



State of Alaska  
Department of Fish and Game  
Sportfish Division

Nomination Form  
Fish Distribution Database

Region SCN USGS Quad(s) SEWARD B-8  
Fish Distribution Database Number of Waterway 244-30-10010

Name of Waterway Kenai River  USGS Name  Local Name  
 Addition  Deletion  Correction  Backup Information

For Office Use

Nomination # <u>08-102</u>	_____ ADF&G Fisheries Scientist	_____ Date
Revision Year: <u>2008 2009</u>	_____ ADNR OHMP Operations Mgr.	_____ Date
Revision to: Atlas _____ Catalog _____ Both _____	<i>[Signature]</i>	<u>5/10/08</u>
Revision Code: <u>F-1</u>	_____ FDD Project Biologist	_____ Date
	_____ Cartographer	_____ Date

OBSERVATION INFORMATION

Species	Date(s) Observed	Spawning	Rearing	Present	Anadromous
sockeye salmon	1951, 1970 - 2003			X	<input checked="" type="checkbox"/>
coho salmon	1980 - 1993, 1997, 1998, 2000 - 2002			X	<input checked="" type="checkbox"/>
Chinook salmon	1980, 1982 - 1993, 1997, 1998, 2000 - 2002			X	<input checked="" type="checkbox"/>
pink salmon	1980 - 82, 1984 - 93, 1997 - 98, 2000 - 02			X	<input checked="" type="checkbox"/>
					<input type="checkbox"/>

**IMPORTANT:** Provide all supporting documentation that this water body is important for the spawning, rearing or migration of anadromous fish, including: number of fish and life stages observed; sampling methods, sampling duration and area sampled; copies of field notes; etc. Attach a copy of a map showing location of mouth and observed upper extent of each species, as well as other information such as: specific stream reaches observed as spawning or rearing habitat; locations, types, and heights of any barriers; etc.

Comments:  
Inclusion of Kenai River (244-30-10010) in AWC supported by historic data  
*Additional Data on file through 2007*  
*Sockeye Salmon - 2004-2007*  
*Coho Salmon - 2004, 2006-2007*  
*Chinook Salmon - 2004, 2006-2007*  
*Pink Salmon - 2004, 2006*  
*Soldotna Comm Fish Archives.*  
*ADF&G Fisheries Data Series No. 07-82 documents and more*

Name of Observer (please print): J. Johnson *First presence*  
Signature: *[Signature]* Date: 6/15/2007  
Agency: ADF&G  
Address: 333 Raspberry Road  
Anchorage, Ak 99518

This certifies that in my best professional judgment and belief the above information is evidence that this waterbody should be included in or deleted from the Fish Distribution Database.  
Signature of Area Biologist: *[Signature]* Date: 4/30/08 Revision 02/05  
Name of Area Biologist (please print): Dave Westerman

Location Code/  
Stream Name/ Kenai Riv

Year	Date	Chinook	Sockeye	Coho	Chum	Pink	Comments	Data Source
Kenai River System								
244-30-10010								
Kenai River								
Kenai C-4								
Seward B-8								
1970			73000				Max. count 88,000 sock. (1951)	All sonar data was collected by ADF&G, Commercial Fisheries Division.
1971			278000				Escapement count (sonar)	
1972			318000				Est. partial survey & sonar counts	Sonar counts were apportioned based on fishwheel catch.
1973			367000				Escapement count (sonar)	
1974			161000				Escapement count (sonar)	Escapement count (sonar)
1975			142000				Escapement count (sonar)	
1976			380000				Escapement count (sonar)	Escapement count (sonar)
1977			707000				Escapement count (sonar)	
1978			398900				Escapement count (sonar)	Escapement count (sonar)
1979			285020				Escapement count (sonar)	
1980		618	464038	7888		262394	Escapement count (sonar)	Escapement count (sonar)
1981			407639	2748		14344	Escapement count (sonar)	
1982		281	619831	1880		3647	Escapement count (sonar), after 6/21	Escapement count (sonar), after 6/22
1983		402	630340	2430			Escapement count (sonar), after 6/22	
1984	6/22-8/09	2240	344571	3006		13541	Escapement count (sonar), includes 10656 fish est. after 8/08	Escapement count (sonar)
1985	6/22-8/12	2267	502820	2644		3344	Escapement count (sonar)	
1986	6/22-8/01	3840	501157	4653		4381	Escapement count (sonar)	Escapement count (sonar)
1987	6/22-8/15	3159	1596871	9064		3483	Escapement count (sonar)	
1988	7/01-8/10	3414	1021469	1812		8761	Escapement count (sonar)	Escapement count (sonar)
1989	7/01-8/15	561	1599959	4970		24985	Escapement count (sonar)	
1990	7/01-8/07	2756	659520	1853		4224	Escapement count (sonar)	Escapement count (sonar)
1991	7/01-8/12	1167	647597	764		2551	Escapement count (sonar)	
1992	7/01-8/13	3836	994798	10486		22541	Escapement count (sonar)	Escapement count (sonar)
1993	7/01-8/13	1598	813617	1120		2867	Escapement count (sonar)	
1994	7/02-8/24		1003446				Escapement count (sonar)	no more apportionment
1995	7/01-8/14		630447				Escapement count (sonar)	
1996	7/01-8/12		794335				Escapement count (sonar)	no more apportionment
1997	7/01-8/25	313	1064818	13781		255	Escapement count (sonar)	
1998	7/01-8/13	834	767558	3679		10585	Escapement count (sonar)	Escapement count (sonar)
1999	7/01-8/18		802379				Escapement count (sonar)	
2000	07/01	1051	624578	7762	0	4366	Escapement count (sonar)	did not apportion
2001	7/01-8/13	7132	650036	8683	0	2179	Escapement count (sonar)	Apportionment began on
2002	7/1-8/14	547	957924	4356	0	39301	Escapement count (sonar)	Apportionment began on
2003	7/1-8/10		1181309				Escapement count (sonar)	did not appt.

