

**Regional Information Report No. 1J10-14**

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# **Situk River Salmon Weir Operational Plan**

by

**Nicole L. Zeiser**

July 2010

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Alaska Department of Fish and Game

Division of Commercial Fisheries



## Symbols and Abbreviations

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<b>Weights and measures (metric)</b>		<b>General</b>		<b>Measures (fisheries)</b>	
centimeter	cm	Alaska Administrative		fork length	FL
deciliter	dL	Code	AAC	mid-eye-to-fork	MEF
gram	g	all commonly accepted		mid-eye-to-tail-fork	METF
hectare	ha	abbreviations	e.g., Mr., Mrs., AM, PM, etc.	standard length	SL
kilogram	kg			total length	TL
kilometer	km	all commonly accepted			
liter	L	professional titles	e.g., Dr., Ph.D., R.N., etc.		
meter	m			<b>Mathematics, statistics</b>	
milliliter	mL	at	@	<i>all standard mathematical</i>	
millimeter	mm	compass directions:		<i>signs, symbols and</i>	
		east	E	<i>abbreviations</i>	
		north	N	alternate hypothesis	H <sub>A</sub>
		south	S	base of natural logarithm	<i>e</i>
		west	W	catch per unit effort	CPUE
		copyright	©	coefficient of variation	CV
		corporate suffixes:		common test statistics	(F, t, $\chi^2$ , etc.)
		Company	Co.	confidence interval	CI
		Corporation	Corp.	correlation coefficient	
		Incorporated	Inc.	(multiple)	R
		Limited	Ltd.	correlation coefficient	
		District of Columbia	D.C.	(simple)	r
		et alii (and others)	et al.	covariance	cov
		et cetera (and so forth)	etc.	degree (angular)	°
		exempli gratia	e.g.	degrees of freedom	df
		(for example)		expected value	<i>E</i>
		Federal Information		greater than	>
		Code	FIC	greater than or equal to	≥
		id est (that is)	i.e.	harvest per unit effort	HPUE
		latitude or longitude	lat. or long.	less than	<
		monetary symbols		less than or equal to	≤
		(U.S.)	\$, ¢	logarithm (natural)	ln
		months (tables and		logarithm (base 10)	log
		figures): first three		logarithm (specify base)	log <sub>2</sub> , etc.
		letters	Jan,...,Dec	minute (angular)	'
		registered trademark	®	not significant	NS
		trademark	™	null hypothesis	H <sub>0</sub>
		United States		percent	%
		(adjective)	U.S.	probability	P
		United States of		probability of a type I error	
		America (noun)	USA	(rejection of the null	
		U.S.C.	United States	hypothesis when true)	$\alpha$
			Code	probability of a type II error	
		U.S. state	use two-letter	(acceptance of the null	
			abbreviations	hypothesis when false)	$\beta$
			(e.g., AK, WA)	second (angular)	"
				standard deviation	SD
				standard error	SE
				variance	
				population	Var
				sample	var

<b>Weights and measures (English)</b>					
cubic feet per second	ft <sup>3</sup> /s				
foot	ft				
gallon	gal				
inch	in				
mile	mi				
nautical mile	nmi				
ounce	oz				
pound	lb				
quart	qt				
yard	yd				

<b>Time and temperature</b>					
day	d				
degrees Celsius	°C				
degrees Fahrenheit	°F				
degrees kelvin	K				
hour	h				
minute	min				
second	s				

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

***REGIONAL INFORMATION REPORT NO. 1J10-14***

**SITUK RIVER SALMON WEIR OPERATIONAL PLAN**

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## ABSTRACT

Annually, the Alaska Department of Fish and Game, Division of Commercial Fisheries, monitors escapement of salmon returning to the Situk River system near Yakutat, Alaska. . A weir provides the primary mode of enumeration for sockeye and Chinook salmon escapements into the Situk River. . These weir counts are used for inseason management of commercial fisheries that target sockeye and Chinook salmon returning to the drainage. The weir crew will enumerate all species of salmon through the Situk River weir and sample adult sockeye salmon *Oncorhynchus nerka* and Chinook salmon *Oncorhynchus tshawytscha* escapements for biological characteristics (age, sex, and length). . This report provides operational guidelines for the Situk River adult salmon weir project including salmon enumeration, sampling procedures, weir protocol, and general camp policies.

Key words: Yakutat, Situk River, escapement, sampling, weir, operational plan, commercial salmon harvest, Chinook salmon, *Oncorhynchus tshawytscha*, sockeye salmon, *Oncorhynchus nerka*, coho salmon, *Oncorhynchus kisutch*, pink salmon, *Oncorhynchus gorbuscha*, chum salmon, *Oncorhynchus keta*.

## INTRODUCTION

The Situk River is a small river located approximately 14 km southeast of the city of Yakutat, Alaska (Figure 1). . The river is approximately 35.2 km (22 miles) in length and empties out of Situk and Mountain Lakes which make up the headwaters of the drainage. The Situk, Ahrnklin, and Lost rivers all flow into the Situk-Ahrnklin Lagoon before entering the Gulf of Alaska. . The Situk River sustains relatively large populations of sockeye *Oncorhynchus nerka*, coho (*O. kisutch*) and pink salmon (*O. gorbuscha*), steelhead (*O. mykiss*), a moderate population of Chinook salmon (*O. tshawytscha*), and a small population of chum salmon (*O. keta*). . Sockeye salmon returning to the Situk River support commercial set gillnet, sport, and subsistence/personal use fisheries. . The commercial set gillnet fishery takes place in the Situk-Ahrnklin Inlet and accounts for approximately 50% of the commercial salmon harvest in the Yakutat Management Area.

Since 1995 Situk fisheries have been actively managed to achieve a specified annual level of escapement. . The Alaska Department of Fish and Game (ADF&G) adopted a biological escapement goal (BEG) of 30,000 to 70,000 sockeye salmon through the Situk River weir (Clark et al. 1995, 2002). . This was the escapement range predicted to produce 90% or more of the estimated maximum sustained yield of sockeye salmon to fisheries. . Inseason management of both Chinook and sockeye salmon fisheries is based on current harvest statistics and daily weir counts. The weir operates until the sockeye salmon run is essentially over, or until high water threatens the safety of the weir. . Escapements of pink and coho salmon are still in progress when the weir is disassembled, thus only partial counts are obtained for these species. .

The age composition of salmon stocks is determined through sampling portions of the escapement and commercial catch. . Sockeye salmon harvested in the Situk-Ahrnklin Inlet set gillnet fishery along with escapements of Situk River sockeye salmon have been sampled for age, sex and length composition annually since 1982. . In runs where specific sockeye salmon escapement and catch data can be combined to estimate the age structure of the run, brood tables can be generated for more accurate run reconstruction and run projections. .

