Fishery Management Report No. 10-56

2009 Kuskokwim Area Management Report

by

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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.

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

FISHERY MANAGEMENT REPORT NO. 10-56

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The Fishery Management Reports series was established in 1989 by the Division of Sport Fish for the publication of an overview of management activities and goals in a specific geographic area, and became a joint divisional series in 2004 with the Division of Commercial Fisheries. Fishery Management Reports are intended for fishery and other technical professionals, as well as lay persons. Fishery Management Reports are available through the Alaska State Library and on the Internet: http://www.sf.adfg.state.ak.us/statewide/divreports/html/intersearch.cfm. This publication has undergone regional peer review.

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ABSTRACT

The 2009 Kuskokwim Area Management Report is an annual volume reporting on management activities of the Alaska Department of Fish and Game, Division of Commercial Fisheries staff in the Kuskokwim River and Bay. The report emphasizes a descriptive account of the information, decisions, and rationale used to manage the Kuskokwim River and Bay commercial salmon (Chinook, *Oncorhynchus tshawytscha*, chum *O. keta*, sockeye *O. nerka*, and coho, *O. kisutch*), Subsistence, and Pacific herring *Clupea pallasi* fisheries, and outlines basic management objectives and procedures. We have included all information deemed necessary to fully explain the rationale behind management decisions in 2009. All narrative and data tabulations in this volume are combined in 4 sections, salmon, freshwater finfish, miscellaneous saltwater finfish followed by herring, to aid in the use of the document as a reference source. The extensive set of tables has been updated to record previously unlisted data for easy reference. Fisheries data in this report supersedes information in previous reports. Corrections or comments should be directed to the Anchorage office. Attention Editor: Charles Brazil, Kuskokwim Area Management Biologist, 333 Raspberry Road, Anchorage Alaska, 99518.

Keywords: Kuskokwim River, Kuskokwim Bay, commercial fisheries, subsistence, Pacific salmon, Chinook, *Oncorhynchus tshawytscha*, chum *O. keta*, sockeye *O. nerka*, and coho salmon, *O. kisutch*, Pacific herring, *Clupea pallasi*.

INTRODUCTION

The Alaska Department of Fish and Game (ADF&G), Division of Commercial Fisheries (CF) is responsible for the management of commercial and subsistence fisheries in the Kuskokwim Area. This annual management report details the activities of fisheries management and research in the Kuskokwim Area during the 2009 season and provides information on the 2010 salmon and herring outlooks and management strategies.

This report is one of a series of Annual Management Reports detailing the management activities of the Division of Commercial Fisheries staff in the Kuskokwim Area. Reports from 1960 to 1974 appear in the Arctic-Yukon-Kuskokwim (AYK) Area report series under the section described as Kuskokwim District. Reports for 1975 to 1986 appear in the Kuskokwim Area Annual Report series. From 1987 to 2002, The Kuskokwim Area Annual Management Reports were included in the Regional Information Report (RIR) series. Beginning in 2003, the Kuskokwim Area Annual Management Reports have been included in the Fisheries Management Report (FMR) series.

Data presented in this report supersede information found in previous management reports. In addition to fishery catch, harvest and effort information, this report includes summary data from many fishery assessment projects. Complete documentation of assessment project findings appear in separate reports. Some of the data presented in this report are preliminary and may be presented with minor differences in future reports.

This report focuses primarily on the salmon and herring subsistence and commercial fisheries. Other marine and freshwater finfish are harvested primarily for subsistence use and recreational activity.

RESOURCE INVENTORY

There are over 40 fish species present in the Kuskokwim Area (Appendix A1). Five species of Pacific salmon are in the area; Chinook or "king" salmon (*Oncorhynchus tshawytscha*), sockeye or "red" salmon (*O. nerka*), coho or "silver" salmon (*O. kisutch*), pink or "humpy" salmon (*O. gorbuscha*), and chum or "dog" salmon (*O. keta*). The Kuskokwim River drainage has the largest populations of Chinook, sockeye, coho and chum salmon in the area. Pink salmon occur

throughout the area with significantly larger returns in even years than in odd years. Little quantitative data on the population size of pink salmon is available because of the lack of commercial markets and interest by subsistence fishermen. Several species of fish other than salmon, herring, and halibut are used for commercial, subsistence, and sport purposes in the Kuskokwim Area including sheefish (*Stenodus leucichthys*), whitefish (*Coregonus*) and (*Prosopium*), char (*Salvelinus alpinus*), burbot (*Lota lota*), Arctic grayling (*Thymallus arcticus*), northern pike (*Esox lucius*), Arctic lamprey (*Lampetra japonica*), rainbow smelt (*Osmerus mordax*), blackfish (*Dallia pectoralis*), rainbow trout (*O. mykiss*), lake trout (*S. namaycush*), threespine stickleback (*Gasterosteus aculeatus*), ninespine stickleback (*Pungitius pungitius*), longnose sucker (*Catostomus catostomus*) and Saffron cod, known locally as "Tom Cod" (*Eleginus gracilus*).

SECTION I. SALMON FISHERIES

MANAGEMENT AREA

The Kuskokwim Area includes the Kuskokwim River drainage, all waters of Alaska that flow into the Bering Sea between Cape Newenham and the Naskonat Peninsula, and Nunivak and St. Matthew Islands (Figure 1).

There are 38 communities consisting of approximately 4,500 households within the Kuskokwim Area. Of those households, approximately 75 percent are situated within the drainage of the Kuskokwim River (ADF&G 2003). Bethel is the largest community in the region, containing approximately 1,500 households. Much of the salmon fishing effort occurs within the mainstem of the Kuskokwim River; however, fishing also occurs in many of the tributaries that contain salmon. Residents of Quinhagak, Goodnews Bay, and Platinum, located along the south shore of Kuskokwim Bay, harvest salmon stocks primarily from the Kanektok, Arolik, and Goodnews River systems. Residents of Kipnuk, Kwigillingok and Kongiganak, located on the north Kuskokwim Bay harvest salmon from within the Kuskokwim River drainage and from local drainages that drain into Kuskokwim Bay. Residents of Toksook Bay, Nightmute, Tununak, Newtok, Chefornak and Mekoryuk, situated near the Bering Sea Coast, harvest salmon from coastal waters as well as local tributaries.

There are 4 commercial salmon fishing Districts in Kuskokwim Area: 1, 2, 4, and 5 (5 AAC 07.200). District 1, the Lower Kuskokwim River, consists of the Kuskokwim River from a line between Apokak Slough and the southernmost tip of Eek Island and Popokamiut upstream to a line between ADF&G regulatory markers located at Bogus Creek, about 9 miles above the Tuluksak River (Figure 2). The downstream boundary has been in effect since 1986, and the upstream boundary was established in 1994 (Appendix A2). District 1 was divided into 2 subdistricts in 2000. Subdistrict 1A consists of that portion of District 1 upstream from a line between regulatory markers located at the downstream end of Steamboat Slough and includes Statistical Areas 335-13 and 335-14. Subdistrict 1B consists of that portion of District 1 downstream from the Steamboat Slough regulatory markers and includes Statistical Areas 335-11 and 335-12. Subdistrict registration requirements are in effect in District 1 (5 AAC 07.370).

District 2, Middle Kuskokwim River, consists of Kuskokwim River from ADF&G regulatory markers located at the upstream entrance to the second slough on the west bank downstream from Kalskag to the regulatory markers at Chuathbaluk (Figure 3). The downstream boundary of District 2 was used for the first time in 1990 (Appendix A2).

The District 4 commercial salmon fishery was established in 1960 (Appendix A2). The district's boundaries extend from the northern-most edge of the mouth of Weelung Creek to the southern-most tip of the south mouth of Arolik River and expand 3 miles from the coast into Kuskokwim Bay (Figure 4). During 2001 to 2004, the northern boundary of District 4 was the northern most edge of Oyak Creek. The Kanektok and Arolik rivers are the main spawning streams in the district. The village of Quinhagak is located at the mouth of the Kanektok River.

The District 5 commercial salmon fishery was established in 1968 (Figure 5, Appendix A2). The boundaries extend east of a line from ADF&G regulatory markers located approximately 2 miles south and 2 miles north on the seaward side of the entrance of Goodnews Bay, expanding east to a line between mouth of Ukfigag Creek to the mouth of the Tunulik River. The Goodnews River drainage is the main spawning drainage in the District. The Goodnews and Middle Fork Goodnews rivers are the primary spawning rivers within the drainage.

The Kuskokwim-Goodnews Area includes those drainages beginning from the headwaters of the Kuskokwim River and all drainages in Kuskokwim Bay (Chythlook 2009). Additionally, the Kuskokwim-Goodnews Area includes all drainages that flow into the Bering Sea from Cape Newenham to the south and including the Ninglick River drainage to the north; Nunivak, St. Matthew, and adjacent islands are also included within the area as well (Chythlook 2009).

In 2009, permanent full-time ADF&G/CF staff assigned to the Kuskokwim Area included the Area Management Biologist, an Assistant Area Biologist, the Working Group/Subsistence Survey Coordinator, the Research Project Biologist, and 2 Assistant Research Biologists. There were additionally 2 long-term Fishery Biologists and numerous seasonal employees to assist in conducting various management and research projects. The staff aids in the enforcement of regulations in cooperation with the Department of Public Safety, Division of Fish and Wildlife Protection (FWP). The staff has also had increasing involvement with Native organizations and the United States Fish and Wildlife Service (OSM) in developing and operating salmon escapement monitoring projects (Appendix B1).

Full-time Sport Fish (SF) Division staff assigned to the Kuskokwim Area includes 1 Kuskokwim-Goodnews Area Management Biologist, and 1 Fishery Biologist Project Leader. Additionally, several seasonal staff members are employed annually to participate in program studies.

MANAGEMENT

Alaska Board of Fisheries

Kuskokwim Area fisheries are governed by regulations of Title 5 of the Alaska Administrative Code (AAC). Subsistence fishing regulations fall within Chapter 1, commercial fishing regulations in Chapter 7, commercial herring fishing regulations in Chapter 27, and sport fishing regulations are in Chapter 70. Other regulations pertaining to Kuskokwim Area fisheries include Chapter 39 (General Provisions and Policies) and Chapter 75 (Sport Fishing General Provisions). Commercial resident species fishery requirements are outlined in 5 AAC 39.734 and 5 AAC 39.780.

The process of developing fishing regulations Kuskokwim Area fisheries occurs within the established Alaska Board of Fisheries (BOF) process. Public input concerning regulations changes and allocation issues is provided for in this process through various means including submission of proposals, direct testimony to the BOF, and through public participation by local

Fish and Game Advisory Committees and the Kuskokwim Salmon Management Working Group (Working Group). Within the Kuskokwim Area there are 4 Fish and Game Advisory Committees; Central Bering Sea, Lower Kuskokwim, and Central Kuskokwim and McGrath. Under the current operating schedule, the BOF meets on a 3-year cycle. Proposals regarding the Kuskokwim Area were most recently discussed during January 2010. The next regularly scheduled BOF meeting to address Kuskokwim Area finfish issues is scheduled for January 2013.

Federal Subsistence Program

The Alaska National Interest Lands Conservation Act (ANILCA) of 1980 provides a priority for rural Alaska residents for taking fish and wildlife on federal public lands and called for creation of Regional Advisory Councils (RAC) to provide rural resident's input into the Federal Subsistence Program (16 U.S.C.A 3114). On October 1, 1999, the Secretaries of Interior and Agriculture published regulations to expand federal involvement in subsistence fisheries to waters in which the federal government claims a federal reserved water right (applicable waters). The Secretary of Interior and the Secretary of Agriculture delegated their authority in Alaska to the Federal Subsistence Board (FSB) to ensure rural residents receive a priority for subsistence taking on federal public lands and applicable waters. Federal subsistence fishing regulations are adopted by the FSB. Regional Advisory Councils provide recommendations and information to the FSB, review policies and management plans, provide a public forum and deal with other matters relating to subsistence uses. The FSB may close fishing for other uses on federal public lands and applicable waters if necessary to ensure a priority for federally qualified rural subsistence users.

Federal subsistence fishing schedules, openings, closings, and fishing methods are established in regulation (Department of Interior 2005-06). In general, these regulations are the same as those issued for the subsistence taking of fish under Alaska Administrative Code. However, differences in regulations do exist in some cases. For example, subsistence fishing is closed for a set amount of time before, during, and after commercial fishing periods under federal regulations, but it is handled by emergency order under state regulations.

Existing Management Plan

Alaska Statute Title 16.05.258, *Subsistence Use and Allocation of Fish and Game*, establishes the subsistence use priority for reasonable harvest opportunity consistent with sustained yield, when resources are not large enough to provide for all consumptive uses. In 1993, the BOF made a positive finding for Customary and Traditional Use for all salmon in the entire Kuskokwim Area (Appendix A2). In 2001, ADF&G recommended that the BOF amend 5 AAC 01.286 to include a revised finding of the amount necessary for subsistence (ANS) for the Kuskokwim Area using subsistence harvest data through 1999. After a thorough review of various options, the Board made a finding of the ANS for the Kuskokwim River by species and for the remainder of the Kuskokwim Area by all species combined (Bergstrom and Whitmore 2004). The ANS ranges for Kuskokwim River drainage by species are as follows: 64,500 to 83,000 Chinook salmon, 39,500 to 75,500 chum salmon, 27,500 to 39,500 sockeye salmon, and 24,500 to 35,000 coho salmon. The ANS range for the remainder of the Kuskokwim Area is from 7,500 to 13,500 salmon. In establishing the ANS range, the BOF used harvest information that represents the pattern of use in the subsistence fishery.

The Kuskokwim River salmon fisheries are managed according to the *Kuskokwim River Salmon Management Rebuilding Plan* (5 AAC 07.365) that provides guidelines for the sustained yield of salmon stocks large enough to meet escapement goals, provide fishermen with a reasonable opportunity to harvest amounts necessary for subsistence, and to provide for other fisheries. The fisheries associated with Kanektok and Arolik rivers are managed according to 5 AAC 07.367 *District 4 Salmon Management Plan*. The objective of this plan is to maintain a level of sustained yield, which will provide for subsistence needs, the long-term economic health of the commercial and sport fishing industries, and recreational opportunities, in the district and freshwater systems flowing into the district. There is no management plan associated with the District 5, Goodnews Bay commercial salmon fishery. Management of District 5 largely mirrors the management of District 4. One strategy in place in District 5 since 1990 has been to delay the commercial opening until late June to increase Chinook salmon escapements into the Goodnews River drainage.

Cooperative Management Process

The Working Group was formed in 1988 by the BOF in response to requests from stakeholders in the Kuskokwim Area that sought a more active role in the management of salmon fishery resources (Francisco et al. 1989). The Working Group has become the forum through which inseason management decisions are made regarding Kuskokwim River subsistence, commercial and sport salmon fisheries. Pre- and postseason Working Group activity provides the opportunity to participate in the regulatory processes that establish fishery management policies and regulations. In 2001, the Working Group modified their bylaws in order to more effectively address Federal Subsistence Management views by including seats for member representatives from the Kuskokwim River Coordinating Fisheries Committee of the Yukon–Kuskokwim Delta and Western Interior Federal Subsistence RAC. The Working Group further modified their bylaws in 2005 to include representation from communities at the headwaters of the drainage, which had not previously had a voice on the Working Group.

Participation in the Working Group process requires a great deal of time from its members and agency staff. The Working Group typically meets first in the spring each calendar year, conducts intensive and frequent meetings during the summer, and holds a wrap-up session in the fall or early winter. Funding provided by Office of Subsistence Management (OSM) is an essential part of enhancing the Working Group process. This funding allows ADF&G staff to more effectively prepare for meetings through better and more frequent distribution of updated fishery status information in a standardized format. The funding also provided travel for Working Group members to participate in meetings relevant to issues concerning Kuskokwim River fisheries, such as the postseason meeting in Anchorage and Kuskokwim Area interagency meetings. State general funds provide additional salary for ADF&G staff that coordinates the Working Group. The combined federal and state funds have further strengthened the Working Group process.

Working Group representative participation in meetings in Bethel and outside the Kuskokwim River drainage allows for an exchange of information between members and fishery assessment project leaders and research planners. Representatives were also able to testify at regulatory meetings in support of Working Group positions. The relationship among Working Group members, project leaders, research planners, and policy makers continues to be fostered, and these interactions are critical to the Working Group process. This relationship ensures that stakeholders remain up-to-date on new information and maintain their direct involvement in the management of the fishery.

From July, 2002 through October, 2004, funding was available for support of the Working Group process through the U.S. Fish and Wildlife Service (USFWS) OSM project FIS 01-116. OSM funding was discontinued in 2005 and reestablished in 2006 under project FIS 06-307. The current OSM project provides funding through 2008 for Working Group member travel to meetings and conferences; meeting supplies and arrangements; and ADF&G staff time to coordinate the Working Group process and to summarize and distribute information for Working Group members.

The Working Group met 15 times in 2009 (Bradley and Carroll 2010). During these meeting, fishery management information was presented by Working Group members, state and federal staff, tribal organizations, fishery partners, and the public. The Working Group discussed subsistence and commercial fishing reports from members and the public, the lower Kuskokwim River inseason subsistence harvest report, test fish project summaries, and reports from weir, tagging, sonar, and aerial survey programs.

BACKGROUND AND HISTORICAL PERSPECTIVE

Kuskokwim River and Kuskokwim Bay salmon fisheries compose the Kuskokwim Area salmon fisheries. The immense size of the Kuskokwim drainage and the distances between the commercial and subsistence fisheries, and the escapement monitoring projects throughout the drainage (Appendix A3) adds complexity to the management of Kuskokwim River salmon fisheries. Chinook salmon begin entry into the Kuskokwim River in late May, while chum and sockeye salmon begin their entry in mid June. Chinook and sockeye salmon entries decline rapidly in early July. Chum salmon run entry begins to decline in late July when coho salmon run entry begins. Coho salmon entry to the river declines in late August to early September. Fishery management information on run size and timing by species is limited until the salmon are distributed throughout the drainage and on the spawning grounds hundreds of miles from and months after the lower river fishery has been initiated. Kuskokwim Bay salmon have similar run timing into the Kanektok, Goodnews and Arolik rivers. These are small drainages in comparison to Kuskokwim River. Although evaluation of run size and timing in Kuskokwim Bay rivers is not immediate, it is much timelier than for Kuskokwim River and there are fewer stocks to evaluate. Therefore, many of the factors that make Kuskokwim River fisheries management difficult are not present in Kuskokwim Bay fisheries.

For the past 2 decades, efforts have been taken to expand coverage and apply new technologies toward the goal of improving estimation of salmon run timing and run strength monitoring by comparison of current year to historic information. These seasonal monitoring programs include the evaluation of subsistence fishery information; test fishery catch rates, radio telemetry projects, mark–recapture projects and commercial harvest catch rates. Additionally, fish have been monitored as they begin reaching clear water tributary streams by weir and sonar passage estimates and aerial spawning ground surveys. These projects assist fishery managers in evaluating the strength of the returning salmon runs.

Kuskokwim Area has no formal forecast for salmon returns. Broad expectations are developed based on an evaluation of parent-year escapements and trends in harvest and productivity. The overall goal of Kuskokwim Area research and management programs is to manage salmon runs for sustained yield by policies set forth by the BOF including: the *Policy for the Management of Mixed Stock Salmon Fisheries* (Mixed Stock Policy: 5 AAC 39.220), *Policy for the Management of Sustainable Salmon Fisheries* (Sustainable Salmon Policy: 5 AAC 39.222.), and. *Policy for*

Statewide Salmon Escapement Goals (Escapement Goal Policy: 5 AAC 39.223). For all statewide fisheries, the Alaska State Legislature has designated subsistence fishing as the highest priority among beneficial users of the resource (A.S. 16.05.258).

The Kuskokwim River salmon fisheries are managed according to the *Kuskokwim River Salmon Management Rebuilding Plan* (5 AAC 07.365) adopted by the BOF in January 2001 (Appendix A2; Burkey et al. 2000) and amended in January 2004 (Bergstrom and Whitmore 2004) and again in 2007 (Linderman and Bergstrom 2006). The purpose of the Rebuilding Plan is to provide guidelines for rebuilding and management of the Kuskokwim River fishery that will result in the sustained yield of salmon stocks large enough to meet escapement goals, provide amounts reasonably necessary for subsistence, and provide for fisheries other than subsistence. The Rebuilding Plan provides direction for establishing a subsistence fishing schedule allowing salmon net and fish wheel fisheries to be open for 4 consecutive days per week in June and July as announced by emergency order. The schedule is implemented in a stepwise progression up the river consistent with salmon run timing. The schedule may be altered based on run strength to achieve escapement goals. The Rebuilding Plan provides direction to revoke the subsistence fishing schedule when it is determined that escapement goals are assured for Chinook and chum salmon. Additionally, subsistence-fishing closures are scheduled by emergency order prior to, during and after commercial fishing periods to assure salmon harvested during open subsistence fishing periods do not reach the commercial market.

The Quinhagak fishery targets fish bound primarily for the Kanektok and Arolik rivers and is managed according to the *District 4 Management Plan* (5 AAC 07.367). The objective of the District 4 management plan is to maintain a level of sustained yield that will provide for subsistence needs, long-term economic health of commercial and sport fishing industries, and recreational opportunities of and freshwater systems flowing into the District. There is no specific management plan for the Goodnews River fishery (District 5); however, the fishery is managed similar to District 4. Regulations do provide for subsistence fishing closures prior to, during and after commercial fishing periods.

Kuskokwim River Chinook salmon are harvested primarily for subsistence use. Directed Chinook salmon commercial fishing in the Kuskokwim River was discontinued in 1987 by regulation through a 6-inch mesh size restriction and later timing of the commercial fishery (Francisco et al. 1988). Chinook salmon continued to be harvested incidentally in chum salmon directed commercial fisheries during late June and July under an incidental guideline harvest range of 0-50,000 fish. Directed Chinook salmon fisheries do occur in Districts 4 targeting Chinook salmon bound for the Kanektok and Arolik rivers) and 5 (targeting fish bound for the Goodnews River drainage). The harvest of sockeye salmon was considered incidental to chum salmon harvest in Kuskokwim River from 1987 to 2003. However, beginning in 2004, a guideline harvest level of 0–50,000 sockeye salmon was established. Kuskokwim District 4 and District 5 commercial fisheries target sockeye salmon. Coho salmon are targeted in all 3 area commercial fishing districts, with directed fisheries being prosecuted in late July, throughout August and in early September.

SALMON STOCK STATUS

Salmon returns to the majority of western Alaskan rivers (including Kuskokwim River) were generally below average from 1997 to 2001. However, these declines were not as evident in Kuskokwim Bay rivers. Kuskokwim Management Area was declared an economic disaster area

by the State of Alaska in 1997, 1998, 2000, and 2001 because of the extremely low chum and Chinook salmon commercial harvest levels and exvessel prices (Appendix A2). In 2000, both Chinook and chum salmon were designated Stocks of Concern by the BOF.

The precise causes for the 1997 to 2001 production failures are not known, but it is hypothesized that poor marine conditions had a large impact on ocean survival of these stocks. Likely factors that have received the most attention to date include the effects of El Niño, ocean and climate regime shifts, and competition relative to ocean carrying capacity (Yukon River Joint Technical Committee 2005).

In 2002, Chinook and chum salmon returns to the Kuskokwim River began to rebound and reached near record abundances from 2004 through 2007 (Estensen et al. 2009). This led to the BOF discontinuing Stock of Concern status for both species. Since 2007, Chinook and chum salmon abundance have returned to near average to average levels, while sockeye salmon abundance has been average to above average. Coho salmon abundance has mostly been average.

SUBSISTENCE FISHERY

The subsistence salmon fishery in the Kuskokwim region is one of the largest and most important in the state and supports one of the largest subsistence salmon fisheries in North America. Many households throughout the region are involved in harvesting, processing, and preserving salmon for subsistence use. The movement of families from permanent winter communities to summer fish camps, situated along rivers and sloughs, is a significant element of annual subsistence harvest efforts. Approximately 1,700 households in the Kuskokwim area annually harvest salmon for subsistence use (Tables 1 and 2, Appendices A4-A7). Many other households, which are not directly involved in catching salmon, participate by assisting family and friends with cutting, drying, smoking, and associated preservation activities (salting, canning and freezing). Studies conducted by the Division of Subsistence indicate that fish contribute as much as 85% of the total pounds of fish and wildlife harvested in a community annually, and salmon as much as 53% of the total annual harvest (Coffing 1991). Harvest of salmon for subsistence use is as much as 650 pounds per capita in some Kuskokwim River communities (Coffing et al. 2001).

Subsistence harvests of salmon have remained relatively stable for the past 15 years with the exception of the 2000 Chinook salmon harvest, the result of a poor run (Appendix A4–A7). Subsistence salmon fishing season is open unless a subsistence fishing schedule closure is imposed *Kuskokwim River Salmon Rebuilding Management Plan* (5 AAC 07.365), (these types of closures have not occurred since 2007), or if closures to the fishery are implemented by emergency order prior to, during and after commercial fishing periods (5 AAC 01.260). Salmon may be taken for subsistence purposes by gillnet, beach seine, hook and line attached to a rod or poles, hand line or fish wheels subject to restrictions (5 AAC 01.270). Additionally, salmon may be taken by spear in the Holitna, Kanektok, Arolik, and Goodnews Bay drainages. Subsistence salmon fishing gillnets may be up to 50 fathoms in length. The aggregate length of set or drift gillnets in use by any individual for the taking of salmon for subsistence purposes may not exceed 50 fathoms. The maximum depth of gillnets with 6-inch or smaller mesh size may be 45 meshes in depth while gillnets with greater than 6-inch mesh size may not be more than 35 meshes in depth.

Subsistence Salmon Harvest Estimation

Postseason Subsistence Harvest Surveys

ADF&G conducts annual household surveys to collect information about the harvest and use of salmon in the Kuskokwim Area (Tables 1 and 2, Appendices A4–A7). Prior to statehood, subsistence salmon harvest information was collected periodically by various federal departments and bureaus. Beginning in 1960, the Division of Commercial Fisheries collected subsistence salmon harvest information along the Kuskokwim River drainage by surveying fishermen at their fish camps during late July. Over the years, data collection methods changed several times. Harvest surveys were initiated in Quinhagak in 1967 and in Goodnews Bay and Platinum starting in 1979. In 1988, the Division of Subsistence took over the annual subsistence salmon harvest survey project from the Division of Commercial Fisheries, and collected and analyzed harvest data through 2007. Division of Subsistence made several changes to the methodology, including starting the data collection in October, well after the summer and fall salmon harvest was completed. This was done primarily to improve estimates of the subsistence coho salmon harvest (for detailed Division of Subsistence harvest monitoring methods, see Walker and Coffing [1993]). In 2008, the Division of Commercial Fisheries resumed responsibility for the annual postseason harvest survey project in the Kuskokwim Area, and dedicated a full-time Fishery Biologist II, based in Anchorage, as the project leader, and a seasonal Fishery Technician III as the crew leader, based in Bethel. The project methodology remains similar to that used by Division of Subsistence since 1989 except that instead of attempting a 100% survey of each community, a stratified random sampling method is used in order to sample communities most effectively within budget constraints on a yearly basis (Carroll and Hamazaki *In prep*) Analysis of the stratified sampling compared with the 100% attempted sampling, as well as adjusted historical salmon harvest estimates from 1989 to 2007 are reported in Hamazaki *In prep*).

ADF&G collaborates with local tribal organizations including the Orutsararmiut Native Council (ONC) in Bethel and the Kuskokwim Native Association (KNA) in Aniak to complete the annual postseason harvest surveys. The Fisheries Information Services (FIS) Division of the U.S. Fish and Wildlife Service (USFWS) Office of Subsistence Management (OSM) provides funding for this cooperative program under the Kuskokwim Area Postseason Subsistence Harvest Surveys project (FIS 08-352). Subsistence surveys have been aimed at primarily gathering data on the harvest and use of Chinook, chum, sockeye, and coho salmon. Pink salmon are harvested in the Kuskokwim Area; however, they are generally available only during even number years. Data for subsistence pink salmon harvests have not been consistently collected during the annual fall survey efforts, and though data have been collected on pink salmon beginning in 2008, those harvests are not reported here. Other Division of Subsistence community baseline studies conducted in the region also include pink salmon harvest data.

2009 Preliminary Harvest Summary

Because of changes in the project methodology in 2008 discussed above, all data reported here will be considered preliminary, and comparisons between 2008, 2009 and historical harvest estimates should be avoided. The peer-reviewed final report for the Postseason Subsistence Harvest Survey Project (Carroll and Hamazaki *In prep*) should be consulted for detailed methods and finalized data.

The 2009 total subsistence salmon harvest preliminary estimates for the Kuskokwim Area were 82,391 Chinook; 44,748 chum; 37,547 sockeye; and 31,690 coho salmon (Tables 1 and 2). Seventy-seven percent of the overall subsistence salmon harvests in the Kuskokwim Area were taken by residents of communities in the lower Kuskokwim River (from Tuluksak downstream to Eek, with 30% of the total harvest occurring in Bethel. The lower river communities are relatively densely populated, with approximately 65% of the total number of households in the Kuskokwim Area.

COMMERCIAL FISHERY

Background

Kuskokwim Area commercial salmon fishing dates back to the late 1800s. In the early years of the fishery, most of the commercial catch was sold locally for dog food (Oswalt 1990; Brown 1983). Salmon have been harvested in the Kuskokwim Area for export since 1913 (Pennoyer 1965). The current system of fishing districts, formerly called subdistricts, was established in 1960 for the Kuskokwim River and Quinhagak, District 4. District 5 was established in 1968. District 3 was eliminated in 1966 because of a lack of landings and District 2 has had only one season of commercial fishing since 1998.

Prior to 1983, a management strategy of conservatively increasing commercial harvest guidelines, establishing trends between catch and escapement, allowed development of the fishery. After changing from a harvest-guideline based management strategy to an escapement-objective based strategy in 1983, average harvests increased until the mid 1990s. The directed Chinook salmon fishery in Kuskokwim River was discontinued in 1987. Kuskokwim Area commercial salmon fishing permits may be utilized in any of the Area's commercial fishing districts. Commercial salmon fishing is allowed in Kuskokwim Area with set or drift gill nets. Initially, Kuskokwim River fishery regulations allowed the use of unrestricted mesh size during the entire season. Regulations in place from 1971 to 1984 required that commercial fishing gillnet mesh size be restricted to 6-inch maximum, after June 25. Districts 4 and 5 commercial fishery mesh sizes have been restricted to 6-inch maximum since inception of the fisheries. In 2007 the BOF adopted a regulation (5 ACC 07.331(c)) that allowed the use of up to 8-inch mesh in the District 1 commercial fishery (Linderman and Bergstrom 2006). However, the use of gear with greater than 6 inch mesh has not been used in the management of the District 1 commercial salmon fishery since being placed into regulation in 2007. Other regulatory changes include the BOF in 2007 adopting regulation giving ADF&G authority to allow the Lower Section of Subdistrict 1-B (5 ACC 07.320) to open to commercial fishing up to 2 hours earlier than the remainder of Subdistrict 1-B (Linderman and Bergstrom 2006).

The Kuskokwim Area commercial fishery was generally stable from 1985 to 1996 (Appendices A8–A20) with the harvests ranging from 800,000 fish to 2.3 million fish (Appendix A8). Effort ranged from 724 to 813 permits fished, and the exvessel value of the fishery ranged from $2.9 million to $12.7 million (Appendix A9). Beginning in 1997, the value of salmon began to decline, which led to a decreasing trend in fishing effort (Appendix A9), number of fish harvested (Appendix A8), and the exvessel value of the fishery (Appendix A9). From 1997 through 2002, commercial salmon harvests in the area ranged from 185,000 fish in 2002 to 758,000 fish in 1998. Effort ranged from 407 permits in 2002 to 707 permits in 1998, and the exvessel value of the fishery ranged from $324,000 in 2002 to $1.6 million in 1998. Furthermore, poor Chinook and chum salmon returns during 1999 through 2001 resulted in the

Kuskokwim River having limited commercial salmon fishing opportunity in June and July (Appendices A10 and A11).

As Kuskokwim River Chinook and chum salmon abundances rebounded in the mid-2000s, poor market conditions for chum salmon, in concert with limited processing capacity, continued to limit commercial salmon fishing opportunity in District 1 during July (Appendix A10). Likewise, the same factors limited commercial fishing opportunity during July in both Districts 4 (Appendix C8) and 5 (Appendix D9), and led to registered buyers imposing harvest limits on fishermen during early July (Appendix A2). Since 2003, commercial salmon harvests in the area have ranged from 442,000 fish to 688,000 fish (Appendix A8). Effort ranged from 434 permit holders to 484 permit holders, and the exvessel value of salmon in the Kuskokwim Area has rebound from the early 2000's with the exvessel value ranging from $893,000 to $1.5 million. A new fish processing plant located in Platinum began operation in 2009 and has improved processing capacity in the area. Also, there are indications of an improving chum salmon market. Both factors in part led to increased fishing opportunity in 2009.

Kuskokwim River Chinook salmon are harvested primarily for subsistence use, with well below historic average commercial harvests since 1996 (Appendix A12). Since 2005, Chinook salmon harvests have contributed nearly 5% of the exvessel value of the total District 1 commercial salmon fishery (Appendix A13). Preliminary run reconstruction (Estensen et al. 2009) information indicates the most recent 10-year average exploitation rate of Chinook salmon is approximately 30%, with the majority of the harvest attributed to the subsistence fishery.

Historically, Kuskokwim River chum salmon, though an important subsistence species, have been primarily targeted for commercial use (Appendix A14). However, since the late 1990s, that fishery has been constrained by low market interest in chum salmon and limited processing capacity (Appendix A14). Since 2005, commercial chum salmon harvests have contributed about 2% to the total exvessel value of the District 1 commercial salmon fishery (Appendix A13). Preliminary run reconstruction information (Estensen et al. 2009) indicates the recent 10-year average exploitation rate of chum salmon is approximately 9%.

Kuskokwim River sockeye salmon are targeted the District 1 commercial fisheries (Appendix A15). Kuskokwim River commercial sockeye salmon harvests make up about 8% of the district's total exvessel value (Appendix A13). Based on preliminary run reconstruction information (Estensen et al. 2009), the recent 10-year average sockeye salmon exploitation rate is approximately 35%.

Kuskokwim River coho salmon are harvested primarily in the commercial fishery (Appendix A16). Kuskokwim River coho salmon commercial fishing in recent years has accounted for the largest number of salmon harvested of greatest value, accounting for over half of District 1's exvessel value (Appendix A13). Based on preliminary run reconstruction information (Estensen et al. 2009), the recent 10-year average exploitation rate of coho salmon is approximately 30%.

In Kuskokwim Bay commercial fisheries, the greatest harvest in terms of number is on sockeye salmon followed by coho, chum, and Chinook salmon (Appendices C5, D6). Sockeye salmon have the greatest harvest value (Appendices C7, D8). Although many more coho salmon are harvested than Chinook salmon, total harvest value for each species is similar. Chum salmon harvest has the lowest value of targeted salmon species in the area. Pink salmon are the least valuable species in Kuskokwim Area commercial fisheries and have not been purchased by area fish buyers in recent years.

The average weights and price paid per pound for each salmon species in the Kuksokwim Area since 1967 can be found in Appendix A17, and the average income per permit holder from commercial salmon fishing can be found in Appendix A18.

Kuskokwim Area fishers owned the majority (703) of the 740 commercial permits renewed in 2009, while non-area residents held 32, and non-Alaskan residents owned 5 permits (Appendix A19). A summary of the number of permits making a landing for each species in District 1 can be found in Appendix A20.

2009 Harvest Summary

Emergency orders are used to prosecute the commercial salmon fisheries in the Kuskokwim Area commercial salmon fisheries are prosecuted through emergency order. A complete listing of the emergencies orders issued for commercial salmon fishing in 2009 can be found in Table 3.

District 1 (Kuskokwim River)

A total of 16 commercial fishing periods occurred in District 1 between June 23 and August 22 (Table 4). Only 1 registered buyer purchased fish in the Kuskokwim Area in 2009. Processing capacity limited all commercial openings to Subdistrict 1-B only, and further limited 3 commercial openings to the Lower Section of Subdistrict 1-B only. Processing capacity did allow for seven 2-hour extensions of fishing time in the Lower Section of Subdistrict 1-B. Because registered catcher-sellers in the district had difficulties getting their harvests to market when commercial periods occurred on Saturdays, 2 commercial periods were prosecuted for catcher-sellers in August to facilitate getting their harvests to market. On average 138 permit holders participated in each commercial opening. Chinook salmon catch rates from late June through early July were average. Chum and sockeye salmon catch rates from late June through mid-July were mostly average to above average. Coho salmon catch rates from late July through August 22 were below average to average.

A total of 342 individual permit holders recorded landings in District 1 during the 2009 season (Table 4), a number below the most recent 10-year (1999–2008) average of 404 permit holders (Appendix A9). The District 1 commercial harvest was 6,664 Chinook, 25,673 sockeye, 104,546 coho, and 76,790 chum salmon (Table 5). The Chinook, sockeye, and chum salmon harvests were above their respective most recent (1999–2008) 10-year average harvests while the coho salmon harvest was below their most recent (1999–2008) 10-year average harvest. The total ex-vessel value of the District 1 commercial salmon fishery was $502,848, above the recent 10-year average value of $445,160.

District 4 (Quinhagak) and District 5 (Goodnews Bay)

The District 4 commercial salmon fishing season opened June 15, District 5 opened on June 22. Both districts opened with management directed toward the harvest of Chinook salmon that provided 2 commercial periods per week provided abundance and processing capacity were adequate. Chinook salmon harvests and catch rates were average to just below average throughout the season. Because of Chinook salmon abundance concerns, commercial fishing opportunity was reduced in both districts in late June to ensure adequate escapement into Kanektok and Goodnews rivers. By July 6, sockeye salmon harvests in both districts had exceeded the Chinook salmon harvest and, by regulation, management was directed toward the sockeye salmon harvest. Sockeye salmon harvest directed management provides 3 commercial periods per week provided abundance and processing capacity are adequate. The sockeye harvest

in District 4 was the highest on record, as was the chum salmon harvest (chum salmon are harvested incidentally). The sockeye salmon harvest in District 5 was average. The coho salmon harvest exceeded the sockeye salmon harvest in District 4 on August 3 and August 12 in District 5. On those dates, by regulation, both districts shifted to coho salmon harvest management which also allows 3 commercial periods a week provided abundance is adequate.

A total of 29 commercial openings were prosecuted in District 4 in 2009 (Table 6). A total of 179 individual permit holders recorded landings in District 4 during the 2009 season, which was above the most recent (1999–2008) 10-year average of 150 permit holders (Appendix C1). The 2009 District 4 commercial harvest was 13,920 Chinook, 112.228 sockeye, 48,115 coho, and 91,214 chum salmon (Table 5, Appendix C2) from 29 periods. The Chinook salmon harvest was well below their most recent 10-year (1999–2008) average of 18,049 fish (Appendix C3), while the sockeye salmon harvest was the highest on record and above their most recent 10-year (1999–2008) average of 58,424 fish (Appendix C4). The chum salmon harvest was also the highest on record and above their most recent 10-year (1999–2008) average of 57,033 fish (Appendix C5). Finally, the coho salmon harvest was below their most recent 10-year (1999–2008) average of 42,168 fish (Appendix C6). The ex-vessel value of the District 4 commercial fishery was $747,637 (Table 5, Appendix C7), above the most recent 10-year (1999–2008) average of $438,864. Commercial salmon harvest by period for Quinhagak, District 4, can be found in Appendix C8.

There were a total of 26 commercial openings in District 5 in 2009 (Table 7). A total of 39 individual permit holders recorded landings in District 5 during the 2009 season, above the most recent 10-year average of 35 (Appendix D1). The District 5 commercial harvest was 1,509 Chinook, 32,544 sockeye, 8,406 coho, and 16,985 chum salmon (Table 5, Appendix D2). The Chinook salmon harvest was below average compared to historical harvests (Appendix D3). Both the sockeye and chum salmon harvests were above average (Appendices D4 and D5) while the coho salmon harvest well below historical averages (Appendix D6). The ex-vessel value of the District 5 commercial fishery was $192,031 (Table 5, Appendix D7), a value well above the historical average of $140,976. Commercial salmon harvest by period for Goodnews Bay, District 5, can be found in Appendix D8.

ESCAPEMENT MONITORING AND ASSESSING RUN ABUNDANCE

The vast size, remoteness, and geomorphic diversity of the Kuskokwim Area present challenges to monitoring salmon escapements and assessing salmon run abundance. Aerial spawning ground surveys have been the most cost-effective means of monitoring salmon escapements, but their usefulness and reliability are limited. The more thorough and rigorous ground based projects such as weirs, counting towers, and sonar have been operated in only a few locations because of costs and limited budgets. Over the past few years, however, the number of escapement projects in the Kuskokwim Area has increased through cooperative partnerships with federal agencies and local organizations (Appendix B1). These cooperative efforts have added substantially to our ability to monitor salmon escapements and to evaluate the effectiveness of inseason management actions.

There are currently 25 established escapement goals for Chinook (14), chum (4), coho (3), and sockeye (4) salmon stocks (Appendix B2). Comprehensive reviews of escapement data for most Kuskokwim Area stocks were conducted in 2004 (ADF&G 2004), in 2007 (Molyneaux and Brannian 2006), and again in 2009 (Volk et al. 2009). Two new goals were established in 2010: a

coho salmon lower bound SEG goal of >19,000 fish at the Kwethluk River weir, and a sockeye salmon SEG range of 4,400 to 17,000 fish at the Kogrukluk River weir.

Aerial Surveys

Aerial survey based escapement goals do not represent the entire spawning populations in the respective streams. The surveys are mostly conducted one time each season during a window of a few days when the maximum numbers of fish are expected to be on the spawning grounds. The escapement goals developed from these surveys are based on the raw, unexpanded counts; therefore, each count serves as an index of abundance rather than a complete census.

