

# **Kodiak Sockeye Salmon Test Fishery Operational Plan, 2013**

by

**Michelle L. Moore**

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April 2013

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Alaska Department of Fish and Game

Divisions of Sport Fish and Commercial Fisheries



## Symbols and Abbreviations

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

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

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## ABSTRACT

In 2010, a two-day purse seine test fishery was conducted by the Alaska Department of Fish and Game (ADF&G) as a pilot study on the west side of Kodiak Island to assess the ability to gauge early season abundance of Karluk-bound sockeye salmon. In early June, prior to the first commercial fishery opening, a number of standardized purse seine sets were conducted within the Karluk Sections (Kodiak Management Area commercial salmon statistical areas 255-20 and 255-10) of the Southwest Kodiak District in an effort to catch fish migrating to Karluk River. The success of the pilot study resulted in procurement of increased test fishery authority in 2011, and continuation in 2012. The 2010–2012 test fisheries provide a strong preliminary indication that the test fishery is a useful tool in indexing the abundance of sockeye salmon migrating to Karluk River during the designated period. This operational plan defines test fishery protocol for the 2013 season.

Key words: Kodiak, test fishery, sockeye salmon, *Oncorhynchus nerka*, escapement, Karluk, catch, operational plan.

## INTRODUCTION

An Alitak Bay salmon test fishery operated from 1986 to 2006, but no salmon test fishery was ever prosecuted on the west side of Kodiak Island until 2010. On June 7–8 2010, a purse seine test fishery pilot study was conducted to gauge the abundance of early-run sockeye salmon returning to the Karluk River well in advance of entering the lagoon. A standardized purse seine set was developed at Cape Uyak, where a southbound hook was held for 30 minutes. Cape Uyak is approximately 9 km from the mouth of Karluk Lagoon and within the primary migratory pathway for Karluk River sockeye salmon (Figures 1 and 2). Given the success of the pilot study, increased test fish authority was requested and granted for fiscal year 2011. An initial attempt for test fish timeframe expansion in 2011 was beset by difficulties and ultimately deemed unnecessary to achieve project goals. The test fishery has been successfully conducted from 2010–2012. Test fishing was shifted one day earlier in 2012 to allow fishermen ample travel time to their desired fishing grounds prior to the first commercial fishing period. The goal for the 2013 season is to continue to conduct the test fishery in order to establish an index useful for assessing the relative abundance of Karluk River early-run sockeye salmon prior to commercial salmon fishing periods. Scale samples are collected to assess age composition and qualitative information (including the presence of a freshwater-age-3 scale pattern found in Karluk River sockeye salmon). All harvested salmon are sold to fund the test fishery.

The Karluk Lake sockeye salmon run has historically provided the largest source of harvestable surplus for the Kodiak commercial salmon fishery (Witteveen et al. 2005). Karluk Lake early-run sockeye salmon is the dominant local stock migrating through Westside Kodiak prior to mid-June (Barrett and Nelson 1995). Westside Kodiak is defined as commercial salmon fishing areas between Low Cape in the South and Cape Paramanof in the north, to Termination Point in the east (Figure 3). Beginning in June and extending into early July, much of the Westside Kodiak fishery management is based on Karluk early-run sockeye salmon escapement, the buildup of sockeye salmon in Karluk Lagoon, and commercial catches (Keyse 2013). A weir operated by ADF&G provides the primary mode of enumeration for sockeye salmon escapement into the Karluk River (Figure 1; Jackson et al. 2012). Over the past 20 years Karluk sockeye salmon have shown an increasing tendency to hold for longer periods in Karluk Lagoon, prior to escaping in large pulses, making timely management problematic.

The main emphasis of the ADF&G salmon management program is to promote maximum sustainable yield for future Kodiak Management Area salmon returns by supporting salmon escapement of sufficient magnitude and temporal and geographic distribution (Keyse 2013).

Simultaneously, the goal is to provide for orderly fisheries, maximize harvest opportunities and product quality, and adhere to management plans adopted by the Alaska Board of Fisheries (BOF). The Kodiak sockeye salmon test fishery will be a useful tool in the pursuit of the above.

## **GOAL**

The goal of the Kodiak sockeye salmon test fishery is to provide data to aid in the management of the Westside Kodiak commercial salmon fishery.

## **OBJECTIVES**

Data derived from the test fishery catch will be used to achieve two primary objectives:

1. Provide management staff with an index of the migratory abundance of sockeye salmon in the Outer Karluk Section during the first week of June.
2. Estimate the age of sockeye salmon caught in the test fishery.

