

**2012 Kotzebue Sound Salmon Fisheries Management
Plan**

by

Jim Menard

May 2012

Alaska Department of Fish and Game

Divisions of Sport Fish and Commercial Fisheries



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Weights and measures (metric)		General		Mathematics, statistics	
centimeter	cm	Alaska Administrative Code	AAC	<i>all standard mathematical signs, symbols and abbreviations</i>	
deciliter	dL	all commonly accepted abbreviations	e.g., Mr., Mrs., AM, PM, etc.	alternate hypothesis	H_A
gram	g	all commonly accepted professional titles	e.g., Dr., Ph.D., R.N., etc.	base of natural logarithm	e
hectare	ha	at	@	catch per unit effort	CPUE
kilogram	kg	compass directions:		coefficient of variation	CV
kilometer	km	east	E	common test statistics	(F, t, χ^2 , etc.)
liter	L	north	N	confidence interval	CI
meter	m	south	S	correlation coefficient	
milliliter	mL	west	W	(multiple)	R
millimeter	mm	copyright	©	correlation coefficient (simple)	r
		corporate suffixes:		covariance	cov
Weights and measures (English)		Company	Co.	degree (angular)	$^\circ$
cubic feet per second	ft ³ /s	Corporation	Corp.	degrees of freedom	df
foot	ft	Incorporated	Inc.	expected value	E
gallon	gal	Limited	Ltd.	greater than	>
inch	in	District of Columbia	D.C.	greater than or equal to	≥
mile	mi	et alii (and others)	et al.	harvest per unit effort	HPUE
nautical mile	nmi	et cetera (and so forth)	etc.	less than	<
ounce	oz	exempli gratia	e.g.	less than or equal to	≤
pound	lb	(for example)		logarithm (natural)	ln
quart	qt	Federal Information Code	FIC	logarithm (base 10)	log
yard	yd	id est (that is)	i.e.	logarithm (specify base)	log ₂ , etc.
		latitude or longitude	lat. or long.	minute (angular)	'
Time and temperature		monetary symbols (U.S.)	\$, ¢	not significant	NS
day	d	months (tables and figures): first three letters	Jan,...,Dec	null hypothesis	H_0
degrees Celsius	°C	registered trademark	®	percent	%
degrees Fahrenheit	°F	trademark	™	probability	P
degrees kelvin	K	United States (adjective)	U.S.	probability of a type I error (rejection of the null hypothesis when true)	α
hour	h	United States of America (noun)	USA	probability of a type II error (acceptance of the null hypothesis when false)	β
minute	min	U.S.C.	United States Code	second (angular)	"
second	s	U.S. state	use two-letter abbreviations (e.g., AK, WA)	standard deviation	SD
Physics and chemistry				standard error	SE
all atomic symbols				variance	
alternating current	AC			population sample	Var
ampere	A			sample	var
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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2012 KOTZEBUE SOUND SALMON FISHERIES MANAGEMENT PLAN

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The Regional Information Report Series was established in 1987 and was redefined in 2006 to meet the Division of Commercial Fisheries regional need for publishing and archiving information such as project operational plans, area management plans, budgetary information, staff comments and opinions to Board of Fisheries proposals, interim or preliminary data and grant agency reports, special meeting or minor workshop results and other regional information not generally reported elsewhere. Reports in this series may contain raw data and preliminary results. Reports in this series receive varying degrees of regional, biometric and editorial review; information in this series may be subsequently finalized and published in a different department reporting series or in the formal literature. Please contact the author or the Division of Commercial Fisheries if in doubt of the level of review or preliminary nature of the data reported. Regional Information Reports are available through the Alaska State Library and on the Internet at <http://www.adfg.alaska.gov/sf/publications/>.