Aerial surveys are ordinarily restricted to clear water streams and lakes, the distribution of which is geographically skewed towards the lower Kuskokwim River basin and coastal streams. Tributaries in the middle and upper Kuskokwim River are often stained from organics or clouded by glacier runoff, both of which markedly reduce the visibility of fish. Escapement assessment through aerial surveys is also subject to a high degree of variability depending on viewing conditions and the experience of staff conducting the surveys.

Aerial surveys are best directed at indexing spawning populations of sockeye and Chinook salmon because these fish are typically more visible than chum and coho salmon. In addition, chum salmon have protracted run timing, and coho salmon are frequently difficult to survey because of weather conditions.

Lower Kuskokwim River

Aerial surveys for Chinook salmon were not conducted over lower river tributaries (Figure 6) in 2009 because poor weather prevented flights from occurring (Appendix B3). Escapement goals have been established for Kwethluk and Kisaralik rivers. Since 2005, in years when surveys have been flown, goals have mostly been achieved or exceeded.

Middle Kuskokwim River

In 2009 aerial surveys for Chinook salmon were conducted over the Holokuk, Oskawalik, and Krogukluk rivers (Figure 6; Appendix B3). Escapement goals have been established for Aniak, Salmon, Holitna, and Krogukluk rivers. In 2009, the aerial surveys count in Krogukluk River was within the established goal range. Since 2005, in years when surveys have been flown, goals have mostly been achieved or exceeded.

Upper Kuskokwim River

Aerial surveys were conducted over the Gagarayah, Cheeneetnuk, and Salmon rivers (Figure 6; Appendix B3). Escapement goals have been established for each river. Both the Gagarayah and Salmon rivers achieved their respective goals, while counts in the Cheeneetuk River fell short of the lower end goal range.

Kuskokwim Bay

Kanektok River (Figure 6 and 7) Chinook, sockeye, and chum salmon have established aerial survey SEGs (Appendix C9). Goodnews River (Figure 6 and 8) Chinook and sockeye salmon also have established SEGs (Appendix D9). Since 2005, in years when surveys were flown, both Kanektok River Chinook and sockeye salmon have either achieved or exceed their SEG (Appendix C9). Aerial surveys for Kanektok River chum salmon have not been flown since

2003. Since 2005, in years when surveys were flown, Goodnews River Chinook and sockeye salmon have achieved or exceeded their respective SEGs (Appendix D9).

No aerial surveys were flown over any Kuskokwim Bay drainages because poor weather prevented flying from occurring.

Ground Based Escapement Assessment

Numerous ground based escapement assessment projects exist throughout the Kuskokwim River drainage and Kuskokwim Bay drainages (Figure 9). Below is a summary of salmon escapement at each project for 2009. Please refer to each project's annual report for specifics such as methods, daily passage counts, climate and hydrological information, and escapement age, sex, and length (ASL) information. The Kuskokwim Area ASL Catalogue (Molyneaux et al. 2010) contains historical as well as current ASL information from the various escapement monitoring projects (past and present), as well information from the area commercial and subsistence harvests.

Kwethluk River Weir

The 2009 Kwethluk River salmon escapements included 5,710 Chinook, 4,385 sockeye, 32,028 chum, and 21,911 coho salmon during the June 29 through September 9 operational period (Appendix B4; Miller and Harper 2010a). In 2009 Chinook salmon failed to achieve the lower end of their SEG range (6,000 to 11,000 fish), the second time since 2007. An escapement goal for coho salmon was established in 2010 and set as a SEG point of >19,000 fish (Volk et al. 2009).

Tuluksak River Weir

The 2009 Tuluksak River salmon escapements included 404 Chinook, 708 sockeye, 13,658 chum and 8,137 coho salmon during the June 26 through September 9 operational period (Appendix B5; Miller and Harper 2010b).The Chinook salmon escapement in 2009 did not achieve the lower end of their SEG range (1,000 to 2,100 fish). Chinook salmon escapement at the weir has not achieved their escapement goal since 2006.

George River Weir

The 2009 George River salmon escapements included 3,663 Chinook, 54 sockeye, 7,941 chum and 12,573 coho salmon during the June 17 through September 20 operational period (Appendix B6; Clark et al. 2010). The Chinook salmon escapement in 2009 achieved the lower end of their SEG rage (3,100 to 7,900 fish). Chinook salmon have achieved their goal twice since 2007.

Kogrukluk River Weir

The 2009 Kogrukluk River salmon escapements included 9,702 Chinook, 23,785 sockeye, 84,940 chum, and 22,981 coho salmon during the June 25 through September 27 operational period (Appendix B7; Williams and Shelden 2010). In 2009, Chinook, chum, and coho salmon either achieved or exceeded their respective SEG goals, as they have consistently since 2000.

Aniak River Sonar

In 2009, total estimated fish passage at the Aniak River sonar site was 479,531 fish, during the June 26 through July 31 operational period (Appendix B8; McEwen 2010). In 2009 chum salmon escapement nearly reached the upper end of their SEG range of 220,000 to 480,000 fish.

Chum salmon escapements have achieved or exceeded their SEG range every year except one since 2000.

Tatlawiksuk River Weir

In 2004, Tatlawiksuk River weir salmon escapements included 2,849 Chinook, 21,583 chum, and 16,408 coho salmon during the 15 June to 18 September operational period. Currently no escapement goals have been established for the river; however, the 2004 Chinook and coho salmon escapements were the highest of 6 years of annual escapement records while chum salmon escapements were third highest. Field operations were incomplete in 2003 due to the weir washing out (Appendix B9; Smith and Sheldon 2010).

Takotna River Weir

The 2004 Takotna River salmon escapements included 463 Chinook, 1,620 chum and 3,207 coho salmon during the 24 June through 18 September operational period (Appendix B10; Stewart et al. 2010). Currently no escapement goals have been established for the river; however, the 2004 Chinook salmon escapement was the second highest of 5 years in which annual escapements were determined. Chum and coho salmon escapements ranked fourth of the 5 years in which annual escapements were determined.

Kanektok River Weir

The Kanektok River weir was operational from 5 July to 11 August in 2009. Estimated escapement at the weir was 6,841 Chinook, 272,483 sockeye, 51,652 chum, and 2,336 coho salmon (Appendix C10, Taylor and Elison 2010a). Because of the location of the weir (approximately mile 42), it is likely a substantial number of Chinook, chum, and coho salmon spawn below the weir. In addition, it is possible a number of Chinook, sockeye, and chum salmon passed the weir site prior to the operation of the weir. The majority of coho salmon passed after weir operations ceased. Thus, escapement counts of do not reflect the total number of spawning salmon in the drainage. Escapement goals have not been established for the Kanektok River weir.

Middle Fork Goodnews River Weir

Middle Fork Goodnews River weir was operational from 28 June to 21 September in 2009. Estimated passage at the weir was 1,630 Chinook, 25,465 sockeye, 19,715 chum and 20,000 coho salmon (Appendix D10; Taylor and Elison 2010b). Chinook and sockeye salmon escapements were within their respective biological escapement goal ranges of 1,500 to 2,900 and 18,000 to 40,000. Chum and coho salmon exceeded their sustainable escapement goal ranges of greater than 12,000 fish for each species.

Salmon Run Strength Assessment

Salmon managers require timely inseason assessment of salmon run abundance. In the Kuskokwim River, escapement projects provide limited usefulness in this regard because of the great distances between the areas of harvest and the project locations. Consequently, managers rely on test fisheries, commercial catch statistics, and informal reports from subsistence and sport fishermen to augment escapement data.

In the Kuskokwim Bay the escapement monitoring projects are much closer to the commercial fishing districts, so escapement data can be effectively used for inseason management. Kuskokwim Bay managers also make use of commercial catch statistics and information from subsistence and

sport fishers. Catch statistics are especially important in District 4 where reliable escapement monitoring has been historically lacking.

Bethel Test Fishery

Daily inseason assessment of Kuskokwim River relative salmon run strength and timing is available from a drift gillnet test fishery operated near Bethel. The Bethel test fishery is located at river mile 80 of the Kuskokwim River, which is about the midpoint of District 1 (Figure 2). The project began in 1984 and the methodology has remained largely unchanged, and methods used for the project can be found in Bue (2005). From early June through late August the test fish crew conducts 3 or 4 systematic gillnet drifts beginning one hour after high tide. The drifts are done at 3 stations distributed across the width of the channel. Each drift is 20 minutes in duration. Two 50 fathom gillnets are used, 1 net is hung with 5 3/8-inch mesh web and the other with 8-inch mesh. The 2 gillnets are rotated between the 3 stations following a systematic schedule. Both mesh sizes are operated from early June through about July 10 when Chinook, sockeye and chum salmon all occur in relatively good abundance. The 8-inch mesh is discontinued after about 10 July when Chinook salmon abundance diminishes. Test fishing with the 5 3/8-inch mesh continues until late August.

The test fish catch from each tide is tallied by species then sold to a local fish buyer or distributed to charities. Catch statistics for Chinook, sockeye, chum and coho salmon are presented as daily catch per unit effort (CPUE) data. Comparisons are made with test fish results from previous years to assess relative abundance and run timing. The comparisons are subjective in that managers need to consider variables such as water level, fishing patterns, and changing river morphology when comparing data from between years, and even within years.

Historically, other test fisheries have been attempted in the Kuskokwim River: Kwegooyuk test fishery, 1966–1983 (Baxter 1970; Huttunen 1984); Eek test fishery, 1988–1994; Kuskokwim River subsistence test fishery, 1988–1990 (Kuskokwim Fishermen's Cooperative, 1991); Aniak test fishery, 1992–1995 (unpublished); Chuathbaluk test fishery, 1992–1993 (unpublished); and the Lower Kuskokwim River test fishery, 1995 (unpublished). Most of these projects were initiated at the prompting of groups other than ADF&G. They were all eventually discontinued for a variety of reasons including lack of funding, consistency problems, difficulties with catch disposition, and ambiguous results.

Inseason Subsistence Catch Monitoring

Inseason interviews of subsistence fishers have been conducted in the Bethel area by ONC technicians, in cooperation with ADF&G since 2001. The Fisheries Information Services (FIS) Division of the U.S. Fish and Wildlife Service (USFWS) Office of Subsistence Management (OSM) provides funding for this cooperative program under the Kuskokwim River Salmon Inseason Subsistence Catch Monitoring project (FIS 10-354). Information from the interviews, in combination with other fisheries information, is used to assess salmon run timing and relative abundance. Together, this information assists fishery managers in making decisions to achieve salmon escapement goals, to provide fishers subsistence opportunity to harvest, and to provide opportunity for commercial and sport fisheries if enough salmon are available. Additionally, this program provides timely insight into the progress of the subsistence fishery; a relative index of catches based on those interviewed, and allows an avenue for local user input into the management process. Comparisons of inseason interview responses can be made among weeks, within a year, and between years to help identify differences in salmon run timing, abundance,

and gain insight into the fishery (gear usage or inseason harvest indices). Summaries of interview responses are presented to the Kuskokwim River Salmon Management Working Group (Working Group), throughout the subsistence fishing season (Patton and Carroll 2010). Fishery managers and the Working Group use these summaries in the decision-making process for the Kuskokwim River subsistence salmon fishery.

Commercial Catch Statistics

Comparison of commercial catch statistics with historical information is another common method for assessing run strength. However, the usefulness of this approach can be confounded by inconsistencies in the number of participating fishers, the duration of commercial fishing periods, river levels, and other variables that might influence catch or the effort applied by fishers.

Subsistence and Sport Fish Information

Throughout each season ADF&G staff members keep in close communication with subsistence and sport fishers to assess their fishing success and the degree to which their needs are being met. These catch reports sometimes play a pivotal role in management decisions.

OUTLOOK FOR 2010

ADF&G does not produce formal forecasts for any salmon runs in the Kuskokwim Area. Salmon run outlooks are qualitative in nature due to the lack of adequate information with which to develop more rigorous forecasts. The commercial harvest outlooks are typically based on a qualitative assessment of parent year spawning escapement, age composition, harvest trends, implications of the current fishery management plan, and expected processing capacity. While the commercial harvest outlooks provide for a general level of expectation, the fisheries are managed based on inseason assessments of the actual runs.

The preliminary informal outlook for 2010 is for salmon abundance to be similar to levels observed in 2009 for all species, and for all Kuskokwim Area fishing districts. Age data collected in 2009 are still being processed, but as of yet, nothing extraordinary has been observed in age compositions to suggest substantial changes in abundance from what occurred in 2009, nor have there been any extraordinary environmental conditions that may have resulted in unusual ocean or freshwater survival. Chinook salmon abundance is again expected to be below the long-term average, but adequate for reasonable subsistence opportunity and for commercial harvest comparable to 2009. Sockeye salmon abundance is expected to be near average in Kuskokwim River (District 1) and Goodnews River (District 5), but above average in Kanektok River (District 4), with sufficient numbers of fish to provide for reasonable subsistence opportunity and for commercial harvest comparable to 2009. Chum salmon abundance should be near average in Kuskokwim River (District 1) and above average in Kuskokwim Bay drainages (Districts 4 and 5), and sufficient to provide for reasonable subsistence opportunity and above average levels of commercial harvest. The outlook for coho salmon is more speculative than other species because the vast majority of annual returns are from one age group, so no insight is available by considering younger age classes; still, given that ocean rearing conditions appear to have been relatively stable over the past few years, abundance in all Kuskokwim Area fishing districts is expected to be comparable to 2009 and adequate for reasonable subsistence opportunity and commercial harvest similar to the past few years.

2010 Alaska Board of Fisheries Regulatory Proposals Affecting Kuskokwim River Salmon

There were 2 proposals reviewed by the BOF during the Arctic-Yukon-Kuskokwim meeting during the January 2010 meeting in Fairbanks (Estensen et al. 2009) that pertained to the commercial and subsistence fisheries in the Kuskokwim Area. Proposal 67 sought to rescind 5 AAC 07.331(c) that permits managers, through emergency order, to allow the use of up to 8-inch mesh size gillnets in the District 1 commercial fishery. The BOF adopted this regulation in 2007, but managers have not allowed the use of gillnets with mesh greater than 6 inches in the District 1 commercial salmon fishery since its adoption. Proposal 67 was not adopted by the BOF.

Proposal 151 sought a letter of recommendation from the BOF to the Alaska Legislature supporting House Bill 227 that would establish a fishery reserve within the Holitna River subbasin. The BOF voted in favor of sending the Legislature a letter of support.

Recent Federal Subsistence Board Actions

In 2009, during RAC and FSB meetings regarding Kuskokwim Area fisheries, issues were discussed at length, however, no regulatory action was implemented.

SECTION II. FRESHWATER FINFISH FISHERY

Several species other than salmon, herring and halibut are used for commercial, subsistence, and recreation purposes in the Kuskokwim Area. They are inconnu or sheefish (*Stenodus leucichthys*), whitefish (*Coregonus*) and (*Prosopium*) char (*Salvelinus*), burbot (*Lota lota*), Arctic grayling (*Thymallus arcticus*), northern pike (*Esox lucius*), Arctic lamprey (*Lampetra japonica*), rainbow smelt (*Osmerus mordax*) blackfish (*Dallia pectoralis*), rainbow trout (*Oncorhynchus mykiss*), lake trout (*Salvelinus namaycush*), threespine stickleback (*Gasterosteus aculeatus*), ninespine stickleback (*Pungitius pungitius*), and longnose sucker (*Catostomus catostomus*). The Division of Sport Fish documents the recreational fisheries.

Subsistence Fishery

Methods used for harvesting subsistence freshwater finfish include set and drift gillnets, seine, fish wheels, long lines, dip nets, jigging (hook and line through the ice), rod-and-reel and pots (locally called "traps"). Subsistence harvests occur year round. These fish may be eaten fresh, dried, smoked or frozen. Most are used for human consumption; however, some are also used for dog food. Regulations do not limit the number of freshwater fish that may be harvested for subsistence. Harvest data for these species are not collected on an annual basis. Data for some Kuskokwim Area communities may be found in the Division of Subsistence Technical Paper series.

Commercial Fishery

The commercial fishery has been sporadic, primarily harvesting whitefish and burbot for local markets. Some of the whitefish harvest occurs under the ice in the winter.

A permit from the Commercial Fisheries Entry Commission is required. A permit from ADF&G to conduct commercial fisheries on whitefish, pike, smelt, burbot and lamprey is also required. Those species may also be taken incidentally to commercial salmon fishing. There were no

freshwater permits issued by the Bethel CF office in 2001 for the Kuskokwim Area. The guidelines for permits are:

1. All waters of the area except the Johnson River drainage and Whitefish Lake are open to commercial harvest of freshwater finfish. The heavy subsistence utilization of freshwater species in these areas is the reason for the closure.
2. Only whitefish, cisco, smelt, pike, burbot, and lamprey may be taken. Sheefish, char and trout may not be taken due to their smaller populations, lower reproductive rates and their heavy utilization in the subsistence and sport fisheries.
3. All legal commercial gear types are allowed.
4. Gillnets may not be less than 2 1/2 or greater than 5 inches stretch mesh. Long lines and set lines must use hooks with a gap between point and shank larger than 3/4 inch.

Appendix A21 presents the freshwater finfish fishery catches and value since 1977. No commercial landings of whitefish were documented in 2009.

STOCK STATUS

Limited ADF&G observations, advisory committee recommendations and fishermen interviews give no indication of declining populations in most drainages. However, residents of Kasigluk, Atmautluak and Nunapitchuk have expressed concerns that subsistence fishers are overexploiting the whitefish stocks in Nunavakpak Lake (near Kasigluk).

SECTION III. MISCELLANEOUS SALTWATER FINFISH

A poorly documented commercial fishery on Saffron or "Tom Cod" (*Eleginus gracilus*) has occurred in the Kuskokwim Area for some time. These fish were surplus to subsistence needs and fishers and local stores were, and often still are, unaware of the regulatory requirements. ADF&G has been trying to inform buyers and sellers of these requirements. Since 1988, the department has had information on the sale of fish exported from the coastal villages to Bethel. Sales within the villages are still undocumented. No commercial landings were documented in 2009.

SECTION IV. HERRING FISHERY

AREA AND DISTRICT BOUNDARIES

The Kuskokwim Area includes all waters of Alaska that flow into the Bering Sea between Cape Newenham and the Naskonat Peninsula (60° 58.17' N. lat., 165° 11' W. long.) to 3 miles seaward as well as the waters surrounding Nunivak and St. Matthew Islands to 3 miles seaward (5 AAC 27.870) (Figure 10). This area supports 5 Pacific herring commercial gillnet sac roe districts and a significant subsistence herring fishery.

The Security Cove District includes all waters between the latitude of Cape Newenham and the latitude of the Salmon River (58° 51.83' N. lat.).

The Goodnews Bay District includes the waters of Goodnews Bay east of a line between the north spit (59° 03.58' N. lat., 161° 49.17' W. long.) and south spit (59° 02.92' N. lat., 161° 49.08' W. long.) at the mouth and west of a line between Ukfigag Creek (59° 04.17' N. lat., 161° 36' W. long.) and Tunulik River (59° 00.08' N. lat., 161° 00.37' W. long.).

The Cape Avinof District consists of all waters landward of Kikegtek, Pingurbek and Kwigluk Islands from the longitude of Ishkowik River (162° 44' W. long.) to the latitude of the Tern Mountain (60° 42' N. lat.).

The Nelson Island District consists of all waters north of Chinigyak Cape (60° 27' N. lat.) and east of Atrnak Point (165° 15' W. long.), and all waters north of Talurarevuk Point (60° 35' N. lat.) and south of the southernmost tip of Chinit Point (60° 36' N. lat.) and east of 165° 30' W. long. and all waters north of the northernmost tip of Chinit Point (60° 37' N. lat.) and south of Kigigak Island (60° 49' N. lat.) and east of 165° 30' W. long.

The Nunivak Island District includes all waters extending 3 miles seaward of mean low water along the northern, eastern, and southern sides of Nunivak Island from Kikoojit Rocks (60° 20' N. lat., 166° 40' W. long.) to Cape Mendenhall (59° 45.17' N. lat., 166° 07' W. long.) (5 AAC 27.875).

BACKGROUND AND HISTORICAL PERSPECTIVE

Subsistence Fishery

Subsistence fishing for Pacific herring in the northeastern Bering Sea is very important in villages of the Yukon-Kuskokwim River delta. Primarily residents of the coastal villages of Kwigillingok, Kongiganak, Kipnuk, Chefornak, Toksook Bay, Nightmute, Tununak, and Newtok participate in the subsistence fishery. Herring stocks utilized by the subsistence fishery are the same stocks targeted by the commercial fishery.

Subsistence harvest surveys occurred sporadically in Kuskokwim delta villages during 1975 to 1996 with surveys conducted annually in Nelson Island villages from 1985 to 1996. Subsistence survey results reflect harvest trends and reported catches represent minimum figures because not all area villages were surveyed and not all fishermen were contacted in those communities. No subsistence herring surveys have been conducted in the Nelson Island District since 1996 or in the Nunivak Island District since 1993. Available data suggests that Nelson Island villages harvest approximately 110 tons of herring annually (Burkey et al. 1998) (Appendix E1).

Commercial Fishery

The Kuskokwim Area commercial herring fishery was initiated in 1977 in Security Cove and Goodnews Bay districts with the first documented deliveries in 1978 in Security Cove District and 1979 in Goodnews Bay District. In 1978 purse seines were allowed in Security Cove District, however, since that time the fishery has been limited to gillnets. Spawn on kelp fisheries were prohibited in 1978 before fisheries were established. Initially these fisheries were managed through open seasons and guideline harvest levels. In 1981 emergency order authority was established to open and close fisheries to provide for an orderly fishery and periodic assessments of herring biomass. A minimum threshold herring abundance of 800 to 1,000 metric tons or spawning activity was established before implementation of the fishery and the guideline harvest levels were established not to exceed 20% of estimated herring biomass. The length of gillnet was established at 100 fathoms. In 1986 the northern boundary of Security Cove was moved from Carter Spit south to the latitude of Salmon River (58° 52’ N. lat.) to provide spatial separation between Security Cove and Goodnews Bay districts. By 1987 the minimum inseason biomass threshold was established at 1,200 short tons (st) and the Goodnews Bay District was designated a superexclusive use area by the BOF limiting permit holder and vessel participation in the commercial fishery. The Goodnews Bay superexclusive use area designation was later

repealed by the BOF in 2004. In 1997 a moratorium on entry into the Goodnews Bay fishery was initiated limiting participation in the fishery to 182 permits.

In 1985, commercial herring fishing was initiated in Nelson and Nunivak Island districts. Emergency order authority was established to open and close these fisheries to provide for an adequate subsistence harvest, and orderly commercial fishery, and to allow for periodic re-assessments of herring biomass. A minimum threshold herring abundance of 1,100 to 1,700 st or spawning activity was established before implementation of the fishery with a guideline harvest level set at 10% of estimated returning biomass to provide protection for the subsistence fisheries. Gillnet length was limited to 100 fathoms. In 1986 the waters within Nelson Island District from Atranak Point and Talurarevuk Point, and the waters between the southern and northern edges of Chinit Point were closed by emergency order at the request of local governing groups to prevent interference with the subsistence fishery. By 1988 these waters were closed to commercial herring fishing by regulation. Beginning in 1987, mechanical shakers were eliminated in Nelson and Nunivak Island fisheries and vessel length was limited to 30 feet. Both districts were designated as combined superexclusive use areas. Implementation of the superexclusive use designation with vessel length restrictions and prohibition of mechanical shakers was in response to requests from fishermen living in communities adjacent to the fisheries. These fishermen believed it would be in the best interest of the fisheries to standardize equipment to help prevent over investment and to limit participation by allowing fishermen to only participate in one herring fishery (Whitmore et al. 2005). The combined superexclusive use designation allows for fishermen holding permits for both Nunivak and Nelson Island fisheries to participate in commercial herring fisheries in both districts during the same season. In 1987 the minimum in-season biomass threshold was increased to 2,500 st, and the commercial guideline harvest level was increased from 10% to a maximum of 15% of estimated biomass in both districts. In December 1997, the BOF approved a proposal that raised the Nelson Island District harvest level to 20% of the available biomass minus 200 tons allocated for subsistence use and increased the commercial guideline harvest level to 20% of the estimated biomass for the Nunivak Island District. In 1987 the Commercial Fisheries Entry Commission (CFEC) initiated the first steps towards limited entry status in the Nelson Island and Nunivak Island districts and both districts were given limited entry status in 1990. In the winter of 2000, the BOF adopted regulations to allow for development of a cooperative herring purse seine fishery in Nunivak Island District and made the regulation permanent in 2001. In 2006 the Alaska Supreme Court determined that authorizing cooperative fisheries of any sort was beyond the BOF authority. Consequently, the management plan for gillnet and cooperative purse seine fishery in the Nunivak Island District was repealed by the BOF in 2006 (5 AAC 27.894).

In 1988, commercial herring fishing was initiated in the Cape Avinof District. A minimum threshold herring abundance of 500 st or spawning activity was established before implementation of the fishery and a guideline harvest level was established not to exceed 15% of the estimated biomass. The commercial herring fishery established the use of gillnets up to 100 fathoms in length, mechanical shakers were prohibited, vessel length was limited to 30 feet, and a superexclusive use designation was established.

Kuskokwim Area herring fisheries developed rapidly in response to the relative strong market for herring sac roe. During 1981 to 1984, an average of 206 fishermen harvested 1,400 st of herring with an average value of $477,000 in Security Cove and Goodnews Bay districts. Addition of Nelson and Nunivak Island fisheries in 1985 and the Cape Avinof fishery in 1988

resulted in an average of 442 fishermen harvesting an average of 2,200 st of herring with an average value of $1.33 million during 1985 to 1989. During the 1990 and 1991 seasons, fishermen participation, harvest levels and values were reduced in response to a decline in herring abundance caused by a lack of recruitment of younger age herring into the fishery. Additional year classes of herring began recruiting to the fishery in 1992. The fishery peaked in 1996 when 802 fishermen harvested over 5,000 st of herring valued at $3.5 million. Although harvest levels remained high during 1997 to 1999 seasons, value declined. The trend in declining value was followed by an annual reduction in effort and harvest levels which continued through the 2006 season, during which 32 fishermen harvested 390 st of herring valued at $70,000. The decline in value of herring sac roe continued through 2009 with no commercial herring harvest occurring in the Kuskokwim Area since 2006 (Appendix E2, E3).

FISHERY MANAGEMENT

The *Bering Sea Herring Fishery Management Plan* (Plan) requires minimum spawning biomass thresholds for each district before commercial fishing. The thresholds are: Security Cove, 1,200 short tons (st); Goodnews Bay, 1,200 st; Cape Avinof, 500 st; Nelson Island, 3,000 st; and Nunivak Island, 1,500 st. The Plan sets the maximum exploitation rate at 20% of the estimated spawning biomass for Security Cove, Goodnews Bay, Nunivak Island, and Nelson Island (5 AAC 27.060). Other regulations further reduce the maximum allowable exploitation rate in the Cape Avinof District to 15% of the estimated available biomass and directs management in the Nelson Island District to include 200 tons of the 20% exploitation rate for subsistence (5 AAC 27.895 (a), (d)).

All commercial herring fisheries are opened and closed by emergency order for an orderly fishery and to allow periodic assessment of herring biomass. ADF&G attempts to harvest stocks in good condition (large volume, increasing abundance, good recruitment) at the upper end of the exploitation range (15–20%). Stocks in poor condition (small volume, decreasing abundance, poor recruitment) are exploited at lower than maximum rates (0–15%).

STOCK STATUS

Assessment Methods

The remoteness of the Kuskokwim Area herring fishing districts present challenges in assessing abundance, implementing fisheries, and monitoring escapement towards sustained yield fishery management. Although the fisheries typically progress in a northward progression, herring fishery and spawn timing is quite similar.

Aerial surveys are flown throughout the herring spawning season in all commercial herring districts, as weather permits and funding allows, determining relative abundance, distribution, and biomass of herring. Occurrence and extent of milt, numbers of fishing vessels and visibility features affecting survey quality are also recorded. Due to depressed herring markets and reallocation of funding, the number of surveys flown and the number of districts surveyed has declined in recent years. Survey aircraft are no longer contracted for a block of flight time but rather chartered locally on an hourly bases and when available. In 2009 the budget allocation allowed for up to 6 surveys of the Security Cove and Goodnews Bay districts and up to 2 surveys of the Nelson Island District. An additional $5000 for aerial surveys was made available through a cooperative agreement with Coastal Villages Seafoods, LLC (CVS), a subsidiary of Coastal Villages Region Fund (CVRF), 1 of 6 groups of the Western Alaska Community Development

Quota (CDQ) program whose membership includes the coastal communities of the Kuskokwim region. The additional funding was for the purpose of conducting aerial surveys of the Nelson Island and Cape Avinof districts.

Aerial survey data collection methods are similar to those used since 1978. Standard conversions of 1.52 st/538 ft2 (water depths less than 16 ft), 2.58 st/538 ft2 (water depths between 16 and 26 ft), and 2.83 st/538 ft2 (water depths greater than 26 ft) were used to convert estimated herring school surface areas to biomass.

In 2009, approximately 9.3 hours were spent conducting aerial surveys in the Kuskokwim Bay Area: 2.5 hours in Security Cove, 5.8 hours in Goodnews Bay, and 1.0 hour at Nelson Island. Survey conditions during the season were characterized as unsatisfactory for most flights because of persistent onshore northwest winds and turbid water conditions. Continuing poor weather from mid May to mid June limited the number of flights over the Nelson Island District. There were no aerial survey flights flown over the Cape Avinof and Nunivak Island districts in 2009.

As a result of the declining interest in the commercial sac roe herring market, the ADFG test fishing program has been reduced from as many as 6 field camp projects in the 1990's to only one test fishing project in 2009. Test fishing with variable mesh gillnets (VMG) collect samples of herring to determine age, sex, size, and sexual maturity (ASL) of the run, and to note occurrence of other schooling fishes. This sampling program is important for determining herring stock status and for making biomass projections. In 2009, test fishing occurred only in the Goodnews Bay District. The last year of data collection from Security Cove District was in 2003, from the Nelson Island District, 2007, from the Cape Avinof District, 2001, and from the Nunivak Island District, 1999. In the absence of data from the Security Cove District VMG data from Goodnews Bay is used to estimate the metrics for the Security Cove District. VMG data from Nelson Island has been used to estimate the metrics for the Nunivak Island and Cape Avinof districts.

SPAWNING POPULATIONS

Security Cove District

Four aerial surveys were flown in the Security Cove District from 15 May to 27 May in 2009. Northwest winds and turbid water conditions persisted throughout the survey period accounting for the 6 day separation between the 15 May survey and the 21 May survey. The unfavorable weather conditions accounted for survey conditions that were primarily unsatisfactory. Herring spawn was observed on 21 May. During an aerial survey flown on 15 May, an estimated 1,836 st of herring were sighted. On 21 May, 3,055 st of herring were observed in the district during an aerial survey flown under fair conditions. Survey conditions on 24 May and 27 May were rated as unsatisfactory with no herring biomass documented on 24 May and only 15 st of biomass documented on 27 May (Table 8).

Goodnews Bay District

Five aerial surveys were flown in the Goodnews Bay District between 15 May and 1 June in 2009. Unfavorable weather conditions accounted for survey conditions that were primarily unsatisfactory. Survey flights flown on 15 May, 21 May, and 24 May documented 3,801 st, 5,641 st, and 6,143 st respectively. Survey conditions during these flights were mixed ranging from fair to unsatisfactory. Survey conditions on 27 May and 1 June were rated as unsatisfactory

with 782 st herring biomass documented on 27 May and no biomass documented on 1 June. No herring spawn was documented in the district during the survey period (Table 9).

Test fishing with variable mesh gillnets occurred from 19 May to 4 June. The goal for the Goodnews Bay test fish program was to sample a minimum of 850 herring collected over a 21-day period. The deployment of the test fish crew was delayed because of reduced funding considerations. ASL information was collected from 1,272 herring. Based on age-by-scale analysis, ages 4, 5, 6, and 7 comprised 86% of the sample (44%, 20%, 10%, and 12% respectively), and ages 9 and older accounted for 10% of the sample (Tables 10–13). The 2009 preseason projection suggested 50% of the returning biomass would be comprised of age 5, 7, and 11 herring (16%, 18%, and 16% respectively). The weaker showing of the older age fish in the sample may be partly due to the late start of the test fish project by which time a minimum biomass of 3,801 st of herring had been observed during an aerial survey 4 days earlier on 15 May.

Nelson Island District

Two aerial surveys were flown in the Nelson Island District between 9 June and 11 June during the 2009 season. Survey conditions on 9 June were rated as fair; however, no herring biomass was documented during that flight. Survey conditions on 11 June were rated as unsatisfactory due to the continuing northwest wind and 68 st of herring biomass was documented during that flight. No herring spawn was documented in the district during these flights (Table 14).

Central Kuskokwim Bay

The Central Kuskokwim Bay area extends from Cripple Creek, north of the entrance to Goodnews Bay, to the Ishkowik River at the mouth of the Kuskokwim River. No commercial herring fishing districts are located in this area. Four aerial surveys were flown in this area from 15 May to 1 June. All flights were flown under unsatisfactory conditions because of turbid water conditions. Survey flights flown on 21 May, and 24 May documented 460 st, and 2,790 st, respectively. No herring spawn was documented in the survey area during these flights (Table 15).

COMMERCIAL FISHERY

Season Summary

There was no commercial harvest of Pacific herring in the Kuskokwim Area in 2009. One processing company did register to buy herring in the Security Cove District, however, once the Togiak District herring fishery finished there was no processor interest in pursuing a commercial fishery in any of the Kuskokwim Bay districts.

OUTLOOK AND MANAGEMENT STRATEGY FOR 2010

Projections from postseason escapement estimates; using historical mean rates of survival, current mean weights for each age class, and estimates of recruitment for each age class (Wespedstad 1982); suggest that the 2010 spawning biomass for the Kuskokwim Bay herring stocks (Security Cove to Nunivak Island) will be approximately 22,914 st with a projected harvest of 4,263 st (Table 16). If the return is as expected, a moderate increase over the projected 2009 biomass will be observed in Security Cove, Cape Avinof, Nelson Island, and Nunivak Island districts while the observed biomass in Goodnews Bay District is projected to remain the same. However, variability in the quality of aerial survey assessments of biomass and deviations from the assumed survival or recruitment rates may result in the observed biomass being either

above or below these projections. Therefore, harvest levels will be adjusted during the season according to observed herring spawning biomass. In addition, in accordance with the Arctic-Yukon-Kuskokwim (AYK) Region harvest policy, newly recruited age classes (age 2 through 5-year-old herring) will not be targeted by the commercial fishery. If it is not possible to determine herring abundance using aerial survey methods, stock abundance will be assessed using information from the projected biomass, test and commercial catches, and spawn deposition observations.

SECURITY COVE DISTRICT

The 2010 projected return to the Security Cove District is 6,014 st. A 20% exploitation rate would result in a harvest of 1,203 st (Table 16). A larger catch may occur if the 2010 biomass assessment is greater than the projection. Commercial fishing will not be allowed until the observed biomass reaches 1,200 st or significant spawning activity is observed. The occurrence and length of fishing periods will depend on stock strength, fishing effort, and spawning activity.

Age 6, 7, and 8 herring are expected to comprise 45% of the returning biomass (19%, 12%, and 14% respectively). Age 9 and older herring are expected to comprise approximately 17% of the biomass. The age structure of herring samples from the Goodnews Bay District in 2009 was used to project the 2010 herring return to the Security Cove District.

GOODNEWS BAY DISTRICT

The management strategy for the Goodnews Bay District will be similar to that planned for Security Cove. The season will open and close by emergency order when a biomass of 1,200 st is observed or significant spawning activity occurs. The 2010 projected return of herring to the Goodnews Bay District is 5,736 st. A 20% exploitation rate would result in a harvest of 1,147 st (Table 16). A larger catch may occur if the 2010 biomass assessment is greater than the projection.

In Goodnews Bay, age 6, 7, and 8 herring are expected to comprise 45% of the returning biomass (20%, 11%, and 14% respectively). Age 9 and older herring are expected to comprise 17% of the biomass.

CAPE AVINOF DISTRICT

Either significant spawning activity or a biomass of 500 st must be observed before the commercial herring season can be opened in the Cape Avinof District. The projected 2010 returning biomass for the Cape Avinof District is 2,393 st (Table 16). The exploitation rate will be no greater than 15% because of the limited database for this area and the priority of subsistence fishing. Assuming a 15% commercial exploitation rate, the projected harvest would be 359 st of herring.

Age 6, 7, and 8 herring are expected to comprise 45% of the returning biomass (20%, 11%, and 14% respectively). Age 9 and older herring are expected to comprise 17% of the biomass.

NELSON ISLAND DISTRICT

In the Bering Sea Herring Fishery Management Plan, the Alaska Board of Fisheries set a minimum biomass threshold of 3,000 st necessary for a commercial herring fishery in the Nelson Island District. The inseason estimate of herring biomass must exceed the threshold level before a commercial fishery can be allowed. The spawning biomass projected to return to the Nelson

Island District in 2010 is 5,449 st (Table 16). The BOF has set the exploitation rate for 2010 at 20% minus 200 st for subsistence harvest. This translates to a harvest of 890 st of herring. A larger catch may occur if the 2010 biomass assessment is greater than the projection.

Age 6, 7, and 8 herring are expected to comprise 45% of the returning biomass (20%, 11%, and 14% respectively). Age 9 and older herring are expected to comprise 17% of the biomass.

NUNIVAK ISLAND DISTRICT

The Nunivak Island District commercial season will open when the returning biomass reaches 1,500 st or when significant spawning is observed. The projected biomass of herring returning to the Nunivak Island District in 2010 is 3,322 st. A 20% exploitation rate would result in a 664 st harvest (Table 16). A larger catch may occur if the 2010 biomass assessment is greater than the projection.

Age 6, 7, and 8 herring are expected to comprise 45% of the returning biomass (20%, 11%, and 14% respectively). Age 9 and older herring are expected to comprise 17% of the biomass.

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TABLES AND FIGURES

Table 1.–Preliminary estimated subsistence salmon harvest by species and community for the Kuskokwim Area, 2009.

Community	Total *N*	total *n*	% Surveyed	Est. Total Chinook	CI (95%)	Est. Total Chum	CI (95%)	Est. Total Sockeye	CI (95%)	Est. Total Coho	CI (95%)
Kipnuk	148	0	0%	-	-	-	-	-	-	-	-
Kwillillingok	71	0	0%	-	-	-	-	-	-	-	-
Kongiganak	92	40	43%	1,081	330	1,217	497	771	303	589	220
N. Kuskokwim Bay	311	40	*13%*	1,081	330	1,217	497	771	303	589	220
Tuntutuliak	82	31	38%	3,078	914	3,341	1,323	935	338	360	244
Eek	77	33	43%	1,718	593	623	269	917	438	229	228
Kasigluk	96	43	45%	2,767	886	1,716	855	1,229	863	553	242
Nunapitchuk	115	43	37%	3,040	751	3,141	975	1,347	407	297	276
Atmautluak	70	31	43%	1,590	412	1,732	855	653	310	72	74
Napakiak	100	40	40%	2,496	784	1,749	872	969	414	436	165
Napaskiak	99	42	42%	5,709	942	1,555	494	1,680	346	841	273
Oscarville	18	11	61%	791	308	523	188	360	241	75	55
Bethel	2,006	682	34%	26,365	2,931	10,470	1,746	11,354	1,531	13,068	2,222
Kwethluk	159	58	36%	6,640	1,194	3,392	1,175	2,310	561	4,056	3,415
Akiachak	141	55	39%	7,139	1,439	2,868	1,277	2,448	731	1,604	680
Akiak	80	37	46%	3,221	982	1,357	624	1,136	351	657	341
Tuluksak	87	35	40%	2,984	1,298	1,452	600	1,588	642	816	479
Lower Kuskokwim	3,130	1,141	*36%*	67,538	4,363	33,919	3,476	26,926	2,322	23,064	4,215
Lower Kalskag	71	25	35%	2,368	1,061	897	608	979	836	291	244
Upper Kalskag	67	30	45%	1,695	457	311	135	358	133	167	108
Aniak	184	166	90%	2,066	208	2,625	572	940	146	2,284	386
Chuathbaluk	37	25	68%	817	259	873	260	525	134	95	51
Middle Kuskokwim	359	246	*68%*	6,946	1,202	4,706	885	2,802	869	2,837	472
Crooked Creek	41	27	66%	739	171	540	209	373	84	289	120
Red Devil [a]	14	5	36%	226	32	214	206	417	236	111	122
Sleetmute	38	29	76%	715	216	384	210	698	193	396	138
Stony River	20	12	60%	649	404	711	580	901	625	585	477
Lime Village [a]	15	0	0%	78	62	469	71	767	45	275	55

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Table 1.–Page 2 of 2.

Community	Total *N*	total *n*	% Surveyed	Est. Total Chinook	CI (95%)	Est. Total Chum	CI (95%)	Est. Total Sockeye	CI (95%)	Est. Total Coho	CI (95%)
Middle Kuskokwim continued											
McGrath	151	58	38%	613	373	878	1,238	1,029	1,249	1,288	1,250
Takotna [b]	26	0	0%	0	0	0	0	0	53	0	0
Nikolai	32	27	84%	293	56	292	94	64	30	197	66
Telida	2	0	0%	-	-	-	-	-	-	-	-
Upper Kuskokwim	339	158	*47%*	3,313	618	3,488	1,418	4,249	1,433	3,141	1,358
Kuskokwim River Total	4,139	1,585	38%	78,878	4,580	43,330	3,889	34,748	2,880	29,631	4,459
Quinhagak	155	74	47%	2,938	595	1,266	332	1,809	410	1,722	600
Goodnews Bay	66	27	41%	510	301	123	83	793	381	252	110
Platinum	17	14	82%	65	20	29	10	197	45	85	27
S. Kuskokwim Bay	238	115	48%	3,513	667	1,418	342	2,799	562	2,059	610
Mekoryuk	62	0	0%	-	-	-	-	-	-	-	-
Newtok	79	0	0%	-	-	-	-	-	-	-	-
Nightmute	55	0	0%	-	-	-	-	-	-	-	-
Toksook Bay	114	0	0%	-	-	-	-	-	-	-	-
Tununak	61	0	0%	-	-	-	-	-	-	-	-
Chefornak	82	0	0%	-	-	-	-	-	-	-	-
Bering Sea Coast	453	0	0%	-	-	-	-	-	-	-	-
Total	4,830	1,700	35%	82,391	4,628	44,748	3,904	37,547	2,934	31,690	4,500

Note: "*N*" is the total number of households, "*n*" is the total number of households surveyed; "Kuskokwim River Total" includes North Kuskokwim Bay Lower, Middle and Upper Kuskokwim areas; dashes (-) indicate data is unavailable.

