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Kodiak Commercial Fisheries Salmon Management Field Camp and Weir Operational Plan, 2011

by

Aaron R. Tiernan

May 2011

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

Symbols and Abbreviations

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Weights and measures (metric)

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

Weights and measures (English)

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

Time and temperature

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

Physics and chemistry

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

General

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

Mathematics, statistics

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

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ABSTRACT

The Alaska Department of Fish and Game (ADF&G) Division of Commercial Fisheries staff will operate six weirs in the Kodiak Management Area (KMA) in 2011. These weirs are on the Karluk, Ayakulik, Dog Salmon, Upper Station, Litnik, and Pasagshak rivers. The weirs are used to enumerate salmon escapements into river systems and are critical management tools because they provide information that assists ADF&G management staff in deciding when to open and close salmon fisheries throughout the season. This operational plan informs seasonal employees of their responsibilities to run effective field camps, operate weirs, and live at remote sites. Operation dates for each weir vary depending upon the run timing of salmon populations into the different systems; however, most begin in late May and continue through mid-September. Chinook *Oncorhychus tshawytscha*, sockeye *O. nerka,* coho *O. kisutch,* pink *O. gorbuscha,* and chum salmon *O. keta;* as well as steelhead *O. mykiss,* and Dolly Varden *Salvelinus malma* are individually counted by field crews. Escapement data collected provides the basis for inseason management actions regulating the commercial, sport, and subsistence fisheries in the KMA.

Key words: weir, escapement, salmon, Kodiak Management Area, field camp, operational plan, ADF&G, KMA, CFD, Upper Station, Litnik, Dog Salmon, Karluk, Ayakulik, fishery, Chinook salmon, *Oncorhynchus tshawytscha*, sockeye salmon, *Oncorhynchus nerka*, coho salmon, *Oncorhynchus kisutch*, pink salmon, *Oncorhynchus gorbuscha*, chum salmon, *Oncorhynchus keta*, Dolly Varden, *Salvelinus malma*, RIR

INTRODUCTION

This operational plan informs Alaska Department of Fish and Game (ADF&G) seasonal field camp employees of their responsibilities for opening and closing field camps. This operational plan instructs them on preparing, maintaining, installing, and operating weirs, and provides tips on how to effectively accomplish required tasks, duties, and responsibilities while in the field. Field employees must read the Standard Operating Procedures (SOP) pertinent to their position and be familiar with the 2011 Kodiak Management Area (KMA) commercial salmon fishery harvest strategy (Dinnocenzo 2011). Also this document is intended to show how the weirs will be operated in 2011 for future users of the results.

The KMA encompasses the entire Kodiak archipelago and that portion of the Alaska Peninsula with waters draining into Shelikof Strait from Cape Douglas to Kilokak Rocks (Figure 1). The KMA is composed of seven commercial salmon fishing districts and 52 sections, which encompass approximately 440 streams supporting commercially viable salmon runs. Five species of salmon are harvested within the KMA. The sum of the escapement goal ranges for KMA salmon spawning systems are 7,000–13,000 Chinook salmon *Oncorhynchus tshawytscha*, 789,000–1,691,000 sockeye salmon *O. nerka*, 5,800–9,800 coho salmon *O. kisutch,* 2,250,000–6,000,000 pink salmon *O. gorbuscha* in odd years and 3,250,000–8,000,000 in even years, and 255,000 chum salmon *O. keta* (Nemeth et al. 2010). Only four streams in the KMA have established coho salmon escapement goals, all of which are accessible from the Kodiak road system.

Weirs are used to enumerate the number of sockeye salmon in major systems in the KMA. These systems include the Karluk River, Ayakulik River, Dog Salmon Creek, and Upper Station (Olga Creek); (Figure 2). Litnik (Afognak River) and Pasagshak weirs are the only weirs on a minor systems (Figure 2) and these are run by ADF&G Division of Commercial Fish Research staff. Other weirs located on minor systems include Buskin weir (ADF&G Sports Fish), Big Bay weir (Alaska State Parks), and Saltery River weir (Kodiak Regional Aquaculture Association). Aerial and foot surveys are conducted to estimate escapement on streams without weirs.

ADF&G personnel will collect biological samples from sockeye salmon escapements (i.e., scales for age, sex, and length data [ASL]). These samples provide the foundation for preseason run forecasts, escapement goal evaluation, and accurate assignment of the run to the stock of origin (run reconstruction; Foster i*n prep*). It is important that the data collected are of the highest quality.

ADF&G will operate KMA weirs from approximately May 22 through September 15. Two crew members are assigned to each weir. Additional assistance may be provided during weir installation and removal, periods of intense salmon escapements, high water, and heavy debris loads.

James Jackson, the Kodiak Finfish Area Management Biologist, is responsible for the management of KMA commercial salmon fisheries and is the overall project supervisor. Kodiak finfish management biologists Joe Dinnocenzo and Geoff Spalinger are the weir camp project biologists. Aaron Tiernan is the weir camp technical advisor. They will provide oversight, logistical, and technical support for weir operations.

GOAL

The primary goal of the KMA weir projects is to enumerate and characterize salmon escapements. Weir counts are critical for the management of commercial salmon fisheries in the KMA. Escapement information provides the basis for ensuring biological integrity and is the foundation for inseason management actions that regulate commercial, sport, and subsistence harvest of salmon. When weir counts are not available, foot surveys and aerial surveys, from fixed winged aircraft, are used to estimate salmon escapement and manage the fisheries.

OBJECTIVES

1. Enumerate adult salmon escapement through the weir and estimate salmon abundance below the weir in rivers, lagoons and bays.
2. Monitor and collect accurate data on escapement quality, including the number of net-marked and "jack" (salmon $\leq$400 mm mid eye to tail fork) sockeye salmon.
3. Collect and maintain accurate age, sex, length (ASL) data for sockeye salmon, including collection of scale samples that are representative of salmon escapements.

METHODS AND PROCEDURES

OPENING CAMP

Gather necessary equipment from the ADF&G warehouse prior to departure (Table 1). Upon arrival at camp, the first day of work will consist of opening the field camp facility, organizing, storing supplies and personal gear, setting up the single sideband (SSB) radio and satellite phone, and preparing the necessary gear and equipment for weir installation. Weir installation will normally occur after the field cabin has been readied.

WEIR INSTALLATION

Refer to Appendix A for weir operations specific to individual camps.

The following list describes procedures relevant to all camps:

- Move tripods from their staged location into the river and evenly space them across the river.

- Line up and square the tripods perpendicular to the river flow.
- Fine tune tripod spacing and leveling. Level each tripod by digging under the highest rear leg to level it out. Leveled tripods make it easier to install and level the boardwalk.
- Install the entire boardwalk shiplap on the posterior portion of the tripod arms; do not nail boardwalk down until it is all leveled. Start at one end of the weir, laying a 2” x 12” x 14’ board across the first set of tripod arms and ensuring it rests on the next consecutive tripod arm. Continue laying out the boardwalk the length of the weir.
- Level the boardwalk with spacers or leveling blocks nailed to the tripod arm, and fine tune the straightness of the boardwalk. Toenail the boardwalk to tripod arms and toenail the boards that overlap one another together with 16d duplex nails. Make sure the end of each individual board rests on a tripod arm.
- Place large rocks or sandbags on each tripod platform to weigh them down.
- Install upper and lower stringers in an alternating pattern across all tripods and extending to the riverbanks on both ends of the weir.
- Begin installing weir panels. Lay each panel flat against the stringers with the base of the panel up off the riverbed approximately 10 inches. Rake and dig a channel in the river bottom to set the panel into. Once a channel is dug, set the panel into the channel and make sure it is straight and level. Next, backfill the channel with stream gravel and rock to ensure it is fish tight. Continue setting weir panels the length of the weir.
- Install counting gate frames along with your weir panels. Determine counting gate locations based on stream depth and river flow. Install gate frames where water flow is greater and depth is adequate for fish passage.
- Tie off all of the weir panels to the upper and lower stringer with seine twine or cable ties.
- Install flash panels in front of and against each counting gate on the river bottom and weigh down with large rocks or sandbags.
- Inspect your work. Walk along the front of the weir backfilling the base of panels with gravel where necessary to ensure the weir is fish tight.
- Install fish trap (Figure 3).
- Install “keep off weir” signs at either side of the weir.

WEIR OPERATION

Refer to Appendix A for weir operations specific to individual camps.

The following list describes procedures relevant to all camps:

- Monitor weirs throughout the day to pass fish. The crew leader will organize a schedule.
- If you don’t have experience identifying fish, your crew leader will train you to visually recognize the different salmon species and their swimming patterns.
- Open a gate and begin counting fish with hand-held tally counters, one tally counter 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.

- If a counting gate will not open, it is probably locked up by gravel or a rock wedged into the framework. Do not attempt to force the gate, or the entire framework may pull out of place along with the flash panel. Free up the gate by inspecting for wedged rock or gravel and removing it with your fingers or a fish pew.
- 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.
- Periodically check your tally counters to ensure they are working properly.
- When you are done counting make sure the counting gate is closed completely. Then write your numbers down on the dry erase board upon entering the cabin or tent.

WEIR MAINTENANCE

Refer to Appendix A for weir operations specific to individual camps.

The following list describes procedures relevant to all camps:

- When out on the weir, be very careful not to injure yourself.
- The weir must be cleaned and inspected daily. Debris build up on the weir may cause poor water flow, leading to scouring at the base of weir panels and weir washout during periods of high water.
- Cleaning the weir includes getting into the river to remove sticks, logs, leaves, grass, gravel and fish carcasses.
- Throw all debris downstream of the weir, allowing it to flow down river.
- Inspect the weir to ensure it is fish tight, look for scoured holes, panels out of place, gaps that are too large between panels, sandbags that have been pushed off of tripods by bears, and make sure flash panels are secure and in place, as well as clean.
- Make sure the framework of the weir is sound and secure. If you find any of the boardwalks loose, any section or parts of the weir broken by bears or that are unsafe, repair it immediately.
- If water levels increase considerably you may need to pull weir panels to avoid a weir wash out. *Note when panels are pulled, an estimate of the number of salmon behind the weir at the time of pulling panels, and an estimate of what may have escaped through while panels were pulled should be documented.
- Keep bears away and off of the weir as much as possible to minimize damage. Follow camp protocol for bear determent.

WEIR REMOVAL

Refer to Appendix A for weir operations specific to individual camps.

The following list describes procedures relevant to all camps:

- Remove counting seats and "keep off weir" signs.

- Cut and remove all seine twine or cable ties attaching the weir panels to the upper and lower stringers.
- Remove all weir panels, counting gates, and flash panels, and place them on the rear of the tripods. Place half of all weir panels, gates, and flash panels at staging locations on either side of the river.
- Remove all upper and lower stringers and store in appropriate staging location.
- Remove all duplex nails securing the boardwalk, then move all sections of the boardwalk and store in appropriate staging location.
- Remove all sandbags from tripods and place half of them on one side of the river bank and the other half on the other side of the river bank.
- Remove half of all tripods and stage on one side of the river; remove the other half and stage on the opposite side of the river.
- Remove all sandbags from the river.
- Stage weir materials in a location far enough from the bank of the river to avoid damage from flooding and ice movement during spring break-up.
- Remove all trash and bring to town (chewed up buoys, burned trash, old fuel buckets, etc.).

ESCAPEMENT SAMPLING

In most camps, sockeye salmon ASL sampling is conducted at a rate of 240 fish per statistical week (Saturday through Friday). Ideally, 80 samples are collected each Monday, Wednesday, and Friday. If it is obvious to the crew leader that following this strategy will result in failure to obtain the desired 240-sample size per week, adjustments should be made. Before the field season begins the KMA salmon research staff will provide field crews a salmon escapement sampling operational plan (Foster 2011). Refer to this plan for sampling guidelines and procedures. Ask a weir camp project supervisor if you have any sampling questions.

CREW LEADER RESPONSIBILITIES

Crew leaders are responsible for training new employees, establishing work schedules, prioritizing daily work assignments, and supervising camp duties. The crew leader will ensure safety is a priority and collect accurate, complete, and well organized data.

Daily Radio Schedule

The previous day's counts and cumulative salmon escapement information will be reported each morning at approximately 8:10 AM on single side band (SSB) frequency 3.230 MHz (Table 1) to the Kodiak ADF&G office. A second radio schedule will be at 4:30 PM on SSB. The evening schedule is intended to check on field personnel, discuss salmon escapement and build up, pass along short lists of supply requests, and receive the latest commercial fishery announcements. Radio schedules are very important, and must be taken seriously. Failure to make two consecutive radio schedules may result in a flight to the camp to ensure the safety of the crew. Advise your supervisor if you plan to miss a radio schedule. Keep your SSB battery charged and have spare fuses available.

