Regional Information Report No. 3A07-06

2007 Kotzebue Sound Salmon Fisheries Management Plan

by

Jim Menard

May 2007

Alaska Department of Fish and Game **Division of 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, Special Publications and the Division of Commercial Fisheries Regional Reports. 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.

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)

Measures (fisheries)

fork length	FL
mideye-to-fork	MEF
mideye-to-tail-fork	METF
standard length	SL
total length	TL

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

REGIONAL INFORMANTION REPORT NO. 3A07-06

2007 KOTZEBUE SOUND SALMON FISHERIES MANAGEMENT PLAN

by
Jim Menard
Division of Commercial Fisheries, Nome

Alaska Department of Fish and Game
Division of Commercial Fisheries
333 Raspberry Road, Anchorage, AK 99518

May 2007

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.sf.adfg.ak.us/statewide/divreprots/htlm/intersearch.cfm.

Jim Menard,
Alaska Department of Fish and Game, Division of Commercial Fisheries,
PO Box 1148, Nome, Alaska, 99762, USA

This document should be cited as:
Menard, J. 2007. 2007 Kotzebue Sound salmon fisheries management plan. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report No. 3A07-06, Anchorage.

The Alaska Department of Fish and Game (ADF&G) administers all programs and activities free from discrimination based on race, color, national origin, age, sex, religion, marital status, pregnancy, parenthood, or disability. The department administers all programs and activities in compliance with Title VI of the Civil Rights Act of 1964, Section 504 of the Rehabilitation Act of 1973, Title II of the Americans with Disabilities Act (ADA) of 1990, the Age Discrimination Act of 1975, and Title IX of the Education Amendments of 1972.

If you believe you have been discriminated against in any program, activity, or facility please write:

ADF&G ADA Coordinator, P.O. Box 115526, Juneau AK 99811-5526

U.S. Fish and Wildlife Service, 4040 N. Fairfax Drive, Suite 300 Webb, Arlington VA 22203

Office of Equal Opportunity, U.S. Department of the Interior, Washington DC 20240

The department's ADA Coordinator can be reached via phone at the following numbers:

(VOICE) 907-465-6077, (Statewide Telecommunication Device for the Deaf) 1-800-478-3648, (Juneau TDD) 907-465-3646, or (FAX) 907-465-6078

For information on alternative formats and questions on this publication, please contact:

ADF&G, Division of Commercial Fisheries, P.O. Box 115526, Juneau AK 99811 (907)465-4210.

TABLE OF CONTENTS

Page

LIST OF TABLES i
LIST OF FIGURES i
ABSTRACT 1
INTRODUCTION 1
Historical Fishing Effort 1
Subsistence Fishery 1
Commercial Fishery 1
2007 RUN OUTLOOK 2
Management Strategies 2
Escapement Objectives 3
TABLES AND FIGURES 5

LIST OF TABLES

Table **Page**

1. Kotzebue District chum salmon fishery historical information, 1962–2006. 6

LIST OF FIGURES

Figure **Page**

1. Kotzebue Salmon district boundaries. 7

ABSTRACT

This management plan provides the expected run outlooks and harvest strategies for Kotzebue Sound salmon fisheries in 2007. Chum salmon *Oncorhynchus keta* are the dominant salmon species in the Kotzebue District, most of which are produced in the Kobuk and Noatak Rivers. No closures in subsistence fishing are expected in 2007. Because of a limited market the department will open the commercial fishery continuously to allow the buyer maximum flexibility in determining fishing periods. 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 will inform fishers, processors and other interested people of the management strategies for the Kotzebue District 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. Subdistrict 1 has six statistical areas open to commercial salmon fishing (Figure 1). Within the Kotzebue District chum salmon are the most abundant anadromous fish. Other salmon species (Chinook, pink, coho, and sockeye) occur in lesser numbers, as do Arctic char and sheefish.

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 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 2006. Previous surveys in the 2000s indicate that Kotzebue residents harvest approximately the same amount of salmon as all the other villages combined.

Commercial Fishery

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 (Table 1). 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 fishers. The 20-year average was 129 fishers; the 5-year average from 1997–2001 was 61. The decrease in participation is likely due to substantial price declines and lack of 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) the last 3 years has been less than one-quarter the fishing effort 20 years ago.