In 1991 the Alaska Board of Fisheries (BOF) adopted a management plan for Chinook salmon in the Situk River. . The plan specifies trigger points based on a BEG of 730 large (age-.3, -.4, and -.5 fish) Chinook salmon with a range of 450 to 1,050 (McPherson et al. 2005). . Plan trigger points regulate the sport and troll fisheries targeting Chinook salmon, the Situk-Ahrnklin Inlet set

gillnet fishery targeting sockeye and incidentally capturing Chinook, and the subsistence/personal use fishery. . The purpose of this report is to provide ADF&G personnel with the project design, objectives, and protocol for the Situk River adult salmon weir.

## **SITUK RIVER WEIR BACKGROUND**

The Situk River weir has been used to count salmon escapements and facilitate inseason management of the fisheries in 1971 and in each year since 1976. . The weir was located about 50 meters downstream of Nine Mile Bridge (Forest Highway 10) in 1971 and from 1976–1987. . In 1988 the weir site was moved downstream so that weir counts provided more timely information for inseason management of the commercial set gillnet fishery. . From 1988–present, the weir has been located in the lower Situk River about a mile above tidewater and in closer proximity to the commercial fishery (Figure 1).

Sockeye escapements have averaged 63,000 since 1998 meeting the BEG of 30,000 to 70,000 established for the Situk River drainage. . In 2008, high winds and major flooding occurred, washing down debris and a large tree which caused great damage to the weir. . The weir was pulled earlier than normal years (July 23), therefore a full escapement estimate could not be made for that year. . Inclement weather along with poor sockeye salmon returns resulted in an estimated weir count of only 22,500 sockeye, thus not meeting escapement needs.

Chinook escapements have averaged 1,100 fish since 1998, meeting the BEG of 450-1,050 fish. . Partial pink salmon counts have ranged from 20,000 to over 300,000 as the weir is usually removed prior to the end of the pink salmon run (BEG range of 42,000 to 200,000). . A very small run of summer chum salmon is also present. . Escapements between 5,000 and 15,000 steelhead have been counted annually since the early 1990's.

## **OBJECTIVES**

1. Enumerate adult salmon escapement by species through the weir annually from approximately June 10 to August 10.
2. Ensure interim escapement sampling objectives are met throughout the season (Sample goals for the season are 800 sockeye and 200 Chinook salmon).
3. Determine age, sex, and length (ASL) composition of adult sockeye and Chinook salmon for Situk River.

## **SUPERVISION**

The Area Management Biologist (AMB), and Assistant Area Management Biologist (AAMB), will supervise the Situk River weir crew. . Day to day operations, task scheduling, and ensuring work quality will be the responsibility of the crew leader. .

During the operation of the weir, the assigned duties may take longer than 37.5 hours/week to accomplish. . When this is expected at the Situk River weir, the crew leader will notify supervisor(s) to authorize overtime if necessary. . No additional overtime may be worked or claimed unless it is first authorized.

## METHODS

### GENERAL WEIR PROTOCOL

The main responsibility of the weir crew is to install and maintain a salmon weir for the purpose of escapement enumeration and sampling. Two ADF&G staff will be assigned to this project and additional assistance, if needed, will be provided during weir installation and removal. The weir is installed on the Situk River during the first week of May and operated by the Division of Sport Fish to count and sample emigrant steelhead kelts for ASL prior to the startup of this project. Around June 10, the downstream migrant trap will be dismantled and an upstream trap will be installed. Weir operations will shift to counting and live-capturing adult sockeye and Chinook salmon by the Division of Commercial Fisheries for the collection of biological data as described in this operational plan.

Weir maintenance is very important to keep the weir fish-tight and prevent washout. The weir will be kept clean of debris and the river substrate will be checked as often as possible to make sure that holes do not develop through which fish might escape. Fish are sometimes seen swimming through the gap at the bottom of the floating panels so weir personnel should pay close attention to this area of the weir. In deeper channels, a dry suit and diving mask will be needed to visually inspect the weir for holes.

Large numbers of fish ( $\geq 200$ ) should not be allowed to build up behind the weir. If fish accumulate behind the weir, they should be counted through the gate.

The daily and cumulative counting form will be used to record the daily escapement counts as shown in Figure 2. Note the time period that the weir gate is opened, and record the daily and cumulative counts for Chinook and sockeye salmon. In the comments section to the right of the page, document other salmon species, net marked fish, holes in the weir, predation, etc.

It is important to keep a daily logbook (Rite in the Rain®) to document a more detailed description of the daily events such as weather information, water levels, maintenance performed, number of fish sampled, bear activity, personnel changes in camp, and so on. The weir crew will relay total daily and cumulative counts for each species to the ADF&G office each morning at 10:00 a.m. via a marine VHF radio (channel 10). Throughout the season, completed ASL forms and scale cards will be turned in to the Yakutat ADF&G office to be sent off to Juneau to be analyzed inseason. When the project is completed, all remaining forms will be brought to the ADF&G office including daily counting forms, ASL forms, camp log books, and radio forms.

### COUNTING PROCEDURES

Chinook salmon are counted and visually classified by size (small, medium, and large) as they pass the weir. Small-sized fish are 20" or less in total length ( $\leq 440$  mm from mid-eye to fork of tail, MEF) and are age-.1 males (1-ocean-age "jacks"). Medium-sized Chinook are 20" to 28" total length (441 to 660 mm MEF) and are nearly all age-.2 males. . Large fish are over 28" total length ( $> 660$  mm MEF) and are mostly age-.3 to age-.5 fish. . When making size determinations, weir personnel will be viewing the passing fish relative to reference marks (20" and 28" long) painted on a white flash panel that is secured on the river bottom near the upstream opening of the passing gate.

Small age-1 (jack) Chinook and sockeye salmon can, to a small extent, squeeze through weir pickets and avoid the weir opening and trap for biological sampling. If you witness this happening, proceed to count and/or sample as you normally would. Small Chinook are assumed biased low and do not count towards the escapement goal.

In the past, all sockeye observed passing the weir were counted and tallied by one size class. Starting in 2010, the weir crew will count sockeye “jacks” and large adult fish separately. Sockeye “jacks” are noticeably smaller than averaged size adult sockeye. Sockeye will be classified as a jack if they are  $\sim <400\text{mm}$ . Procedures for sampling adult sockeye salmon can be found in Appendices A1 through A6. General Camp policies and equipment use can be found in Appendix B1.

### **ESCAPEMENT SAMPLING FOR AGE, LENGTH, AND SEX**

The crew stationed at the Situk River weir site will conduct salmon escapement sampling for age, length, and sex. Sockeye and Chinook salmon will be the only species sampled. Appendix A1 describes sampling and recording procedures.