[a] These villages were not surveyed in 2008, therefore the total harvest is estimated using historical average household harvest expanded by the number of households. Source: T. Hamazaki, Commercial Fisheries Biometrician, ADFG&G, Anchorage, personal communication.

[b] Takotna is not surveyed, but harvest is estimated to be zero based on harvest practices. Source: T. Hamazaki, Commercial Fisheries Biometrician, ADFG&G, Anchorage, personal communication.

Table 2.–Subsistence salmon harvest estimates, Kuskokwim Management Area, 1989–2009.

YEAR	Households		Estimated Salmon Harvest				
	Total	Surveyed	Chinook	Sockeye	Coho	Chum	Total
1989	3,422	2,135	85,322	37,088	57,786	145,106	325,287
1990	3,317	1,830	92,675	39,659	50,708	131,470	314,513
1991	3,347	2,024	90,226	56,401	55,620	96,314	298,561
1992	3,314	1,724	68,685	34,158	44,494	99,576	246,914
1993	3,274	1,816	91,722	51,362	35,295	61,724	240,103
1994	3,179	1,821	98,378	39,280	36,504	76,949	251,111
1995	3,652	1,894	100,157	28,622	39,165	68,941	236,885
1996	3,643	1,837	81,597	35,037	34,699	90,239	241,572
1997	3,510	1,831	85,506	41,251	30,717	40,993	198,466
1998	3,495	1,849	86,113	37,579	27,240	67,664	218,595
1999	4,180	2,523	77,660	49,388	27,753	47,612	202,413
2000	4,441	2,750	68,841	44,832	35,670	55,371	204,714
2001	4,483	2,297	77,570	51,965	31,686	51,117	212,338
2002	4,339	2,798	70,219	27,733	34,413	73,234	205,599
2003	4,535	2,375	72,498	36,894	38,791	46,291	194,474
2004	4,670	2,432	85,086	34,892	39,406	55,575	214,959
2005	3,903	1,610	72,174	47,656	36,751	28,838	186,762
2006	4,657	1,514	68,041	34,849	32,809	68,812	204,510
2007	4,618	1,356	72,097	34,578	26,270	53,298	186,243
2008 [a]	4,758	997	105,041	65,610	53,593	72,782	297,026
2009 [a]	4,830	1,700	82,391	37,547	31,690	44,748	196,376
5-Year Average 03 to 07	4,477	1,857	73,979	37,774	34,805	50,563	197,390
10-Year Average 98 to 07	4,332	2,150	75,030	40,037	33,079	54,781	203,061
All Years Average 89 to 07	3,920	2,016	81,069	40,341	36,555	67,445	225,485

Source: For 1989 to 2007: Alaska Department of Fish and Game, Division of Subsistence, Alaska Subsistence Fisheries Database, Version 3.5.

[a] Numbers reported here are preliminary estimates generated by the Division of Commercial Fisheries. Methodology to estimate harvest has changed slightly since 2007 with the incorporation of stratified sampling. A revision of historical estimates published by Division of Subsistence from 1990 to 2007 using the current methodology is pending review. Comparison of 2008 and 2009 estimates with years prior should be made cautiously.

Table 3.–Emergency Order summary, Kuskokwim Management Area, 2009.

EO#	DESCRIPTION	Effective Date - Expiration Date	Rescind EO#	EO Still In EFFECT
		Kuskokwim River Salmon		
3-S-WR-01-09	Opened the Kuskokwim River commercial fishing season. Issued June 21, 2009	12:01 a.m. 6/21/2009 Exp 11:59 p.m. 09/01/09	None	None
3-S-WR-02-09	Established subsistence closures before, during, and after commercial openings in Subdistrict 1B. Issued June 21, 2009	12:01 a.m. 6/23/2009 Exp 11:59 p.m. 9/1/2009	None	None
3-S-WR-03-09	Establishes a commercial fishing period in Subdistrict 1B. Issued June 21, 2009	3:00 p.m. 06/23/09 Exp 07:00 p.m. 6/23/09	None	3-S-WR-01-09 3-S-WR-02-09
3-S-WR-04-09	Establishes a commercial fishing period in Subdistrict 1B. Issued June 25, 2009	1:00 p.m. 06/26/09 Exp 05:00 p.m. 6/26/2009	None	3-S-WR-01-09 3-S-WR-02-09
3-S-WR-05-09	Establishes a commercial fishing period in Subdistrict 1B. Issued June 29, 2009	1:00 p.m. 07/01/09 Exp 4:00 p.m. 7/01/2009	None	3-S-WR-01-09 3-S-WR-02-09
3-S-WR-06-09	Established subsistence closures before, during, and after commercial openings in the Lower Section of Subdistrict 1B. Issued July 10, 2009	12:01 p.m. 7/11/2009 Exp 12:00 noon 9/1/2009	None	None
3-S-WR-07-09	Establishes a commercial fishing period in the Lower Section of Subdistrict 1B. Issued July 10, 2009	1:00 p.m. 7/11/2009 Exp 5:00 p.m. 7/11/2009	None	3-S-WR-01-09 3-S-WR-02-09 3-S-WR-06-09
3-S-WR-08-09	Establishes a commercial fishing period in Subdistrict 1B. Issued July 13, 2009	1:00 p.m. 7/14/2009 Exp 5:00 p.m. 7/14/2009	None	3-S-WR-01-09 3-S-WR-02-09

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Table 3.–Page 2 of 6.

EO#	DESCRIPTION	Effective Date - Expiration Date	Rescind EO#	EO Still In EFFECT
3-S-WR-09-09	Establishes commercial fishing periods in Subdistrict 1B. Issued July 17, 2009	1:00 p.m. 7/18/2004 Exp 7:00 p.m. 7/18/2009	None	3-S-WR-01-09 3-S-WR-02-09
3-S-WR-10-09	Establishes commercial fishing periods in Subdistrict 1B. Issued July 27, 2009	1:00 p.m. 7/28/09 Exp 5:00 p.m. 7/28/2009	None	3-S-WR-01-09 3-S-WR-02-09
3-S-WR-11-09	Opens the Lower Section of Subdistrict 1-B to commercial salmon fishing 2-hours earlier than the scheduled Subdistrict 1-B period Issued July 27, 2009	11:00 a.m. 7/28/2009 Exp 5:00 p.m. 7/28/2009	None	3-S-WR-01-09 3-S-WR-02-09 3-S-WR-06-09 3-S-WR-10-09
3-S-WR-12-09	Establishes commercial fishing periods in Subdistrict 1B. Issued July 31, 2009	1:00 p.m. 8/1/2009 Exp 5:00 p.m. 8/1/2009	None	3-S-WR-01-09 3-S-WR-02-09
3-S-WR-13-09	Opens the Lower Section of Subdistrict 1-B to commercial salmon fishing 2-hours earlier than the scheduled Subdistrict 1-B period Issued July 31, 2009	11:00 a.m. 8/1/2009 Exp 5:00 p.m. 8/1/2009	None	3-S-WR-01-09 3-S-WR-02-09 3-S-WR-06-09 3-S-WR-12-09
3-S-WR-14-09	Establishes commercial fishing periods in Subdistrict 1B. Issued August 3, 2009	1:00 p.m. 8/4/2009 Exp 5:00 p.m. 8/4/2009	None	3-S-WR-01-09 3-S-WR-02-09
3-S-WR-15-09	Opens the Lower Section of Subdistrict 1-B to commercial salmon fishing 2-hours earlier than the scheduled Subdistrict 1-B period Issued August 3, 2009	11:00 a.m. 8/4/2009 Exp 5:00 p.m. 8/4/2009	None	3-S-WR-01-09 3-S-WR-02-09 3-S-WR-06-09 3-S-WR-14-09
3-S-WR-16-09	Establishes commercial fishing periods in Subdistrict 1B. Issued August 3, 2009	06:00 a.m. 8/3/2009 Exp 6:00 p.m. 8/3/2009	None	3-S-WR-01-09 3-S-WR-02-09

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Table 3.–Page 3 of 6.

EO#	DESCRIPTION	Effective Date - Expiration Date	Rescind EO#	EO Still In EFFECT
3-S-WR-17-09	Establishes commercial fishing periods in Subdistrict 1B. Issued August 7, 2009	1:00 p.m. 8/8/2009 Exp 5:00 p.m. 8/8/2009	None	3-S-WR-01-09 3-S-WR-02-09
3-S-WR-18-09	Opens the Lower Section of Subdistrict 1-B to commercial salmon fishing 2-hours earlier than the scheduled Subdistrict 1-B period Issued August 7, 2009	11:00 a.m. 8/8/2009 Exp 5:00 p.m. 8/8/2009	None	3-S-WR-01-09 3-S-WR-02-09 3-S-WR-06-09 3-S-WR-17-09
3-S-WR-19-09	Establishes commercial fishing periods in Subdistrict 1B. Issued August 10, 2009	11:00 a.m. 8/11/2009 Exp 5:00 p.m. 8/11/2009	None	3-S-WR-01-09 3-S-WR-02-09
3-S-WR-20-09	Opens the Lower Section of Subdistrict 1-B to commercial salmon fishing 2-hours earlier than the scheduled Subdistrict 1-B period Issued August 11, 2009	9:00 a.m. 8/11/2009 Exp 5:00 p.m. 8/11/2009	None	3-S-WR-01-09 3-S-WR-02-09 3-S-WR-06-09 3-S-WR-19-09
3-S-WR-21-09	Establishes a commercial fishing period in the Lower Section of Subdistrict 1B. Issued August 12, 2009	11:00 a.m. 8/13/2009 Exp 5:00 p.m. 8/14/2009	None	3-S-WR-01-09 3-S-WR-02-09 3-S-WR-06-09
3-S-WR-22-09	Establishes commercial fishing periods in Subdistrict 1B. Issued August 14, 2009	11:00 a.m. 8/16/2009 Exp 5:00 p.m. 8/16/2009	None	3-S-WR-01-09 3-S-WR-02-09
3-S-WR-23-09	Establishes commercial fishing periods in Subdistrict 1B. Issued August 17, 2009	11:00 a.m. 8/18/2009 Exp 5:00 p.m. 8/18/2009	None	3-S-WR-01-09 3-S-WR-02-09
3-S-WR-24-09	Opens the Lower Section of Subdistrict 1-B to commercial salmon fishing 2-hours earlier than the scheduled Subdistrict 1-B period	11:00 a.m. 8/18/2009	None	3-S-WR-01-09 3-S-WR-02-09 3-S-WR-06-09 3-S-WR-23-09

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Table 3.–Page 4 of 6.

EO#	DESCRIPTION	Effective Date - Expiration Date	Rescind EO#	EO Still In EFFECT
3-S-WR-25-09	Establishes commercial fishing periods in Subdistrict 1B. Issued August 21, 2009	11:00 a.m. 8/22/2009 Exp 5:00 p.m. 8/22/2009	None	3-S-WR-01-09 3-S-WR-02-09
3-S-WR-26-09	Opens the Lower Section of Subdistrict 1-B to commercial salmon fishing 2-hours earlier than the scheduled Subdistrict 1-B period Issued August 21, 2009	9:00 a.m. 8/22/2004 Exp 5:00 p.m. 8/22/2004	None	3-S-WR-01-09 3-S-WR-02-09 3-S-WR-06-09 3-S-WR-25-09
	Kuskokwim Bay Salmon			
3-S-WB-01-09	Opens the commercial salmon fishing season in District W-4. Issued June 8, 2009	9:00 a.m. 6/15/2009 Exp 9:00 p.m. 9/8/2009	None	None
3-S-WB-02-09	Establishes a commercial fishing period in District 4. Issued June 8, 2009	9:00 a.m. 6/15/2009 Exp 9:00 p.m. 6/15/2009	None	3-S-WB-01-09
3-S-WB-03-09	Establishes a commercial fishing period in District 4. Issued June 16, 2004	9:00 a.m. 6/17/2009 Exp 9:00 p.m. 6/17/2009		3-S-WB-01-09
3-S-WB-04-09	Opens the commercial salmon fishing season in District W-5. Issued June 18, 2009	9:00 a.m. 6/22/2009 Exp 9:00 p.m. 6/22/2009		None
3-S-WB-05-09	Establishes commercial fishing period in District 4 and District 5. Issued June 18, 2009	9:00 a.m. 6/22/2009 Exp 9:00 p.m. 6/22/2009		3-S-WB-01-09 3-S-WB-04-09
3-S-WB-06-09	Establishes commercial fishing period in District 4 and District 5. Issued June 23, 2009	9:00 a.m. 6/25/2009 Exp 9:00 p.m. 6/25/2009		3-S-WB-01-09 3-S-WB-04-09
3-S-WB-07-09	Establishes commercial fishing period in District 4 and District 5. Issued June 28, 2009	9:00 a.m. 6/30/2009 Exp 9:00 p.m. 6/30/2009		3-S-WB-01-09 3-S-WB-04-09

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Table 3.–Page 5 of 6.

EO#	DESCRIPTION	Effective Date - Expiration Date	Rescind EO#	EO Still In EFFECT
3-S-WB-07-09	Establishes commercial fishing period in District 4 and District 5.	9:00 a.m. 6/30/2009		3-S-WB-01-09 3-S-WB-04-09
	DESCRIPTION	Effective Date - Expiration Date	Rescind EO#	
	Issued June 28, 2009	Exp 9:00 p.m. 6/30/2009		
3-S-WB-08-09	Establishes commercial fishing period in District 4 and District 5.	9:00 a.m. 7/6/2009		3-S-WB-01-09 3-S-WB-04-09
	Issued July 1, 2009	Exp 9:00 p.m. 7/6/2009		
3-S-WB-09-09	Establishes commercial fishing schedule for District 4 and District 5.	9:00 a.m. 7/8/2009		3-S-WB-01-09 3-S-WB-04-09
	Issued July 7, 2009	Exp 9:00 p.m. 7/10/2009		
3-S-WB-10-09	Establishes commercial fishing schedule for District 4 and District 5.	9:00 a.m. 7/13/2009		3-S-WB-01-09 3-S-WB-04-09
	Issued July 11, 2009	Exp 9:00 p.m. 7/15/2009		
3-S-WB-11-09	Establishes commercial fishing schedule for District 4 and District 5.	9:00 a.m. 7/16/2009		3-S-WB-01-09 3-S-WB-04-09
	Issued July 15, 2009	Exp 9:00 p.m. 7/17/2009		
3-S-WB-12-09	Establishes commercial fishing schedule for District 4 and District 5.	9:00 a.m. 7/20/2009		3-S-WB-01-09 3-S-WB-04-09
	Issued July 20, 2009	Exp 9:00 p.m. 7/22/2009		
3-S-WB-13-09	Establishes commercial fishing schedule for District 4 and District 5.	9:00 a.m. 7/24/2009		3-S-WB-01-09 3-S-WB-04-09
	Issued July 23, 2009	Exp 9:00 p.m. 7/27/2009		
3-S-WB-14-09	Establishes a commercial fishing period for District 4 and District 5.	9:00 a.m. 7/25/2009		3-S-WB-01-09 3-S-WB-04-09
	Issued July 24, 2009	Exp 9:00 p.m. 7/25/2009		

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Table 3.–Page 6 of 6.

EO#	DESCRIPTION	Effective Date - Expiration Date	Rescind EO#	EO Still In EFFECT
3-S-WB-15-09	Establishes commercial fishing schedule for District 4 and District 5. Issued July 28, 2009	9:00 a.m. 7/29/2009 Exp 9:00 p.m. 7/31/2009		3-S-WB-01-09 3-S-WB-04-09
3-S-WB-16-09	Establishes commercial fishing schedule for District 4 and District 5. Issued August 2, 2004	9:00 a.m. 8/3/2009 Exp 9:00 p.m. 8/5/2009		3-S-WB-01-09 3-S-WB-04-09
3-S-WB-17-04	Establishes commercial fishing schedule for District 4 and District 5. Issued August 6, 2009	9:00 a.m. 8/7/2009 Exp 9:01 p.m. 8/10/2009		3-S-WB-01-09 3-S-WB-04-09
3-S-WB-18-09	Establishes commercial fishing schedule for District 4 and District 5. Issued August 11, 2009	9:00 a.m. 8/12/2009 Exp 9:00 p.m. 8/14/2009		3-S-WB-01-09 3-S-WB-04-09
3-S-WB-19-09	Establishes a commercial fishing period for District 4. Issued August 15, 2009	9:00 a.m. 8/17/2009 Exp 9:00 p.m. 8/17/2009		3-S-WB-01-09 3-S-WB-04-09
3-S-WB-20-09	Establishes a commercial fishing period for District 4 and District 5. Issued August 16, 2004	9:00 a.m. 8/19/2009 Exp 9:00 p.m. 8/19/2009		3-S-WB-01-09 3-S-WB-04-09
3-S-WB-21-09	Establishes a commercial fishing period for District 4 and District 5. Issued August 20, 2009	9:00 a.m. 8/21/2009 Exp 9:00 p.m. 8/21/2009		3-S-WB-01-09 3-S-WB-04-09
3-S-WB-22-09	Establishes a commercial fishing schedule for District 4 and District 5. Issued August 23, 2009	9:00 a.m. 8/24/2009 Exp 9:00 p.m. 8/26/2009		3-S-WB-01-09 3-S-WB-04-09
3-S-WB-23-04	Rescinds that portion of emergency order 3-S-WB-22-09 that allowed a commercial period in District 4 and District 5 on August 26, 2009. Issued August 25, 2009	9:00 a.m. 8/26/2009 Exp 9:00 p.m. 8/26/2009		3-S-WB-01-09 3-S-WB-04-09 3-S-WB-22-09

Table 4.–Commercial salmon harvest, District W-1, Kuskokwim River, Kuskokwim Management Area.

Period	Date	Permits	Sub-District[a]	Hours	Del	Chinook Catch	Chinook Lbs	Chinook CPUE	Sockeye Catch	Sockeye Lbs	Sockeye CPUE	Coho Catch	Coho Lbs	Coho CPUE	Chum Catch	Chum Lbs	Chum CPUE
1	6/23	167	W-1B	4	172	3,003	36,425	4.50	8,112	58,109	12.14	-	-	0.00	9,149	63,945	13.70
2	6/26	189	W-1B	4	193	2,552	32,257	3.38	6,870	49,421	9.09	-	-	0.00	14,466	100,804	19.13
3	7/1	173	W-1B	3	173	762	11,022	1.47	7,798	54,455	15.03	-	-	0.00	18,703	125,806	36.04
4	7/11	70	W1-B LR	4	72	87	1,255	0.31	1,069	7,444	3.82	-	-	0.00	7,500	48,988	26.79
5	7/14	39	W1-B LR	4	39	26	370	0.17	810	5,437	5.19	23	156	0.15	4,530	29,747	29.04
6	7/18	112	W1-B	6	118	83	1,419	0.12	677	4,711	1.01	1,340	8,797	1.99	12,870	81,678	19.15
7	7/28	190	W1-B	4[b]	191	58	1,061	0.08	78	567	0.10	14,516	100,387	19.10	4,982	30,747	6.56
8	8/1	220	W1-B	4[b]	223	24	433	0.03	80	582	0.09	16,846	117,133	19.14	1,599	10,069	1.82
9	8/4	219	W1-B	4[b]	221	27	435	0.03	70	501	0.08	19,334	137,242	22.07	1,731	10,128	1.98
10	8/6	2[c]	W1-B	12	2	0	-	0.00	-	-	0.00	377	2,377	15.71	31	202	1.29
11	8/8	210	W1-B	4[b]	211	12	194	0.01	27	162	0.03	16,224	116,757	19.31	633	3,586	0.75
12	8/11	233	W1-B	6[b]	234	17	314	0.01	35	200	0.03	15,569	112,762	11.14	436	2,572	0.31
13	8/13	49	W-1B LR	6	50	3	41	0.01	18	110	0.06	3,709	28,198	12.62	58	390	0.20
14	8/16	0[c]	W-1B	6	0	no deliveries			no deliveries			no deliveries			no deliveries		
15	8/18	183	W-1B	6[b]	185	6	77	0.01	15	110	0.01	10,189	78,371	9.28	81	459	0.07
16	8/22	140	W-1B	6[b]	140	4	62	0.00	14	89	0.02	6,419	50,538	7.64	21	137	0.03
Totals		342[d]		83	2,224	6,664	85,365		25,673	181,898		104,546	752,718		76,790	509,258	

Note: Dashes indicate no data.

[a] LR denotes Lower River (stat area 11).

[b] Does not include 2-hr extension for the Lower Section of W1-B.

[c] Period was for registered catcher/sellers only.

[d] Number of individual permit holders participating for the season.

Table 5.–Commercial salmon harvest and ex-vessel value by District, Kuskokwim Management Area, 2009.

	Chinook	Sockeye	Coho	Pink	Chum	Total
Lower Kuskokwim River, District W-1						
Fish	6,664	25,673	104,546	2	76,790	213,675
Pounds	85,365	181,989	752,718	7	509,258	1,529,337
Avg. Price	$0.72	$0.56	$0.35	$0.00	$0.15	
Value	$61,452	$101,445	$263,457	$0	$76,494	$502,848
		Avg. 1999-2008				
Fish	2,438	8,666	189,107	3	21,515	221,728
Value	$15,454	$33,467	$387,593	$1	$8,646	$445,160
Quinhagak, District W-4						
Fish	13,920	112,153	48,115	0	91,158	265,346
Pounds	185,940	694,330	390,178	0	639,951	1,910,399
Price	$0.70	$0.55	$0.35		$0.15	
Value	$130,561	$384,209	$136,562	$0	$95,993	$747,325
		Avg. 1999-2008				
Fish	18,049	58,425	42,199	0	34,084	152,756
Value	$122,667	$192,044	$102,073	$1	$18,882	$435,666
Goodnews Bay, District W-5						
Fish	1,509	32,544	8,406	0	16,985	59,444
Pounds	19,047	227,575	72,731	0	126,656	446,009
Price	$0.70	$0.59	$0.35	$0.00	$0.15	
Value	$13,333	$134,244	$69,272	$0	$18,988	$235,837
		Avg. 1999-2009				
Fish	2,214	26,686	12,748	0	7,018	48,666
Value	$13,793	$89,582	$33,235	$0	$4,053	$140,664
Kuskokwim Area Total						
Fish	22,093	170,370	161,067	2	184,933	538,465
Pounds	290,352	1,103,894	1,215,627	7	1,275,865	3,885,745
Price	$0.71	$0.56	$0.35	$0.00	$0.15	
Value	$205,346	$619,898	$469,291	$0	$191,475	$1,486,010
		Avg. 1999-2009				
Fish	22,701	93,776	244,222	6	62,616	423,321
Value	$151,915	$315,093	$523,204	$1	$31,581	$1,021,794
Avg weight	13.1	6.5	7.5		6.9	

Table 6.–Commercial salmon harvest, District W-4, Quinhagak, Kuskokwim Management Area, 2009.

					Chinook				Sockeye				Chum				Coho			
Period	Date	Permits	Hours	Landings	Catch	Lbs	CPUE	CPUE	Catch	Lbs	CPUE	CPUE	Catch	Lbs	CPUE	CPUE	Catch	Lbs	CPUE	CPUE
1	6/15	79	12	88	1,608	18,072	1.5	1.7	142	1,002	0.1	0.1	231	1,722	0.2	0.2	0	0	0.0	0.0
2	6/17	73	12	76	1,878	21,489	2.1	2.1	245	1,832	0.3	0.3	183	1,422	0.2	0.2	0	0	0.0	0.0
3	6/22	110	12	157	3,482	41,138	1.8	2.6	1,892	13,845	1.0	1.4	2,005	15,610	1.1	1.5	0	0	0.0	0.0
4	6/25	120	12	173	2,849	38,399	1.4	2.0	4,753	32,959	2.3	3.3	3,931	30,043	1.9	2.7	0	0	0.0	0.0
5	6/30	122	12	197	1,302	19,276	0.6	0.9	10,329	70,272	4.4	7.1	7,391	54,316	3.1	5.0	0	0	0.0	0.0
6	7/6	120	12	218	723	11,607	0.3	0.5	14,406	94,040	5.5	10.0	6,171	44,526	2.4	4.3	0	0	0.0	0.0
7	7/8	131	12	215	798	13,358	0.3	0.5	12,919	81,012	5.0	8.2	10,633	75,024	4.1	6.8	0	0	0.0	0.0
8	7/10	122	12	201	382	6,274	0.2	0.3	14,274	87,409	5.9	9.8	11,026	78,732	4.6	7.5	2	14	0.0	0.0
9	7/13	95	12	119	133	2,615	0.1	0.1	7,810	48,203	5.5	6.9	7,256	51,308	5.1	6.4	0	0	0.0	0.0
10	7/15	111	12	131	137	2,510	0.1	0.1	8,623	51,853	5.5	6.5	6,323	43,392	4.0	4.7	3	20	0.0	0.0
11	7/16	77	6	88	72	1,271	0.1	0.2	6,946	41,001	13.2	15.0	4,579	32,379	8.7	9.9	4	35	0.0	0.0
12	7/17	80	12	118	135	2,482	0.1	0.1	6,561	38,047	4.6	6.8	6,732	46,148	4.8	7.0	3	25	0.0	0.0
13	7/20	70	12	103	92	1,772	0.1	0.1	6,877	39,674	5.6	8.2	4,557	31,182	3.7	5.4	110	858	0.1	0.1
14	7/22	73	12	118	81	1,460	0.1	0.1	6,898	39,045	4.9	7.9	4,710	31,562	3.3	5.4	211	1,518	0.1	0.2
15	7/24	79	12	112	74	1,091	0.1	0.1	4,048	23,163	3.0	4.3	4,268	28,319	3.2	4.5	548	3,750	0.4	0.6
16	7/25	61	12	75	42	778	0.0	0.1	1,960	10,887	2.2	2.7	3,794	25,536	4.2	5.2	610	4,300	0.7	0.8
17	7/27	41	12	47	27	525	0.0	0.1	837	4,475	1.5	1.7	1,868	12,665	3.3	3.8	618	4,385	1.1	1.3
18	7/29	19	12	21	3	43	0.0	0.0	134	768	0.5	0.6	284	1,927	1.1	1.2	209	1,515	0.8	0.9
19	7/31	38	12	57	17	305	0.0	0.0	847	4,705	1.2	1.9	2,240	14,939	3.3	4.9	2,289	17,227	3.3	5.0
20	8/3	53	12	74	22	377	0.0	0.0	470	2,813	0.5	0.7	866	5,582	1.0	1.4	3,733	28,043	4.2	5.9
21	8/5	56	12	80	8	161	0.0	0.0	245	1,409	0.3	0.4	639	4,044	0.7	1.0	4,254	33,175	4.4	6.3
22	8/7	69	12	97	11	274	0.0	0.0	239	1,512	0.2	0.3	562	3,587	0.5	0.7	4,952	39,879	4.3	6.0
23	8/10	70	12	98	8	160	0.0	0.0	235	1,470	0.2	0.3	374	2,417	0.3	0.4	4,572	37,495	3.9	5.4
24	8/12	58	12	72	4	68	0.0	0.0	92	578	0.1	0.1	169	1,080	0.2	0.2	4,076	33,132	4.7	5.9
25	8/14	64	12	82	8	85		0.0	131	807		0.2	146	974		0.2	5,973	48,965		7.8
26	8/17	66	12	92	9	140		0.0	96	612		0.1	99	682		0.1	5,507	46,354		7.0
27	8/19	66	12	102	4	48		0.0	77	499		0.1	66	427		0.1	5,181	44,574		6.5
28	8/21	56	12	80	5	98		0.0	51	333		0.1	31	227		0.0	3,930	33,429		5.8
29	8/24	45	12	51	6	64		0.0	16	105		0.0	24	179		0.0	1,330	11,485		2.5
Totals		179	342	3,142	13,920	185,949			112,153	694,330			91,158	639,951			48,115	390,206		

Table 7.–Commercial salmon harvest, District 5, Goodnews Bay, Kuskokwim Management Area, 2009.

					Chinook			Sockeye			Chum			Coho		
Period	Date	Permits	Hours	Landings	Catch	Lbs	CPUE	Catch	Lbs	CPUE	Catch	Lbs	CPUE	Catch	Lbs	CPUE
1	6/22	20	12	23	511	5,346	2.1	736	5,217	3.1	658	5,183	2.7	0	0	0.0
2	6/25	20	12	33	361	4,122	1.5	2,243	16,061	9.3	1,374	10,975	5.7	0	0	0.0
3	6/30	22	12	36	221	2,978	0.8	3,207	23,346	12.1	1,996	16,028	7.6	0	0	0.0
4	7/6	26	12	44	110	1,728	0.4	3,578	25,516	11.5	2,466	19,052	7.9	0	0	0.0
5	7/8	24	12	34	53	932	0.2	3,545	24,728	12.3	1,680	12,472	5.8	0	0	0.0
6	7/10	31	12	38	63	941	0.2	3,001	21,181	8.1	1,506	11,119	4.0	0	0	0.0
7	7/13	24	12	28	21	388	0.1	1,719	11,677	6.0	1,477	10,665	5.1	1	3	0.0
8	7/15	23	12	27	30	467	0.1	2,195	15,243	8.0	1,654	11,868	6.0	0	0	0.0
9	7/16	17	6	17	10	137	0.1	814	5,353	8.0	600	4,126	5.9	0	0	0.0
10	7/17	22	12	24	31	528	0.1	1,413	9,734	5.4	1,313	9,444	5.0	0	0	0.0
11	7/20	16	12	18	20	343	0.1	815	5,909	4.2	606	4,489	3.2	9	71	0.0
12	7/22	13	12	17	17	280	0.1	1,368	9,193	8.8	432	3,027	2.8	15	104	0.1
13	7/24	14	12	16	6	76	0.0	1,120	7,761	6.7	309	2,092	1.8	13	93	0.1
14	7/25	14	12	14	10	158	0.1	1,095	7,838	6.5	304	1,968	1.8	25	185	0.1
15	7/27	12	12	13	7	109	0.0	583	4,087	4.0	125	854	0.9	28	201	0.2
16	7/29	6	12	6	1	24	0.0	79	575	1.1	24	165	0.3	15	102	0.2
17	7/31	10	12	11	4	63	0.0	456	3,404	3.8	119	800	1.0	153	1,144	1.3
18	8/3	11	12	13	4	72	0.0	481	3,283	3.6	86	590	0.7	151	1,137	1.1
19	8/5	15	12	16	5	66	0.0	614	4,222	3.4	83	572	0.5	376	2,872	2.1
20	8/7	16	12	18	9	120	0.0	624	4,257	3.3	61	397	0.3	314	2,418	1.6
21	8/10	15	12	18	0	0	0.0	693	4,696	3.9	43	276	0.2	427	3,411	2.4
22	8/12	16	12	19	5	59	0.0	536	3,430	2.8	22	158	0.1	796	6,511	4.1
23	8/14	19	12	22	1	28	0.0	746	4,990	3.3	25	170	0.1	1,229	10,207	5.4
24	8/19	17	12	25	5	39	0.0	440	2,896	2.2	12	87	0.1	1,991	18,055	9.8
25	8/21	20	12	24	2	22	0.0	303	2,000	1.3	3	23	0.0	1,840	16,645	7.7
26	8/24	18	12	20	2	21	0.0	140	978	0.6	7	56	0.0	1,023	9,572	4.7
Totals		39	306	574	1,509	19,047		32,544	227,575		16,985	126,656		8,406	72,731	

Table 8.–Herring aerial survey biomass estimates, Security Cove District, Kuskokwim Bay, 2009.

	Flight		Spawn		Biomass Estimates by Index Area [a]						
					SEC		CGV		SRM		
Date	No.	Hours	No.	Length (mi)	Tons	Rating [b]	Tons	Rating [b]	Tons	Rating [b]	Total
15 May	1	0.73	0	0.0	627	5	949	4	260	5	1,836
21 May	2	n/r	2	n/r	1,808	3	627	3	619	3	3,055
24 May	3	0.27	0	0.0	n/s	5	n/s	5	n/s	5	0
27 May	4	0.5	0	0.0	15	5	0	5	0	5	15

Note: n/r= not recorded; n/s = not surveyed; n/a = not applicable.

[a] Index Areas: SEC = Cape Newenham to Pinnacle Rock; CGV = Chagvan Bay to Salmon River; SRM = South Red mountain to Salmon River.

[b] Survey Ratings: 1 = Excellent visibility; 2 = Good (light ripple, uneven lighting, easy to see schools): 3 = Fair (light chop, some glare or shadows, relatively easy to see school); 4 = Poor (rough seas, strong glare, difficult to see schools); 5 = unsatisfactory.

Table 9.–Herring aerial survey biomass estimates, Goodnews Bay District, Kuskokwim Bay, 2009.

	Flight		Spawn		Biomass estimates by index area [a]								
					NRM		GBE		GNB		CRB		
Date	No.	Hours	No. of	length (mi)	Tons	Rating [b]	Tons	Rating [b]	Tons	Rating [b]	Tons	Rating [b]	Total
15 May	1	1.12	0	0.0	277	5	1,627	4	1,753	4	144	5	3,801
21 May	2	n/r	0	0.0	379	3	4,455	3	5	5	802	3	5,641
24 May	3	1.45	0	0.0	116	5	1,396	4	338	5	4,293	5	6,143
27 May	4	1.11	0	0.0	0	5	431	5	351	5	n/s	5	782
1 Jun	5	n/r	0	0.0	n/s	5	0	5	0	5	0	5	0

Note: n/r= not recorded; n/s = not surveyed; n/a = not applicable.

[a] Index Areas: NRM = Thorenson Mt. to Seattle Creek; GBE = Goodnews Bay entrance to south edge of Nunvakfak Lake; GNB = all waters of Goodnews Bay; CRB = south edge of Nunvakfak Lake to Carter Spit.

[b] Survey Ratings: 1 = Excellent; 2 = Good (light ripple, uneven lighting, easy to see schools): 3 = Fair (light chop, some glare or shadows, relatively easy to see school); 4 = Poor (rough seas, strong glare, difficult to see schools); 5 = unsatisfactory.

Table 10.–Herring age composition, Goodnews Bay District, Kuskokwim Bay, 2009.

District	Age (years)												Total weight (st)
	2	3	4	5	6	7	8	9	10	11	12	13+	
Goodnews Bay[a]	0.0	0.2	43.5	19.8	10.6	11.7	3.7	2.2	2.0	3.3	1.6	1.4	6,143

[a] ADF&G variable mesh gillnet.

Table 11.–Herring age composition of biomass, Goodnews Bay District, 2009.

	% by Weight / Tons												Total weight
Age	2	3	4	5	6	7	8	9	10	11	12	13+	(st)
District													
Goodnews Bay[a]		0.2 / 1,229	43.5 / 2,671	19.8 / 1,216	10.6 / 651	11.7 / 719	3.7 / 227	2.2 / 135	2.0 / 123	3.3 / 203	1.6 / 98	1.4 / 86	6,143

[a] ADF&G variable mesh gillnet.

Table 12.–Age composition of Pacific herring caught by ADF&G test gillnet, Goodnews Bay District, Kuskokwim Bay, 2009.

District	Fishery	Age Composition (no. of fish / percent)			Sample Size
		< 6	6-8	> 8	
Goodnews Bay	test fishery (VMG)	763 / 63	313 / 26	127 / 11	1,203

Table 13.–Length composition by age of Pacific herring caught by ADF&G test gillnet fishery, Goodnews Bay District, Kuskokwim Bay, 2009.

		Age Class								
		< 6			6 - 8			> 8		
		Length (millimeters)								
District	Fishery	min	avg	max	min	avg	max	min	avg	max
Goodnews Bay	test fishery (VMG)	204	232	275	216	276	352	240	308	341

		Age Class								
		< 6			6 - 8			> 8		
		Weight (grams)								
District	Fishery	min	avg	max	min	avg	max	min	avg	max
Goodnews Bay	test fishery (VMG)	97	160	346	125	305	525	204	437	688

Table 14.–Herring aerial survey biomass estimates, Nelson Island District, Kuskokwim Bay

	Flight		Spawn		Biomass estimates by index area [a]								
					KGB		CPV		TAB		NLK		
Date	No.	Hours	No. of	Length (mi)	Tons	Rating [b]	Tons	Rating [b]	Tons	Rating [b]	Tons	Rating [b]	Total
9 Jun	1	n/r	0	0.0	0	3	0	3	0	3	0	3	0
11 Jun	2	0.63	0	0.0	0	5	68	5	0	5	0	5	68

Note: n/r= not recorded; n/s = not surveyed; n/a = not applicable.

[a] Index Areas: KGB = Kangirlvar Bay, Chinigyak Cape to Umkumiut; CPV = Cape Vancouver, Umkumiut to Taluvarevuk Point; TAB = Tununak Bay, Taluvarevuk Point to Niliklguk; NLK = Niliklguk to the tundra flats. Index areas CYC, Kolovinarak River to Chinigyak Cape, and KIG, Tundra Flats to Kigigak Island were not surveyed in 2003.

[b] Survey Ratings: 1 = Excellent; 2 = Good (light ripple, uneven lighting, easy to see schools): 3 = Fair (light chop, some glare or shadows, relatively easy to see school); 4 = Poor (rough seas, strong glare, difficult to see schools); 5 = unsatisfactory.

Table 15.–Herring aerial survey biomass estimates, Central Kuskokwim Bay, Kuskokwim Bay, 2009.

	Flight		Spawn		Biomass Estimates by Index Area [a]						
					CCS		CCN		JSB		
Date	No.	Hours	No.	Length (mi)	Tons	Rating [b]	Tons	Rating [b]	Tons	Rating [b]	Total
15 May	1	0.18	0	0.0	0	5	0	5	0	5	0
21 May	2	0.18	0	0.0	80	5	304	5	76	5	460
24 May	3	0.48	0	0.0	2,511	4	279	4	0	5	2,790
1 Jun	4	0.18	0	0.0	0	5	0	5	0	5	0

Note: n/r= not recorded; n/s = not surveyed; n/a = not applicable.

[a] Index Areas: CCS = Carter Spit to Cripple Creek; CCN = Cripple Creek to Jacksmith Point; JSB = Jacksmith Bay to Quinhagak.

[b] Survey Ratings: 1 = Excellent visibility; 2 = Good (light ripple, uneven lighting, easy to see schools): 3 = Fair (light chop, some glare or shadows, relatively easy to see school); 4 = Poor (rough seas, strong glare, difficult to see schools); 5 = unsatisfactory.

Table 16.–2010 Pacific herring spawning biomass projections and harvest levels, Kuskokwim Bay, 2009.

District	Projected Biomass (st) [a]	Guideline Harvest (st)	Exploitation Rate (%)	Threshold[b]
Security Cove	6,014	1,203	20	1,200
Goodnews Bay	5,736	1,147	20	1,200
Cape Avinof	2,393	359	15	500
Nelson Island	5,449	890	16[c]	3,000
Nunivak Island	3,322	664	20	1,500
Kuskokwim Bay Totals	22,914	4,263		

[a] Projection may be adjusted based on inseason biomass estimates.

[b] Threshold biomass needed to allow commercial fishery (5 AAC 27.060)

[c] Nelson Island exploitation rate is 20% of projected biomass minus 200 st for subsistence harvest.

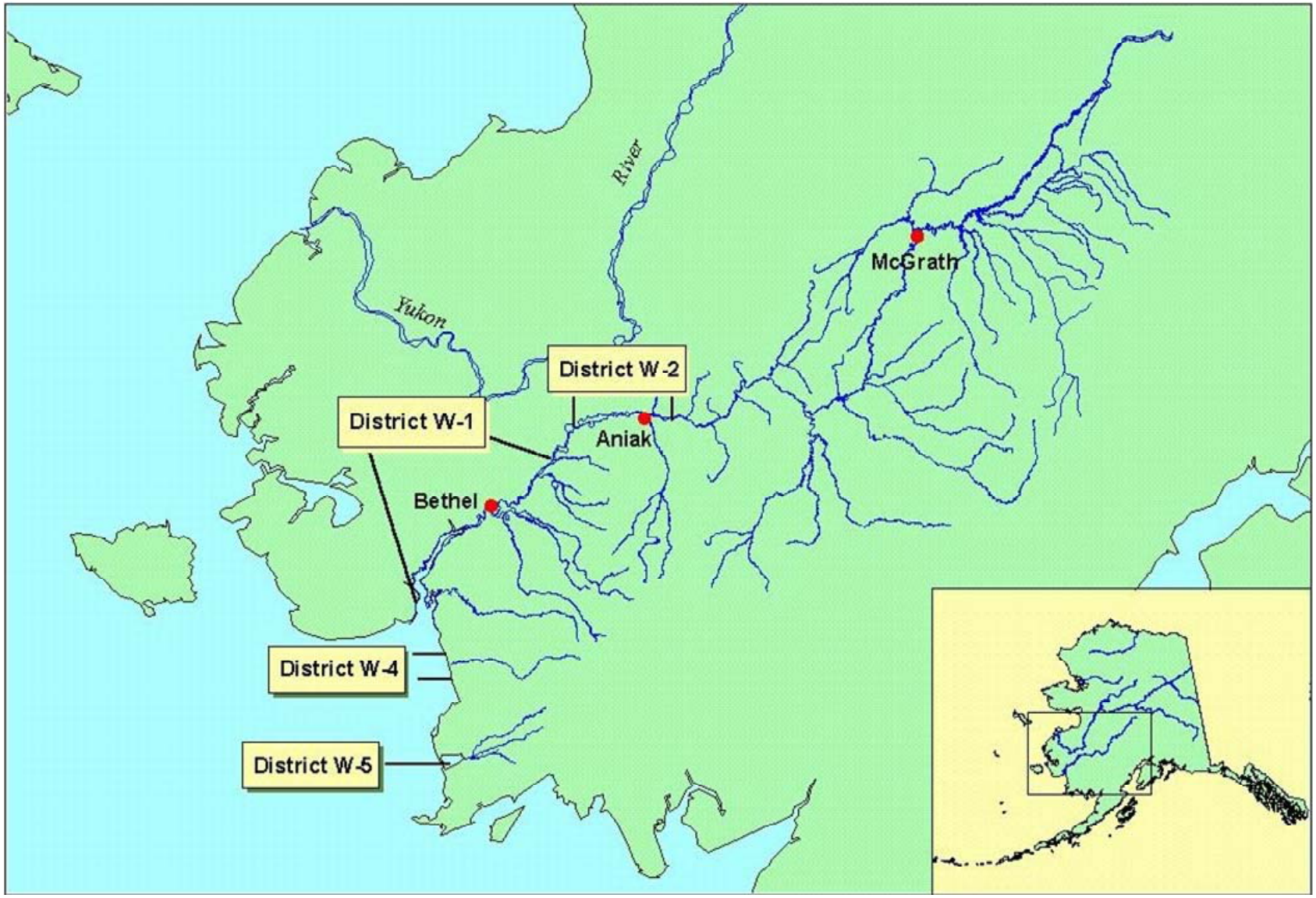

Figure 1.–Map of the Kuskokwim Management Area.