nonsockeye counts are incomplete and do not represent true run strength

Location Code/

Stream Name/ Kenai Riv

	Year	Date	Chinook	Sockeye	Coho	Chum	Pink	Comments	Data Source
Kenai River System									
244-30-10010									
Kenai River									
Kenai C-4									
Seward B-8									
Lower river									
Chinook sonar									
Early run	1987	6/03-6/30	21913					Esc. count (sonar)	ADF&G, SF, Nelson
	1988	5/16-6/30	20880					Esc. count (sonar)	ADF&G, SF, Nelson
	1989	5/16-6/30	17992					Esc. count (sonar)	ADF&G, SF, Nelson
	1990	5/16-6/30	10768					Esc. count (sonar)	ADF&G, SF, Nelson
	1991	5/16-6/30	10939					Esc. count (sonar)	ADF&G, SF, Nelson
	1992	5/16-6/30	10087					Esc. count (sonar)	ADF&G, SF, Nelson
	1993	5/16-6/30	19669					Esc. count (sonar)	ADF&G, SF, Nelson
	1994	5/16-6/30	18403					Esc. count (sonar)	ADF&G, SF, Nelson
	1995	5/16-6/30	21884					Esc. count (sonar)	ADF&G, SF, Nelson
	1996	5/16-6/30	23505					Esc. count (sonar)	ADF&G, SF, Nelson
	1997	5/01-6/30	14963					Esc. count (sonar)	ADF&G, SF, web site
	1998	5/01-6/30	13103					Esc. count (sonar)	ADF&G, SF, web site
	1999	5/16-6/30	25666					Esc. count (sonar)	ADF&G, SF, web site
	2000	5/16-6/30	12479					Esc. count (sonar)	ADF&G, SF, web site
	2001	5/16-6/30	16676					Esc. count (sonar)	ADF&G, SF, web site
	2002	5/16-6/30	7162					Esc. count (sonar)	ADF&G, SF, web site
	2003	5/16-6/30	13325					Esc. count (sonar)	ADF&G, SF, web site
Late run	1987	7/01-8/15	48123					Esc. count (sonar)	ADF&G, SF, Nelson
	1988	7/01-8/11	52008					Esc. count (sonar)	ADF&G, SF, Nelson
	1989	7/01-8/07	29035					Esc. count (sonar)	ADF&G, SF, Nelson
	1990	7/01-7/26	33474					Esc. count (sonar)	ADF&G, SF, Nelson
	1991	7/01-8/08	34614					Esc. count (sonar)	ADF&G, SF, Nelson
	1992	7/01-8/10	30314					Esc. count (sonar)	ADF&G, SF, Nelson
	1993	7/01-8/10	51991					Esc. count (sonar)	ADF&G, SF, Nelson
	1994	7/01-8/7	53474					Esc. count (sonar)	ADF&G, SF, Nelson
	1995	7/01-8/9	44336					Esc. count (sonar)	ADF&G, SF, Nelson
	1996	7/1-7/31	53934					Esc. count (sonar)	ADF&G, SF, Nelson
	1997	7/01-8/10	54881					Esc. count (sonar)	ADF&G, SF, Nelson
	1998	7/01-8/10	34878					Esc. count (sonar)	ADF&G, SF, web site
	1999	7/01-8/10	48069					Esc. count (sonar)	ADF&G, SF, web site
	2000	7/01-8/15	44517					Esc. count (sonar)	ADF&G, SF, web site
	2001	7/01-8/03	33916					Esc. count (sonar)	ADF&G, SF, web site
	2002	7/1-8/10	41807					Esc. count (sonar)	ADF&G, SF-Jim Miller
	2003	7/1-8/3	41659					Esc. count (sonar)	ADF&G, SF-Jim Miller