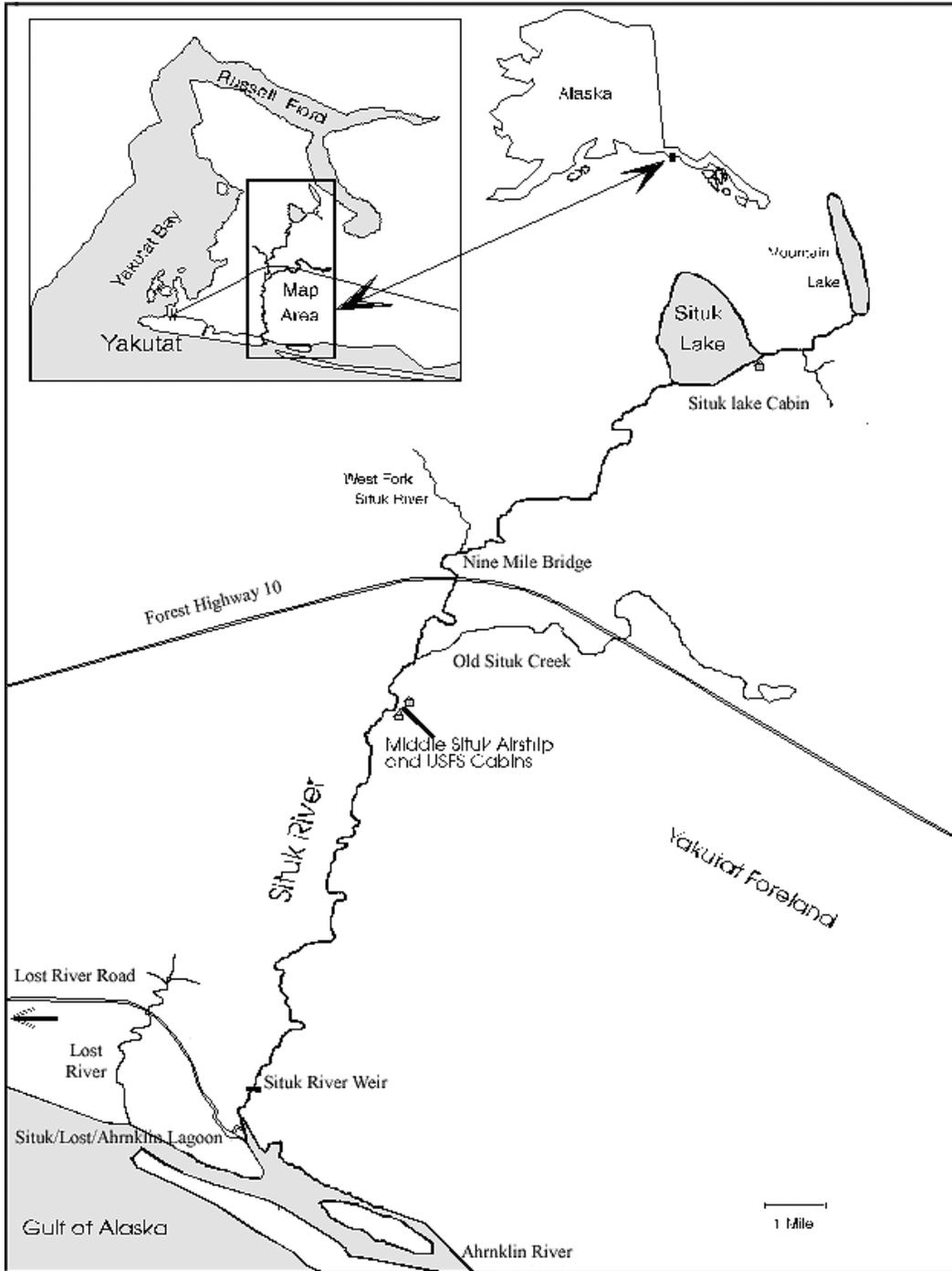
The sample goals are to obtain a sample size of 800 or more adult sockeye salmon and 200 or more Chinook salmon samples by the end of the project. The ultimate goal is to spread sampling proportionally over the immigrating population. **Sampling goals for sockeye** salmon will be determined by **multiplying the total weir passage since the last sampling event by 1% (.01)**. An optimum sampling goal for Chinook salmon is to sample 15% (0.15) of the Chinook run that passed the weir since the last sampling event. However, due to low trapping numbers, **all Chinook salmon encountered in the trap will be sampled!** As long as 1% of the sockeye run since the last sampling event are sampled, the sampling events can be spread out to 3 times a week over 3 non-consecutive days. This will yield a more representative sample for the week (statistical week). The standard statistical week starts on Monday and ends on the following Sunday. Refer to Appendix A6 for statistical calendar weeks. (Appendix A6).

Once sampling goals are calculated, weir staff will open the trap long enough to approximately achieve the sockeye salmon goal for that day. Ideally, all sockeye and Chinook salmon in the trap will be sampled. In the event that the trap contains many more sockeye than desired, a systematic sample of the sockeye (e.g., every-other sockeye handled) will be sampled. When immigration rates are very low (as in the first and last several weeks of most years when daily movements can be only a few fish per night), all of the sockeye and Chinook salmon will be sampled

Samples will consist of scales, length, and sex data. Scales will be mounted on a gum card with the corresponding data (sex and length) recorded on an optical scan form (Appendix A2). Length will be measured from mid-eye to tail-fork (Appendix A4). Sex data will be determined by kype (nose) development or visual determination of the presence or absence of an ovipositor, eggs, or milt. It is imperative that all scales collected correspond to the length and sex data for that fish. Experienced personnel will provide training on these procedures for new employees.

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**Figure 1.**—Map of the Situk River drainage, Situk-Ahrnklin Lagoon and present weir site.

EXAMPLE

Situk River Weir Daily Counting Forms

Date: July 4, 2010

7#

Time Period	Adult Sockeye		Sockeye Jacks		Total Daily Cumulative	Chinook						Comments: Other species, predation, holes in the weir, visibility, net marks behind the weir count estimate, etc.
	Daily Counts	Daily Cum	Daily Counts	Daily Cum		Daily Counts			Cum Daily			
						L	M	S	L	M	S	
8:00/8:15	22	22	0	0	22	0	1	0	0	1	0	1 Steelhead down
9:30/9:45	4	26	0	0	26	5	0	1	5	1	1	
10:45/11:00	13	39	1	1	40	10	4	0	15	5	1	1 pink up
13:00/13:15	57	96	1	2	98	0	10	0	15	15	1	
15:10/15:30	15	111	4	6	117	7	6	2	22	31	3	6 net marks
18:20/18:40	18	129	2	8	137	2	0	1	24	31	4	
21:00/21:30	23	152	1	9	161	10	1	2	34	32	6	
Daily Total	152		9	161					34	32	6	
Previous Day's Cum	10,431		110	10,541					268	102	29	
Total Cumulative	10,583		119	10,702					302	134	35	

Figure 2.—Situk River daily and cumulative escapement form.

