	1,469	486	536
8/07	0	62,794	327	467,413	0	1,469	0	536
8/08 [a]	43	62,837	5,062	472,475	0	1,469	190	726
8/09 [a]	15	62,852	721	473,196	0	1,469	34	760
8/10	30	62,882	1,116	474,312	0	1,469	84	844

-continued-

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho
8/11	15	62,897	720	475,032	0	1,469	18	862
8/12	0	62,897	120	475,152	0	1,469	0	862
8/13	0	62,897	15	475,167	0	1,469	0	862
8/14	0	62,897	0	475,167	0	1,469	0	862
Total	62,897		475,167		1,469		862	

Note: The inside box in the cumulative column is the day when the midpoint of the total was reached. The outside box is from the day the first quartile was reached to the day the third quartile was reached.

[a] Some portion of the count was interpolated.

Appendix H2.–Expanded daily and cumulative (Cum.) migration of all salmonid species past Inglutalik River counting tower, Norton Sound, 2012.

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho
6/21	0	0	0	0	0	0	0	0
6/22	0	0	0	0	0	0	0	0
6/23	0	0	0	0	0	0	0	0
6/24	0	0	0	0	0	0	0	0
6/25	0	0	0	0	0	0	0	0
6/26	0	0	0	0	0	0	0	0
6/27	0	0	0	0	0	0	0	0
6/28 [a]	0	0	0	0	69	69	0	0
6/29	0	0	0	0	27	96	0	0
6/30	0	0	0	0	9	105	0	0
7/01	0	0	0	0	-3	102	0	0
7/02	18	18	69	69	9	111	0	0
7/03	231	249	405	474	3	114	0	0
7/04	126	375	99	573	3	117	0	0
7/05	465	840	441	1,014	27	144	0	0
7/06	1,200	2,040	831	1,845	141	285	0	0
7/07	2,481	4,521	2,337	4,182	45	330	0	0
7/08	1,662	6,183	3,474	7,656	27	357	0	0
7/09	3,342	9,525	7,308	14,964	84	441	0	0
7/10 [a]	1,606	11,131	3,509	18,473	48	489	0	0
7/11	2,304	13,435	5,529	24,002	60	549	0	0
7/12	2,478	15,913	11,415	35,417	45	594	0	0
7/13 [a]	1,012	16,925	4,992	40,409	20	614	15	15
7/14 [a]	549	17,474	2,154	42,563	113	727	0	15
7/15	792	18,266	876	43,439	87	814	0	15
7/16	1,302	19,568	2,094	45,533	45	859	0	15
7/17	348	19,916	630	46,163	18	877	0	15
7/18	528	20,444	1,329	47,492	15	892	0	15
7/19	990	21,434	2,046	49,538	24	916	0	15
7/20	2,010	23,444	4,710	54,248	126	1,042	0	15
7/21 [a]	2,986	26,430	5,317	59,565	27	1,069	0	15
7/22	1,698	28,128	8,538	68,103	18	1,087	0	15
7/23	1,833	29,961	4,857	72,960	15	1,102	0	15
7/24	453	30,414	1,914	74,874	24	1,126	0	15
7/25 [a]	372	30,786	2,322	77,196	3	1,129	6	21
7/26	675	31,461	2,250	79,446	30	1,159	30	51
7/27	264	31,725	1,932	81,378	0	1,159	36	87
7/28	87	31,812	1,974	83,352	0	1,159	30	117
7/29	246	32,058	1,059	84,411	0	1,159	15	132
7/30	240	32,298	1,785	86,196	0	1,159	39	171
7/31	243	32,541	1,326	87,522	0	1,159	93	264
8/01	99	32,640	762	88,284	0	1,159	87	351
8/02	150	32,790	618	88,902	0	1,159	57	408
8/03	15	32,805	162	89,064	0	1,159	18	426
8/04	45	32,850	255	89,319	0	1,159	33	459
8/05	30	32,880	216	89,535	0	1,159	21	480
8/06	27	32,907	159	89,694	0	1,159	30	510
8/07	33	32,940	216	89,910	0	1,159	27	537

-continued-

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho
8/08	39	32,979	183	90,093	0	1,159	36	573
8/09	21	33,000	168	90,261	0	1,159	42	615
8/10	24	33,024	78	90,339	0	1,159	63	678
8/11	12	33,036	138	90,477	0	1,159	96	774
8/12	12	33,048	54	90,531	0	1,159	78	852
8/13	12	33,060	87	90,618	0	1,159	75	927
8/14	12	33,072	63	90,681	0	1,159	54	981
8/15	6	33,078	45	90,726	0	1,159	24	1,005
8/16	6	33,084	18	90,744	0	1,159	39	1,044
8/17	6	33,090	15	90,759	0	1,159	45	1,089
8/18	6	33,096	39	90,798	0	1,159	42	1,131
8/19	0	33,096	0	90,798	0	1,159	27	1,158
8/20	0	33,096	18	90,816	0	1,159	90	1,248
8/21	9	33,105	6	90,822	0	1,159	69	1,317
8/22	6	33,111	3	90,825	0	1,159	63	1,380
8/23	12	33,123	6	90,831	0	1,159	51	1,431
Total	33,123		90,831		1,159		1,431	

Note: The inside box in the cumulative column is the day when the midpoint of the total was reached. The outside box is from the day the first quartile was reached to the day the third quartile was reached.

[a] Some portion of the count was interpolated.

Appendix H3.–Age and sex compositions by year for Inglutalik River chum salmon ASL samples, 2011–2012.

Year	Sampling dates	Number of samples		Percent by sex		Percent by (Age group)						
				Male	Female	(0.1)	(0.2)	(0.3)	(0.4)	(0.5)	(0.6)	(0.7)
2011	7/09–8/10	131	[a]	40.7	59.3							
2012	7/09–7/25	56	[a]									

[a] Sample size insufficient for age composition analysis.

Appendix H4.–Inglutalik River counting tower water temperature (Temp.) and stream stage (Depth) observations, Norton Sound 2008–2012.

	2011		2012	
Date	Temp. (°C)	Depth (cm)	Temp. (°C)	Depth (cm)
6/21			9.0	55.5
6/22			9.0	53.3
6/23			12.0	30.5
6/24	10.0	64.0	13.0	54.9
6/25	15.0	85.3	12.0	57.9
6/26	13.0	51.8	14.0	64.0
6/27	14.0	51.8	13.0	41.1
6/28	14.0	50.3	14.0	39.6
6/29	14.0	57.9	14.0	24.1
6/30	12.0	54.9	15.0	23.8
7/01	11.0	50.3	15.0	24.1
7/02	7.0	57.9	14.0	26.2
7/03	12.0	46.3	15.0	30.5
7/04	9.0	57.9	14.0	38.7
7/05	11.0	53.3	15.0	67.1
7/06	12.0	97.5	15.0	67.1
7/07	13.0	67.1	16.0	91.4
7/08	14.0	36.6	18.0	76.2
7/09	15.0	27.4	17.0	48.8
7/10	15.0	41.1	15.0	52.4
7/11	15.0	24.4	14.0	42.1
7/12	10.0	120.4	17.0	33.2
7/13	11.0	121.9	17.0	33.5
7/14	14.0	36.6	14.0	42.4
7/15	12.0	45.7	14.0	42.7
7/16	10.0	45.7	14.0	39.6
7/17	10.0	44.2	14.0	48.8
7/18	14.0	90.8	12.0	56.4
7/19	13.0	100.6	11.0	46.3
7/20	10.0	73.2	12.0	49.7
7/21	NA	NA	12.0	39.6
7/22	14.0	56.4	13.0	49.4
7/23	15.0	53.3	13.0	70.7
7/24	13.0	100.6	14.0	115.2
7/25	14.0	67.1	12.0	100.6
7/26	14.0	85.3	12.0	76.2
7/27	14.0	88.4	12.0	42.1
7/28	15.0	67.1	12.0	121.9
7/29	15.0	70.1	12.0	47.5
7/30	15.0	86.9	11.0	54.9

-continued-

	2011		2012	
Date	Temp. (°C)	Depth (cm)	Temp. (°C)	Depth (cm)
7/31	13.0	85.3	9.0	57.3
8/01	12.0	83.8	10.0	53.6
8/02	12.0	76.2	10.0	67.1
8/03	NA	NA	11.0	73.8
8/04	13.0	73.2	12.0	70.7
8/05	12.0	82.3	11.0	79.9
8/06	12.0	83.8	10.0	73.2
8/07	10.0	79.2	9.0	44.2
8/08	NA	NA	9.0	39.6
8/09	NA	NA	7.0	48.8
8/10	NA	NA	12.0	42.7
8/11	10.0	67.1	11.0	42.7
8/12	NA	NA	13.0	73.2
8/13	9.0	128.0	13.0	39.6
8/14	9.0	118.9	13.0	48.8
8/15			12.0	61.0
8/16			12.0	167.6
8/17			13.0	121.9
8/18			12.0	121.9
8/19			13.0	100.6
8/20			13.0	106.7
8/21			13.0	112.8
8/22			12.0	118.3
8/23			10.0	67.1
8/24			10.0	146.3
8/25			9.0	189.0

Note: Recorded water temperatures are morning water temperatures, except where morning temperatures were not available. Recorded water depths are highest recorded daily water depth.

