

**Operational Plan Amendment: Frazer Lake Sockeye
Salmon Fish Pass and Smolt Sampling**

by

Steven E. Thomsen

Jodi Estrada

and

Darin Ruhl

March 2016

Alaska Department of Fish and Game

Divisions of Sport Fish and Commercial Fisheries



Symbols and Abbreviations

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centimeter	cm	Alaska Administrative Code	AAC	<i>all standard mathematical signs, symbols and abbreviations</i>	
deciliter	dL	all commonly accepted abbreviations	e.g., Mr., Mrs., AM, PM, etc.	alternate hypothesis	H_A
gram	g	all commonly accepted professional titles	e.g., Dr., Ph.D., R.N., etc.	base of natural logarithm	e
hectare	ha	at	@	catch per unit effort	CPUE
kilogram	kg	compass directions:		coefficient of variation	CV
kilometer	km	east	E	common test statistics	(F, t, χ^2 , etc.)
liter	L	north	N	confidence interval	CI
meter	m	south	S	correlation coefficient	
milliliter	mL	west	W	(multiple)	R
millimeter	mm	copyright	©	correlation coefficient	
		corporate suffixes:		(simple)	r
Weights and measures (English)		Company	Co.	covariance	cov
cubic feet per second	ft ³ /s	Corporation	Corp.	degree (angular)	°
foot	ft	Incorporated	Inc.	degrees of freedom	df
gallon	gal	Limited	Ltd.	expected value	E
inch	in	District of Columbia	D.C.	greater than	>
mile	mi	et alii (and others)	et al.	greater than or equal to	≥
nautical mile	nmi	et cetera (and so forth)	etc.	harvest per unit effort	HPUE
ounce	oz	exempli gratia		less than	<
pound	lb	(for example)	e.g.	less than or equal to	≤
quart	qt	Federal Information Code	FIC	logarithm (natural)	ln
yard	yd	id est (that is)	i.e.	logarithm (base 10)	log
		latitude or longitude	lat. or long.	logarithm (specify base)	log ₂ , etc.
Time and temperature		monetary symbols		minute (angular)	'
day	d	(U.S.)	\$, ¢	not significant	NS
degrees Celsius	°C	months (tables and figures): first three letters	Jan, ..., Dec	null hypothesis	H_0
degrees Fahrenheit	°F	registered trademark	®	percent	%
degrees kelvin	K	trademark	™	probability	P
hour	h	United States	U.S.	probability of a type I error	
minute	min	(adjective)		(rejection of the null hypothesis when true)	α
second	s	United States of America (noun)	USA	probability of a type II error	
		U.S.C.	United States Code	(acceptance of the null hypothesis when false)	β
Physics and chemistry		U.S. state	use two-letter abbreviations (e.g., AK, WA)	second (angular)	"
all atomic symbols				standard deviation	SD
alternating current	AC			standard error	SE
ampere	A			variance	
calorie	cal			population	Var
direct current	DC			sample	var
hertz	Hz				
horsepower	hp				
hydrogen ion activity	pH				
(negative log of)					
parts per million	ppm				
parts per thousand	ppt, ‰				
volts	V				
watts	W				

REGIONAL OPERATIONAL PLAN CF.4K.2014.01

**OPERATIONAL PLAN AMENDMENT: FRAZER LAKE SOCKEYE
SALMON FISH PASS AND SMOLT SAMPLING**

by

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Division of Commercial Fisheries

March 2016

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SIGNATURE PAGE

Project Title: Operational Plan Amendment: Frazer Lake Sockeye Salmon Fish Pass and Smolt Sampling

Project Leader(s): *Darin Ruhl, Fishery Biologist II*

Division, Region and Area: Division of Commercial Fisheries, Region IV, Kodiak

Project Nomenclature: Frazer Fish Pass and Smolt Increments (FM 722 and FM 723)

Period Covered: April 2014–September 2016

Field Dates: May 1–September 1

Plan Type: Category II Amendment

Approval

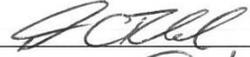
Title	Name	Signature	Date
Project Leader	Darin Ruhl		3/9/16
Research Coordinator	Kevin Schaberg		3/9/16

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PURPOSE

Frazer Lake, within the Kodiak Management Area, was originally devoid of anadromous fish species due to a 10-meter barrier waterfall. From 1951 to 1971, sockeye salmon *Oncorhynchus nerka* were introduced to Frazer Lake. In 1962, a fish pass was constructed around the barrier fall to allow fish to migrate up into the lake system. Since construction of the fish pass, the Alaska Department of Fish and Game (ADF&G) has annually operated and maintained the fish pass structure to ensure sockeye salmon are able to access Frazer Lake. Additionally, ADF&G enumerates and collects biological data from sockeye salmon smolt and adults. This operational plan is intended to provide the field staff with a reference document for the daily operations of the Frazer Lake fish pass and smolt operations.

REASON FOR CHANGE

A change in the sampling design at Frazer fish pass occurred in 2012, and was discovered in the fall of 2015. This change in methods resulted in a biased estimate of age composition. From 2012–2015, some jacks were left out of the population sample which resulted in an underestimation of the contribution of jacks to the overall age composition. The age composition estimate of the escapement used in the Frazer brood table previously came from applying the age composition sampled at the Frazer fish pass to the number of fish that passed through the Dog Salmon weir. The age sample at Frazer was assumed to reflect the age composition of the escapement at Dog Salmon weir, as it was found to be statistically similar when tested in 2007. Due to the sampling errors beginning in 2012, the relative jack compositions at Frazer fish pass and Dog Salmon weir were not the same. The sample error did not affect the count of jacks at Dog Salmon weir, which allowed staff to develop a reasonable estimate of the age composition.

Frazer Lake sockeye salmon often exhibit a proportion of jacks much higher than what is expected to be normal variability. Since 2003, occurring in two year cycles, the proportions have been above what has been historically observed in nearby systems or documented in literature. Because of concern from the public and the Board of Fisheries, the department was directed to take a more active role in reducing the proportion of jacks from the spawning population.

DESCRIPTION OF CHANGE

Sockeye salmon adult age, sex, length (ASL) sampling at Frazer fish pass utilizes a trap with two gates located in front of the adult counting tank. Prior to sampling adult sockeye for ASL, 2 digits will be selected from a random numbers chart that will represent the time the ASL subsample will be collected (e.g., 3 and 2 = 32 minutes) after a 10-minute buffer time has elapsed. The buffer should mitigate migration patterning or settling of adult sockeye that may bias the early portion of the ASL sample. The 10-minute buffer time will start once both gates have been opened. All fish that are passed will be enumerated over that 10-minute period. Once the 10-minute buffer and the random unit of time have been reached, i.e. 10 minutes + 32 minutes = 42 minutes, the front gate will be closed and a subsample of at least 40 sockeye will be collected for ASL sampling. If more than 40 sockeye are collected, all fish will be sampled. All random numbers selected for each ASL sample will be documented over the course of the season. A minimum of 40 adult sockeye salmon will be sampled for ASL at a frequency of 6 times per statistical week for a total of 240 salmon. Fish will be sampled proportionally (the number of fish sampled will increase as run magnitude increases) to ensure representative samples are collected. ASL sampling is most representative when conducted during days of high

passage as opposed to days of low passage. When sampling for ASL, counting cannot be conducted.

To ensure the sampling design does not bias the ASL sample, in-season trials will be employed in 2016 to observe adult behavior within the counting tank to identify how the composition of salmon migrating through the counting gates can become biased, specifically, if jacks migrate before large adults or males pass before females.

The Frazer field crew will report daily and cumulative jack percentages to the project biologist and fishery managers during daily radio schedules. If the portion of jacks in the cumulative escapement through the Frazer fish pass reaches or exceeds 25 percent, the fisheries manager will initiate implementation of a plan to randomly remove jacks from the escapement in an attempt to keep the overall jack composition at or below 25 percent. This will be done through passive methods at the top of the fish pass, and all jacks will be counted towards the total run, but will not be included in the escapement.

All scales, when possible, will be collected from the preferred area of each fish (Appendix A2; INPFC 1963). Scales will be mounted on scale “gum” cards and returned to the Kodiak ADF&G office where impressions will be made on cellulose acetate (Clutter and Whitesel 1956). Sex will be determined by observation of external morphological characteristics and length will be determined by measuring the distance from mid-eye to tail fork using a metric ruler, to the nearest millimeter.

ASL data will be recorded in a log book, which will be kept in a binder at camp until the end of the season. This data will also be entered daily into a Rugged Digital Assistant (RDA) and electronic data will be sent bi-weekly to the ADF&G Kodiak office. Details and procedures for adult sampling and entering RDA data are outlined in the Kodiak Management Area sockeye salmon catch and escapement sampling operational plan, 2014 (Moore 2014).

Fish ages will be determined in town by examining scale impressions for annual growth increments using a microfiche reader fitted with a 60X lens following designation criteria established by Mosher (1968). Ages will be recorded using European notation (Koo 1962), where a decimal separates the number of winters spent in fresh water (after emergence) from the number of winters spent in salt water (e.g., 2.3). The total age of the fish includes an additional year representing the time between egg deposition and emergence of fry.

Additional details and procedures for adult sampling are outlined in the Kodiak Management Area sockeye salmon catch and escapement sampling operational plan, 2014 (Moore 2014).

**APPENDIX A. OPERATIONAL PLAN: FRAZER LAKE
SOCKEYE SALMON FISH PASS AND SMOLT SAMPLING**

Regional Operational Plan CF.4K.2014.01

Operational Plan: Frazer Lake Sockeye Salmon Fish Pass and Smolt Sampling

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March 2014

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gram	g	all commonly accepted professional titles	e.g., Dr., Ph.D., R.N., etc.	base of natural logarithm	e
hectare	ha	at	@	catch per unit effort	CPUE
kilogram	kg	compass directions:		coefficient of variation	CV
kilometer	km	east	E	common test statistics	(F, t, χ^2 , etc.)
liter	L	north	N	confidence interval	CI
meter	m	south	S	correlation coefficient	
milliliter	mL	west	W	(multiple)	R
millimeter	mm	copyright	©	correlation coefficient	
		corporate suffixes:		(simple)	r
Weights and measures (English)		Company	Co.	covariance	cov
cubic feet per second	ft ³ /s	Corporation	Corp.	degree (angular)	°
foot	ft	Incorporated	Inc.	degrees of freedom	df
gallon	gal	Limited	Ltd.	expected value	E
inch	in	District of Columbia	D.C.	greater than	>
mile	mi	et alii (and others)	et al.	greater than or equal to	≥
nautical mile	nmi	et cetera (and so forth)	etc.	harvest per unit effort	HPUE
ounce	oz	exempli gratia		less than	<
pound	lb	(for example)	e.g.	less than or equal to	≤
quart	qt	Federal Information Code	FIC	logarithm (natural)	ln
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degrees Fahrenheit	°F	registered trademark	®	percent	%
degrees kelvin	K	trademark	™	probability	P
hour	h	United States	U.S.	probability of a type I error	
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all atomic symbols				standard deviation	SD
alternating current	AC			standard error	SE
ampere	A			variance	
calorie	cal			population	Var
direct current	DC			sample	var
hertz	Hz				
horsepower	hp				
hydrogen ion activity	pH				
(negative log of)					
parts per million	ppm				
parts per thousand	ppt, ‰				
volts	V				
watts	W				

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Project leader(s): *Steven Thomsen, Fishery Biologist II*

Division, Region, and Area *Division of Commercial Fisheries, Region IV, Kodiak*

Project Nomenclature: *Frazer Fish Pass and Smolt Increments (FM 722 and FM 723)*

Period Covered April 2014 – September 2016

Field Dates: May 1 – September 1

Plan Type: Category II

Approval

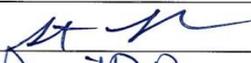
Title	Name	Signature	Date
Project leader	Steven Thomsen		2-19-14
Biometrician	Dave Barnard		14 Feb 2014
Research Coordinator	Nick Sagalkin		2/6/2014

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PURPOSE

Frazer Lake, within the Kodiak Management Area, was originally devoid of anadromous fish species due to a 10-meter barrier waterfall. From 1951 to 1971, sockeye salmon *Oncorhynchus nerka* were introduced to Frazer Lake. In 1962, a fish pass was constructed around the barrier fall to allow fish to migrate up into the lake system. Since construction of the fish pass, the Alaska Department of Fish and Game (ADF&G) has annually operated and maintained the fish pass structure to ensure sockeye salmon are able to access Frazer Lake. Additionally, ADF&G enumerates and collects biological data from sockeye salmon smolt and adults. This operational plan is intended to provide the field staff with a reference document for the daily operations of the Frazer Lake fish pass and smolt operations.

BACKGROUND

Frazer Lake is located on the southern end of Kodiak Island and is the second largest lake within the Kodiak Archipelago (Figure 1). Frazer Lake is 14.2 km long, and 1.6 km wide, with a surface area of 16.1 km². Dog Salmon Creek is the outlet of Frazer Lake and drains into Olga Bay. Prior to 1951, Frazer Lake was void of sockeye salmon *Oncorhynchus nerka* because of a ten m barrier waterfall, which prohibited anadromous fish from entering the lake (Meehan et al. 1965; Russell 1972). Egg, fry, and adult transplants (1951–1971) from sockeye salmon systems on Kodiak Island (Karluk and Red lakes) and the Alaska Peninsula (Becharof Lake) were used to establish a sockeye salmon run to the Frazer system with adults returning for the first time in 1956 (Russell 1972). From 1956 to 1961, returning adults were backpacked around the falls and, in 1962, a fish pass was constructed to allow returning salmon to access the lake environment. A second fish pass was installed in 1979, with the intention of increasing fish passage during peak migration periods.

Conservative fishery management practices built the Frazer Lake run from 25,000 sockeye salmon in 1971 to 645,739 fish in 1985. Blackett (1979) estimated a spawning capacity of 365,000 adults based upon limnological and spawning habitat information. Declines in smolt condition and shifts in zooplankton size and community composition prompted lowering the escapement goal range to 200,000–275,000 adults in 1986 (Kyle et al. 1988). The goal was lowered again to a range of 140,000–200,000 in 1988 (Nelson and Lloyd 2001). The current biological escapement goal range of 75,000–170,000 fish is based on stock-recruit analysis, and has been in place since 2008 (Nemeth et al. 2010). A fertilization program was instituted from 1988 to 1992 in response to the declines in smolt size resulting from overescapement.

Sockeye salmon adult enumeration and age, sex, and length (ASL) sampling have been conducted annually at the Frazer Lake since 1956. Since 1985, smolt age, weight, and length (AWL) data and zooplankton density and community composition have been measured annually. Smolt emigration estimates and timing have been obtained inconsistently since 1985.

In 1983, a weir was installed on Dog Salmon Creek, located 0.7 km upstream from lower Olga Bay. The purpose for the Dog Salmon weir was to obtain chum *O. keta*, and pink salmon *O. gorbuscha* escapement counts and more timely sockeye salmon counts.

Discrepancies between sockeye salmon counts through Dog Salmon weir and Frazer fish pass have led to numerous fish pass modifications to expedite fish passage through Frazer fish pass (Thomsen et al. 2013). Consequently, a water diversion is now employed to increase attractant

water flow to the entrance of the fish pass. Additionally, minimizing fish build-up below the fish pass helps accelerate fish movement.

Continuation of the Frazer Lake sockeye salmon run is dependent on unobstructed and timely adult fish passage into Frazer Lake.

OBJECTIVES

The project goal is to operate the fish pass to allow adult fish passage into Frazer Lake, while collecting important adult and juvenile data to help manage the Frazer Lake sockeye salmon stock.

CREW OBJECTIVES

1. To estimate the abundance (N), age composition, and average size and weight of outmigrating sockeye salmon smolt within 25% (relative error) of the true value with 95% confidence,
2. Enumerate adult salmon escapement through Frazer fish pass; providing unobstructed and timely adult fish passage to Frazer Lake,
3. To estimate the average age, sex, and length (ASL) from the sockeye salmon escapement into Frazer Lake where estimates are within $d=0.07$ of the true proportion (for each age group within each stratum) with 95% confidence.