## **APPENDICES**

## **SCALE SAMPLING**

The following is an explanation of how salmon scale samples are taken. . If you have not taken scales before, or if you have any questions, ask somebody who has had experience with scale sampling. . Scales must be readable and properly organized to be useful, so follow proper technique when sampling.

## **SCALE GUM CARDS**

A scale card (gum card is a gum-backed sheet with 40 positions, numbered 1 through 40),for mounting individual scales refer to Appendix A2. . Scale samples are placed on the cards in sequential order.

It is important to keep the gum card dry at all times. . A wet gum card is useless as the scales will fall off and prevent a readable impression from being taken. . If the gum card does get wet, the scales should be remounted onto a new gum card with care taken to keep each scale in its original position.

The completed gum card should be allowed to dry fully before storing long-term. All gum cards should be stored with a sheet of wax paper placed between them, to keep the cards from sticking to each other, and kept in a moisture-proof container.

For **both sockeye and Chinook, a new scale card and ASL form is started for each new sampling event**, even if the previous card is not filled. It is important that scale card number and information match the information entered on the corresponding optical scan form (ASL). **Always. . . start a new scale card and a new ASL form when you begin a new statistical week.**

Record the following information on each **gum card**:

### **Species:**

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

### **Card Number:**

Gum cards are numbered sequentially beginning with “001” and continue through the entire season. . Do not repeat or omit gum card numbers.

### **Locality:**

Write out the name of the system being sampled (e.g., Situk River weir).

### **Statistical code:**

Transfer the appropriate digits from the optical scan form, starting with the 3-digit district, then the 2-digit sub district, then a 3 digit stream number (e.g., 182-70-010 for Situk River). Refer to Appendix A3 for your location’s statistical code.

### **Sampling date:**

Record the date when fish were sampled.

### **Gear:**

Write out completely (e.g., weir trap).

### **Collector(s):**

Record the last name of the person(s) sampling and their respective jobs (e.g., Plucker/recorder – Smith, Wrestler – Johnson).

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-continued-

**Remarks:**

Record any pertinent information (e.g., 1 scale/fish, ASL #)

**COLLECTING SCALES**

For sampling you will need:

- Clipboard with ASL forms
- Pencils (No. 2)
- Gum Cards
- Wax paper inserts
- Forceps (tweezers)
- Plastic scale card holders (optional)
- Measuring board/tape measure

During the **sampling of sockeye salmon**, you will take **one scale** from each fish. Mount scale on gum card in sequential order starting with placement #1. The next scale sample will be placed on #2 and so forth. While **sampling Chinook**, you will take **4 scales** from each fish. Mount the first 4 scales on scale #1, 11, 21, and 31 (working down in a column instead of rows). Mount the second set of scales (fish number 2) on scale #2, 12, 22, and 32 etc. Pluck the "preferred scale" from the fish using forceps (Appendix A5). The preferred scale is located on the left side of the fish, 2 rows above the lateral line on the diagonal from the posterior insertion of the dorsal fin to the anterior origin of the anal fin. If the preferred scales are missing, reabsorbed, or obviously deformed, try the right side of the fish. If preferred scales are missing from both sides, collect a scale from an area as close to the preferred area as possible or sample a different fish.

After removing the scale from the salmon, clean the scale by wiping the under-surface (the side adhering to the fish) on the back of your hand or between 2 fingers to remove all the skin (silver color). Make sure no dirt, slime, or skin remains on the scale. Moisten the scale and mount the scale on the gum card with the ridged side up. The ridged side is the same side that is exposed on the salmon. Finally, mount the scale so the anterior end (the end of the scale closest to the salmon's head when plucked) is oriented toward the top of the gum card (Appendix A5).

Scales should be neat, clean, orderly, and properly oriented on the card. This is essential for the scales to adhere to the gum card and to make determination of the salmon's age possible by a scale reader (the purpose of the entire sampling process). If all the silver-colored skin is not removed and the scale is not totally clean, it will not adhere to the gum card or it will not be legible when it is viewed for aging or other evaluation.

**GENERAL SAMPLING GUIDELINES**

If any difficulty is encountered in determining the sex of the fish being sampled, write, "I had trouble sexing these fish" on the top margin of the optical scan and ask your supervisor for help as soon as possible before sexing additional fish.

Measure all adult sockeye salmon lengths to the nearest 5 millimeters from the middle of the eye to the fork of the tail. (Appendix A4)

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–continued–

In the past weir data has been recorded on waterproof paper or in a “Rite in the Rain” notebook and then transcribed on to the ASL forms. This accounted for too many errors so it was recommended that the ASL forms be used to record data while sampling fish. Rite in the Rain notebooks will be used again if it turns out the ASL forms become unreadable and transcribing data becomes necessary. After sampling is done, it is the responsibility of the crew leader to check all data for errors before turning it over to the supervisor.

### **COMPLETING THE FORMS**

Salmon from many systems throughout the state are sampled for length, sex, and age annually by field crews. This database is essential for sound management of the State’s salmon resources. To be useful, data must be recorded on the optical scan forms neatly and accurately. The following procedures are to be adhered to when sampling for length, sex, and scales using optical scan forms (Appendices A1-A5).

Complete each section of the left side of the optical scan form using a No. 2 pencil and darken the corresponding ovals as shown in the figures. It is imperative that you darken the oval completely and neatly. Make every effort to darken the entire oval because the optical scanner that reads and records the data from the optical scan forms often misses partially filled, or lightly filled ovals, but avoid pressing so hard as to indent the paper. Do not stack forms when filling them out and label only one form at a time to avoid "the carbon paper effect" and resulting stray marks. It is necessary to review the forms after each day and ensure that all the data is filled in and appropriately marked.

Fill out the entries along the left side of the **optical scan form** (Appendix A2) as described below:

#### **Description:**

Write out the name of the species, District, sub-district system and the type of sampling being done (e.g., Sockeye or Chinook/ Dist. 182-70-010/weir/Situk River Esc./Wk 29).

#### **Card:**

Record the gum card number corresponding to the optical scan being filled out. The optical scan forms and corresponding gum cards are numbered sequentially throughout the season starting with 001. Consult your crew leader for the current card number. Each optical scan form will have only one corresponding gum card. Each scale collected must correspond to the same fish on the optical scan form.

#### **Species:**

Refer to the reverse side of the optical scan form for the correct digit (e.g., mark 2 for sockeye, or 1 for Chinook).

#### **Date:**

Day, Month, and Year: use appropriate digits for the date the fish are sampled.

#### **District:**

Refer to Appendix A3 for your district code. It will be the first 3 digit number (e.g., 182-70-010 in the case of Situk River).