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ABSTRACT

This management plan provides the expected run outlooks and harvest strategies for Kotzebue Sound salmon fisheries in 2012. Chum salmon *Oncorhynchus keta* are the dominant salmon species in the Kotzebue District most of which are produced in the Kobuk and Noatak Rivers. Based on the chum salmon run outlook no closures in subsistence fishing are expected and there will be a surplus for commercial harvest in 2012. Because of an expected limited market the department will open the commercial fishery to limited fishing periods based on buyer capacity. The department will restrict commercial fishing time if commercial catches or test fish catches indicate a weak run or if a more orderly fishery is necessary to prevent waste.

Key words: Kotzebue Sound, Kobuk, Noatak, chum salmon, *Oncorhynchus keta*, subsistence, commercial, fishing, escapement, strategy.

INTRODUCTION

This Kotzebue District salmon fisheries management plan is to inform fishermen, processors and other interested people of the management strategies for the commercial salmon fishery. The Kotzebue District includes all waters from Cape Prince of Wales to Point Hope. The Kotzebue District is divided into three subdistricts and all are open to commercial fishing. Most fishing occurs in Subdistrict 1, which is subdivided into six statistical areas to help managers determine catch location (Figure 1). Within the Kotzebue District chum salmon *Oncorhynchus keta* are the most abundant anadromous fish. Other salmon species (Chinook *O. tshawytscha*, pink, *O. gorbuscha*, coho, *O. kisutch*, and sockeye *O. nerka*) occur in lesser numbers, as do Dolly Varden *Salvelinus malma*, and sheefish (inconnu sheefish *Stenodus leucichthys*).

HISTORICAL FISHING EFFORT

Subsistence Fishery

Subsistence fishing has long been an important food gathering activity for people of the Kotzebue Sound drainages. The most recent subsistence survey of salmon harvests in 2004, excluding city of Kotzebue residents, estimated a total of 20,604 chum salmon were harvested from the Kobuk River and 3,997 chum salmon were harvested from the Noatak River. Over 90% of the subsistence salmon harvests are chum salmon. Subsistence salmon surveys were not done in 2011. Previous surveys in the 2000s indicate that Kotzebue residents harvest approximately the same amount of salmon as all the other villages combined.

Commercial Fishery

The historical commercial chum salmon harvests are listed in Table 1. Commercial chum salmon harvests during the 20 years when there was a major buyer (1982-2001) ranged from 55,907 to 521,406 fish, the 20-year average being 220,720. The 5-year (1997-2001) average catch was 141,741. This significant decrease reflects the lack of demand for salmon on the open market that began in the mid-1990s as buyers began to purchase less salmon. Fishing effort during 1982–2001 ranged from 45 to 199 fishermen. The 20-year average was 129 fishermen; the 5-year average from 1997–2001 was 61 fishermen. The decrease in participation was likely due to substantial price declines and declining market.

In 2002, the last significant buyer in the commercial fishery decided to not purchase fish in Kotzebue. Because there was no major buyer only 3 permit holders fished in 2002. Likewise, in 2003 there were only 4 permit holders. In both 2002 and 2003, one permit holder became a licensed agent for a buyer outside of Kotzebue, and worked with other permit holders to provide product for that market.

Beginning in 2004 one buyer provided a limited market for permit holders. The fishing effort (permits fished) over the in the next 5 years was one-quarter the fishing effort of 20 years ago. From 2004–2008 there were less than 50 permit holders participating in the commercial fishery each year with the average being 44 permit holders. In 2009 there was an increase to 62 permit holders participating in the fishery and in 2010, 67 permit holders fished. The 2010 harvest of 270,343 chum salmon was the best harvest since 1995. In 2011, because of runway closures at the Kotzebue airport due to construction, the buyer switched to evening and overnight fishing periods. Although the price of \$0.40 per pound for chum salmon was the same as the previous year there was a much larger fishing effort in 2011 when 89 permit holders fished. The increase in fishing effort was likely the result of the evening fishing hours allowing those with day jobs to participate in the fishery. The 2011 catch of 264,321 chum salmon was slightly below the previous year's catch.