Use the satellite phone if the radio will not operate. **You may contact someone at the Kodiak ADF&G during normal working hours (M-F 8:00AM–4:30PM) on SSB frequency 3.230 MHz. The satellite dispatch phone may also be used for communicating with the office when SSB reception is poor.** Refer to Appendix B for satellite phone and dispatch instructions and Appendix C for instructions on operating your electrical system.

Forms

The crew leader will fill out a weekly weir camp report (Figure 4) and a daily crew leader report (Figure 5). The weekly weir camp report includes weather and daily escapement data that occurred during the past week. The daily crew leader report will keep the project supervisor informed of fish estimates, conflicts with crew or public, and the duties accomplished during the past two weeks. In addition, any items that were sent to the office and any items that were not received on the most recent supply flight will be recorded. All paperwork is to be sent to the office on resupply flights.

Time Sheets and Leave

Crew leaders are responsible for keeping an accurate record of each employee's work hours. Each employee will fill out a timesheet on the 15th and the last day of each month (Figure 6). Most projects can be finished within normal working hours; however, there may be occasions when the normal working day (7.5 hours) is insufficient to complete the necessary tasks. **If unusual circumstances arise that require additional overtime, the crew leader must notify the project leader immediately.** Send in signed timesheets with resupply flights. **Complete timesheets in PEN only (blue ink if available)**. **If you cross out anything on your timesheet you must initial by where you crossed it out.**

Data Management

It is imperative that measurements be accurate and data be recorded properly. Forms and samples should be complete, correct, and neat. It is the crew leader's responsibility to keep a daily log that includes a record of weather, water temperature, stream depth (recorded at 7:55 AM), water conditions, work accomplished, escapement counts, and survey notes. Additional entries should include comments related to fishing activity, bear and people encounters, smolt migrations, weir problems, regulation violations, cabin maintenance, and aircraft traffic.

Camp Inventory and Closing Camp

Each camp will be inventoried for all gear, supplies and fuels that remain on site prior to camp close-up. Winterizing the cabin should include (but is not limited to) covering windows, covering and insulating propane connections, closing and locking all doors, winterizing all motorized equipment, and chaining and locking boats in a secure location. See Tables 2,3, and 4 for examples of a weir camp closing inventory and a camp closing checklist.

ADDITIONAL GUIDELINES AND PROCEDURES

Refer to SOP III-720 for Field Camp Safety procedures.

Camp Policies

- The use of alcoholic beverages <u>while on duty</u> will be grounds for dismissal. **The use of illegal drugs will be grounds for dismissal.** For more information on possession and use of alcohol, refer to SOP II-071 and SOP III-700

- All ADF&G employees are required to act in a professional manner at all times and be especially courteous to the public.
- **Injuries and loss or damage of state equipment must be reported to the project supervisor within 24 hours.**

Ordering Food and Supplies

Field crews will purchase necessary items prior to leaving Kodiak and may also request items (e.g., groceries, supplies and equipment) while in the field. Crews will only purchase items authorized by the project leader. Grocery and supply flights are scheduled twice a month. Grocery orders for 2 weeks out will need to be sent in on the backhaul of the last grocery flight. **(i.e. your grocery order will need to be sent in 2 weeks early)**. You can always add items to the list at a later time before the supply flight. Order enough food to eat healthy, but be reasonable. If grocery orders become unreasonable, less expensive items will be substituted. Grocery and supply orders must be in the Kodiak office at least one week prior to the scheduled flight. Grocery forms/ordering lists are provided to keep track of needed items.

Alcoholic beverages, personal grooming supplies, newspapers, magazines, and tobacco must be purchased with personal funds. Personal funds may be left with the logistics leader who will put the funds in a secure location until requested for use in purchasing personal items.

Visitors/Public Interaction

Weir sites often receive many visitors that come by the camp to see bears and watch fish passing through the weir. Keep the camp clean and be courteous and helpful to visitors, but also inform them of the boundaries. The general public is not allowed to access the weir. Make sure "keep off weir" signs are posted in visible locations at both ends of the weir. In addition to those signs make sure to install the "no sport fishing" signs 100 yards upstream and downstream of the weir. Remember, your primary role is to operate and maintain the weir and accomplish the associated responsibilities of the project.

Firearms

All field camp employees must be able to safely use firearms. A state owned shotgun will be provided at each camp. Training on safe handling and shooting of firearms will be conducted for all personnel. Load firearms only when working, traveling, or camping in bear country or when firing for practice. Load a round into the chamber only when confrontation with a bear is imminent. **Anyone handling a firearm should always treat it as if it is loaded.** Guns should be cleaned frequently, especially after being fired. Make certain that firearms are completely unloaded while doing so. Firearms will be stored on site in a location out of reach of the public. **Misuse of firearms will not be tolerated and may be cause for immediate dismissal**. Always unload a firearm of all ammunition before boarding a vessel or aircraft. Ammunition should be stored in a cool place in a waterproof container to avoid corrosion. For more information on bear safety, refer to SOP III-780.

Bears

Weir camps have high concentrations of bears. Do not antagonize bears and make every attempt to coexist with them. Each bear is a potential danger. Do not attract bears by leaving food or unburned garbage around. Make sure you burn trash completely and maintain a clean camp. If you are having problems with a particular bear notify your supervisor. When attempting to

frighten a bear away by shooting, shoot away from the bear because you may inadvertently wound it. Do not shoot a bear unless, in your best judgment, it is endangering someone's life. Do not shoot unless it is absolutely necessary. If a bear is shot, notify your project supervisor immediately. If a bear hangs around or on the weir and will not leave, cracker shells can be loaded and shot in the approximate direction of bears, but **NOT at the bears.** Rocks may also be used at your discretion, keeping in mind that a bear is a potential danger. For more information on bear safety, refer to SOP III-780 and SOP III-720.

Garbage

Burn garbage completely to prevent bear problems. Do not burn during windy or dry weather conditions. The U.S. Fish and Wildlife Service prohibits garbage pits on the Refuge. Never start fires with fuel. To prevent grass fires keep grass and brush trimmed at least fifteen feet away from the burn barrel. 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.

Burn tin cans along with burnable garbage. Burning cans eliminates residual food and odors that attract bears. Send in burnt cans and non-burnable items on supply flights. All garbage must be double bagged. Empty fuel containers should also be sent in as soon as possible on return grocery flights for immediate recycling.

Use a slop bucket for biodegradable garbage (food scraps, etc.) that is dumped away from camp either in the river or bay. Don't compost food because it attracts bears.

Fire and First Aid Safety

All crew members will attend a mandatory CPR and First Aid training course prior to going to the field. Ensure a fully stocked first aid kit and fully charged, operational 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. (**Install new batteries at the beginning of each season).** Refer to SOP III-700 and SOP III-720 for more information regarding safety and first aid.

Drinking Water

Stream and lake water may be contaminated with bacteria or harmful parasites. "Micron" water filters are provided in field camps 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.

Boating and ATVs

Refer to SOP III-740 for Boating Safety protocol.

Some camps are furnished with boats or ATV's. They have been provided to transport materials, supplies, and equipment between campsites and supply planes or vessels. They may be used for transportation to and from assigned field duties such as surveys, fishery monitoring, or collecting harvest information. They are not intended for personal use or recreational purposes. Boats and ATVs may be accessed and operated only by trained ADF&G personnel and will be secured when not in use. Be safety conscious at all times; do not speed or drive recklessly.

All personnel must wear United States Coast Guard (U.S.C.G.) approved Personal Flotation Devices (life jacket, float coat, or exposure suit) at all times when operating boats. If you suspect conditions may be dangerously rough, don't go out on the water. A waterproof Emergency Positioning Indicator Radio Beacon (EPIRB), a flare kit and a tool kit (including wrenches, pliers, screw drivers, spare spark plugs, and spark plug wrench) must be in the boat or raft at all times. If you must travel at night, carry a flashlight. Know how to activate your EPIRB; check the battery power and expiration date.

Unauthorized use of an ADF&G ATV or boat will result in a notation on your evaluation, and the discontinuation of ATV or boat use at your field station, or your dismissal from employment.

- Only state employees may use ADF&G vehicles, ATVs, and boats.
- Only one employee may ride on an ATV at a time.
- A safety helmet must always be worn when riding an ATV.

Equipment Maintenance

Outboard motors and generators must be kept in good operating condition and require regular maintenance. At the end of each season, equipment should be tagged with a description of the equipment's condition and most recent maintenance on the tag. All equipment returning to Kodiak is stored at the warehouse in the salmon management locker or the salmon management trailer van behind the warehouse. See Appendix D for instructions on operation and maintenance of outboards and generators.

Maintenance and Cleanliness of Cabins and Outbuildings

Cabin and facility maintenance is an important aspect of camp life; the buildings must be kept clean, structurally sound, and safe. Make a list of projects and repairs that need to be accomplished during the season. Send in a list of materials needed for these projects/repairs. Order supplies in advance. Repairs and maintenance should be scheduled on days when fish migrations are slow to keep this work within normal work periods.

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. Any violation will be recorded on your evaluation and may be cause for immediate dismissal. Refer to SOP II-040.

Basic Procedures Regarding Violations

ADF&G field personnel have a responsibility to be aware of and report violations of state or federal fishing and hunting regulations. The following is a guideline for obtaining the appropriate information and/or evidence to prove that a violation has been committed. If a violation is seen, all pertinent information pertaining to the violation should be recorded immediately, retained by the employee, and the project leader must be notified. A copy of each regulation book should be available in camp.

The use of the following five W's 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?

Interview all witnesses to a violation and record statements pertaining to the violation along with witnesses' names and addresses. If you have a camera, record as much as possible on film. Always carry your camera if you suspect you may encounter a violation. Collect as much information and evidence as possible and immediately contact your supervisor or a State Trooper from the Alaska Wildlife Troopers (AWT). (907) 486-4121.

If the violator refuses to cooperate with an employee without enforcement authority, no action should be taken, other than to relay all information and evidence collected to an AWT officer as soon as possible.

Personal Injury

Personal injury poses the greatest risk to personnel. In the event of major medical emergencies access to adequate care is limited due to the remote location of the facility. For minor injuries, first aid kits are located in the cabin. **In the event that you injure yourself, fill out an injury report as soon as possible and give to your supervisor.** For emergencies or injuries that require professional medical attention contact the U.S.C.G. (1-800-478-5555 or VHF channel 16) or refer to Table 1.

Emergencies

In the event of a medical emergency, administer first aid to stabilize the situation. If an injury is life threatening, immediately notify the US Coast Guard at their Search and Rescue Emergency phone number **1-800-478-5555** on the satellite phone. The US Coast Guard can also be reached on SSB radio frequency 4.125 MHz or on VHF channel 16.

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

- Location of your field camp or specific location of the emergency (Table 1);
- Name and phone number of supervisor;
- General nature of medical emergency;
- 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.

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Dinnocenzo, J. 2011. Kodiak management area harvest strategy for the 2011 commercial salmon fishery. Alaska Department of Fish and Game, Fishery Management Report No. 11-18, Anchorage.

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Nemeth, M. J., M. J. Witteveen, M. B. Foster, H. Finkle, J. W. Erickson, J. S. Schmidt, S. J. Fleischman, and D. Tracy. 2010. Review of escapement goals in 2010 for salmon stacks in the Kodiak Management Area, Alaska. Alaska department of Fish and Game, Fishery Manuscript Series No. 10-09, Anchorage.

TABLES AND FIGURES

Table 1.–Emergency Numbers, Radio Frequency and Camp GPS coordinates.

Contact	Phone Number	Radio Frequency	Other Frequencies
US Coast Guard	800-478-5555	SSB freq. 4.125 MHz	VHF channel 16
ADFG Office	486-1830 or 486-1825	SSB freq. 3.230 MHz (WON	2.450 MHz, 4.125 MHz
State Troopers	486-4121		

ADFG Staff	Phone Number
James Jackson	(w) 486-1808, (h) 486-2480, (c) 539-2097
Joe Dinnocenzo	(w) 486-1807, (h) 486-5014, (c) 942-5014
Geoff Spalinger	(w) 486-1804, (h) 486-5582, (c) 952-567-1420
Aaron Tiernan	(w) 486-1810, (c) 978-855-0990

Camps	GPS Coordinates	SSB Radio Call Sign
Ayakulik	57° 11.60' N. Lat., 154° 31.39' W. Long	WQF 466
Karluk	57° 33.89' N. Lat., 154° 22.85' W. Long	WNJI 929
Upper Station	57° 03.33' N. Lat., 154° 21.17' W. Long	WNJI 929
Dog Salmon	57° 07.75' N. Lat., 154° 00.10' W. Long	WNJI 929

Table 2.–Equipment and supply list.

Field equipment for the commercial fisheries salmon management weir and field projects is stored at the ADF&G warehouse on Rezanof Drive.

Tent - If needed.

Visqueen or tarp - Use for tent ground cloth and to keep equipment and supplies covered when you arrive or depart from field camp.