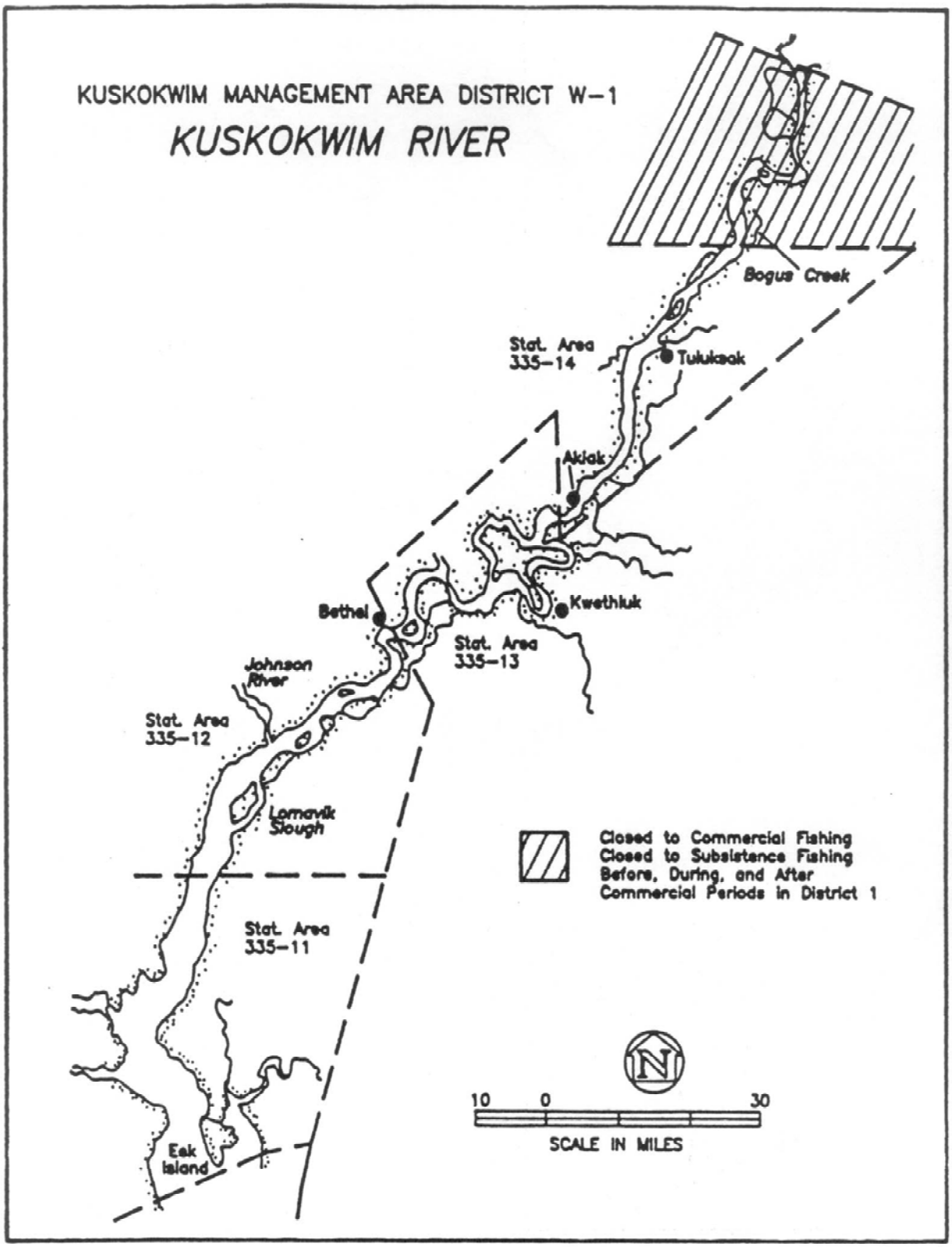

Figure 2.–Map of commercial fishing district W-1, Kuskokwim River, Kuskokwim Management Area.

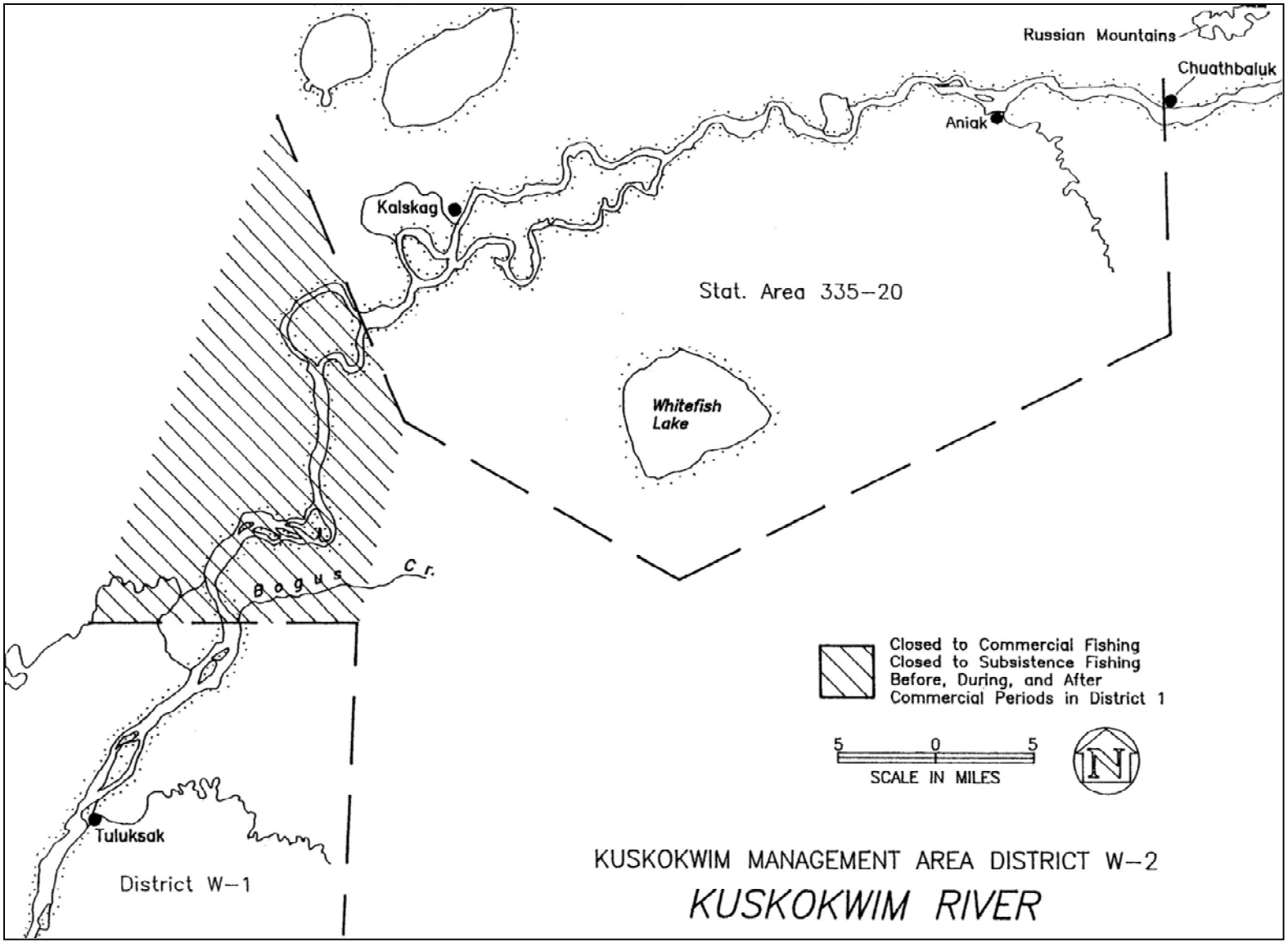

Figure 3.–Map of commercial fishing district W-2, Kuskokwim River, Kuskokwim Management Area.

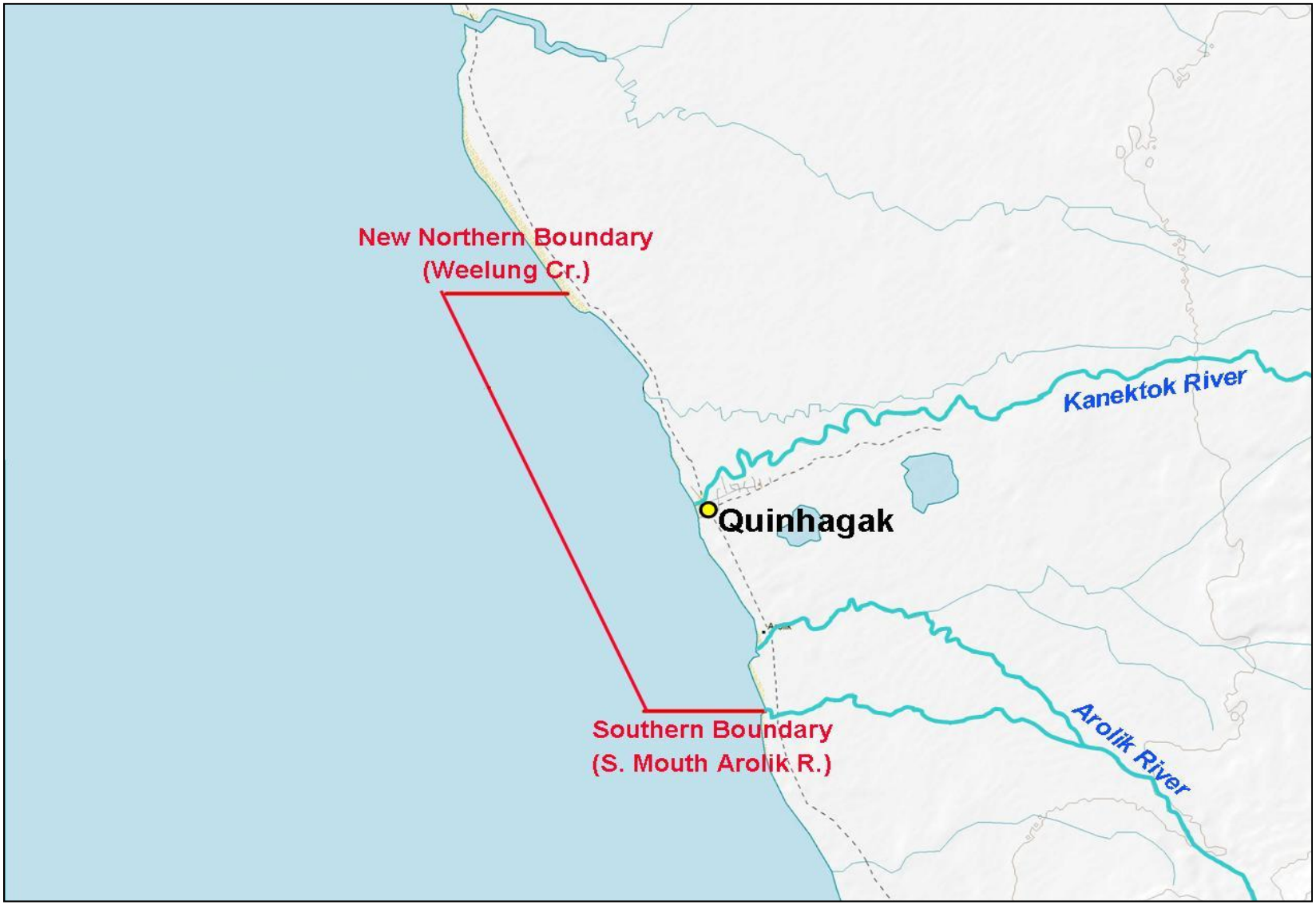

Figure 4.–Map of commercial fishing district W-4, Quinhagak, Kuskokwim Management Area.

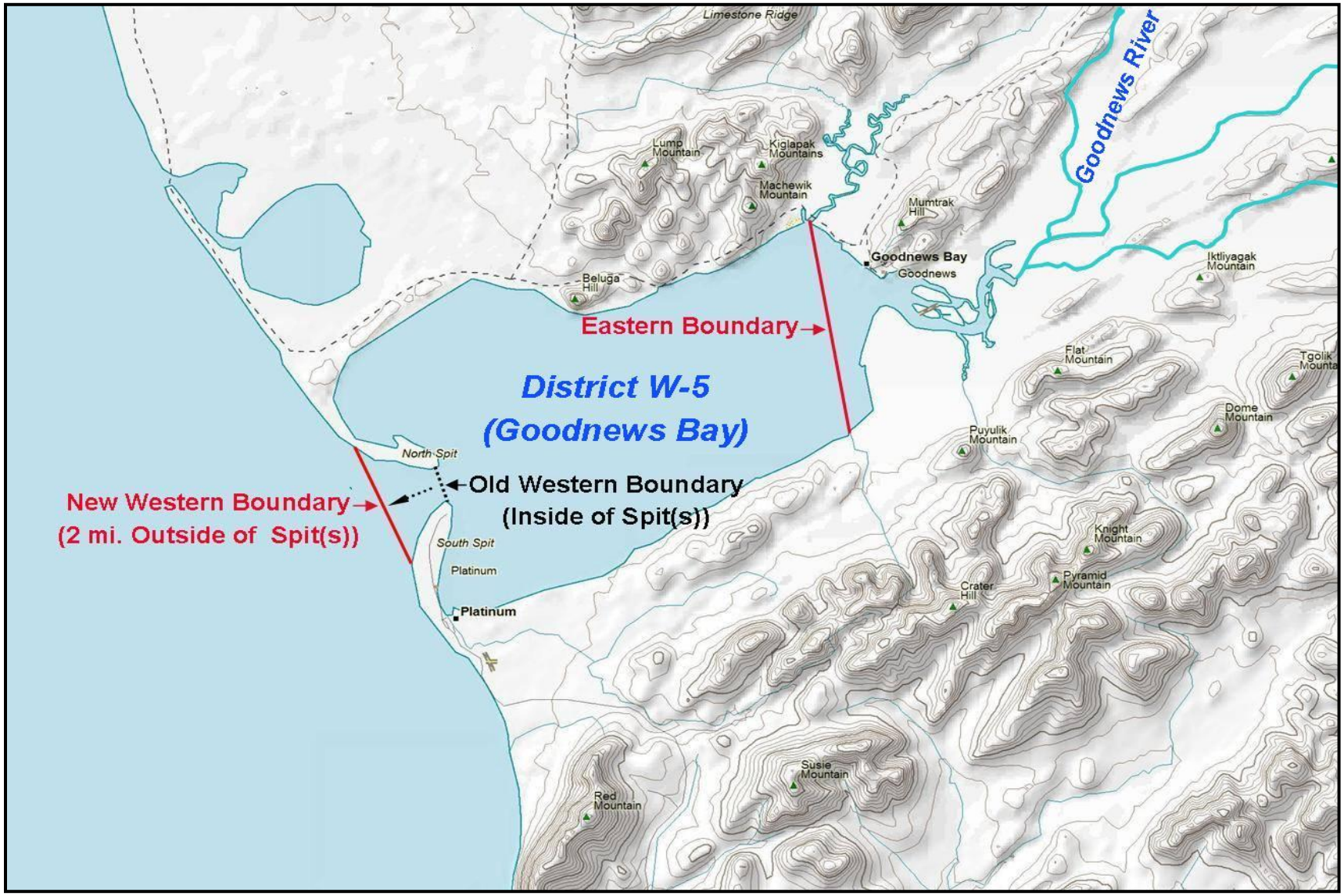

Figure 5.–Map of Commercial Fishing District W-5, Goodnews Bay, Kuskokwim Management Area.

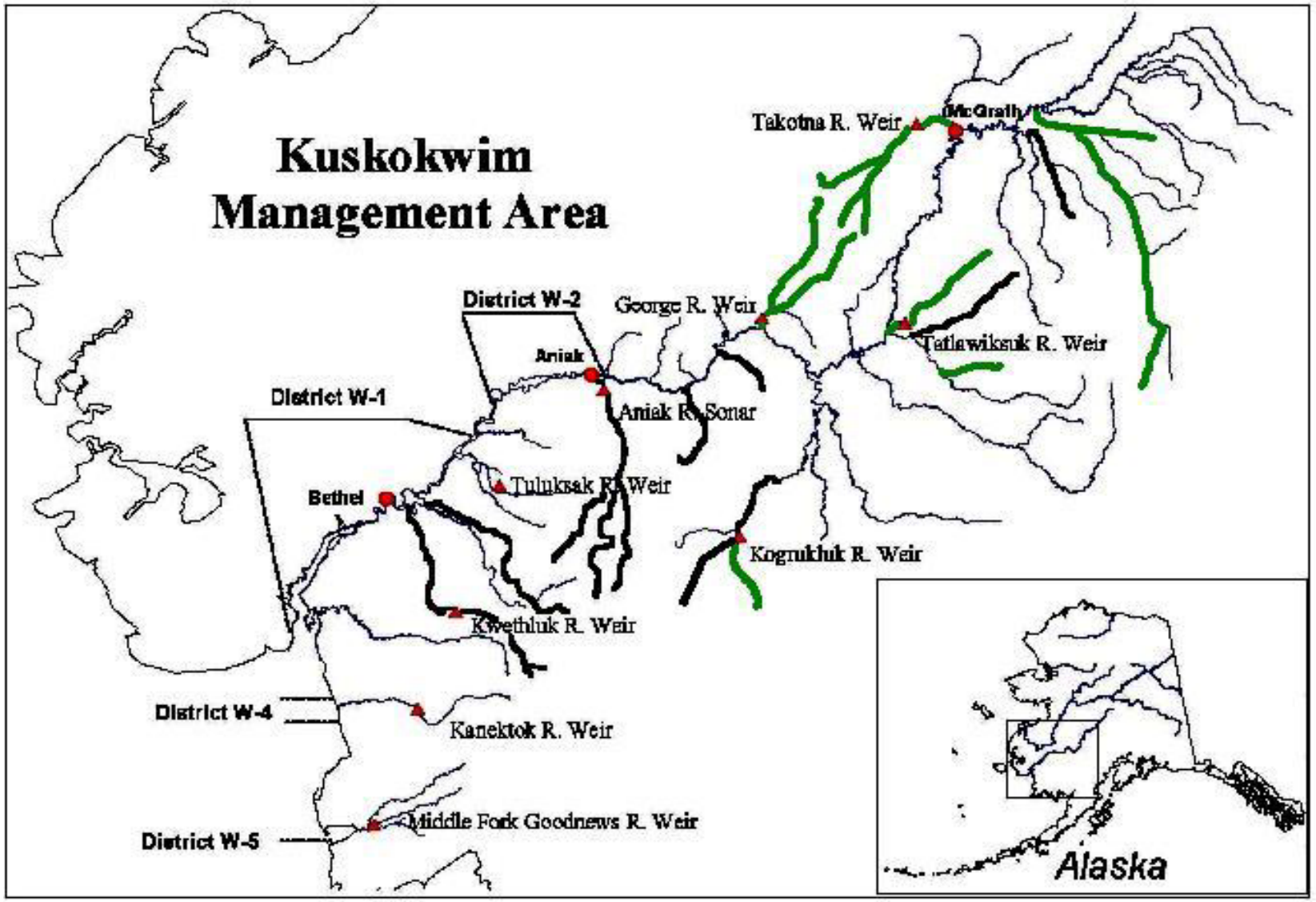

Figure 6.–Map of aerial survey streams, Kuskokwim Management Area.

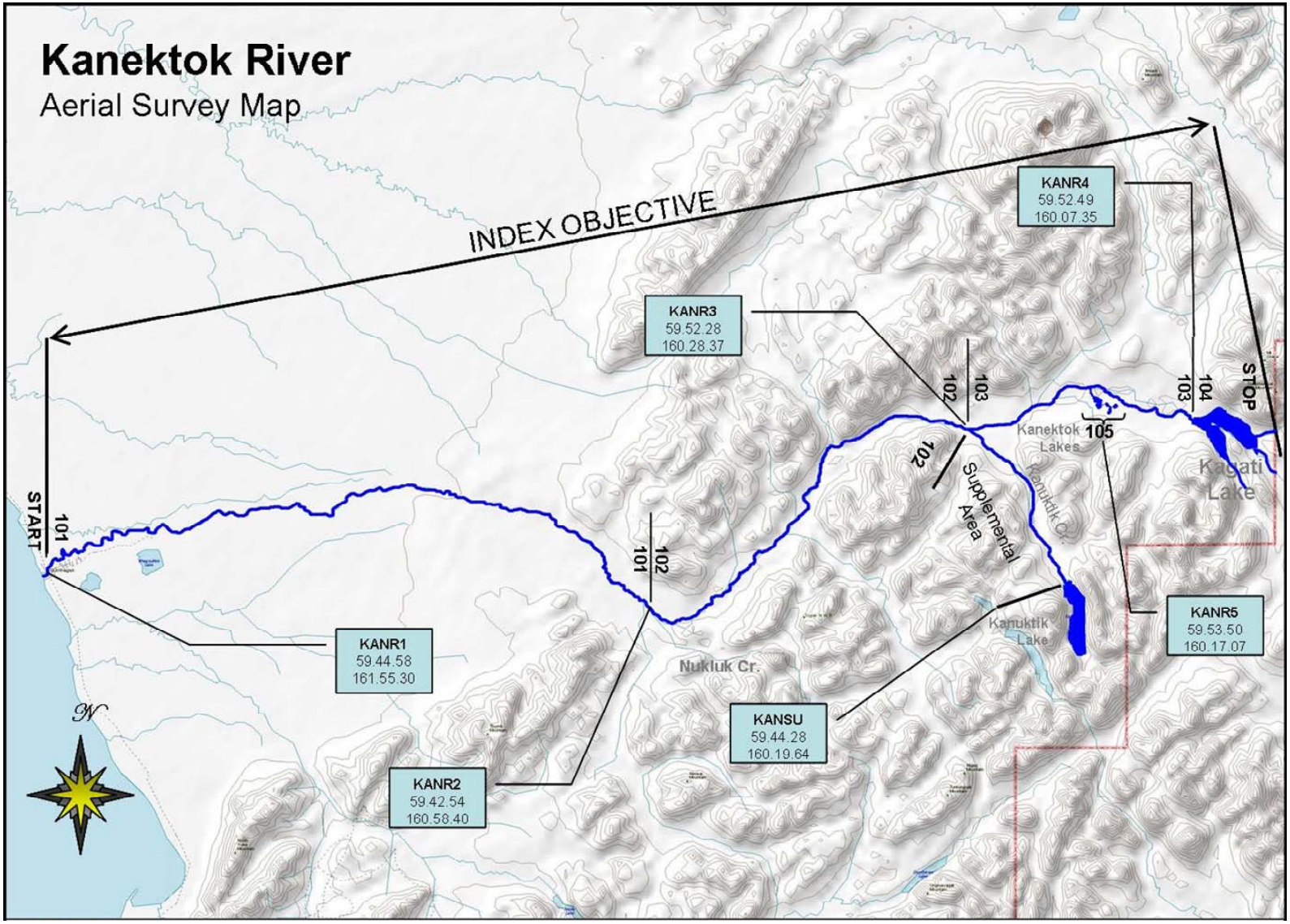

Figure 7.–Aerial survey map of the Kanektok River, Kuskokwim Management Area.

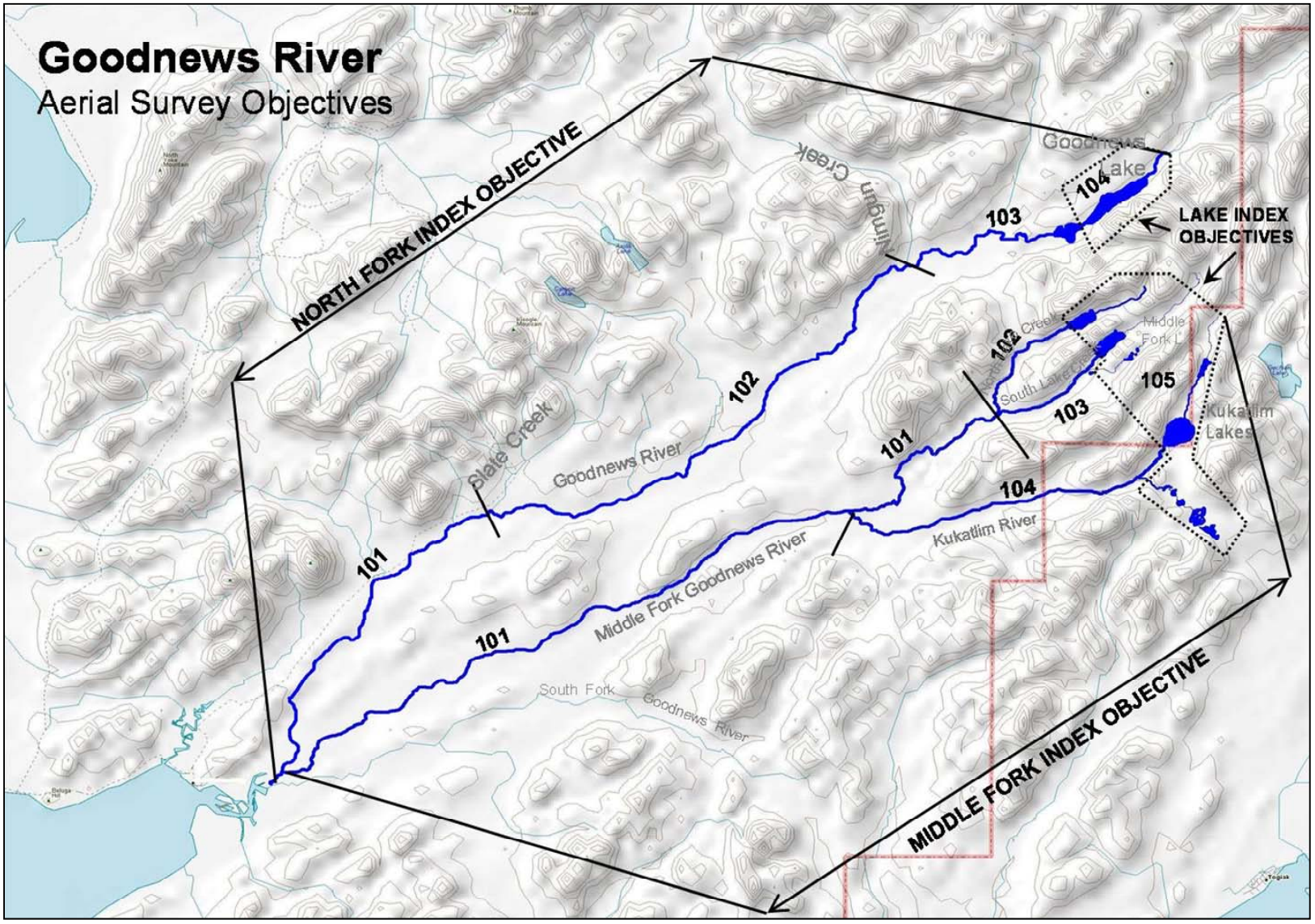

Figure 8.–Aerial survey map of the Goodnews River drainage, Kuskokwim Management Area.

Figure 9.–Groundbased escapement projects, Kuskokwim Management Area.

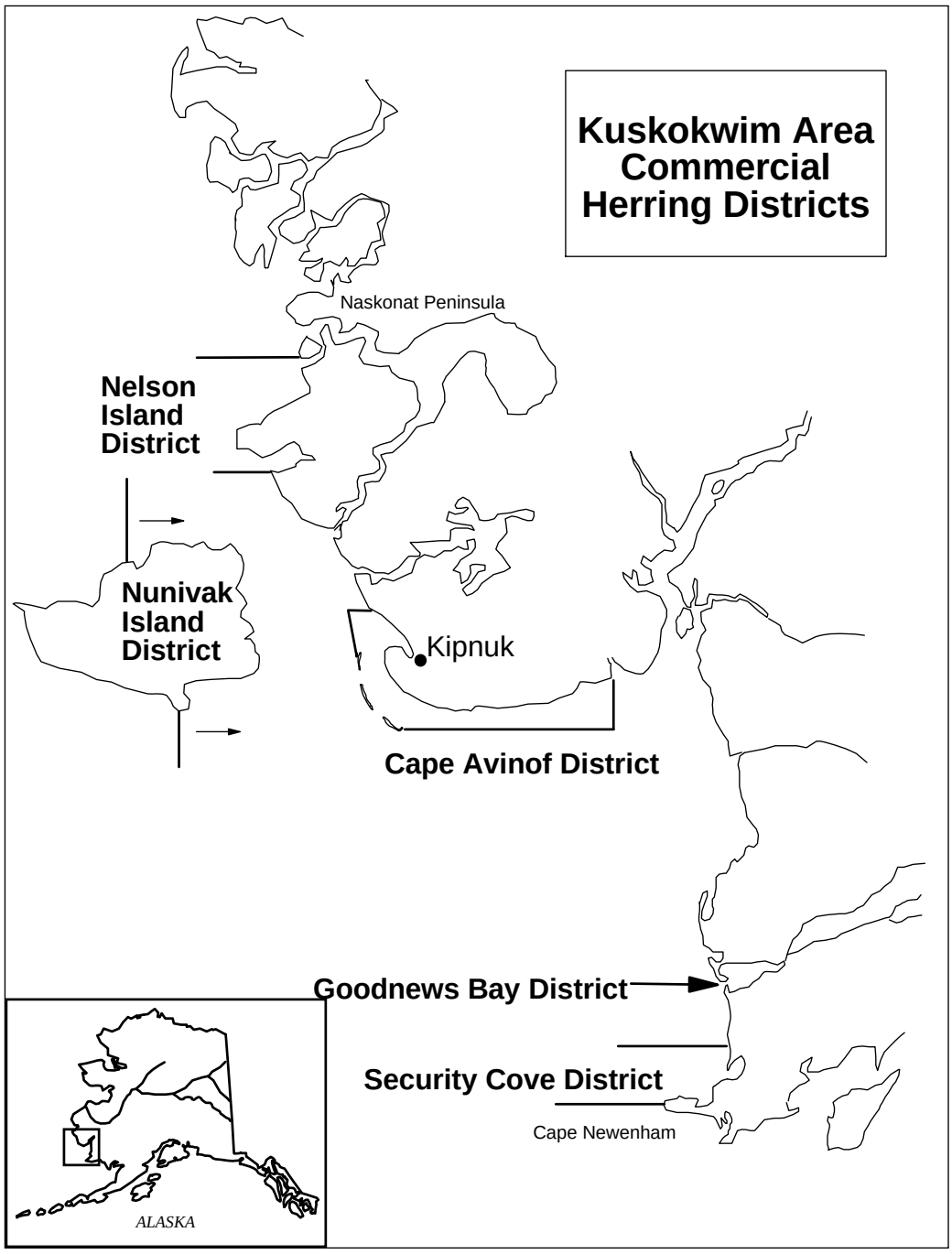

Figure 10.–Commercial herring districts, Kuskokwim Management Area.

APPENDIX A

Appendix A1.–Fish species commonly found, Kuskokwim Management Area.

Species Code	Genus and Species[a]	Common Name[a]
110	*Gadus macrocephalus*	Pacific Cod
113	*Eleginus gracilis*	Saffron Cod
129	*Platichthys stellatus*	Starry Flounder
122	*Pleuronectes glacialis*	Arctic Flounder
127	*Pleuronectes aspera*	Yellowfin Sole
128	*Pleuronectes vetulus*	English Sole
162	*Cottus cognatus*	Slimy Sculpin
166	*Oligocottus maculosus*	Tidepool Sculpin
192	*Hexagrammos stelleri*	Whitespotted Greenling
200	*Hippoglossus stenolepis*	Pacific Halibut
230	*Clupea pallasi*	Pacific Herring
410	*Oncorhynchus tshawytscha*	Chinook Salmon
420	*Oncorhynchus nerka*	Sockeye Salmon
430	*Oncorhynchus kisutch*	Coho Salmon
440	*Oncorhynchus gorbuscha*	Pink Salmon
450	*Oncorhynchus keta*	Chum Salmon
500	*Esox lucius*	Northern Pike
513	*Osmerus mordax*	Rainbow Smelt
514	*Hypomesus olidus*	Pond Smelt
516	*Mallotus villosus*	Capelin
520	*Salvelinus alpinus*	Arctic Char
532	*Salvelinus malma*	Dolly Varden
541	*Oncorhynchus mykiss*	Rainbow Trout
550	*Salvelinus namaycush*	Lake Trout
570	*Stenodus leucichthys*	Inconnu
588	*Coregonus nasus*	Broad Whitefish
589	*Coregonus pidschian*	Humpback Whitefish
583	*Coregonus sardinella*	Least Cisco
584	*Coregonus autumnalis*	Arctic Cisco
586	*Prosopium cylindraceum*	Round Whitefish
590	*Lota lota*	Burbot
600	*Lampetra tridentata*	Pacific Lamprey
601	*Lampetra japonica*	Arctic Lamprey
610	*Thymallus arcticus*	Arctic Grayling
630	*Dallia pectoralis*	Alaska Blackfish
640	*Catostomus catostomus*	Longnose Sucker
660	*Gasterosteus aculeatus*	Threespine Stickleback
661	*Pungitius pungitius*	Ninespine Stickleback
670	*Percopsis omiscomaycus*	Trout Perch
NA	*Megalocottus platycephalus*	Belligerent Sculpin
NA	*Myoxocephalus quadricornis*	Fourhorn Sculpin

[a] Based on American Fisheries Society Special Publication No. 20, Common and Scientific Names of Fishes from the United States and Canada (Fifth Edition). Committee and Names of Fishes, Bethesda, Maryland, 1991.

Appendix A2.–Historical events, Kuskokwim Management Area, 1913–2008.

Year	Event
1913	Commercial sale of salmon export first documented in the Kuskokwim Area.
1954	Commercial Chinook salmon quota established.
1959	First Chinook landing since quota established.
1960	Kanektok Counting Tower (1960–1962)
	Quinhagak District (W-4) commercial salmon fishery established.
	Kuskokwim Area divided into 4 subdistricts; Lower Kuskokwim River (Subdistrict 1), Middle Kuskokwim River (Subdistrict 2), Upper Kuskokwim River (Subdistrict 3), Quinhagak (Subdistrict 4). District boundaries are not well recorded; in the Aniak area some commonly used drift sites overlap between District 2 and 3 which confused catch reporting.
	Kuskokwim River Drainage Surveys, 1960.
1961	ADF&G Kuskokwim River tagging study.
1962	ADF&G Kuskokwim River tagging study.
	Boundary between Subdistricts 2 and 3 changed; the new location was not recorded but the most likely location was Kolmakof River. The reason for the change was to move the boundary to a point which was between commonly used gillnet locations and thereby avoid confusion in catch reporting. As a result, there were no landings in Subdistrict 3.
1963	ADF&G Kuskokwim River tagging study.
	Boundaries of subdistrict documented; Subdistrict 1 extended from Kuskokuak to Mishevik Slough, Subdistrict 2 was from Mishevik Slough to Kolmakof River, Subdistrict 3 was upstream of Kolmakof River.
1965	Kwegooyuk test fishery (1965–1984; no records available for 1965).
1966	ADF&G Kuskokwim River tagging study.
	Subdistrict 3 was deleted from the regulations due to a lack of landings.
1968	Goodnews Bay District (W-5) commercial salmon fishery established.
1969	District 4 tagging study (1969-1970) on Chinook and chum salmon.
	Kogrukluk River (aka. Holitna River, Ignatti) tower/weir (1969–present).
1970	Effect of explosive detonation in ice on northern pike.
1971	Commercial fishing time in the Kuskokwim River reduced from two 24-hour periods per week to
	two 12-hour periods per week.
	Chum fishery begins in the Kuskokwim River; season was from 25 June to 31 July, location limited to waters downstream of Napakiak, mesh size restricted to 6 in. or smaller.
	Fishing periods established by Emergency Order in August.
	Gillnet mesh size in Districts 4 and 5 restricted to 6 inch or smaller.
1974	Commercial sale of salmon roe from subsistence caught fish (1974–1977).

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Year	Event
1976	Commercial fishing time in the Kuskokwim River was reduced from two 12 hour periods per week to two 6 hour periods per week.
	Eek River reconnaissance survey.
	Study on genetic variants in chum and Chinook salmon.
1977	Fishing periods to be established by Emergency Order before 26 June and after 31 July.
	Limited entry permits issued.
	Subsistence fishing closed 24 hours before during and 6 hours after each commercial fishing period.
	Hoholitna River reconnaissance survey
1978	Kasigluk River reconnaissance survey.
	Kwethluk River sonar project.
1979	The portion of District 1 used during the chum salmon season was extended from Napakiak upstream to Bethel.
	Kasigluk River sonar project.
	High seas salmon fleet moved for west of 160° W. longitude to west of 180° W. longitude.
1980	Subsistence fishing closed 24 hours before, during and 6 hours after each commercial fishing period.
	Aniak River sonar project.
1981	Pilot test fish and FanScan projects at Bethel.
	Inventory of Kisaralik River and Lake.
	Goodnews River counting tower (1981-1990).
	Salmon River (Pitka Fork drainage) weir project (1981-1984).
	Species identification program results in better differentiation of sockeye and chum salmon.
1982	Kanektok River sonar project (1982-1986).
1983	Pilot test fish project at Bethel using drift gillnets.
	Provisional escapement goals established for many of the major spawning tributaries in the area.
	Management strategy shifts from guideline harvest based to obtaining escapement objective.
1984	Kwegooyuk test fishery replaced by the Bethel drift test fishery.
1985	Commercial fishing restricted to mesh sizes less than or equal to 6 inches.
	Chum season utilizes entire length of District 1.
1986	*Migratory timing of coho salmon in the Kuskokwim Area, 1979-1984.*
	Kuskokwim River salmon abundance estimate based on calibrated test fish CPUE.
	Downstream boundary of District 1 extended to a line from Apokak Slough to Popokamiut.
1987	Discontinued the directed commercial Chinook salmon fishery in the Kuskokwim River.
	Sale of Chinook salmon limited to 14,000 in the Kuskokwim River June commercial fishery.

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Year	Event
	First fishing period restricted to that portion of District 1, which is downstream of Bethel, due to Chinook conservation concerns.
	Subsistence fishing in all of District 2 and its tributary streams is closed before, during and after commercial periods.
	South peninsula sockeye and chum salmon tagging study.
1988	Review of the estimation of Kuskokwim River annual salmon passage through expansion of the Bethel test fish CPUE.
	Kuskokwim River sonar project (1988-1995).
	Kuskokwim River subsistence test fisheries (1988-1990).
	District 1 upstream boundary extended to Bogus Creek.
	District 2 reduced in size; downstream boundary moved upstream to High Bluffs, the upstream boundary moved downstream to Chuathbaluk.
	Portion of Kuskokwim River between Districts 1 and 2 closed to subsistence fishing when District 1 subsistence fishing is closed.
	Reorganization of District 1 Statistical Areas.
	District 4 Salmon Management Plan adopted.
	Establishment of the Kuskokwim River Salmon Management Working Group (1988-present).
	Eek Test Fishery (1988-1990, 1992-1995).
1989	USFWS conducted genetic sampling throughout the Kuskokwim Area.
	USFWS conducted Chinook tagging study in the lower Kuskokwim River.
	Record low temperatures recorded in interior Alaska coupled with shallow snow pack threaten survival of salmon eggs/fry from 1988 spawning.
1990	ADF&G genetic sampling (1990–1996).
	Reorganization of District 1 statistical areas.
	Upstream boundary of District 1 moved downstream from Bogus Creek to Big (Nelson) Island.
	Downstream boundary of District 2 moved upstream to second slough below Kalskag.
	District 4 northern boundary is extended north to Weelung Creek.
1991	USFWS operates Tuluksak River weir (1991-1994).
	Weir replaces counting tower on Goodnews River (1991-present).
1992	Aniak and Chuathbaluk test fisheries (1992-1995).
	Eek test fishery is re-established for the coho season.
	USFWS operates Kwethluk River weir (1992).
	Ban on high-seas drift gillnet fishing imposed.
	Unusual proportion of returning 5-year old chum salmon had reduced growth between the second third annuli.