## **TASKS**

1. Distribute the Kodiak salmon test fishery request for quotations (RFQ) – Target Date: May 6, 2013.
2. Award bid to purse seine vessel – Target Date: May 20, 2013.
3. Conduct standardized purse seine test fishing at Cape Uyak – Target Date: June 6–7, 2013.
4. Enumerate all catches, by species, from the test fishery and report data in a timely manner to the Kodiak ADF&G office.
5. Sample the test fish caught sockeye salmon for age by collecting scale samples.
6. Record the weather, tidal observations, and other physical parameters in conjunction with the test fishery.

## **SUPERVISION**

Fishery biologist Michelle Moore will act as overall project leader.

## **PROCEDURES**

### **RFQ**

Distribute the Request for Quotation (RFQ) bid package by May 6, 2013 (Appendix A.).

### **TEST FISHERY PROTOCOL**

The preferred location for test fishing is at Cape Uyak in the Outer Karluk Section of the Southwest Kodiak District (Figures 1–2). A hook for southbound fish will typically be held at Cape Uyak for 30 minutes. Fish will be seined using a 2–3 strips deep 250-fathom net with a 50 fathom lead. The strategy is to seine in a standardized manner during the daylight hours while recording geographic coordinates, tidal cycle, seas, and weather conditions. The 2012 test fishery results provided in Table 1 show an example of some data that will need to be recorded. While the preferred and typical set location is Cape Uyak, it is possible that sets will be conducted anywhere between Rocky Point and Cape Karluk (Figure 2).

When the set is complete, all fish captured will be enumerated by species. Scale samples will be collected from harvested sockeye salmon. Ideally, 50 percent of sockeye salmon harvested in the standardized sets will be sampled for age. A minimum of 40 sockeye salmon will be sampled

from each set. If less than 40 fish are caught in a set, then the number of fish caught will be the sample size for that set. Fishing days include a minimum of 6 sets; if 40 sockeye salmon are caught in each set, the minimum sample size per day 240 fish. The KMA Salmon Catch and Escapement Sampling Operational Plan (Moore *In Prep*) provides details on collecting scales from sockeye salmon. All salmon will be transferred into the boat's fish hold containing refrigerated seawater (RSW) after sampling is complete. The number and species of marine mammals in the vicinity of the set will be noted. Test fisheries are required to record bycatch; all species captured will be enumerated and logged. All Chinook salmon will be released immediately; Chinook salmon will not be allowed to flounder on deck.

If test fishery catches are extremely high and the test fish's allowable authority is or will be surpassed, all salmon will be enumerated in the seine and released without being brought aboard. Test fishery salmon harvested will be sold to a processing facility. Fish tickets will be issued to the State of Alaska, Department of Fish and Game, Division of Commercial Fisheries, Kodiak. Date, pounds, number of fish, and price will be double checked, and a copy of all fish tickets will be retained by the ADF&G employee(s).

## **SAFETY**

United States Coast Guard approved personal flotation devices must be worn at all times while on the water. Safety is the highest priority of this project. State safety regulations and Standard Operating Procedures (SOPs) will be followed at all times. Employees are required to review and sign the following SOPs before beginning work:

- 111-700 Safety Policies and Standards
- 111-730 Aircraft Safety for Passengers
- 111-740 Boating Safety

## **DATA REPORTING**

Test fishery field personnel will report test fishery catch numbers to the Kodiak office as soon as possible using satellite phone.

Data from the test fishery will be compiled and published by Michelle L. Moore in the 2013 Kodiak Management Area Catch and Escapement Sampling Results report that will be published in January of 2014.

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## **TABLES AND FIGURES**

Table 1.—Kodiak Salmon test fishery conditions and results, 2012.