2012 RUN OUTLOOK

The outlook for the 2012 season is based on the parent-year escapements and returning age classes observed in the test fish samples from the Kobuk and Noatak Rivers in 2011. The 4-year-old component of the run is expected to be above average based on the 3-year-old return in 2011. The 5-year-old component of the run is expected to be average based on the 4-year-old return last year. The 3-year-old and 6-year-old age classes are much smaller components of the run and are expected to be average. The commercial harvest is expected to fall within the range of 250,000 to 280,000 chum salmon, if market conditions can accept that level of harvest.

MANAGEMENT STRATEGIES

Primary commercial fishery management objectives are to provide adequate chum salmon passage through the commercial fishery: (1) to ensure sustained runs by allowing adequate escapement, and (2) to meet subsistence harvest uses. Fishery management will be dependent on comparing period and cumulative season catch rates to prior years and test fishing results on the Kobuk and Noatak rivers.

Age composition of commercial salmon catches will be closely monitored to determine the strength of age classes in the run. If there is a low abundance of older salmon, which tend to migrate into freshwater first, catch rates will likely be weak early in the season. A strong 4-year-old return may cause midseason catches to rise.

Demand for chum salmon during the 2012 season is expected to be the same as 2011 as the same buyer is expected to return. However, the buyer may decide to purchase fish from a limited number of permit holders who are willing to provide a higher quality salmon by taking care of the fish after harvest.

If the commercial fishery is similar to last year there will be 6 to 8 hour fishing periods on any day of the week, except Sunday. If the buyer opts for longer fishing periods similar to the 12-hour periods in the late 1990s and early 2000s then there will likely be a one-day closure midweek.

In order to allow the buyer flexibility and an orderly fishery the department plans to open the commercial fishery to the hours requested by the buyer. If poor run strength necessitates fishing restrictions, the department will establish periodic closures of the fishery.

During the last 8 years, the commercial fishing schedule has been set by the buyer. However, the 2006 run exhibited late run timing and the department did restrict fishing time to allow for more salmon passage through the commercial fishing district. Otherwise, in all other years beginning in

2004, there was no restriction of the fishing time requested by the buyer. The department will consult with the buyer if concern arises about salmon runs and the need to reduce commercial fishing time.

The department intends to open the commercial fishery anytime after July 9 when the buyer is ready or permit holders indicate they are ready to fish and a market is available. By regulation the commercial season closes after August 31.

If commercial catches indicate a weak run, and are in agreement with test fish catches in the Kobuk River, the department will consider reducing fishing time in late July to two short duration periods per week or less. If commercial catches indicate sufficient run strength the department will allow commercial fishing to continue based on market conditions and escapement indicators. Likewise, in August as the Noatak River chum salmon run passes through the district the department will consider restrictions if commercial catches indicate a weak run, and are in agreement with department test fish catches. No time restrictions on subsistence fishing are expected in 2012.

ESCAPEMENT OBJECTIVES

Inseason escapement-based management will consist of one test fish project on the Kobuk River, limited test fishing on the Noatak River, and reports from subsistence fishermen. The test fishing project on the Kobuk River, in the vicinity of Kiana, will provide an inseason index of chum salmon passage. The department has an index objective of 600 for the season at the test fish project. If the index is projected to fall short of 600 then restriction in commercial fishing time will be necessary to make sure adequate escapement is moving into the Kobuk River. Test fishing is also likely to occur in August on the Noatak River and comparisons made to previous season's catches. If there are poor test fish catches on the Noatak River and there are poor catches in the commercial fishery, then restriction in commercial fishing time may be necessary.

Aerial surveys will be attempted beginning in September. Aerial surveys are not a direct count or estimate of the salmon population, but are used as an index for comparison with surveys both in season and in prior years. Surveys are conducted too late to affect present year fisheries decisions, but do provide useful information in evaluating management decisions and help project future salmon returns. Aerial survey data are utilized to: (1) evaluate initial run strength while salmon are traveling to the spawning grounds, and (2) document peak salmon abundance on the spawning grounds as an index to total escapement. These enumeration techniques are best initiated during times of low river water levels, high water clarity, and good sunlight penetration. Unfortunately, these conditions are not always available.