LIMNOLOGY SAMPLING OBJECTIVES

Sampling will be conducted by Kodiak Regional Aquaculture Association staff and analysis will be conducted at the Kodiak Island Laboratory following methods in Ruhl (2013).

4. Evaluate water chemistry, nutrients, and zooplankton samples in Frazer Lake.

TASKS

General

1. Set up camp. Target date 1 May.
2. Collect physical data daily: air temperature, water temperature, water level, percent cloud coverage, wind direction and velocity, and precipitation.

Smolt Monitoring

3. Install an inclined-plane smolt trap (Figures 2 and 3) as the primary trapping system until the smolt bypass system can be operated satisfactorily. When in operation, this trapping system will use single-site mark-recapture testing with a target goal of recapturing 5 to 7% of released, dyed smolt. Target date: 2 May until no longer needed.
4. Test the smolt bypass system (Canadian fan trap; Figures 2 and 4). This trapping system will be secondary to the inclined-plane trapping system until testing has been completed. Target date: 4 May until the end of the smolt emigration (approximately 3 July).
5. Enumerate the daily smolt trap catch of fish by species.
6. Collect AWL data from 40 sockeye salmon smolt five days a week for a total of 200 sampled smolts per week throughout the outmigration. If a large outmigration occurs on a day without scheduled sampling, additional sampling may be required.

7. Conduct weekly mark-recapture and mortality testing to estimate the total smolt emigration. Retain 50 unmarked sockeye salmon smolt for holding mortality testing. Dye up to 950 sockeye salmon smolt using Bismarck Brown Y (BBY) dye and retain 50 smolt for delayed mortality testing. Release between 500–900 dyed smolt for mark-recapture testing.
8. Conduct weekly smolt bypass system mortality testing. Capture 100 unmarked sockeye salmon smolt exiting the lower pipe and retain in a divided live box, 50 smolt on one side will be checked and released after 24 hours and the smolt on the other side will be checked and released after 48 hours.

Adult Monitoring

9. Install, operate, and maintain the near shore fish pass continuously until a decision to close the fish pass is made by the project biologist. Target dates: approximately 10 June–1 September.
10. Enumerate adult salmon escapement through the fish pass by species and provide accurate daily escapement reports. Record the number of net-marked and “jack” (400 mm or less) sockeye salmon escaping through the fish pass.
11. Collect representative scales (for age determination), length, and sex from a minimum of 80 adult sockeye salmon three times per week for a minimum, total of 240 ASL sampled fish per statistical week escaping to Frazer Lake. Ensure representative samples are collected weekly throughout the season.

METHODS

SOCKEYE SALMON SMOLT MONITORING

Smolt trapping at Frazer Lake will consist of a single-site mark-recapture technique using an inclined-plane trap to estimate smolt outmigration abundance (Carlson et al. 1998). In addition, testing of a smolt bypass system will be conducted to ascertain its effectiveness.

Study Design

A single inclined-plane trap will be installed just upstream of the ten m waterfall and concrete water diversion weir where the trap has been located in past years (Figures 2 and 3; Todd 1994). No wings will be added to the trap but the associated supports, live box, platform, and walkway will be installed.

Daily emigration of sockeye salmon smolt will be estimated using individual and/or catch-weight counts. Mark-recapture strata testing will be adjusted to accommodate changes in trapping. The release site is located far enough upstream to allow mixing of marked and unmarked smolt (0.7 km).

Trap efficiency estimates will be conducted at the start of each stratum. The smolt season will be divided into nine strata of equal duration. However, strata may be combined if smolt numbers are insufficient to capture a representative sample and additional strata may be added to account for changes in estimation methods. Smolt trapping will be concluded when the number of captured smolt drops to less than 100 smolt per day for 3 consecutive days.

Stratum	Dates included
Stratum 1	May 1-7
Stratum 2	May 8-14
Stratum 3	May 15-21
Stratum 4	May 22-28
Stratum 5	May 29-June 4
Stratum 6	June 5-11
Stratum 7	June 12-18
Stratum 8	June 19-25
Stratum 9	June 26-July 2

Trap efficiency will be estimated within each stratum by conducting dye release trials using BBY dye. The percentage derived from these trials is used to estimate the total number of sockeye salmon smolt that outmigrated from Frazer Lake. The proportion of recaptured marked (dyed) smolt to unmarked smolt will be used to estimate trap efficiency.

To conduct trap efficiency trials, a total of 1,000 sockeye salmon smolt will be captured using the inclined-plane trap (until the bypass system is fully operational). Details are covered in the Mark-Recapture Instructions section on pages 11 and 12.

Trap efficiency will be adjusted to account for any mortality associated with holding smolt for the experiment. Delayed mortality and holding mortality trials will be conducted during each stratum to determine if adjustment to trap efficiency are needed. Details are covered in the Delayed and Holding Mortality Experiments section on page 12.

Estimates of population abundance will be calculated using a modification of the stratified Peterson estimator (Carlson et al. 1998). Trap efficiency E_h for stratum h is calculated as

$$E_h = \frac{m_h + 1}{M_h + 1}, \quad (1)$$

where

M_h = the number of marked smolt released in stratum h (M_h will be adjusted to reflect any holding mortality. i.e. M_h will be reduced using the proportion of mortality of undyed to dyed smolt that occurs during the delayed mortality and holding mortality trials for each stratum)

m_h = the number of marked smolt recaptured in stratum h

A modification of the stratified Petersen estimator (Carlson et al. 1998) is used to estimate the number of unmarked smolt U_h emigrating within each stratum h as

$$\hat{U}_h = \frac{u_h(M_h + 1)}{m_h + 1}, \quad (2)$$

where

u_h = number of unmarked smolt recaptured in stratum h .

Variance of the smolt abundance estimate is estimated as

$$\hat{\text{var}}(\hat{U}_h) = \frac{(M_h + 1)(u_h + m_h + 1)(M_h - m_h)u_h}{(m_h + 1)^2(m_h + 2)}. \quad (3)$$

Total abundance of U of unmarked smolt over all strata is estimated by

$$\hat{U} = \sum_{h=1}^L \hat{U}_h, \quad (4)$$

where L is the number of strata. Variance for \hat{U} is estimated by

$$\hat{\text{var}}(\hat{U}) = \sum_{h=1}^L v(\hat{U}_h), \quad (5)$$

and 95% confidence intervals are estimated using

$$\hat{U} \pm 1.96\sqrt{v(\hat{U})}, \quad (6)$$

which assumes that \hat{U} is approximately normally distributed.

Within each stratum h , the total population size by age class j is estimated as,

$$\hat{U}_{jh} = \hat{U}_h \hat{\theta}_{jh}, \quad (7)$$

where $\hat{\theta}_{jh}$ is the observed proportion of age class j in stratum h . Variance of $\hat{\theta}_{jh}$ is estimated using the standard variance estimate of a population proportion (Thompson 1987). The variance of \hat{U}_{jh} is then estimated by

$$\hat{\text{var}}(\hat{U}_{jh}) = \hat{U}_h^2 v(\hat{\theta}_{jh}) + \hat{U}_h v(\hat{\theta}_{jh})^2. \quad (8)$$

The total number of emigrating smolt within each age class is estimated by summing the individual strata estimates, and its variance is likewise estimated by summation over the individual strata estimates.

Statistical assumptions are taken from (Carlson et al. 1998).

1. The population is unchanging (i.e., a closed population with no immigration or outmigration),
2. all smolt have the same probability of being marked (i.e., trap is not selective and strata are consistent),
3. all smolt have the same probability of capture (i.e., marking fish does not affect their behavior),
4. all marked smolt released can be recovered (i.e., marking mortality was minimal and accurate),
5. all marked smolt are identifiable (i.e., crew well trained and strata are discrete),
6. and marks are not lost after marking (i.e., effectively stained).

Inclined-Plane Smolt Trap Installation Procedures

The inclined-plane trap will be installed in Dog Salmon Creek just upstream of the 10 m waterfall and the concrete water diversion system (Figures 2 and 3). Anchor the trap with sufficient space to install the catch box, work platform, and sampling live box between the trap and water diversion. To capture a representative portion of the outmigrating smolt, position the trap towards the middle of the river where water velocity is great enough to make it difficult for smolt to avoid capture.

Anchor the trap to shore with cables attached to hand-powered cable “come-along” winches fixed to each stream bank. The trap will be secured to an aluminum pipe frame, which will allow the back end of the trap and live box to be adjusted vertically in response to water level fluctuations.

1. Position the inclined-plane trap as indicated in Figure 3.
2. Anchor the trap with cables and “come-along” winches to positions on the stream banks.
3. Use 3.0 m (10') sections of 5.1 cm (2") diameter pipe joined by NU-RAIL® fittings as a frame to secure and support the trap.
4. Using a come-a-long winch, secured to the overhead steel pipe cross member, elevate the downstream end of the trap.
5. Install a catch box to the codend of the trap for smolt capture.
6. Install a board walk and work platform leading from the bank to the catch box. Build the board walk using rack master supports and 2"x12' boards (Figure 3).

Smolt Trap Operation

Smolt trapping will be conducted continuously (24-hours a day) for the duration of the smolt outmigration. A single trapping or sampling day will be the 24-hour period from noon of the first day to noon the following day and the date recorded will correspond with the prior day. Smolt primarily migrate at night. Smolt needed for sampling will be held in a live-box until sampled. To ensure safe and efficient operation, monitor the trap(s) frequently.

All fish captured in the trap(s) will be identified by species and enumerated daily. Proper identification of sockeye salmon smolt is crucial. A helpful source for juvenile salmonid identification is the ‘Field Identification of Coastal Salmonids’ by Pollard et al. (1997). It is the responsibility of the crew leader to ensure species are properly identified. If in doubt, freeze a sample for later verification or send a digital photograph to the Kodiak office. Only sockeye salmon smolt will be sampled for AWL. Specific procedures for sampling and recording smolt AWL data are provided in Appendix A.

1. Keep the traps and wings free of debris to maintain consistent trap efficiency and minimize smolt mortality.
2. Monitor traps frequently. The traps should be checked every 3–4 hours during the day and every 1–2 hours at night when being fished.
3. Modify or pull wings from the water to allow smolt to pass safely if unforeseen conditions occur and smolt trapping must temporarily cease. If possible, any modifications to the trapping system will be discussed with the project biologist before implementation. If

immediate modifications are necessary to avoid major mortality or loss of equipment, the project biologist will be notified as soon as possible.

4. Plastic sheeting may need to be added to the perforated plates to reduce pinning or increase flow into the trap.
5. Smolt will be handled with care, as sockeye salmon smolt are very sensitive to any stress, and mortality can occur through the loss of just a few scales.
6. Use a dip net to remove and release the fish as they are counted.
7. A tally denominator will be used to enumerate the smolt to ensure an accurate count.

Smolt Enumeration

All fish entering the trap will be counted by species with handheld tally denominators. Smolt enumeration data (including mortality) will be recorded on the *Daily Smolt Catch Reporting Form* (Figure 10) and the *Weekly Smolt Catch Summary Form* (Figure 11). If fish passage intensifies to the point of inundating the crew, risking smolt mortality, follow timed count or catch-weight procedures. Note: if conducting a mark-recapture test, all smolt must be visually inspected for marks (dye) and counted. Please review the timed count and catch-weight procedures before needed.

Catch-Weight Procedures

Catch-weight counts will be used when operating the inclined-plane trap. Use catch-weight counts when fish passage exceeds the crew's ability to accurately count all fish captured. Catch-weight estimation should only be used when the live box is too full to count by hand (> 2,000). If performing a mark-recapture test all smolt must still be examined for evidence of dye and tallied appropriately. The catch-weight method estimates the number of smolt by using total weight and counts taken from a subsample from the live box and expands for total smolt weight in the live box. Data will be reported on a *Catch-weight Worksheet* (Figure 13), a *Catch-weight Form* (Figure 14), and then on the *Daily Smolt Catch Reporting Form* (Figure 10).

1. Hang bicycle scale.
2. Dip the catch-weight bucket into water and thoroughly coat. Let excess water drain from bucket. Record wet weight of catch-weight bucket on the *Catch-weight Worksheet*. Note: A new bucket wet weight will be recorded before starting a new aggregate weight count (1st bucket, 11th bucket, 21st bucket, etc).
3. Use a dip net to carefully remove smolt from live box and place in catch-weight bucket. Do not overfill the bucket. A range between 2.00 kg to 4.50 kg is acceptable, given an average empty wet bucket weight of 1.00 kg. Do not tare the scale.
4. Record smolt weight for each aggregate bucket load.
5. For every 10th aggregate weight, the number of sockeye smolt in the sample will be individually numerated. The number of other fish or smolt species must also be counted to adjust for species composition. Time of every 10th aggregate weight will be recorded.
6. Catch-weight counts will continue until individual counts are possible. If the catch-weight counts do not end on the 10th aggregate weight, the last catch-weight count will be individually numerated.

7. Weights recorded within the *Catch-weight Worksheet* include both smolt and wet bucket weight. Weights recorded within the *Catch-weight Form* will only include smolt weight. Each aggregate weight count must have the wet bucket subtracted from its total before recording in the *Catch-weight Form*.
8. Sockeye smolt numbers for each catch-weight count are estimated by using the smolt weight and counts taken from the 10th aggregate weight sample.
9. Number of smolt in subsequent samples is calculated by $Sc = (Sr \times Ws) / Wr$.
 - a) Sc: Calculated number of fish of each species
 - b) Sr: Number of fish of each species in the reference sample (10th aggregate weight count)
 - c) Ws: Weight of subsequent sample
 - d) Wr: Weight of the reference sample
10. Smolt mark recapture numbers are not included in the number of sockeye.

Age, Weight, Length (AWL) Sampling

The crew will collect AWL data from 40 randomly selected sockeye salmon smolt five days a week for a total of 200 AWL samples per week (Appendices A1 and A2). If less than 40 sockeye smolt are caught in a day, the crew will sample all sockeye smolt captured. During peak outmigration, AWL samples should be collected 7 days a week; during very large outmigration events (daily passage < 10,000 smolt at a 5% recapture rate) the crew should sample 80 smolt per day. AWL data will be recorded on a *Weekly Smolt Catch Form* (Figure 11) and in a log book, both of which are to be kept in a binder at camp until the end of the season. These data will also be entered into a Rugged Digital Assistant (RDA) and electronic data will be sent to the ADF&G Kodiak office (Appendix A2). Dyed smolt will not be included in AWL sampling.

1. A sub sample of smolt will be collected throughout the night and held in the instream live box. The following day, all smolt from the live box will be anesthetized using tricaine methanesulfonate (MS-222) prior to being sampled. After being sampled, all smolt will be held in aerated buckets of water until they have recovered from the anesthetic, and subsequently released downstream from the trap.
2. Fork length will be recorded to the nearest 1 mm and weight to the nearest 0.1 g. Scales will be removed from the preferred area of each fish following procedures outlined by the International North Pacific Fisheries Commission (INPFC 1963) and mounted on a microscope slide for age determination.
3. Age will be estimated in town from scales viewed with a microfiche reader at 60X magnification and recorded in European notation (Koo 1962) following the criteria established by Mosher (1968). In addition, the overall health or condition factor of each sampled smolt will be assessed by calculating its body condition factor K (Bagenal and Tesch 1978) as

$$K = \frac{W}{L^3} 10^5 \quad (9)$$

where

W = weight and L = length.