APPENDIX I: NORTH RIVER TOWER

Appendix I1.–Expanded daily and cumulative (Cum.) migration of all salmonid species past North River counting tower, Norton Sound, 2008.

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho
6/19	0	0	0	0	0	0	0	0
6/20	0	0	6	6	0	0	0	0
6/21	0	0	84	90	0	0	0	0
6/22	6	6	138	228	18	18	0	0
6/23	0	6	162	390	0	18	0	0
6/24	0	6	54	444	0	18	0	0
6/25	0	6	54	498	0	18	0	0
6/26	0	6	156	654	0	18	0	0
6/27	0	6	342	996	12	30	0	0
6/28	12	18	522	1,518	0	30	0	0
6/29	48	66	1,674	3,192	0	30	0	0
6/30	36	102	1,566	4,758	6	36	0	0
7/01	0	102	858	5,616	0	36	0	0
7/02	15	117	924	6,540	0	36	0	0
7/03	24	141	3,396	9,936	12	48	0	0
7/04	90	231	6,582	16,518	18	66	0	0
7/05	120	351	13,110	29,628	6	72	0	0
7/06	240	591	24,822	54,450	12	84	0	0
7/07	144	735	18,150	72,600	6	90	0	0
7/08	132	867	28,344	100,944	63	153	0	0
7/09	54	921	8,418	109,362	39	192	0	0
7/10	0	921	1,950	111,312	9	201	6	6
7/11	0	921	1,353	112,665	3	204	12	18
7/12	66	987	6,454	119,119	21	225	18	36
7/13	144	1,131	7,734	126,853	132	357	6	42
7/14	18	1,149	5,907	132,760	33	390	24	66
7/15	24	1,173	8,148	140,908	72	462	30	96
7/16	66	1,239	5,544	146,452	191	653	342	438
7/17	78	1,317	6,050	152,502	15	668	108	546
7/18	48	1,365	6,136	158,638	9	677	102	648
7/19	60	1,425	6,594	165,232	36	713	84	732
7/20	66	1,491	8,094	173,326	36	749	114	846
7/21	180	1,671	7,194	180,520	48	797	258	1,104
7/22	276	1,947	7,188	187,708	54	851	222	1,326
7/23	246	2,193	6,114	193,822	6	857	138	1,464
7/24	282	2,475	6,672	200,494	6	863	186	1,650
7/25	138	2,613	4,518	205,012	-18	845	246	1,896
7/26	186	2,799	4,116	209,128	30	875	186	2,082
7/27	264	3,063	3,336	212,464	0	875	192	2,274
7/28	12	3,075	2,394	214,858	0	875	180	2,454
7/29	66	3,141	3,084	217,942	6	881	174	2,628
7/30	192	3,333	2,160	220,102	12	893	264	2,892
7/31	582	3,915	3,102	223,204	24	917	888	3,780
8/01	156	4,071	1,998	225,202	6	923	180	3,960
8/02	174	4,245	2,262	227,464	0	923	270	4,230
8/03	36	4,281	1,920	229,384	0	923	204	4,434
8/04	132	4,413	1,338	230,722	0	923	270	4,704
8/05	12	4,425	1,752	232,474	0	923	72	4,776

-continued-

Appendix I1.–Page 2 of 2.

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho
8/06	294	4,719	2,070	234,544	0	923	396	5,172
8/07	240	4,959	1,374	235,918	0	923	288	5,460
8/08	120	5,079	1,092	237,010	6	929	378	5,838
8/09	327	5,406	827	237,837	0	929	246	6,084
8/10	246	5,652	864	238,701	-12	917	264	6,348
8/11	372	6,024	918	239,619	0	917	522	6,870
8/12	168	6,192	672	240,291	-12	905	354	7,224
8/13	156	6,348	426	240,717	0	905	276	7,500
8/14	252	6,600	282	240,999	0	905	252	7,752
8/15	219	6,819	291	241,290	0	905	288	8,040
8/16	288	7,107	201	241,491	0	905	390	8,430
8/17	144	7,251	72	241,563	0	905	378	8,808
8/18	294	7,545	24	241,587	0	905	1,074	9,882
8/19	168	7,713	24	241,611	0	905	414	10,296
8/20	60	7,773	48	241,659	0	905	246	10,542
8/21	96	7,869	24	241,683	0	905	288	10,830
8/22	126	7,995	6	241,689	0	905	390	11,220
8/23	96	8,091	60	241,749	0	905	375	11,595
8/24	18	8,109	42	241,791	0	905	54	11,649
8/25	342	8,451	0	241,791	0	905	510	12,159
8/26	204	8,655	0	241,791	0	905	330	12,489
8/27	150	8,805	0	241,791	0	905	186	12,675
8/28	24	8,829	6	241,797	0	905	318	12,993
8/29	138	8,967	-6	241,791	0	905	258	13,251
8/30	44	9,011	-1	241,790	0	905	72	13,323
8/31	23	9,034	2	241,792	0	905	120	13,443
9/01	138	9,172	0	241,792	0	905	264	13,707
9/02	192	9,364	6	241,798	0	905	252	13,959
9/03	48	9,412	0	241,798	0	905	162	14,121
9/04	24	9,436	0	241,798	0	905	126	14,247
9/05	48	9,484	0	241,798	0	905	132	14,379
9/06	24	9,508	0	241,798	0	905	171	14,550
9/07	-6	9,502	0	241,798	0	905	120	14,670
9/08	-18	9,484	0	241,798	0	905	240	14,910
9/09	12	9,496	0	241,798	0	905	162	15,072
9/10	12	9,508	0	241,798	0	905	252	15,324
9/11	0	9,508	0	241,798	0	905	120	15,444
9/12	-6	9,502	0	241,798	0	905	96	15,540
9/13	0	9,502	0	241,798	0	905	108	15,648
Total	9,502		241,798		905		15,648	

Note: The inside box in the cumulative column is the day when the midpoint of the total was reached. The outside box is from the day the first quartile was reached to the day the third quartile was reached.

Appendix I2.–Expanded daily and cumulative (Cum.) migration of all salmonid species past North River counting tower, Norton Sound, 2009