One of the primary fishery management strategies is to provide for escapement within sustainable escapement goal ranges (SEG) for each river system. These ranges developed in 2007 are based on an analysis of historical harvest and escapement information of specific index areas within major drainages. These aerial survey escapement objectives are: (1) subject to continued review, (2) intended to evaluate escapement trends between years, and (3) are not a total count of the salmon escapement. The Noatak and upper Kobuk Rivers are flown annually if personnel and weather conditions permit and other rivers are flown on an opportunistic basis. The chum salmon escapement goals are as follows: Noatak River (mouth to Kelly Bar, including the Eli River) – 42,000 to 91,000, Squirrel River – 4,900 to 10,500, Salmon River – 3,300 to 7,200, Tutuksuk River – 1,400 to 3,000, and upper Kobuk River 9,700 to 21,000.

TABLES AND FIGURES

Table 1.–Kotzebue District chum salmon fishery historical information, 1962–2011.

Year	Total Catch	Number of Permits ^a	Season Catch per Permit Holder	Gross Value of Catch to Permit Holders
1962	129,948	84	1,547	\$4,500
1963	54,445	61	893	\$9,140
1964	76,449	52	1,470	\$34,660
1965	40,025	45	889	\$18,000
1966	30,764	44	699	\$25,000
1967	29,400	30	980	\$28,700
1968	30,212	59	512	\$46,000
1969	59,335	52	1,141	\$71,000
1970	159,664	82	1,947	\$186,000
1971	154,956	91	1,703	\$200,000
1972	169,664	104	1,631	\$260,000
1973	375,432	148	2,537	\$925,000
1974	627,912	185	3,394	\$1,822,784
1975	563,345	267	2,110	\$1,365,648
1976	159,796	220	726	\$580,375
1977	195,895	224	875	\$1,033,950
1978	111,494	208	536	\$575,260
1979	141,623	181	782	\$990,263
1980	367,284	176	2,087	\$1,446,633
1981	677,239	187	3,622	\$3,246,793
1982	417,790	199	2,099	\$1,961,518
1983	175,762	189	930	\$420,736
1984	320,206	181	1,769	\$1,148,884
1985	521,406	189	2,759	\$2,137,368
1986	261,436	187	1,398	\$931,241
1987	109,467	160	684	\$515,000
1988	352,915	193	1,829	\$2,581,333
1989	254,617	165	1,543	\$613,823
1990	163,263	153	1,067	\$438,044
1991	239,923	142	1,690	\$437,948
1992	289,184	149	1,941	\$533,731
1993	73,071	114	641	\$235,061
1994	153,452	109	1,408	\$233,512
1995	290,730	92	3,160	\$316,031
1996	82,110	55	1,493	\$56,310
1997	142,720	68	2,099	\$187,978
1998	55,907	45	1,242	\$70,587
1999	138,605	60	2,310	\$179,781
2000	159,802	64	2,497	\$246,786
2001	211,672	66	3,207	\$322,650
2002	8,390	3	2,797	\$7,572
2003	25,423	4	6,356	\$26,377
2004	51,038	43	1,187	\$64,420
2005	75,971	41	1,853	\$124,820
2006	137,961	42	3,285	\$216,654
2007	147,087	46	3,198	\$243,149
2008	190,550	48	3,970	\$385,270
2009	187,562	62	3,025	\$376,554
2010	270,343	67	4,035	\$860,125
Average	197,209	111	1,950	\$586,591
2011	264,321	89	2,970	\$867,085

^a During 1962-1966 and 1968-1971 figures represent the number of vessels licensed to fish in the Kotzebue District, not the number of fishermen.