Raft - Make sure proper floorboards, pump-hose, oars, drain plug, and patch kit are included. Assemble and inflate raft and check for leaks. Make sure you secure extra raft chamber valves.

Outboard motor - Change lower end unit lube at the start of the season. Bring spare spark plugs, lower end lube, fuel hose, and fuel filters. Make sure you have the proper fuel hose and tank for your motor. Don't forget 2-cycle or 4-cycle oil for the motors, as appropriate. Gas tanks are stored in the fuel shed.

Cook stove & hose - If needed, check to ensure it works. Propane tanks are in the fuel shed at the warehouse.

Cooler - If needed.

Lantern - Remember to purchase lantern fuel and extra mantles. Make sure it works.

SSB radio - Make sure the radio suitcase contains the black coaxial cable, 12-volt power cable, antenna (3.230 MHz frequency) and spare fuses.

Satellite Phone - Make sure battery is good and that the phone is activated.

Communications - Handheld VHF radios plus an extra set of AA batteries.

12 Volt battery - Make sure to charge battery; battery testers are available at the office or the warehouse (battery must be transported in a case).

Solar panel - Check wires and connections.

Boat kit - A Rubbermaid tote should include: Lower end lube, fuel filters, hose connectors, hose clamps, seine twine, tool kit, outboard oil, cable ties, metal wire, fuel pump diaphragms and a flare kit.

Propane - Make sure propane tanks are full.

Stove oil - Use only #1 heating oil.

Outboard gas tank, hose, oil & gas - Be sure to know the correct mixture of your motor. Take at least 3 containers of gas, preferably one tank and two 5-gallon containers.

Firearm & cleaning kit - Shotguns, ammunition, and gun cases are available at the office; check with a project supervisor. Know how to clean, load, and carry the firearm safely.

Emergency/ safety equipment - EPIRB, rescue light, first aid kit, mustang suit or float coat.

Groceries - Purchase sufficient groceries for approximately two weeks, plus some extra quick meals in case supply flights are delayed. **When selecting groceries, consider the weight and bulk of your items, as space is limited on flights.**

-continued-

Table 2.–Page 2 of 2.

Paperwork - Paperwork located in camp boxes in ADF&G office for your camp.

Personal gear - Warm clothes, sleeping bag & pad, books and any other hobbies you may want to work on.

Sampling gear - Scale cards, write in the rain books, polarized glasses, gloves, waders, wading boots and rain gear. Also a computer and and RDA will be provided for sampling purposes only.

At the end of the field season, please make sure all equipment from your camp is put away properly and in the correct place. If you choose to return next season, this may again be your gear. A few items such as lanterns, SSB radios, and 12-volt batteries probably will be shared with the herring camps.

Table 3.–Example of a weir camp closing inventory.

WEIR CAMP CLOSING INVENTORY

Weir Camp: Karluk

Date 9/2008

# item	Location
1 Stihl chainsaw	Shed
1 DeWalt tool set	Town warehouse
1 Skillsaw	Shed
1 Ratchet set	Shed
1 Stihl weed-eater	Shed
2 Flashlights	Attic
2 Headlamps	Attic
1 Shotgun cleaning kit	Storage bench
1 First aid kit	Town warehouse
3 Extension cords	Shed
2 Come alongs	Shed
3 Shovels	Shed
2 Rakes	Shed
3 Pews	Shed
2 4' levels	Shed
2 Hammers	Shed
1 Toolbox	Shed
1 5 gal. Gasoline	Shed
1 5 gal. Stove oil	Shed
1 100 lb. Propane tank (1/3 full)	Shed
1 40lb. Propane tank (1/2 full)	Shed
2 Handheld VHF's	Town warehouse
Need for next season	
100lb. Propane tank (full)	
15 gal. Gasoline	
15 gal. Stove oil	
New headlamps	
Garbage can	

Table 4.–Camp closing checklist.

Camp chores (Depending on field camp)

Box/store food
Clean stove
Clean behind stove
Clean refrigerator-defrost and block door open
Mop floor
Make sure coax cable is secure
Disconnect propane lines and tape ends
Make a pile of gear to return to town
Clean ashes out of wood stoves
Spray tools with WD-40
Winterize outboard-if not brought to town
Store gas jugs in shed
Flip outhouse and cover hole
Lock and chain skiffs that remain onsite
Make sure batteries are properly hooked up to solar panels for an overwinter charge
Place mothballs in each room
Store all tools
Clean up burn pit
Board windows
Board shed door shut
Cover Chimneys with buckets

Items to bring to town

Radios-SSB and VHF
Shotgun
Satellite phone
First aid kit
Outboard motor-depending on camp
Generator-depending on camp
Solar panels-Karluk only
Rafts (if any)

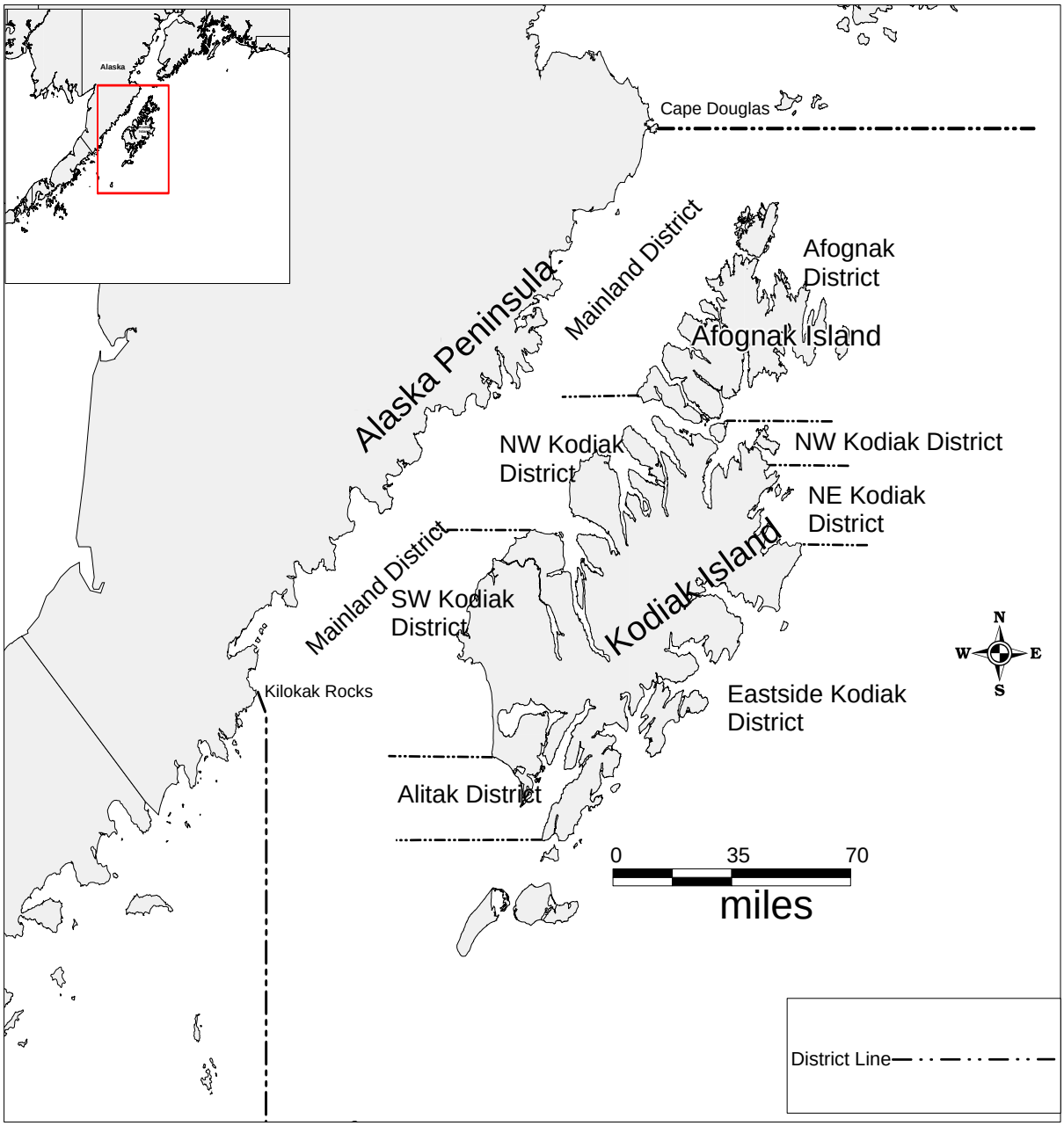

Figure 1.–Map depicting the Kodiak Salmon Management Area.

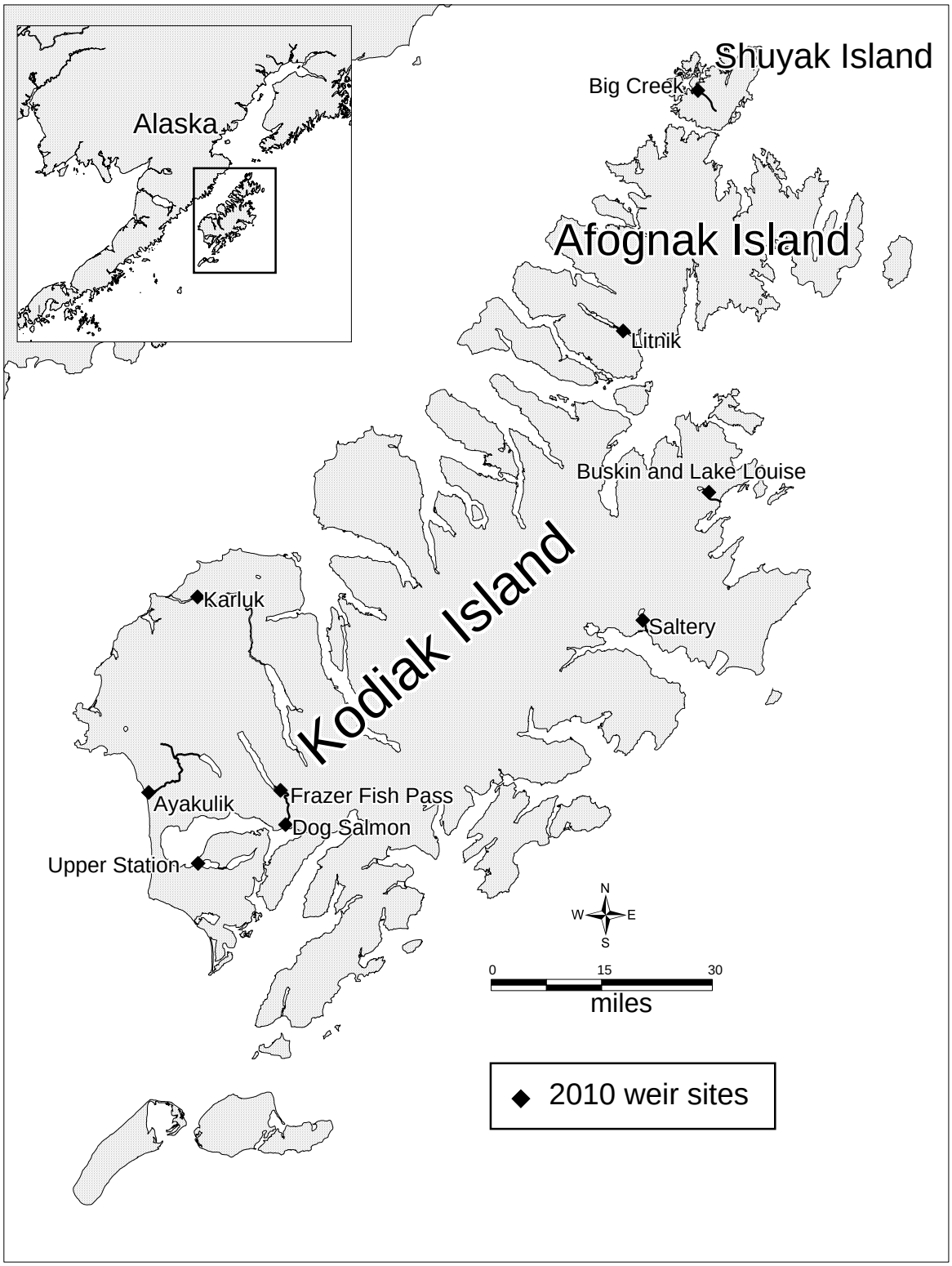

Figure 2.–Map depicting the Kodiak Management Area weir locations operated in 2010.

Figure 3.–Picture of weir trap setup.