Mark-Recapture Instructions

The dyeing process can be very stressful to smolt, so every effort should be made to minimize and avoid unnecessary handling of the smolt during the process. Excessive handling (netting), increased water temperatures, transport, and exposure to the dye are the primary stresses. Individually, these can induce mortality. The following methods will be used for marking and releasing smolt:

1. Once a week, 1,000 sockeye salmon smolt will be collected for marking or holding trials. If the outmigrating run strength is not sufficient to capture 1,000 smolt in one night, smolt will be collected and held in a live-box for up to two days to achieve a sufficient sample size.
2. Of the 1,000 sockeye salmon smolt collected, 950 sockeye salmon smolt will be marked and 50 will remain unmarked. Approximately, 900 dyed smolt will be released and 50 dyed smolt will be retained to monitor delayed mortality. The 50 unmarked smolt will be retained to monitor holding mortality. Non-released smolt (50 marked and 50 unmarked) will be held and assessed separately under similar conditions. Smolt sampled for AWL will not be used in these tests.
3. Dye marking with BBY will take place at the release site after transport. All data will be recorded on the *Smolt Dye Release Form* (Figure 15).
4. For transport, nearly fill a 32-gallon garbage can with stream water with a bilge pump (water needs to be clean and cool, from a deep pool).
5. If excessive mortality occurs (greater than 5%) institute the follow procedure for subsequent transport in the garbage can. Prior to adding smolt, add sodium bicarbonate (baking soda) to obtain a 0.25% (1 g/gal or 264 mg/l) solution to maintain a stable blood pH. Add non-ionized salt to achieve a 0.75% solution (3 g/gal or 793 mg/l). This solution level approaches physiological levels and reduces metabolic stress and electrolyte depletion that can cause mortality.
6. Place an oxygen hose with air stone in the garbage can and adjust to maintain 9 mg/l or 100% saturation throughout transport.
7. Following transport, all smolt will be held in the garbage can for a minimum of 30 minutes to relax. Maintain oxygen saturation and keep the water temperature within 2°C of initial transport. Smolt displaying “abnormal” behavior will NOT be released as part of the test or retained for delayed mortality. A fish with “abnormal” behavior may be swimming on its side, upside down, or continuously puffing or flaring its gills. All dead and “abnormal” fish that are discovered at this stage of the dye test must be removed from this test population, returned to the river DOWNSTREAM of the smolt trap and recorded on the Smolt Dye Release Form as mortality in its respective cell.
8. After the 30 minute resting period, dissolve ~ 3 mg/L of BBY dye (4.0 g/30 gallons BBY premixed into a small amount of water) in the garbage can with the 950 smolt (make sure to remove the 50 non-dyed smolt before adding the dye) and monitor oxygen and temperature continuously. Water temperature and dissolved oxygen will be recorded in the mark-recapture log book throughout the process using a YSI® Pro ODO meter.

9. For the marking process, all smolt will remain in the garbage can for a minimum of 60 minutes. To avoid diluting the dye, do not add any river water to adjust the temperature during the marking process.
10. After the marking process, use the bilge pump to replace the dye with river water. Overflow holes in the garbage can allow excess water to be removed.
11. Dyed smolt displaying “normal” behavior will be counted and released evenly across the creek from water filled buckets. The process should be timed such that smolt will be released at approximately 2200 hours. The remaining 50 marked and 50 unmarked smolt will be held separately in a live box up to four days to determine smolt survival from the marking and holding tests (4 days unless excessive mortality occurs).
12. Monitor the inclined-plane smolt trap for marked smolt daily from the day of the release and continue until the next dye test. The number of dyed smolt observed will be recorded on the *Daily Smolt Catch Reporting Form* (Figure 10) and the *Weekly Smolt Catch Form* (Figure 11). The daily smolt catch will not include recaptured marked smolt as they were already counted. The trap efficiency from each dye test will be identified as a percentage of the dyed fish recovered divided by the dyed smolt released (less holding mortality).

Delayed and Holding Mortality Experiments

Delayed and holding mortality experiments are used to estimate the baseline mortality of released smolt during mark-recapture. This experiment is comprised of two parts. The 50 marked smolt placed in the live box will be monitored daily for mortality over a four-day period. The 50 unmarked smolt placed separately in the live box will also be monitored daily for mortality over a four-day period. The mortality of both smolt groups will be entered separately to assess both holding and marking mortality. Additionally, check the marked smolt for mark visibility each day to ensure mark retention. Smolt used for the mortality experiments will be handled the same way as the smolt being released, except they will not be released.

Smolt Bypass System

A smolt bypass system, utilizing a Canadian fan trap and piping will be tested to assess the efficiency and potential mortality of the system. The project biologist will determine when and at what recapture rate the smolt bypass system will operate.

The smolt bypass system trap will be installed 0.7 km upstream of the waterfall (Figures 2 and 4). A support system will be installed to elevate the trap in response to water level fluctuations and permit the trap to be raised to eliminate fishing when not in use. No wings or walkway will be added until initial efficiency and mortality testing has been conducted.

The bypass system will divert smolt traveling downstream from the lake through a pipe, circumventing the falls. Sockeye salmon smolt will be piped from the Canadian fan trap into the smolt shack, and then the smolt will proceed through the fish pass and exit downstream of the falls. Place the Canadian fan trap 0.7 km upstream of the concrete water diversion system (Figures 2 and 4). Position the trap towards the middle of the river where water velocity is great enough to make it difficult for smolt to avoid capture and to capture a representative portion of the outmigrating smolt.

Installation of the Trap and Support Structures

1. Position the Canadian fan trap as indicated in Figure 4.

2. Anchor the trap with cables and turnbuckles positioned on the stream bank.
3. Use 3.0 m (10') sections of 5.1 cm (2") diameter pipe joined by NU-RAIL[®] fittings as a frame to secure and support the trap.
4. Use a come-a-long, secured to the overhead steel pipe cross member, to elevate the downstream end of the trap.

Installation of Pipe from Canadian Fan Trap to Existing Pipe

5. Connect sections of 6" HDPE pipe from the codend of the trap to the existing pipe which exits the adult counting tank and is located downstream approximately 0.7 km. A short section of flex pipe will be installed first, closest to the trap codend (Figure 4). The last section of pipe utilizes a cam lock to attach to the existing pipe (Figure 6).

Connections to Existing Pipe

6. Connect and secure the existing pipe passing through the adult counting structure (Figure 7). This pipe remains in position over winter but requires some horizontal positioning and tightening of fittings and straps once connected to the upstream sections of pipe to stay in place.
7. Position and secure the flex pipe leading into the smolt shack (Figure 8). This flex pipe may need to be lowered to induce water flow.
8. The flex pipe exiting the smolt shack tank and the 6" HDPE pipe passing through the empty fish pass remain in position over winter. Check the couplings in the adult resting tank to make sure they are secure before operation.
9. A short section of flex pipe will be needed at the bottom of the fish pass to decrease the rate of flow and prevent smolt mortality. Testing of exit configurations will need to be conducted.

Smolt shack

10. Components of the smolt shack counting tank are listed in Figure 5. These components remain connected overwinter but may require some adjustments during operation. Make sure the lever on the counting trough is positioned so water flow and fish are directed into the live box unless conducting timed counts.
11. Adjust the water level in the counting tank by raising or lowering the standpipe located on the downstream end of the tank (Figure 9). Further adjustment of water flow is accomplished by raising or lowering the Canadian Fan trap, changing wing length, or lining the trap and wings with plastic sheeting.

Installation of Smolt Trap Wings

Installation of wings on the Canadian Fan trap will be required to adjust the trap catch rate. The length and extent of wing coverage will alter the weekly mark-recapture rate and should be adjusted to target a 25% capture rate after initial testing. At the project biologists discretion, the capture rate will be incrementally increased to 100%.

12. Construct wings upstream of the trap in a "V" configuration using a frame made from 2.8 m (8') back legs, 1.4 m (4') front legs, and 2.8 m (8') cross members with 5.1 cm (2") diameter pipe and NU-RAIL[®] fittings (Figure 4). Make sure the angle of the wings is under 15

degrees to maintain sufficient flow speed and decrease the potential of pinning smolt. For 100% capture wing length should extend from 30 to 35 m, ending at both banks.

13. Attach 1.3 x 2.5 m (4' x 8') sheets of aluminum perforated plate to the frame starting at the trap and working upstream. The first sheet of perforated plate is secured to the side of the trap with screws where the plate and the side of the trap are joined. The trap and perforated plate should rest on the streambed; continue placing sheets of perforated plate on the frame with each upstream piece overlapping the previous downstream piece by approximately 6" and securing the plates together with bailing wire.
14. Place Lortex (black plastic screen) over the seams of the perforated plate and any other areas with protruding edges that may be hazardous to smolt. Place sand bags in a continuous line to hold the lortex on the stream bottom.
15. Line the inside walls and bottom of the trap with a plastic tarp and/or Lortex as needed to minimize smolt pinning against the perforated plate and increase water velocity.

Timed Count Procedures

Timed counts will only be used when operating the smolt bypass system. Use timed counts when fish passage exceeds the crew's ability to accurately count all fish captured and limit smolt mortality. Timed counts will be conducted every half-hour (30 minutes), normally only from 2300 hours through 0500 hours. Half-hour counts are from 1.0 minutes (minimum) to 8.0 minutes (maximum) in duration. The duration is dependent on the rate of smolt movement (e.g., the minimum time is used during large migrations and the maximum time during slower smolt movements). Note: these timed count procedures are based on a bypass system located at Spiridon Lake and may require in-season adjustment. Data will be reported on a *Timed Count Worksheet* (Figure 12) and then on the *Daily Smolt Catch Reporting Form* (Figure 10).

1. At the beginning of a count, the gate on the counting trough is swung away from the operator, allowing smolt to drop into the counting basket submerged in the tank; use a stopwatch to time the collection of smolt in the counting basket.
2. At the end of the count, the gate is moved towards the operator, allowing smolt to bypass the counting basket. Record the count-time and enumerate the smolt from the counting basket, then release them down the pipeline.
3. Use the same procedures (number 1 and 2 above), if large smolt movements occur during the day (0500 to 2300 hours).
4. At the end of daily counting shift (~0500 hours), secure the gate in the open position, allowing smolt to fall into the counting basket. Cover the trough and catch basket with perforated plate to prevent smolt from jumping on to the floor.
5. Check the catch basket first thing in the morning (0900 hours); individually enumerate and release the smolt collected. Repeat this step just prior to noon when the counting day ends.
6. If smolt are spilling from the pipes at a slow rate, all smolt should be collected in the counting basket and counted individually.

Smolt Bypass System Mortality Experiments

Smolt bypass system mortality testing will be conducted weekly until discontinued by the project biologist. Sufficient testing will be conducted to ascertain smolt bypass system mortality.

Capture 100 unmarked sockeye salmon smolt exiting the lower pipe and retain in a divided live box. Examine and releases the 50 smolt from one side after 24 hours and record the results. Repeat for the other side after 48 hours.

ADULT SOCKEYE SALMON MONITORING

Many major components of the fish pass are permanently assembled and require minimal assembly. Major assembled components include two steep passes, cement resting tanks, cement entrance and exit (counting tank) structures, the framework and walkway of the fish diversion weir below the falls, and the cement and stop log portions of the upper water diversion above the falls (Figure 16). Major components needing assembly include panels on the fish diversion weir and upper water diversion and a secondary lower water diversion assembly (Figure 16).

The fish pass nearest to the cabin (old fish pass) will be open and operational for adult salmon passage approximately two days after sockeye salmon are first counted through Dog Salmon weir (around 15 May) and remain open through 1 September. Additional instructions can also be found on the memory stick provided to the crew leader.

Installing the Fish Diversion Weir

The fish diversion weir, located below the falls, directs fish into the fish pass entrance. The weir needs to be installed prior to arrival of salmon to prevent salmon from being trapped between the weir and the falls. The diversion weir should be inspected daily for holes and cleaned when required. This prevents fish from escaping through the lower diversion weir, which has been a major problem in the past.

1. Weir materials (weir panels, aluminum flat stock, 2"x6" boards, and stop sign posts) are located on the stream banks on either side of permanent walkway. Hardware (lag bolts) are in the shop,
2. Stage materials across the weir walkway,
3. To prepare for panel installation, clean any debris such as gravel from inside the panel rail; located upstream of the weir on the creek bottom,
4. Place weir panels vertically into the channel rail starting on the near side of the weir. Align the panels next to each other moving towards the far side of the weir. Special attention should be paid to gaps and the alignment of the weir panels because fish can escape through the diversion weir and become trapped at the base of the falls. Underwater "Aqua scopes" are used to check the alignment of panels in the groove.
5. Panels are secured to the weir using upper and lower stringers, sandwiching the weir panels to prevent movement. The upper stringers consist of 3" aluminum flat stock, placed on top of the panels and secured to 2"x8" boards attached to the weir with 1/2" or 9/16" x 3.5 or 4" lag bolts. The lower stringers consist of 8' square stock (stop sign posts), placed on top of the panels and secured to 2"x6" boards placed behind (downstream) the weir with 1/2" or 9/16"x 6" lag bolts,
6. After securing all panels check for gaps in between the rail and panels to ensure the weir is fish tight. Cover gaps with rocks or small zip-tied pieces of fencing.

Installing the Lower Water Diversion

To increase water flow to the fish pass entrance a small (~20') water diversion will be placed upstream of the weir leading from the island to the cabin (near) side of the weir (Figure 16). The diversion is constructed using rackmaster pieces and aluminum perforated plate in a manner similar to smolt trap wings. Rackmaster fittings are located in the shed. All remaining materials are located on the near side bank.

1. Construct the diversion using a frame made from 1.3 m (4') legs, and 2.8 m (8') cross members, 5.1 cm (2") diameter pipe and NU-RAIL® fittings,
2. Attach 1.3 by 2.5 m (4' x 8') sheets of aluminum perforated plate to the frame starting at the weir (use the thin bend sheets).

Installing the Upper Water Diversion

The upper water diversion consists of two parts (Figures 16 and 17). The near shore (cabin side) portion consists of brackets and perforated panels placed on top of the near bank concrete wall to prevent fish from returning downstream. The far shore portion consists of vertical I-beams and removable stop logs to alter stream height at the entrance of the fish pass.

1. Place large brackets (stored in the adult sampling shack) on the concrete wall spaced approximately 4' apart. Attach perforated steel panels to the brackets using zip-ties,
2. To increase the water level entering into the fish pass, add stop-logs into slots between I-beams (located on the far bank). To decrease the water level, remove stop logs.

Opening the Fish Pass

The fish pass nearest the cabin is utilized by adult salmon returning to Frazer Lake. The far fish pass is utilized for smolt bypass piping. Once opened, the fish pass will be operated continuously until a decision to close the fish pass is made by the project biologist.

1. Remove the three resting tank covers and remove any debris,
2. Insert wood drain plugs on the inside of the tanks into drain holes; plugs should fit tightly so that internal tank water pressure holds the plug in place,
3. Replace tank covers,
4. Slowly remove 4"x4" beams and visqueen blocking water flow into the adult counting tank. Note: if stop-logs are removed rapidly, gravel is deposited into the counting tank,
5. After the water level has stabilized, ensure that the steep pass is about 3/4 full of water. This volume is necessary to attract sockeye salmon to the entrance tank and promote optimum fish passage. A water level of 1.8–1.9 feet should be maintained on the staff gauge by removing or placing stop-logs at the far end of the water control diversion (top of falls),
6. Inspect the counting tank and fish pass for holes where fish could escape uncounted,
7. Make sure the fish pass entrance is unobstructed and has sufficient water flow,
8. Place a white flash board (a perforated panel covered with a white sign) in front of the sampling trap exit to assist with visibility and species identification,
9. Post and maintain a "Keep off fish pass" sign on the trail between the cabin and the fish pass, as well as the other signs directing visitor traffic to appropriate trails.

Fish Pass Operation

Fish will be counted by field technicians as they migrate upstream through the fish pass and counting tank through the adult sampling trap. The sampling and counting gates will remain closed until staff are present to count fish through the weir for escapement enumeration or when fish are being collected in the live trap for ASL.

Fish will be visually identified and enumerated by crew members and recorded daily on the *Weekly Salmon Escapement Enumeration Form* (Figure 18). A subset of the adult sockeye salmon passing through the pass will be randomly selected and sampled for ASL data.