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Year	Event
	Failure of age 4 chum salmon in the Kuskokwim River; Aniak drainage especially hard hit; attributed to cold winter of 1988-89.
1993	Failure of age 4 and 5 chum salmon in the Kuskokwim River, Yukon River, and the Norton Sound/Kotzebue Area; cause unknown; especially hard hit were the Aniak drainage and the Yukon fall chum; commercial fishing severely restricted, chum sport fishery was closed, and the subsistence salmon fishery was restricted and closed for a period of time (first time ever).
1994	Working Group commissioned and Dr. Mundy started "Recommendations for Strengthening the Cooperative Management Process of the Kuskokwim River Salmon Management Working Group".
	Upstream boundary of District 1 moved upstream to Bogus Creek.
1995	BSFA operates a chum salmon radio telemetry project on the Kuskokwim River.
	Takotna Community School and ADF&G operate a salmon counting tower on the Takotna River (1995-1998).
	AVCP and BSFA operate the Lower Kuskokwim test fishery in cooperation with ADF&G; the project is a modification of the Eek test fishery.
1996	ADF&G genetic sampling for late spawning chum salmon and one mixed stock sample from District 1.
	Near record low water levels during June and early August coupled with record high water temperatures.
	Irregular fishing schedule in District 1 during June and July due to limited market interest for chum salmon.
	Record early coho run coupled with record high harvest and escapement at Kogrukluk River.
	AVCP and ADF&G operate a salmon counting tower on the Kwethluk River (1996–1999).
	KNA and ADF&G operate a salmon weir on the George River (1996-present).
	Aniak River sonar is relocated to allow for full channel ensonification and configurable sonar technology is employed (1996-present).
	Native Village of Kwinhagak (NVK) begins development of a salmon counting tower on the Kanektok River.
	Kuskokwim River declared an economic disaster area due to very low chum and coho salmon returns, harvests and exvessel prices. Northern boundary of District 4 moved 3 miles south from July 14 to July 28. Record low chum salmon escapement at Kogrukluk River weir.
	Second summer of record low water levels in the Kuskokwim River basin during the summer and fall coupled with record high water temperatures.
	Anomalous Bering Sea conditions: warm water, odd plankton blooms, sea bird die offs, etc.
	Aniak chum salmon return vastly exceeded expectations based on 1992-1993 spawning abundance estimates.
	Due to an extremely low return of chum salmon, ADF&G, AVCP, KNA, KRSMWG, ONC, TCC and McGrath Native Village Council issue a joint appeal for subsistence users to conserve chum salmon. Record low subsistence harvest of chum salmon in the Kuskokwim Area.
	Aniak processor does not operate due to depressed salmon market (1997-present).

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Year	Event
	Sale of salmon roe is prohibited in Districts 1 and 2 (effective beginning December 1997).
	Middle Fork Goodnews River weir converted from fixed-panel to a resistance board "floating weir" and operated through majority of coho run for first time (1997-present).
	NVK and ADF&G operate a salmon counting tower on the Kanektok River (1997-1998).
1998	Kuskokwim River declared an economic disaster area for second straight year due to low chum and coho salmon returns, harvests and exvessel prices.
	KNA and ADF&G operate a salmon weir on the Tatlawiksuk River (1998-present).
	Second year of anomalous Bering Sea conditions: warm water, odd plankton blooms, sea bird die offs, etc.
	High water levels severely restrict operational period of many Kuskokwim Area escapement projects.
	Record low average water temperature measured at the Bethel test fish site.
1999	Kuskokwim River experiences extremely low Chinook, chum and coho salmon returns, harvests and exvessel prices for third consecutive year. All species have very late run timing. Kuskokwim Bay coho returns and harvests extremely low.
	Federal government assumes control of subsistence fishery management in federal waters on October 1.
	KNA-operated salmon weirs on the Tatlawiksuk and George Rivers converted to resistance board (floating) weirs and operations extended through coho run.
	Kuskokwim River sonar project begins redevelopment using split-beam sonar and is relocated to a new site one mile above upstream end of Church Slough.
2000	Kuskokwim River declared an economic disaster area due to extremely low chum salmon return, harvest and exvessel price. Chinook salmon returns are very low for second consecutive year. Many subsistence fishermen report that they were unable to meet their Chinook and chum salmon harvest goals.
	Due to an extremely low return of Chinook salmon, ADF&G, AVCP, KNA, KRSMWG, Kwethluk IRA, TCC, McGrath Native Village Council and USFWS issue a joint appeal for subsistence users to conserve Chinook salmon.
	ADF&G and Federal Office of Subsistence Management (FOSM) restrict subsistence Chinook salmon fishery.
	Takotna Community Schools and ADF&G operate a resistance board weir on the Takotna River (2000-present).
	Kwethluk IRA and USFWS operate a resistance board weir on the Kwethluk River (2000-present).
	District W-1 divided into Subdistricts W-1A (above Bethel) and W-1B (below Bethel) and fishermen are required to register to fish in only one subdistrict. Due to limited processing capacity, only one subdistrict is opened at a time to reduce harvest.
	Commercial fishermen required to identify vessels with either ADF&G or CFEC permit number.

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Year	Event
	ADF&G Sport Fish Division creates Lower Yukon-Kuskokwim Management Area and stations Area Management Biologist in Bethel.
	Line attached to a pole (rod and reel) added to legal gear for subsistence fishing in AVCP area (prior to 2000 fishing season).
	Use of rod and reel for subsistence extended throughout the Kuskokwim Area (2000–2001 BOF meeting).
2001	Alaska Board of Fisheries designates Kuskokwim River Chinook and chum salmon to be stocks of yield concern based on the Sustainable Fisheries Policy because of poor runs since 1997.
	Subsistence fishing schedule implemented in the Kuskokwim River during June and July to conserve Chinook and chum salmon and provide for adequate fishing opportunity throughout the drainage.
	Kuskokwim River declared an economic disaster area due to low chum salmon return, harvest and exvessel price. No commercial fishing periods in Kuskokwim River in June and July. Chinook salmon returns are below average in size.
	Due to an extremely low return of Chinook salmon, ADF&G, AVCP, KNA, KRSMWG, Kwethluk IRA, McGrath Native Village Council, ONC, and USFWS issue a joint appeal for subsistence users to conserve Chinook and chum salmon.
	Native Community of Tuluksak and USFWS operate a resistance board weir on the Tuluksak River.
	NVK and ADF&G operate a salmon counting weir on the Kanektok River.
	ADF&G/CF and KNA operate fish wheels at Kalskag and Birch Tree Crossing to tag salmon and then make salmon population estimates.
2002	The State of Alaska declared the Kuskokwim region a disaster area for the fifth year in six because of low salmon prices in the bay and river and a complete lack of buyers during the chum season on the river.
	ADF&G did not join USFWS and Native groups in issuing a pre-season appeal for subsistence users to conserve Chinook and chum salmon because such a request is allocative in nature and only the BOF makes allocation decisions.
	In June the Federal Subsistence Board adopted a special regulatory action that tied the time allowed for sport fishing to the time allowed for subsistence net and fish wheel fishing in federal waters in the Kuskokwim River drainage. Upon a request for reconsideration by ADF&G, the Federal Subsistence Board rescinded its decision. The reason for the rescission was that under ANILCA, sport fishing on federal waters is managed by ADF&G unless there are overriding conservation or subsistence concerns. In this instance there were no overriding conservation or subsistence concerns.
	A subsistence fishing schedule was implemented in the Kuskokwim River during June to conserve Chinook and chum salmon and to provide adequate subsistence fishing opportunity throughout the drainage. However, because an average Chinook run and an above average chum run developed, the subsistence schedule was lifted on June 28.
	The Kuskokwim River Fisheries Co-op dissolved. ACR #28 was accepted by BOF so that the formation of a Chignik-style salmon fishing cooperative on the Kuskokwim River could be considered.

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Year	Event
	ADF&G/SF and KNA operated salmon radio telemetry projects on the Kuskokwim main stem and on the Holitna River to estimate salmon abundance.
	Second consecutive season of no chum salmon (June or July) directed commercial fishery.
2003	A subsistence fishing schedule was implemented in the Kuskokwim River during June to conserve Chinook and chum salmon and to provide adequate subsistence fishing opportunity throughout the drainage. However, because an average Chinook and chum salmon run developed, the subsistence schedule was lifted on July 3.
	Third consecutive season of no chum salmon (June or July) directed commercial fishery.
	ADF&G/SF and KNA operated salmon radio telemetry projects on the Kuskokwim main stem and on the Holitna River to estimate salmon abundance.
	Record high coho salmon escapements throughout the Kuskokwim Area.
2004	The Alaska Board of Fisheries continued the stock of yield concern designation for Kuskokwim River Chinook and chum salmon based on the Sustainable Fisheries Policy. Chinook and chum salmon returns have been improving since 2000; however, a majority of annual returns in the previous five years did not have adequate harvestable surpluses beyond escapement and subsistence needs.
	The Alaska Board of Fisheries provided a commercial guideline harvest level of 0-50,000 sockeye salmon for the Kuskokwim River.
	The Alaska Board of Fisheries readopted regulations: 1) to increase subsistence fishing opportunity prior to and after commercial salmon fishing periods, 2) to provide opportunity for subsistence salmon fishing to occur in a portion of the District 1 subdistrict not open to commercial fishing, and 3) modified Kuskokwok Slough subsistence fishing regulations to be consistent with District 1 waters.
	The northern boundary of District W-4 (Quinhagak) was relocated approximately one mile north from Oyak Creek to the northernmost edge of the mouth of Weelung Creek.
	The western boundary of District W-5 (Goodnews Bay) was relocated seaward from a line between the northern and southern most points of the North and South spits at the entrance to Goodnews Bay to a line extending from approximately two miles South on the seaward entrance of Goodnews Bay to approximately two miles North on the seaward entrance to Goodnews Bay.
	Regulations for Districts 4 and 5 were amended to provide emergency order authority to increase gillnet length to 100 fathoms provided run strength was adequate
	The Goodnews Bay District herring superexclusive use regulations were repealed.
	Evaluation of AYK Region escapement goals and methodology resulted in revisions of the majority of existing Kuskokwim Area escapement goals to Sustainable Escapement Goal ranges using the Bue-Hasbrouck method (ADF&G 2004, Bue and Hasbrouck 2001).
	A subsistence fishing schedule was implemented in the Kuskokwim River during June to conserve Chinook and chum salmon and to provide adequate subsistence fishing opportunity throughout the drainage. However, because an above average Chinook salmon run and an average to above average chum salmon run developed, the subsistence schedule was lifted on June 18.
	A limited chum and sockeye directed commercial fishery was prosecuted in late June and early July for the first time since 2000. Participation and processor capacity was limited compared to previous years.

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Year	Event
	Water levels in rivers throughout the Kuskokiwm Area were well below average from mid-July through September. Kuskokwim River water level attained a 50-year low during August as measured at the USGS gauging station at Crooked Creek.
2005	Chum escapements were at record highs at nearly all monitoring projects with the exception of George River where escapement was near average.
	Chinook escapements ranged from above average to record highs at nearly all monitored locations with the exception of George River where the escapement was near average.
	Commercial salmon fishing opportunity in District 1 reduced in July because of poor chum salmon market conditions.
	Commercial salmon fishing opportunity in the Kuskokwim Bay districts was reduced during July because of limited processing capacity, and in August because of below average coho salmon abundance.
2006	Commercial salmon fishing opportunity in District 1 reduced in July because of poor chum salmon market conditions.
	Chum salmon escapements were at record highs at the Kwethluk, George, and Takotna river monitoring projects.
	During four commercial periods in early July limits were imposed on the number of fish that could be delivered by District 4 and 5 fishermen because of limited capacity to process an above average catch.
2007	The Alaska Board of Fisheries (BOF) discontinued the stock of concern designation for Kuskokwim River Chinook and chum salmon based on at or above the historical average runs each year since 2002.
	The BOF passed a proposal giving ADF&G authority to allow up to 8-inch mesh gillnets in District 1 by emergency order; otherwise, all commercial openings will continue to be limited to gillnet mesh sizes of 6 inches or less. The BOF's intent in allowing for up to 8-inch mesh gear was not to establish a large mesh gear Chinook salmon commercial fishery, but to provide a management tool that may or may not be used. Additionally, the commercial Chinook salmon fishery closure was discontinued, and the commercial salmon fishery is to be managed based on run strength and harvestable surpluses of Chinook, sockeye, and chum salmon.
	The BOF passed a proposal giving ADF&G authority to allow the lower portion of Subdistrict 1-B to open to commercial fishing up to two (2) hours earlier than the remainder of Subdistrict 1-B.
	A lack of processing capacity, commercial interest, and continued poor chum salmon market conditions resulted in no commercial openings in June and July.
	From late June through mid-July, limits on the number of fish that could be delivered by District 4 and 5 fishermen were imposed because of limited processing capacity.
2008	Commercial salmon fishing opportunity in District 1 reduced in July because of poor chum salmon market conditions.
	From late June through mid-July, limits on the number of fish that could be delivered by District 4 and 5 fishermen were imposed because of limited processing capacity.

Appendix A3.–Distance to selected locations from the mouth of the Kuskokwim River.

Location [a]	Distance from River Mouth [b]		Distance from Bethel	
	Kilometer	Miles	Kilometer	Miles
Popokamiut (Downstream boundary District 1)	(3)	(2)	(109)	(68)
Kuskokwim River Mouth [b]	0	0	(106)	(66)
Apokak Slough (Downstream boundary District 1)	5	0	(106)	(66)
Eek River	13	8	(93)	(58)
Eek (community)	46	29	(60)	(37)
Kwegooyuk	22	13	(85)	(53)
Kinak River	32	20	(74)	(46)
Tuntutuliak (community)	45	28	(61)	(38)
Kialik River	50	31	(56)	(35)
Fowler Island	68	42	(39)	(24)
Johnson River	77	48	(29)	(18)
Napakiak (community)	87	54	(19)	(12)
Napaskiak (community)	97	60	(10)	(6)
Oscarville (community)	97	60	(10)	(6)
Bethel (community)	106	66	0	0
Gweek River	135	84	29	18
Kwethluk River	131	82	25	16
Kwethluk (community)	132	82	26	16
Kwethluk River Weir	216	134	109	68
Akiachak (community)	143	89	37	23
Kasigluk River	150	93	43	27
Kisaralik River	151	94	45	28
Akiak (community)	161	100	55	34
Mishevik Slough,	183	114	77	48
Tuluksak River	192	119	85	53
Tuluksak (community)	192	120	86	54
Tuluksak River Weir	248	154	142	88
Nelson Island	190	118	84	52
Bogus Creek (Upstream Boundary District 1)	203	126	97	60
High Bluffs	233	145	127	79
Downstream Boundary District 2	262	163	156	97
Mud Creek Slough	267	166	161	100
Lower Kalskag	259	161	153	95
Kalskag (community)	263	163	157	97
Lower Kalskag Fish wheel (2004)	249	155	143	89
Kalskag Fish wheel (2002, 2003, and 2005)	270	168	163	102
Birchtree Fish wheel (2001 to 2004)	294	183	187	117
Aniak River	307	191	201	125
Aniak (community)	307	191	201	125
Aniak Sonar Site	323	201	217	135
Chuathbaluk (community)	323	201	217	135
Upstream Boundary District 2	322	200	216	134
Kolmakof River	344	214	238	148
Napaimiut (community)	359	223	253	157

-continued-

Location [a]	Distance from River Mouth [b]		Distance from Bethel	
	Kilometer	Miles	Kilometer	Miles
Holokuk River	362	225	256	159
Sue Creek	381	237	275	171
Oskawalik River	398	247	291	181
Crooked Creek (community)	417	259	311	193
Georgetown (community)	446	277	340	211
George River	446	277	340	211
George River Weir	453	281	347	215
Red Devil (community)	472	293	365	227
Sleetmute (community)	488	303	381	237
Holitna River	491	305	385	239
Hoholitna River	538	334	432	268
Chukowan River	709	441	603	375
Kogrukluk River	709	441	603	375
Kogrukluk River Weir	710	441	604	375
Stony River (community)	534	332	428	266
Stony River	536	333	430	267
Lime Village (community)	644	400	538	334
Telaquana River	727	452	621	386
Telaquana Lake (outlet)	756	470	650	404
Swift River	560	348	454	282
Tatlawiksuk River	563	350	457	284
Tatlawiksuk River Weir	568	353	462	287
Devil's Elbow	599	372	492	306
Vinasale (abandoned community)	665	413	558	347
Takotna River	752	467	645	401
Takotna (community)	832	517	726	451
Takotna River Weir	835	519	729	453
McGrath (community)	753	468	647	402
Middle Fork	806	501	700	435
Big River	827	514	721	448
Pitka Fork	845	525	739	459
Medfra (community)	863	536	756	470
South Fork	869	540	763	474
East Fork	882	548	776	482
North Fork	884	549	777	483
Nikolai (community)	941	585	835	519
Swift Fork	1,078	670	972	604
Telida (community)	1,128	701	1,022	635
Highpower Creek	1,151	715	1,044	649
Fish Creek	1,234	767	1,128	701
Headwaters South Fork	1,292	803	1,186	737
Headwaters North Fork	1,548	962	1,442	896

Note: Distances are determined using a computer version (Garmin Topo MapSource) of U.S. Geological Survey 1:100,000 scale maps. Routing is as if traveling by boat. Parentheses around numbers indicate downstream distances from Bethel.

[a] Locations not on the mainstem of the Kuskokwim River are listed as subordinate to the point of departure from the mainstem.

[b] The "mouth" of the Kuskokwim River is defined as the southernmost tip of Eek Island (latitude N 60° 05.569, longitude W 162° 19.054), and is one of three points that define the downstream boundary of District 1.

Appendix A4.–Subsistence Chinook salmon harvest estimates by community, Kuskokwim Management Area, 1989–2008.

Community	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008 [a]
Kipnuk	54	108	80	-	348	150	-	-	-	119	29	170	1	1	-	49	-	-	-	-
Kwigillingok	-	-	-	9	80	7	-	15	-	100	-	-	-	-	-	345	-	-	-	-
Kongiganak	1,412	1,442	778	904	781	1,271	843	830	1,609	1,250	1,320	1,299	1,454	808	1,386	1,478	1,508	1,429	-	2,065
N KUSKOKWIM BAY	1,466	1,550	858	913	1,209	1,428	843	845	1,609	1,469	1,349	1,469	1,455	809	1,386	1,872	1,508	1,429	-	2,065
Tuntutuliak	3,781	4,044	4,143	3,524	3,633	4,679	4,023	4,027	3,730	4,008	3,645	2,939	2,993	3,632	3,095	3,402	4,508	3,341	3,295	4,420
Eek	1,580	4,920	2,360	2,232	2,619	2,917	3,535	2,568	2,253	2,131	1,816	2,112	1,728	2,432	2,364	2,636	2,899	272	110	2,826
Kasigluk	2,173	3,167	2,955	94	548	694	392	579	880	541	480	731	588	381	356	1,526	-	157	-	3,442
Nunapitchuk	3,170	3,199	4,106	3,575	3,810	4,746	4,400	3,234	4,086	4,934	4,521	3,354	3,250	3,883	3,763	4,104	3,480	3,357	4,664	4,361
Atmautluak	1,227	2,569	1,784	1,422	1,818	1,819	1,918	1,801	1,768	1,452	1,469	1,174	740	1,282	1,396	1,701	1,720	-	1,364	1,953
Napakiak	3,710	4,158	2,543	3,328	3,972	3,545	3,902	3,784	2,873	3,504	2,380	2,178	2,290	1,931	2,105	2,060	2,695	4,109	2,318	2,313
Napaskiak	4,699	4,972	3,864	4,133	5,671	6,356	4,984	4,453	4,887	5,452	3,827	4,309	4,662	3,856	5,012	3,220	4,262	3,983	4,965	5,064
Oscarville	1,591	898	1,422	122	1,475	1,385	1,438	996	512	981	2,289	-	1,753	953	1,073	998	987	825	1,048	1,423
Bethel	24,655	19,641	28,817	17,196	22,083	24,515	29,568	20,783	21,253	23,963	24,996	22,515	27,209	19,305	21,475	27,504	22,293	23,095	29,548	35,144
Kwethluk	7,562	9,218	7,511	6,504	9,181	9,262	8,931	9,183	6,872	7,940	6,081	4,925	6,127	6,429	4,938	6,119	5,402	5,581	4,924	8,264
Akiachak	5,504	7,168	5,657	4,163	7,231	8,081	6,571	5,209	7,414	6,507	5,373	6,124	6,445	6,860	5,346	6,647	4,611	4,389	7,021	9,475
Akiak	4,811	5,178	3,247	3,207	4,280	4,759	4,118	4,569	3,378	3,311	2,356	2,190	3,369	3,340	3,896	3,653	3,420	3,407	3,463	3,519
Tuluksak	3,791	1,878	3,351	2,382	3,755	4,534	4,333	3,143	5,627	3,701	2,348	2,432	2,451	2,364	3,678	3,117	2,498	830	-	3,539
LOWER KUSKO RIVER	68,256	71,008	71,761	51,881	70,076	77,293	78,111	64,331	65,533	68,425	61,581	54,983	63,605	56,648	58,497	66,687	58,775	53,346	62,720	85,743
Lower Kalskag	3,337	2,493	3,947	2,269	3,930	3,976	5,321	2,870	3,549	2,041	1,787	1,822	2,181	1,210	2,016	1,918	1,387	2,227	1,043	2,442
Upper Kalskag	1,256	1,558	1,105	1,366	1,679	1,340	1,396	1,351	1,107	1,244	1,688	1,237	1,014	1,420	1,128	2,442	2,225	1,154	407	2,216
Aniak	3,406	3,189	3,261	3,955	4,618	3,413	3,422	3,204	3,794	3,508	2,596	3,117	2,524	2,994	2,077	2,606	1,987	2,011	2,737	3,348
Chuathbaluk	403	1,674	791	933	1,447	1,043	2,615	880	1,290	810	1,110	303	627	663	399	1,041	863	618	147	750
MIDDLE KUSKO RIVER	8,401	8,914	9,105	8,525	11,675	9,772	12,754	8,304	9,740	7,602	7,181	6,479	6,346	6,287	5,620	8,007	6,462	6,010	4,334	8,756
Crooked Creek	451	929	947	472	771	968	934	864	944	772	681	575	508	790	831	1,003	826	383	12	582
Red Devil	189	273	168	328	487	379	425	337	452	262	161	94	175	248	72	165	191	197	284	152
Sleetmute	420	711	770	801	1,767	1,327	885	1,230	1,171	947	447	430	473	516	685	618	393	582	903	644
Stony River	692	498	586	233	445	359	559	597	863	445	55	21	139	293	111	621	-	250	-	667
Lime Village	105	240	60	0	41	216	144	48	59	241	155	45	262	-	65	66	-	-	-	60
McGrath	418	1,231	880	1,038	567	1,052	800	1,203	974	769	1,295	642	360	700	506	500	54	501	392	561
Takotna	62	62	0	0	0	0	-	0	0	2	0	0	5	9	-	16	-	0	0	0

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Community	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008 [a]
Nikolai	716	560	421	605	475	449	979	305	232	330	288	155	282	507	15	510	3	479	0	251
Telida	1	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	0	-	-
UPPER KUSKO RIVER	3,053	4,504	3,833	3,476	4,553	4,750	4,726	4,583	4,695	3,768	3,082	1,962	2,204	3,063	2,285	3,499	1,467	2,392	1,591	2,917
KUSKO RIVER TOTAL	81,176	85,976	85,556	64,794	87,513	93,243	96,435	78,062	81,577	81,264	73,194	64,893	73,610	66,807	67,788	80,065	68,212	63,177	68,645	99,481
Quinhagak	3,542	6,013	3,693	3,447	3,368	3,995	2,746	3,075	3,433	4,041	3,167	3,106	2,923	2,475	3,898	3,726	3,083	3,521	3,412	4,383
Goodnews Bay	419	351	894	318	628	712	858	403	437	713	805	601	859	703	649	851	794	630	24	1,135
Platinum	48	188	23	56	80	72	25	12	12	5	66	102	36	154	88	103	74	46	-	42
S KUSKOKWIM BAY	4,010	6,552	4,610	3,821	4,076	4,779	3,629	3,490	3,882	4,758	4,038	3,809	3,818	3,332	4,635	4,680	3,951	4,197	3,436	5,560
Mekoryuk	0	0	0	0	0	6	-	0	-	1	15	2	-	12	10	3	2	0	0	-
Newtok	5	1	0	-	0	2	-	-	-	-	-	19	12	13	0	0	0	-	-	-
Nightmute	0	3	20	-	-	8	-	-	-	-	6	8	-	-	4	0	-	-	-	-
Toksook Bay	127	143	25	49	128	341	94	45	47	48	407	58	130	54	51	327	8	667	16	-
Tununak	5	0	15	-	5	0	-	-	-	40	0	52	0	1	5	5	-	-	-	-
Chefornak	-	-	0	21	-	-	-	-	-	2	-	-	-	-	5	6	-	-	-	-
BERING SEA COAST	137	147	60	70	133	357	94	45	47	91	428	139	142	80	75	341	10	667	16	-
TOTAL ESTIMATE	85,323	92,675	90,226	68,685	91,722	98,378	100,157	81,597	85,506	86,113	77,660	68,841	77,570	70,219	72,498	85,086	72,173	68,041	72,097	105,041

Note: Dashes indicate no data.

Source for 1989 to 2007: Alaska Department of Fish and Game, Division of Subsistence, Alaska Subsistence Fisheries Database, Version 3.5.

[a] Numbers reported here are preliminary estimates generated by the Division of Commercial Fisheries. Methodology to estimate harvest has changed slightly since 2007 with the incorporation of stratified sampling. A revision of historical estimates published by Division of Subsistence from 1990 to 2007 using the current methodology is pending review. Comparison of 2008 and 2009 estimates with years prior should be made cautiously.

Appendix A5.–Subsistence chum salmon harvest Estimates by community, Kuskokwim Management Area, 1989–2008.

Community	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008 [a]
Kipnuk	0	540	205	-	601	214	-	-	-	114	31	269	2	5	-	156	-	-	-	-
Kwigillingok	-	-	-	0	200	5	-	30	-	250	-	-	-	-	-	160	-	-	-	-
Kongiganak	1,967	980	1,036	1,524	811	1,340	1,275	1,331	902	1,643	1,152	1,850	1,998	1,965	970	1,587	1,519	1,990	-	1,576
N KUSKOKWIM BAY	1,967	1,520	1,241	1,524	1,612	1,559	1,275	1,361	902	2,007	1,183	2,119	2,000	1,970	970	1,903	1,519	1,990	-	1,576
Tuntutuliak	5,068	6,250	4,755	6,052	2,899	5,232	3,488	5,852	2,877	3,774	1,862	2,735	2,621	3,845	2,514	2,262	3,525	3,410	2,421	4,655
Eek	972	3,090	814	1,397	244	624	815	923	649	787	508	636	347	1,259	621	587	764	169	130	725
Kasigluk	3,007	3,406	3,137	26	374	537	457	1,196	1,278	218	350	930	550	306	297	906	-	103	-	2,033
Nunapitchuk	6,923	5,240	6,055	8,229	4,854	4,587	4,297	5,833	2,794	5,389	4,742	4,694	4,749	6,917	4,139	4,200	3,640	4,266	6,588	5,057
Atmautluak	3,014	4,006	2,394	3,183	1,345	1,455	3,466	2,672	1,484	1,916	1,667	1,819	1,350	2,189	1,539	1,793	1,635	-	1,802	2,538
Napakiak	7,068	8,389	2,340	4,401	2,281	4,096	3,084	4,249	1,458	4,556	1,573	2,987	1,723	2,391	1,384	1,746	2,726	6,781	2,537	1,796
Napaskiak	13,079	8,166	6,582	6,061	3,622	5,605	4,271	4,983	2,589	4,227	2,687	2,848	2,399	3,720	2,893	2,569	1,931	2,989	2,489	2,913
Oscarville	1,341	925	1,141	29	566	676	1,018	1,552	35	420	1,906	-	2,097	1,121	704	855	633	873	725	880
Bethel	25,581	18,436	22,770	14,908	9,172	12,341	15,821	16,403	8,790	12,057	11,163	10,616	11,319	15,082	9,829	12,162	11,794	18,794	15,836	18,627
Kwethluk	10,128	11,102	5,497	7,647	3,491	6,102	6,050	11,870	3,554	4,786	3,449	5,048	4,365	7,434	2,348	3,597	3,897	5,337	4,517	5,835
Akiachak	7,747	9,133	5,994	5,771	3,492	6,286	4,074	4,993	1,768	2,467	2,741	4,589	2,872	5,048	3,943	3,635	2,126	3,179	4,407	4,027
Akiak	13,000	8,235	6,668	5,907	7,549	4,599	1,878	4,640	1,725	2,231	1,202	2,456	2,093	2,527	2,715	3,211	3,193	2,417	3,435	2,958
Tuluksak	9,796	5,845	5,695	4,798	3,834	2,476	2,609	3,167	2,887	3,224	1,566	2,504	1,862	3,042	1,555	2,017	2,108	1,058	-	4,661
LOWER KUSKO RIVER	106,725	92,225	73,843	68,409	43,722	54,614	51,327	68,333	31,887	46,051	35,417	41,862	38,347	54,881	34,481	39,540	37,972	49,376	44,887	56,705
Lower Kalskag	4,932	4,212	2,886	2,758	3,062	2,758	1,455	3,357	1,487	977	759	1,641	1,316	1,187	1,569	1,225	954	2,821	1,461	2,030
Upper Kalskag	3,427	1,321	2,357	2,843	578	864	1,351	1,621	405	487	665	1,558	1,187	2,333	485	1,559	1,039	1,988	95	1,734
Aniak	10,404	9,089	3,492	7,870	2,900	2,612	3,566	8,447	1,747	5,023	1,764	1,943	1,982	3,002	1,160	2,331	2,539	3,611	3,391	2,739
Chuathbaluk	2,051	4,510	1,912	2,502	2,895	1,615	1,807	2,089	1,244	1,027	729	704	2,338	1,553	2,249	1,815	497	959	123	579
MIDDLE KUSKO RIVER	20,813	19,131	10,648	15,974	9,435	7,847	8,179	15,514	4,883	7,514	3,916	5,846	6,823	8,075	5,463	6,930	5,029	9,379	5,070	7,082
Crooked Creek	779	2,884	1,367	904	715	649	358	347	311	2,561	806	812	943	1,266	889	1,662	882	926	0	956
Red Devil	1,376	1,466	1,236	1,523	1,004	1,220	882	787	551	565	193	53	335	325	49	103	232	35	160	171
Sleetmute	1,813	1,874	1,862	3,151	681	1,533	1,758	1,215	417	981	367	390	328	1,105	408	863	295	1,106	860	346
Stony River	1,352	1,132	602	1,335	775	932	1,375	443	591	897	358	99	143	560	275	670	-	395	-	1,403
Lime Village	2,100	2,500	715	0	508	2,080	920	500	251	964	1,012	294	683	-	140	189	-	-	-	487
McGrath	1,276	2,839	1,068	2,854	590	1,294	1,486	206	131	1,462	260	161	199	665	610	254	101	745	315	1,233

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Appendix A5.–Page 2 of 2.

Community	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008 [a]
Takotna	250	56	0	0	0	0	-	10	0	15	0	0	8	1	-	0	-	0	0	0
Nikolai	1,221	882	495	818	353	293	301	249	65	519	89	60	65	171	35	260	8	255	16	59
Telida	15	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	0	-	-
UPPER KUSKO RIVER	10,181	13,633	7,345	10,584	4,625	8,001	7,080	3,758	2,316	7,964	3,085	1,869	2,704	4,093	2,406	4,001	1,518	3,462	1,351	4,655
KUSKO RIVER TOTAL	139,687	126,509	93,077	96,491	59,394	72,022	67,861	88,966	39,987	63,537	43,601	51,696	49,874	69,019	43,320	52,374	46,038	64,207	51,308	70,018
Quinhagak	1,568	3,234	1,593	1,833	1,008	1,452	686	930	600	1,448	1,810	912	747	1,839	1,129	1,112	915	1,865	1,725	1,805
Goodnews Bay	620	193	144	921	188	425	152	214	133	285	250	280	182	312	126	221	187	544	7	853
Platinum	164	139	5	85	0	45	3	5	0	31	31	84	44	95	50	36	22	104	-	106
S KUSKOKWIM BAY	2,352	3,566	1,743	2,838	1,196	1,923	841	1,149	733	1,763	2,092	1,276	973	2,246	1,305	1,369	1,124	2,513	1,732	2,764
Mekoryuk	2,915	1,067	1,178	0	808	2,337	-	0	-	2,176	1,583	2,120	-	1,292	1,484	881	460	0	134	-
Newtok	20	4	0	-	0	0	-	-	-	-	-	16	36	20	9	0	9	-	-	-
Nightmute	30	35	60	-	-	7	-	-	-	-	10	2	-	-	15	0	-	-	-	-
Toksook Bay	86	224	103	246	296	660	239	124	273	171	326	217	234	657	133	938	27	2,092	125	-
Tununak	16	65	150	-	30	0	-	-	-	0	0	44	0	0	10	0	-	-	-	-
Chefornak	-	-	3	1	-	-	-	-	-	17	-	-	-	-	15	13	-	-	-	-
BERING SEA COAST	3,067	1,395	1,494	247	1,134	3,004	239	124	273	2,364	1,919	2,399	270	1,969	1,666	1,832	496	2,092	259	-
TOTAL ESTIMATE	145,106	131,470	96,314	99,576	61,724	76,949	68,941	90,239	40,993	67,664	47,612	55,371	51,117	73,234	46,291	55,575	47,658	68,812	53,299	72,782

Note: Dashes indicate no data.

Source for 1989 to 2007: Alaska Department of Fish and Game, Division of Subsistence, Alaska Subsistence Fisheries Database, Version 3.5.

[a] Numbers reported here are preliminary estimates generated by the Division of Commercial Fisheries. Methodology to estimate harvest has changed slightly since 2007 with the incorporation of stratified sampling. A revision of historical estimates published by Division of Subsistence from 1990 to 2007 using the current methodology is pending review. Comparison of 2008 and 2009 estimates with years prior should be made cautiously.

Appendix A6.–Subsistence sockeye salmon harvest estimates by community, Kuskokwim Management Area, 1989–2008.

Community	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008 [a]
Kipnuk	402	175	136	-	90	132	-	-	-	107	54	179	4	11	-	89	-	-	-	-
Kwigillingok	-	-	-	0	140	5	-	10	-	125	-	-	-	-	-	70	-	-	-	-
Kongiganak	658	423	533	905	705	702	530	722	1,128	888	991	1,789	1,460	774	637	876	987	1,191	-	1,333
N KUSKOKWIM BAY	1,060	598	669	905	935	839	530	732	1,128	1,120	1,045	1,968	1,464	785	637	1,035	987	1,191	-	1,333
Tuntutuliak	1,173	1,954	1,768	1,894	955	3,185	1,134	1,526	2,048	1,275	2,048	1,236	1,701	972	1,555	1,446	2,102	1,447	1,374	2,226
Eek	170	1,177	489	671	406	461	283	478	584	382	625	878	923	748	714	472	893	119	16	693
Kasigluk	235	810	1,421	81	122	275	165	588	499	53	183	666	320	59	210	336	-	53	-	1,513
Nunapitchuk	1,026	1,097	2,277	2,273	2,545	1,555	882	1,735	2,330	2,250	3,493	2,111	2,583	1,382	2,521	1,381	1,589	1,548	2,124	2,410
Atmautluak	1,143	1,501	881	1,304	1,387	796	1,099	1,456	724	1,050	1,874	1,516	958	1,015	868	874	1,194	-	828	1,470
Napakiak	1,752	1,375	1,176	1,315	1,150	1,627	959	1,083	1,455	1,705	2,115	2,026	1,861	1,201	1,223	1,068	1,803	1,202	1,152	1,683
Napaskiak	721	1,227	2,673	2,428	3,495	1,933	1,605	2,446	2,329	1,617	2,058	2,611	3,428	1,292	2,420	883	1,286	1,170	1,346	2,736
Oscarville	404	153	711	35	932	324	414	212	78	288	2,165	-	1,620	377	700	354	257	545	537	713
Bethel	7,316	6,392	17,669	7,173	10,503	8,563	8,190	7,112	10,868	8,134	13,145	12,536	15,709	7,350	10,542	10,598	12,883	11,775	13,556	17,984
Kwethluk	2,414	4,055	3,723	1,829	3,790	3,742	2,504	4,035	3,581	4,036	3,112	3,685	3,960	1,993	1,776	2,741	2,177	2,134	2,630	4,989
Akiachak	2,420	3,176	4,123	3,095	4,545	3,323	2,019	2,607	3,014	2,654	3,130	3,597	4,300	2,436	3,016	2,894	2,134	1,999	2,896	4,700
Akiak	2,492	1,739	1,708	1,458	3,558	1,786	643	1,449	1,398	1,478	1,145	970	1,916	1,195	1,698	1,162	1,681	1,658	3,107	2,621
Tuluksak	2,314	1,120	3,595	2,034	2,492	1,393	1,244	1,075	1,558	1,490	1,490	2,207	1,759	1,011	1,333	1,397	935	941	-	2,568
LOWER KUSKO RIVER	23,579	25,775	42,212	25,589	35,878	28,964	21,141	25,803	30,468	26,413	36,584	34,039	41,038	21,031	28,576	25,606	28,934	24,591	29,566	46,306
Lower Kalskag	767	851	1,092	467	2,339	950	681	1,144	1,455	574	605	885	824	247	714	673	409	926	531	1,736
Upper Kalskag	338	287	276	333	349	298	55	294	251	245	614	636	304	485	483	603	825	420	128	952
Aniak	959	1,356	2,031	1,180	1,578	571	975	1,277	1,124	1,151	1,310	1,143	2,223	723	670	867	975	721	953	1,873
Chuathbaluk	215	1,178	1,246	471	823	995	472	661	881	248	460	515	537	337	287	385	353	349	41	362
MIDDLE KUSKO RIVER	2,279	3,672	4,644	2,451	5,090	2,813	2,183	3,376	3,710	2,218	2,989	3,179	3,888	1,792	2,154	2,528	2,562	2,416	1,653	4,923
Crooked Creek	436	1,556	998	489	831	512	192	304	350	716	690	505	476	413	747	760	596	315	0	764

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Community	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008 [a]
Red Devil	356	445	426	315	717	311	620	977	697	346	568	107	361	92	289	97	283	432	299	379
Sleetmute	776	1,060	1,164	855	1,609	1,158	1,083	1,304	1,458	1,398	946	759	940	603	668	604	512	828	1,350	1,071
Stony River	1,084	835	1,912	1,462	1,488	802	1,342	1,218	1,607	433	1,230	266	138	460	139	804	-	325	-	1,679
Lime Village	5,653	2,333	956	0	2,800	1,760	700	500	660	2,782	2,550	918	1,516	-	1,000	831	-	-	-	1,191
McGrath	0	0	0	0	0	0	0	0	0	0	74	42	244	323	242	168	0	113	365	1,253
Takotna	0	0	0	0	0	0	-	0	0	0	0	0	0	0	-	0	-	0	0	0
Nikolai	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	17	0	14
Telida	0	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	0	-	-
UPPER KUSKO RIVER	8,306	6,229	5,457	3,121	7,445	4,543	3,937	4,303	4,772	5,675	6,059	2,597	3,675	1,891	3,085	3,264	1,395	2,030	2,014	6,351
KUSKO RIVER TOTAL	35,224	36,274	52,982	32,065	49,347	37,159	27,792	34,214	40,078	35,426	46,677	41,783	50,065	25,499	34,452	32,433	33,878	30,228	33,233	58,913
Quinhagak	633	1,950	1,772	1,264	1,082	1,000	573	400	556	1,490	1,639	1,341	914	855	1,622	1,086	1,633	2,177	1,303	2,875
Goodnews Bay	710	970	1,132	669	784	669	219	411	472	483	770	1,028	921	794	672	805	1,143	947	36	3,665
Platinum	151	153	150	158	51	101	34	7	137	25	102	177	53	256	111	155	90	60	-	157
S KUSKOKWIM BAY	1,493	3,074	3,054	2,090	1,917	1,770	826	818	1,165	1,998	2,511	2,546	1,888	1,905	2,405	2,046	2,866	3,184	1,339	6,697
Mekoryuk	0	50	1	0	1	87	-	0	-	21	2	7	-	204	2	8	0	0	0	-
Newtok	10	3	0	-	0	20	-	-	-	-	-	124	0	85	0	0	2	-	-	-
Nightmute	0	10	210	-	-	15	-	-	-	-	5	71	-	-	20	10	-	-	-	-
Toksook Bay	277	242	105	1	66	228	5	5	8	101	193	253	12	32	0	359	5	1,438	5	-
Tununak	83	7	50	-	30	0	-	-	-	20	0	48	0	8	5	10	-	-	-	-
Chefornak	-	-	0	1	-	-	-	-	-	13	-	-	-	-	10	26	-	-	-	-
BERING SEA COAST	370	312	366	2	97	350	5	5	8	155	200	503	12	329	37	413	7	1,438	5	-
TOTAL ESTIMATE	37,088	39,659	56,401	34,158	51,362	39,280	28,622	35,037	41,251	37,579	49,388	44,832	51,965	27,733	36,894	34,892	36,751	34,850	34,577	65,610

Note: Dashes indicate no data.

Source for 1989 to 2007: Alaska Department of Fish and Game, Division of Subsistence, Alaska Subsistence Fisheries Database, Version 3.5.

[a] Numbers reported here are preliminary estimates generated by the Division of Commercial Fisheries. Methodology to estimate harvest has changed slightly since 2007 with the incorporation of stratified sampling. A revision of historical estimates published by Division of Subsistence from 1990 to 2007 using the current methodology is pending review. Comparison of 2008 and 2009 estimates with years prior should be made cautiously.

Appendix A7.–Subsistence coho salmon harvest estimates by community, Kuskokwim Management Area, 1989–2008.