ALASKA DEPARTMENT OF FISH AND GAME
KODIAK MANAGEMENT AREA
WEEKLY SALMON WEIR CAMP REPORT FOR YEAR: 2005

Location: Ayakulik Personnel: Chiles/Reid Weekly Report no: 7 For Week Ending Saturday: July 7

Date	Daily Total Salmon Escapement						Daily Totals	Steelhead		Jack No.	Jack % Sockeye	Net Mark Sockeye	Reds Sampled	Dollys up	H_2O Level	H_2O Temp.	Weather		
	Sockeye	L. Sockeye	Chinook	Pink	Coho	Chum		Down	Up								Ceiling	Vis.	Wind Dir/Sp
Sun. D	296		56	0	0	0	352	0	0	20	6.8	4	0	12	13	7.5	2,000 solid	5	SE 15-20
7/1 C	213,789		6,211	0	0	0	220000	697	0	4,256	2.0	675		623			Rain		
Mon. D	26		100	0	0	0	126	0	0	0	0.0	1	80	36	13.5	7.5	1,000 Solid	3-5	E 10-15
7/2 C	213,815		6,311	0	0	0	220126	697	0	4,256	2.0	676		659			RDF		
Tue. D	569		29	0	0	0	598	0	0	102	17.9	15	0	50	13.5	7.5	500 Solid	1-2	NE 20-25
7/3 C	214,384		6,340	0	0	0	220724	697	0	4,358	2.0	691		709			RDF		
Wed. D	2,326		39	0	0	0	2365	0	0	156	6.7	30	80	106	14	7.5	CAVU		SW 5-10
7/4 C	216,710		6,379	0	0	0	223089	697	0	4,514	2.1	721		815					
Thur. D	781		212	0	0	0	993	0	0	68	8.7	24	0	26	14	8	CAVU		Calm
7/5 C	217,491		6,591	0	0	0	224082	697	0	4,582	2.1	745		841					
Fri. D	105		62	0	0	0	167	0	0	9	8.6	5	80	16	13.5	8	4,000	Unl.	W 15
7/6 C	217,596		6,653	0	0	0	224249	697	0	4,591	2.1	750		857					
Sat. D	265		106	0	0	0	371	0	0	18	6.8	9	0	93	13.5	8	4,000	Unl.	SW 15-25
7/7 C	217,861		6,759	0	0	0	224620	697	0	4,609	2.1	759		950					
Total for week	4,368		604				4,972			373		88	240	339					

Additional Comments: Bear and people problems, smolt migration, weir problems, estimated escapements, cabin repair, etc.

1-Jul Approximately 2,000 Sockeye in lagoon

2-Jul No additional build up in lagoon, small numbers of jumpers off mouth

3-Jul Found hole in Weir in the morning, Estimate of 200 Sockeye included in escapment counts

4-Jul Lots of rafters today, fishing is slow upriver

5-Jul Approximately 500 Sockeye in lagoon

6-Jul New sow with cubs trying to fish behind weir, respond well to yelling

7-Jul Lots of jumpers off the mouth, looks some pinks starting to jump as well

***Note** Daily sockeye jack counts must be included in the overall daily count

Figure 4.–Weekly weir camp reporting form.

Weir Camp: Ayakulik		Project Biologist: Geoff Spalinger						
Time Period for Report: May 1-May 14								
Date:	Weir was fish tight? yes		Hrs. compromised between:					
	If not why?		Estimated escapement through by species:					
	Survey:	Kings	Reds	Pink	Coho	Chum	Time	Turbidity
	Quality:		500	20	2	1	5:25pm	clear
	Describe where fish were seen:				Ceiling	Visibility	Wind dr/sp	
	In banya hole				3k broken	Unlimited	Calm	
Date:	Weir was fish tight?		Hrs. compromised between:					
	If not why?		Estimated escapement through by species:					
	Survey:	Kings	Reds	Pink	Coho	Chum	Time	Turbidity
	Quality:							
	Describe where fish were seen:				Ceiling	Visibility	Wind dr/sp	
Date:	Weir was fish tight?		Hrs. compromised between:					
	If not why?		Estimated escapement through by species:					
	Survey:	Kings	Reds	Pink	Coho	Chum	Time	Turbidity
	Quality:							
	Describe where fish were seen:				Ceiling	Visibility	Wind dr/sp	
Date:	Weir was fish tight?		Hrs. compromised between:					
	If not why?		Estimated escapement through by species:					
	Survey:	Kings	Reds	Pink	Coho	Chum	Time	Turbidity
	Quality:							
	Describe where fish were seen:				Ceiling	Visibility	Wind dr/sp	
Date:	Weir was fish tight?		Hrs. compromised between:					
	If not why?		Estimated escapement through by species:					
	Survey:	Kings	Reds	Pink	Coho	Chum	Time	Turbidity
	Quality:							
	Describe where fish were seen:				Ceiling	Visibility	Wind dr/sp	

Figure 5.–Daily crew leader report.

ALASKA DEPARTMENT OF FISH AND GAME Time and Attendance Report

Pay period ending: 2/15/2006 SSN: _____ Name: _____ 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.

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
Wed	2/1	8:00	12:00	13:00	16:30												7.50				**0.00**	**7.50**
Thu	2/2	8:00	12:00	13:00	16:30												7.50				**0.00**	**7.50**
Fri	2/3	8:00	12:00	13:00	16:30												7.50				**0.00**	**7.50**
Sat	2/4	8:00	10:30														2.50				**0.00**	**2.50**
Sun	2/5	8:00	10:30														2.50				**0.00**	**2.50**
Mon	2/6	8:00	12:00	13:00	16:30												7.50				**0.00**	**7.50**
Tue	2/7	8:00	12:00	13:00	16:30												7.50				**0.00**	**7.50**
Wed	2/8	8:00	12:00	13:00	16:30												7.50				**0.00**	**7.50**
Thu	2/9	8:00	12:00	13:00	16:30												7.50				**0.00**	**7.50**
Fri	2/10	8:00	12:00	13:00	16:30												7.50				**0.00**	**7.50**
Sat	2/11	8:00	10:30														2.50				**0.00**	**2.50**
Sun	2/12	8:00	10:30														2.50				**0.00**	**2.50**
Mon	2/13	8:00	12:00	13:00	16:30												7.50				**0.00**	**7.50**
Tue	2/14	8:00	12:00	13:00	16:30												7.50				**0.00**	**7.50**
Wed	2/15	8:00	12:00	13:00	16:30												7.50				**0.00**	**7.50**
																					0.00	**0.00**
TOTALS															0.00	0.00	92.50	0.00	0.00	0.00	0.00	92.50

	Charge to:		
	Notation	CC/LC	%
1			100%
2			
3			
4			
		Total	100%

	Comments		Comments
2/1		2/9	
2/2		2/10	
2/3		2/11	
2/4		2/12	
2/5		2/13	
2/6		2/14	
2/7		2/15	
2/8			

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

_____ **Date:** _____
Employee's Signature

_____ **Date:** _____
Supervisor's Signature

_____ **Date:** _____
Approving Officer Signature

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	0.00	11104444-11104444

USE PEN ONLY.

Figure 6.–Timesheet example.

APPENDIX A. WEIR CAMPS

The Karluk weir is approximately 101 m (330 ft) long and is located about 1.3 km (0.8 mi) upstream from the confluence of Karluk River and Karluk Lagoon on the southwest side of Kodiak Island (Figure 1). The weir was first constructed in 1921 at its current location and was operated annually here until 1941. The weir was moved to "the portage," approximately 12.9 km (8 mi) down river from the Karluk Lake outlet from 1942 to 1945. Between 1946 and 1975 it was operated at the outlet of Karluk Lake. It was re-established at its present location in 1976.

Opening Camp

- Obtain keys from your project supervisor.
- Equipment and tools for the Karluk weir are stored in the ADF&G warehouse and labeled.
- Batteries and solar panels are stored at the ADF&G warehouse in the salmon locker.
- Fuels needed for this camp include: propane, #1 heating oil, unleaded gasoline, two-cycle oil for the survey boat, and 10W-30 motor oil for the generator. Talk to your project supervisor to determine how much fuel is needed.
- Weir personnel will be transported to the float plane landing in the upper lagoon and then will hike to the cabin to obtain the survey skiff and canoe. All gear and supplies are moved to the cabin and weir site with the canoe after securing the survey skiff at the skiff landing.
- The cabin consists of a 2-story, 16' x 20' cabin with refrigerator and light propane connections, an outhouse and a banya.
- There is no water supply to the cabin. Water is obtained from the river or rain bucket and filtered. It is wise to store water early due to the load of pink salmon carcasses that will pollute the water later in the season and make water gathering more complicated. Water can also be obtained from the small creek that is across from the cabin on the other bank.
- Banya and outhouse are located in close proximity to the cabin. Wood for heating the banya is obtained from the beach at the outlet of Karluk Lagoon.
- The stairway from the edge of the bluff to the riverbank needs to be repaired and installed each spring.

Weir Installation

- The 2011 weir will be placed in the same location as in 2010, directly in front of the cabin. The Karluk weir is a conventional wooden tripod weir. This weir also utilizes a section of floating weir panel that serves as a raft gate to allow rafters to pass down river and to flush out mass amounts of spawned out salmon. The boardwalk for the weir consists of 2" x 12" x 14' boards and is staged between the cabin and banya.
- Weigh tripods down with large rocks from the riverbed or sandbags.
- Install five to six counting gates accompanied by flash panels. More may be required on even years.
- Secure and tie off weir panels to the upper and lower stringers with seine twine.
- Install adult sampling trap and steelhead trap (Figure 3).

-continued-

Weir Maintenance

- The weir is cleaned and inspected for scouring and holes every morning and cleaned throughout the day as necessary.
- The debris load is usually heavy after moderate to heavy rainfall and may increase later in the season especially on large pink salmon years.
- Pull some weir panels during high water events; when the river begins to cloud up, when debris build-up increases significantly, and when the water level covers the indicator rock located 10 yards upstream of the weir. This will prevent from the weir washing out. Estimate the number of fish and species past the weir when not fish tight.

Miscellaneous

- Install "No Sport Fishing" regulatory markers 100 yards upstream and downstream from the weir.
- Make repairs, and maintain buildings and grounds surrounding the cabin and banya. Trim the grass along the trail to the boat landing. At season's end, cut a trail and an area large enough to stage tripods behind the banya.
- Repair and or maintain the boat and canoe. During the season, the boat is moored at the head of the lagoon.
- Conduct surveys of the lagoon and river when directed by office staff.
- Clean and lime outhouse on a regular basis to help keep bears away.
- The grocery/supply flight arrives on the north shore of the lagoon approximately 0.5 km below the upper lagoon boat landing.
- All tools, gear, and equipment are returned to Kodiak and stored in the warehouse.
- Remove all food from cabin at the end of the season and bring to town bunkhouse.

The Ayakulik weir is approximately 35 m (120 ft) long and is located about 1.3 km (0.8 mi) upstream from the outlet of the Ayakulik River into the Shelikof Strait, on the southwest side of Kodiak Island (Figure 1). A weir was originally constructed on the Ayakulik River in 1929 at the outlet of Red Lake and operated at that location until 1969. The weir has been at its current location since 1970.

Opening Camp

- Assorted tools and equipment for the Ayakulik camp are stored at the ADF&G warehouse.
- Fuels required at this camp include: gasoline, propane and two-cycle oils. Talk to your project supervisor to figure out how much of each you will need prior to going out to your camp.
- Obtain the keys to the cabin from your project supervisor. You will need a cordless drill, claw hammer and an adjustable wrench. The basement of the cabin is locked and nailed shut. The basement must be opened first to obtain a ladder to reach the window on the northeast corner of the cabin.
- Living quarters consist of a one story, 16’ x 20’, single room cabin with half basement and a 16’ x 24’ one story cabin with loft. The “big” cabin has four bunks, a propane refrigerator and cook stove, a gravity fed water system, a wood heating stove, propane and 12-volt lights.
- Propane connections are located in the basement for propane lights, refrigerator and cook stove.
- The banya and outhouse are located adjacent to the cabin. Firewood for heating the cabin and banya is obtained from the beach.
- Water for the gravity fed water system is obtained from the river and hauled to a 55-gallon drum that supplies the kitchen sink.
- The cabin has a 12-volt battery bank charged by solar panels permanently attached to the roof. This 12-volt system powers the SSB radio and VHF base station.

Weir Installation

- The 2011 weir will be placed in the same location as in 2010. The Ayakulik weir is a wooden tripod weir with a 20’ raft gate. The raft gate is stored below the small cabin. The tripods are staged behind the banya as well as the weir panels.
- Weigh down each tripod with large rocks from the river bottom along with sand bags.
- Install four to six counting gates accompanied by flash panels and one fish trap gate.
- Secure the upper portion of weir panels to the upper stringers with seine twine.
- Install the adult and steelhead sampling trap.
- Install the raft gate on the far bank.

Weir Maintenance

- The weir is cleaned and inspected for scouring and holes every morning and cleaned throughout the day as necessary.
- Debris load is usually heavy after moderate to heavy rainfall.