1. Monitor the fish pass throughout the day and pass fish once they have built up. Mornings and evenings are typically the best times for fish passage. The crew leader will organize a schedule. Increase the counting frequency during the peak of the sockeye escapement to minimize migration delays,
2. If you don't have experience identifying fish, your project leader or designee will train you to visually recognize the different salmon species and their swimming patterns. When fish have accumulated in the counting tank take time to visually study them and note differences,
3. Begin counting fish by opening both trap gates and enumerating them as they pass through with handheld tally counters, one for each species. Regulate the gate opening by using a wedge to lock the gate into position. If you open the gate too far, fish will pass through quickly and you will not be able to accurately count and identify them. Monitor escapement quality, including the number of net-marked and "jack" (< 400 mm) sockeye salmon,
4. When counting fish and conducting surveys, wear polarized glasses for greater visual recognition and eye protection from the sun's reflection off of the water,
5. Periodically check your tally denominators to ensure they are working properly,
6. When finished counting make sure the counting gates are closed completely.

Fish Pass Maintenance

The fish pass should be cleaned and checked daily for cover tightness, obstructed or sufficient water flow, and holes. Fix or adjust the pass as necessary. Under no circumstances should obstructive materials be placed in the exit tank or steep passes. Do not let detergents or chemicals enter the fish pass water supply.

1. The fish pass and weirs must be cleaned and inspected daily. Debris build up on the diversion weir may lead to scouring. Make sure to remove any dead fish observed in the counting tank as soon as possible because dead fish will accumulate in the resting tanks making the end of season task of cleaning extremely unpleasant,
2. Cleaning the fish pass and weir includes getting into the river to remove sticks, logs, leaves, grass, gravel, fish carcasses, and garbage,
3. Throw all debris (except garbage) over the weir, allowing it to flow down river,
4. Inspect the weir to ensure it is fish tight; look for scouring, panels out of place, gaps between panels (greater than a fingers width). Make repairs if needed,
5. Make sure the framework of the weir is sound and secure. If you find any loose or broken parts, repair it immediately.

Age, Sex, Length (ASL) Sampling

Adult sockeye salmon sampling utilizes a trap with two gates located in front of the adult counting tank. A minimum of 80 adult sockeye salmon will be sampled for ASL at a frequency of three times per statistical week for a total of 240 salmon. To sample fish open the inner gate and leave the outer gate closed. When sampling, counting cannot be conducted. Make sure to leave enough salmon in the counting tank to collect samples. Jacks tend to enter the trap first so leave the trap open for sufficient time to allow proportional mixing. Sockeye salmon adults will be chosen at random for sampling purposes.

All scales, when possible, will be collected from the preferred area of each fish (Appendix A2; INPFC 1963). Scales will be mounted on scale “gum” cards and returned to the Kodiak ADF&G office where impressions will be made on cellulose acetate (Clutter and Whitesel 1956). Sex will be determined by observation of external morphological characteristics and length will be determined by measuring the distance from mid-eye to tail fork using a metric ruler, to the nearest millimeter.

ASL data will be recorded in a log book, which will be kept in a binder at camp until the end of the season. This data will also be entered daily into a Rugged Digital Assistant (RDA) and electronic data will be sent bi-weekly to the ADF&G Kodiak office. Details and procedures for adult sampling and entering RDA data are outlined in the Kodiak Management Area sockeye salmon catch and escapement sampling operational plan, 2014 (Moore 2014).

Fish ages will be determined in town by examining scale impressions for annual growth increments using a microfiche reader fitted with a 60X lens following designation criteria established by Mosher (1968). Ages will be recorded using European notation (Koo 1962), where a decimal separates the number of winters spent in fresh water (after emergence) from the number of winters spent in salt water (e.g., 2.3). The total age of the fish includes an additional year representing the time between egg deposition and emergence of fry.

Additional details and procedures for adult sampling are outlined in the Kodiak Management Area sockeye salmon catch and escapement sampling operational plan, 2014 (Moore 2014).

Closing the Fish Pass

Close the fish pass when instructed by the project biologist (approximately 1 September).

1. Remove the fish and water diversion weirs below the falls. Place all materials in the same location they were found. Tie the panels together with rope to prevent movement during storage,
2. Remove stop-logs, perforated plating, and I-beam supports from the water control weir. Stack logs on the far stream bank and store the I-beams (well-greased) in the adult sampling shed,
3. Replace 4"x4" beams in front of the sampling trap; add visqueen as necessary to stop water flow between beams,
4. Remove all fish from the counting tank and place them above the falls. Make sure to include the fish in the daily escapement count. Netting the fish can be time consuming; allowing the water level to drop assists in netting,

5. Starting at the top of the fish pass, open the resting tanks (one at a time) and remove the wooden plugs. This is done by tapping the plugs into the tanks from the outside. When the water level has dropped sufficiently, remove all fish and debris. Record the live and dead fish in the camp log,
6. Replace the resting tank covers and leave the wooden plugs in the tanks. All water should be drained from the tanks. All residual materials within the tanks should be removed,
7. Inspect the fish pass and the facility for needed repairs, and list needed materials in the daily log and annual report.

ADDITIONAL GUIDELINES AND PROCEDURES

COMMUNICATION

During the smolt season (May and June) required data will be relayed to the project biologist each day at 1:15 PM by satellite phone or Single Side Band (SSB; Appendix B1) radio. During the adult season (July and August) required data will be relayed twice, daily. First, to ADF&G management at 8:10 AM by SSB radio or by satellite phone, then to the project biologist at 8:45 AM by satellite phone or by SSB radio.

The morning radio communication is an important tool which provides local air charter pilots with the current weather conditions and provides the most recent escapement data to fishery managers who utilize this information to make daily management decisions. The Commercial Fishery Management section also maintains an afternoon radio schedule for their management weirs at 1630 hr (4:30 PM) which is an optional radio communication. If contact to the Kodiak office is necessary at other times, information can be transmitted via the satellite telephone, with the satellite dispatch service, or with the SSB radio.

DATA REPORTING REQUIREMENTS

The crew leader will ensure all field camp reporting requirements are met. Hard copies of data forms and the camp journal will be completed on a daily basis. "Rite in the rain" logbooks will be used for ASL and AWL sampling. After completing a sampling event and upon returning to the cabin, the data will be transferred to the corresponding data forms and entered into the RDA. In preparation for the resupply flights, the activity report and the adult and juvenile scale samples will be properly packaged and clearly labeled with *ADF&G Attn: Steven Thomsen 486-1872*. **MAKE SURE TO DOUBLE CHECK DATA BEFORE PASSING THEM ON TO TOWN.**

Data reporting requirements can be categorized into three groups:

1. Provide daily: daily smolt and adult counts, mark-recapture and mortality testing results, and daily weather observations,
2. Provide bi weekly: timesheets (Appendix D), bi-weekly crew leader report (Appendix C), smolt scale slides, adult scale cards, smolt AWL and adult ASL data on jump drive provided,
3. Provide seasonally: *Daily Smolt Catch Reporting Form* (Figure 10), the *Weekly Smolt Catch Summary Form* (Figure 11), *Timed Count Worksheet* (Figure 12), *Catch-Weight Sampling Form* (Figure 14), *Catch-Weight Worksheet* (Figure 13), *Smolt Dye Release Form* (Figure 15), *Weekly Salmon Escapement Enumeration Form* (Figure 18), *Daily Physical Observation*

Form (Figure 19), completed daily camp activity log book, smolt AWL and adult ASL data log books, and an end of season crew leader report.

Collect climate data at noon each day. These data will include water and air temperatures (°C), stream height (cm), estimated percent cloud cover, and wind direction and velocity (km/hr). Measure stream height with a stream gauge located in the same spot each year.

CAMP OPENING

The crew leader will ensure all items necessary for camp opening are in working order and refer to last year's end of season crew leader report to make sure project needs and repairs can be accommodated.

Camp Equipment Check Out and Check In

Items with state identification stickers need to be inventoried yearly. To make this process accurate and prompt requires cooperation from camp personnel. Stickered items remaining at camp must be listed on the closing inventory each year (i.e. outboards, ATVs, refrigerators). Stickered items stored in town must be checked in and out for the season and returned to their proper location (i.e. radios, guns, EPIRBs, rafts).

ORDERING FOOD AND SUPPLIES

Field crews will purchase the first round of groceries and commodities prior to leaving Kodiak. Resupply items (e.g., groceries, fuel, mail, etc.) will be sent via chartered float plane on a bi-weekly basis, near the 1st and 15th of each month. Completed timesheets, crew leader reports, scale gum cards, and electronic data should be put on these flights and addressed to the project lead.

All air charter flights will be set up through the Kodiak office. Appropriate information in regard to flight logistics and times will be relayed via the daily radio communications. Small lists can be relayed over the SSB radio or satellite phone; however, these lists should be limited to just a few items. Blank grocery lists will be available in the field so the crew can place orders 2 weeks in advance for preparation of the next supply flight. It should also be remembered that the grocery budget allocates \$30/day/person and this allocation will not be exceeded. If it becomes apparent the grocery budget is being surpassed the project leader will notify staff so appropriate reductions can be made.

When planning for the resupply flights it is important to prepare back haul items and maximize the use of the chartered aircraft. Items to send back to town include empty fuel containers, non-burnable trash, biological data, and reports. When backhauling items it is important to notify office personnel of the expected items. During the bear viewing season some items may be sent as freight with air charter services visiting Frazer.

Alcoholic beverages, personal grooming supplies, newspapers, magazines, and tobacco must be purchased with personal funds. Please purchase as many of these personal items as possible prior to leaving for the field and be sure to set up a slush fund for incidentals before departure.

CAMP CLOSURE

The crew leader will ensure the camp is winterized and all items left at camp will be inventoried. Make sure all stickered items are brought back to town and check in or inventoried. Items to

return include all radios (SSB, satellite phone, and VHF's), EPIRB, defibrillator, and the shotgun. Items to include on the inventory list (with state ID #) include the lake skiff and outboard, refrigerator, and the ATV. Include the inventory and project needs and repairs in the crew leader's report.

CAMP POLICIES

- Alcoholic beverages are not to be stored or consumed in areas open to public view. If alcohol is consumed at a camp, the employee must be 21 years of age or older and off work without any duty scheduled for the remainder of the day. Under no circumstances shall he or she engage in the operation of any State equipment, nor shall he or she return to duty status under the influence of alcohol. The abuse of alcoholic beverages will be grounds for immediate dismissal.
- All employees will be required to act in a professional manner at all times and be especially courteous to the public.
- Injuries must be reported to the project supervisor within 24 hours.
- Loss or damage of equipment must be reported to the project supervisor within 24 hours.

VISITOR/PUBLIC INTERACTION

Many people visit Frazer Lake participating in activities ranging from day-use fishing and bear viewing to extended use through the Kodiak National Wildlife Refuge (KNWR) cabins or as campers. Most of these visitors come by the cabin site because the falls attract bears and provide excellent bear viewing opportunities. Visitors are also interested in seeing the fish exiting the fish pass. Due to this frequent contact, the camp must be kept clean and presentable. The field staff will act in a professional and courteous manner that is helpful to visitors. Visitors must also be informed of boundaries, limitations, and hazards. Be helpful, but remember the primary role of ADF&G staff is to run the smolt and adult sockeye salmon research project. KNWR will have personnel available to interact with the public during the peak bear viewing season to limit interruptions to ADF&G staff. Make sure the "keep off weir" sign is posted in a visible location. Under no circumstance should any employee accept gratuities or payment.

If possible, the crew should try to perform routine maintenance on the weir before 9 AM and after 5 PM to limit bear viewing disturbances. When work that may cause bear viewing disturbance is necessary, inform bear viewers of your intentions before proceeding with work. Also try to limit hazing of bears when bear viewers are present but do not sacrifice camp operations or staff safety.

The field crew will not allow media teams into the compound area or engage in interviews without PRIOR consent with the project leader. Failure to adhere to this policy may result in disciplinary action.

Violations

If a violation is observed, try to record the incident by photo or video and write down any pertinent details. Do not approach the person if it seems unsafe to do so. Inform your supervisor and the management team by radio either at next schedule or as soon as possible, depending on the level of the violation.

The use of the five Ws can aid in obtaining sufficient information pertaining to a violation.

1. What is the violation?
2. When did the violation take place?
3. Where did the violation occur?
4. Who is in violation and who are the witnesses?
5. Why was the violation committed?

SAFETY

State of Alaska safety regulations and Standard Operating Procedures (SOPs) must be followed at all times. On-site personnel will exercise extreme caution when considering safety issues. Employees not following state safety regulations may be subject to disciplinary action, including termination. Employees are expected to review, understand and sign the following SOPs before field deployment. Sections of the SOP that are required reading for field personnel include:

111-700	Safety Policies and Standards	111-740	Boating Safety
111-710	Office/Warehouse Safety	111-750	Vehicle Safety
111-720	Field Camp Safety	111-760	Laboratory Safety
111-730	Aircraft Safety for Passengers	111-780	Firearm/Bear Safety

An approved personal flotation device will be worn at all times while boating. A survival kit including matches, VHF radio, flare gun, EPIRB, spare motor parts, and a first aid kit will also be in the boat at all times.

Emergencies

Follow the emergency response flow chart provided in the camp binder or on the zip drive provided to the crew leader with additional emergency information.

In the event of a medical emergency, administer first aid to stabilize the situation. If an injury is life threatening and occurs on the water, immediately notify the US Coast Guard at **800-478-5555** on the satellite phone. If an injury is life threatening and occurs on land, immediately notify the Alaska State Troopers at **907-486-4121** on the satellite phone. The US Coast Guard can also be reached on SSB radio frequency 4.125 MHz or on VHF channel 16. See Appendix B for details on how to use satellite phones. A zip drive has been provided to the crew leader with additional emergency information. The zip drive should be in a location easy to access for all crew members (i.e. near SSB or satellite phone).

When contacting the U.S. Coast Guard or troopers, have the following information ready to pass along:

The Frazer Cabin is located at **57°12.1' N latitude and 154°3' W longitude**.

- Name and phone number of supervisor,
- General nature of medical emergency,
- Number of patients
- Specific information regarding the patient (name, age, primary complaint, and vital signs),
- Your assessment and treatment,

- Wind and weather conditions, and
- Other information pertinent to a possible medical evacuation.

First Aid and Fire Safety

All crew members not already certified will take a mandatory CPR and First Aid training course prior to going in the field. The crew leader will ensure that a fully stocked first aid kit and fully charged, operable fire extinguishers are in camp and that all personnel know where they are located and how to use them. Make sure smoke and carbon monoxide alarms are installed and operational.

In the event of a fire use the emergency response flow chart and try to contain the fire with water pumps. The camp has a large 2" and a small 1" water pump on site.

Firearms

All field camp employees must be able to safely use firearms. A firearm will be provided for camp use. Training on safe handling and shooting of firearms will be conducted for all personnel. Loaded guns (with a round in the chamber of the gun) are prohibited inside camp facilities. **Anyone handling a firearm should always treat it as if it is loaded.** Clean guns frequently. Make certain that firearms are completely unloaded while doing so. Firearms will be stored on site, unloaded, in a location out of sight from the public. Any misuse of firearms will not be tolerated and may be cause for immediate dismissal. Always unload a firearm of all ammunition before boarding a vehicle, vessel, or aircraft.

Garbage

Completely burn garbage to prevent attracting bears. Do not burn during windy or dry weather conditions. Never start fires with fuel. To prevent grass fires keep grass and brush trimmed to at least fifteen inches away from the burn pit. It is best to burn trash early in the morning or late in the evening when the wind is minimal and humidity is high. Never leave a fire unattended. Tin cans should be burned with burnable garbage to eliminate residual food and odors that attract bears. Send in burnt cans and non-burnable items on supply flights. All garbage that is sent to town must be double bagged.

Biodegradable garbage should be placed into a slop bucket (food scraps, etc.) and dumped away from camp in the river downstream of the weir. Do not compost biodegradable food because it attracts bears.