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho
6/19	0	12	0	0	0	0	0	0
6/20	12	18	0	0	0	0	0	0
6/21 [a]	6	24	0	0	6	6	0	0
6/22	6	24	0	0	0	6	0	0
6/23	0	24	0	0	6	12	0	0
6/24	0	24	0	0	0	12	0	0
6/25 [a]	0	24	0	0	0	12	0	0
6/26	0	24	0	0	12	24	0	0
6/27	0	24	6	6	6	30	0	0
6/28	0	24	0	6	0	30	0	0
6/29	0	30	0	6	0	30	0	0
6/30	6	48	96	102	24	54	0	0
7/01	18	84	24	126	6	60	0	0
7/02	36	126	60	186	30	90	0	0
7/03	42	150	126	312	60	150	0	0
7/04	24	150	60	372	18	168	0	0
7/05	0	156	12	384	24	192	0	0
7/06	6	318	72	456	24	216	0	0
7/07	162	420	234	690	180	396	0	0
7/08	102	474	378	1,068	42	438	0	0
7/09	54	480	288	1,356	18	456	0	0
7/10	6	1,050	216	1,572	6	462	0	0
7/11	570	1,770	3,240	4,812	90	552	0	0
7/12	720	2,052	8,370	13,182	336	888	0	0
7/13	282	2,070	13,626	26,808	312	1,200	0	0
7/14	18	2,140	6,336	33,144	24	1,224	0	0
7/15 [a]	70	2,324	5,361	38,505	39	1,263	13	13
7/16 [a]	184	3,020	3,655	42,160	26	1,289	127	140
7/17	696	3,098	13,164	55,324	306	1,595	156	296
7/18	78	3,284	6,786	62,110	138	1,733	96	392
7/19	186	3,758	5,598	67,708	42	1,775	18	410
7/20	474	4,292	12,600	80,308	102	1,877	42	452
7/21	534	5,168	9,036	89,344	72	1,949	24	476
7/22	876	5,354	19,272	108,616	132	2,081	144	620
7/23	186	5,468	7,656	116,272	18	2,099	30	650
7/24	114	5,750	5,928	122,200	42	2,141	78	728
7/25	282	6,182	6,060	128,260	18	2,159	36	764
7/26	432	6,374	6,012	134,272	12	2,171	30	794
7/27	192	6,818	8,304	142,576	6	2,177	120	914
7/28	444	7,238	8,520	151,096	24	2,201	264	1,178
7/29	420	7,310	4,506	155,602	36	2,237	168	1,346
7/30	72	7,388	4,770	160,372	42	2,279	150	1,496
7/31	78	7,676	4,410	164,782	6	2,285	264	1,760
8/01	288	7,754	4,470	169,252	0	2,285	726	2,486
8/02	78	7,874	3,000	172,252	0	2,285	210	2,696
8/03	120	8,036	2,928	175,180	12	2,297	414	3,110
8/04	162	8,168	2,766	177,946	6	2,303	270	3,380
8/05	132	8,198	1,908	179,854	6	2,309	468	3,848

-continued-

Appendix I2.–Page 2 of 2.

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho
8/06	30	8,216	1,314	181,168	0	2,309	282	4,130
8/07	18	8,276	1,386	182,554	0	2,309	210	4,340
8/08	60	8,403	1,500	184,054	0	2,309	156	4,496
8/09 [a]	127	8,451	925	184,979	6	2,315	282	4,778
8/10	48	8,493	858	185,837	0	2,315	666	5,444
8/11	42	8,571	948	186,785	0	2,315	168	5,612
8/12	78	8,667	588	187,373	24	2,339	246	5,858
8/13	96	8,883	468	187,841	6	2,345	360	6,218
8/14	216	9,021	504	188,345	0	2,345	588	6,806
8/15	138	9,183	432	188,777	0	2,345	414	7,220
8/16	162	9,321	510	189,287	0	2,345	174	7,394
8/17	138	9,459	426	189,713	12	2,357	552	7,946
8/18	138	9,489	120	189,833	0	2,357	642	8,588
8/19	30	9,537	36	189,869	0	2,357	330	8,918
8/20	48	9,567	90	189,959	0	2,357	678	9,596
8/21	30	9,597	72	190,031	0	2,357	642	10,238
8/22	30	9,621	96	190,127	0	2,357	1,734	11,972
8/23	24	9,621	6	190,133	0	2,357	822	12,794
8/24	0	9,639	42	190,175	0	2,357	948	13,742
8/25	18	9,657	0	190,175	0	2,357	1,302	15,044
8/26	18	9,657	18	190,193	0	2,357	984	16,028
8/27	0	9,657	0	190,193	0	2,357	834	16,862
8/28	0	9,687	18	190,211	0	2,357	774	17,636
8/29	30	9,699	12	190,223	0	2,357	354	17,990
8/30	12	9,711	18	190,241	0	2,357	804	18,794
8/31	12	9,729	0	190,241	0	2,357	1,164	19,958
9/01	18	9,771	12	190,253	0	2,357	522	20,480
9/02	42	9,771	24	190,277	0	2,357	138	20,618
9/03	0	9,777	0	190,277	0	2,357	114	20,732
9/04	6	9,783	0	190,277	0	2,357	138	20,870
9/05	6	9,783	0	190,277	0	2,357	222	21,092
9/06	0	9,789	0	190,277	0	2,357	228	21,320
9/07	6	9,789	6	190,283	0	2,357	180	21,500
9/08	0	9,789	0	190,283	0	2,357	162	21,662
9/09	0	9,795	0	190,283	0	2,357	156	21,818
9/10	6	9,795	6	190,289	0	2,357	180	21,998
9/11	0	9,795	0	190,289	0	2,357	276	22,274
Total	9,795		190,289		2,357		22,274	

Note: The inside box in the cumulative column is the day when the midpoint of the total was reached. The outside box is from the day the first quartile was reached to the day the third quartile was reached.

[a] Some portion of the count was interpolated.

Appendix I3.–Expanded daily and cumulative (Cum.) migration of all salmonid species past North River counting tower, Norton Sound, 2010

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho
6/19	0	0	0	0	0	0	0	0
6/20	0	0	0	0	0	0	0	0
6/21	0	0	0	0	0	0	0	0
6/22	120	120	42	0	0	0	0	0
6/23	138	258	30	42	0	0	0	0
6/24	18	276	42	72	18	18	0	0
6/25 [a]	53	329	45	114	0	18	0	0
6/26	84	413	60	159	0	18	0	0
6/27	30	443	6	219	0	18	0	0
6/28	30	473	36	225	0	18	0	0
6/29	90	563	84	261	0	18	0	0
6/30	42	605	300	345	0	18	0	0
7/01	84	689	618	645	30	48	0	0
7/02	192	881	1,062	1,263	0	48	0	0
7/03	204	1,085	4,296	2,325	6	54	0	0
7/04	336	1,421	3,678	6,621	18	72	0	0
7/05	1,362	2,783	11,826	10,299	30	102	0	0
7/06	336	3,119	6,276	22,125	6	108	0	0
7/07	114	3,233	990	28,401	12	120	0	0
7/08	342	3,575	5,166	29,391	6	126	0	0
7/09	504	4,079	9,036	34,557	6	132	0	0
7/10	720	4,799	15,672	43,593	42	174	0	0
7/11	66	4,865	4,026	59,265	0	174	0	0
7/12	24	4,889	4,812	63,291	12	186	0	0
7/13	126	5,015	5,502	68,103	0	186	0	0
7/14	198	5,213	5,844	73,605	24	210	0	0
7/15	510	5,723	7,596	79,449	0	210	0	0
7/16 [a]	246	5,969	6,421	87,045	44	254	0	0
7/17	816	6,785	9,324	93,466	78	332	0	0
7/18	204	6,989	3,396	102,790	42	374	0	0
7/19	714	7,703	5,958	106,186	126	500	0	0
7/20 [a]	415	8,118	3,585	112,144	63	563	0	0
7/21	450	8,568	3,444	115,729	24	587	54	54
7/22	174	8,742	2,376	119,173	36	623	24	78
7/23	252	8,994	2,484	121,549	0	623	66	144
7/24 [a]	222	9,216	3,712	124,033	44	667	122	266
7/25	402	9,618	2,550	127,745	24	691	162	428
7/26	180	9,798	2,190	130,295	6	697	66	494
7/27	360	10,158	2,892	132,485	30	727	54	548
7/28	342	10,500	2,766	135,377	48	775	108	656
7/29	384	10,884	1,674	138,143	36	811	138	794
7/30	498	11,382	1,878	139,817	60	871	120	914
7/31	294	11,676	1,512	141,695	36	907	180	1,094
8/01	198	11,874	1,290	143,207	90	997	366	1,460
8/02	270	12,144	906	144,497	6	1,003	264	1,724
8/03	198	12,342	870	145,403	12	1,015	120	1,844
8/04	192	12,534	630	146,273	6	1,021	102	1,946
8/05	378	12,912	714	146,903	42	1,063	342	2,288

-continued-

Appendix I3.–Page 2 of 2.