Date	Start Time	Set #	Area	Weather	Wind	Seas	Duration	Tide Status	Catch		
									Sockeye	Chum	Chinook*
6/6/2012	6:37 AM	1	Cape Uyak	Sunny	Var 5-10	1'	27 minutes	ebb	240	0	0
6/6/2012	7:59 AM	2	Cape Uyak	Sunny	Var 5-10	1'	30 minutes	ebb	335	4	0
6/6/2012	9:00 AM	3	Cape Uyak	Sunny	Var 5-10	1'	30 minutes	ebb	243	1	1
6/6/2012	10:15 AM	4	Cape Uyak	Sunny	Var 5-10	1'	30 minutes	slack/switch	524	2	1
6/6/2012	11:30 AM	5	Cape Uyak	Sunny	Var 5-10	1'	30 minutes	flood	37	0	0
6/6/2012	12:51 PM	6	Cape Uyak	Sunny	Var 5-10	1'	30 minutes	flood	235	4	0
6/6/2012	2:00 PM	7	Cape Uyak	Sunny	Var 5-10	1'	30 minutes	flood	170	1	2
6/6/2012	3:10 PM	8	Cape Uyak	Sunny	Var 5-10	1'	30 minutes	flood	96	1	0
6/6/2012	4:50 PM	9	Cape Uyak	Sunny	Var 5-10	1'	30 minutes	slack/switch	184	0	0
6/7/2012	5:40 AM	1	Cape Uyak	Overcast, light rain	NW 10	1'-2'	30 minutes	ebb	52	0	0
6/7/2012	6:53 AM	2	Cape Uyak	Overcast, light rain	NW 10	1'	30 minutes	ebb	140	0	0
6/7/2012	8:09 AM	3	Cape Uyak	Overcast, light rain	NW 10	1'	28 minutes	ebb	12	0	0
6/7/2012	9:15 AM	4	Cape Uyak	Overcast, light rain	NW 10	1'	30 minutes	ebb	94	0	0
6/7/2012	10:25 AM	5	Cape Uyak	Overcast, light rain	NW 10	1'	30 minutes	ebb	0	0	0
6/7/2012	11:30 AM	6	Cape Uyak	Overcast, light rain	NW 10	1'	27 minutes	slack/switch	88	2	0
6/7/2012	12:50 PM	7	Cape Uyak	Overcast, light rain	NW 10	1'	30 minutes	flood	158	0	0
6/7/2012	1:55 PM	8	Cape Uyak	Overcast, light rain	NW 10	1'	45 minutes	flood	52	0	0
Total									2,660	15	4

\*Note: Chinook salmon were immediately released back into the water.