Drinking Water

Stream and lake water may be contaminated with bacteria or harmful parasites. A "Micron" water filter is provided in the camp to filter all drinking water. If filter cartridges are damaged, replace them immediately. If filters are not available, boil your drinking water for at least 10 minutes. Be sure to read the instruction manual with each filter for cleaning and care information.

ALL-TERRAIN VEHICLES

Frazer field camp is furnished with an All-Terrain Vehicle (ATV; 4-wheeler) and a small tractor. These are provided to transport materials, supplies, and equipment between the camp and supply planes. They may be used for transportation to and from sites of assigned field duties, such as

surveys. They are not intended for personal use or recreational purposes. The ATV and tractor may be accessed and operated only by trained personnel and will be secured when not in use. Be safety conscious at all times; do not speed or drive recklessly and always wear an ATV helmet.

Unauthorized use of the ATV will result in a notation on your evaluation or your dismissal from employment.

MAINTENANCE

Facility maintenance is an important aspect of camp life; the cabins and fish pass must be kept structurally sound and safe. Refer to last year's end of season crew leader report for a list of needed projects and repairs. Provide a list of materials needed to accomplish the projects and repairs to your project leader. Repairs and maintenance should be scheduled on days when fish passage is slow to keep this work within normal work periods. A zip drive has been provided to the crew leader with equipment manuals and maintenance information.

The generator, outboard motors, and ATV must be kept in good operating condition and require regular maintenance. At the end of each season, equipment should be winterized and tagged with a description of the equipment's condition on the tag.

COMPLIANCE WITH ADF&G REGULATIONS

All employees are responsible for complying with local subsistence, sport fishing, and hunting regulations. Copies of State and Federal regulations will be available to all field camp personnel and kept in camp. Any violation will be recorded on your evaluation and may be cause for immediate dismissal.

SCHEDULE AND DELIVERABLES

The annual schedule of activities for the 2014 – 2016 fishing season is as follows:

Date	Activity
May 1-September 1	Frazer field camp crew on site.
May 1-July 1	Smolt trap installed and operational.
May 15-September 1	Adult fish pass open and operational.
Daily	Daily escapement data are reported during morning radio with ADF&G Kodiak, crew lead collects Daily Weather Observation Data, and writes in the daily camp log book. Crew enumerates smolt and/or adult salmon as is necessary and sample 40 smolt/day 5 days/week.
Weekly	Crew will collect 240 sockeye adult ASL samples.
Every two weeks	Crew will send in bi-weekly report, timesheets, any smolt/adult scales and electronic data.
Post-season	Crew lead completes a field inventory and end of season report, scale samples aged and reported, escapement data are turned in.

RESPONSIBILITIES

Fisheries Biologist II:	Off-site supervisor responsible for data quality management, logistics, maintaining communication with the field camp, and ensuring the field crew is trained correctly. Supervises project, runs logistics, trains crew, assists in field as necessary.
Fishery Biologist I:	On-site crew lead; trains and performs duties as assigned by FB II. Field crew; assists with enumeration, data collection, and camp chores.
Fish and Wildlife Technician II:	Field crew member; assists with enumeration and data collection, duties assigned by crew lead, and camp chores.
KRAA Intern:	Field crew member; assists with enumeration and data collection, duties assigned by crew lead, and camp chores.

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FIGURES

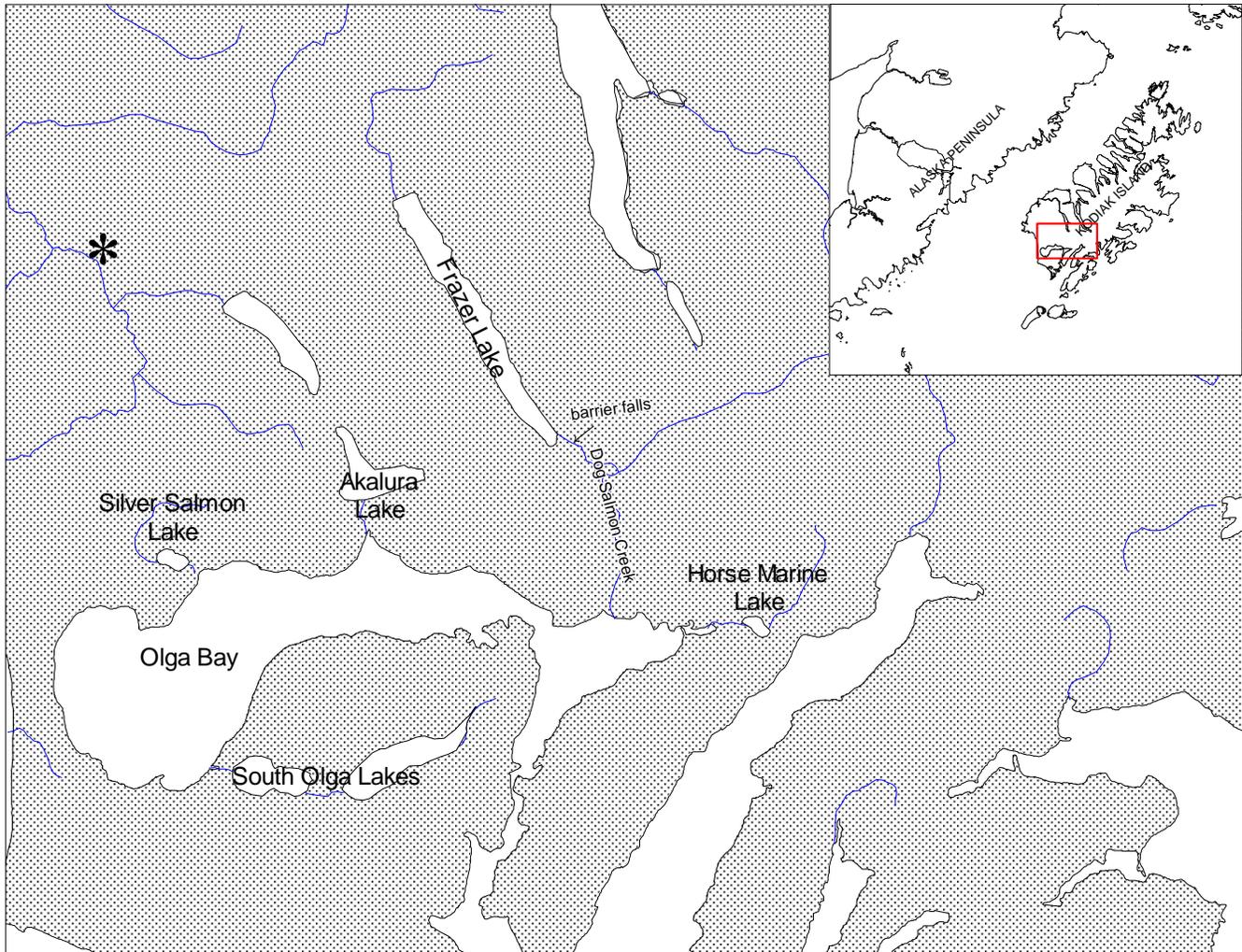


Figure 1.—Location of Frazer Lake on Kodiak Island, Dog Salmon Creek and the Barrier Falls.



Figure 2.—Dog Salmon River smolt trap placement.



Figure 3.—Inclined-plane smolt trap and board walk.



Figure 4.—Canadian Fan (bypass) smolt trap and wings.

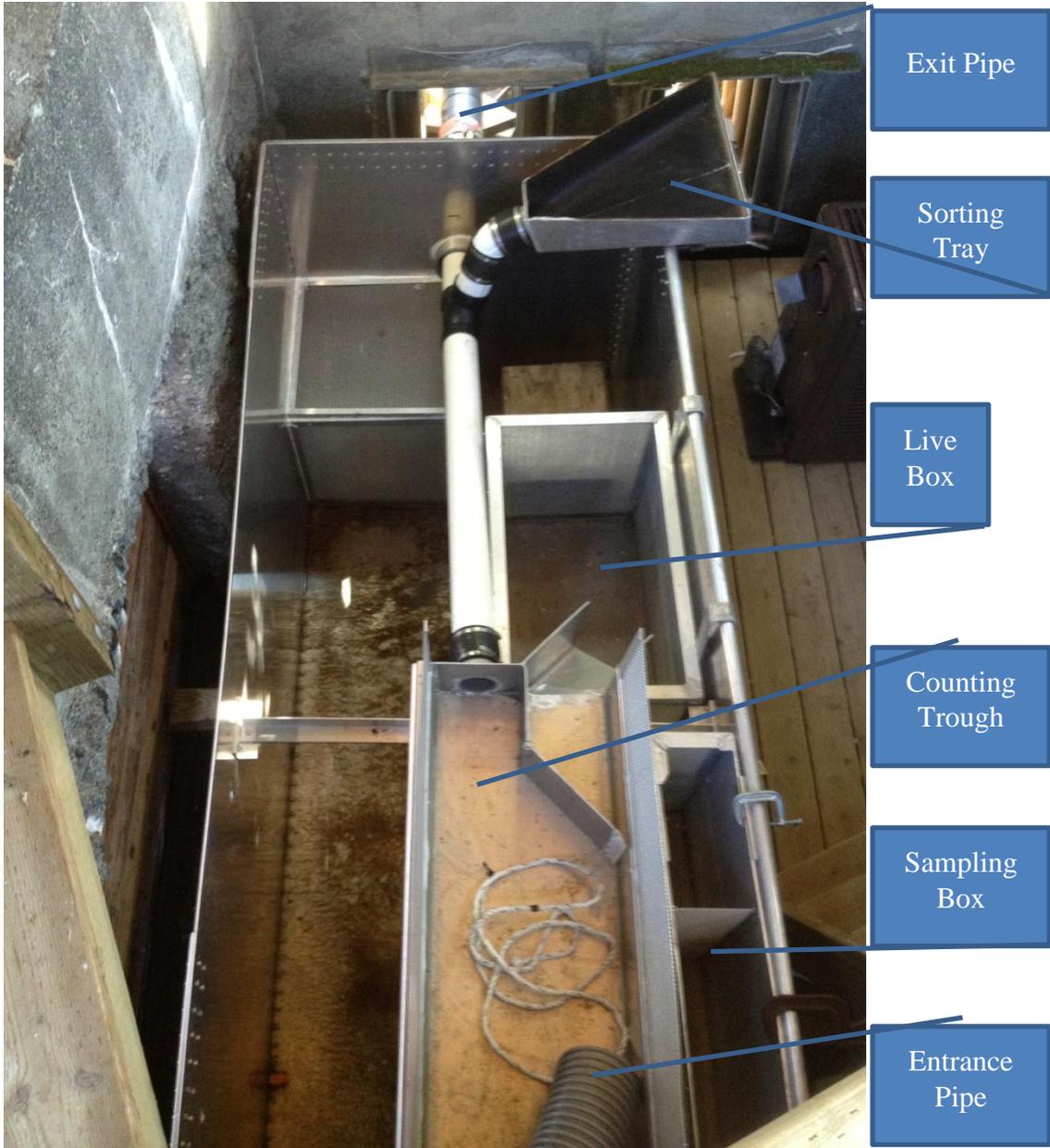


Figure 5.—Smolt shack counting tank assembly with labeled components.



Figure 6.–Smolt pipe connection through the adult counting structure.



Figure 7.—Existing smolt pipe assembly situated in the adult counting structure.



Figure 8.–Flex pipe position entering the smolt shack.



Figure 9.-Smolt counting tank exit.

CATCH-WEIGHT WORKSHEET

Date: _____ Time: _____ to _____ Project Location _____

Basket weight (wet): _____

Basket #	Weight (fish+ basket)	Basket #	Weight (fish + basket)	Basket #	Weight (fish+ basket)	Basket #	Weight (fish+ basket)
1		11		21		31	
2		12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	
TOTAL:		TOTAL:		TOTAL:		TOTAL:	
GRAND TOTAL _____				LESS BASKET WEIGHTS _____ = _____ (a)			

Sample Biomass (Fish plus basket weight)	CATCH	
	Sockeye Smolt	Other
1		
2		
3		
4		
5		
TOTAL:	(c)	(d)

GRAND TOTAL _____	LESS BASKET WEIGHTS _____ = _____	(b)
-------------------	-----------------------------------	-----

ESTIMATED CATCH: _____	; SMOLT (ac/b): _____	; OTHER(ad/b) _____	.
------------------------	-----------------------	---------------------	---

Figure 13.–Catch-weight worksheet.

SMOLT DYE RELEASE FORM

DATE: _____

CREW NAMES: _____

PROJECT LOCATION: _____

NUMBER OF FISH COLLECTED: _____
(from live box)

	COLLECTION LIVE BOX	TRANSPORT CONTAINER	DYE TUB	RECOVERY CONTAINER	STREAM RELEASE
START TIME (military)					
START TEMP (degree celsius)					
END MORTALITY (number of fish)					
OXYGEN SUPPLEMENT O ₂ or aerator					

DYE SOLUTION (mixture): _____ DYE (grams); _____ WATER (gallons)

TOTAL NUMBER OF MORTALITIES (NOT RELEASED OR TESTED): _____

TOTAL NUMBER OF DYED FISH RELEASED: _____

COMMENTS:

MORTALITY TESTING

DELA YED (DYED) MORTALITY

Fish Tested: _____
Total Morts: _____
% Mortality: _____

HOLDING (UNDYED) MORTALITY

Fish Tested: _____
Total Morts: _____
% Mortality: _____

Date	Morts

Date	Morts

Figure 15.—Smolt dye release form.

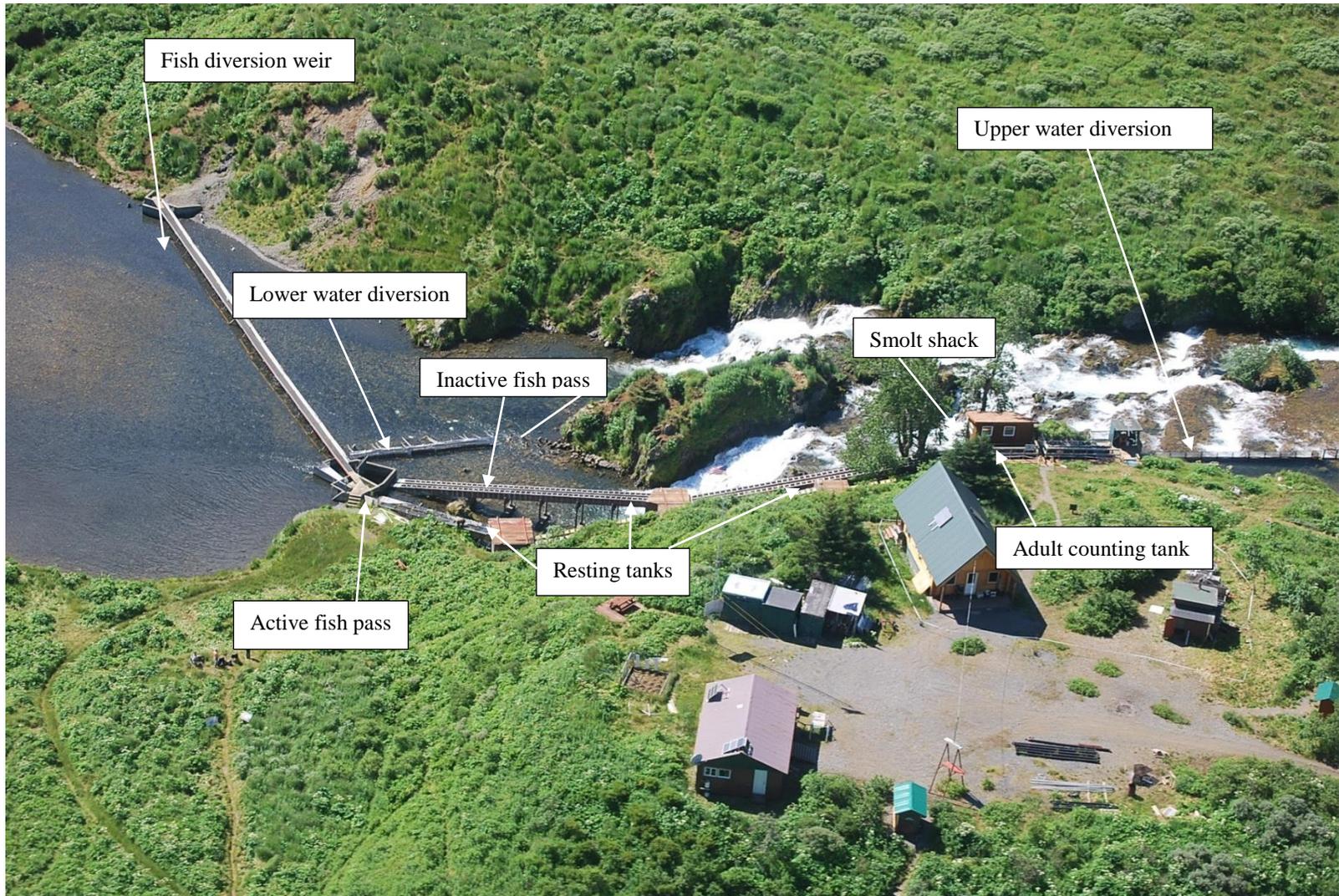


Figure 16.—Frazer fish pass component locations.