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho
8/06	246	13,158	660	147,617	54	1,117	450	2,738
8/07	474	13,632	414	148,277	42	1,159	252	2,990
8/08	246	13,878	438	148,691	18	1,177	600	3,590
8/09	240	14,118	390	149,129	54	1,231	504	4,094
8/10	480	14,598	300	149,519	0	1,231	366	4,460
8/11 [a]	144	14,742	170	149,819	0	1,231	48	4,508
8/12 [a]	250	14,992	264	149,989	15	1,246	347	4,855
8/13 [a]	211	15,203	177	150,253	10	1,256	251	5,106
8/14 [a]	169	15,372	101	150,430	0	1,256	168	5,274
8/15 [a]	78	15,450	40	150,531	0	1,256	115	5,389
8/16 [a]	139	15,589	20	150,571	0	1,256	213	5,602
8/17	54	15,643	6	150,591	0	1,256	120	5,722
8/18 [a]	29	15,672	11	150,597	0	1,256	91	5,813
8/19 [a]	27	15,699	-4	150,608	0	1,256	98	5,911
8/20	24	15,723	-18	150,604	0	1,256	102	6,013
8/21	36	15,759	12	150,586	0	1,256	78	6,091
8/22	84	15,843	-6	150,598	0	1,256	156	6,247
8/23	66	15,909	0	150,592	0	1,256	114	6,361
8/24	60	15,969	24	150,592	0	1,256	78	6,439
8/25	12	15,981	36	150,616	0	1,256	138	6,577
8/26	54	16,035	6	150,652	0	1,256	114	6,691
8/27	36	16,071	0	150,658	0	1,256	78	6,769
8/28	30	16,101	0	150,658	0	1,256	42	6,811
8/29	12	16,113	-6	150,658	0	1,256	54	6,865
8/30	0	16,113	6	150,652	0	1,256	84	6,949
8/31	12	16,125	0	150,658	0	1,256	108	7,057
9/01	18	16,143	6	150,658	0	1,256	162	7,219
9/02	12	16,155	-6	150,664	0	1,256	138	7,357
9/03	36	16,191	30	150,658	0	1,256	150	7,507
9/04	18	16,209	0	150,688	0	1,256	12	7,519
9/05	6	16,215	0	150,688	0	1,256	84	7,603
9/06	0	16,215	0	150,688	0	1,256	84	7,687
9/07	0	16,215	0	150,688	0	1,256	36	7,723
Total	16,215		150,688		1,256		7,723	

Note: The inside box in the cumulative column is the day when the midpoint of the total was reached. The outside box is from the day the first quartile was reached to the day the third quartile was reached.

[a] Some portion of the count was interpolated.

Appendix I4.–Expanded daily and cumulative (Cum.) migration of all salmonid species past North River counting tower, Norton Sound, 2011

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho
6/17 [a]	0	0	0	0	0	0	0	0
6/18 [a]	0	0	0	0	0	0	0	0
6/19	0	0	0	0	0	0	0	0
6/20	0	0	0	0	0	0	0	0
6/21	0	0	0	0	0	0	0	0
6/22	0	0	0	0	0	0	0	0
6/23 [a]	45	45	0	0	0	0	0	0
6/24	60	105	0	0	0	0	0	0
6/25	42	147	0	0	0	0	0	0
6/26	18	165	0	0	0	0	0	0
6/27	0	165	0	0	12	12	0	0
6/28	0	165	0	0	0	12	0	0
6/29	0	165	0	0	6	18	0	0
6/30	12	177	12	12	0	18	0	0
7/01	84	261	0	12	0	18	0	0
7/02	96	357	0	12	0	18	0	0
7/03	552	909	0	12	6	24	0	0
7/04	684	1,593	0	12	18	42	0	0
7/05	180	1,773	0	12	18	60	0	0
7/06	444	2,217	54	66	54	114	0	0
7/07	546	2,763	24	90	30	144	0	0
7/08	4,002	6,765	36	126	108	252	0	0
7/09	960	7,725	66	192	30	282	0	0
7/10	60	7,785	66	258	12	294	0	0
7/11	330	8,115	198	456	42	336	0	0
7/12	534	8,649	510	966	96	432	6	6
7/13	60	8,709	120	1,086	6	438	0	6
7/14	384	9,093	342	1,428	0	438	0	6
7/15	1,452	10,545	1,014	2,442	30	468	18	24
7/16	1,110	11,655	1,422	3,864	66	534	12	36
7/17	660	12,315	810	4,674	48	582	6	42
7/18 [a]	801	13,116	1,170	5,844	89	671	35	77
7/19 [a]	914	14,030	2,193	8,037	0	671	14	91
7/20	1,152	15,182	6,594	14,631	12	683	114	205
7/21	528	15,710	11,736	26,367	36	719	126	331
7/22	264	15,974	8,286	34,653	-6	713	102	433
7/23	222	16,196	11,748	46,401	30	743	12	445
7/24	198	16,394	4,080	50,481	18	761	30	475
7/25	582	16,976	7,926	58,407	24	785	72	547
7/26	348	17,324	8,370	66,777	12	797	36	583
7/27	264	17,588	9,390	76,167	12	809	30	613
7/28	618	18,206	14,448	90,615	6	815	84	697
7/29	312	18,518	15,024	105,639	6	821	96	793
7/30 [a]	226	18,744	9,133	114,772	3	824	73	866
7/31 [a]	139	18,883	3,242	118,014	0	824	50	916
8/01 [a]	142	19,025	2,682	120,696	0	824	39	955
8/02	96	19,121	3,216	123,912	0	824	24	979
8/03	48	19,169	2,574	126,486	0	824	24	1,003

-continued-

Appendix I4.–Page 2 of 2.

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho
8/04	72	19,241	1,470	127,956	0	824	48	1,051
8/05	48	19,289	1,248	129,204	0	824	78	1,129
8/06	12	19,301	918	130,122	0	824	66	1,195
8/07 [a]	10	19,311	681	130,803	13	837	15	1,210
8/08 [a]	1	19,312	573	131,376	0	837	48	1,258
8/09 [a]	66	19,378	911	132,287	0	837	99	1,357
8/10 [a]	55	19,433	996	133,283	0	837	74	1,431
8/11 [a]	54	19,487	554	133,837	0	837	68	1,499
8/12 [a]	116	19,603	435	134,272	0	837	57	1,556
8/13 [a]	51	19,654	799	135,071	1	838	77	1,633
8/14 [a]	55	19,709	641	135,712	1	839	86	1,719
8/15 [a]	65	19,774	523	136,235	1	840	104	1,823
8/16 [a]	78	19,852	422	136,657	1	841	114	1,937
8/17 [a]	88	19,940	368	137,025	0	841	119	2,056
8/18 [a]	97	20,037	322	137,347	0	841	122	2,178
8/19 [a]	96	20,133	241	137,588	0	841	127	2,305
8/20 [a]	100	20,233	150	137,738	0	841	135	2,440
8/21 [a]	99	20,332	89	137,827	0	841	142	2,582
8/22 [a]	40	20,372	23	137,850	0	841	86	2,668
8/23	120	20,492	132	137,982	0	841	240	2,908
8/24	66	20,558	72	138,054	0	841	132	3,040
8/25	234	20,792	42	138,096	0	841	234	3,274
8/26	132	20,924	162	138,258	0	841	192	3,466
8/27 [a]	106	21,030	146	138,404	0	841	123	3,589
8/28	48	21,078	24	138,428	0	841	48	3,637
8/29	72	21,150	12	138,440	0	841	96	3,733
8/30	90	21,240	60	138,500	0	841	192	3,925
8/31	42	21,282	30	138,530	0	841	150	4,075
9/01	30	21,312	0	138,530	0	841	222	4,297
9/02	30	21,342	0	138,530	0	841	114	4,411
9/03	12	21,354	12	138,542	0	841	66	4,477
9/04	12	21,366	0	138,542	0	841	90	4,567
9/05	0	21,366	0	138,542	0	841	72	4,639
9/06	18	21,384	0	138,542	0	841	72	4,711
9/07	6	21,390	0	138,542	0	841	48	4,759
9/08	0	21,390	0	138,542	0	841	120	4,879
9/09	6	21,396	0	138,542	0	841	72	4,951
9/10	0	21,396	0	138,542	0	841	24	4,975
Total	21,396		138,542		841		4,975	

Note: The inside box in the cumulative column is the day when the midpoint of the total was reached. The outside box is from the day the first quartile was reached to the day the third quartile was reached.

[a] Some portion of the count was interpolated.