-continued-

Miscellaneous

- Consider pulling the weir panels when you see standing water in the yard and when water in the river begins to cloud up. An indicator rock is located 30 yards downstream from the weir. When the water level covers this rock you should evaluate the situation and consider pulling panels.
- Install "No Sport Fishing" regulatory markers 100 yards upstream and downstream from the weir.
- This camp has a large number of bears that frequent the weir. Do not let them loiter around the camp and weir!
- Make repairs and maintain buildings and grounds surrounding the cabin and banya. Trim grass around buildings, the trail to weir and the boat landing at the lagoon.
- Clean and lime the outhouse on a regular basis.
- Repair and maintain the boat. During the season the boat is anchored on the shore of the river next to the trail by the east lodge.
- Grocery and supply flights land in the lagoon near the lodge and sometimes on the beach.
- At the end of the season the boat is stored next to the cabin with four to six full sandbags on top.
- The 12-volt battery bank remains connected to the solar panel at the end of the season and the switch is to remain in the "on" position.
- Window boards are attached with carriage bolts and the nuts are attached from the inside. You must exit the cabin through the window on the northeast corner. This window must be left open one half inch because it locks from the inside. The board covering this window is attached with two padlocks and two lag bolts.
- All tools, generator, ladder, the old outboard motor, and fuels are stored in the basement; at the end of the season make sure to winterize and fog the outboard engine before storage. The remaining equipment including power tools, new outboard motor (if on site), and chain saw are returned to Kodiak and stored in the warehouse.
- Remove all food from the cabin at the end of the season.
- At the end of the season return the shotgun, SSB radio and antenna, first aid kit, cordless drill, handheld VHF, and logbooks back to Kodiak to store in the warehouse.

The Upper Station weir is approximately 11 m (35 ft) long and is located near the outlet of Olga Creek into upper Olga Bay on the south end of Kodiak Island (Figure 1). The weir was first constructed in 1929 just above the lagoon, approximately 0.23 km (0.14 mi) above its current location, and was operated there until 1969. From 1969 to 1992 the weir was operated near the outlet of lower Olga Lake, then moved to its current location in 1993.

Opening Camp

- Obtain keys to the cabin and the combination to one lock from your weir camp project leader before departing for this camp. You will need a cordless drill with phillips and square-head bits to remove window board screws.
- Fuels needed for this camp include: propane, #1 heating oil, gasoline and two-cycle oil for an outboard engine that is used at the end of the season to move tripods in the metal skiff. Obtain quantity information from your camp supervisor.
- An air charter will transport personnel to Olga Bay. Personnel will then cross the creek in chest waders and install the footbridge across the creek to move gear and supplies to the cabin. The footbridge involves placement of one tripod in the middle of the creek and installing a section of boardwalk from each bank of the river to the tripod.
- Living quarters consist of a one story, 14’ x 24’, cabin. The cabin is wired to operate 12v DC powered lights. An oil stove heats the cabin.
- There is an outbuilding that serves as a one person bunkhouse and banya.
- The master buss bar fuse stored next to the fuse panel needs to be installed prior to operating the 12-volt solar system.
- The SSB radio, VHF, and two 12-volt lights are powered by a bank of five 12-volt batteries located on the deck near the main cabin that are connected to a permanently mounted solar panel on the roof of the cabin.
- Two propane connections for the refrigerator, stove and lights are located behind the cabin.
- Rainwater from the roof collects in plastic garbage cans and feeds the gravity fed water system to the kitchen sink. There is also a pump and hose used to pump water from the creek. There is a filtration container on site for drinking water.

Weir Installation

- The 2011 weir will be placed in the same location as in 2010. The weir is located northwest of the cabin, and downstream approximately 225 yards. There is a boardwalk from the cabin leading to the weir. The beach also gives access to the weir.
- The Upper Station weir is a conventional wooden tripod weir. It has three tripods, one counting gate, and one sampling trap gate.
- Tripods for the weir are staged adjacent to the banya. The tripods are floated downstream to the weir site, and returned to the staging location at the end of the season by tilting them into a metal boat and motoring them back upstream for winter storage.
- Other weir materials are staged on the bluff above the weir site.

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- The bank at the northwest end of the weir needs to be reinforced with a fiberglass tarp approximately seven feet upstream and approximately five feet above the water line before the weir is installed.
- Install the sampling trap on the bluff side of the creek, reasonably close to the creek bank.
- Weigh the tripods down with either sandbags or rocks.
- Secure the upper portion of weir panels to the upper stringers with seine twine.
- Install the debris trap on the upstream side of the footbridge.

Weir Maintenance

- The weir is cleaned and inspected for scouring and holes every morning and cleaned throughout the day as necessary.
- Debris load can be heavy after moderate to heavy rainfall, or after high easterly winds when large amounts of river and lake grass may build up on this weir.
- Consider pulling weir panels during high water, when the water in the river begins to cloud up, when debris build-up increases significantly and when the water level covers the adult salmon trap.

Miscellaneous

- Install "No Sport Fishing" regulatory markers 100 yards upstream and downstream from the weir.
- This camp has a banya for washing. There is a shortage of wood at Upper Station, however wood can be gathered with the skiff at Stintz Bluffs or elsewhere.
- Conduct a visual survey of the bay each morning before radio schedule. It is normally adequate to survey from the shore with binoculars viewing east towards Stintz Bluff and west toward Hook Point.
- Conduct salmon surveys of the stream several times per day. The best technique is to walk the beach side of the river from the mouth to the weir.
- Clean and lime the outhouse on a regular basis. The outhouse hole tends to fill with water at this site no matter where you dig a new hole.
- Grocery and supply flights are normally unloaded on the beach near the footbridge. Weather conditions may force the plane to land at lower Olga Lake. Supplies are transported in a wheelbarrow to the camp.
- The 12-volt battery bank remains connected to solar panels at the end of the season.
- Remove all biodegradable food from the cabin at the end of the season.
- The aluminum workboat is stored next to the tripods after they are staged at the end of the season which is located by the banya.
- Window boards are attached with square head screws.
- At season's end return the shotgun, SSB, SSB antenna, first aid kit, cordless drill, handheld VHF, and logbooks back to Kodiak.

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- Winterize motorized equipment stored on site at the end of the season.
- Clean the rain barrels and water filter at season's end.
- All tools and the generator are stored in the cabin at season's end. Fuels are stored in the fuel shed and remaining gear and equipment is returned to Kodiak and stored in the warehouse.

The Dog Salmon weir consists of three weirs, 38 m (125'), 41 m (135'), and 8 m (25') in length on the three lower forks of the Dog Salmon River, 0.5 km (0.3 mi) upstream of their outlets into Olga Bay on the south end of Kodiak Island (Figure 2). The Dog Salmon River drains from Frazer Lake.

Opening Camp

- Before departing Kodiak for camp, obtain keys from the project supervisor.
- Fuels needed for this camp include: propane, #1 heating oil, gasoline and two-cycle oil.
- **If possible, arrange your arrival time during high tide in Olga Bay**. The air charter can then taxi into the river and drop personnel and supplies on the bank of the east river branch upstream near the trailhead close to the signpost. Have your chest waders handy.
- All tools and motorized equipment are normally stored on site.
- Living quarters consist of a 16’ x 20’ two bedroom cabin with a mudroom entry and a storage and equipment shed attached at the rear. The main cabin has an oil stove, propane and 12-volt lights and is wired for 110-volt service by connecting the three prong 110 plug located in the generator shed to the generator.
- There is an outbuilding that serves as a one person bunkhouse and banya. A wood stove heats the banya. Wood used for burning is obtained from dead trees on site or wood collected on the weir throughout the season.
- A 12-volt battery bank located on the east deck of the cabin powers the SSB and VHF radios, the refrigerator igniter and 12-volt lights. This battery bank is charged by three solar panels permanently mounted to the roof.
- Window shutters are attached with wing nuts screwed to hangar bolts.
- There are three propane connections with regulators located on the west side of the cabin. Each hookup is stored under the cabin on shelving between floor joists. One hookup is for propane lights in the bedrooms, one is for propane lights in the main room and the last hookup is for the refrigerator and cook stove.

Weir Installation

- The 2011 weirs will be placed in the same locations as the 2010 weirs. The east weir is located adjacent to the cabin. The west and far west weirs are approximately one-quarter of a mile from the cabin with trails leading to each weir. The Dog Salmon weirs are conventional wooden tripod weirs and utilize approximately 22 tripods. All weir materials are staged on the bank of their respective weir sites.
- Weigh each tripod down with sandbags.
- The gravel and rock in the riverbed at the east weir tends to scour under panels. Make sure panels are entrenched when this weir is installed.
- Install four counting gates accompanied by flash panels at both the east and west weirs.
- Secure the upper portion of weir panels to the upper stringers with seine twine.
- Install the steelhead trap on the east and west weirs.

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Weir Maintenance

- The weirs are cleaned and inspected for scouring and holes every morning and cleaned throughout the day as necessary.
- Debris load can be heavy after moderate to heavy rainfall or high winds.
- Consider pulling weir panels during high water when the river begins to cloud up, when debris build-up increases significantly or when the water level rises two-thirds of the way up the indicator rock located just behind the west weir.

Miscellaneous

- Install "No Sport Fishing" regulatory markers 100 yards upstream and downstream from the weirs.
- Maintain buildings and grounds surrounding the cabin and banya.
- Keep trail to the boat landing and the west weir mowed to provide good visibility or the surroundings.
- Maintain and make repairs on two boats. The 22 foot boat is moored offshore at the edge of Dog Salmon Flats or to the east of the camp in Iversons Cove. The 16 foot Lund is moored in the river at upper or lower skiff landings, depending on the river water level.
- **Fuel for boats, the generator and motorized equipment as well as propane and #1 heating oil are purchased from the Ocean Beauty tender operating in Olga Bay.**
- Conduct surveys of the river branches and the Dog Salmon Flats Section throughout the day as required.
- Survey the lower East River and the Dog Salmon Flats Section with the small skiff. The West River is surveyed by walking the west riverbank. The prime time to survey is three hours after low tide. Typically, fish move into the river on low tide and tend to move up to the weir on high tide.
- Biodegradables from the slop bucket are to be dumped in the bay.
- Clean and lime outhouse on a regular basis.
- Check and maintain 12-volt battery bank.
- Grocery and supply flights land in the bay on the Dog Salmon Flats. The smaller boat is used to meet the chartered flight and to transport groceries and supplies to the upper boat landing.
- At the end of the season, the large skiff is transported back to Kodiak by tender and the smaller skiff is chained and locked to a cottonwood tree next to the east weir materials staging platform. The outboard motor for the smaller boat is stored in the equipment shed. Make sure to winterize and fog engine before storing for the winter.
- All tools, generator, outboard motor for the smaller boat, ladders and fuels are stored on site at the end of the season. The remaining gear and equipment are returned to Kodiak and are stored in the warehouse.
- Remove all perishable food from cabin at the end of the season and bring back to town.
- The 12-volt battery bank remains connected to solar panel at the end of the season.
- Window boards are attached with wing nuts and washers to hanger bolts mounted at each window.

The Litnik weir is approximately 27 m (88 ft) long and is located about 0.8 km (0.5 mi) above the outlet of the Afognak River, which flows into Afognak Bay, on the south end of Afognak Island (Figure 2). A weir was first constructed in 1921 at a site located approximately 0.64 km (0.4 mi) below the outlet of Afognak Lake, where intermittent weir counts occurred up to 1978, then annually until 1985. In 1986 it was moved to its current location and has been operated there since.

Opening Camp

- Obtain the keys to the cabin from your weir camp project leader.
- Obtain a cordless drill from the warehouse.
- Fuels needed at this camp include: propane, #1 heating oil, gasoline and two-cycle oil.
- The four-wheel ATV is stored at the warehouse.
- Equipment, supplies and the ATV are transported to this camp via the state R/V K-Hi-C.
- Offload equipment, supplies, and the ATV from the R/V K-Hi-C to shore with a skiff at high tide.
- Equipment and tools are stored in the basement and banya.
- The SSB antenna is strung up between the small cabin and the clothesline post. The coax runs along the cabin and into the main cabin through a hole in the wall, to the radio table.
- The main cabin has one propane hookup located outside next to the oil barrel for the refrigerator and propane lights. The rear cabin has one propane hookup for propane lights located along the north side.
- Living quarters consist of a main cabin, 14’ x 16’, and a smaller one-room cabin located directly behind the main cabin. The main cabin has a refrigerator, cook stove and oil heating stove. These cabins are not typically locked up at the end of the season. The Afognak Native Corporation and their employees may use this cabin after ADF&G crew departs in September.
- Drinking water is obtained from the river and filtered for drinking.
- A battery bank consisting of three 12-volt batteries powers the SSB radio. The batteries are charged by solar panels mounted to the roof.