Community	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008 [a]
Kipnuk	200	460	30	-	25	185	-	-	-	85	75	223	74	69	-	250	-	-	-	-
Kwigillingok	-	-	-	0	80	0	-	5	-	40	-	-	-	-	-	55	-	-	-	-
Kongiganak	562	413	540	544	502	566	605	421	618	275	222	339	925	596	768	551	781	530	-	545
N KUSKOKWIM BAY	762	873	570	544	607	751	605	426	618	400	297	562	999	665	768	856	781	530	-	545
Tuntutuliak	508	1,135	729	761	820	441	365	1,339	669	935	331	3,435	337	1,153	2,329	1,205	1,132	778	443	3,238
Eek	349	1,620	343	531	206	426	347	389	80	306	258	488	207	904	1,493	764	346	11	0	1,307
Kasigluk	772	958	1,769	174	228	387	518	368	518	140	92	1,667	344	142	134	690	-	107	-	1,154
Nunapitchuk	469	573	1,167	2,226	321	781	641	1,310	872	427	391	366	392	790	676	416	716	567	1,765	648
Atmautluak	971	350	254	518	426	411	566	537	531	425	205	224	369	591	407	561	471	-	361	421
Napakiak	1,757	1,700	597	1,237	590	920	390	600	168	749	487	502	644	578	1,098	1,259	628	1,258	906	1,446
Napaskiak	1,130	922	754	866	783	2,012	580	398	658	540	355	889	466	716	1,522	613	598	1,171	521	728
Oscarville	430	43	136	0	0	49	0	19	60	2	970	-	42	119	27	306	86	232	134	65
Bethel	22,390	19,341	28,136	15,902	13,764	12,258	19,906	12,929	15,108	11,294	12,414	13,794	14,949	12,966	13,237	15,068	11,143	17,004	12,787	16,969
Kwethluk	3,736	3,928	2,380	2,325	1,838	1,816	1,304	3,195	1,193	1,731	2,993	3,271	1,688	2,515	1,933	2,907	2,584	980	1,186	7,144
Akiachak	1,890	1,621	2,393	2,108	1,351	1,531	677	850	441	477	663	2,509	1,633	1,620	2,611	2,130	1,572	1,215	2,167	4,098
Akiak	4,959	1,591	2,231	1,137	1,315	1,110	501	972	846	674	254	483	564	1,113	1,135	1,236	1,673	348	1,089	1,384
Tuluksak	1,483	946	1,903	1,544	412	285	531	1,116	434	879	307	523	971	1,181	1,523	870	465	180	-	867
LOWER KUSKO RIVER	40,843	34,725	42,792	29,328	22,054	22,428	26,325	24,022	21,580	18,579	19,721	28,151	22,606	24,388	28,125	28,025	21,414	23,851	21,359	39,469
Lower Kalskag	981	375	510	469	778	845	718	1,022	652	347	302	428	539	241	375	295	293	759	337	95
Upper Kalskag	688	300	493	931	354	184	167	360	781	812	153	288	416	1,032	605	1,288	508	1,534	107	1,915
Aniak	2,640	1,484	1,143	1,844	1,091	1,682	1,265	2,671	1,494	1,308	1,418	1,922	1,906	2,616	1,552	1,655	1,886	1,101	2,435	2,911
Chuathbaluk	272	813	93	349	366	795	84	395	217	55	137	469	541	607	313	249	311	504	47	530
MIDDLE KUSKO RIVER	4,581	2,971	2,238	3,593	2,588	3,506	2,234	4,448	3,145	2,522	2,010	3,107	3,402	4,496	2,845	3,487	2,998	3,898	2,926	5,451
Crooked Creek	530	886	277	413	409	581	381	171	261	392	515	132	70	420	430	670	148	318	0	1,825
Red Devil	1,591	866	1,132	1,160	1,812	994	1,557	1,274	1,391	425	455	158	427	413	209	54	345	290	181	335
Sleetmute	1,009	1,023	1,557	1,132	880	649	1,075	846	419	301	226	552	452	689	678	325	463	441	365	210
Stony River	611	423	502	744	512	505	1,083	571	450	429	511	10	347	517	879	612	-	470	-	521
Lime Village	2,025	538	336	300	618	960	246	0	277	776	600	362	590	-	164	220	-	-	-	615

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Community	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008 [a]
McGrath	537	2,408	882	2,780	1,989	2,558	2,225	919	753	924	553	700	420	1,067	1,099	1,079	309	668	275	176
Takotna	40	0	0	0	0	0	-	0	0	3	0	21	26	20	-	51	-	0	0	0
Nikolai	328	73	83	173	267	119	545	64	141	113	117	31	165	105	43	156	31	240	0	81
Telida	60	-	-	0	-	-	-	-	-	0	-	-	-	-	-	200	-	0	-	-
UPPER KUSKO RIVER	6,731	6,216	4,768	6,702	6,487	6,366	7,112	3,846	3,692	3,363	2,976	1,966	2,497	3,231	3,502	3,367	1,296	2,427	821	3,763
KUSKO RIVER TOTAL	52,917	44,786	50,369	40,167	31,737	33,050	36,276	32,742	29,035	24,864	25,004	33,786	29,504	32,780	35,240	35,735	26,489	30,706	25,106	49,228
Quinhagak	3,787	4,174	3,232	2,958	2,152	2,739	2,561	1,467	1,264	1,702	2,021	1,088	1,525	1,099	2,047	1,209	1,443	1,019	1,143	2,465
Goodnews Bay	830	1,556	1,789	1,163	1,197	435	296	293	343	312	439	414	508	202	1,110	1,411	615	592	20	1,785
Platinum	77	90	39	190	29	77	9	59	54	19	143	103	108	95	209	206	224	112	-	115
S KUSKOKWIM BAY	4,694	5,820	5,060	4,310	3,378	3,251	2,867	1,819	1,661	2,034	2,603	1,605	2,141	1,396	3,366	2,826	2,282	1,723	1,163	4,365
Mekoryuk	106	52	130	2	53	87	-	3	-	178	64	78	-	114	112	126	58	14	0	-
Newtok	15	4	0	-	0	0	-	-	-	-	-	64	0	0	0	0	0	-	-	-
Nightmute	70	0	20	-	-	0	-	-	-	-	0	2	-	-	0	0	-	-	-	-
Toksook Bay	35	46	1	15	57	116	22	135	21	97	83	112	16	74	58	661	11	365	0	-
Tununak	9	0	0	-	70	0	-	-	-	60	0	23	25	49	0	40	-	-	-	-
Chefornak	-	-	39	0	-	-	-	-	-	7	-	-	-	-	15	18	-	-	-	-
BERING SEA COAST	235	102	190	17	180	203	22	138	21	342	147	279	41	237	185	845	69	379	0	-
TOTAL ESTIMATE	57,846	50,708	55,620	44,494	35,295	36,504	39,165	34,699	30,717	27,240	27,753	35,670	31,686	34,413	38,791	39,406	28,840	32,808	26,269	53,593

Appendix A8.–Commercial and subsistence salmon harvest, Kuskokwim Management Area, 1913–2008.

	Commercial Harvest						Subsistence Harvest							Total
Year	Chinook	Sockeye	Chum	Pink	Coho	Subtotal	Chinook	Sockeye	Chum	Other[a]	Pink	Coho[b]	Subtotal	Harvest
1913	7,800	-	-	-	-	7,800	-	-	-	-	-	-	-	7,800
1914	-	2,667	-	-	-	2,667	-	-	-	-	-	-	-	2,667
1915	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1916	949	-	-	-	-	949	-	-	-	-	-	-	-	949
1917	7,878	-	-	-	-	7,878	-	-	-	-	-	-	-	7,878
1918	3,055	-	-	-	-	3,055	-	-	-	-	-	-	-	3,055
1919	4,836	-	-	-	-	4,836	-	-	-	-	-	-	-	4,836
1920	34,853	-	-	-	-	34,853	-	-	-	-	-	-	-	34,853
1921	9,854	-	-	-	-	9,854	-	-	-	-	-	-	-	9,854
1922	8,944	6,120	-	-	-	15,064	-	-	-	-	-	-	180,000	195,064
1923	7,254	-	-	-	-	7,254	-	-	-	-	-	-		7,254
1924	19,253	900	-	7,167	7,167	34,487	17,700	-	-	203,148	-	-	220,848	255,335
1925	1,644	5,800	-	-	-	7,444	10,800	-	-	230,850	-	-	241,650	249,094
1926	-	-	-	-	-	-		-	-	-	-	-	738,576	738,576
1927	-	-	-	-	-	-		-	-	-	-	-	286,254	286,254
1928	-	-	-	-	-	-		-	-	-	-	-	481,090	481,090
1929	-	-	-	-	-	-		-	-	-	-	-	560,196	560,196
1930	7,626	2,448	-	-	-	10,074		-	-	-	-	-	538,650	548,724
1931	8,541	-	-	-	-	8,541		-	-	-	-	-	389,367	397,908
1932	9,339	-	-	-	-	9,339		-	-	-	-	-	746,415	755,754
1933	-	-	-	-	-	-	6,290	-	-	443,998	-	-	450,288	450,288
1934	-	-	-	-	-	-	20,800	-	-	597,132	-	-	617,932	617,932
1935	6,448	-	-	-	8,296	14,744	22,930	-	-	554,040	-	-	576,970	591,714
1936	624	-	-	-	-	624	33,500	-	-	549,423	-	-	582,923	583,547
1937	480	-	-	-	-	480		-	-	537,111	-	-	537,111	537,591
1938	624	-	-	-	828	1,452	10,153	-	-	400,242	-	-	410,395	411,847
1939	134	-	-	-	-	134	14,000	-	-	125,425	-	-	139,425	139,559
1940	247	-	-	-	500	747	8,000	-	-	415,523	-	-	423,523	424,270
1941	187	-	-	-	674	861	8,000	-	-	415,523	-	-	423,523	424,384
1942	-	-	-	-	-	-	6,400	-	-	325,339	-	-	331,739	331,739
1943	-	-	-	-	-	-	6,400	-	-	325,339	-	-	331,739	331,739
1944	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1945	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1946	2,288	-	-	-	674	2,962	-	-	-	-	-	-	-	2,962
1947	5,356	-	-	-	-	5,356	-	-	-	-	-	-	-	5,356

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	Commercial Harvest						Subsistence Harvest							Total
Year	Chinook	Sockeye	Chum	Pink	Coho	Subtotal	Chinook	Sockeye	Chum	Other[c]	Pink	Coho[b]	Subtotal	Harvest
1948	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1949	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1950	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1951	4,210	-	-	-	-	4,210	-	-	-	-	-	-	-	4,210
1952	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1954	57	-	-	-	-	57	-	-	-	-	-	-	-	57
1955	-	-	-	-	-	-	-	-	-	-	-	-		-
1956	-	-	-	-	-	-	-	-	-	-	-	-		-
1957	-	-	-	-	-	-	-	-	-	-	-	-		-
1958	-	-	-	-	-	-	-	-	-	-	-	-		-
1959	3,760	-	-	-	-	3,760	-	-	-	-	-	-		3,760
1960	5,969	5,649	0	0	5,498	17,116	18,887	-	-	301,753	-	-	320,640	337,756
1961	23,246	2,308	18,864	90	5,090	49,598	28,934	-	-	179,529	-	-	208,463	258,061
1962	20,867	10,313	45,707	4,340	12,432	93,659	13,582	-	-	175,304	-	161,849	350,735	444,394
1963	18,571	0	0	0	15,660	34,231	34,482	-	-	170,829	-	137,649	342,960	377,191
1964	21,230	13,422	707	939	28,992	65,290	29,017	-	-	219,208	-	190,191	438,416	503,706
1965	24,965	1,886	4,242	0	12,191	43,284	24,697	-	-	250,878	-	-	275,575	318,859
1966	25,823	1,030	2,610	268	22,985	52,716	49,325	-	-	175,735	-	-	225,060	277,776
1967	29,986	652	8,235	0	58,239	97,112	61,262	-	-	214,468	-	-	275,730	372,842
1968	43,157	5,884	19,684	75,818	154,275	298,818	35,698	-	-	278,008	-	-	313,706	612,524
1969	64,777	10,362	50,377	1,251	110,473	237,240	40,617	-	-	204,105	-	-	244,722	481,962
1970	64,722	12,654	60,566	27,422	62,245	227,609	69,612	-	-	246,810	-	11,868	328,290	555,899
1971	44,936	6,054	99,423	13	10,006	160,432	43,013	-	-	116,391	-	6,899	166,303	326,735
1972	55,598	4,312	97,197	1,952	23,880	182,939	38,176	-	-	120,316	-	1,325	159,817	342,756
1973	51,374	5,224	184,207	634	152,408	393,847	38,451	-	-	179,259	-	23,746	241,456	635,303
1974	30,670	29,003	196,127	60,099	179,579	495,478	26,665	-	-	277,170	-	32,780	336,615	832,093
1975	28,219	17,686	225,308	910	112,751	384,874	47,569	-	-	176,389	-	-	223,958	608,832
1976	49,262	14,636	231,877	39,998	112,130	447,903	58,055	-	-	223,792	-	4,312	286,159	734,062
1977	58,256	18,621	298,959	434	263,727	639,997	58,158	-	-	203,397	-	12,193	273,748	913,745
1978	63,194	13,734	282,044	61,968	247,271	668,211	38,145	-	-	125,052	-	12,437	175,634	843,845
1979	53,314	39,463	297,167	574	308,683	699,201	57,053	-	-	163,451	-		220,504	919,705
1980	48,599	42,213	561,483	30,306	327,908	1,010,509	62,047	-	-	168,987	-	47,335	278,369	1,288,878
1981	79,377	105,940	485,653	463	278,541	949,974	64,274	-	-	163,554	-	28,301	256,129	1,206,103
1982	79,816	97,716	326,481	18,259	567,452	1,089,724	61,141	-	-	195,691	-	45,181	302,013	1,391,737

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	Commercial Harvest						Subsistence Harvest							Total
Year	Chinook	Sockeye	Chum	Pink	Coho	Subtotal	Chinook	Sockeye	Chum	Other[c]	Pink	Coho[b]	Subtotal	Harvest
1983	93,676	90,834	306,554	379	248,389	739,832	51,020	-	-	149,172	-	2,834	203,026	942,858
1984	74,016	81,304	488,480	23,902	826,774	1,494,476	60,668	-	-	144,651	-	15,016	220,335	1,714,811
1985	74,083	121,221	224,680	111	382,096	802,191	45,720	33,632	95,999	-	1,062	24,524	200,937	1,003,128
1986[c]	44,972	142,029	349,268	16,569	736,910	1,289,748	54,256	20,239	142,930	[c] -	-	29,742	247,167	1,536,915
1987[c]	65,558	170,849	603,274	163	478,594	1,318,438	71,804	25,180	70,709	-	291	18,085	186,069	1,504,507
1988[cd]	74,563	149,949	1,443,953	37,592	623,733	2,329,790	75,107	33,102	153,980	-	-	43,866	306,055	2,635,845
1989[c]	66,914	82,365	801,355	819	554,411	1,505,864	85,322	37,088	145,091	-	-	57,846	325,347	1,831,211
1990[c]	84,451	203,919	521,023	16,050	443,783	1,269,226	92,675	39,659	131,470	-	-	50,708	314,512	1,583,738
1991[c]	48,170	202,441	502,187	522	556,818	1,310,138	90,226	56,401	96,314	-	-	55,620	298,561	1,608,699
1992[c]	67,597	192,341	436,506	85,978	772,449	1,554,871	68,685	34,158	99,576	-	-	44,494	246,913	1,801,784
1993[c]	26,636	167,235	94,937	71	686,570	975,449	91,722	51,362	61,724	-	-	35,295	240,103	1,215,552
1994[c]	27,345	191,169	360,893	84,870	856,100	1,520,377	98,378	39,280	76,949	-	-	36,504	251,111	1,771,488
1995[c]	72,352	198,045	707,212	318	555,539	1,533,466	100,157	28,622	68,941	-	-	39,165	236,885	1,770,351
1996[c]	22,959	122,260	301,975	1,663	1,099,865	1,548,722	81,597	35,037	90,239	-	-	34,699	241,572	1,790,294
1997[c]	47,990	123,002	67,200	7	166,648	404,847	85,506	41,251	40,993	-	-	30,717	198,467	603,314
1998[c]	44,402	130,074	268,199	2,720	312,517	757,912	86,113	37,579	67,664	-	-	27,240	218,596	976,508
1999[c]	25,019	81,201	72,659	2	32,251	211,132	77,660	49,388	47,612	-	-	27,753	202,413	413,545
2000[c]	26,115	109,939	49,574	17	307,439	493,084	68,841	44,832	55,371	-	-	35,670	204,714	697,798
2001[c]	14,384	59,545	21,893	0	220,804	316,626	77,570	51,965	51,117	-	-	31,686	212,338	528,964
2002[c]	12,531	24,190	34,951	0	113,199	184,871	70,219	27,733	73,234	-	-	34,413	205,599	390,470
2003[c]	16,014	63,646	36,225	0	346,555	462,440	72,498	36,894	46,291	-	-	38,791	194,474	656,914
2004[c]	30,235	63,492	51,965	0	542,206	687,898	85,086	34,892	55,575	-	-	39,406	214,959	902,857
2005[c]	31,014	120,379	85,236	19	205,762	442,410	72,174	47,656	28,838	-	1,343	29,963	179,974	622,384
2006[c]	24,853	148,783	94,789	1	224,865	493,291	68,041	34,849	68,812	-	2,710	32,809	207,221	700,512
2007[c]	22,864	153,762	79,510	0	189,448	445,584	72,097	34,577	53,299	-	-	26,269	186,242	631,826
2008[c,e]	23,958	112,580	97,889	15	259,666	494,108	105,461	66,228	76,234	-	-	56,577	304,500	798,608
2009[c,e]	22,093	170,370	184,933	2	161,067	538,465	82,391	37,547	44,748	-	-	31,690	196,376	734,841
10 -Yr. Avg.[f]	24,743	95,501	79,500	276 [g]	249,505	449,525	75,030	40,037	54,781	-	-	32,400	202,653	652,178

Note: Dashes indicate no data.

[a] Includes sockeye, pink and chum salmon.

[b] Reported subsistence coho salmon harvest only. Coho salmon subsistence harvest is poorly documented with no Kuskokwim River estimates attempted prior to 1988.

[c] Reported commercial harvests includes personal use catch and Bethel Test Fishery sales and donations.

[d] Beginning in 1988, estimates are based on a new formula therefore data since 1988 is not comparable with previous years.

[e] Numbers reported here are preliminary estimates generated by the Division of Commercial Fisheries. Methodology to estimate harvest has changed slightly since 2007 with the incorporation of stratified sampling. A revision of historical estimates published by Division of Subsistence from 1990 to 2007 using the current methodology is pending review. Comparison of 2008 and 2009 estimates with years prior should be made cautiously.

[f] 10-year average from 1999 to 2008.

[g] Even years only.

Appendix A9.–Estimated exvessel value of the commercial salmon harvest, Kuskokwim Management Area, 1980–2009.

	District 1		District 2		District 4		District 5			
Year	Value of Catch	Permits Fished [a]	Value of Catch	Permits Fished [a]	Value of Catch	Permits Fished [a]	Value of Catch	Permits Fished [a]	Total Value	Total Permits
1980	-	663	-	43	-	169	-	48	-	923
1981	-	679	-	153	-	186	-	48	-	1,066
1982	-	686	-	60	-	177	-	48	-	971
1983	-	679	-	43	-	226	-	79	-	1,027
1984	-	654	-	58	-	263	-	77	-	774
1985	-	654	-	23	-	300	-	69	-	781
1986	-	688	-	43	-	324	$268,250	86	$268,250	790
1987	$4,893,016	705	$139,049	29	$858,818	310	$572,293	116	$6,463,176	800
1988	$10,060,427	745	$246,069	29	$1,381,661	289	$1,038,041	125	$12,726,198	813
1989	$3,883,321	743	$131,168	30	$746,071	227	$378,962	88	$5,139,522	824
1990	$3,385,636	742	$121,329	22	$1,013,472	390	$361,203	82	$4,881,640	823
1991	$2,971,767	749	$111,651	23	$592,436	346	$273,795	72	$3,949,649	819
1992	$3,764,804	741	$147,992	22	$993,664	349	$439,331	111	$5,345,791	814
1993	$2,533,895	737	$90,906	20	$898,255	408	$440,955	114	$3,964,011	804
1994	$3,559,114	706	$129,555	17	$837,157	307	$591,903	116	$5,117,729	793
1995	$2,776,677	712	$107,913	21	$1,047,188	382	$287,599	87	$4,219,377	798
1996	$2,108,418	620	$11,015	8	$534,726	218	$222,388	54	$2,876,547	714
1997	$430,614	604	$2,944	4	$497,071	289	$121,973	53	$1,052,602	702
1998	$982,791	615	$617	3	$467,843	203	$184,060	50	$1,635,311	707
1999	$170,278	509	$0	0	$279,092	218	$102,803	73	$552,173	604
2000	$509,594	532	$3,039	4	$466,560	230	$212,336	46	$1,191,529	623
2001	$429,534	412	$0	0	$228,615	159	$98,458	32	$756,607	514
2002	$127,208	318	$0	0	$167,748	114	$28,703	30	$323,659	407
2003	$453,187	359	$0	0	$304,553	114	$135,287	34	$893,027	438
2004	$943,767	390	$0	0	$405,344	116	$135,246	29	$1,484,357	467
2005	$448,853	403	$0	0	$571,965	145	$134,295	29	$1,155,113	484
2006	$451,390	373	$0	0	$551,182	132	$141,235	24	$1,143,807	453
2007	$380,842	366	$0	0	$660,865	125	$223,329	28	$1,265,036	456
2008	$538,310	374	$0	0	$750,731	146	$198,070	25	$1,487,111	462
2009	$502,848	342	$0	0	$747,325	179	$192,031	39	$1,442,204	434
10 Yr Avg (1999-2008)	$445,296	404	$304	0	$438,666	150	$140,976	35	$1,025,242	491

Note: Dashes indicate information not available.

[a] Number of permits that made at least one delivery.

Appendix A10.–Commercial salmon harvest by period, District W-1, Kuskokwim River, Kuskokwim Management Area, 1996–2009.

		# of	Hours	Permit	Chinook		Sockeye		Chum		Coho	
Year	Date	Permits	Fished	Hours	Catch	CPUE	Catch	CPUE	Catch	CPUE	Catch	CPUE
1995	6/22	569	4	2,276	6,895	3.03	4,420	1.94	49,157	21.60	0	0.00
	6/26	568	4	2,272	9,452	4.16	19,449	8.56	93,152	41.00	0	0.00
	6/29	565	4	2,260	4,972	2.20	18,188	8.05	83,580	36.98	0	0.00
	7/3	475	4	1,900	2,847	1.50	17,078	8.99	89,427	47.07	0	0.00
	7/6	481	4	1,924	1,521	0.79	14,765	7.67	81,246	42.23	0	0.00
	7/10	494	4	1,976	906	0.46	7,100	3.59	86,368	43.71	21	0.01
	7/14	435	4	1,740	546	0.31	4,219	2.42	43,137	24.79	221	0.13
	7/18	336	6	2,016	366	0.18	2,482	1.23	37,294	18.50	671	0.33
	7/21	368	4	1,472	202	0.14	940	0.64	21,039	14.29	1,272	0.86
	8/4	234	6	1,404	64	0.05	123	0.09	1,072	0.76	48,665	34.66
	8/8	611	6	3,666	95	0.03	363	0.10	1,229	0.34	98,548	26.88
	8/12	617	6	3,702	50	0.01	359	0.10	899	0.24	102,421	27.67
	8/16	593	6	3,558	52	0.01	147	0.04	208	0.06	65,713	18.47
	8/19	555	6	3,330	28	0.01	87	0.03	133	0.04	41,057	12.33
	8/22	497	6	2,982	16	0.01	113	0.04	157	0.05	43,978	14.75
	8/26	477	6	2,862	25	0.01	117	0.04	101	0.04	29,129	10.18
	8/29	355	6	2,130	15	0.01	45	0.02	39	0.02	17,790	8.35
	9/1	219	6	1,314	2	0.00	31	0.02	12	0.01	5,783	4.40
Total		712	92	42,784	28,054		90,026		588,250		455,269	
1996	6/17	245	2	490	2,045	4.17	1,850	3.78	11,560	23.59	0	0.00
	6/20	283	2	566	2,046	3.61	6,423	11.35	27,442	48.48	0	0.00
	6/24	240	2	360	666	1.85	4,420	12.28	19,438	53.99	0	0.00
	7/2	224	2	448	545	1.22	3,962	8.84	20,915	46.69	0	0.00
	7/5	194	2	388	316	0.81	3,481	8.97	17,651	45.49	2	1.00
	7/8	211	2	422	178	0.42	6,795	16.10	18,801	44.55	24	0.06
	7/12	237	2	474	230	0.49	3,781	7.98	26,468	55.84	1,608	3.39
	7/16	197	2	394	87	0.22	602	1.53	15,192	38.56	4,675	11.87
	7/19	267	3	801	164	0.20	298	0.37	13,390	16.72	14,746	18.41
	7/22	417	6	2,502	183	0.07	639	0.26	14,504	5.80	50,443	20.16
	7/25	487	8	3,896	124	0.03	256	0.07	9,024	2.32	113,637	29.17
	7/29	526	6	3,156	97	0.03	186	0.06	3,828	1.21	144,773	45.87
	7/31	464	6	2,784	52	0.02	92	0.03	1,541	0.55	122,946	44.16
	8/3	541	6	3,246	59	0.02	129	0.04	1,097	0.34	132,540	40.83
	8/7	514	6	3,084	43	0.01	73	0.02	581	0.19	94,332	30.59
	8/10	502	6	3,012	45	0.01	60	0.02	797	0.26	83,653	27.77
	8/13	471	6	2,826	25	0.01	82	0.03	296	0.10	70,053	24.79
	8/16	459	6	2,754	28	0.01	147	0.05	215	0.08	49,012	17.80
	8/20	400	6	2,400	19	0.01	83	0.03	51	0.02	25,870	10.78
	8/23	293	6	1,758	9	0.01	22	0.01	23	0.01	13,133	7.47
	8/26	209	6	1,254	11	0.01	23	0.02	13	0.01	8,684	6.93
Total		620	93	37,015	6,972		33,404		202,827		930,131	
1997	6/23	353	6	2,118	10,023	4.73	21,218	10.02	13,090	6.18	0	0.00
	7/31	429	6	2,574	141	0.05	352	0.14	2,060	0.80	14,963	5.81
	8/6	513	6	3,078	145	0.05	229	0.07	1,387	0.45	37,216	12.09
	8/12	507	6	3,042	61	0.02	122	0.04	408	0.13	56,149	18.46
	8/18	475	6	2,850	66	0.02	67	0.02	58	0.02	21,273	7.46
Total		604	30	13,662	10,436		21,988		17,003		129,601	
1998	6/24	338	6	2,028	6,413	3.16	9,043	4.46	32,467	16.01	0	0.00
	6/29	426	6	2,556	6,358	2.49	22,506	8.81	66,789	26.13	0	0.00
	7/3	445	4	1,780	2,277	1.28	15,985	8.98	51,471	28.92	1	0.00
	7/11	417	4	1,668	1,127	0.68	10,172	6.10	29,407	17.63	23	0.01
	7/22	346	6	2,076	460	0.22	1,538	0.74	15,663	7.54	3,633	1.75
	7/27	370	6	2,220	356	0.16	932	0.42	7,500	3.38	18,497	8.33
	8/1	425	6	2,550	156	0.06	235	0.09	2,787	1.09	26,791	10.51
	8/6	496	6	2,976	88	0.03	295	0.10	1,020	0.34	45,128	15.16
	8/11	464	6	2,784	67	0.02	95	0.03	388	0.14	58,426	20.99
	8/17	439	6	2,634	34	0.01	45	0.02	122	0.05	34,640	13.15
	8/22	382	6	2,292	19	0.01	53	0.02	67	0.03	18,936	8.26
	8/29	154	6	924	1	0.00	7	0.01	17	0.02	4,093	4.43

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Year	Date		Number of Permits	Hours Fished	Permit Hours	Chinook Catch	Chinook CPUE	Sockeye Catch	Sockeye CPUE	Chum Catch	Chum CPUE	Coho Catch	Coho CPUE
Total			615	68	26,488	17,356		60,906		207,698		210,168	
1999	6/30		409	6	2,454	4,668	1.90	16,772	6.83	22,700	9.25	0	0.00
	8/7		389	6	2,334	37	0.02	204	0.09	306	0.13	23,593	10.11
Total			509	12	4,788	4,705		16,976		23,006		23,593	
2000	7/5	a	224	4	896	357	0.40	3,658	4.08	11,026	12.31	0	0.00
	8/1	a	248	6	1,488	12	0.01	94	0.06	156	0.10	25,642	17.23
	8/4	b	123	6	738	7	0.01	7	0.01	53	0.07	50,260	68.10
	8/5	a	270	6	1,620	8	0.00	73	0.05	43	0.03	32,056	19.79
	8/8	b	186	6	1,116	9	0.01	26	0.02	55	0.05	26,771	23.99
	8/9	a	217	6	1,302	13	0.01	57	0.04	128	0.10	20,905	16.06
	8/12	b	189	6	1,134	12	0.01	17	0.01	23	0.02	37,451	33.03
	8/14	a	224	6	1,344	6	0.00	75	0.06	33	0.02	16,766	12.47
	8/17	b	193	6	1,158	5	0.00	23	0.02	15	0.01	17,916	15.47
	8/18	a	199	6	1,194	6	0.01	58	0.05	16	0.01	14,697	12.31
	8/21	b	158	6	948	4	0.00	3	0.00	10	0.01	8,577	9.05
	8/22	a	143	6	858	1	0.00	32	0.04	4	0.00	4,489	5.23
	8/25	ab	106	6	636	4	0.01	7	0.01	8	0.01	4,191	6.59
Total			532	76	14,432	444		4,130		11,570		259,721	
2001	8/3	a	144	4	576	9	0.02	22	0.04	347	0.60	17,174	29.82
	8/6	b	108	4	432	8	0.02	5	0.01	101	0.23	20,089	46.50
	8/8	ab	262	6	1,572	23	0.01	11	0.01	356	0.23	46,369	29.50
	8/11	b	175	6	1,050	20	0.02	10	0.01	218	0.21	41,643	39.66
	8/13	a	143	4	572	5	0.01	4	0.01	37	0.06	9,647	16.87
	8/15	ab	296	6	1,776	5	0.00	15	0.01	122	0.07	28,893	16.27
	8/17	ab	259	6	1,554	12	0.01	9	0.01	65	0.04	11,064	7.12
	8/20	ab	149	6	894	6	0.01	5	0.01	17	0.02	5,440	6.09
	8/22	ab	149	6	894	0	0.00	3	0.00	4	0.00	8,149	9.12
	8/25	ab	118	6	708	2	0.00	0	0.00	5	0.01	4,530	6.40
Total			412	54	10,028	90		84		1,272		192,998	
2002	8/2	a	40	2	80	7	0.09	3	0.04	134	1.68	2,492	31.15
	8/5	ab	175	4	700	18	0.03	41	0.06	573	0.82	11,164	15.95
	8/8	b	119	6	714	22	0.03	20	0.03	541	0.76	22,890	32.06
	8/9	a	132	6	792	8	0.01	9	0.01	254	0.32	13,749	17.36
	8/12	b	136	6	816	9	0.01	8	0.01	292	0.36	22,962	28.14
	8/13	a	109	6	654	8	0.01	3	0.00	106	0.16	10,206	15.61
Total			318	30	3,756	72		84		1,900		83,463	
2003	7/31	b	57	2	114	11	0.10	13	0.11	405	3.55	7,717	67.69
	8/1	a	95	4	380	30	0.08	69	0.18	545	1.43	9,707	25.54
	8/4	b	91	4	364	7	0.02	10	0.03	310	0.85	14,308	39.31
	8/5	a	119	4	476	13	0.03	69	0.14	214	0.45	12,233	25.70
	8/7	b	123	6	738	16	0.02	3	0.00	374	0.51	30,162	40.87
	8/8	a	118	4	472	12	0.03	41	0.09	200	0.42	15,800	33.47
	8/11	b	130	4	520	9	0.02	9	0.02	208	0.40	31,371	60.33
	8/12	a	107	4	428	12	0.03	10	0.02	116	0.27	18,703	43.70
	8/14	b	141	4	564	12	0.02	2	0.00	78	0.14	36,537	64.78
	8/15	a	116	4	464	15	0.03	12	0.03	67	0.14	16,027	34.54
	8/18	b	105	3	315	3	0.01	3	0.01	40	0.13	14,219	45.14
	8/19	a	95	4	380	6	0.02	15	0.04	25	0.07	8,720	22.95
	8/21	b	111	6	666	2	0.00	3	0.00	27	0.04	18,804	28.23
	8/22	a	49	6	294	0	0.00	1	0.00	14	0.05	2,914	9.91
	8/25	b	109	6	654	1	0.00	5	0.01	32	0.05	12,789	19.56
	8/26	a	112	6	672	4	0.01	2	0.00	15	0.02	11,434	17.01
	8/28	b	100	6	600	3	0.01	7	0.01	40	0.07	8,228	13.71
	8/29	b	60	6	360	0	0.00	4	0.01	29	0.08	4,524	12.57
	9/1	b	44	8	352	1	0.00	1	0.00	12	0.03	3,504	9.95
	9/2	b	37	8	296	0	0.00	0	0.00	7	0.02	3,011	10.17
	9/3	b	30	8	240	1	0.00	2	0.01	6	0.03	3,121	13.00
Total			359	107	9,349	158		281		2,764		283,833	

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Year	Date		Number of Permits	Hours Fished	Permit Hours	Chinook Catch	Chinook CPUE	Sockeye Catch	Sockeye CPUE	Chum Catch	Chum CPUE	Coho Catch	Coho CPUE
2004	6/30	a	52	2	104	522	5.02	1,781	17.13	2,798	26.90	0	0.00
	7/2	b	44	3	132	488	3.70	1,900	14.39	2,426	18.38	0	0.00
	7/6	b	38	3	114	238	2.09	1,853	16.25	1,946	17.07	3	0.03
	7/7	a	50	4	200	384	1.92	1,780	8.90	5,086	25.43	16	0.08
	7/28	b	90	4	360	127	0.35	70	0.19	2,343	6.51	6,004	16.68
	7/30	a	99	4	396	61	0.15	273	0.69	587	1.48	9,462	23.89
	8/2	b	105	6	630	75	0.12	70	0.11	849	1.35	16,267	25.82
	8/3	a	115	6	690	68	0.10	192	0.28	646	0.94	23,957	34.72
	8/5	b	120	6	720	39	0.05	41	0.06	586	0.81	19,235	26.72
	8/6	a	144	6	864	59	0.07	110	0.13	624	0.72	28,638	33.15
	8/9	b	139	6	834	54	0.06	168	0.20	504	0.60	47,151	56.54
	8/10	a	151	6	906	18	0.02	57	0.06	207	0.23	20,022	22.10
	8/12	b	152	6	912	29	0.03	50	0.05	371	0.41	28,751	31.53
	8/13	a	91	6	546	16	0.03	8	0.01	95	0.17	20,353	37.28
	8/16	b	144	6	864	22	0.03	14	0.02	140	0.16	29,965	34.68
	8/17	a	114	6	684	8	0.01	33	0.05	44	0.06	8,491	12.41
	8/19	b	118	6	708	5	0.01	9	0.01	110	0.16	6,834	9.65
	8/20	a	82	6	492	11	0.02	30	0.06	103	0.21	9,287	18.88
	8/23	ab	206	8	1,648	26	0.02	23	0.01	223	0.14	32,563	19.76
	8/24	ab	211	8	1,688	24	0.01	28	0.02	178	0.11	32,156	19.05
	8/27	ab	224	8	1,792	9	0.01	22	0.01	124	0.07	31,623	17.65
	8/30	ab	186	8	1,488	9	0.01	13	0.01	85	0.06	23,649	15.89
	9/2	ab	163	6	978	2	0.00	5	0.01	32	0.03	14,563	14.89
	9/4	ab	122	6	732	6	0.01	0	0.00	13	0.02	11,986	16.37
	9/6	ab	115	6	690	2	0.00	2	0.00	15	0.02	8,406	12.18
	9/8	ab	80	6	480	3	0.01	0	0.00	15	0.03	6,025	12.55
Total			390	148	19,652	2,305		8,532		20,150		435,407	
2005	6/24	a	188	4	752	2,276	3.03	7,938	10.56	13,553	18.02	0	0.00
	6/28	b	51	3	153	405	2.65	2,879	18.82	3,178	20.77	0	0.00
	6/30	b	71	4	284	850	2.99	6,290	22.15	7,317	25.76	0	0.00
	7/1	a	151	4	604	874	1.45	6,962	11.53	27,901	46.19	0	0.00
	8/2	a	125	6	750	94	0.13	1,155	1.54	3,297	4.40	8,666	11.55
	8/4	b	75	6	450	47	0.10	303	0.67	4,156	9.24	8,814	19.59
	8/5	a	171	6	1,026	88	0.09	790	0.77	3,159	3.08	21,463	20.92
	8/8	b	129	6	774	59	0.08	305	0.39	2,971	3.84	25,165	32.51
	8/9	a	174	6	1,044	25	0.02	404	0.39	1,389	1.33	20,026	19.18
	8/11	b	139	6	834	30	0.04	205	0.25	1,282	1.54	19,686	23.60
	8/15	a	127	6	762	16	0.02	179	0.23	274	0.36	7,768	10.19
	8/22	b	128	6	768	6	0.01	45	0.06	372	0.48	12,049	15.69
	8/25	a	106	6	636	3	0.00	109	0.17	88	0.14	6,549	10.30
	8/29	b	103	6	618	5	0.01	22	0.04	121	0.20	7,159	11.58
	9/1	ab	128	6	768	6	0.01	59	0.08	81	0.11	4,974	6.48
Total			404	81		4,784		27,645		69,139		142,319	
2006	6/26	b	74	6	444	1,647	3.71	5,218	11.75	19,694	44.36	0	0.00
	6/28	a	99	6	594	846	1.42	6,456	10.87	16,312	27.46	0	0.00
	8/1	a	135	6	810	56	0.07	287	0.35	1,098	1.36	10,309	12.73
	8/3	b	80	6	480	28	0.06	63	0.13	1,032	2.15	8,872	18.48
	8/4	a	128	6	768	24	0.03	49	0.06	1,462	1.90	10,650	13.87
	8/7	b	103	6	618	30	0.05	76	0.12	1,361	2.20	12,163	19.68
	8/8	a	151	6	906	23	0.03	99	0.11	667	0.74	14,162	15.63
	8/10	b	118	6	708	26	0.04	50	0.07	969	1.37	17,139	24.21
	8/11	a	157	6	942	20	0.02	96	0.10	400	0.42	23,209	24.64
	8/14	b	133	6	798	21	0.03	47	0.06	336	0.42	15,668	19.63
	8/15	a	155	6	930	11	0.01	36	0.04	120	0.13	18,253	19.63
	8/17	b	130	6	780	11	0.01	32	0.04	240	0.31	18,455	23.66
	8/18	a	128	6	768	7	0.01	20	0.03	108	0.14	7,833	10.20
	8/21	b	106	6	636	5	0.01	11	0.02	60	0.09	5,678	8.93
	8/22	a	113	6	678	5	0.01	23	0.03	52	0.08	6,004	8.86
	8/24	b	68	6	408	3	0.01	3	0.01	45	0.11	3,318	8.13
	8/25	a	95	6	570	6	0.01	27	0.05	32	0.06	5,427	9.52
	8/28	ab	110	6	660	7	0.01	18	0.03	36	0.05	5,120	7.76
	8/30	ab	84	6	504	1	0.00	7	0.01	46	0.09	3,338	6.62
Total			373	114		2,777		12,618		44,070		185,598	

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Year	Date		Number of Permits	Hours Fished	Permit Hours	Chinook Catch	Chinook CPUE	Sockeye Catch	Sockeye CPUE	Chum Catch	Chum CPUE	Coho Catch	Coho CPUE
2007	8/1	[a]	138	6	828	32	0.04	131	0.16	3,500	4.23	19,133	23.11
	8/3	[b]	107	6	642	41	0.06	62	0.10	2,510	3.91	19,728	30.73
	8/6	[a]	172	6	1,032	28	0.03	153	0.15	1,082	1.05	15,926	15.43
	8/8	[b]	124	6	744	9	0.01	55	0.07	1,208	1.62	14,402	19.36
	8/10	[a]	187	6	1,122	29	0.03	128	0.11	724	0.65	13,059	11.64
	8/13	[b]	125	6	750	10	0.01	13	0.02	463	0.62	12,491	16.65
	8/14	[a]	176	6	1,056	11	0.01	44	0.04	436	0.41	15,411	14.59
	8/16	[b]	121	6	726	3	0.00	17	0.02	316	0.44	7,696	10.60
	8/17	[a]	135	6	810	4	0.00	31	0.04	112	0.14	6,231	7.69
	8/20	[b]	80	6	480	3	0.01	4	0.01	110	0.23	3,266	6.80
	8/22	[ab]	141	6	846	8	0.01	24	0.03	154	0.18	7,447	8.80
	8/24	[ab]	129	6	774	1	0.00	41	0.05	148	0.19	6,259	8.09
Total			366	72		179		703		10,763		141,049	
2008	6/20	[a]	171	6	1,026	6,415	6.25	8,653	8.43	12,903	12.58	0	0.00
	6/24	[a]	126	3	378	1,372	3.63	2,906	7.69	6,560	17.35	0	0.00
	6/27	[a]	135	3	405	990	2.44	3,842	9.49	7,804	19.27	0	0.00
	7/2	[ab]	1	4	4	19	4.75	75	18.75	0	0.00	0	0.00
	7/12	[ab]	1	6	6	1	0.17	2	0.33	160	26.67	0	0.00
	7/19	[ab]	1	6	6	0	0.00	2	0.33	98	16.33	14	2.33
	7/22	[ab]	1	6	6	0	0.00	3	0.50	120	20.00	94	15.67
	7/25	[ab]	1	6	6	0	0.00	0	0.00	0	0.00	80	13.33
	7/30	[ab]	1	6	6	0	0.00	2	0.33	113	18.83	117	19.50
	8/2	[ab]	1	6	6	0	0.00	0	0.00	0	0.00	150	25.00
	8/4	[b]	66	3	198	9	0.05	13	0.07	487	2.46	6,149	31.06
	8/6	[a]	118	4	472	15	0.03	29	0.06	482	1.02	12,013	25.45
	8/8	[ab]	224	6	1,344	18	0.01	23	0.02	940	0.70	28,877	21.49
	8/11	[b]	108	4	432	5	0.01	9	0.02	369	0.85	14,991	34.70
	8/13	[a]	167	4	668	6	0.01	17	0.03	143	0.21	19,667	29.44
	8/15	[a]	169	4	676	4	0.01	9	0.01	111	0.16	20,137	29.79
	8/18	[b]	112	4	448	4	0.01	0	0.00	47	0.10	11,513	25.70
	8/20	[a]	137	4	548	4	0.01	7	0.01	35	0.06	7,017	12.80
	8/22	[ab]	192	6	1,152	1	0.00	8	0.01	84	0.07	11,237	9.75
	8/25	[ab]	164	6	984	2	0.00	1	0.00	60	0.06	10,806	10.98
Total			374	97	8,771	8,865		15,601		30,516		142,862	
2009	6/23		167	4	668	3,003	4.50	8,112	12.14	9,149	13.70	0	0.00
	6/26		58	4	232	2,552	11.00	6,870	29.61	14,466	62.35	0	0.00
	7/1		48	3	144	762	5.29	7,798	54.15	18,703	129.88	0	0.00
	7/11		70	4	280	87	0.31	1,069	3.82	7,500	26.79	0	0.00
	7/14		39	4	156	26	0.17	810	5.19	4,530	29.04	23	0.15
	7/18		44	6	264	83	0.31	677	2.56	12,870	48.75	1,340	5.08
	7/28	[c]	56	4	224	58	0.26	78	0.35	4,982	22.24	14,516	64.80
	8/1	[c]	73	4	292	24	0.08	80	0.27	1,599	5.48	16,846	57.69
	8/4	[c]	62	4	248	27	0.11	70	0.28	1,731	6.98	19,334	77.96
	8/6		2	12	24	0	0.00	0	0.00	31	1.29	377	0.00
	8/8	[c]	70	4	280	12	0.04	27	0.10	633	2.26	16,224	57.94
	8/11	[c]	59	6	354	17	0.05	35	0.10	436	1.23	15,569	43.98
	8/13		49	6	294	3	0.01	18	0.06	58	0.20	3,709	12.62
	8/16			6				Commercial Opening, no deliveries					
	8/18	[c]	47	6	282	6	0.02	15	0.05	81	0.29	10,189	36.13
	8/22	[c]	33	6	198	4	0.02	14	0.07	21	0.11	6,419	32.42
Total			342	83	3,940	6,664		25,673		76,790		104,546	

[a] Subdistrict W-1B (below Bethel) opening.