Appendix I5.–Expanded daily and cumulative (Cum.) migration of all salmonid species past North River counting tower, Norton Sound, 2012

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho
6/26	0	0	0	0	0	0	0	0
6/27	6	6	24	24	0	0	0	0
6/28	0	6	18	42	6	6	0	0
6/29	0	6	42	84	0	6	0	0
6/30 [a]	0	6	66	150	0	6	0	0
7/01	0	6	6	156	0	6	0	0
7/02	6	12	102	258	6	12	0	0
7/03	0	12	186	444	6	18	0	0
7/04	0	12	144	588	0	18	0	0
7/05	0	12	132	720	0	18	0	0
7/06	6	18	462	1,182	12	30	0	0
7/07	114	132	4,980	6,162	60	90	0	0
7/08	198	330	5,742	11,904	84	174	0	0
7/09	156	486	3,570	15,474	60	234	0	0
7/10	18	504	3,444	18,918	0	234	0	0
7/11	108	612	3,372	22,290	12	246	0	0
7/12	156	768	6,708	28,998	48	294	0	0
7/13	72	840	6,090	35,088	6	300	0	0
7/14	90	930	5,076	40,164	18	318	0	0
7/15	264	1,194	8,490	48,654	12	330	0	0
7/16	432	1,626	11,886	60,540	36	366	42	42
7/17	174	1,800	9,682	70,222	6	372	24	66
7/18	102	1,902	9,288	79,510	72	444	12	78
7/19	384	2,286	6,730	86,240	72	516	6	84
7/20	330	2,616	5,394	91,634	66	582	0	84
7/21	606	3,222	6,006	97,640	30	612	0	84
7/22	186	3,408	4,032	101,672	12	624	0	84
7/23	582	3,990	3,492	105,164	36	660	0	84
7/24	360	4,350	3,672	108,836	12	672	12	96
7/25	162	4,512	3,570	112,406	24	696	12	108
7/26	366	4,878	3,996	116,402	90	786	66	174
7/27	222	5,100	2,874	119,276	66	852	78	252
7/28	258	5,358	2,046	121,322	36	888	114	366
7/29	66	5,424	1,404	122,726	6	894	126	492
7/30	180	5,604	1,662	124,388	24	918	102	594
7/31	228	5,832	1,188	125,576	0	918	102	696
8/01	186	6,018	1,308	126,884	6	924	162	858
8/02	210	6,228	1,038	127,922	6	930	300	1,158
8/03	72	6,300	1,218	129,140	6	936	84	1,242
8/04	222	6,522	1,944	131,084	6	942	162	1,404
8/05	186	6,708	1,260	132,344	0	942	156	1,560
8/06	102	6,810	840	133,184	0	942	126	1,686
8/07	318	7,128	564	133,748	6	948	150	1,836
8/08	222	7,350	360	134,108	12	960	96	1,932
8/09	168	7,518	408	134,516	6	966	168	2,100
8/10	258	7,776	552	135,068	0	966	108	2,208
8/11	138	7,914	462	135,530	0	966	144	2,352
8/12	174	8,088	294	135,824	0	966	72	2,424

-continued-

Appendix I5.–Page 2 of 2.

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho
8/13	102	8,190	462	136,286	6	972	132	2,556
8/14	114	8,304	360	136,646	0	972	90	2,646
8/15	252	8,556	174	136,820	0	972	138	2,784
8/16	210	8,766	96	136,916	0	972	120	2,904
8/17	162	8,928	48	136,964	0	972	120	3,024
8/18	144	9,072	24	136,988	0	972	162	3,186
8/19	48	9,120	24	137,012	0	972	72	3,258
Total	9,120		137,012		972		3,258	

Note: Quartiles are not shown because the target operational period of the project was not fully monitored.

[a] Some portion of the day's count was interpolated.

Appendix I6.–Age and sex compositions by year for North River chum salmon ASL samples, 2001–2012.

Year	Sampling dates	Number of samples	Percent by sex		Percent by (Age group)						
			Male	Female	(0.1)	(0.2)	(0.3)	(0.4)	(0.5)	(0.6)	(0.7)
2001				No data collected							
2002				No data collected							
2003				No data collected							
2004				No data collected							
2005				No data collected							
2006				No data collected							
2007				No data collected							
2008				No data collected							
2009				No data collected							
2010				No data collected							
2011	7/10–8/08	200	57.6	42.4	0.0	0.0	35.9	63.1	0.5	0.5	0.0
2012	7/21–8/14	116[a]	47.3	52.7							

[a] Sample size insufficient for age composition analysis.

Appendix I7.–Age and sex compositions by year for North River Chinook salmon ASL samples, 2001–2012.

Year	Sampling dates	Number of samples	Percent by sex		Percent by (Age group)						
			Male	Female	(1.1)	(1.2)	(1.3)	(1.4)	(2.3)	(1.5)	(2.4)
2001				No data collected							
2002				No data collected							
2003				No data collected							
2004				No data collected							
2005				No data collected							
2006				No data collected							
2007				No data collected							
2008				No data collected							
2009				No data collected							
2010				No data collected							
2011	7/08–8/11	142	88.9	11.1	5.6	69.1	18.5	6.8	0.0	0.0	0.0
2012				No data collected							

Appendix I8.–Age and sex compositions by year for North River coho salmon ASL samples, 2001-2012.

Year	Sampling dates	Number of samples	Percent by sex		Percent by (Age group)				
			Male	Female	(1.1)	(2.1)	(2.2)	(3.1)	(4.1)
2001			No data collected						
2002			No data collected						
2003			No data collected						
2004			No data collected						
2005			No data collected						
2006			No data collected						
2007			No data collected						
2008			No data collected						
2009			No data collected						
2010			No data collected						
2011			No data collected						
2012	8/14	14[a]							

[a] Sample size insufficient for age composition analysis.

Appendix I9.–North River counting tower water temperature (Temp.) and stream stage (Depth) observations, Norton Sound 2008–2012.

	2008		2009		2010		2011		2012	
Date	Temp. (°C)	Depth (cm)	Temp. (°C)	Depth (cm)	Temp. (°C)	Depth (cm)	Temp. (°C)	Depth (cm)	Temp. (°C)	Depth (cm)
6/19	23.0	78.7	10.0	59.7						
6/20	20.0	78.7	8.0	55.9						
6/21	21.0	78.7	8.0	64.8			7.0	54.6		
6/22	27.0	73.7	8.0	58.4			7.0	63.5		
6/23	8.0	71.1	8.0	54.6	13.0	45.7	7.0	86.4		
6/24	8.0	78.7	7.0	53.3	12.0	52.1	7.0	83.8		
6/25	7.0	81.3	6.0	53.3	12.0	49.5	8.0	73.7	9.0	71.1
6/26	7.0	76.2	5.0	58.4	12.0	48.3	8.0	71.1	9.0	71.1
6/27	8.0	71.1	5.0	62.2	9.0	50.8	9.0	69.9	10.0	68.6
6/28	8.0	71.1	5.0	55.9	8.0	48.3	9.0	68.6	11.0	63.5
6/29	9.0	68.6	6.0	50.8	10.0	47.0	9.0	66.0	11.0	62.2
6/30	9.0	68.6	5.0	48.3	11.0	44.5	8.0	66.0	12.0	61.0
7/01	9.0	63.5	8.0	45.7	12.0	45.7	8.0	63.5	10.0	61.0
7/02	8.0	63.5	9.0	43.2	12.0	48.3	7.0	63.5	10.0	62.2
7/03	9.0	61.0	11.0	40.6	11.0	45.7	9.0	58.4	7.0	61.0
7/04	10.0	57.2	11.0	38.1	13.0	44.5	8.0	58.4	NA	NA
7/05	11.0	55.9	9.0	36.8	13.0	63.5	8.0	66.0	NA	NA
7/06	12.0	53.3	11.0	35.6	13.0	88.9	8.0	64.8	11.0	55.9
7/07	NA	NA	12.0	33.7	10.0	77.5	8.0	61.0	13.0	57.2
7/08	NA	NA	9.0	31.1	11.0	66.0	10.0	55.9	14.0	55.9
7/09	NA	NA	10.0	30.5	12.0	58.4	10.0	53.3	12.0	68.6
7/10	10.0	48.3	9.0	30.5	12.0	55.9	10.0	53.3	9.0	63.5
7/11	8.0	48.3	10.0	27.9	12.0	55.9	10.0	55.9	11.0	59.7
7/12	10.0	48.3	10.0	26.7	10.0	53.3	8.0	63.5	NA	NA
7/13	8.0	55.9	13.0	25.4	9.0	53.3	7.0	62.2	11.0	57.2
7/14	8.0	50.8	14.0	24.1	10.0	50.8	7.0	58.4	10.0	58.4
7/15	8.0	53.3	13.0	24.1	9.0	50.8	7.0	63.5	10.0	58.4
7/16	9.0	55.9	13.0	22.9	10.0	48.3	7.0	73.7	11.0	57.2
7/17	8.0	68.6	14.0	20.3	10.0	48.3	6.0	94.0	10.0	55.9
7/18	10.0	63.5	13.0	20.3	10.0	48.3	6.0	96.5	9.0	57.2
7/19	8.0	61.0	13.0	20.3	9.0	62.2	8.0	91.4	9.0	58.4
7/20	7.0	58.4	13.0	19.1	8.0	81.3	8.0	86.4	11.0	58.4
7/21	6.0	61.0	12.0	17.8	8.0	78.7	9.0	81.3	10.0	57.2
7/22	7.0	58.4	14.0	16.5	9.0	76.2	9.0	78.7	11.0	55.9
7/23	8.0	55.9	12.0	16.5	7.0	83.8	10.0	78.7	11.0	57.2
7/24	9.0	55.9	12.0	15.2	7.0	83.8	8.0	78.7	11.0	59.7
7/25	9.0	53.3	12.0	15.2	8.0	83.8	9.0	73.7	9.0	58.4
7/26	7.0	53.3	12.0	15.2	10.0	78.7	10.0	71.1	11.0	59.7
7/27	9.0	58.4	12.0	14.0	10.0	77.5	9.0	73.7	9.0	72.4
7/28	8.0	53.3	13.0	22.9	10.0	82.6	9.0	71.1	9.0	86.4