The 2004 harvest by 43 permit holders was 51,077 chum salmon, 128 Chinook salmon, 124 Dolly Varden and 3 sockeye salmon. The 2005 harvest by 41 permit holders was 75,971 chum salmon, 7 Chinook salmon and 181 Dolly Varden. The 2006 commercial harvest by 42 permit holders was 138,660 chum salmon. There were 9 Chinook salmon, 5 sockeye salmon, 3 pink salmon, 278 Dolly Varden and 13 whitefish caught in the commercial fishery and kept for personal use in 2006.

2007 RUN OUTLOOK

The outlook for the 2007 season is based on the parent-year returns and returning age classes observed in the test fish samples from the Kobuk and Noatak Rivers in 2006. During the 2007 season, the 4-year-old component of the run is expected to be above average. The 5-year-old component of the run is expected to be average based on the 4-year-old return this past season. The 3-year-old and 6-year-old age classes are much smaller components of the run and are expected to be above average. The commercial harvest is expected to fall within the range of 100,000 to 150,000 chum salmon, if market conditions can accept that level of harvest.

MANAGEMENT STRATEGIES

Primary commercial fishery management objectives are to provide adequate chum salmon escapement through the commercial fishery: (1) to ensure sustained runs by allowing adequate escapement, and (2) to meet subsistence harvest needs. 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 mid-season catches to rise.

Demand for chum salmon during the 2007 season is expected to be the same as 2006 as the same buyer is returning. 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 the weekdays and weekends will be closed to fishing. 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 1 day closure mid week and the weekends would be closed to fishing.

In order to allow the buyer some flexibility the department plans to open the commercial fishery continuously and allow the buyer to direct their fleet when to fish. If a problem develops with wastage of salmon because of the continuous fishing period the department will restrict fishing openings to a schedule that best fits market conditions. If poor run strength necessitates having fishing restrictions, the department will have periodic closures of the fishery.

During the last 5 years the commercial fishing schedule has been set by the buyer. Only in 2006 did the department restrict fishing time to allow for more salmon passage through the commercial fishing district. 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. If the fishery is

similar to the last 5 years then the commercial fishery will continue to be open continuously. However, if a more orderly fishery is needed the department may set a series of commercial periods weekly to the benefit of permit holders and the buyers. By regulation the commercial season closes after August 31, but usually the buyer ceases operations the fourth week of August as catches dwindle and more water marked fish show up in the catches.

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 considered 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 2007.

ESCAPEMENT OBJECTIVES

Inseason escapement-based management will be limited to aerial surveys, one test fish project on the Kobuk River, and limited test fishing on the Noatak River. 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 goal of 600 for the season at the test fish project. If the goal 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 will also occur on a weekly basis in August in the Noatak River and comparisons made to previous season's catches. If there are poor test fish catches on the Noatak and there are poor catches in the commercial fishery then restriction in commercial fishing time will be necessary.

Aerial surveys will be attempted beginning in late August and ending in mid-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 inseason and in prior years. Typically 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 SEG's developed in 2006 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, 1962–2006.