[b] Subdistrict W-1A (above Bethel) opening.

[c] Two hours of additional fishing time was allowed in Lower Section of W1-B.

Appendix A11.–Commercial salmon harvest by period, District W-2, Kuskokwim River, Kuskokwim Management Area, 1994–2009.

Year	Date	Number of Permits	Hours Fished	Chinook		Sockeye		Chum		Coho	
				Catch	CPUE	Catch	CPUE	Catch	CPUE	Catch	CPUE
1994	Aug 04	14	6	6	0.07	0	0.00	808	9.62	4,040	48.10
	Aug 09	17	6	3	0.03	0	0.00	350	3.43	5,790	56.76
	Aug 12	17	8	0	0.00	0	0.00	226	1.66	10,539	77.49
	Aug 15	16	8	0	0.00	1	0.01	151	1.18	7,190	56.17
	Aug 18	15	8	1	0.01	0	0.00	106	0.88	2,710	22.58
	Aug 22	12	8	0	0.00	1	0.01	34	0.35	1,855	19.32
	Aug 25	7	8	0	0.00	0	0.00	12	0.21	1,492	26.64
	Aug 27	6	6	0	0.00	1	0.03	2	0.06	677	18.81
Total		20	58	10		3		1,689		34,293	
1995	Jun 26	16	4	1,656	25.88	535	8.36	3,628	56.69	0	0.00
	Jun 29	13	4	707	13.60	620	11.92	3,577	68.79	0	0.00
	Jul 03	9	4	284	7.89	456	12.67	2,200	61.11	0	0.00
	Jul 06	8	4	74	2.31	331	10.34	2,372	74.13	0	0.00
	Jul 10	6	4	32	1.33	293	12.21	1,874	78.08	0	0.00
	Jul 14	2	4	7	0.88	51	6.38	480	60.00	0	0.00
	Jul 18	6	6	9	0.25	44	1.22	1,638	45.50	6	0.17
	Jul 21	5	4	4	0.20	132	6.60	899	44.95	13	0.65
	Aug 04	6	6	10	0.28	4	0.11	484	13.44	1,321	36.69
	Aug 08	9	6	2	0.04	6	0.11	379	7.02	2,816	52.15
	Aug 12	8	6	5	0.10	1	0.02	79	1.65	2,643	55.06
	Aug 16	12	6	1	0.01	0	0.00	41	0.57	4,398	61.08
	Aug 19	5	6	1	0.03	0	0.00	4	0.13	1,679	55.97
	Aug 22	8	6	0	0.00	1	0.02	9	0.19	1,750	36.46
	Aug 26	3	6	0	0.00	0	0.00	0	0.00	712	39.56
	Aug 29	3	6	0	0.00	0	0.00	4	0.22	660	36.67
	Sept 01	1	6	0	0.00	0	0.00	0	0.00	194	32.33
Total		21	88	2,792		2,474		17,668		16,192	
1996	Jun 24	6	2	145	12.08	69	5.75	613	51.08	0	0.00
	Jul 2	4	2	175	21.88	109	13.63	376	47.00	0	0.00
	Jul 5	3	2	8	1.33	38	6.33	606	101.00	0	0.00
	Jul 8	4	4	42	2.63	92	5.75	877	54.81	0	0.00
	Jul 12	4	4	60	3.75	56	3.50	758	47.38	0	0.00
	Jul 16	1	4	5	1.25	33	8.25	336	84.00	3	0.75
	Jul 19	3	4	9	0.75	9	0.75	444	37.00	51	4.25
	Jul 22	2	6	0	0.00	6	0.50	414	34.50	234	19.50
	Jul 25	3	8	2	0.08	5	0.21	367	15.29	700	29.17
	Jul 29	2	6	1	0.08	2	0.17	98	8.17	668	55.67
	Jul 31	1	6	0	0.00	2	0.33	148	24.67	162	27.00
	Aug 10	2	6	0	0.00	0	0.00	0	0.00	787	65.58
	Aug 13	5	6	0	0.00	1	0.03	5	0.17	1,761	58.70
	Aug 16	2	6	0	0.00	0	0.00	8	0.67	590	49.17
	Aug 20	3	6	0	0.00	52	2.89	0	0.00	1,063	59.06
	Aug 23	2	6	0	0.00	0	0.00	0	0.00	620	51.67
	Aug 26	5	6	0	0.00	0	0.00	0	0.00	541	18.03
Total		8	84	447		474		5,050		7,180	

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Appendix A11.–Page 2 of 2.

Year	Date	Number of Permits	Hours Fished	Chinook Catch	Chinook CPUE	Sockeye Catch	Sockeye CPUE	Chum Catch	Chum CPUE	Coho Catch	Coho CPUE
1997	Aug 12	2	6	1	0.08	0	0.00	23	1.92	494	41.17
	Aug 18	3	6	4	0.22	1	0.06	0	0.00	708	39.33
Total		4	12	5		1		23		1,202	
1998	Aug 06	3	6	3	0.17	0	0	111	6.17	313	17.39
	Aug 11	No harvest/ No deliveries									
Total		3	6	3		0		111		313	
1999	No commercial fishery in W-2										
2000	Aug 12	4	6							1237	51.54
	Aug 21	2	6							439	36.58
Total		12	12							1,676	
2001	No commercial fishery in W-2										
2002	No commercial fishery in W-2										
2003	No commercial fishery in W-2										
2004	No commercial fishery in W-2										
2005	No commercial fishery in W-2										
2006	No commercial fishery in W-2										
2007	No commercial fishery in W-2										
2008	No commercial fishery in W-2										
2009	No commercial fishery in W-2										

Appendix A12.–Chinook salmon utilization, Kuskokwim River, Kuskokwim Management Area, 1960–2009.

	Commercial Harvest[a]		Subsistence Harvest[b]		Test-Fish	Sport Fish	Total	10-yr Avg
Year	Annual	10-yr Avg[c]	Annual	10-yr Avg[c]	Harvest	Harvest	Utilization	Utilization[c]
1960	5,969	-	18,887	-	-	-	24,856	-
1961	18,918	-	28,934	-	-	-	47,852	-
1962	15,341	-	13,582	-	-	-	28,923	-
1963	12,016	-	34,482	-	-	-	46,498	-
1964	17,149	-	29,017	-	-	-	46,166	-
1965	21,989	-	24,697	-	-	-	46,686	-
1966	25,545	-	49,325	-	285	-	75,155	-
1967	29,986	-	59,913	-	766	-	90,665	-
1968	34,278	-	32,942	-	608	-	67,828	-
1969	43,997	-	40,617	-	833	-	85,447	-
1970	39,290	22,519	69,612	33,240	857	-	165,517	56,008
1971	40,274	25,851	43,242	38,312	756	-	148,435	70,074
1972	39,454	27,987	40,396	39,743	756	-	148,335	80,132
1973	32,838	30,398	39,093	42,424	577	-	145,330	92,073
1974	18,664	32,480	27,139	42,885	1,236	-	122,404	101,956
1975	22,135	32,632	48,448	42,698	704	-	146,616	109,580
1976	30,735	32,646	58,606	45,073	1,206	-	168,266	119,573
1977	35,830	33,165	56,580	46,001	1,264	33	93,707	128,884
1978	45,641	33,750	36,270	45,668	1,445	116	83,472	129,189
1979	38,966	34,886	56,283	46,000	979	74	96,302	130,753
1980	35,881	34,383	59,892	47,567	1,033	162	96,968	131,839
1981	47,663	34,042	61,329	46,595	1,218	189	110,399	124,984
1982	48,234	34,781	58,018	48,404	542	207	107,001	121,180
1983	33,174	35,659	47,412	50,166	1,139	420	82,145	117,047
1984	31,742	35,692	56,930	50,998	231	273	89,176	110,728
1985	37,889	37,000	43,874	53,977	79	85	81,927	107,405
1986	19,414	38,576	51,019	53,519	130	49	70,612	100,936
1987	36,179	37,443	67,325	52,761	384	355	104,243	91,171
1988	55,716	37,478	70,943 [d]	53,835	576	528	127,763	92,225
1989	43,217	38,486	81,175	57,303	543	1,218	126,153	96,654
1990	53,504	38,911	85,976	59,792	512	394	140,386	99,639
1991	37,778	40,673	85,556	62,400	117	401	123,852	103,981
1992	46,872	39,685	64,794	64,823	1,380	367	113,413	105,326
1993	8,735	39,549	87,513	65,500	2,483	587	99,318	105,967
1994	16,211	37,105	93,243	69,511	1,937	1,139	112,530	107,684
1995	30,846	35,552	96,435	73,142	1,421	541	129,243	110,020
1996	7,419	34,847	78,062	78,398	247	1,432	87,160	114,751
1997	10,441	33,648	81,577	81,102	332	1,227	93,577	116,406
1998	17,359	31,074	81,264	82,527	210	1,434	100,267	115,340
1999	4,705	27,238	73,194	83,560	98	252	78,249	112,590

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Year	Commercial Harvest[a] Annual	Commercial Harvest[a] 10-yr Avg[c]	Subsistence Harvest[b] Annual	Subsistence Harvest[b] 10-yr Avg[c]	Test-Fish Harvest	Sport Fish Harvest	Total Utilization	10-Yr Average[c]
2000	444	23,387	64,893	82,761	64	105	65,506	107,800
2001	90	18,081	73,610	80,653	86	290	74,076	100,312
2002	72	14,312	66,807	79,459	288	319	67,486	95,334
2003	158	9,632	67,788	79,660	409	401	68,756	90,741
2004	2,305	8,775	80,065	77,687	691	857	83,918	87,685
2005	4,784	7,384	70,393	76,370	557	572	76,306	84,824
2006	2,777	4,778	63,177	73,765	352	444	66,750	79,530
2007	179	4,314	68,645	72,277	305	1,478	70,607	77,489
2008	8,865	3,287	99,481 [e]	70,984	420	750 [f]	109,516	75,192
2009	6,664	2,438	78,878 [e]	72,805	470	750 [f]	86,762	76,117
10-yr Avg (1999-2008)	2,438		72,805		327	547	76,117	91,150

Note: Dashes indicate no data.

[a] Districts 1 and 2; also includes harvests in District 3 from 1960 to 1965. Does not include personal use.

[b] Estimated subsistence harvest expanded from villages surveyed.

[c] Running 10-year average. Does not include most recent year.

[d] Beginning in 1988, estimates made using new formula. Data since 1988 is not comparable with previous years.

[e] Numbers reported here are preliminary subsistence harvest estimates generated by Division of Commercial Fisheries. Methodology to estimate harvest has changed slightly since 2007 with the incorporation of stratified sampling. A revision of historical estimates published by Division of Subsistence from 1990 to 2007 using the current methodology is pending review. Comparison of 2008 and 2009 estimates with those prior to 2007 should be done cautiously.

[f] Sport fish harvest for 2008 and 2009 unavailable. The most recent 5-year (2003–2007) sport fish harvest average was used to estimate harvest for that year.

Appendix A13.–Commercial salmon harvest and exvessel value, District W-1, Kuskokwim River, Kuskokwim Management Area, 1993–2009.

	Chinook		Sockeye		Pink		Chum		Coho		Total	
Year	Number	Value	Number	Value	Number	Value	Number	Value	Number	Value	Number	Value
1993	8,714	$72,659	27,003	$140,000	64	$59	42,718	$112,756	586,330	$2,535,321	664,829	$2,860,795
1994	16,201	$126,892	49,362	$188,691	30,930	$8,967	269,426	$381,639	690,369	$2,875,803	1,056,288	$3,581,992
1995	28,054	$280,287	90,026	$448,530	335	$50	588,250	$724,273	455,269	$1,313,742	1,161,934	$2,766,882
1996	6,972	$23,665	33,404	$97,176	1,621	$744	202,827	$170,977	930,131	$1,824,683	1,174,955	$2,117,245
1997	10,436	$36,843	21,988	$64,922	2	$1	17,003	$19,509	129,601	$2,167,491	179,030	$2,288,766
1998	17,356	$74,387	60,906	$209,860	92	$55	207,698	$183,307	210,168	$516,024	496,220	$983,633
1999	4,705	$22,266	16,976	$86,442	2	-	23,006	$16,428	23,593	$44,633	68,282	$169,769
2000	444	$3,044	4,130	$14,272	7	$3	11,570	$7,967	259,721	$489,644	275,872	$514,930
2001	90	$534	84	$265	-	-	1,272	$827	192,998	$422,573	194,444	$424,199
2002	72	$212	84	$196	-	-	1,900	$1,190	83,463	$124,763	85,519	$126,361
2003	158	$846	282	$803	-	-	2,764	$1,087	284,064	$450,451	287,268	$453,187
2004	2,305	$9,815	8,532	$19,549	-	-	20,150	$6,611	435,407	$907,791	466,394	$943,766
2005	4,784	$29,040	27,645	$109,063	-	-	69,139	$23,115	142,319	$287,635	243,887	$448,853
2006	2,777	$16,192	12,618	$41,891	1	$1	44,070	$14,988	185598	$378,318	245,064	$451,390
2007	179	$1,607	703	$2,411	-	-	10,763	$3,033	141,049	$373,789	152,694	$380,840
2008	8,865	$70,988	15,601	$59,777	15	$4	30,516	$11,212	142,862	$396,329	197,859	$538,310
2009	6,664	$61,452	25,673	$101,445	2	$-	76,790	$76,494	104,546	$263,457	213,675	$502,848
10-yr Avg (1999-2008)	2,438	$15,454	8,666	$33,467	3	$1	21,515	$8,646	189,107	$387,593	221,728	$445,160

Note: Dashes indicate no data.

Appendix A14.–Chum salmon utilization, Kuskokwim River, Kuskokwim Management Area, 1960–2009.

	Commercial Harvest[a]		Subsistence Harvest[b]		Test-Fish	Sport Fish	Total	10-Year
Year	Annual	10-yr Avg[c]	Annual	10-yr Avg[c]	Harvest	Harvest	Utilization	Average[c]
1960	0	-	301,753 [d]	-	-	-	301,753	-
1961	0	-	179,529 [d]	-	-	-	179,529	-
1962	0	-	161,849 [d]	-	-	-	161,849	-
1963	0	-	137,649 [d]	-	-	-	137,649	-
1964	0	-	190,191 [d]	-	-	-	190,191	-
1965	0	-	250,878 [d]	-	-	-	250,878	-
1966	0	-	175,735 [d]	-	502 [e]	-	176,237	-
1967	148	-	208,445 [d]	-	338	-	208,931	-
1968	187	-	275,008 [d]	-	562	-	275,757	-
1969	7,165	-	204,105 [d]	-	384	-	211,654	-
1970	1,664	750	246,810 [d]	208,514	1,139 [e]	-	458,877	209,443
1971	68,914	916	116,391 [d]	203,020	254	-	389,495	225,155
1972	78,619	7,808	120,316 [d]	196,706	486	-	403,935	246,152
1973	148,746	15,670	179,259 [d]	192,553	675	-	536,903	270,360
1974	171,887	30,544	277,170 [d]	196,714	2,021	-	678,336	310,286
1975	184,171	47,733	176,389 [d]	205,412	1,062	-	614,767	359,100
1976	177,864	66,150	223,792 [d]	197,963	2,101	-	667,870	395,489
1977	248,721	83,937	198,355 [d]	202,769	576	129	447,781	444,652
1978	248,656	108,794	118,809 [d]	201,760	2,153	555	370,173	468,537
1979	261,874	133,641	161,239 [d]	186,140	412	259	423,784	477,979
1980	483,751	159,112	165,172 [d]	181,853	2,058	324	651,305	499,192
1981	418,677	207,320	157,306 [d]	173,689	1,793	598	578,374	518,435
1982	278,306	242,297	190,011 [d]	177,781	504	1,125	469,946	537,323
1983	276,698	262,265	146,876 [d]	184,750	1,069	922	425,565	543,924
1984	423,718	275,061	142,542 [d]	181,512	1,186	520	567,966	532,790
1985	199,478	300,244	94,750	168,049	616	150	294,994	521,753
1986	309,213	301,774	141,931 [d]	159,885	1,693	245	453,082	489,776
1987	574,336	314,909	70,709	151,699	2,302	566	647,913	468,297
1988	1,381,674	347,471	151,967 [f]	138,935	4,379	764	1,538,784	488,310
1989	749,182	460,773	139,672	142,250	2,082	2,023	892,959	605,171
1990	461,624	509,503	126,509	140,094	2,107	533	590,773	652,089
1991	431,802	507,291	93,077	136,227	931	378	526,188	646,036
1992	344,603	508,603	96,491	129,804	15,330	608	457,032	640,817
1993	43,337	515,233	59,394	120,452	8,451	359	111,541	639,526
1994	271,115	491,897	72,022	111,704	11,998	1,280	356,415	608,123
1995	605,918	476,636	67,861	104,652	17,473	226	691,478	586,968
1996	207,877	517,280	88,966	101,963	2,864	280	299,987	626,617
1997	17,026	507,147	39,987	96,667	790	86	57,889	611,307
1998	207,809	451,416	63,537	93,595	1,140	291	272,777	552,305
1999	23,006	334,029	43,601	84,752	562	180	67,349	425,704

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Year	Commercial Harvest[a] Annual	Commercial Harvest[a] 10-yr Avg[c]	Subsistence Harvest[b] Annual	Subsistence Harvest[b] 10-yr Avg[c]	Test-Fish Harvest	Sport Fish Harvest	Total Utilization	10-yr Avg Utilization[c]
2000	11,570	261,412	51,696	75,145	1,038	26	64,330	343,143
2001	1,272	216,406	49,874	67,663	1,743	112	53,001	290,499
2002	1,900	173,353	69,019	63,343	2,666	53	73,638	243,180
2003	2,764	139,083	43,320	60,596	1,713	53	47,850	204,841
2004	20,150	135,026	52,374	58,988	1,810	84	74,418	198,471
2005	69,139	109,929	46,777	57,024	4,459	500	120,875	170,272
2006[e]	44,070	56,251	64,206	54,915	3,547	13	111,836	113,211
2007	10,763	39,871	51,308	52,439	3,237	424	65,732	94,396
2008	30,516	39,871	70,018 [g]	53,571	2,472	215 [h]	103,221	95,181
2009	76,790	21,515	43,330 [g]	54,219	2,741	215 [h]	123,076	78,225
10-yr Avg (1999-2008)	21,515		54,219		2,325	166	78,225	217,890

Note: Dashes indicate no data.

[a] Districts 1 and 2 only; no chum harvests were reported in District 3. Does not include personal use.

[b] Estimated subsistence harvest expanded from villages surveyed.

[c] Running 10-year average. Does not include most recent year.

[d] Includes small numbers of small Chinook, sockeye and coho salmon.

[e] Includes small numbers of sockeye.

[f] Beginning in 1988, estimates made using new formula. Data since 1988 is not comparable with previous years.

[g] Numbers reported here are preliminary subsistence harvest estimates generated by Division of Commercial Fisheries. Methodology to estimate harvest has changed slightly since 2007 with the incorporation of stratified sampling. A revision of historical and 2009 estimates with those prior to 2007 should be done cautiously.

[h] Sport fish harvest for 2008 and 2009 unavailable. The most recent 5-year (2003–2007) sport fish harvest average was used to estimate harvest for that year.

Appendix A15.–Sockeye salmon utilization, Kuskokwim River, Kuskokwim Management Area, 1969–2009.

Year	Commercial Harvest[a] Annual	Commercial Harvest[a] 10-yr Avg[c]	Subsistence Harvest[b] Annual	Subsistence Harvest[b] 10-yr Avg[c]	Test Fish Harvest	Sport Fish Harvest	Total Utilization	10-yr Avg Utilization[c]
1969	322	-	-	-	-	-	322	-
1970	117	-	-	-	-	-	117	-
1971	2,606	-	-	-	-	-	2,606	-
1972	102	-	-	-	-	-	102	-
1973	369	-	-	-	-	-	369	-
1974	136	-	-	-	-	-	136	-
1975	23	-	-	-	-	-	23	-
1976	2,971	-	-	-	-	-	2,971	-
1977	9,379	-	-	-	-	-	9,379	-
1978	733	-	-	-	-	-	733	-
1979	1,054	1,676	-	-	-	-	2,730	1,676
1980	360	1,749	-	-	-	-	2,109	1,917
1981	48,375	1,773	-	-	-	-	50,148	2,116
1982	33,154	6,350	-	-	-	-	39,504	6,870
1983	68,855	9,655	-	-	-	41	78,551	10,810
1984	48,575	16,504	-	-	-	-	65,079	18,628
1985	106,647	21,348	-	-	-	72	128,067	25,123
1986	95,433	32,010	-	-	-	196	127,639	37,927
1987	136,602	41,257	-	-	-	217	178,076	50,394
1988	92,025	53,979	-	-	-	291	146,295	67,264
1989	42,747	63,108	35,224	-	-	33	98,365	81,820
1990	84,870	67,277	36,274	-	-	61	103,612	91,383
1991	108,946	75,728	52,982	-	-	38	128,748	101,534
1992	92,218	81,785	32,065	-	-	131	113,981	109,394
1993	27,008	87,692	49,347	-	-	348	137,387	116,841
1994	49,365	83,507	37,159	-	-	359	121,025	122,725
1995	92,500	83,586	27,792	-	-	95	111,473	128,320
1996	33,878	82,171	34,214	-	-	315	116,700	126,660
1997	21,989	76,016	40,078	-	-	423	116,517	125,566
1998	60,906	64,555	35,426	-	-	178	100,159	119,410
1999	16,976	61,443	46,677	38,056	-	54	163,206	114,797
2000	4,130	58,866	41,783	39,201	-	46	144,026	121,281
2001	84	50,792	50,065	39,752	510	231	50,890	125,322
2002	84	39,905	25,499	39,461	228	42	25,853	117,536
2003	282	30,692	34,452	38,804	0	140	34,874	108,724
2004	8,532	28,019	32,433	37,315	742	400	42,107	98,472
2005	27,645	23,936	34,129	36,842	1,062	636	63,472	90,580
2006	12,618	17,451	30,226	37,476	519	231	43,594	85,780
2007	703	15,325	33,234	37,077	488	382	34,807	78,470
2008	15,601	13,196	58,913[d]	36,392	584	273[e]	75,371	70,299
2009	25,673	8,666	34,748[d]	38,741	515	384[e]	61,320	67,820
10-yr Avg (1999-2008)	8,666		38,741		516[f]	256	67,820	101,126

Note: Dashes indicate no data.

[a] Districts 1 and 2 only. Harvest does not include personal use.

[b] Estimated subsistence harvest expanded from villages surveyed.

[c] Running 10-year average. Does not include most recent year.

[d] Numbers reported here are preliminary subsistence harvest estimates generated by Division of Commercial Fisheries. Methodology to estimate harvest has changed slightly since 2007 with the incorporation of stratified sampling. A revision of historical and 2009 estimates with those prior to 2007 should be done cautiously.

[e] Sport fish harvest for 2008 and 2009 unavailable. The most recent 5-year (2003–2007) sport fish harvest average used to estimate.

[f] Average for 2001–2009.

Appendix A16.–Coho salmon utilization, Kuskokwim River, Kuskokwim Management Area, 1960–2009.

Year	Commercial Harvest[a] Annual	Commercial Harvest[a] 10-yr Avg[c]	Subsistence Harvest[b] Annual	Subsistence Harvest[b] 10-yr Avg[c]	Test Fish Harvest	Sport Fish Harvest	Total Utilization	10-yr Avg Utilization[c]
1960	2,498	-	-	-	-	-	2,498	-
1961	5,044	-	-	-	-	-	5,044	-
1962	12,432	-	-	-	-	-	12,432	-
1963	15,660	-	-	-	-	-	15,660	-
1964	28,613	-	-	-	-	-	28,613	-
1965	12,191	-	-	-	-	-	12,191	-
1966	22,985	-	-	-	-	-	22,985	-
1967	56,313	-	-	-	-	-	56,313	-
1968	127,306	-	-	-	-	-	127,306	-
1969	83,765	-	-	-	-	-	83,765	-
1970	38,601	36,681	-	-	-	-	38,601	-
1971	5,253	40,291	-	-	-	-	5,253	-
1972	22,579	40,312	-	-	-	-	22,579	-
1973	130,876	41,327	-	-	-	-	130,876	-
1974	147,269	52,848	-	-	-	-	147,269	-
1975	81,945	64,714	-	-	-	-	81,945	-
1976	88,501	71,689	-	-	-	-	88,501	-
1977	241,364	78,241	-	-	-	-	241,364	-
1978	213,393	96,746	-	-	-	-	213,393	-
1979	219,060	105,355	-	-	-	-	219,060	-
1980	222,012	118,884	-	-	-	-	222,012	-
1981	211,251	137,225	-	-	-	-	211,251	-
1982	447,117	157,825	-	-	-	-	447,117	-
1983	196,287	200,279	-	-	-	1,375	197,662	-
1984	623,447	206,820	-	-	-	1,442	624,889	-
1985	335,606	254,438	-	-	-	136	335,742	-
1986	659,988	279,804	-	-	-	1,222	661,210	-
1987	399,467	336,953	-	-	-	1,767	401,234	-
1988	524,296	352,763	-	-	-	927	525,223	-
1989	479,856	383,853	52,917	-	-	2,459	482,315	-
1990	410,332	409,933	44,786	-	-	581	410,913	-
1991	500,935	428,765	50,369	-	-	1,003	501,938	-
1992	666,170	457,733	40,167	-	-	1,692	667,862	-
1993	610,739	479,638	31,737	-	-	980	611,719	480,899
1994	724,689	521,084	33,050	-	-	1,925	726,614	522,305
1995	471,461	531,208	36,276	-	-	1,497	472,958	532,477
1996	937,299	544,793	32,742	-	-	3,423	940,722	546,199
1997	130,803	572,524	29,035	-	33,703	2,408	195,949	574,150
1998	210,481	545,658	24,864	-	-	2,419	237,764	553,621
1999	23,593	514,277	25,004	37,594	213	1,998	50,808	524,875
2000	261,379	468,650	33,786	34,803	2,828	1,689	299,682	481,725
2001	192,998	453,755	29,504	33,703	1,723	1,204	225,429	470,602
2002	83,463	422,961	32,780	31,617	2,484	2,030	120,757	442,951
2003	284,064	364,691	35,240	30,878	570	3,244	323,118	388,240
2004	435,407	332,023	35,735	31,228	2,259	4,996	478,397	359,380
2005	142,319	303,095	27,613	31,497	1,499	3,539	174,970	334,558
2006	185,598	270,181	30,706	30,630	1,186	1,474	218,964	304,760
2007	141,049	195,011	25,107	30,427	1,557	2,504	170,217	232,584
2008	142,862	196,035	49,228 [d]	30,034	2,954	3,151 [e]	198,195	232,584
2009	104,546	189,273	29,631 [d]	32,470	2,204	3,151 [e]	139,532	230,011
10-yr Avg (1999-2008)	189,273		32,470		1,727	2,583	226,054	377,226

-continued-

Note: Dashes indicate no data.

[a] Districts 1 and 2 only. Harvest does not include personal use.

[b] Estimated subsistence harvest expanded from villages surveyed.

[c] Running 10-year average. Does not include most recent year.

[d] Numbers reported here are preliminary subsistence harvest estimates generated by Division of Commercial Fisheries. Methodology to estimate harvest has changed slightly since 2007 with the incorporation of stratified sampling. A revision of historical and 2009 estimates with those prior to 2007 should be done cautiously.

[e] Sport fish harvest for 2009 unavailable. The most recent 5-year (2001–2008) sport fish harvest average used to estimate.

Appendix A17.–Commercial salmon average mean weights and prices paid, Kuskokwim Area, Kuskokwim Management Area, 1967–2009.

	Average Weight (lb)					Average Price ($)				
Year	Chinook	Sockeye	Chum	Pink	Coho	Chinook	Sockeye	Chum	Pink	Coho
1967	27.8	7.4	7.0	[a]	5.9	0.13	0.05	0.04	[a]	0.09
1968	23.8	6.2	7.9	4.0	7.2	0.16	0.10	0.04	0.05	0.09
1969	19.6	6.2	5.8	3.6	7.3	0.19	0.15	0.07	0.06	0.10
1970	18.9	5.4	6.1	3.3	7.3	0.20	0.21	0.08	0.08	0.14
1971 [b]	26.2	6.9	6.4	[a]	6.1	0.17	0.10	0.08	[a]	0.13
1972	24.7	[a]	6.5	[a]	6.4	0.20	[a]	0.08	[a]	0.16
1973	26.7	[a]	6.8	[a]	5.8	0.25	[a]	0.19	[a]	0.26
1974	17.1	6.3	6.8	4.1	7.5	0.46	0.34	0.25	0.23	0.27
1975	14.9	[a]	6.4	[a]	8.2	0.54	[a]	0.26	[a]	0.31
1976 [c]	17.0	6.7	7.0	3.5	7.8	0.64	0.43	0.27	0.25	0.40
1977	22.7	8.3	7.3	3.9	7.8	1.15	0.45	0.45	0.25	0.65
1978	24.2	6.5	8.9	3.9	7.1	0.50	0.49	0.32	0.12	0.40
1979	16.6	6.9	7.0	3.9	7.9	0.66	0.53	0.37	0.11	0.75
1980	14.1	6.7	6.4	3.6	6.9	0.47	0.31	0.24	0.12	0.64
1981	17.8	7.2	7.5	3.5	6.4	0.84	0.61	0.23	0.11	0.63
1982	19.3	7.2	7.3	3.6	7.3	0.82	0.41	0.22	0.05	0.53
1983	18.8	6.8	7.4	3.5	6.8	0.54	0.51	0.33	0.05	0.39
1984	16.4	6.6	6.7	3.2	7.7	0.89	0.52	0.28	0.07	0.55
1985	17.0	7.0	7.1	3.6	7.5	0.71	0.59	0.25	0.05	0.51
1986	17.0	7.2	6.8	3.4	6.4	0.80	0.70	0.25	0.05	0.60
1987	15.2	7.5	6.8	3.7	7.2	1.10	1.30	0.27	0.10	0.73
1988	14.1	7.3	6.9	3.4	7.2	1.30	1.42	0.40	0.15	1.25
1989	16.6	7.2	6.8	3.4	7.3	0.75	1.20	0.26	0.05	0.55
1990	15.1	6.7	6.9	3.2	6.5	0.56	1.05	0.26	0.12	0.62
1991	15.3	6.9	6.3	3.4	6.5	0.56	0.67	0.31	0.12	0.45
1992	13.4	7.0	6.8	3.9	7.3	0.66	0.90	0.32	0.06	0.45
1993	14.3	7.1	6.5	3.4	6.6	0.62	0.70	0.40	0.25	0.58
1994	15.6	6.9	6.6	3.6	7.6	0.51	0.53	0.21	0.08	0.57
1995	17.3	6.9	6.9	3.7	7.2	0.60	0.71	0.18	0.12	0.41
1996	15.7	7.2	7.2	3.8	8.0	0.26	0.40	0.11	0.12	0.25
1997	16.2	7.1	7.3	2.7	7.5	0.28	0.42	0.12	0.10	0.33
1998	14.2	6.8	6.9	3.8	7.8	0.27	0.53	0.13	0.10	0.32
1999	15.5	6.5	7.3	3.0	6.6	0.32	0.58	0.10	0.05	0.32
2000	15.6	6.8	7.6	3.2	6.9	0.39	0.55	0.10	0.10	0.28
2001	20.0	7.6	7.5	[a]	7.7	0.36	0.35	0.10	[a]	0.28
2002	13.9	6.7	7.9	[a]	7.9	0.35	0.35	0.10	[a]	0.20
2003	13.6	7.3	8.0	[a]	6.9	0.35	0.44	0.21	[a]	0.10
2004	12.1	6.6	6.9	[a]	6.9	0.35	0.35	0.08	[a]	0.32
2005	14.5	6.7	6.7	3.7	7.4	0.59	0.55	0.05	0.05	0.27
2006	13.9	6.4	6.9	4.0	6.3	0.54	0.48	0.05	0.25	0.33
2007	14.1	6.6	6.8	[a]	7.2	0.59	0.53	0.05	[a]	0.38
2008	12.9	6.7	7.1	4.2	7.1	0.73	0.58	0.05	0.06	0.43
2009	13.1	6.5	6.9	3.5	7.6	0.71	0.56	0.15	0.00	0.35
10 Yr Avg (1999-2008)	14.6	6.8	7.3	3.6	7.1	0.46	0.48	0.09	0.10	0.29

[a] Information unavailable.

[b] Information on price per pound was not available for District 5.

[c] Information was not available for District 4.

Appendix A18.–Commercial salmon exvessel value, permits fished and average income, Kuskokwim Management Area, 1964–2009.

Year	Gross Value to Fishermen	Permits Fished[a]	Average Income
1964	83,030	-	-
1965	90,950	-	-
1966	87,466	-	-
1967	138,647	-	-
1968	290,370	-	-
1969	297,233	-	-
1970	362,470	-	-
1971	371,220	-	-
1972	360,727	-	-
1973	$827,735	-	-
1974	$1,056,042	-	-
1975	$899,178	-	-
1976	$1,380,229	-	-
1977	$3,891,950	-	-
1978	$2,337,470	-	-
1979	$3,678,000	-	-
1980	$2,725,134	923	$2,952
1981	$3,766,525	1066	$3,533
1982	$4,213,954	971	$4,340
1983	$2,670,400	1027	$2,600
1984	$5,809,000	774	$7,505
1985	$3,248,089	781	$4,159
1986	$4,746,089	790	$6,008
1987	$6,463,176	800	$8,079
1988	$12,726,198	813	$15,653
1989	$5,139,522	824	$6,237
1990	$4,881,640	823	$5,932
1991	$3,949,649	819	$4,823
1992	$5,345,791	814	$6,567
1993	$3,964,011	804	$4,930
1994	$5,117,729	793	$6,454
1995	$4,219,377	798	$5,287
1996	$2,876,547	714	$4,029
1997	$1,052,602	702	$1,499
1998	$1,635,311	707	$2,313
1999	$522,173	604	$865
2000	$1,191,529	623	$1,913
2001	$756,607	514	$1,472
2002	$323,659	407	$795
2003	$893,027	438	$2,039
2004	$1,484,357	467	$3,178
2005	$1,155,113	484	$2,387
2006	$1,143,807	453	$2,525
2007	$1,265,036	456	$2,774
2008	$1,487,111	462	$3,219
2009	$1,442,204	434	$3,323
10 Yr Avg (1999-2008)	$1,022,242	491	$2,117

Note: Dashes indicate no data.

[a] Number of permits that made at least one delivery.

Appendix A19.–Commercial salmon fishery entry permits by location, Kuskokwim Management Area, 1994–2009.

Village	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Akiachak	64	64	64	66	67	67	67	67	68	67	68	70	70	69	71	72
Akiak	24	24	23	23	24	23	23	23	24	24	22	22	20	20	21	18
Aniak	10	11	10	11	11	11	11	11	11	10	10	10	9	9	9	8
Atmautluak	27	28	28	28	27	26	27	27	26	26	24	23	22	21	19	17
Bethel	163	164	157	162	168	167	161	165	173	171	168	169	168	161	155	152
Chefornak	6	5	2	2	3	2	2	2	2	2	2	2	2	3	3	2
Chuathbaluk	2	2	2	2	2	2	1	2	2	2	0	1	0	0	0	0
Eek	39	39	40	37	37	36	39	38	39	36	37	37	38	37	37	38
Goodnews Bay	28	29	27	26	28	28	26	26	25	24	22	22	22	22	22	22
Hooper Bay	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0
Kalskag	8	5	8	7	7	7	7	4	3	3	3	3	4	2	2	2
Kasigluk	41	45	44	44	43	44	44	45	42	42	41	41	39	39	38	36
Kipnuk	17	18	17	16	15	15	15	14	14	13	13	11	11	11	9	9
Kongiganak	20	21	21	21	19	20	18	16	15	14	12	12	13	13	13	12
Kwethluk	62	57	58	57	55	56	57	55	49	49	49	49	52	49	47	48
Kwigillingok	20	20	18	19	18	19	19	17	17	15	15	15	13	12	11	11
Mekoryuk	1	2	2	1	1	0	0	0	0	0	0	0	0	0	1	0
Napakiak	41	37	39	39	39	39	38	38	35	33	32	34	33	33	32	36
Napaskiak	34	33	35	36	36	34	33	33	34	32	30	28	28	29	28	27
Newtok	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0
Nunapitchuk	47	46	48	48	46	46	46	46	46	44	44	42	43	42	41	41
Oscarville	3	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1
Platinum	5	5	4	4	4	4	5	4	4	3	3	4	4	4	3	4
Quinhagak	76	79	83	82	83	82	84	82	83	82	83	80	77	78	81	82
Sleetmute	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Toksook Bay	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0
Tuluksak	27	27	27	27	27	27	27	27	28	26	26	23	23	24	23	22
Tuntutuliak	43	43	44	45	43	42	42	43	43	41	41	39	39	41	40	41
Tununak	0	1	1	0	1	1	0	0	0	0	0		0	0	0	1
Kuskokwim Area Subtotal	809	809	806	806	807	800	794	788	787	763	749	740	733	722	709	703
Anchorage	10	8	12	11	11	13	16	16	16	17	18	16	18	20	21	18
Anchor Point			0	0	0	0	0	0	0	0	0	1	1	1	0	0
Atqasuk	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1
Dillingham	1	1	1	1	1	1	1	1	1	0	0	0	1	1	1	1
Fairbanks	2	3	2	2	1	1	1	1	1	1	1	1	2	2	2	2
Juneau	0	0	0	0	0	0	0	0	2	1	2	1	2	3	3	3

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Village	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Kenai	0	0	0	0	0	1	1	2	2	2	1	1	0	0	0	0
Manokotak	2	2	2	1	1	1	1	1	1	1	0	0	0	0	0	0
Noorvik	0	0	0	0	0	1	1	1	0	1	0	0	0	0	0	0
Palmer	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	2
Sitka	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	1
Stebbins			0	0	0	0	0	0	0	0	0	1	0	0	0	0
Togiak	1	1	1	1	0	0	0	0	1	1	0	0	0	0	0	0
Twin Hills	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1
Unalaska	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1
Wasilla	0	0	0	0	1	1	1	1	1	0	1	1	1	1	2	2
Non-Local AK Resident Subtotal	16	15	18	16	15	20	23	25	26	25	24	23	29	33	35	32
California		2	1	1	1	2	1	1	1	1	1	1	1	0	0	0
Oregon		1	1	1	1	1	1	1	1	1	1	1	0	0	0	0
Washington		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Residents of other States		3	3	3	3	3	3	2	2	2	2	4	4	5	5	4
Non-Resident Subtotal	0	7	6	6	6	7	6	5	5	5	5	7	6	6	6	5
Total Number of Permits	825	831	830	828	828	827	823	818	818	793	778	770	768	761	750	740

Appendix A20.–Commercial salmon fishing effort, Kuskokwim Management Area, 1970–2009.