-continued-

	2008		2009		2010		2011		2012	
Date	Temp. (°C)	Depth (cm)	Temp. (°C)	Depth (cm)	Temp. (°C)	Depth (cm)	Temp. (°C)	Depth (cm)	Temp. (°C)	Depth (cm)
7/29	7.0	53.3	13.0	20.3	10.0	81.3	10.0	73.7	9.0	87.6
7/30	8.0	55.9	12.0	15.2	10.0	74.9	NA	111.8	8.0	91.4
7/31	7.0	63.5	11.0	20.3	12.0	73.7	8.0	104.1	5.0	94.0
8/01	7.0	68.6	10.0	38.1	12.0	69.9	7.0	95.3	8.0	99.1
8/02	7.0	68.6	12.0	38.1	12.0	67.3	7.0	91.4	8.0	106.7
8/03	8.0	68.6	12.0	35.6	11.0	67.3	8.0	88.9	8.0	106.7
8/04	8.0	66.0	15.0	34.3	11.0	66.0	8.0	94.0	7.0	109.2
8/05	6.0	63.5	12.0	38.1	12.0	64.8	7.0	106.7	7.0	106.7
8/06	8.0	62.2	12.0	31.8	11.0	66.0	6.0	119.4	7.0	104.1
8/07	8.0	61.0	12.0	30.5	12.0	66.0	5.0	121.9	7.0	99.1
8/08	8.0	61.0	12.0	29.2	11.0	69.9	5.0	123.2	8.0	96.5
8/09	8.0	59.7	12.0	27.9	12.0	77.5	5.0	124.5	8.0	91.4
8/10	10.0	57.2	12.0	25.4	10.0	88.9	6.0	118.1	8.0	87.6
8/11	10.0	58.4	10.0	25.4	9.0	96.5	6.0	116.8	9.0	87.6
8/12	9.0	58.4	12.0	24.1	9.0	111.8	5.0	132.1	10.0	82.6
8/13	8.0	57.2	10.0	24.1	N/A	N/A	5.0	152.4	9.0	78.7
8/14	8.0	53.3	10.0	27.9	N/A	N/A	NA	NA	10.0	77.5
8/15	9.0	53.3	10.0	24.1	N/A	N/A	NA	NA	8.0	74.9
8/16	9.0	53.3	10.0	21.6	6.0	109.2	NA	NA	10.0	73.7
8/17	9.0	56.5	9.0	21.6	6.0	110.5	NA	NA	8.0	80.0
8/18	8.0	61.0	11.0	20.3	11.0	119.4	NA	NA	8.0	101.6
8/19	6.0	58.4	9.0	21.6	8.0	114.3	NA	NA	8.0	119.4
8/20	6.0	50.8	10.0	19.1	6.0	110.5	NA	NA		
8/21	9.0	48.3	10.0	19.1	5.0	106.7	NA	NA		
8/22	7.0	48.3	10.0	20.3	5.0	101.6	5.0	86.4		
8/23	7.0	45.7	9.0	22.9	7.0	101.6	4.0	83.8		
8/24	7.0	44.5	9.0	22.9	7.0	97.8	5.0	81.3		
8/25	5.0	43.2	9.0	24.1	7.0	92.7	5.0	83.8		
8/26	6.0	43.2	7.0	22.9	8.0	90.2	5.0	81.3		
8/27	6.0	41.3	7.0	22.9	8.0	87.6	5.0	76.2		
8/28	7.0	40.6	6.0	22.9	8.0	88.9	6.0	71.1		
8/29	6.0	39.4	6.0	21.6	7.0	88.9	6.0	68.6		
8/30	6.0	38.1	9.0	22.9	7.0	83.8	7.0	71.1		
8/31	7.0	38.1	8.0	30.5	7.0	78.7	6.0	71.1		
9/01	6.0	38.1	8.0	49.5	7.0	78.7	6.0	71.1		
9/02	7.0	36.2	8.0	55.9	7.0	78.7	6.0	71.1		
9/03	7.0	35.6	7.0	58.4	7.0	80.0	6.0	68.6		
9/04	9.0	35.6	7.0	54.6	7.0	81.3	6.0	67.3		
9/05	2.0	35.6	7.0	52.1	7.0	91.4	6.0	66.0		
9/06	7.0	34.3	8.0	48.3	8.0	94.0	6.0	63.5		
9/07	8.0	33.0	6.0	47.0	7.0	114.3	6.0	61.0		
9/08	9.0	33.0	8.0	44.5			5.0	61.0		
9/09	6.0	33.0	7.0	41.9			4.0	61.0		
9/10	7.0	33.0	7.0	40.6			3.0	71.1		
9/11	5.0	31.8	8.0	40.6						
9/12	5.0	31.8								
9/13	5.0	30.5								

Note: Recorded water temperatures are morning water temperatures, except where morning temperatures were not available. Recorded water depths are highest recorded daily water depth.

APPENDIX J: UNALAKLEET RIVER WEIR

Appendix J1.–Daily and cumulative (Cum.) migration of all salmonid species past the Unalakleet River weir, Norton Sound, 2010.