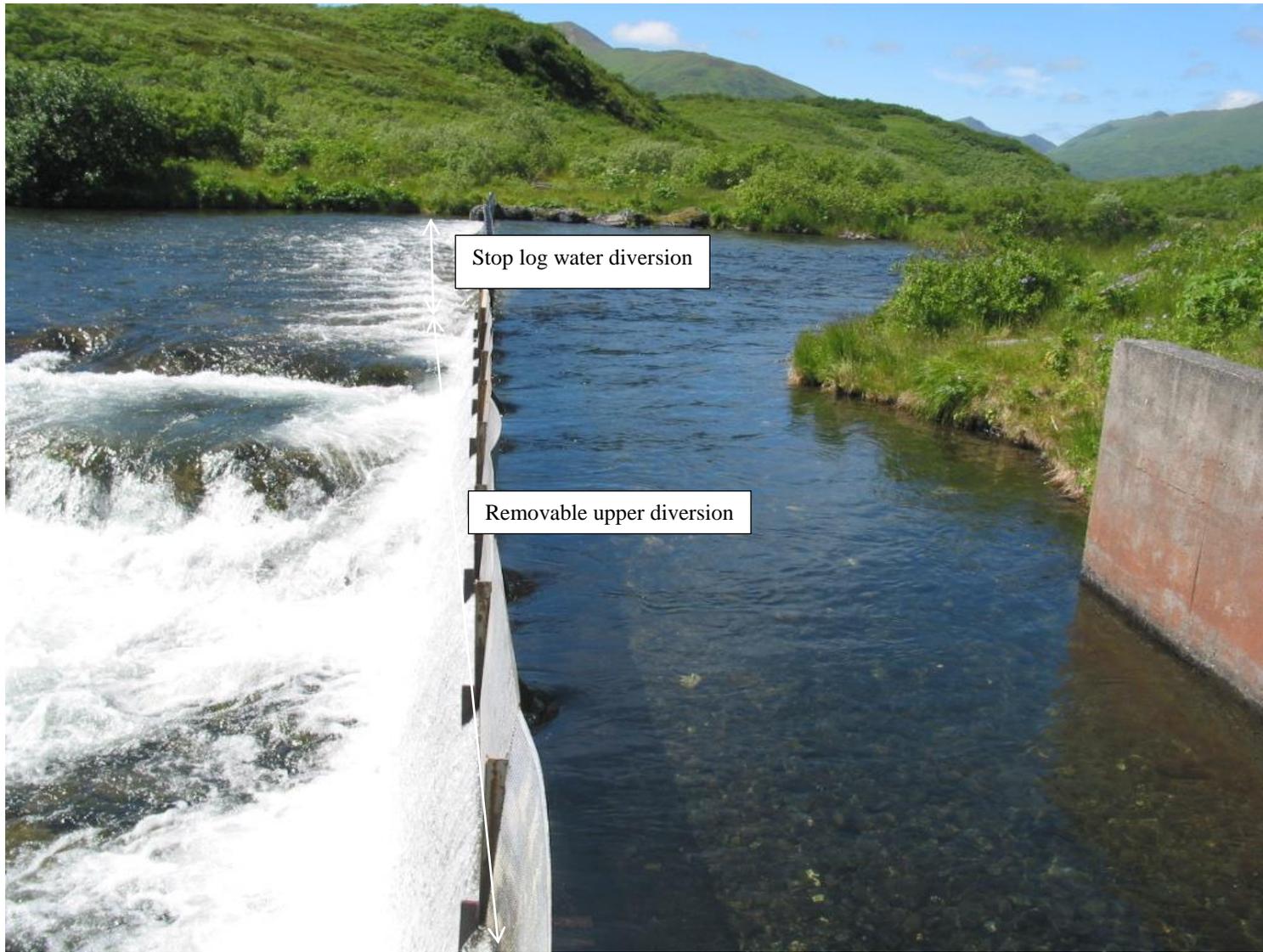


Figure 17.—Frazer fish pass upper diversion components.

**ALASKA DEPARTMENT OF FISH AND GAME KODIAK MANAGEMENT AREA
WEEKLY SALMON WEIR CAMP REPORT FOR YEAR:**

Location:

Personnel:

Weekly Report no:

Daily Total Salmon Escapement							Additional Comments:
Date	Sockeye	Chinook	Pink	Jack #	Jack %	Sampled Reds	
Sun. D							
C							
Mon. D							
C							
Tue. D							
C							
Wed. D							
C							
Thur. D							
C							
Fri. D							
C							
Sat. D							
C							
Total for week							

Note: D represents daily and C represents cumulative.

Figure 18.-Weekly salmon escapement enumeration form.

APPENDIX A. SMOLT SAMPLING

Appendix A2.–Statistical (sampling) weeks and associated calendar dates.

Week	Calendar Dates	Week	Calendar Dates
10	1-Mar – 7-Mar	28	5-Jul – 11-Jul
11	8-Mar – 14-Mar	29	12-Jul – 18-Jul
12	15-Mar – 21-Mar	30	19-Jul – 25-Jul
13	22-Mar – 28-Mar	31	26-Jul – 1-Aug
14	29-Mar – 4-Apr	32	2-Aug – 8-Aug
15	5-Apr – 11-Apr	33	9-Aug – 15-Aug
16	12-Apr – 18-Apr	34	16-Aug – 22-Aug
17	19-Apr – 25-Apr	35	23-Aug – 29-Aug
18	26-Apr – 2-May	36	30-Aug – 5-Sep
19	3-May – 9-May	37	6-Sep – 12-Sep
20	10-May – 16-May	38	13-Sep – 19-Sep
21	17-May – 23-May	39	20-Sep – 26-Sep
22	24-May – 30-May	40	27-Sep – 3-Oct
23	31-May – 6-Jun	41	4-Oct – 10-Oct
24	7-Jun – 13-Jun	42	11-Oct – 17-Oct
25	14-Jun – 20-Jun	43	18-Oct – 24-Oct
26	21-Jun – 27-Jun	44	25-Oct – 31-Oct
27	28-Jun – 4-Jul	45	1-Nov – 7-Nov

Sampling Procedures

Label Slides

The left portion of each slide should be labeled prior to sampling using a fine point permanent marker with the slide number, species, area sampled, date, and fish numbers of the sample (Figure 1).

Slide number

Write the number of the slide.

Species

Write out completely (e.g., Sockeye).

Area sampled

Write the area where the fish were collected.

Sampling date

The sampling day is the 24-hour period from noon of the first day to noon the following day, and is identified by the calendar date corresponding to noon on the first day.

Fish numbers

Fish should be sequentially numbered, beginning with 1 each sampling event. By starting with 1 each sampling event, it is possible to track how many fish have been sampled. Five fish are placed on each slide.

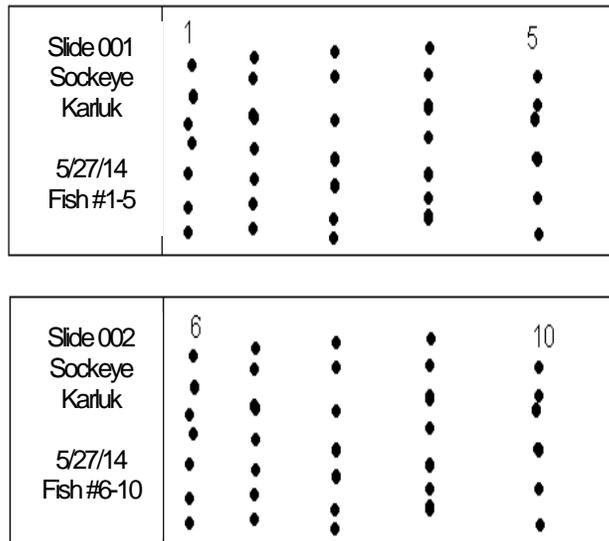


Figure 1.–Properly labeled smolt slide.

Sample ASAP

Sample smolt as soon as possible after they are captured.

Mix anesthetizing solution

Wearing latex gloves to prevent direct exposure to the anesthetic, dissolve a small amount (approximately of 1 g) of Tricane Methanesulfate (MS-222) and baking soda in about 2 L of cold water in a dish pan. The amount of anesthetic needed will vary depending on the water temperature, freshness of the chemical, and size of the smolt.

Set up recovery bucket

Set up an additional bucket of water to be used as a recovery bucket. This bucket should be filled with fresh water, aerated, and covered to avoid stress on the fish.

Transport smolt to sampling area

Transport smolt, using clean 5-gallon buckets, to the sampling area. Buckets containing smolt should be filled with fresh water, aerated, and covered to avoid stress on the fish. Fish can be placed into the bucket using a dip net, or by dipping the bucket into the live box.

Anesthetize smolt a few at a time

Place a few smolt in the anesthetic solution until they become subdued to a point where they can no longer flex their axial musculature but can still ventilate their gills. The concentration of the solution should be such that it immobilizes the fish in 2–3 minutes.

Lightly dry preferred area

After the fish are anesthetized, carefully remove a fish from the dish pan and gently pat dry with a paper towel.

Sample smolt

Place the fish on its right side to sample the left side. Quickly and carefully take length and weight measurements, and remove 5–10 scales from the preferred area of the smolt using a scalpel (Figure 2). On salmon species, the preferred scale is located where a straight line between the posterior insertion of the dorsal fin and the anterior insertion of the anal fin crosses the second scale row dorsal to the lateral line. If scales are not present in this area then scales should be taken from the secondary location, which is the same area on the right side of the fish.

-continued-

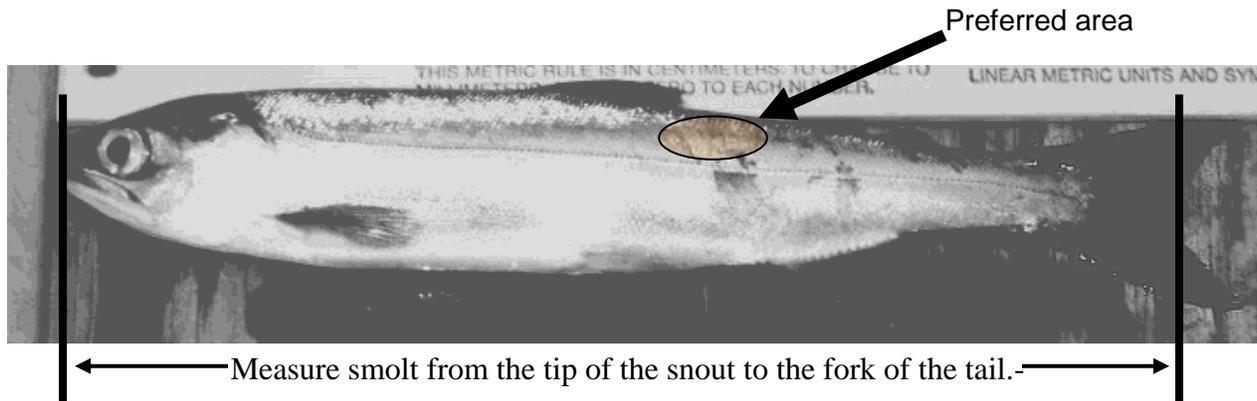


Figure 2.–Smolt with proper length measurement and preferred area highlighted.

Move smolt to recovery bucket

Transfer sampled smolt from the sampling station to the recovery bucket. It is important to sample as quickly as possible and immediately place smolt into the recovery bucket to prevent mortality.

Align scales on slide

Using the dissecting probe, line up and spread out the scales on the slide under the correct fish number (Figure 1).

Clean sampling supplies

Wipe off the scalpel and dissecting probe to remove scales and slime before another smolt is sampled.

Continue sampling

Continue sampling smolt until sampling goals are met, or all available smolt have been sampled. Depending on how long it takes to complete the sample, the water in all buckets (holding, recovery, and anesthetizing) may need to be refreshed.

Release smolt

Once the sampled fish have recovered and are swimming normally in the recovery bucket, they should be released downstream of the trapping location.

-continued-

Data Entry/Management

Data obtained while sampling, is recorded using a Meazure Rugged Digital Assistant (RDA). The RDA is a waterproof device used to digitally record sampling data. Sample information is transferred from the device to a netbook after each sample. A USB flash drive is used to save and transfer data from the netbooks located in field camps, to the office, throughout the season. An RDA is shown in Figure 3.

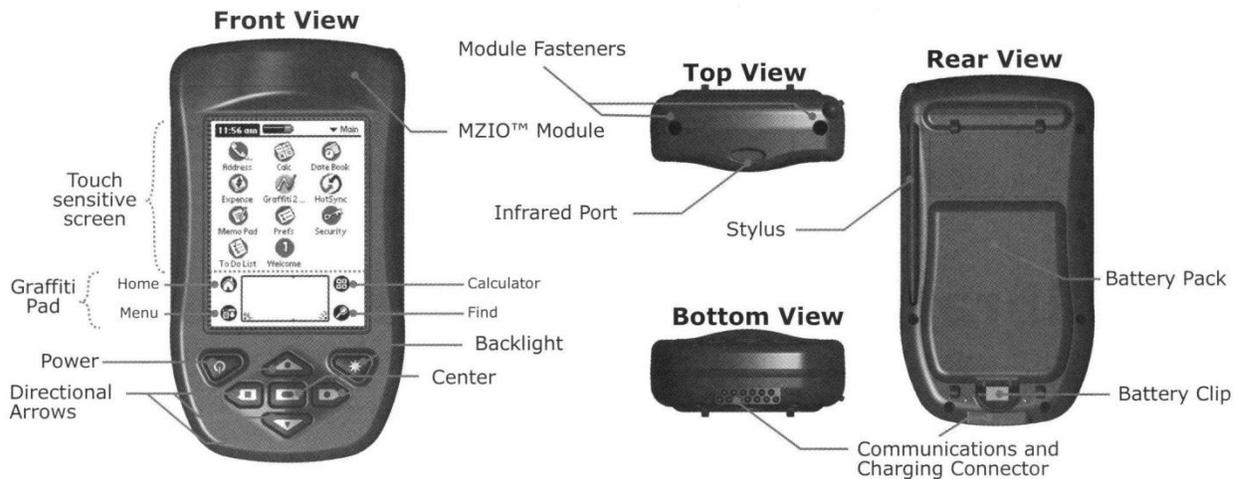


Figure 3.–Rugged Digital Assistant (RDA).