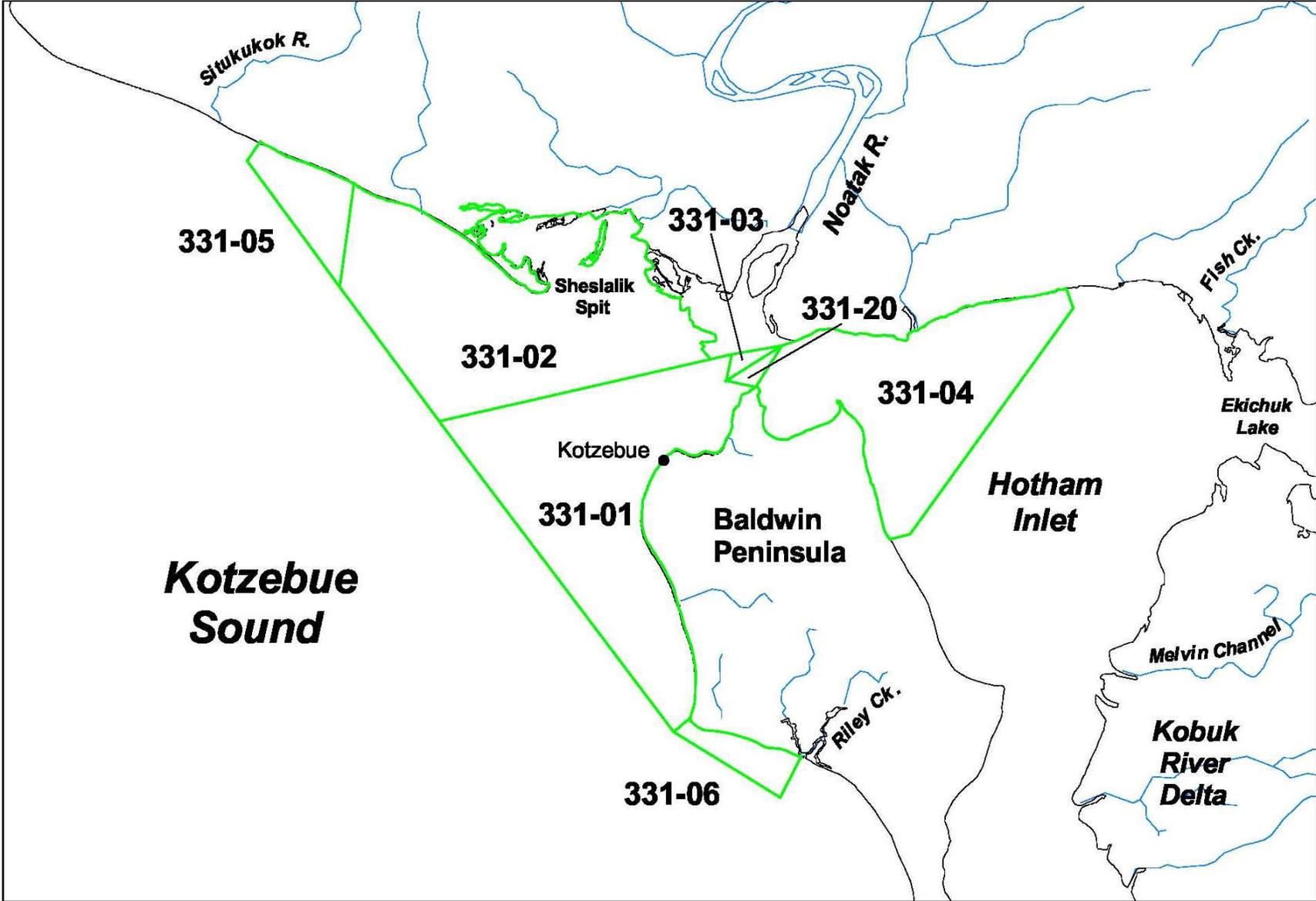


Figure 1.-Kotzebue salmon subdistrict boundaries.