Weir Installation

- The 2011 weir will be placed in the same location as in 2010, directly downstream and adjacent to the main cabin. The weir is a wooden tripod weir with 2" aluminum pipes for upper and lower stringers.
- This Litnik weir uses approximately 10 tripods. Each tripod should be weighted down with large rocks from the river bottom or sand bags.
- Install the adult sampling trap. It is installed approximately 15 feet from the bank closest to the main cabin.
- One counting gate is installed near the center of the weir.
- Secure the upper portion of weir panels to upper stringers with seine twine.

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Weir Maintenance

- The weir is cleaned and inspected for scouring and holes every morning and throughout the day as necessary.
- This weir resists scouring because the river substrate consists of large rocks. Personnel working this weir still need to inspect the weir daily for scouring and holes.
- Debris load tends to be light at this weir. Major debris may develop later in the season consisting of pink salmon carcasses.
- Consider pulling weir panels when the water in the river begins to cloud up, when debris build-up increases significantly and when the water level covers the adult salmon trap.

Miscellaneous

- Install "No Sport Fishing" regulatory markers 100 yards upstream and downstream from the weir.
- Clean and lime the outhouse regularly.
- Routinely trim and cut grass around buildings and on the trail to the weir.
- Biodegradables from the slop bucket are dumped behind the weir.
- Burn trash in the burn barrel and backhaul non-burnables to town.
- Install the boat running line in the river at the trailhead to the cabin.
- Conduct daily salmon surveys of the lower river and bay.
- When this weir is removed, half of the materials are staged on each side of the river adjacent to the weir.
- At the end of the season, store dishes, tools and miscellaneous equipment in the basement and banya.

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, for each event, you have obtained direct and explicit permission from your project supervisor. This does not mean that field crew leaders may grant permission for personal use of this phone. Only the project supervisor 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. **After each authorized use of the satellite phone-business or personal, the log must be filled out. This log is to be turned into the office on every other resupply flight.**

The primary purpose for having this satellite phone is for your safety. The secondary purpose 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. 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 available for official or emergency use.

Instructions

The portable sat phone/dispatch 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 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.

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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, 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. To intercept a call, follow the above procedure.

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.

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, then 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.

LOCKING UP

Occasionally if someone hits the wrong buttons on the portable ST-151 model (suitcase model) it could lock up the handset. To unlock the handset there is an unlock code which can be generic or specific to your phone. Turn on the phone and hit 0 0 0 0 (the generic code). If that doesn't unlock the handset punch in FCN 8, 2 (function, 8, 2). The phone should then give you an UNLOCK CODE message followed by 4 digits. Enter these 4 digits and it should unlock the handset. If this doesn't work sometimes you can unlock your handset by punching FCN 8, 2 followed by 0 0 0 0. One of these methods should unlock your handset.

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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 on the satellite phone in the phone logbook, except for dispatch calls. 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 to 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 **1-800-478-5555**. 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 the situation.

If there is an enforcement emergency, use the dispatch microphone to call the Kodiak office or the Alaska State Trooper, Bureau of Wildlife Enforcement (**DN 6370**).

See Table 1 on pages 9-11 for further instruction concerning emergencies.

APPENDIX C. ELECTRICAL SYSTEM OPERATION MANUAL

SOLAR PANELS

Each field camp utilizes an independent power system consisting of 12-volt photovoltaic (PV) solar panels and a PV charge controller that charge a 12-volt battery bank for powering needed electrical components. Solar PV panels, when oriented towards the sun, will create direct current (DC) electricity. This DC electricity will effectively charge a bank of 12-volt batteries by providing a higher voltage than the battery voltage. In our common 12-volt systems, each solar PV panel will generate approximately 20 volts open circuit when directly oriented towards the sun. Any cloud cover or partial shading will reduce solar PV output considerably.

Both amperage and voltage numbers are displayed digitally on the PV charge controller. The PV charge controller regulates and limits the amount of electrical flow generated by the solar PV panels to the battery bank that is necessary to keep the 12-volt battery bank fully charged. Learn to understand what the amperage and voltage numbers represent and you will be in control of your power system.

Voltage is the most important reading you'll need to understand. A common misconception is that when a 12-volt battery meters 12.0 volts the battery is fully charged. The reality is that at 12.0 volts the battery is in a very discharged state. Many electronics may not work properly at such a low voltage. **A 12-volt battery isn't fully charged until it reads at least 12.7 volts.** The solar panels, batteries and the loads (power being utilized or withdrawn from the system) in each system work in a dynamic equilibrium. The voltage rises and falls as power is deposited and withdrawn throughout the day and night. The actual reading that is important when assessing the state of charge of a battery is the "rest" voltage. This voltage is defined as the voltage reading when the batteries have been at "rest" for several hours. This means no loads on and no solar power coming in. In practical terms this is the voltage early in the morning before any loads are on and after the sun (solar energy) has been off the panels for a few hours.

If your solar array can't keep up with your essential loads then it will be necessary to add more solar PV panels or run the gas generator to re-charge the batteries as needed. Most of the small gas generators in the field camps have 2 DC output lugs, one positive lug and one negative lug. These output lugs can be wired in parallel to the battery for recharging. Typically these chargers put out a maximum of 8.3 amps DC. At Dog Salmon and Upper Station the gell cell batteries must be trickle charged (less than 2 amps).

Batteries and connections are prone to corrosion in a marine environment. It is essential that battery terminals, all wiring and connections are clean and tight. A good cleaning with a wire brush and a check of all bolts and screws for proper tightness should be performed at the beginning and end of each field season. Most of the batteries that are now in use in our field camps are sealed or gelled electrolyte type. These batteries don't require any maintenance other than cleaning. Some of the older electrolyte lead/acid batteries have removable plastic caps and require a periodic topping off with distilled water. Filtered rainwater can safely be used where no distilled water is available. When the electrolyte level falls below the lead plates in the older style lead/acid batteries, add distilled water. Terminal and connections that are dressed with grease or LPS-3 will be far less prone to corrosion.

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One problem inherent in the operation of the solar powered radio is that some of the charge controllers will create Radio Frequency (RF) noise or static on some radio frequencies when they are regulating voltages above 14.2-volts. In this case, it may be necessary to throw the solar PV input switch to the off position temporarily while you use the radio or device that is experiencing the RF static. After you use the device just remember to put the input switch back in the on position to resume proper charging.

SEASONAL SHUTDOWN PROCEDURE

In most cases the solar panels are left in their permanent position and the charge controller remains in the charging mode. The essential thing to remember is that all loads need to be disconnected by throwing the "main load" switch or breaker to the fuse panel to the off position. This disconnects any electrical current flowing to the fuse panel. Remove any other loads that may be directly attached to the battery such as radios, clocks, DC chargers etc. Leave the "PV input" switch or breaker in the **ON** position.

Batteries can freeze and burst if left in a discharged state in cold ambient temperatures. A fully charged battery will not freeze even at 60 degrees below zero. **Make sure you don't leave the battery bank in a discharged state**. If necessary run the generator in order to bring the batteries to a full state of charge before departing camp.

BATTERY STATE OF CHARGE REFERENCE GUIDE

Battery near full charge while charging……13.8 to 14.2 volts

Battery near full discharge while charging……12.3 to 13.2 volts

Battery fully charged with light load…….12.4 to 12.7 volts

Battery fully charged with heavy load……...11.8 to 12.5 volts

Rest voltage 100% charged……12.7 volts

Rest voltage 80% charged……..12.5 volts

Rest voltage 60% charged……..12.2 volts

Rest voltage 40% charged……..11.9 volts

Rest voltage 20% charged……..11.6 volts

Troubleshooting

The first step in troubleshooting is ensuring that you have the proper voltage to the device that's experiencing a problem. Most electronics in these systems are wired to a DC fuse panel. Next check the fuse panel for a blown fuse. If the fuse is o.k. then check to ensure all electrical connections are clean and tight. In addition some devices such as VHF and single sideband radios may also have inline fuses, check these as well. Blown fuses and poor connections are the most common culprit. If the solar PV panels aren't charging the 12-volt battery bank, check the main solar input fuse to make sure it is good and ensure that the breaker switch is in the on position. If the solar PV panels still don't put out proper voltage, check the wiring between the panels and the charge controller and check the connections on the rear of the solar PV panels. Make sure all connections are tight and clean. If corrosion is evident, use contact cleaner and or fire emery cloth or sand paper to gently clean connections.

APPENDIX D. GENERAL EQUIPMENT AND CAMP MAINTENANCE

GENERAL EQUIPMENT AND CAMP MAINTENANCE

FUEL

Kodiak ADF&G weir camps use three types of fuel: # 1 diesel, regular unleaded gasoline and propane. There are usually a few containers of leftover fuel at the camp and we take more in on the first flight in. Additional fuel is ordered from town to supplement fuel levels as needed throughout the season.

#1 Diesel (heating oil) is used for stoves (building heat).

Unleaded Gasoline is used for skiff outboards, ATVs and portable generators as well as landscaping equipment.

Propane is used for ovens and refrigerators.

Engine Oil (2-stroke vs. 4-stroke)

2-stroke engines do not have a dedicated engine oil lubrication system similar to those found in conventional automobiles. Thus, 2-stroke type oil must be mixed with gasoline to lubricate the engine while gas is consumed. Most small outboards require a 100:1 gas/oil mix (5 ounces oil for 1 gallon gas).

To add 2-stroke oil to the 2-stroke outboard motors: directly add the correct ratio of 2-stroke oil to the gas tank. The proper ratio can be located on the back of the 2-stroke oil container. Failure to add 2-stoke oil will quickly destroy any 2-stroke engine.

In contrast, 4-stroke engines have dedicated oil lubrication systems. 4-stroke engine oil is not consumed during normal operation but engine oil must be regularly checked by removing the cowling and checking the oil level on the dipstick. Under normal conditions, 4-stroke engine oil typically needs to be changed only once every season.

Refer to the owner's manuals in the office for detailed information on each outboard.

NOTE: 2-stoke and 4-stroke oils are not interchangeable. Use the appropriate oil type at all times.

DRIVE SYSTEMS (Propellers vs. Jet Drives)

Outboards with propellers are more efficient than jet drives and are used for towing, boating long distance, or in rough water conditions. In shallow water, extra caution must be used with propellers. Reduce RPM's to a minimum and tilt the outboard up to prevent striking bottom. Before operating propeller driven skiffs, become familiar with the steering and tilt mechanisms specific to each outboard and ensure a spare prop and the proper tools are onboard. Before and after each use, check props for nicks, rolled tips, or bent blades. Damaged propellers will cause a loss in performance and can create vibrations harmful to the engine. Props with worn blades might also allow the engine to accelerate beyond the recommended operating range resulting in permanent damage to the engine. When a propeller is damaged while operating, stop and assess the damage before continuing. If the prop is severely damaged, slowly proceed to the nearest level shoreline and replace.

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To change propellers use the following procedures:

1. Remove cotter pin holding castle nut in place.
2. Remove castle nut with wrench by turning counter-clockwise while holding the propeller in place.
3. Carefully note order, and remove bushing(s) between castle nut and propeller.
4. Slide propeller off drive shaft.
5. Slide replacement propeller on by aligning groves inside propeller with those on the drive shaft.
6. Replace bushings in same order and arrangement they were removed.
7. Tighten castle nut such that the cotter pin hole in the drive shaft is visible between the 'castle' grooves such and a cotter pin can be inserted to prevent the nut from spinning loose. Do not over-tighten the castle nut.
8. Insert new cotter pin and bend the ends outward to secure it in place.

Jet drives work by forcing water through a tapered sleeve (housing) using an internal impeller. The result is a water jet that propels the skiff forward. To work efficiently, there must be a close fit between the impeller and sleeve. Thus, pulling sand, gravel, wood, weeds or other foreign objects into the jet drive can damage both the impeller and sleeve resulting in permanent damage or loss in performance.

When foreign objects (i.e. eel grass in Karluk Lagoon) are pulled into the jet unit (indicated by loss of power or change in rpm's), stop immediately and turn engine off. Lift outboard and remove all objects from the 'foot grate' on the bottom of the jet unit. A screw driver or pocket knife may be needed to remove objects lodged in the grate. In some instances the foot will need to be removed to clear objects that have passed through the grate. To remove the foot, slowly proceed to the nearest shoreline and carefully unbolt the foot from the lower unit, clean thoroughly, and replace ensuring the pointed end of the foot is oriented forward (towards bow).