Entering Data Into The RDA

To begin using the RDA, turn it on by pressing the power button (Table 1). Using the stylus, tap the home icon in the bottom portion of the screen to bring up the main menu. It may be necessary to press the home icon several times to bring up the entire main menu. Next, tap the Forms 5.1 icon. Pendragon Forms (Forms 5.1) is the program that you will use to enter all of the sample data. After the icon is selected, the Pendragon Forms screen will appear. If a form was left open by a previous user, it may be necessary to hit the Quit or Done button to get to the main list of forms. Highlight the appropriate sampling form (Smolt_2014.XX) and select New, which is found in the lower left corner of the screen. The four main buttons of the form will now be visible: Enter Background Info, Sample Next Fish, Review, and Quit.

-continued-

Image	Description
	Power Button - Button you will press on the RDA itself
	Home Icon - Use the stylus to navigate to the home screens
 Forms 5.1	Forms 5.1 Icon - Use the stylus to open pendragon forms 5.1
	This is an example of a button within pendragon forms. Use the stylus to select these buttons.

Table 1.–Buttons and icons addressed in the text.

Enter Background Info

Background information must be entered at the start of each sampling event. A new day always constitutes a new sampling event, so it will be necessary to enter new background information typically once per sampling day. It is important to edit background information when any change in sampling information occurs. The following topics constitute sampling information. If information in one of the following categories changes, it is necessary to change the background information.

Species

Select the appropriate species from the drop down list on the RDA.

Management Area

Choose the relevant management area from the dropdown list. Samples collected from Kodiak Island statistical areas must have Kodiak selected as the proper management area.

Area Sampled

Select the area that best represents where the fish were sampled, such as Ayakulik River, from the dropdown list.

Location ID (N/A for some areas)

Enter the site where the fish being sampled are from. For Karluk Lake sockeye salmon smolt sampling, Site 1 is the outlet site and Site 2 is further downstream.

Location Type

Indicate the type of area in which the fish were captured.

-continued-

Gear Type

Select the type of gear in which the smolt were caught.

Date of Sample

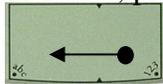
For smolt, the sampling day is the 24-hour period from noon of the first day to noon the following day, and is identified by the calendar date corresponding to noon on the first day.

Sampler Initials

Enter the initials of the sampling crew (up to 3 persons). This can be done by writing in the box on the bottom of the screen, or by using the pop up keyboard.

Notes

1. When entering text, tap on the dot by the abc icon to bring up a keyboard. 
2. To delete a character, place the stylus in the text box and draw a small straight line from right to left.



Sample Next Fish:

After entering background information, the RDA is ready to collect individual fish data. The Sample Next Fish button is used to enter the details of each fish sampled. It is not necessary to click on the Sample Next Fish button when entering the first fish of a new sample. After entering the background information, the form automatically knows to go to the sample next fish section of the form. As you continue to sample, simply tap Sample Next Fish or Next to enter individual fish data. This option is used when continuing to the next fish of a sample where no background information has changed. Fish data that is entered here is associated with the current background information logged. The following constitute fish data and should be entered for each fish.

Scale Slide (Card) Number

Slides are numbered sequentially by date throughout the season starting with 1. A separate numbering sequence will be used for each species or major location change. Consult your crew leader for the current slide number. It is crucial to make sure the number written on the slide matches the slide (card) number entered into the RDA. The slide number will automatically advance to next number after five fish have been sampled.

Fish Number

The fish number is a sequential numbering system that begins with the number 1 for each sampling event. This allows samplers to keep track of the number of fish sampled each day (or since the background was changed). By default, the fish number in the RDA will automatically advance after each fish is sampled.

Length in mm

Enter the length of the smolt from tip of snout to tail fork in millimeters (i.e., 108). If for some reason you do not collect a length measurement, enter 999.

Fin Clip and Genetics

Select the Skip Fin Clip and Genetics button if appropriate. If sampling involves fin clips or genetics you can enter the optional fin clip and genetics information.

Sample Next Fish

Select Sample Next Fish to continue sampling.

Review/Edit

The review button can be a very useful tool during sampling. It can be used to ensure data being entered is accurate, or it can be used for editing fish data during a sample. The review portion of the form displays slide number, fish number, length, and weight. The most recently sampled fish appear first. To enter the review screen, tap on the Review button on the main screen of the form. After the data has been reviewed and edited, tap the Done button on the bottom right of the screen to return to the main screen of the form. If Sample Next Fish is selected after leaving the review screen, the auto-increment will continue as if the review screen was never entered.

Reviewing Data

To review the last data entered, tap the Review button on the main screen of the form. Use the scroll bar on the right side of the screen to look at the fish that have been entered.

Editing Data

If fish data needs to be edited, tap on it using the stylus. Tap on the Sample Next Fish button to go through the fish data that was previously entered for that fish. Changes can be made as needed. Buttons chosen prior to the review are highlighted with asterisks. After a fish has been edited, the main review screen appears. If a fish is accidentally selected from the main review screen, click the button that has the slide#-fish# to return to the main review screen without going through the fish data. As mentioned above, tap Done to exit the review portion of the form and return to the main screen.

Quit

When sampling is complete, tap Quit to exit the form.

Data Management

After sampling is done for the day, the data must be backed up on the RDA itself and then transferred (by HotSync) to the netbook.

Backing up data

After each sample the RDA should be backed up so that data is stored on both of the compact flash drives. Turn the RDA on, and tap the home icon in the bottom portion of the screen to bring up the main menu. Tap the CardBkup icon if it is present, and then the Backup Now button at the top left of the screen. The data will now be on both flash drives. If the RDA does not have a CardBkup icon, it will back up automatically.

Downloading Data to Netbook

Connect the communications cable into the RDA and a USB port on the netbook. Press the power button to turn on the RDA and begin a HotSync by tapping the home icon, and then the HotSync icon found on the main menu. Tapping the large icon in the center of the screen will start the HotSync operation (Figure 4). Please make sure the RDA is dry before downloading any data to the netbook.

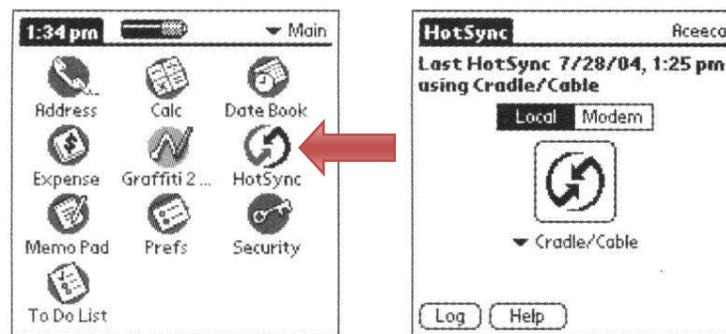


Figure 4.–HotSync Screens Found on RDA.

Editing, Naming, and Saving Data

If a mistake is realized during a sample it is often easiest to document the mistake and send the correction in with the USB flash drive for the Kodiak office to fix. If a mistake is made during the sample it can be changed using the review portion of the form in the RDA. Data can also be changed after it is downloaded onto the netbook, but is not recommended unless the Kodiak office is consulted first. A HotSync operation after changes have been made on the netbook will update the RDA.

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To view data, HotSync the RDA and open Pendragon Forms Manager (a shortcut should be located to the right of the start menu) on the netbook. Select the form (Smolt_2014.XX), and click Edit/View under Data Functions on the right side of the window. All data will now be visible. Simply make the necessary minor changes here and exit out of the window to save. It is important to change the correct the numbers under the proper column which is where it is best to consult the Kodiak office. Hotsync the RDA to the netbook after any changes are made on the netbook to update the RDA with all changes.

After data has been edited and verified, a copy of the database will need to be exported from the Pendragon software and saved on the netbook. In Pendragon Forms Manager under Data Functions on the right side of the window, click To ASCII. Navigate to the folder in which the data is being saved. Type in the file name and then save. The file name should follow this format: Area_Sampled_Smolt_YYYYMMDD.csv (e.g., Afognak_River_Smolt20140614.csv). After saving, a window will pop up stating the file has been created. Each .csv file will contain all of the data that has been collected up to that point in the season. Do not edit or save the .csv file as an excel file or it will be difficult or impossible to upload the data into the database.

Transferring Data from Netbook onto USB Flash Drive

Up to date data should be sent into the main office as often as possible (e.g., with the grocery plane). Insert a USB flash drive into an appropriate port on the netbook. Double click on MyComputer, which is found on the desktop of the netbook. Navigate to the folder where your data is saved and highlight the most recent file (determined by the date) by single clicking. With the file highlighted, click on edit at the top of the window and then copy. Open up MyComputer and double click on the USB flash drive (often called “Removable Disk”) found under the heading “Devices with Removable Storage.” Click on edit at the top of the window, and then paste. The .csv file that was copied earlier will appear in the window indicating it was copied to the flash drive. Exit out of all windows and single click on the safely remove hardware button on the bottom right corner of the desktop in the quick start menu. Click on “Safely remove USB Mass Storage Device.” A pop-up will verify that it is now safe to remove the flash drive from the system.

Powering the Netbook and RDA

1. The RDA can be charged with either the AC or DC powering options. It is the crew leaders responsibility to keep it charged
2. The netbook can only be charged with the AC power adaptor, therefore plan accordingly for generator use. The charging light on the netbook is red when charging, and green when fully charged.
3. If there are powering problems, please contact the office immediately.

Some Notes and Reminders

1. Connect the AC adaptor to the bottom of the communications cable to charge the RDA batteries. If using the DC charger, connect the charger into the communications port.
2. If a mistake is noticed before moving onto the next fish, the previous button can be used to make changes in the RDA without having to go to the review screen or alter the data on the netbook.
3. Each length, weight, and scale must correspond to a single fish! It is the responsibility of the crew leader to be sure the data has been entered correctly.
4. Never put data from different dates onto one slide, and always enter new background information. Even if only one fish is sampled that day, enter new background information and begin with a new slide the next day.
5. Responsibility for accuracy lies first with the primary data collector(s) and finally with the crew leader. Sloppy or incomplete data or slides will be returned to individual collectors for correction.
6. Ensure that all equipment is well kept. Electronics should be stored in a clean safe place. The RDA must be completely dry before transferring data to the netbook. RDA batteries must be charged to make certain sampling is not hampered. It is the responsibility of the crew leader to make sure that all data is carefully examined and before returning it to their supervisor.

Troubleshooting

Resetting the RDA

If problems are encountered with the RDA, a soft reset can be done without losing data. To perform a soft reset hold the power and backlight button down together, and release at the same time. If a soft reset does not work, the office should be contacted about other options for resetting.



Press and release Power and Backlight button together

Hotsync Error Message

HotSync message "Exceeded user storage space limit of 500KB in form 'Smolt_2014.XX'

1. Open Pendragon Forms Manager
2. Under Form Function click on "Properties"
3. Click on "Advanced Properties"
4. Click on the "Synchronization Tab"
5. Change the Storage Limit (KB) to 5000 instead of 500.
6. Click "OK"
7. Under Form Functions Click on "Distribute"

APPENDIX B. SATELLITE TELEPHONE AND DISPATCH INSTRUCTIONS

The following information serves as a Policy Statement regarding the allowable uses of ADF&G satellite phones and Instructions on the proper method to successfully set up and operate the satellite phone system assigned to your camp.

These systems are not like standard telephones or cell phones, nor are they like a single side band or VHF radio. Communication is sent through the transmitter to low level satellites, then is beamed down to ground stations, either directly to another satellite phone system or to a switching station linked to standard telephone lines. As such, there is a much higher cost involved in operation than with standard telephone long distance or cell phone charges.

Under no circumstances may you use this satellite phone system for personal calls, unless a family or personal emergency exists. This does not mean that field crew leaders may grant permission for personal use of this phone. Only the project biologist may give you such permission. ANY DELIBERATE MISUSE OF THIS SYSTEM, SUCH AS MAKING UNAPPROVED, NON-EMERGENCY, OR PERSONAL CALLS, WILL RESULT IN DISCIPLINARY ACTION, WHICH MAY INCLUDE SUSPENSION OR DISCHARGE.

The primary purpose for having this satellite phone is for secure, reliable communications between remote field stations and ADF&G offices (Kodiak, Chignik, Cold Bay, Sand Point, or Port Moller), ADF&G research vessels (Resolution or K-Hi-C), Fish and Wildlife Protection vessels and offices, or other field camps that are similarly equipped. The secondary purpose is for your SAFETY. With these phones you are capable of directly dialing emergency services at any time of the day or night. It is essential that these phone systems are maintained in good working order, are fully charged or hooked to sufficient power at all times, and remain free for official or emergency use.

INSTRUCTIONS

The portable sat phone unit must be charged with power. There is an internal battery pack, and a 12-volt adapter is available in order to hook the phone to a larger battery bank, that may in turn be recharged by generator or solar panels.

Turn the unit on using the power switch in the lower left corner. A green light, just above the switch, should come on indicating that the unit is sufficiently powered. If no light or a red light comes on, you will need to charge the unit, or attach it to your 12-volt battery bank via the appropriate connections.

The back, or top, of the briefcase-like unit is the antenna, and it must be oriented correctly in order to access the receiving satellite. The top of the case should be open and pointed in a general east-southeast direction. You must have a fairly clear line-of sight to the horizon in that direction; this unit will NOT work through walls or mountains. The angle of the antenna should be almost vertical; remember to lock the support arm that attaches the lid to the main body of the unit, along the right side.

This system has two means for calling; a telephone-like handset (for dial in or dial out phone calls), and a push-to-talk microphone (for ‘dispatch’, unit to unit, calls). All calls made with the handset are billed per minute of use, at an expensive rate. All calls on the ‘AlaskaNet’ dispatch system, using the microphone, are essentially FREE.

When first turned on, the handset and microphone should become active, with the display panels on the top of the phone handset and microphone lighting up (one LED panel, hopefully the one on the handset, should read SLEEP). The display will show, after a few moments, whether a connection has been established with the satellite, and how strong the signal is (ex. *B05 S 21*). Turn the unit slightly, and raise or lower the lid/antenna slightly until the highest possible signal strength is indicated (normally above 20 but will work down to 8). Lock the lid/antenna in place and do not turn the unit again, until your communications are finished. Once a strong signal is acquired push the “*” button for 2 seconds. Wait until there is a “beep” and the LCD screen displays ‘00:DN ??’, then dial the number.

Alaska Dispatch System

Because all calls made on the dispatch system are FREE, this is the method of choice for using the satellite phone units. There are several ADF&G offices, many field camps, and two research vessels on the AlaskaNet dispatch system, as well as Fish and Wildlife Protection/State Troopers offices and vessels, plus many canneries, fishing vessels, and tenders. You should have received a 10-12 page directory with your phone.

First, make sure the unit is turned on, and that there is sufficient power. Set the unit up so that the signal strength is at the maximum for your location. You should see the signal strength on the microphone display (ex. *B05 S 21*), and the handset display should read SLEEP. Once a strong signal is acquired push the “*” button for 2 seconds. Wait until there is a “beep”.

On the microphone display, below the signal strength, there should be a query, ‘00:DN ??’. This is asking you to ‘dial’ in the 4-digit dispatch number that you wish to call. After you have entered the 4-digit dispatch number of the unit you wish to contact, hold in the microphone key and a connection will be made with the satellite, which will then try to connect with the dispatch number you punched in. IF a connection is made you will hear two beeps (“bird chirps”) and the microphone display will read SELF. While continuing to hold in the microphone key, call the station you wish to talk to. USE ALL THE SAME FORMALITIES AS WHEN CALLING ON A SSB RADIO. For example, say “Calling the ADF&G Kodiak Office, Calling the ADF&G Kodiak Office; this is Karluk Weir”. When you release the microphone key, the unit will beep again.

BE PATIENT. It will take some time for the signal to go up to the satellite, down to the number you called. It may take the other party some time to get to the microphone and respond (this is especially true for calls to the ADF&G office; supervisors have to walk down to the radio room to respond). When they respond, their 4-digit dispatch number (DN) will show on the microphone display. This is a private conversation, unlike the previous dispatch service.