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**Subdistrict:**

Refer to Appendix A3 for your subdistrict code. It will be the first 2 digit number (e.g., 182-70-010 in the case of Situk River).

**Stream:**

Refer to Appendix A3 for your stream number. It will be the second 3 digit number (e.g., 182-70-010 in the case of Situk River).

**Port:**

Leave Blank

**Stat. week:**

List the appropriate number from the calendar date in Appendix A6 (e.g., mark 27 for sampling in the week between June 28 and July 4).

**Project:**

Refer to the reverse side of the optical scan form for the correct code (e.g., mark 3 for escapement sampling at a weir site).

**Gear:**

Refer to the reverse side of the optical scan form (e.g., mark 00 for weir trap).

**Harvest code:**

Leave blank

**Length type:**

Mark 2 when sampling adults: mid-eye to tail fork (Appendix A2).

**# cards:**

This is the number of scale card(s) used that correspond to that optical scan form (e.g., mark 1 for sockeye)

It is extremely important to keep the optical scan forms flat, dry, and clean. Fish slime and water curling will cause the optical scanning reader machine to reject the entire optical scan form. If unnecessary pencil marks, dark spots, etc. are visible, they need to be erased or the machine will misinterpret the mark. It is necessary to fill in all information and darken the circles completely.

Additional data columns are available on the reverse of the optical scan for individual project use. If you take weights (as in the case of smolt sampling), you need to transfer the dark boxes (litho code) on the front left margin of the form to the left margin on the back. This code needs to be entered on the back exactly as it appears on the front.

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### SOME REMINDERS

- Record length by blackening the appropriate column circles on the optical scan form. Column 3 on the optical scan form is used for fish over 999 millimeters long. Measure all salmon to the nearest 5 millimeter.
  - Optical scan forms should be carefully edited before submitting to the immediate supervisor. **This is extremely important, and cannot be emphasized enough.** Re-check header information on optical scan forms: make sure all available information is filled in. Card numbers should not be repeated. Crew leaders should take time to ensure that the circles are being blackened correctly, if the circles are not darkened properly or sloppily marked the optical scanner records the information incorrectly or misses it entirely. Keep marks within each circle and completely fill them. Do not go outside the circle.
  - Transfer important comments from scale cards to optical scan forms. After pressing scales, the cards are seldom referred to again, and important remarks can be lost. Write any necessary comments in the top margin (not on the left side) or on the reverse side of the optical scan form. If no room is available on the optical scan form to completely explain the remarks, use a separate piece of paper.
  - The data processing program requires the "litho code" on the optical scan form (it is located in the upper right margin of the optical scan form). It helps if the optical scan forms are used in the order of this code. It should not be difficult to keep them in order if they are arranged that way from the beginning and kept in a folder.
  - If the optical scan forms get wrinkled or blotched they should be copied to a new form before submitting to the area office. The optical scanning machine is extremely sensitive to wrinkles and blotches and will misread or reject the sheets.
  - Look down the form from 2 angles after the data has been recorded to pick up any glaring mistakes. A common error, for instance, is placing both the 1 and 9 of a 419 mm fish in the 10's column with nothing in the 1's column.
  - It is important for post-season editing that all information is provided on every ASL form and gum card. Include such information as who wrestled the fish, plucked the scale, and filled out the forms. It is the responsibility of the crew leader to make sure all information is entered correctly.
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Appendix B.—Examples of an optical scan form, and scale cards from Situk River escapement.

SOCKEYE / DIST. 182-70-010 / WEIR TRAP / SITUK RIVER ESC. / WK 29

DESCRIPTION: SPECIES / DIST., SUB-DIST. OR STREAM / GEAR / PORT OR ESCAPEMENT SYSTEM / WEEK 076165

CARD:	#	SEX	T	100S	LENGTH	1's	E	FRESH	AGE	MARINE	USER CODE
001	1	F	1	0	1	0	1	0	1	0	1
SPECIES:	2	F	1	0	1	0	1	0	1	0	1
DAY:	13	F	1	0	1	0	1	0	1	0	1
MONTH:	07	F	1	0	1	0	1	0	1	0	1
YEAR:	10	F	1	0	1	0	1	0	1	0	1
DISTRICT:	182	F	1	0	1	0	1	0	1	0	1
SUB-DISTRICT:	70	F	1	0	1	0	1	0	1	0	1
STREAM:	010	F	1	0	1	0	1	0	1	0	1
PORT:		F	1	0	1	0	1	0	1	0	1
STAT.:	29	F	1	0	1	0	1	0	1	0	1
WEEK:	3	F	1	0	1	0	1	0	1	0	1
PROJECT:	00	F	1	0	1	0	1	0	1	0	1
GEAR:		F	1	0	1	0	1	0	1	0	1
HARVEST CODE:		F	1	0	1	0	1	0	1	0	1
LENGTH TYPE:		F	1	0	1	0	1	0	1	0	1
# CARDS:	1	F	1	0	1	0	1	0	1	0	1
USER CODE DEFINITIONS:		F	1	0	1	0	1	0	1	0	1
0		F	1	0	1	0	1	0	1	0	1
1		F	1	0	1	0	1	0	1	0	1
2		F	1	0	1	0	1	0	1	0	1
3		F	1	0	1	0	1	0	1	0	1
4		F	1	0	1	0	1	0	1	0	1
5		F	1	0	1	0	1	0	1	0	1
6		F	1	0	1	0	1	0	1	0	1
7		F	1	0	1	0	1	0	1	0	1
8		F	1	0	1	0	1	0	1	0	1
9		F	1	0	1	0	1	0	1	0	1

ADFG ADULT SALMON AGE - LENGTH FORM VERSION 3.0(4/93) FORM NO. 5009 ACCU-SCAN™ 4332FC0000 (Info on Head) APPERSON PRINT MANAGEMENT SERVICES

Note: Situk weir location code is as follows: 182 for district, 70 for subdistrict, 010 for stream.  
All 3 sets of numbers comprise a stat code of 182-70-010

Species: Sockeye Card No. 001  
 Locality: Situk Weir  
 Stat Code: 182-70-010-  
 Sampling Date: Mo. 07 Day 13 Year 2010  
 Gear: Weir Trap  
 Collector(s): ZFISER(W), MILLER(P,R)  
 Remarks: 1 Scale per fish  
ASL # 076165