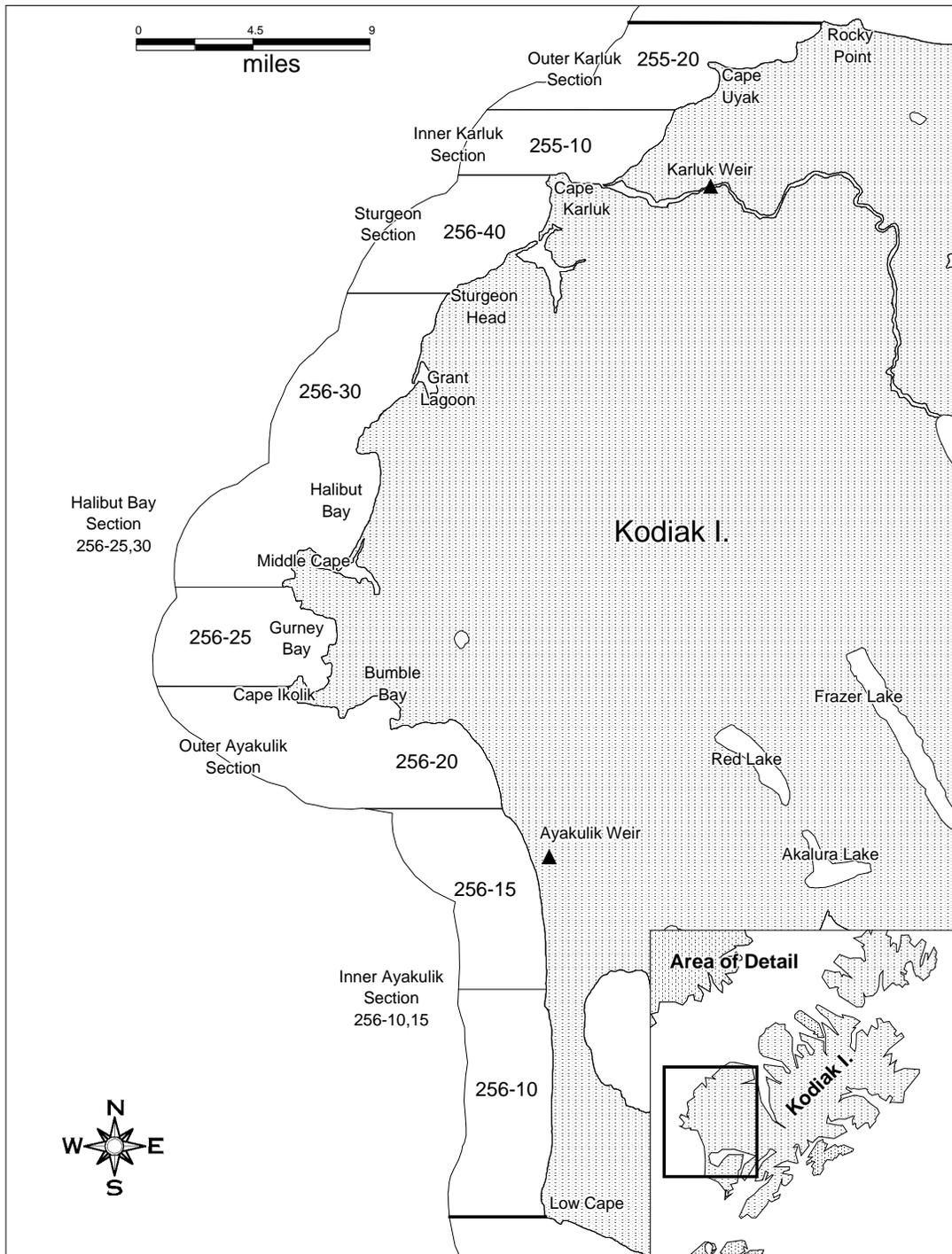


Figure 2.—Kodiak Management Area commercial salmon statistical areas in the Southwest Kodiak District (Karluk/Sturgeon, Halibut/Gurney bays, and Ayakulik areas) harvests.