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho	Daily Sockeye	Cum. Sockeye
6/23	10	10	7	7	0	0	0	0	0	0
6/24	66	76	350	357	2	2	0	0	0	0
6/25	54	130	649	1,006	7	9	0	0	0	0
6/26	84	214	883	1,889	5	14	0	0	0	0
6/27	49	263	868	2,757	1	15	0	0	0	0
6/28	10	273	185	2,942	1	16	0	0	0	0
6/29	117	390	297	3,239	1	17	0	0	0	0
6/30	1,434	1,824	4,799	8,038	5	22	0	0	10	10
7/01	2,333	4,157	12,054	20,092	11	33	0	0	17	27
7/02	1,870	6,027	16,679	36,771	25	58	0	0	1	28
7/03	2,502	8,529	21,790	58,561	17	75	0	0	0	28
7/04	1,495	10,024	21,876	80,437	20	95	0	0	0	28
7/05	2,899	12,923	58,472	138,909	21	116	0	0	35	63
7/06	1,713	14,636	20,583	159,492	22	138	0	0	0	63
7/07	1,206	15,842	9,389	168,881	42	180	0	0	0	63
7/08	2,171	18,013	11,457	180,338	18	198	0	0	8	71
7/09	4,108	22,121	36,995	217,333	58	256	0	0	10	81
7/10	6,134	28,255	92,673	310,006	68	324	0	0	18	99
7/11	1,171	29,426	34,565	344,571	32	356	0	0	10	109
7/12	863	30,289	26,337	370,908	17	373	0	0	0	109
7/13	521	30,810	17,534	388,442	10	383	0	0	0	109
7/14	2,308	33,118	46,435	434,877	39	422	0	0	0	109
7/15	734	33,852	22,438	457,315	21	443	0	0	2	111
7/16	2,282	36,134	37,851	495,166	94	537	0	0	2	113
7/17	2,821	38,955	41,672	536,838	88	625	0	0	3	116
7/18	2,054	41,009	84,057	620,895	55	680	0	0	0	116
7/19	2,185	43,194	25,883	646,778	42	722	1	1	8	124
7/20	2,527	45,721	30,515	677,293	126	848	134	135	1	125
7/21	3,112	48,833	26,659	703,952	58	906	338	473	0	125
7/22	2,187	51,020	16,598	720,550	20	926	175	648	0	125
7/23	1,479	52,499	12,206	732,756	11	937	183	831	1	126
7/24	2,073	54,572	20,448	753,204	26	963	351	1,182	0	126
7/25	3,698	58,270	28,231	781,435	22	985	603	1,785	1	127
7/26	3,002	61,272	12,460	793,895	11	996	448	2,233	2	129
7/27	2,206	63,478	11,732	805,627	10	1,006	616	2,849	1	130
7/28	1,447	64,925	8,159	813,786	5	1,011	433	3,282	0	130
7/29	2,936	67,861	9,917	823,703	5	1,016	839	4,121	0	130
7/30	1,230	69,091	4,761	828,464	3	1,019	575	4,696	0	130
7/31	1,720	70,811	4,440	832,904	2	1,021	686	5,382	0	130
Total	70,811		832,904		1,021		5,382		130	

Note: The inside box in the cumulative column is the day when the midpoint of the total was reached. The outside box is from the day the first quartile was reached to the day the third quartile was reached.

Appendix J2.–Daily and cumulative (Cum.) migration of all salmonid species past the Unalakleet River weir, Norton Sound, 2011.

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho	Daily Sockeye	Cum. Sockeye
6/17	0	0	0	0	0	0	0	0	0	0
6/18	25	25	0	0	0	0	0	0	0	0
6/19	64	89	0	0	0	0	0	0	1	1
6/20	26	115	0	0	0	0	0	0	0	1
6/21	8	123	0	0	0	0	0	0	0	1
6/22	22	145	0	0	0	0	0	0	0	1
6/23	531	676	3	3	2	2	0	0	1	2
6/24	1,701	2,377	7	10	15	17	0	0	0	2
6/25	872	3,249	2	12	2	19	0	0	0	2
6/26	208	3,457	5	17	3	22	0	0	1	3
6/27	85	3,542	1	18	3	25	0	0	0	3
6/28	312	3,854	3	21	11	36	0	0	1	4
6/29	2,011	5,865	3	24	11	47	0	0	0	4
6/30	604	6,469	1	25	11	58	0	0	3	7
7/01	289	6,758	0	25	6	64	0	0	0	7
7/02	932	7,690	10	35	9	73	0	0	0	7
7/03	2,688	10,378	23	58	30	103	0	0	1	8
7/04	2,894	13,272	5	63	32	135	0	0	0	8
7/05	163	13,435	2	65	1	136	0	0	0	8
7/06	2,475	15,910	43	108	9	145	0	0	1	9
7/07	4,269	20,179	182	290	19	164	0	0	3	12
7/08	7,049	27,228	343	633	46	210	0	0	2	14
7/09	5,867	33,095	380	1,013	49	259	0	0	19	33
7/10	588	33,683	104	1,117	18	277	0	0	8	41
7/11	4,676	38,359	690	1,807	41	318	0	0	16	57
7/12	5,626	43,985	930	2,737	54	372	0	0	15	72
7/13	4,042	48,027	961	3,698	38	410	0	0	1	73
7/14	904	48,931	595	4,293	21	431	0	0	6	79
7/15	2,598	51,529	1,387	5,680	72	503	5	5	9	88
7/16	4,902	56,431	2,709	8,389	161	664	16	21	5	93
7/17	4,476	60,907	2,728	11,117	176	840	58	79	20	113
7/18	5,212	66,119	4,879	15,996	67	907	90	169	7	120
7/19 [a]	57	66,176	41	16,037	1	908	0	169	0	120
7/20 [b]	3,864	70,040	9,191	25,228	38	946	120	289	7	127
7/21 [a]	6,947	76,987	11,406	36,634	41	987	428	717	5	132
7/22	2,515	79,502	13,502	50,136	8	995	150	867	6	138
7/23	1,733	81,235	19,298	69,434	4	999	105	972	3	141
7/24	1,006	82,241	12,184	81,618	1	1,000	173	1,145	1	142
7/25	1,713	83,954	15,740	97,358	5	1,005	208	1,353	4	146
7/26	2,894	86,848	23,339	120,697	4	1,009	229	1,582	1	147
7/27	1,708	88,556	24,960	145,657	4	1,013	215	1,797	1	148
7/28	1,518	90,074	25,965	171,622	3	1,016	317	2,114	1	149
7/29	3,870	93,944	61,654	233,276	4	1,020	394	2,508	6	155
7/30	1,484	95,428	27,843	261,119	1	1,021	1,028	3,536	2	157
7/31	1,227	96,655	22,328	283,447	1	1,022	848	4,384	2	159
8/01	1,332	97,987	18,183	301,630	3	1,025	1,044	5,428	10	169
8/02	934	98,921	11,121	312,751	0	1,025	860	6,288	6	175
8/03	1,335	100,256	12,849	325,600	0	1,025	653	6,941	1	176

-continued-

Date		Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho	Daily Sockeye	Cum. Sockeye
8/04		1,270	101,526	12,005	337,605	0	1,025	934	7,875	0	176
8/05		1,076	102,602	8,446	346,051	3	1,028	1,312	9,187	2	178
8/06		1,283	103,885	7,498	353,549	1	1,029	959	10,146	3	181
8/07	[a]	165	104,050	812	354,361	1	1,030	85	10,231	0	181
Total		104,050		354,361		1,030		10,231		181	

Note: The inside box in the cumulative column is the day when the midpoint of the total was reached. The outside box is from the day the first quartile was reached to the day the third quartile was reached.

[a] Partial count because water was above the boat gate and fish passed unmonitored.

[b] Some portion of the count was interpolated.

Appendix J3.–Daily and cumulative (Cum.) migration of all salmonid species past the Unalakleet River weir, Norton Sound, 2012.