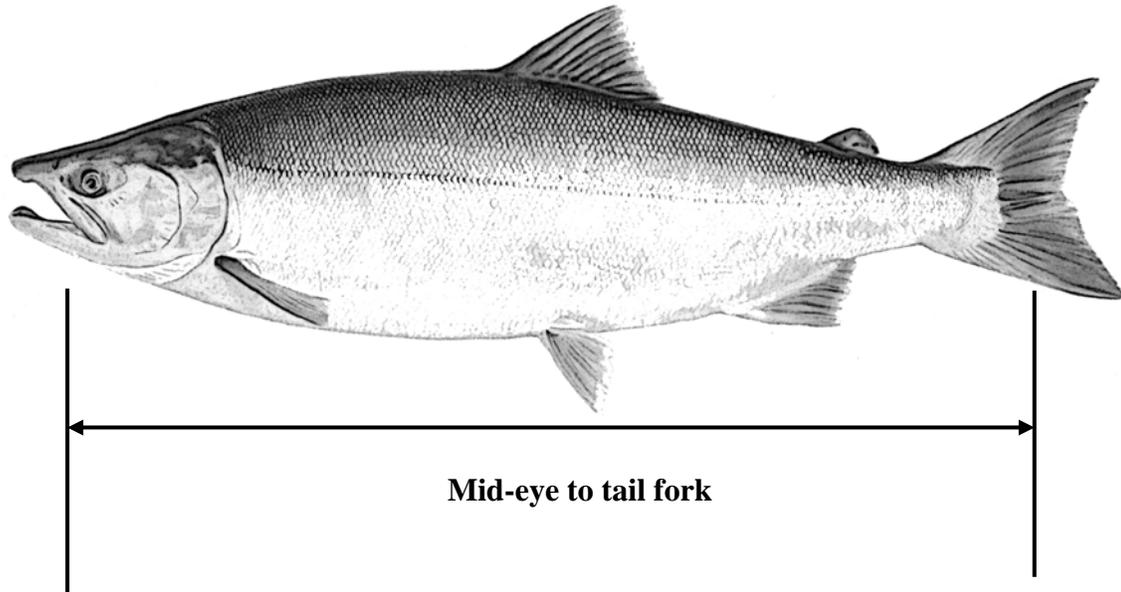
10	9	8	7	6	5	4	3	2	1
20	19	18	17	16	15	14	13	12	11
30	29	28	27	26	25	24	23	22	21
40	39	38	37	36	35	34	33	32	31

Species: Chinook Card No. 001  
 Locality: Situk Weir  
 Stat Code: 182-70-010-  
 Sampling Date: Mo. 07 Day 15 Year 2010  
 Gear: Weir Trap  
 Collector(s): WOODS(W), MUNOZ(P,R)  
 Remarks: 4 Scales per fish  
ASL # 076160

10	9	8	7	6	5	4	3	2	1
20	19	18	17	16	15	14	13	12	11
30	29	28	27	26	25	24	23	22	21
40	39	38	37	36	35	34	33	32	31

Appendix C .-Measuring adult salmon length.

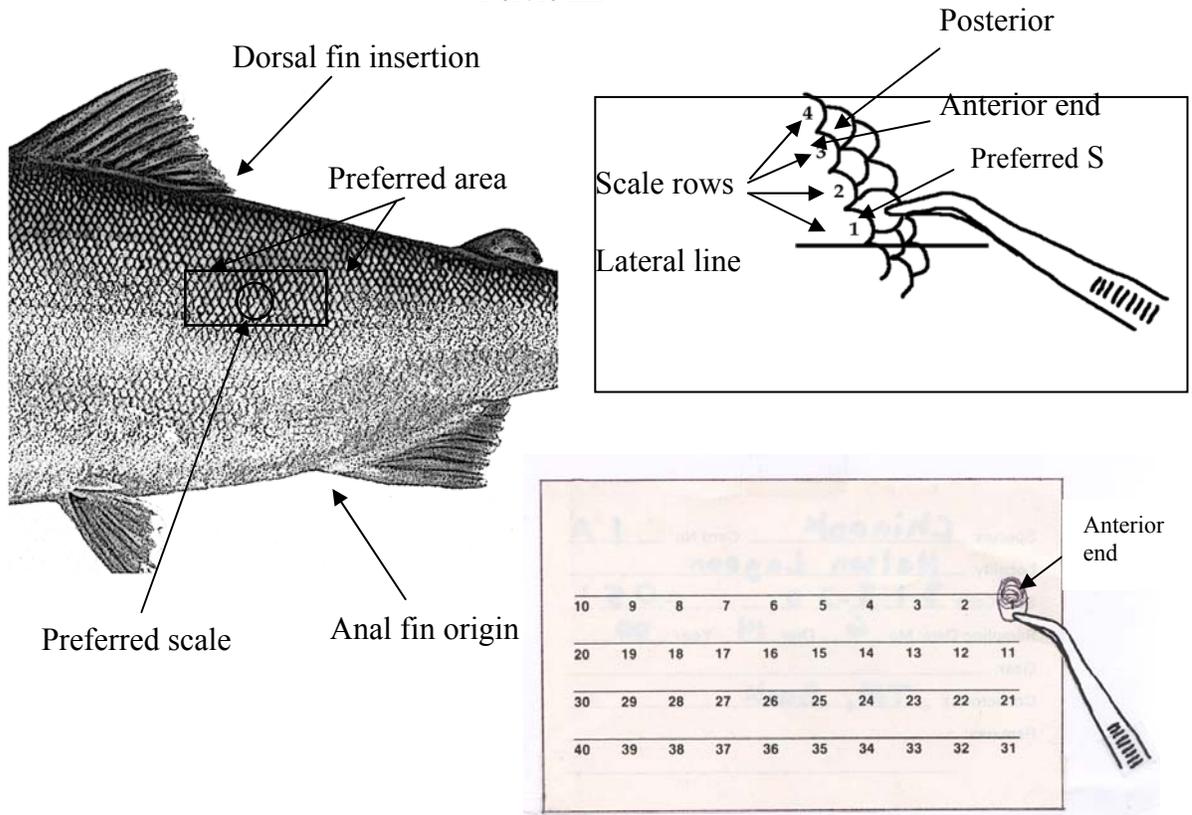
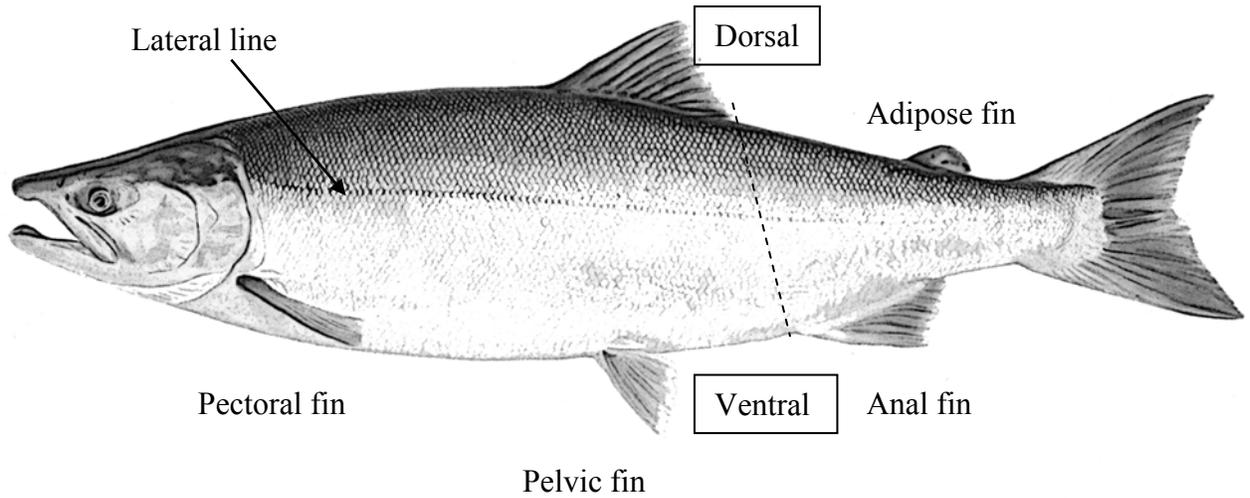
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Because the length and shape of the snout of salmon changes as the fish approaches sexual maturity, length measurements are made from the middle of the eye to the fork of the tail. The length is always recorded to the nearest 5 millimeter. The procedure for measuring mid-eye to fork of tail is as follows:

1. Place the salmon flat, right side down, on a board that has a ruler mounted on it with a metric scale. Orient the salmon with its head on your right, the tail in your left hand, and the salmon's dorsal surface (back) towards you. This puts the salmon in the correct orientation for the plucker to remove the preferred scale from the fish's left side if the plucker is standing on the other side of the measuring board.
  2. Line the eye of the salmon up with the end of the ruler, and then hold the salmon's head with your right hand. Gently sliding your thumb into the salmon's mouth and grasping the lower jaw works well for larger fish.
  3. Flatten and spread the tail against the board with your left hand. Read the mid-eye to tail fork length to the nearest 5 millimeter and record sex and length on ASL form.
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Appendix D.—Preferred scale sampling area on an adult salmon.



Do not turn scale over (ridged side should face up, as on fish). Place scales directly over the number on the gum card. Mount scale with anterior portion of scale oriented toward the top of the card, posterior end toward the bottom.

Appendix E.–Statistical weeks (sampling periods) and corresponding calendar dates for 2010.

Statistical Week	Beginning Date	Ending Date
20	9-May	15-May
21	16-May	22-May
22	23-May	29-May
23	30-May	5-Jun
24	6-Jun	12-Jun
25	13-Jun	19-Jun
26	20-Jun	26-Jun
27	27-Jun	3-Jul
28	4-Jul	10-Jul
29	11-Jul	17-Jul
30	18-Jul	24-Jul
31	25-Jul	31-Jul
32	1-Aug	7-Aug
33	8-Aug	14-Aug
34	15-Aug	21-Aug
35	22-Aug	28-Aug
36	29-Aug	4-Sep
37	5-Sep	11-Sep
38	12-Sep	18-Sep
39	19-Sep	25-Sep
40	26-Sep	2-Oct

## **EQUIPMENT MAINTENANCE**

Equipment maintenance is one of the most important operations you will perform during the field season. The outboard motors, generators, and other equipment must be kept in good operating condition.

It will be the crew leader's responsibility to see that all equipment is kept in operating condition.

## **ENGINE CARE AND OUTBOARD OPERATION**

If outboard uses mixed fuel, the correct outboard motor fuel mixture is 50:1. The newer Precision Blend outboards mix the 2-cycle oil and gas automatically, but older engines will need to have their fuels pre-mixed. Always pour the oil into the tank first, then add 2 or 3 gallons of gas and mix thoroughly, then fill tank to capacity always using a large funnel and filter. Some outboards may be 4-stroke engines, which need to have oil level checked routinely. Always mix fuel tanks or equipment under cover to prevent water contamination and always use a funnel and filter. Note that some chainsaws have a fuel mixture of 25:1, but some newer model (e.g., Stihls) use a 50:1 mix. Chainsaw gas should be mixed in a separate can and clearly marked that it is chainsaw fuel to avoid accidentally being used in outboards.

Always place outboard motors in neutral when starting and always make sure a safety line is attached between the boat and motor. Perform a check daily of the clamp screws “dog ears” that hold the outboard to the transom. Also routinely check the motor for loose screws and bolts, cracks, and breaks, especially in the area of the lower unit. Never start or run an outboard in the tilted position.

In the normal operation of an outboard, a stream of water is discharged from a hole in the bottom edge of the cowling or from the back of the shaft. If this stream of water stops, the water pump may not be working and the motor should be shut off. On propeller outboards, the side plate over the water intake can be removed for cleaning as it may be plugged. If the pump continues not to function, the outboard should not be run, and a report to base camp should be made. On jet units, a cover on the side of the cylinder head through which water circulates can be removed and cleaned, and the cover over the temperature sensor (thermostat) can also be cleaned to restore flow. Take along a piece of bailing wire to dislodge sand from the small water discharge tube under the cowling.

Check the gear oil in the lower unit of the outboard once a week and drain and replace the gear oil at the end of the season and every 50 hours of operation. Jet units must be greased daily. This is crucial. Grease guns will be provided.

If the skeg or jet unit hits bottom, check the screws to make sure they are still secure and there is no damage to the lower unit. Also, remove any rocks stuck between the grates on the jet unit.

All outboards are to be tilted in the up position when moored to preclude silt accumulation in the jet unit or water pump and skeg or housing damage.

If your outboard will not start, check the following:

- Check to make sure the kill switch is clipped to the engine properly.
- Check to see if the fuel line is connected properly to the motor and the tank and not pinched or kinked, and that the air vent on the tank is open.
- Check to see if there is water in the gasoline.
- If the engine is flooded, wait 5 minutes for the plugs to dry before attempting to start again.
- Check the spark plugs and spark plug wires as they may be fouled or defective (replace if needed).

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## **BOATS**

Boats are to be kept clean and free of loose tools and debris, and moored at locations where they are not subject to damage by other traffic or through contact with the river bottom in rock laden areas. Boats must be bailed regularly of rainwater to keep them from sinking.

Further responsibility includes maintaining a bow line on each assigned craft and ensuring that each boat is properly moored at the end of each work day to preclude possible loss or damage.

## **GENERATORS**

Portable generators may be supplied to field camps. Their maintenance is important. Since most of the generators have 4-cycle engines, mixed gas must not be used. The crankcase oil reservoir should be checked daily and maintained at the full level. At the end of the season, and after 25 hours of operation, the oil should be changed. Spark plugs should be checked at every oil change for fouling and gap.

## **CAMP MAINTENANCE**

Maintaining a clean and efficient field camp is required. Maintenance of living accommodations and other installations will be performed as necessary. All materials necessary will be provided.