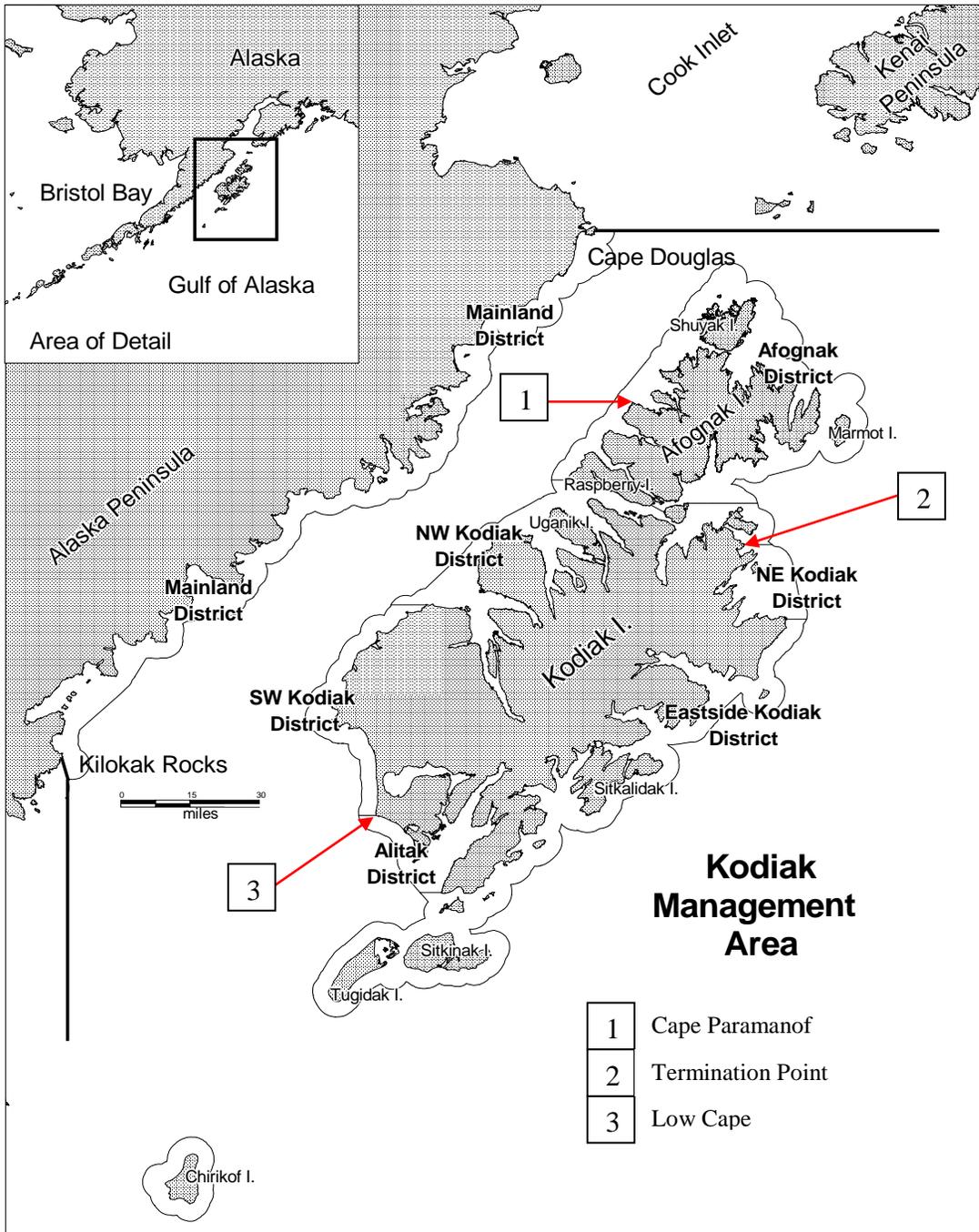


Figure 3.–Kodiak Management Area commercial salmon fishing districts with Westside Kodiak boundaries.



**APPENDIX A. 2013 KODIAK SOCKEYE SALMON TEST  
FISHERY BID SPECIFICATIONS**

The Alaska Department of Fish and Game (ADF&G) is soliciting bids to charter one (1) purse seine fishing vessel to conduct test fishing in the Outer Karluk Section on June 6–7, 2013. Additional test fishing may be required as determined by the department.

The test fishery will be used to gauge the early season abundance of Karluk sockeye salmon. Each fishing day will include a minimum of 6, thirty-minute sets at ADF&G's discretion. Test fishing will normally be conducted at Cape Uyak, but may occur from Cape Karluk to Rocky Point. All fish caught and revenue generated from the sale of those fish, will become the property of the State of Alaska. Interested bidders must have 5-years experience seining in the area. Up to 2 ADF&G employees may be aboard the charter vessel while fishing to monitor and collect scale samples from the test fish catch. The start date and actual numbers of charter days may vary depending on weather. The charter will originate in Kodiak or Larsen Bay and will terminate in Larsen Bay or where the test fish catch will be sold to ensure the highest quality product.

Purse seining will take place during daylight hours but exact times will be governed by on-grounds weather and tidal conditions. Sockeye salmon caught during standardized sets will be sampled for age by collecting a scale (conducted by ADF&G employee(s) onboard). At the conclusion of the standardized sets, non-standardized purse seining may be conducted at the discretion of the ADF&G employee(s).

The vessel must be at least 48 feet in overall length with a raised enclosed wheelhouse, an operational down-sounding sonar, GPS, and operational communications equipment (VHF radio plus satellite phone system). The charter vessel must be equipped with refrigerated seawater (RSW) to maintain the fish in good quality before delivery, and must be capable of operating under weather and sea conditions common to the area and season. The vessel must provide 2–3 meals/day for up to two ADF&G personnel for the duration of the charter. ADF&G staff may overnight aboard the vessel. Additionally, first aid and fire-fighting equipment, and a Coast Guard approved life raft with capacity for the entire crew (including ADF&G staff) must be aboard the chartered vessel at all times while under contract. The vessel must meet safety standards outlined by the USCG and be available for vessel inspection if requested by the State. The chartered vessel will provide all supplies and equipment necessary for vessel operation including fuel and equipment lubricants. ADF&G will have general direction over the activity of the vessel, but the contractor will be responsible for the safe operation of the vessel.

The successful bidder must show current insurance information. Protection and Indemnity insurance, including crew exposure, in the amount of at least \$300,000 is required. The State will provide insurance coverage for State employees only. The contractor will hold the State harmless from any liability caused by loss of vessel or damage caused to or by the vessel.

The 2013 bid should be based on a percentage of the catch value, not to exceed 80%. Bids exceeding 80% of the value of the catch will be rejected. The contract will be awarded to the bidder with the lowest percentage of the total value of the catch. A minimum of \$1,750 dollars per fishing day is guaranteed to the awarded bidder upon completion of test fishery obligations. The total value of the test fishery catch is not to exceed \$25,000, the allowable test fish authority. Delays or interruptions in the charter due to equipment failure will be the responsibility of the skipper and lost time will be deducted from the charter costs or can be made up by extending the charter duration at the discretion of ADF&G employee(s). The bid will be awarded on Monday, May 20, 2013 to the lowest bidder meeting the vessel requirements. ADF&G reserves the right to reject any or all quotes.

**Bids must be received by the Alaska Department of Fish and Game in Kodiak by 5:00 p.m. Sunday, May 19, 2013.**