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho	Daily Sockeye	Cum. Sockeye
6/24	0	0	0	0	0	0	0	0	0	0
6/25	4	4	2	2	2	2	0	0	0	0
6/26	10	14	75	77	0	2	0	0	0	0
6/27	2	16	94	171	1	3	0	0	1	1
6/28	10	26	52	223	0	3	0	0	0	1
6/29	30	56	162	385	0	3	0	0	0	1
6/30	70	126	404	789	0	3	0	0	0	1
7/01	75	201	346	1,135	0	3	0	0	1	2
7/02	80	281	404	1,539	1	4	0	0	0	2
7/03	115	396	1,285	2,824	0	4	0	0	0	2
7/04	382	778	832	3,656	2	6	0	0	1	3
7/05	498	1,276	1,564	5,220	3	9	0	0	0	3
7/06	745	2,021	2,466	7,686	2	11	0	0	2	5
7/07	2,161	4,182	8,507	16,193	9	20	0	0	6	11
7/08	3,566	7,748	27,635	43,828	13	33	0	0	13	24
7/09	1,480	9,228	18,538	62,366	9	42	0	0	3	27
7/10	2,067	11,295	22,618	84,984	15	57	0	0	0	27
7/11	2,640	13,935	24,828	109,812	14	71	0	0	7	34
7/12	3,487	17,422	54,021	163,833	13	84	0	0	17	51
7/13	1,372	18,794	31,034	194,867	11	95	0	0	14	65
7/14	1,241	20,035	34,985	229,852	15	110	0	0	11	76
7/15	2,531	22,566	51,282	281,134	33	143	3	3	9	85
7/16	2,223	24,789	52,140	333,274	21	164	0	3	15	100
7/17	1,850	26,639	40,897	374,171	21	185	0	3	28	128
7/18	1,573	28,212	41,681	415,852	22	207	26	29	17	145
7/19	1,860	30,072	42,330	458,182	24	231	43	72	9	154
7/20	2,508	32,580	41,757	499,939	52	283	103	175	8	162
7/21	4,202	36,782	38,255	538,194	74	357	86	261	7	169
7/22	3,158	39,940	29,203	567,397	66	423	128	389	13	182
7/23	2,355	42,295	21,469	588,866	43	466	193	582	5	187
7/24	1,940	44,235	21,921	610,787	57	523	142	724	4	191
7/25	1,112	45,347	11,602	622,389	23	546	117	841	6	197
7/26	2,695	48,042	10,368	632,757	24	570	202	1,043	6	203
7/27	1,725	49,767	7,488	640,245	25	595	230	1,273	4	207
7/28	1,943	51,710	5,765	646,010	28	623	320	1,593	1	208
7/29	1,361	53,071	3,849	649,859	26	649	526	2,119	0	208
7/30	1,269	54,340	3,595	653,454	34	683	818	2,937	2	210
7/31	1,200	55,540	2,940	656,394	15	698	482	3,419	2	212
8/01	1,198	56,738	3,067	659,461	26	724	1,184	4,603	1	213
8/02 [a]	1,329	58,067	2,346	661,807	20	744	816	5,419	0	213
8/03 [b]	1,402	59,469	2,807	664,614	23	767	690	6,109	2	215
8/04 [b]	1,111	60,580	2,082	666,696	16	783	951	7,060	3	217
8/05 [b]	1,026	61,606	1,528	668,224	10	793	1,107	8,167	3	220
8/06	1,034	62,640	1,625	669,849	1	794	1,095	9,262	4	224
8/07	781	63,421	697	670,546	2	796	1,365	10,627	4	228
8/08	1,019	64,440	721	671,267	3	799	1,151	11,778	1	229
8/09	740	65,180	589	671,856	1	800	669	12,447	6	235
8/10	1,219	66,399	514	672,370	2	802	1,135	13,582	1	236
8/11	1,057	67,456	456	672,826	7	809	732	14,314	0	236

-continued-

Date	Daily Chum	Cum. Chum	Daily Pink	Cum. Pink	Daily Chinook	Cum. Chinook	Daily Coho	Cum. Coho	Daily Sockeye	Cum. Sockeye
8/12	1,075	68,531	429	673,255	7	816	879	15,193	0	236
8/13	933	69,464	376	673,631	5	821	878	16,071	0	236
8/14	697	70,161	321	673,952	1	822	711	16,782	1	237
8/15	698	70,859	298	674,250	1	823	766	17,548	0	237
Total	70,859		674,250		823		17,548		237	

Note: The inside box in the cumulative column is the day when the midpoint of the total was reached. The outside box is from the day the first quartile was reached to the day the third quartile was reached.

[a] Partial count because water was above the boat gate and fish passed unmonitored.

[b] Some portion of the count was interpolated.

Appendix J4.–Age and sex compositions by year for Unalakleet River chum salmon ASL samples, 2010–2012.

Year	Sampling dates	Number of samples	Percent by sex		Percent by (Age group)						
			Male	Female	(0.1)	(0.2)	(0.3)	(0.4)	(0.5)	(0.6)	(0.7)
2010	7/05-7/29	247	41.3	58.7	0.0	6.1	78.1	15.0	0.8	0.0	0.0
2011	6/27-8/07	221	47.8	52.2	0.0	1.3	54.3	44.3	0.0	0.0	0.0
2012	6/24-7/28	199	50.7	49.3	0.0	0.0	49.3	47.4	3.3	0.0	0.0

Appendix J5.–Age and sex compositions by year for Unalakleet River Chinook salmon ASL samples, 2010–2012.

Year	Sampling dates	Number of samples	Percent by sex		Percent by (Age group)						
			Male	Female	(1.1)	(1.2)	(1.3)	(1.4)	(2.3)	(1.5)	(2.4)
2010	7/14-7/23	23[a]									
2011	6/24-7/25	179	73.5	26.5	0.0	56.4	28.4	15.2	0.0	0.0	0.0
2012	6/24-7/30	208	64.8	35.2	0.0	27.4	58.3	14.3	0.0	0.0	0.0

[a] Sample size insufficient for sex composition analysis.

Appendix J6.–Unalakleet River weir water temperature (Temp.) and stream stage (Depth) observations, Norton Sound 2010–2012.

	2010		2011		2012	
Date	Temp. (°C)	Depth (cm)	Temp. (°C)	Depth (cm)	Temp. (°C)	Depth (cm)
6/17			10.0	43.2		
6/18			8.5	41.9		
6/19			9.0	38.1		
6/20			9.5	37.5		
6/21			8.0	35.6		
6/22			8.0	35.6		
6/23	NA	49.5	7.3	48.3		
6/24	NA	50.8	7.0	63.5	NA	NA
6/25	NA	53.3	8.5	61.0	9.0	48.3
6/26	12.0	52.1	8.0	53.3	9.8	51.4
6/27	10.0	50.8	8.5	52.1	10.0	46.4
6/28	7.5	50.8	8.8	48.3	11.0	42.9
6/29	8.0	49.5	10.0	47.0	11.0	39.4
6/30	10.0	48.3	9.0	43.2	10.8	37.5
7/01	11.0	45.7	7.5	41.9	10.8	36.8
7/02	12.0	48.3	7.0	40.6	9.5	34.9
7/03	11.0	48.3	8.8	36.8	12.0	31.8
7/04	11.0	47.0	8.8	35.6	11.3	31.1
7/05	12.0	49.5	8.8	34.3	10.8	29.5
7/06	10.0	81.3	9.0	33.0	11.5	28.3
7/07	9.0	81.3	8.5	30.5	12.5	26.0
7/08	10.0	76.2	10.0	30.5	12.0	26.0
7/09	11.0	68.6	8.0	26.7	11.0	28.6
7/10	12.0	61.0	10.0	24.1	10.5	38.1
7/11	12.0	55.9	10.0	26.7	11.5	31.8
7/12	11.0	53.3	8.5	30.5	11.5	29.2
7/13	10.0	50.8	8.0	35.6	11.0	26.7
7/14	10.0	50.8	7.5	34.3	10.0	26.7
7/15	9.0	47.0	7.5	34.3	10.0	27.2
7/16	9.5	45.7	7.0	45.7	10.5	26.7
7/17	10.0	45.7	6.5	61.0	10.0	26.0
7/18	10.0	43.2	6.5	71.1	9.3	25.4
7/19	9.0	43.2	7.0	76.2	9.0	25.1
7/20	9.5	50.8	7.5	101.6	10.5	25.4
7/21	10.0	55.9	9.0	83.8	NA	NA
7/22	10.0	57.2	12.0	73.7	10.8	22.9
7/23	9.0	58.4	11.0	66.0	10.5	23.2
7/24	9.5	63.5	10.0	64.8	10.5	24.1
7/25	9.0	66.0	10.0	58.4	NA	NA
7/26	9.5	66.0	10.0	55.9	10.5	24.1

-continued-

	2010		2011		2012	
Date	Temp. (°C)	Depth (cm)	Temp. (°C)	Depth (cm)	Temp. (°C)	Depth (cm)
7/27	9.0	66.0	9.5	54.6	10.0	37.3
7/28	9.0	69.9	10.5	52.1	9.5	43.2
7/29	9.0	82.6	10.0	49.5	9.0	46.4
7/30	8.5	83.8	8.5	55.9	8.5	55.9
7/31	9.5	81.3	10.0	58.4	8.5	61.0
8/01			9.0	55.9	7.0	68.6
8/02			8.8	61.0	7.5	92.7
8/03			8.0	59.7	8.0	101.6
8/04			9.0	55.9	7.5	106.7
8/05			8.0	69.9	7.5	103.2
8/06			7.0	94.0	8.3	96.5
8/07			8.0	96.5	8.3	87.6
8/08			8.0	104.1	8.5	80.0
8/09			7.5	106.7	8.3	70.5
8/10			7.5	104.1	8.5	68.6
8/11					10.3	62.9
8/12					9.5	58.4
8/13					9.3	54.6
8/14					10.9	51.4
8/15					10.5	47.6

Note: Recorded water temperatures are morning water temperatures, except where morning temperatures were not available. Recorded water depths are highest recorded daily water depth.