COOLING SYSTEMS

All facility outboards are water cooled. Cold water is pulled into the outboard below the waterline and circulated throughout the engine before it's discharged with the exhaust. Thus, there are no antifreeze levels to check or radiators to maintain. However, all outboards have a small valve above the waterline on the back of cowling that discharges a small stream of water at all times while running. This discharge or 'pee' valve is an indication that the cooling system is working properly. It is important to ensure the discharge valve is working properly before and after each use or immediately after hitting bottom. **Running outboards while water is not being ejected from this valve may result in damage to the engine.**

Occasionally weeds or other objects get sucked into the water system that can damage the water pump or clog the small hose that leads to the discharge valve. If the outboard is overheating (loss of power, surging RPM's, knocking and/or getting louder), turn off immediately. Raise the lower unit to ensure the water intake ports (located on both sides of lower unit just above the prop, and on the foot of the jet unit) are free from weeds. If the intakes are unobstructed and no water is emitted from the discharge valve after restarting, turn off and check to ensure the valve itself is unobstructed by feeding a short flexible length wire into the valve outlet on the back of the outboard. If the outboard continues to overheat (or you suspect cooling system failure) tow the

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skiff to the weir facility and consult the owner's manual for troubleshooting cooling system components.

Outboard Operation

- The correct outboard motor fuel mixture for standard 2-stroke engines is 100:1. Newer Precision Blend outboards mix the two-cycle oil and gas automatically, but older engines require their fuels pre-mixed. Always pour the oil into the tank first, then add 2 or 3 gallons of gas and mix thoroughly. Fill tank to capacity always using a large funnel and chamois filter.
- Always mix fuel tanks or equipment under cover to prevent water contamination and always use a funnel and filter. **Always mark the container "Premixed" if that is the case, ratio and for what machinery.**
- Always place outboard motors in neutral when starting or shutting off the engine. Always make sure a safety line is attached to the boat and motor, in case the motor detaches from the transom.
- Perform a check daily of the screw clamps 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 fully upright position.
- Check the gear oil in the lower unit of the propeller powered outboard once a week and drain and replace the gear oil every 50 hours of operation.
- If the skeg or jet unit hits bottom, check the screws for tightness, and look for housing damage or oil leakage.
- All outboards are to be tilted in the up position when moored.
- At the end of the season, winterize all outboard motors.
- Boats are to be kept clean and free of loose tools and debris. Only moor boats where they are not subject to damage from wave action or contact with the river bottom in rocky areas.
- Maintain a bowline on each boat and ensure that each boat is properly moored at the end of each workday.
- Check for leaks.

If your outboard will not start, check the following:

- Make sure the on/off switch and safety "kill switch" clip is in the on position
- Check to see if the fuel line is connected 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.

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- If the engine is flooded, wait five minutes for the plugs to dry before attempting to start again.
- Check the spark plugs, they may be fouled or defective (replace if needed), also check for corroded, loose, or disconnected wires.

WINTERIZING OUTBOARDS AND SKIFFS

All skiffs and outboards are removed from the water, winterized and stored for the winter. Following are the general guidelines for winterizing outboards and skiffs:

Outboards

1. Disconnect spark plug wires, remove, inspect and clean/replace sparkplugs.
2. Spray fogging oil into each cylinder (1-2 seconds) and replace spark plugs.
3. Turn over engine several times to distribute fogging oil within each cylinder.
4. Rinse exterior with freshwater and clean residue from all surfaces. Remove corrosion and lubricate electrical connections.
5. Remove outboard from skiff and hang upright in outboard shop.
6. Change lower unit lubricant by removing the lower drain plug and upper vent plug. Once all lubricant has drained, inject new lubricant into lower drain plug until lube begins to drain out of vent hole. Quickly replace both plugs.
7. Inspect props and jet impellers sleeves. Service or replace as necessary.
8. Change crankcase oil in 4-stroke engines. Refer to owner's manual for specific procedures and oil types (located in office file cabinet). Fill oil reservoirs in 2-stroke models.
9. Lubricate all service points, including grease zerks, shift/throttle linkages, and steering cables. Refer to owner's manual for specific lubrication points.
10. Date and record maintenance activities on a label and attach directly to each outboard (include which skiff the outboard came from).

Skiffs

1. Remove, clean and label all gas tanks/lines, anchors, toolboxes, oars, bilge pumps and floatation devices. Store in outboard shop. Use a wire brush to remove any rust on tools and lubricate with anti-corrosion spray before storing for winter.
2. Remove batteries. Clean, label and fully charge for storage.
3. Drain, inspect and replace fuel filters as necessary.
4. Scrub hull and floorboards with bleach and water solution.
5. Clean and lubricate steering and throttle parts to prevent corrosion. Label all cables and hoses that are removed and make a detailed description of where they are reattached for the following season.
6. Remove drain plugs and attach to the hull.
7. Secure all skiffs with a sturdy line or chain to prevent them from floating or blowing away during winter.

Generators

Portable generators are supplied to field camps. Their maintenance follows the same line as outboards. 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. After 25 hours of operation the oil should be changed. Spark plugs should be checked every season for fouling and gap.

APPENDIX E. JUVENILE SALMON IDENTIFICATION KEY

Key to Field Identification of Anadromous Juvenile Salmonids in the Pacific Northwest

By

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ABSTRACT

A key is presented with descriptive illustrations to help in field identification of live, juvenile salmonids in fresh waters of the Pacific Northwest. Other juvenile fish that may be mistakenly identified as salmonids are included.

INTRODUCTION

Species identification of live, anadromous juvenile salmonids is frequently a problem to the field biologist. The purpose of this key is to list and illustrate the external characteristics which will expedite field identification of juvenile salmonids in the Pacific Northwest.

Five species of Pacific salmon (pink, chum, sockeye, chinook, and coho); four species of trout (cutthroat, brown, Dolly Varden, and rainbow or steelhead); and other juvenile and adult fish [1] that may be mistaken for salmon or trout in fresh water are described in this key.

USE OF KEY

The characteristics for identification are listed in a series of alternative statements, some of which are illustrated. To use the key, examine the first statement; if applicable, proceed to the next and continue to successive statements until the species is identified. If a statement is not applicable, pass to the alternative characteristics indicated by numbers in parentheses (numbers on the drawings correspond to numbers of statements in the key). Continue in this manner until the specimen is identified. Some external characteristics are positive separating features (marked with asterisk), whereas others are not. Therefore, two or more statements should be considered before final rejection. If a precise identification cannot be made using the external characteristics —and the fish can be sacrificed, a positive identification can usually be made from internal features (marked with double asterisks). A bibliography of keys that utilize more descriptive internal characteristics is included in this paper.

[1] Especially adult smelt, family Osmeridae.

KEY

1. (47) Adipose fin and scales present. (Fig. 1)
2. (48) Fleshy appendage at base of pelvic fins present.
3. (49) Mouth large, reaching at least to center of eye.

Family Salmonidae

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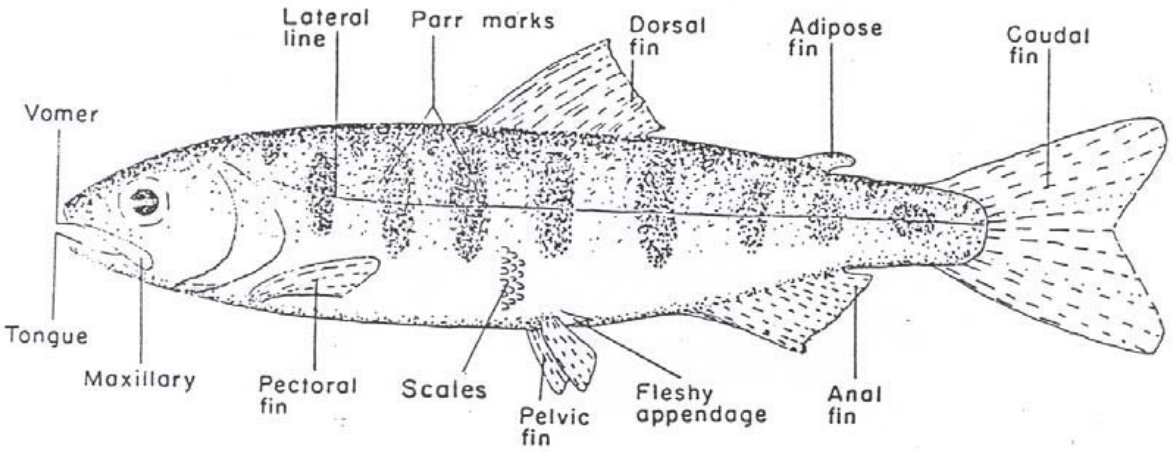

Figure 1.—A hypothetical salmonid showing external characteristics.

4. (17) Anal fin higher than long, with 8 to 12 developed rays (Fig. 2A)
5. (52) *Teeth on head and shaft of vomer. (Fig. 3A)

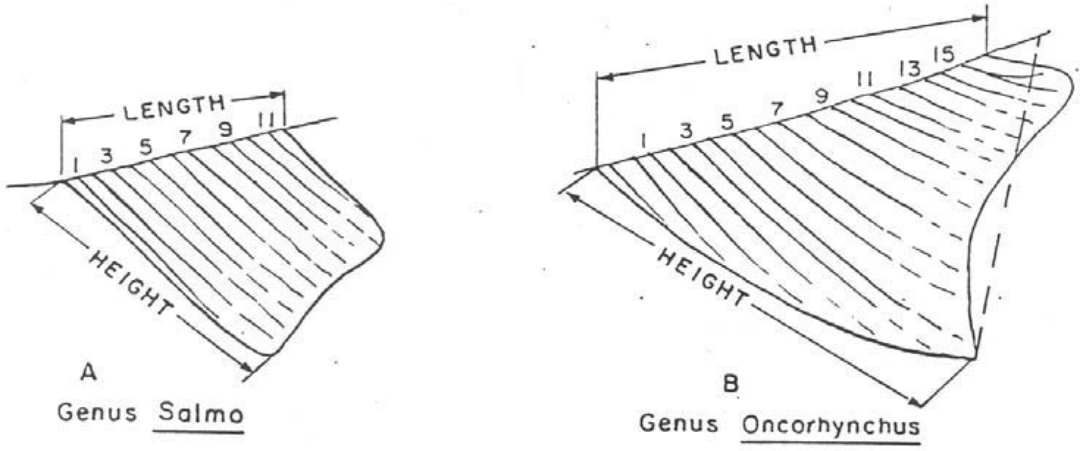

Figure 2.—Anal fins: (A) Trout, genus *Salmo;* (B) Pacific salmon, genus *Oncorhynchus.* The two drawings show differences in structure and fin ray count. (Note that the length of the anal fin is its overall basal length, and its height is that distance from the origin of the fin to the tip of the anterior lobe. In counting fin rays, include only those which originate from the base and terminate at the outer margin of the fin or are half as long as [or greater than] the longest ray.)

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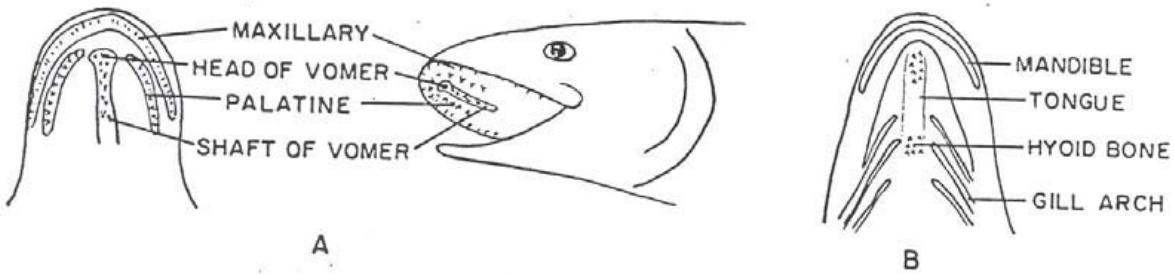
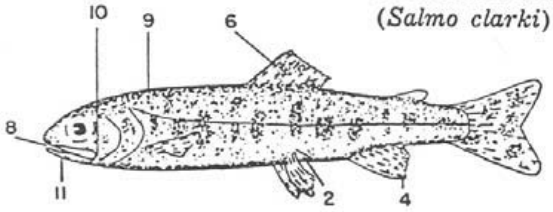


Figure 3.—Location of dentition in (A) the roof and (B) the floor of the mouth of salmonid fishes. (Presence or absence of teeth on the vomer or tongue may be determined by use of the little finger or a blunt instrument. The small hyoid teeth at the base of the tongue are located between the gill arches of the lower jaw and are difficult to find.)