	Commercial Catch					Escapement (escapement goal ranges)				
Year	Number Caught	Number Permits	Average Catch per Permit	Total Value [a]	Value per Fisher	Squirrel R. (4.9K-10.5K)	Salmon R. (3.3K-7.2K)	Tutuksuk R. (1.4K-3K)	Upper Kobuk R. (9.7K-21K)	Noatak R. (42K-91K)
1962	129,948	84	1,547	$4,500	$54	5,384	12,936	10,841	9,224	177,080
1963	54,445	61	893	$9,140	$150	2,200	1,535	670	4,535	2,005 [b]
1964	76,449	52	1,470	$34,660	$667	8,009	9,353	2,685	7,985	89,798
1965	40,025	45	889	$18,000	$400	7,230	1,500 [b]		2,750	6,152
1966	30,764	44	699	$25,000	$568	1,350	3,957	1,383	1,474	101,760
1967	29,400	30	980	$28,700	$957	3,332	2,116	169	2,495	29,120 [b]
1968	30,212	59	512	$46,000	$780	6,746	3,367	823	2,370	44,896
1969	59,335	52	1,141	$71,000	$1,365	6,714	2,561	159	7,500 [b]	34,013
1970	159,664	82	1,947	$186,000	$2,268	4,418	3,000 [b]	2,000 [b]	13,908	138,145
1971	154,956	91	1,703	$200,000	$2,198	6,628	5,453	1,384	17,202	41,056
1972	169,664	104	1,631	$260,000	$2,500	32,126	2,073 [b]		18,155	67,601 [b]
1973	375,432	148	2,537	$925,000	$6,250	12,345	6,891		2,470 [b]	32,144
1974	627,912	185	3,394	$1,822,784	$9,853	32,523	29,190	8,312	28,120	151,889
1975	563,345	267	2,110	$1,365,648	$5,115	32,256	9,721	1,344 [b]	10,702	97,811
1976	159,796	220	726	$580,375	$2,638	7,229	1,161	758	2,522 [b]	45,779
1977	195,895	224	875	$1,033,950	$4,616	1,964 [b]				11,963 [b]
1978	111,494	208	536	$575,260	$2,766	1,863	814 [b]	368 [b]	1,981 [b]	43,342
1979	141,623	181	782	$990,263	$5,471	1,500 [b]	674 [b]	382 [b]	2,008	17,515 [b]
1980	367,284	176	2,087	$1,446,633	$8,220	13,563	8,456	1,165	11,472	174,751
1981	677,239	187	3,622	$3,246,793	$17,363	9,854	4,709	1,114	8,648	116,352
1982	417,790	199	2,099	$1,961,518	$9,857	7,690	1,821 [b]	1,322	14,674	20,871 [b]
1983	175,762	189	930	$420,736	$2,226	5,115	1,677	2,637	33,746	82,817
1984	320,206	181	1,769	$1,148,884	$6,347	5,473	1,471	1,132	10,621	72,900
1985	521,406	189	2,759	$2,137,368	$11,309	6,160	2,884	5,089	6,278	46,380 [b]
1986	261,436	187	1,398	$931,241	$4,980	4,982	1,971	4,257	6,015	41,535 [b]
1987	109,467	160	684	$515,000	$3,219	2,708 [c]	3,333	206	8,210	8,295 [b]
1988	352,915	193	1,829	$2,581,333	$13,375	4,848 [b]	6,208	3,122	11,895 [b]	54,569 [b]
1989	254,617	165	1,543	$613,823	$3,720					[c]
1990	163,263	153	1,067	$438,044	$2,863	5,500	6,335	2,275	15,355	26,345
1991	239,923	142	1,690	$437,948	$3,084	4,606	5,845	744	24,525	85,690
1992	289,184	149	1,941	$533,731	$3,582	2,765	1,345	1,162	11,803	35,036 [b]
1993	73,071	114	641	$235,061	$2,062	4,463	13,880	1,196	12,158	30,210 [b]
1994	153,452	109	1,408	$233,512	$2,142					[c]
1995	290,730	92	3,160	$316,031	$3,435	10,605	13,988	3,901	35,725	167,120
1996	82,110	55	1,493	$56,310	$1,024	21,795	21,740	8,200	74,770	336,940
1997	142,720	68	2,099	$187,978	$2,764	4,779 [b]	1,181 [b]	164 [b]	8,513 [b]	[c]
1998	55,907	45	1,242	$70,578	$1,568	[c]	[c]	[c]	600 [b]	[c]
1999	138,605	60	2,310	$179,781	$2,996	13,513	4,989	2,906	27,340	59,225 [b]
2000	159,802	64	2,497	$246,715	$3,855					[c]
2001	211,672	66	3,207	$314,100	$4,759				11,640	
2002	8,390	3	2,797		[d]				3,447 [b]	700 [b]
2003	25,423	4	6,355	$26,377	$6,594				11,175	34,575
2004	51,077	43	1,188	$64,420	$1,498				26,018	50,141
2005	75,971	41	1,853	$124,820	$3,044					[c]
2006	138,660	42	3,301	$216,654	$3,301				48,750	39,785

[a] Some estimates between 1962 and 1981 include only chum value which in figures represent represent over 99% of the total value. Figures after 1981 represent the chum value as well as incidental species such as char, whitefish and other salmon.