Remember to be patient; wait until the other party stops speaking and you hear the unit beep (indicating that they are finished with this portion of their communication), the display should read SELF, and you may key microphone to talk. Then you must again wait for the other party to respond. If the other party is not there, they simply will not answer. If the satellite connection cannot be made, the display will read ‘Unable to Connect’ or ‘Not Available’.

Phone System

DO NOT USE THE HANDSET TO PLACE CALLS UNLESS ABSOLUTELY NECESSARY. All calls made with the handset are billed per minute of use, at an expensive rate. Calls should only be made to supervisors, either when radio or dispatch contact is not possible or when a confidential message needs to be relayed. Calls are made by dialing out, almost like a standard telephone. Punch in the area code and telephone number, then PRESS SEND (button located in the upper right corner of the handset). Because there is a satellite relay, there will be a slight delay between when you speak and when the other party hears you, so be patient.

Note EVERY call in a phone logbook. The system will show you the amount of time you’ve used on the call, on the LED panel. Note the number called, the date, approximate time, and the length of the call (minutes and seconds). When the call is completed, you MUST push the END button (top right corner of handset buttons), otherwise the system will remain active and YOU will be billed for the time (at almost a dollar a minute). Remember, PRESS END.

If someone calls in to this unit, it will ring, like a standard telephone. Press the SEND button to start the conversation, but remember to PRESS END to finish the call. ADF&G is billed for all calls made using the handset, both the calls you dial out and any calls dialed in.

IN CASE OF EMERGENCY:

If there is a medical emergency, or a real danger to life or health, IMMEDIATELY call the US Coast Guard Rescue Coordination Center at 800-478-5555. Be ready to tell them your name, exact location (latitude and longitude or nearby major landmark), and the exact nature of your emergency. They may question you extensively, so be prepared. There are emergency doctors on-call that can advise you. After the call is completed, immediately call your supervisor, at work or at home, and relay the details of your experience.

If there is an enforcement emergency, use the dispatch microphone to call the Kodiak office or the Alaska State Trooper, Fish and Wildlife Protection (DN 6370).

APPENDIX C. WEEKLY REPORT EXAMPLE

Frazer Lake Biweekly Report

Activity Report for August 10th – August 25th, 2013.

Adult Sockeye Counts and Sampling

Frazer Lake Escapement

The Frazer fish pass was closed for the 2013 season on August 17th. The cumulative sockeye salmon escapement for the 2013 season is 136,059 (Figure 1). A total of 21,932 jacks have been passed for the 2013 season, representing a jack percentage of 16.12%. The 2013 pink escapement for Frazer Lake is 19, Chinook is 42, and steelhead is one. A total of 446 Dolly Varden have been passed through the weir for the 2013 season. Cumulative escapement of observed net marked salmon is 5,470; representing a percentage of 4.02% of the total 2013 season run.

Dog Salmon Escapement

The Dog Salmon weir was closed for the 2013 season on August 16th. The 2013 sockeye escapement for the Dog Salmon Weir is 129,369. The end cumulative sockeye escapement for Frazer is 136,059, representing a difference of 6,690 between the Dog Salmon weir and the Frazer weir (Figure 1).

Adult Sockeye Sampling

A total of 2,080 sockeye salmon have been sampled for the 2013 season. A weekly total of 240 sockeye were sampled for adult sampling stratum 34 (August 9th – August 15th). Jack percentage of sampled sockeye is 6.11%. Percentage of males in the cumulative sample is 39.95% and females are 60.05% (Figure 3).

Weather

The Frazer Fish pass was closed for the 2013 season on August 17th. Water temperatures and stream height measurements were suspended with the closure of the fish pass.

Stream water levels had remained relatively stable as changes in the fish pass water height have required periodic adjustments to the stream water level. Stream water levels have steadily decreased from a high of 33.5 cm on August 12th to a low of 31.5 cm on August 15th. Rising water height within the fish pass has required the removal of 12 wood blocks from the upper water diversion wall. During operation, the fish pass water level was 1.78 feet. The average water level height for the 2013 season is 35.71cm. Water temperature has fluctuated with variable cloud cover from a high of 14.0 °C on August 11th to a low of 10.5 °C on August 14th. Average water temperature for the 2013 season is 8.84°C.

Miscellaneous

Cabin and camp compound area

A variety of camp projects have been accomplished from August 10th to August 25th. Additional gravel has been added to the trail. New shelves were installed within the cabin living room and bedrooms. Nails and screws were removed from the burn pits within the compound. Cut alder wood was moved into the bonya to season over winter. The propane refrigerator within the garage was tested and appears to be in working order. The clothes line was removed and stored within the garage. The wood pile was consolidated and covered with plastic and tarps for the winter season.

Smolt trap

The smolt by-pass system was installed on August 16th to test the water flow and trap location. Ninety percent of the smolt trap wings were installed and tested with a stream height of 32.0 cm. Once the smolt pipes were connected to the trap it was discovered that the pipes retained air from installation. Small holes were drilled into the pipes to allow purging of the trapped air. Water flow into the smolt holding tank was excellent, and water flow down the exit pipe was good. A–frames for the smolt wings were made and stored near the smolt trap above the second island from the falls. Two large A–frames to regulate water flow into the trap were constructed and stored near the smolt pipes. Perforated plates for the wings were stored near the wing A–frames above the second island. Smolt pipes were staged in small groups along the bank of the river for installation in May. All smolt pipe bolts and rubber gaskets were stored in the garage.

Smolt shack and holding tank

The drain cage was riveted in place and caulking was added to seal any rough edges. Two support hooks were bolted onto the smolt collection cage and secured into place below the sorting table. The sorting table was moved forward in the holding tank. The back support beam of the sorting table was removed and the front support beam was moved forward. The sampling storage cage was shortened and secured into place to the left of the sorting table. Sharp edges of the storage cage were caulked and sealed. The exit pipe of the drain duct of the smolt tank was shortened. Edges and cracks of the drain system was caulked and sealed. The smolt release tray was realigned to a proper angle and secured with rubber conduits. The inside of the release tray pipes were caulked to allow for smoother water flow. A new door and the two back windows were installed within the smolt shack. Railing along the top and left side of the stairs was constructed

Construction

The Fish and Game outhouse roof was trimmed and new roofing tiles were installed. The railing around the adult holding tank was reinforced. The keep off fish pass sign was reinstalled on the railing for the winter. The boardwalk in front of the holding tank was adjusted and secured to fit the new railing. The old boat shed was razed and a new boat shed was constructed.

Anticipated Projects for the 2014 season

Mechanical

The old Kubota tractor was not operational for the remainder of the 2013 season. After examination, it appears to be a problem with the solenoid. It is recommended that the solenoid be replaced for the 2014 season. The four-wheeler also exhibited difficulty with starting, but the pull starter works fine. It is most likely a problem with the four-wheeler battery and should be replaced for the 2014 season. It was discovered that the Frazer air compressor is unable to run under the power of the small Honda generator. It is recommended that the larger Honda generator be used for the Frazer air compressor.

Construction

A door and entrance ramp will be constructed for the new boat shed. The roof of the boat shed will be finished and roofing tiles will be added. All of the cabin window and door covers will receive an additional coat of stain or paint. Additional cabinets and shelves will be added to the smolt sampling shack. The oil drip stove will be installed within the smolt shack. A section of flex pipe will be added to the end of the smolt by-pass system to decrease water velocity exiting from the pipe system. Additional shelves and cabinets will be made for the garage living space. The cabin will receive an additional coat of stain for the 2014 season. Support boards will be added to the perforated plate of the smolt wings. Screws and washers for the support boards are stored in the garage below the weather camera control box.

Miscellaneous

Additional gravel will be added to the lake trail and large rocks will be removed. Trail maintenance will be continued throughout the 2014 season. The old refuge outhouse will be moved from the Fish and Game compound. The large hole near the fish pass upper water diversion wall will be filled in with large rocks over the 2014 season. During construction of the smolt by-pass system, it was noticed that a lot of biological film built up on pipe fitting connecting the smolt pipes from the adult holding tank to the smolt trap. It is recommended that a wire brush be used to clean the fitting before installation.

APPENDIX D. TIMESHEET INSTRUCTIONS

All ADF&G employees must fill out a time sheet biweekly, and these timesheets must be turned in to the Administrative staff in Kodiak in a timely manner. Please follow these instructions when filling out your time sheets to avoid payroll problems. When a flight comes out to drop off groceries, or for any other reason, near the end of a pay period, camp personnel need to send in their timesheets. Fill in the time sheet up to the day you send them in and attempt to project your remaining hours worked.

EVE TIMESHEET INSTRUCTIONS

**PLEASE MAKE SURE THE FOLLOWING ITEMS ARE CORRECTLY FILLED OUT ON THE
TIMESHEET.**

1. Pay Period End Date
2. Employee ID Number (NOT Social Security Number)
3. Name
4. Division
5. Enter time as actual hours worked
6. Ensure time calculated equals time worked (Work Hours Total = Daily Start/Stop Times)
7. No less than 37.5 hours need to be met weekly starting Monday and ending Sunday
8. Enter the Appropriate hours for sea duty, standby, or hazard
9. **If working past midnight—write 23:59** on the day worked and **on the next day—write 00:01**. (Ex: On the 24th you worked until 01:30 AM, you would put 23:59 as your stop time on the 24th and your start time as 00:001 on the 25th).
10. Clock out for lunch and back in when you return.
11. Supervisors make sure all leave is entered—be it personal, annual, sick, holiday, flex, etc.
12. Enter the total hours worked **IN EACH COLUMN** for each individual code—1,2,3, or 4
13. **Supervisors make sure the pay code is correct for the time charged** and in the “Charge To” box (left center) before you sign.
14. In the “Comments” section—please list the following if applicable:
 - a. Departure and return time via boat, EX: 10:00 am dep. Port via F/V Hasta La Pasta, 3:00 am arr. Port.
 - b. Departure and return time of low level aerial survey (for each flight if more than one), and type of plane being used (180, 260, Beaver).
 - c. Hazard pay for aerial surveys is in **4-hr increments** at the time the survey begins—**NOT**—4 hours hazard pay for each survey.
 - d. Explain the reason for hazard pay for each day—**no one hired after July 1, 1996 gets hazard duty pay unless working under the 4-hour increment rule qualifier:**
 - i. DIVING
 - ii. NON-PILOT AERIAL
 - iii. TRANSPORTATION BY HELICOPTOR OR WORKING ON/UNDER IT

- iv. WORK FROM 25 FT TOWER
 - e. Explain whether you worked or did not work on holidays
 - f. Explain Standby pay (Ex: 1000-1500 standby for boat gate). Must be on standby roster prior to claiming standby pay. **Standby hours cannot be the same as hours worked. The only hours not documented as 15-min increments are 2359/0001. Hours can start/stop on the same hour as shift time (Ex: Start/stop for work—0800-1200, standby hours can be 1200-2359, or 0001-0800).**
 - g. SU Employees—Floating Holiday forms must be faxed in for approval prior to the holiday worked. If at sea, premium pay is more pay than floating the holiday.
 - h. SU Employees—FlexTime agreements must be submitted for approval **prior** to working the hours.
 - i. If using **Comp in Lieu of OT**—write in LARGE LETTERS at the bottom of EACH TIMESHEET it applies to: “COMP IN LIEU OF OT.”
 - j. Explain any other variances from the normal in this area for each day.
 - k. If Flexing the last work week of the pay period, write “Flexing Work Week” on the **last day of the pay period.**
15. Premium Pay—if premium pay is to be charged to a **DIFFERENT** pay code than regular hours worked—log the hours and codes at the bottom right section in **“OVERRIDES.”**
16. Make sure both the employee and supervisor have signed and dated the timesheet. IF the employee is in the field the supervisor may sign for the employee and write “For John Doe.” Fax or scan and e-mail the timesheet WITH signatures as soon as possible. If the hours are different, please write **“Amended”** on it.
17. **MOST IMPORTANTLY—PLEASE WRITE LEGIBLY.** The faxed copies are very hard to decipher—the neater they are written the less time spent on the phone or e-mail confirming hours.
18. **PLEASE DO NOT USE** pencils, pink or red pens (they do not show up well when faxed or scanned).

****EVEN IF WORK IS STARTED IN THE MIDDLE OF THE PAY PERIOD, ALL DATES NEED TO BE WRITTEN IN FOR THE PAY PERIOD****

Crew leaders are responsible for reviewing each crew member’s timesheet before sending them to town to ensure that they are properly filled out.

Appendix D2.-Example of a completed timesheet.

ALASKA PARTMENT OF FISH AND GAME Time and Attendance Report

★ Pay period ending: 4/15/2012 ^{★EMPLOYEE#} EID ID# 100001 ★ Name: Giovanni Corleone ★ Division Commercial Fisheries

Record times in military format. Example: 6:00 p.m. = 18:00. If you work past midnight, stop at 23:59 and resume at 00:01 the next day.

EXAMPLE

Day	Date	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Leave Taken	Sea Duty	Standby	Hazard	Code 1	Code 2	Code 3	Code 4	Holiday / Leave	Work Hrs Total	
Sun	4/1																					
Mon	4/2											P 7.50										7.50
Tue	4/3	8:00	18:30										SWD		10.50	10.50						10.50
Wed	4/4	8:00	18:30										SWD		10.50	10.50						10.50
Thu	4/5	8:00	16:30										SWD		8.50	8.50						8.50
Fri	4/6	8:00	18:30										SWD		9.50	10.50						10.50
Sat	4/7	★ All dates in the pay period need to be included.																				
Sun	4/8														7.50	10.50						10.50
Mon	4/9	8:00	18:30												5.50	10.50						10.50
Tue	4/10	8:00	18:30												8.00	10.50						10.50
Wed	4/11	8:00	18:30												2.50	8.50						8.50
Thu	4/12	8:00	16:30										SWD		8.50	8.50						8.50
Fri	4/13	8:00	16:30										SWD		8.50	8.50						8.50
Sat	4/14	8:00	16:30										RDO		8.50	8.50						8.50
Sun	4/15	8:00	12:00	13:00	22:00								RDO		13.00	13.00						13.00
TOTALS															68.50	40.00	70.00				7.50	110.00

★ Must take Personal Leave if going on Sea Duty to fulfill the work week.

★ No Sea Duty Pay unless at sea for 24 hours or more

★ HAZARD DUTY PAY only during hours worked, if eligible.

Charge to:			
Notation	CC/LC		%
1 LAS-AGNA	11234567-11234567		33%
2 PASTA	11002234-11002234		58%
3			
4			
Total			91%

Comments		Comments	
4/1		4/9	F/V Hasta La Pasta Dep 09:00 Arrived 1630
4/2	Personal Leave Taken	4/10	F/V Hasta La Pasta Dep 11:00 Arrived 1630
4/3	F/V Hasta La Pasta Departed 11:00	4/11	F/V Hasta La Pasta Dep 08:30 Arrived 1630
4/4	AT SEA F/V HASTA LA PASTA	4/12	F/V Hasta La Pasta Departed 14:30
4/5	AT SEA F/V HASTA LA PASTA	4/13	AT SEA F/V HASTA LA PASTA
4/6	FV HASTA LA PASTA ARRIVED 1730	4/14	AT SEA F/V HASTA LA PASTA
4/7		4/15	AT SEA F/V HASTA LA PASTA
4/8			

★ We certify that the information provided above is true and correct.

★ [Signature] Employee's Signature Date: 3/28/12

★ [Signature] Supervisor's Signature Date: 3/28/12

____ Approving Officer Signature Date: _____

Leave Use Codes
 H=Holiday X=Comp Ann
 S=Sick Y=Comp Pers
 A=Annual C=Court
 P=Personal L=LWOP

Premium Pay Codes (PPC)
 110 - Sea Duty 250 - Straight Time
 206 - Hazard 251 - Overtime
 211 - Standby

Holiday, Leave, Overtime and Premium Pay Overrides		
Codes	Hours	CC/LC
Leave & Holiday	7.50	11104444-11104444

★ Handwrite in if using COMP TIME FOR OT → "COMP IN LIEU OF OT"