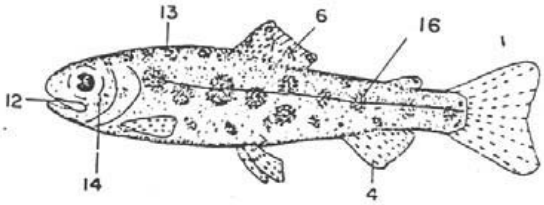
6. (18) Dorsal fin with large dark spots.
Trout
Genus *Salmo*

7. (53) Adipose fin not orange; no row of pale round spots along lateral line.
8. (12) *Small hyoid teeth at base of tongue. (Fig. 3B)
9. (13) Not more than five parr marks on mid-dorsal ahead of dorsal fin.
10. (14) Maxillary reaching past posterior margin of eye.
11. (15) Red or yellowish hyoid mark under lower jaw. Tail usually black spotted.
Cutthroat trout
(*Salmo clarki*)



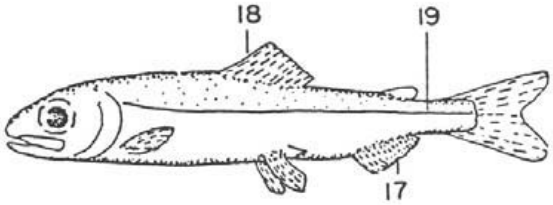
12. (8) *No teeth at base of tongue.
13. (9) Five to 10 parr marks along mid-dorsal ridge ahead of dorsal fin.
14. (10) Maxillary short, not reaching past posterior margin of eye.
15. (11) No hyoid mark under lower jaw. Few or no spots on tail.

16. (20) Parr marks almost round.
Rainbow or steelhead trout
(*Salmo gairdneri*)



17. (4) Anal fin longer than high, with 13 or more developed rays. (Fig. 2B)
18. (6) Dorsal fin without large dark spots, may be black tipped.
Pacific salmon
Genus *Oncorhynchus*

19. (20) No parr marks. Fry leave fresh water while small—approximately 1.75 inches (45 mm) long.
Pink salmon
(*O. gorbuscha*)



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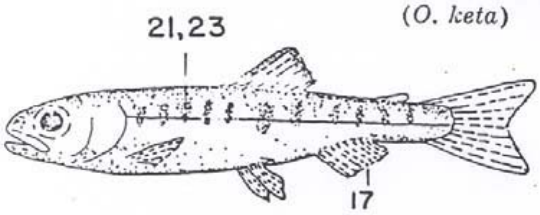
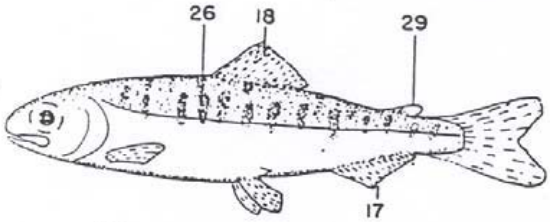
20. (16) Parr marks present as vertical bars or oval spots.
21. (30) Parr marks short, extending little, if any, below lateral line.
22. (25) Gill rakers on first arch, 19 to 26. ** Pyloric caeca, 140 to 186.
23. (26) Parr marks faint. Sides below lateral line iridescent green.
24. (27) Small when migrating from fresh water, approximately 1.5 inches (40 mm) long.

Chum salmon
(*O. keta*)



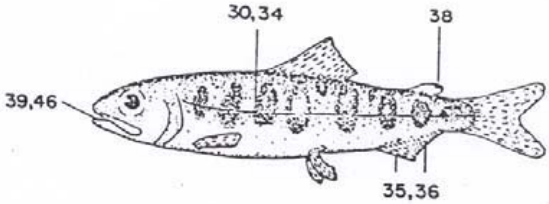
25. (22) Gill rakers on first arch, 30 to 40. **Pyloric caeca 60 to 115.
26. (23) Parr marks usually sharply defined. Sides below lateral line silvery, not iridescent green.
27. (24) Relatively large when migrating from fresh water, approximately 3 to 5 inches (80 to 126 mm) long.
28. (31) Gill rakers long and slender, more than 29 on first arch.
29. (32) Adipose fin clear, not pigmented.

Sockeye salmon
(*O. nerka*)



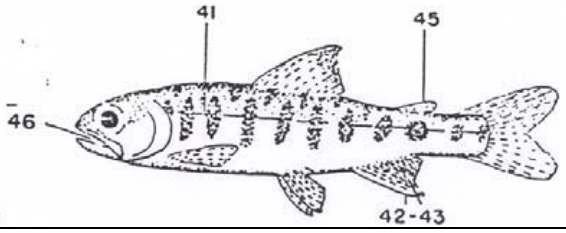
30. (21) Parr marks large, vertical bars centered by lateral line.
31. (28) **Gill rakers short and thick, fewer than 29 on first arch.
32. (29) Adipose fin at least partially pigmented.
33. (40) **Plyloric caeca more than 90.
34. (41) Parr marks broader than interspaces.
35. (42) Anterior rays of anal fin not distinctly longer than rest, not white edged.
36. (43) Anal fin not pigmented.
37. (44) Black spots, when present, on both lobes of caudal fin.
38. (45) Adipose fin not completely mottled, clear area at anterior base of fin.
39. (46) Black gums along base of lower teeth.

Chinook salmon
(*O. tshawytscha*)



40. (33) **Plyloric caeca less than 80.
41. (34) Parr marks narrower than interspaces.
42. (35) Anterior rays of anal fin elongated; when depressed they extend to base of last ray. (Fig. 2B)
43. (36) Anal fin pigmented between rays, resulting in black banding.
44. (37) Black spots, when present, on upper lobe of caudal.
45. (38) Adipose fin completely pigmented.
46. (36) Mouth gray to white.

Coho salmon
(*O. kisutch*)



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47. (1) Adipose fin not present; scales present or lacking.
Not Salmonidae

48. (2) No fleshy appendage at base of pelvic fins.
Smelts
Family Osmeridae

49. (3) Mouth small, not reaching center of eye; teeth weak or absent.

50. (51) Depressed dorsal fin, shorter than head.
Whitefishes
Genus *Coregonus*

51. (50) Depressed dorsal fin, longer than head.
Arctic grayling
(*Thymallus arcticus*)

52. (5) **Teeth on head of vomer only.
Chars
Genus *Salvelinus*
Dolly Varden (*S. malma*)

53. (7) Adipose fin orange; row of distinct pale round spots along lateral line.
Brown trout
(*Salmo trutta*)

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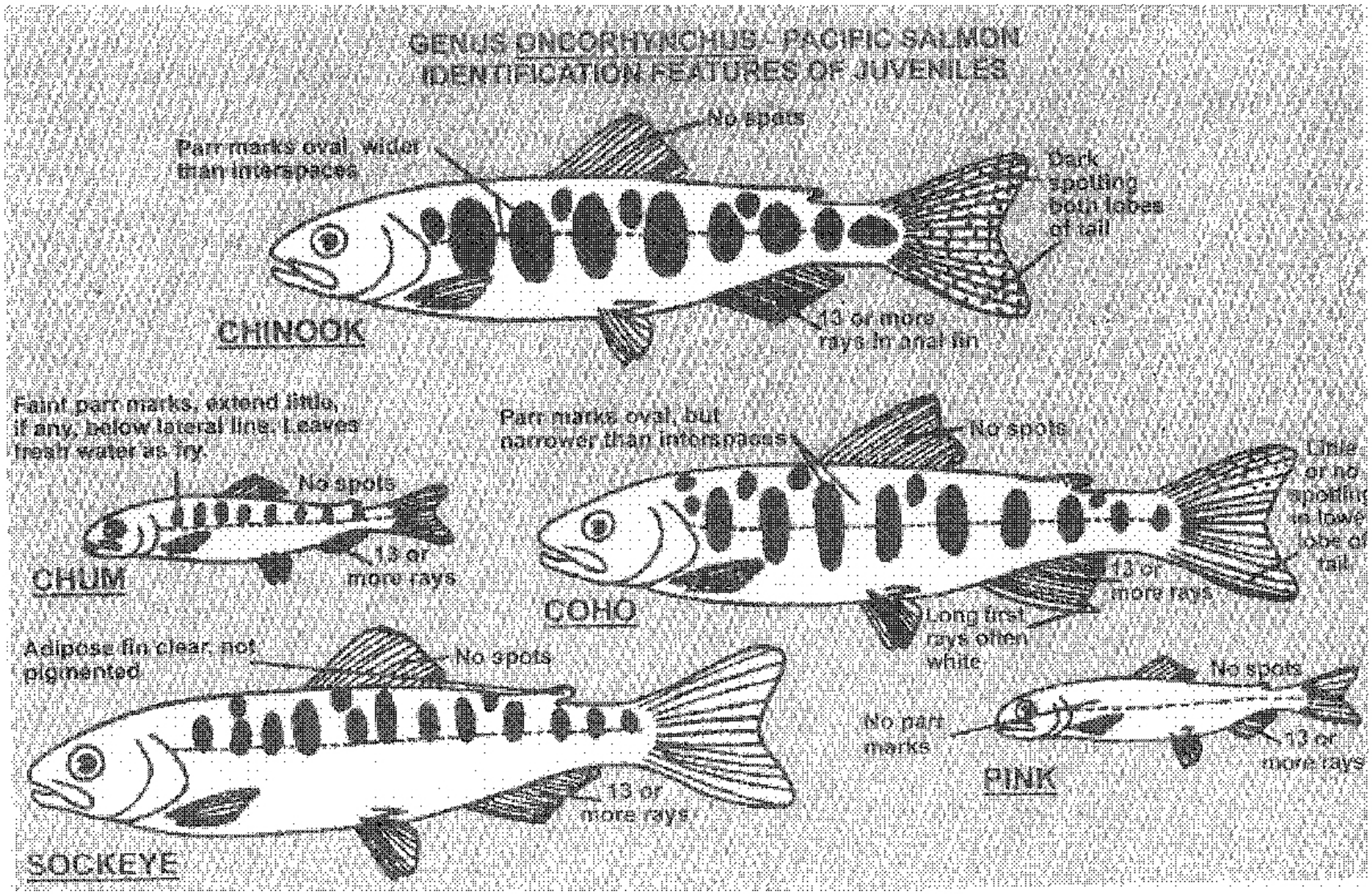

GENUS ONCORHYNCHUS - PACIFIC SALMON
IDENTIFICATION FEATURES OF JUVENILES
No spots
Parr marks oval, wider than interspaces
Dark spotting both lobes of tail
13 or more rays in anal fin
CHINOOK
Faint parr marks, extend little, if any, below lateral line. Leaves fresh water as fry.
No spots
13 or more rays
CHUM
Parr marks oval, but narrower than interspaces
No spots
Little or no spotting in lower lobe of tail
13 or more rays
Long first rays often white
COHO
Adipose fin clear, not pigmented
No spots
13 or more rays
SOCKEYE
No spots
No parr marks
13 or more rays
PINK

CHINOOK FINGERLING

Length 4 – 8 cm.; dorsal fin with dark leading edge and white tip; parr marks are prominent, and are above and below lateral line and are about equal with light portions; anal and pelvic fins have white or light leading edges; adipose fin with dark edge. Smolts are bright silver with faint parr marks.

COHO FINGERLING

Length 3 – 4 cm; dorsal and anal fin have conspicuous white leading edge followed by dark stripe; parr marks above and below lateral line, but with rounded dark areas above lateral line; reddish tail.

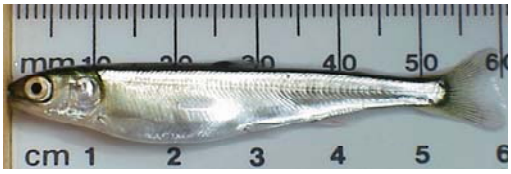
COHO SMOLT

Length 8 – 13 cm; dorsal surface brown or green; parr marks small, faint, or absent when bright silver; vertical surface silver; tail and dorsal fin have black tips with few spots.

CHUM FINGERLING

Length 3.5 – 4 cm; slender body with faint parr marks above lateral line; dorsal surface dark green; ventral surface and sides silver.

PINK FINGERLING



Length 3 – 6 cm; slender body with no parr marks; dorsal surface dark green; ventral surface and sides silver.

SOCKEYE AND KOKANEE FINGERLING

Length 2 – 3 cm; light green back; parr marks fait, short, oval and mainly above lateral line.

SOCKEYE SMOLT

Length 8 – 13 cm; dorsal surface brown or green; parr marks small, faint or absent when bright silver, ventral surface silver.

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RAINBOW (STEELHEAD) FINGERLING

Length 1 – 4 cm.; forward dorsal surface has parr-like marks; parr marks are prominent; marks are longer than are wide at lateral line; dorsal fin is spotted and has white tip on six rays; adipose fin with continuous dark edge; white leading edges on anal and pelvic fins.

RAINBOW (STEELHEAD) JUVENILE

Length 7 – 15 cm.; body spots abundant; dorsal fins are spotted with white tip over six rays; caudal fin is spotted; anal and pelvic fins with white tips; pink or red strip on side of body; parr marks may be present.

CUTTHROAT FINGERLING

Length 2 – 4 cm.; parr marks prominent, circular in shape at lateral line; dorsal fin spotted, has white tip on three rays; adipose fin has dark edge; white leading edges on anal and pelvic fins.

CUTTHROAT JUVENILE

Length 7 – 15 cm.; body spots abundant; spotting below lateral line, equally heavy o anterior and posterior halves of body; dorsal fin spotted with white tip over three rays, caudal fin is spotted, anal and pelvic fins with white tips; parr marks may be present.

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