[b] Poor survey conditions or incomplete, early or late survey.

[c] Due to unsatisfactory conditions, no aerial surveys were flown.

[d] Value of fishery is confidential when less than 4 permit holders participate in a fishery.

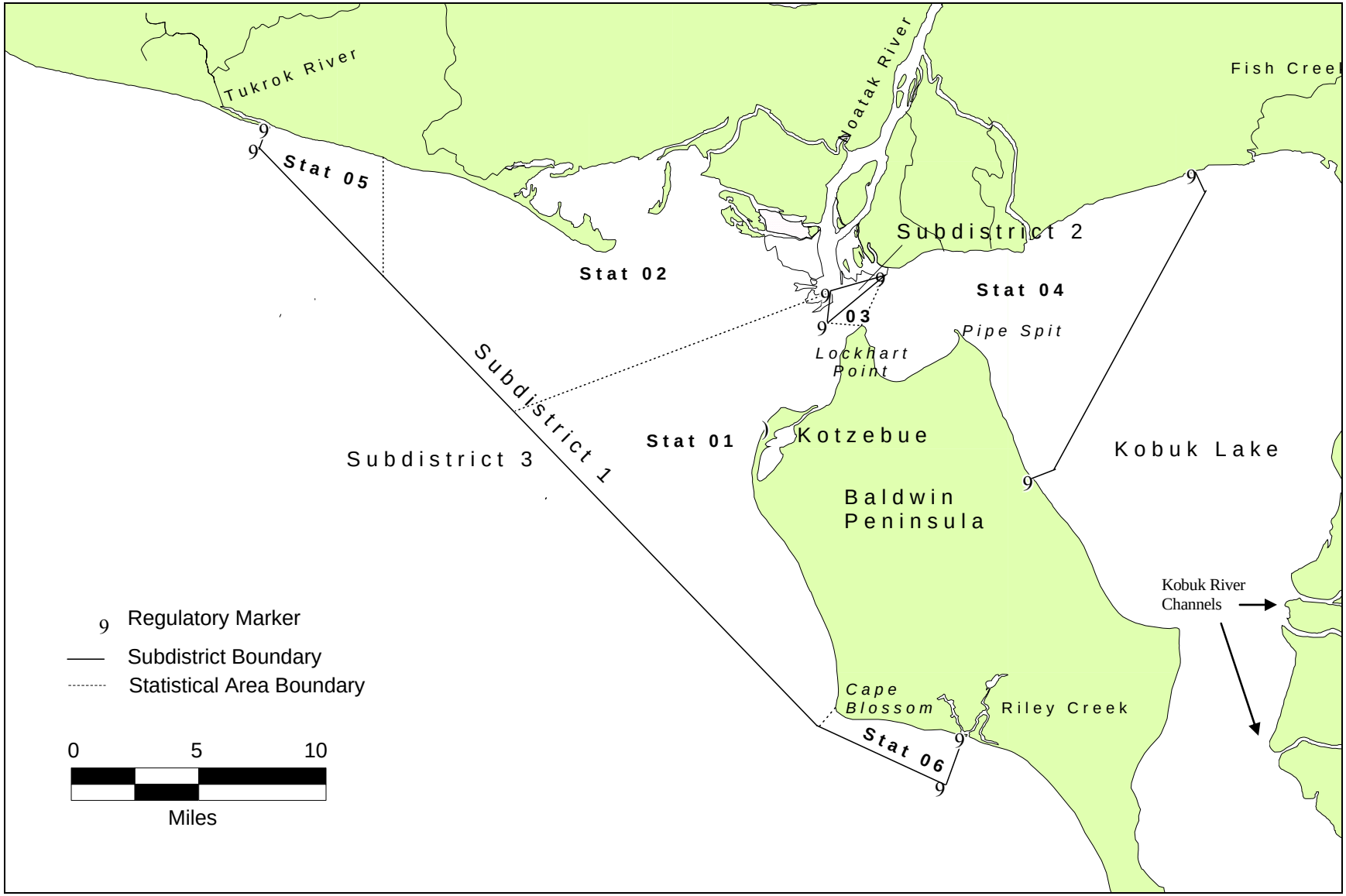

Figure 1.–Kotzebue Salmon district boundaries.