Grounds will be kept free of litter. All garbage will be bagged up and disposed of in town. Special precautions should be observed to ensure that garbage does not attract bears and other scavenger species.

Upon completion of the summer season, all camp equipment will be cleaned prior to winter storage. All sampling nets, tarps and cloth items must be dry before being stored. All skiffs will be brought back to the ADF&G compound.

The crew leader at the close of the field season will take a complete equipment inventory. A report detailing the equipment and storage locations will be submitted at the end of the season to the supervisor. A list of equipment needing replacement or repair will also be submitted, along with an equipment need list for next season.

## **CAMP POLICY**

No alcoholic beverages are to be stored in areas open to public view. If alcohol is consumed at a camp an employee must be of legal age and off duty and under no circumstances shall he or she engage in the operation of any State equipment or firearms. Employees will not return to duty status under the influence of alcohol.

The crew leader of each camp shall establish a policy on living standards and personnel behavior in accordance with State guidelines. Time off for individual crew members must be scheduled by the supervisor. All employees will be required to act in a professional manner at all times and shall be especially courteous to the public.

It will be the responsibility of the crew leader to prevent any abuse of State equipment. The crew leader will report within 24 hours to the supervisor any damaged or lost equipment.

## **FOOD ORDERS**

ADF&G will provide all food and non-alcoholic beverages while working at the weir. Groceries are purchased about once a week by either the field crew when in town or by available office personnel. It is useful to keep an on-going grocery list so you have an idea of what is needed and not needed since fridge and freezer space is limited.

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## **VHF MARINE RADIO SCHEDULES**

Radio schedules are used to pass on pertinent information to/from the field offices. It is expected that all employees will participate in these schedules or that if an employee is not available that the crew leader will pass on pertinent information to the employee. **Radio schedules will be made once a day at 10:00 AM on channel 10.** The morning schedule is used for updated escapement counts, grocery orders or any gear or equipment needed at the weir site. . Keep the conversations short so we do not hold up others using the same channel. In an emergency, the Coast Guard can be summoned using channel 16.

Any employees performing job duties away from the cabins (such as boating trips up/downriver) or hiking/fishing/etc. on their own time are required to let others know their plans such as where they are going and when they are expected to return. Also, in each camp is a handheld VHF radio (with spare batteries), backpack with basic survival gear, and firearm and ammunition which the employee is encouraged to carry for their own safety. All employees should be aware of the gear in the camp and should request additional safety/survival items if needed or missing. Employees with any questions or concerns are asked to pass them on to their supervisor.

## **FIREARMS**

A State weapon will be provided at each camp. If you are unfamiliar with the operation and use of a firearm, please let your supervisor know. Training will be provided for anyone who requests it or is unfamiliar with firearms. Loaded guns are prohibited inside the camp facilities. Anyone handling a firearm should always treat it as if it were loaded. Guns should be kept clean and oiled and be completely unloaded while being cleaned. Any horseplay or misuse of firearms while working for the Department of Fish and Game will not be tolerated and may be grounds for immediate dismissal. Completely unload a firearm of all rounds before entering a vessel, airplane, or 4- wheeler.

## **BEARS**

Do not encourage bears to come around camp by leaving food or unburned garbage around. Do not shoot at a bear unless, in your best judgment, it is endangering someone's life or damaging personal or state property. Use your best judgment on whether to shoot a bear if property is at stake. When trying to frighten a bear away by shooting, do not fire toward it. You may wound it by pulling the shot, ricochets, etc. Do not use cracker shells at close distance (<30'). If a cracker shell hits a bear at close range, it may penetrate the body cavity and explode inside the bear, killing it. If you are having problems with a particular bear around camp, call the appropriate supervisory office and notify them of the situation. The Division of Wildlife Conservation personnel may take care of the problem.

## **GARBAGE**

Burn garbage as needed, and box up any non-burnable trash to haul back to town. Be sure all burn barrels have proper grates or covers to prevent grass fires from sparks. Never leave a fire unattended and always have adequate fire extinguishing materials handy. . Food that is discarded should be contained in a “slop bucket” inside the cabin. . As needed, the bucket can be then be dumped into the river downstream of the weir. . This should be done in the evenings when there are no “sporties” fishing down river.

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## **FISH AND WILDLIFE VIOLATIONS**

This is not intended as an inclusive procedure for handling violations. Below are guidelines for obtaining the necessary information and/or evidence to document a violation. It is important to be familiar with the commercial fishing, subsistence fishing, sport fishing, and hunting regulations in your area. Violation reporting procedures are printed on the back cover of the commercial fishing regulation book. Request the regulation book if your camp does not have one.

The use of the “4 W’s” can greatly aid the Fish & Wildlife Protection officer in obtaining sufficient evidence for a case.

- What is the violation?
- When did the violation occur (e.g. date, time, tide condition, etc.)
- Where did the violation occur?
- Who is in violation and who are witnesses?

It is important that specifics about the event be documented so the appropriate officer can follow-up and contact those involved. If you have a camera available, pictures are extremely valuable in prosecuting offenders. Collect as much information as possible and contact your supervisor or a State Trooper from the Alaska Wildlife Troopers Division immediately. If you do not feel comfortable, or your personal safety may be in danger, do not pursue the violation. Contact your supervisor and they will handle the situation. Be aware that you do not have the power to arrest somebody or seize equipment. Just limit yourself to documenting the event as safely as possible.

## **TRANSPORTATION**

Do not endanger life or property by going out in a boat on dangerously rough water. If you are unfamiliar with running boats in marine waters and/or on rivers, it is imperative to inform the crew leader of this and proper training should occur. All personnel must wear a Coast Guard approved life jacket when out on any water. Be conservative and use good judgment: if you think it is dangerous, don't go out on the water.

Extra shear pins or propellers, and a tool kit which includes pliers, spark plugs, and a spark plug wrench, should be in the boat at all times. Also, handheld VHF and flares should also be carried. In case travel at night becomes necessary, carry a flashlight.

## **FIRE AND FIRST AID**

All remote employees are required to have up to date First Aid and CPR certificates. The Situk River is not considered remote, therefore; it is not required for this project. Make an effort to avoid intestinal parasites such as *Giardia*. When in doubt, boil your drinking water for 15 minutes.

Check your camp's fire extinguisher. Know where it is and how to use it! Inventory your camp first aid kit, replace items as needed and become familiar with basic first aid treatment. Review the first aid booklet.

Keep the cabin, surrounding area, and yourself clean and neat. Appearance is important. You will not always be notified of the intended arrival of visitors, officials, etc. Visitor impressions are often based on your appearance.

## **COMPATIBILITY OF FIELD PERSONNEL**

If you find yourself unable to get along with your camp mate, notify your supervisor and an attempt will be made to resolve the situation.

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