**Fishery Data Series No. 07-82**

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# **Upper Cook Inlet Salmon Escapement Studies, 2006**

by

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and

**T. Mark Willette**

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Alaska Department of Fish and Game

Divisions of Commercial Fish and Sport Fisheries



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## ABSTRACT

Sockeye salmon *Oncorhynchus nerka* escapements into 4 river systems of Upper Cook Inlet, Alaska, were estimated using side-looking (formerly referred to as side-scanning) sonar equipment. Estimated sockeye salmon escapements were 1,499,692 into the Kenai River, 368,092 into the Kasilof River, 92,533 into the Crescent River, and 92,896 into the Yentna River. Species composition of fish wheel catches was used to apportion sonar counts in the Crescent and Yentna rivers during the entire sockeye salmon run and for Kenai and Kasilof rivers late in the sockeye salmon run. Incomplete indices of escapements of other salmonid species were also obtained by sonar for pink *O. gorbuscha* and coho salmon *O. kitsutch* in the Kenai and Kasilof rivers; for pink and chum salmon *O. keta* and Dolly Varden *Salvelinus malama* in the Crescent River; and pink, chum, and coho salmon in the Yentna River. The primary age classes for sockeye salmon in the Kenai River consisted of -1.2 (9.9%), -1.3 (38.7%), and -2.3 (44.0%); for the Kasilof River -1.2 (35.3%), -1.3 (30.5%) and -2.2 (27.4%); for the Crescent River age-1.3 (42.6%), -2.3 (36.2%), and -1.2 (14.3%); and for the Yentna River -1.2 (44.0%) -1.3 (39.3%), and -2.3 (5.8%). Sockeye salmon length and sex ratio data were within normal historical bounds in each river. The majority of fish counts were recorded within the onshore half of the ensonified range. Hourly peak salmon counts were typically recorded during the afternoon and evening hours along both banks in the Kenai River. Peak hourly counts along the north bank of the Kasilof River generally began in the morning hours and did not substantially decline until after midnight, when counts dropped sharply from the daytime and evening highs. Peak counts along the Kasilof south bank were highest in mid morning and lowest for several hours after midnight. Peak hourly counts along both banks of the Crescent River occurred in mid and late morning through the evening and reflected post meridiem high tides. Peak hourly counts along the north bank of the Yentna River occurred during the evening hours, whereas the south bank counts were highest from mid morning through the afternoon and into the evening, often declining substantially late in the evening. High water events were not a problem on any of the rivers except late in the season on the Yentna River. Two independent studies to estimate escapement were conducted on the Kenai and Yentna rivers in 2006. A DIDSON sonar counter was placed on both banks of the Kenai and Yentna rivers and the north bank of the Kasilof River to collect escapement data independent of the Bendix counter. A mark-recapture study was conducted to establish a third estimate of sockeye salmon run strength in both the Kenai and Susitna (including Yentna) rivers. Due to the mark-recapture studies, fish wheels were operated for atypically long periods every day, which may have impacted run timing on the Yentna River but not on the Kenai River. Results of these studies will be published in another report.

Key words: Upper Cook Inlet, sockeye salmon, Kenai River, Kasilof River, Crescent River, Yentna River, Susitna River, age, sex, length, sonar, escapement, fish wheel, substrate less, Bendix, DIDSON.

## INTRODUCTION

The primary objectives of Upper Cook Inlet (UCI) salmon escapement projects in 2006 were to estimate: (1) the daily and cumulative escapement of sockeye *Oncorhynchus nerka* salmon into the Kenai, Kasilof, Crescent, and Yentna rivers and (2) the age, length, and sex composition of those escapements. Meeting these objectives aids fisheries biologists in making day-to-day fisheries management decisions for Upper Cook Inlet to achieve escapement goals.

The Alaska Board of Fisheries has set optimal escapement goals (OEG), (considers both biological and allocative issues) for sockeye salmon in the Kenai and Kasilof rivers. The OEG for late-run sockeye salmon into the Kenai River is between 500,000 and 1,000,000 sockeye salmon and is 150,000 to 300,000 sockeye salmon for the Kasilof River. A sustainable escapement goal (SEG), (an escapement index that provides for sustained yields over a 5–10 year period), was set for the Yentna River at 90,000 to 160,000 sockeye salmon. The Crescent River biological escapement goal (escapement that provides for greatest potential for maximum sustained yield - BEG) is 30,000 to 70,000 sockeye salmon.

Prior to 1968, sockeye salmon escapement estimates in UCI, Alaska (Figure 1) were based on surveys of clear water spawning areas and provided no information about the distribution or