Year	Unrestricted Mesh Season	Restricted Mesh Season	Coho Salmon Season	Total
1970	361	[a]	266	387
1971	418	216	83	422
1972	405	176	245	425
1973	456	341	411	530
1974	606	467	516	666
1975	472	540	533	737
1976	561	517	516	674
1977	563	522	572	653
1978	615	617	597	723
1979	591	617	613	685
1980	553	579	586	663
1981	589	613	586	679
1982	610	576	596	686
1983	544	619	577	679
1984	520	587	619	654
1985	[b]	598	627	654
1986	[b]	631	663	688
1987	[b]	680	694	703
1988	[b]	[c]	[c]	746

	Number of Permits Landing Each Species						
	Chinook	Sockeye	Coho	Pink	Chum	Roe	Total
1989	695	688	732	261	719	22	745
1990	724	722	714	526	736	1	744
1991	687	705	731	159	733	1	749
1992	711	706	706	520	722	0	741
1993	669	654	717	54	715	0	740
1994	651	666	682	664	700	0	706
1995	684	692	680	80	699	0	712
1996	482	514	615	196	593	17	620
1997	445	446	593	2	551	0	604
1998	555	568	580	48	589	0	618
1999	412	425	388	2	442	0	509
2000	210	328	515	5	353	0	532
2001	77	61	413	0	258	0	411
2002	59	31	318	0	270	0	318
2003	117	112	359	0	287	0	359
2004	279	248	383	0	346	0	390
2005	317	373	374	0	393	0	403
2006	237	295	363	1	341	0	379
2007	115	233	366	0	354	0	367
2008	233	235	344	1	328	0	374
2009	271	273	321	1	323	0	342
10-yr Avg (1999-2008)	206	234	382	1	337	0	404

[a] No commercial salmon season.

[b] No unrestricted mesh season.

[c] Fishery continued without interruption.

Appendix A21.–Commercial freshwater finfish harvest, Kuskokwim Management Area, 1977–2009.

Year	Number of Fishermen[b]	Number Caught[a]		Total Weight (lbs)		Total Value ($)		
		Whitefish[c]	Burbot	Whitefish	Burbot	Whitefish	Burbot	Total
1977	3	718	0	[d]	0	952	0	952
1978	[b]	1,735	0	6,017	0	d	0	d
1979	[b]	3,219	0	11,211	0	d	0	d
1980	4	603	0	2,173	0	830	0	830
1981	4	1,197	0	4,620	0	2,310	0	2,310
1982	5	1,512	0	6,219	0	2,856	0	2,856
1983	0	0	0	0	0	0	0	0
1984	2	0	651	0	d	0	[d]	[d]
1985	5	555	1,829	2,275	2,016	1,137	455	1,592
1986	3	0	0	0	3,428	0	857	857
1987	4	417	0	1,260	0	1,008	0	1,008
1988	3	[d]	[d]	2,588	7	1,991	3	1,994
1989	7	178	282	583	270	501	597	1,098
1990	11	1,664	[d]	5,502	10	5,166	5	5,171
1991	5	1,413	41	2,442	256	2,412	197	2,609
1992	6	2,124	18	6,309	86	6,285	43	6,328
1993	5	2,509	0	5,208	0	4,898	0	4,898
1994	3	2,393	0	4,905	0	4,345	0	4,345
1995	1	[d]	0	2,363	0	2,507	0	2,507
1996	2	3,139	0	4,915	0	4,776	0	4,776
1997	14	4,447	0	5,770	0	4,832	0	4,832
1998	0	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0
2002	1	193	0	339	0	339	0	339
2003	1	646	0	1,163	0	1,192	0	1,192
2004	0	0	0	0	0	0	0	0
2005	0	0	0	0	0	0	0	0
2006	0	0	0	0	0	0	0	0
2007	0	0	0	0	0	0	0	0
2008	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0

[a] Does not include catches incidental to the commercial salmon fishery.

[b] Does not include fishermen who delivered catches incidental to the commercial salmon fishery.

[c] Includes cisco, pike, and blackfish.

[d] Data not available.

APPENDIX B

Appendix B1.–Salmon assessment programs, Kuskokwim Management Area, 2009.

Project Name	Location	Primary Objectives	Duration	Agency	Responsibility
Salmon Management	Kuskokwim Area	- develop a comprehensive plan for managing salmon stocks of the Kuskokwim Area. - define goals and objectives. - identify potential opportunities and concerns. - recommend appropriate procedures. - evaluate priorities. - provide sustained yield fishery Management	All Year	ADFG/CF ADFG/SF OSM KRSMWG	all aspects all aspects monitor regulations and inseason actions make recommendations
Postseason Subsistence Catch and Effort Assessment	Kuskokwim Area	- document and estimate the catch and associated effort of the subsistence salmon fisheries via interviews, catch calendars, mail-out questionnaires and telephone interviews. - Household surveys in Bethel - Household surveys in Aniak.	Post-season	ADFG/S ONC KNA OSM	all aspects survey crew survey crew funding - Bethel & Aniak
Age-Sex-Length (ASL) Processing and Reporting	Kuskokwim Area	- scale aging, sample processing and reporting for salmon age, sex and length information about of Chinook, sockeye, chum and coho salmon from escapement, and commercial and subsistence fisheries.	All Year	ADFG/CF OSM	all aspects funding
Escapement (ASL) Sampling	Kuskokwim Area	- sample collection for age, sex and length information about of Chinook, sockeye, chum and coho salmon from tributary spawning populations monitored with weir or sonar.	June - Sept	ADFG/CF OSM	all aspects funding
Aerial Surveys	Kuskokwim Area	- index relative abundance of Chinook salmon spawning escapement in selected streams throughout the Kuskokwim Area. - index relative abundance of sockeye salmon spawning escapement in the Kanektok and Goodnews Rivers. - September reconnaissance flights in the upper Kuskokwim river for fall chum salmon	July - Aug	ADFG/CF NMFS	all aspects Funding - Upper Kusko
Sport Catch, Harvest and Effort Assessment	Kuskokwim Area	- statewide mail-out survey to estimate sport catch, harvest and effort	post-season	ADFG/SF	all aspects
Chum Genetic Sampling	Kuskokwim Area	- collect genetic baseline samples from discreet spawning populations (Tatlawiksuk River) - collect genetic mixed-stock samples for Kalskag (ADF&G fish wheels) as part of Fall Chum salmon study.	June - July	ADFG/CF KNA OSM AYK SSI	all aspects sample collection funding Fall Chum
Coho Genetic Sampling	Kuskokwim Area	- collect genetic baseline samples from discreet spawning populations (MF Goodnews weir, Kanektok Weir, Kwethluk weir, Kisaralik River, Tuluksak weir, Salmon River (Aniak), George weir, Tatlawiksuk weir, Takotna weir, South Fork Kuskokwim River at Nikolia (from fish wheels)	August - September	ADFG/CF USFWS KNA TATC OSM	all aspects sample collection sample collection sample collection funding
Commercial Catch and Effort Assessment	Districts 1, 2, 4 and 5	- document and estimate the catch and associated effort of the commercial salmon fishery via receipts (fish tickets) of commercial sales and dock side sampling.	June - Sept	ADFG/CF	all aspects

- continued -

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Project Name	Location	Primary Objectives	Duration	Agency	Responsibility
Commercial Catch ASL Sampling	Districts 1, 4 and 5	- determine age, sex, and length of salmon harvested in the commercial fisheries.	June - Aug	ADFG/CF	all aspects
Lower Kuskokwim River In-Season Subsistence Harvest Monitoring	Lower Kuskokwim River	- weekly interviews with subsistence fishers in lower Kuskokwim River to assess adequacy and quality of harvest - collect age-sex-length samples from subsistence caught Chinook salmon in the lower Kuskokwim River to determine composition of Kuskokwim River subsistence harvest.	June-August	ADFG/S ADFG/CF ONC OSM -	all aspects Chinook ASL collection all aspects - Bethel funding -
Kuskokwim River Fall Chum Salmon Investigation	Kuskokwim River	- describe the distribution, morphology, and biology of adult fall chum salmon in comparison to summer chum salmon; assess the run timing and relative abundance of adult fall chum salmon in the lower Kuskokwim River.	June - Sept	ADFG/CF AYK SSI	all aspects funding
Kuskokwim River Mark-Recapture	RM. 179	- Spaghetti tags were deployed on sockeye, chum, and coho salmon caught near Kalskag in the mainstem Kuskokwim River and recovered upstream in the mainstem and at several tributaries to determine stock-specific run timing, stock-specific travel speed, and to estimate total coho salmon run abundance using a two-sample mark–recapture design.	June 7-Sept 10.	ADFG/CF ADFG/SF KNA USFWS OSM	all aspects crew support crew support, tag recovery crew support funding
Kuskokwim River Radio Telemetry	RM. 221	- estimate escapement and distribution of Chinook salmon passing upstream of Kalskag	June - Sept	ADFG/S KNA ADFG/CF OSM	all aspects crew support tag recovery funding
Bethel Test Fishery	Bethel Area RM. 80	- index relative run timing of Chinook, sockeye, chum, and coho salmon using drift gillnets - index relative run abundance of Chinook, sockeye, chum, and coho salmon using CPUE derived from drift gillnet catches.	June - Aug	ADFG/CF ONC OSM	all aspects crew support funding ONC crew
Heavy Metal Sampling	Bethel Area RM. 80	- collect whole Chinook, chum, sockeye pink and coho salmon for examination of heavy metal content.	June - Aug	DEC ADFG/CF ONC	all aspects sample collection
Kwethluk River Weir	mile 55 Kwethluk River RM. 99	- estimate daily escapement of Chinook, sockeye, chum, coho and pink salmon into the Kwethluk River. - estimate age, sex and length composition of Chinook, chum, and coho salmon escapement. - collect environmental / habitat information	June - Sept	USFWS ADFG/CF OVK ONC	all aspects inseason data mgt. crew support funding
Tuluksak River Weir	mile 47 Tuluksak River RM. 136	- estimate daily escapement of Chinook, sockeye, chum, coho, and pink salmon into the Tuluksak River. - estimate age, sex and length composition of Chinook, chum, and coho salmon escapement. - collect environmental / habitat information	June - Sept	USFWS ADFG/CF TUTC OSM	all aspects inseason data mgt. crew support funding
Aniak River Sonar	mile 12 Aniak River RM. 225	- estimate daily escapement of salmon into the Aniak River. - estimate age, sex and length composition of chum salmon escapement	June - July	ADFG/CF AVCP BSFA	all aspects crew support funding funding AVCP crew

-continued-

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Project Name	Location	Primary Objectives	Duration	Agency	Responsibility
George River Weir	mile 4 George River RM. 309	- estimate daily escapement of Chinook, sockeye, chum, pink, and coho salmon into the George River. - estimate age, sex and length composition of Chinook, chum, and coho salmon escapement. - collect environmental / habitat information	June - Sept	KNA ADFG/CF BSFA OSM NMFS	all aspects all aspects funding
Holitna River Radio Telemetry	RM. 335	- estimate escapement and distribution of Chinook, chum, and coho salmon into the Holitna River sub-basin.	June - Sept	ADFG/S KNA ADFG/CF OSM	all aspects crew support tag recovery funding
Kogrukluk River Weir	mile 136 Holitna River Drainage RM. 335	- estimate daily escapement of Chinook, sockeye, chum, and coho salmon into the Kogrukluk River. - estimate age, sex and length composition of Chinook, chum, and coho salmon escapement	June - Sept	ADFG/CF ONC ~~NMFS~~ OSM	all aspects crew support funding
Tatlawiksuk River Weir	mile 2.5 Tatlawiksuk River RM. 383	- estimate daily escapement of Chinook, sockeye, chum, pink, and coho salmon into the Tatlawiksuk River. - estimate age, sex and length composition of Chinook, chum, and coho salmon escapement. - collect environmental / habitat information	June - Sept	KNA ADFG/CF BSFA ~~NMFS~~ OSM	all aspects all aspects funding
Takotna River Weir	mile 52 Takotna River RM. 507	- estimate daily escapement of Chinook, chum, and coho salmon into the Takotna River. - estimate age, sex and length composition of Chinook, chum, and coho salmon escapement. - collect environmental / habitat information	June - Sept	TATC ADFG/CF BSFA ~~NMFS~~ OSM	all aspects planning & supplies funding
Kanektok River Weir	~ mile 13 Kanektok River Kuskokwim Bay	- estimate daily escapement of Chinook, sockeye, chum, pink, and coho salmon into the Kanektok River. - estimate age, sex and length composition of Chinook and chum salmon escapement.	June - Sept	NVK ADFG/CF OSM BSFA	all aspects planning & supplies funding funding
Middle Fork Goodnews River Weir	~ mile 5 Middle Fork Goodnews River Kuskokwim Bay	- estimate daily escapement of Chinook, sockeye, chum, pink, and coho salmon into the Middle Fork Goodnews River. - estimate age, sex and length composition of Chinook, sockeye, chum, and coho salmon escapement	June - Sept	ADFG/CF OSM	all aspects funding for coho extension

Notes:

ADFG/CF = Division of Commercial Fisheries, Alaska Department of Fish and Game
ADFG/S = Division of Subsistence, Alaska Department of Fish and Game
ADFG/SF = Division of Sport Fish, Alaska Department of Fish and Game
AVCP = Association of Village Council Presidents
BIA = Bureau of Indian Affairs
BSFA = Bering Sea Fishermen's Association
DEC = Department of Environmental Conservation
KNA = Kuskokwim River Native Association
NVK = Native Village of Kwinhagak
ONC = Orutsararmuit Native council
OSM = Federal Office of Subsistence Management
OVK = Organized Village of Kwethluk
TATC = Takotna Tribal Council
TUTC = Tuluksak Traditional Council
USFWS = U.S. Fish and Wildlife Service

Appendix B2.–Salmon spawning escapement objectives, Kuskokwim Management Area, 2009.

Area	Escapement Objectives [a]							
	Chinook		Sockeye		Coho		Chum	
	Goal	Enumeration Method	Goal	Enumeration Method	Goal	Enumeration Method	Goal	Enumeration Method
Kuskokwim River								
Kwethluk River	6,000-11,000	Weir	-	-	>19,000[b]	Weir	-	-
Kisaralik River	400-1,200	Aerial Survey	-	-	-	-	-	-
Salmon River (Aniak)	330-1,200	Aerial Survey	-	-	-	-	-	-
Aniak River	1,200-2,300	Aerial Survey	-	-	-	-	210,000-480,000	Sonar
George River	3,100-7,900	Weir	-	-	-	-	-	-
Holitna River	970-2,100	Aerial Survey	-	-	-	-	-	-
Kogrukluk Weir	5,300-14,000	Weir	4,400-17,000[b]	Weir	13,000-28,000	Aerial Survey	15,000-49,000	Weir
Cheneetnuk River	340-1,300	Aerial Survey	-	-	-	-	-	-
Tuluksak River	1,000-2,100	Weir	-	-	-	-	-	-
Gagaraya River	300-830	Aerial Survey	-	-	-	-	-	-
Pitka Fork (Salmon River)	470-1,600	Aerial Survey	-	-	-	-	-	-
Kuskokwim Bay								
Kanektok River to Kagati Lake	3,500-8,000	Aerial Survey	14,000-34,000	Aerial Survey	-	-	>5,200	Aerial Survey
Goodnews River (mainstem)	640-3,300	Aerial Survey	5,500-19,500	Aerial Survey	-	-	-	-
Middle Fork Goodnews River	1,500-2,900	Weir	18,000-40,000	Weir	>12,000	Weir	>12,000	Weir

Note: Dash means goal not established.

Source: Volk et al. 2009.

[a] All goals are SEGs except for BEGs established for Chinook and sockeye salmon at Middle Fork Goodnews River.

[b] Goal not in effect until 2010 season.

Appendix B3.–Chinook salmon spawning aerial survey index estimates, Kuskokwim River Drainage, Kuskokwim Management Area, 1979–2009.

	Lower Kuskokwim				Middle Kuskokwim							Upper Kuskokwim		
Year	Eek	Kwethluk	Kisaralik	Tuluksak	Aniak	Kipchuk (Aniak)	Salmon (Aniak)	Holokuk	Oskawalik	Holitna	Kogrukluk Weir	Gagarayah	Cheeneetnuk	Salmon (Pitka)
1975					202	94								
1976		997								2,571	5,579	663		
1977		1,116		439				60				897	1,407	1,940
1978		1,722	2,417	403			322			2,766	13,667	504		1,100
1979	-	-	-	-	-	-	-	45	-	-	11,338	-	-	682
1980	2,378	-	-	1,035	-	-	1,186	-	-	-	-	-	-	1,450
1981	-	2,034	672	-	9,074	-	-	-	-	-	16,655	-	-	1,439
1982	-	471	81	-	-	-	-	42	-	521	10,993	-	-	413
1983	188	-	-	202	1,909	-	231	33	-	1,069	-	-	-	572
1984	-	-	-	-	-	-	-	-	-	-	4,926	-	1,177	545
1985	1,118	51	63	142	-	-	-	135	-	-	4,619	-	1,002	620
1986	-	-	-	-	424	-	336	100	-	650	5,038	-	317	-
1987	1,739	-	-	-	-	193	516	210	193	-	-	205	-	-
1988	2,255	-	869	188	954	-	244	-	80	-	8,506	-	-	473
1989	1,042	610	152	-	2,109	994	631	-	-	-	11,940	-	-	452
1990	-	-	631	200	1,255	537	596	157	113	-	10,218	-	-	-
1991	1,312	-	217	358	1,564	885	583	-	-	-	7,850	-	-	-
1992	-	-	-	-	2,284	670	335	64	91	2,022	6,755	328	1,050	2,536
1993	-	-	-	-	2,687	1,248	1,082	114	103	1,573	12,332	419	678	1,010
1994	-	-	1,243	-	-	1,520	1,218	-	-	-	15,227	807	1,206	1,010
1995	-	-	1,243	-	3,171	1,215	1,446	181	326	1,887	20,630	1,193	1,565	1,911
1996	-	-	-	-	-	-	985	85	-	-	14,199	-	-	-
1997	-	-	-	-	2,187	855	980	165	1,470	2,093	13,280	-	345	-
1998	522	126	457	-	1,930	443	557	-	-	-	-	-	-	-
1999	-	-	-	-	-	-	-	18	98	-	5,570	-	-	-
2000	-	-	-	-	714	182	238	42	-	301	3,181	-	-	362
2001	-	-	-	-	-	-	598	-	186	1,130	9,298	143	-	1,033
2002	-	1,795	1,727	-	-	1,615	1,236	186	295	1,578	10,059	452	-	1,255
2003	1,236	2,628	654	94	3,514	1,493	1,242	528	844	-	11,760	1,095	810	1,391
2004	4,653	6,801	6,913	1,196	5,569	1,868	2,177	539	293	4,842	19,440	670	918	1,138
2005	-	5,059	4,112	672	-	1,944	4,097	510	582	2,795	22,000	788	1,155	1,809
2006	-	-	4,734	-	5,639	1,618	-	705	386	3,924	19,414	531	1,015	928
2007	-	-	1,373	173	3,984	2,147	1,458	146	73	1,894	13,029	1,035	-	1,014
2008	-	487	1,493	-	3,222	1,061	589	190	213	832	9,730	177	290	1,305
2009	-	-	-	-	-	-	-	565	378	-	9,517	303	323	632
SEG[a]		580-1,800	400-1,200		1,200-2,300		330-1,200			970-2,100	5,300-14,000	300-830	340-1,300	470-1,600

Note: Estimates are from "peak" aerial surveys conducted between 20 and 31 July with fair or good overall rankings. Dashes denote no information available.

Appendix B4.–Salmon spawning escapement estimates, Kwethluk River, Kuskokwim River Drainage, 1992–2009.

		Kwethluk River				
Year	Operating Period [a]	Chinook	Sockeye	Chum	Pink [b]	Coho
Weir						
1992	06/20 to 09/12	9,675	1,316	30,595	45,952	45,605
Counting Tower						
1996	06/21 to 07/27	7,415	[c]	[c]	[c]	
1997	06/20 to 08/12	10,395	1,374	10,659	[c]	
1998	07/24 to 08/18	[c]	[c]	[c]	[c]	
1999	07/15 to 08/18	[c]	[c]	[c]	[c]	
Weir						
2000	06/22 to 09/15	3,547	358	11,691	1,407	25,610
2001	08/12 to 09/15	[b]	[b]	[b]	[b]	21,596
2002	06/22 to 09/19	8,502	272	35,854	1,415	23,298
2003	06/20 to 09/14	14,474	2,928	41,812	1,885	107,789
2004	06/25 to 09/10	28,605	3,490	38,646	3,054	64,216
2005		Weir did not operate				
2006	06/20 to 09/19	17,619	6,732 [c]	47,490	1,685	25,664[d]
2007	6/20 to 09/10	13,267	5,262	57,230	628	19,473
2008	6/15 to 09/10	5,312	2,451	20,048	335	49,973
2009	6/29 to 09/9	5,710	4,385	32,028	1,118	21,911
SEG		6,000-11,000				>19,000[e]

[a] The operational period is inclusive of days when passage was estimated; unless noted otherwise, less than 20% of the total annual escapement is estimated.

[b] Pink salmon numbers are not estimated or underestimated, weirs pickets are not small enough to keep pink salmon from going through.

[c] Field operations were incomplete and no total annual escapement was estimated.

[d] Field operations were incomplete; more than 20% of the total annual escapement is based on daily passage estimates.

[e] Goal goes into effect in 2010.

Appendix B5.–Salmon spawning escapement estimates, Tuluksak River, Kuskokwim River Drainage, 1991–2009.

Tuluksak River Weir						
Year	Operating Period [a]	Chinook	Sockeye	Chum	Pink[b]	Coho
1991	06/12 to 09/18	697	34	7,675	392	4,651
1992	06/24 to 09/10	1,083	129	11,183	2,470	7,501
1993	06/17 to 09/10	2,218	88	13,804	210	8,328
1994	06/29 to 09/11	2,917	82	15,724	3,487	7,952 [c]
2001	06/29 to 09/10	997 [c]	137	19,321	48	23,768 [c]
2002	06/10 to 09/10	1,346	82	9,958	27	11,487
2003	06/16 to 09/14	1,064	288	11,724	662	41,071
2004	06/20 to 09/10	1,475	136	11,796	496	20,336
2005	06/24 to 09/09	2,653	642	35,696	2475	11,324
2006	06/24 to 09/10	1,044	985	25,648	2445	5,438 [c]
2007	06/20 to 09/10	374	352	17,286	64	2,807
2008	06/20 to 09/13	665	185	12,518	111	7,457
2009	06/26 to 09/09	404	708	13,658	49	8,137
SEG		1,000-2,100				

[a] The operational period is inclusive of days when passage was estimated; unless noted otherwise, less than 20% of the total annual escapement is estimated.

[b] Pink salmon numbers are not estimated or underestimated, weirs pickets are not small enough to keep pink salmon from going through.

[c] Field operations were incomplete and no total annual escapement was estimated.

Appendix B6.–Salmon spawning escapement estimates, George River, Kuskokwim River drainage, 1996–2009.

Year	Operating Period [a]	Chinook	Sockeye	Chum	Pink[b]	Coho
George River Weir						
1996	06/15 to 09/20	7,716	98 [c]	19,393	644	-
1997	06/09 to 09/20	7,823	445	5,907	17	9,210
1998	06/15 to 09/20	- [d]	- [d]	- [d]	4	-
1999	06/15 to 09/25	3,548 [c]	39	11,552 [c]	97	8,914
2000	06/15 to 09/20	2,960	22	3,492	61	11,262
2001	06/15 to 09/22	3,309	24	11,601	83	14,398
2002	06/15 to 09/20	2,444	17	6,543	630	6,759
2003	06/15 to 09/20	4,693 [c]	16	33,666 [c]	158	33,280
2004	06/15 to 09/24	5,207	177	14,409	36	12,499
2005	06/15 to 09/20	3,845	276	14,828	79	8,200
2006	06/15 to 09/20	4,357	164	41,467	1,232	11,296
2007	06/14 to 09/20	4,883	74	55,842 [c]	325	29,317
2008	06/15 to 09/22	2,698	94	29,978	2,444	21,931
2009	06/17 to 09/20	3,663	54	7,941	318	12,573
SEG		3,100-7,900				

[a] The operational period is inclusive of days when passage was estimated; unless noted otherwise, less than 20% of the total annual escapement is estimated.

[b] Pink salmon numbers are not estimated or underestimated, weirs pickets are not small enough to keep pink salmon from going through.

[c] Field operations were incomplete; more than 20% of the total annual escapement is based on daily passage estimates.

[d] Field operations were incomplete and no total annual escapement was estimated.

Appendix B7.–Salmon spawning escapement estimates, Kogrukluk River, Kuskokwim River drainage, 1969–2009.

Year	Operating Period [a]	Chinook	Sockeye	Chum	Pink [c]	Coho
Kogrukluk River Tower [b]						
1969	07/01 to 07/31	2,980	269	6,824	9	0
1970	07/01 to 07/31	3,868	1,695	7,726	7	0
1971	07/01 to 07/31	[d]	[d]	[d]	[d]	[d]
1972	07/01 to 07/31	1,934	714	8,981	4	0
1973	07/01 to 07/31	1,725	205	5,318	0	0
1974	07/01 to 07/31	3,724	290	4,881	5	0
1975	07/01 to 07/31	1,970	2,305	8,290	3	0
1976	07/01 to 07/31	3,261	4,433	9,170	4	0
1977	07/01 to 07/31	1,988	2,140	5,047	10	0
1978	07/01 to 07/31	6,712	746	16,514	9	0
Kogrukluk River Weir						
Escapement Goal:		10,000		30,000		25,000
1976	06/29 to 07/31	5,600	2,326	8,117	0	[d]
1977	07/14 to 07/27	1,385	1,112	10,388	2	[d]
1978	06/28 to 07/31	13,667	1,670	48,125	2	[d]
1979	07/01 to 07/24	11,338	2,628	18,599 [e]	1	[d]
1980	07/01 to 07/11	6,572 [f]	3,200 [f]	41,777 [f]	0	[d]
1981	06/27 to 10/05	16,809	18,077	57,374	5	11,455
1982	07/09 to 09/14	10,993 [e]	17,297 [e]	64,077 [e]	17	37,796
1983	06/23 to 09/27	3,025 [e]	1,176 [e]	9,416 [e]	0	8,538
1984	06/19 to 09/15	4,928	4,133	41,484	17	27,595
1985	07/06 to 09/24	4,625	4,359	15,005	7	16,441
1986	06/29 to 09/07	5,038 [e]	4,247 [e]	14,693	10	22,506 [e]
1987	07/15 to 09/24	4,063 [e]	973 [e]	17,422 [e]	1	22,821
1988	07/05 to 09/17	8,520	4,402	39,543 [e]	23	13,512
1989	07/07 to 08/24	11,940 [e]	5,810 [e]	39,547 [e]	2	1,272
1990	06/28 to 09/07	10,214	8,407	26,765	1	6,132 [e]
1991	07/04 to 09/15	7,850 [e]	16,455	24,188	2	9,964 [e]
1992	07/01 to 08/21	6,755	7,539	34,104	10	26,057 [e]
1993	07/02 to 09/06	12,333	29,366	31,901	1	20,517 [e]
1994	07/02 to 09/14	15,227 [e]	14,192 [e]	46,635 [e]	2	34,695 [e]
1995	07/02 to 09/06	20,651	10,996	31,265	9	27,862 [e]
1996	06/29 to 09/15	14,199	15,386	48,494	1	50,555

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Year	Operating Period [a]	Chinook	Sockeye	Chum	Pink [b]	Coho
1997	06/28 to 09/21	13,285	13,078	7,958	0	12,238
1998	07/18 to 09/19	12,107 [e]	16,773 [e]	36,441 [e]	0	24,348
1999	07/06 to 09/18	5,570	5,864	13,820	0	12,609
2000	07/02 to 09/20	3,310	2,865	11,491	0	33,135
2001	06/21 to 09/25	9,298 [e]	8,776 [e]	30,570 [e]	9	19,387
2002	06/26 to 09/24	10,104	4,050	51,570	0	14,516
2003	06/15 to 09/20	11,771	9,164	23,413	3	74,604
2004	06/21 to 09/18	19,651	6,775	24,201	16	27,041
2005	06/22 to 09/22	22,000	37,939	197,723	114	24,116
2006	06/28 to 09/14	19,414	60,807	180,594	1676 [e]	17,011 [e]
2007	06/26 to 09/23	13,029 [e]	16,525 [e]	49,505 [e]	48 [e]	27,033
2008	07/03 to 09/30	9,730	19,675	44,978	1081	29,661
2009	06/25 to 09/27	9,702	23,785	84,940	60	22,981
SEG		5,300-14,000		15,000-49,000		13,000-28,000

[a] The operational period is inclusive of days when passage was estimated; unless noted otherwise, less than 20% of the total annual escapement is estimated.

[b] The Kogrukluk River tower was located approximately 6 miles upstream of the current Kogrukluk River weir, and upstream of Shotgun Creek.

[c] Pink salmon numbers are not estimated or underestimated, weirs pickets are not small enough to keep pink salmon from going through.

[d] Field operations were incomplete and no total annual escapement was estimated.

[e] Field operations were incomplete; more than 20% of the total annual escapement is based on daily passage estimates.

[f] Field operations were incomplete; sum of daily counts is an underestimate of total escapement, but considered reasonable. Additional estimates were not made.

Appendix B8.–Salmon spawning escapement estimates, Aniak River, Kuskokwim River drainage, 1980–2009.

Year	Operating Period [a]	Chinook	Chum	Coho
Aniak River Sonar [b]				
Escapement Goal:			250,000	
Non user-configurable, one-bank expanded estimates				
1980	06/22 to 07/31	56,469	1,600,032	-
	08/16 to 09/12			81,556
1981	06/15 to 08/05	42,060	649,849	-
1982	06/21 to 08/01	33,864	529,758	-
1983	06/19 to 07/31	4,911	166,452	-
1984	06/19 to 07/31	-	317,688	-
1985	06/22 to 07/31	-	273,306	-
1986	06/25 to 07/31	-	219,770	-
1987	06/21 to 07/31	-	204,834	-
1988	06/23 to 07/31	-	485,077	-
1989	06/23 to 07/31	-	295,993	-
1990	06/23 to 08/04	-	246,813	-
1991	6/22 to 08/05	-	366,687	-
1992	06/15 to 08/06	-	87,467	-
1993	06/15 to 08/06	-	15,278	-
1994	06/26 to 08/06	-	474,356	-
1995	06/23 to 07/23	-	- [c]	-
User-configurable, two-bank estimates				
1996	06/21 to 07/31	-	402,195	-
1997	06/16 to 08/03	-	289,654	-
1998	06/24 to 07/31	-	351,792	-
1999	06/26 to 08/03	-	214,429	-
2000	06/26 to 07/31	-	177,384	-
2001	06/26 to 07/31	-	408,830	-
2002	06/26 to 07/31	-	472,346	-
2003	06/26 to 07/31	-	477,544	-
2004	06/25 to 07/31	-	672,931	-
2005	06/22 to 07/31	-	1,151,505	-
2006	06/26 to 07/31	-	1,108,626	-
2007	06/24 to 07/31	-	696,801	-
2008	06/26 to 07/31	-	427,911	-
2009	06/26 to 07/31	-	479,531	-
SEG			220,000-480,000	

Note: Dashes indicate no data.

[a] The operational period is inclusive of days when passage was estimated; unless noted otherwise, less than 10% of the total annual escapement is estimated.

[b] Sonar counts for the Aniak River are generally not apportioned to species, but chum salmon dominate throughout most of the project operational period. The minimum target operational period is defined here as June 26 to July 28.

[c] Field operations were incomplete and no total annual escapement was estimated.

Appendix B9.–Salmon spawning escapement estimates, Tatlawiksuk River, Kuskokwim River drainage, 1998–2009.

Year	Operating Period [a]	Chinook	Sockeye	Chum	Pink [b]	Coho
Tatlawiksuk River Weir						
1998	06/15 to 09/20	[c]	[c]	[c]	[c]	[c]
1999	06/15 to 09/20	1,490	6	9,599	1	3,455
2000	06/15 to 09/20	810	0	6,965	[c]	[c]
2001	06/15 to 09/20	2,010	3	23,718	3 [d]	10,539 [d]
2002	06/15 to 09/22	2,237	1	24,542	1	11,345
2003	06/15 to 09/20	1,683 [d]	[c]	[c]	[c]	[c]
2004	06/15 to 09/20	2,833	10	21,245	0	16,410
2005	06/12 to 09/22	2,918	77	55,720	1	7,495
2006	06/15 to 09/20	1,700	41	32,301	20	9,453 [d]
2007	06/14 to 09/20	2,061	27	83,246	7	8,685
2008	06/15 to 09/20	1,071	39	30,896	19	11,065
2009	06/15 to 09/20	1,071	39	19,975	3	10,148

[a] The operational period is inclusive of days when passage was estimated; unless noted otherwise, less than 20% of the total annual escapement is estimated.

[b] Pink salmon numbers are not estimated or underestimated, weirs pickets are not small enough to keep pink salmon from going through.

[c] Field operations were incomplete and no total annual escapement was estimated.

[d] Field operations were incomplete; more than 20% of the total annual escapement is based on daily passage estimates.

Appendix B10.–Salmon spawning escapement estimates, Takotna River, Kuskokwim River drainage, 1998–2009.

Year	Operating Period [a]	Chinook	Sockeye	Chum	Coho
Takotna River Tower					
1995	06/24 to 09/20	- [b]	- [b]	- [b]	- [b]
1996	06/15 to 09/20	422	-	2,872	-
1997	06/17 to 09/20	1,197	-	1,839	-
1998	06/24 to 09/20	- [b]	- [b]	- [b]	- [b]
1999		Weir was not operational			
Takotna River Weir					
2000	06/24 to 09/20	345	4	1,254	3,957
2001	06/23 to 09/20	721	1	5,414	2606
2002	06/23 to 09/22	316	1	4,377	3984
2003	06/24 to 09/20	378	4	3,393	7,171
2004	06/23 to 09/20	461	17	1,630	3,207
2005	06/10 to 09/20	499	35	6,467	2,216
2006	06/16 to 09/22	539	60	12,598	5,548
2007	06/20 to 09/20	418	14	8,900	2,853
2008	06/20 to 09/23	413	13	5,691	2,817
2009	06/24 to 09/25	311	4	2,487	2,708

Note: Pink salmon numbers are not estimated because weirs pickets are not small enough to keep pink salmon from going through. Dash denotes no information available.

[a] The operational period is inclusive of days when passage was estimated; unless noted otherwise, less than 20% of the total annual escapement is estimated.

[b] Field operations were incomplete and no total annual escapement was estimated.

APPENDIX C

Appendix C1.–Commercial salmon fishing periods, hours, and permits fished, District W-4 Quinhagak, Kuskokwim Bay, 1970–2009.

Year	Number of Periods	Fishing Hours	Permits Fished[a]
1970	14	1,494	88
1971	6	630	61
1972	16	192	107
1973	28	504	109
1974	30	360	196
1975	24	288	127
1976	27	324	181
1977	27	324	258
1978	37	444	200
1979	36	432	206
1980	36	432	169
1981	33	396	186
1982	34	408	177
1983	28	318	226
1984	33	396	263
1985	23	276	300
1986	29	348	324
1987	19	216	310
1988	32	384	288
1989	29	348	227
1990	30	444	390
1991	31	372	346
1992	34	420	349
1993	32	384	409
1994	32	384	308
1995	35	414	382
1996	27	298	218
1997	31	372	289
1998	34	408	203
1999	19	228	218
2000	27	324	230
2001	20	231	159
2002	24	294	114
2003	24	288	114
2004	24	288	116
2005	23	276	145
2006	29	348	132
2007	33	396	125
2008	31	372	146
2009	29	342	179
10 Yr Avg (99-08)	25	305	150
Hist Avg (70-08)	28	386	215

[a] Permits that made at least one delivery during the year.

Appendix C2.–Commercial salmon harvests District W-4, Quinhagak, Kuskokwim Bay, 1960–2009.

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1960	0	5,649	3,000	0	0	8,649
1961	4,328	2,308	46	90	18,864	25,636
1962	5,526	10,313	0	4,340	45,707	65,886
1963	6,555	0	0	0	0	6,555
1964	4,081	13,422	379	939	707	19,528
1965	2,976	1,886	0	0	4,242	9,104
1966	278	1,030	0	268	2,610	4,186
1967	0	652	1,926	0	8,087	10,665
1968	8,879	5,884	21,511	75,818	19,497	131,589
1969	16,802	3,784	15,077	953	38,206	74,822
1970	18,269	5,393	16,850	15,195	46,556	102,263
1971	4,185	3,118	2,982	13	30,208	40,506
1972	15,880	3,286	376	1,878	17,247	38,667
1973	14,993	2,783	16,515	277	19,680	54,248
1974	8,704	19,510	10,979	43,642	15,298	98,133
1975	3,928	8,584	10,742	486	35,233	58,973
1976	14,110	6,090	13,777	31,412	43,659	109,048
1977	19,090	5,519	9,028	202	43,707	77,546
1978	12,335	7,589	20,114	47,033	24,798	111,869
1979	11,144	18,828	47,525	295	25,995	103,787
1980	10,387	13,221	62,610	21,671	65,984	173,873
1981	24,524	17,292	47,551	160	53,334	142,861
1982	22,106	25,685	73,652	11,838	34,346	167,627
1983	46,385	10,263	32,442	168	23,090	112,348
1984	33,663	17,255	132,151	16,249	50,422	249,740
1985	30,401	7,876	29,992	28	20,418	88,715
1986	22,835	21,484	57,544	8,700	29,700	140,263
1987	26,022	6,489	50,070	66	8,557	91,204
1988	13,893	21,574	68,605	21,311	29,247	154,630
1989	20,820	20,582	44,607	273	39,395	125,677
1990	27,644	83,681	26,926	12,056	47,717	198,024
1991	9,480	53,657	42,571	115	54,493	160,316
1992	17,197	60,929	86,404	64,217	73,383	302,130
1993	15,784	80,878	55,817	7	40,924	193,410
1994	8,564	72,314	83,912	35,904	61,301	261,995
1995	38,584	68,194	66,203	186	81,462	254,629
1996	14,165	57,665	118,718	20	83,005 [a]	273,573
1997	35,492	69,508	32,862	5	38,435	176,302
1998	23,158	41,382	80,183	2,217	45,095	192,035
1999	18,426	41,315	6,184	0	38,091	104,016
2000	21,229	68,557	30,529	3	30,553	150,871
2001	12,775	33,807	18,531	0	17,209	82,322
2002	11,486	17,820	26,695	0	29,319	85,320
2003	14,444	33,941	49,833	0	27,868	126,086
2004	25,365	34,437	82,710	0	25,850	168,362
2005	24,195	68,801	51,708	19	13,529	158,252
2006	19,184	106,308	26,831	0	39,151	191,474
2007	19,575	109,517	34,710	0	62,232	226,034
2008	13,812	69,743	94,257	0	57,033	234,845
2009	13,920	112,153	48,115	0	91,158	265,346
10 Yr Avg (99-08)	18,049	58,425	42,199	2 [b]	34,084	152,758
Hist Avg (60-08)	16,197	29,792	36,850	8,532 [b]	33,907	125,277

[a] Estimate of chum roe included.

[b] Even years only.

Appendix C3.–Chinook salmon total utilization, District W-4 Quinhagak, Kuskokwim Bay, 1960–2009.

	Commercial Harvest[a]		Subsistence Harvest[b]		Sport Fish		Total	10-Year
Year	Annual	10-yr Avg	Annual	10-yr Avg	Annual	10-yr Avg	Utilization	Average
1960	0						0	
1961	4,328						4,328	
1962	5,526						5,526	
1963	6,555						6,555	
1964	4,081						4,081	
1965	2,976						2,976	
1966	278						278	
1967	0		1,349				1,349	
1968	8,879		2,756				11,635	
1969	16,802						16,802	
1970	18,269	4,943					18,269	
1971	4,185	6,769					4,185	7,180
1972	15,880	6,755					15,880	7,166
1973	14,993	7,791					14,993	8,201
1974	8,704	8,634					8,704	9,045
1975	3,928	9,097					3,928	9,507
1976	14,110	9,192					14,110	9,602
1977	19,090	10,575	2,012				21,102	10,986
1978	12,335	12,484	2,328				14,663	12,961
1979	11,144	12,830	1,420				12,564	13,264
1980	10,387	12,264	1,940				12,327	12,840
1981	24,524	11,476	2,562				27,086	12,246
1982	22,106	13,510	2,402				24,508	14,536
1983	46,385	14,132	2,542		1,511		50,438	15,399
1984	33,663	17,271	3,109		922		37,694	18,943
1985	30,401	19,767	2,341		672		33,414	21,842
1986	22,835	22,415	2,682		938		26,455	24,791
1987	26,022	23,287	3,663	2,334	508		30,193	26,025
1988	13,893	23,980	3,690 [c]	2,499	1,910		19,493	26,934
1989	20,820	24,136	3,542	2,635	884		25,246	27,417
1990	27,644	25,104	6,013	2,847	503		34,160	28,685
1991	9,480	26,829	3,693	3,255	316		13,489	30,869
1992	17,197	25,325	3,447	3,368	656		21,300	29,509
1993	15,784	24,834	3,368	3,472	1,006	882	20,158	29,188
1994	8,564	21,774	3,995	3,555	751	832	13,310	26,160
1995	38,584	19,264	2,746	3,643	739	814	42,069	23,722
1996	14,165	20,082	3,075	3,684	689	821	17,929	24,587
1997	35,492	19,215	3,433	3,723	1,632	796	40,557	23,735
1998	23,158	20,162	4,041	3,700	1,475	909	28,674	24,771

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Year	Commercial Harvest[a] Annual	Commercial Harvest[a] 10-yr Avg	Subsistence Harvest[b] Annual	Subsistence Harvest[b] 10-yr Avg	Sport Fish Annual	Sport Fish 10-yr Avg	Total Utilization	10-Year Average
1999	18,426	21,089	3,167	3,735	854	865	22,447	25,689
2000	21,229	20,849	3,106	3,698	833	862	25,168	25,409
2001	12,775	20,208	2,923	3,407	947	895	16,645	24,510
2002	11,486	20,537	2,475	3,330	779	958	14,740	24,826
2003	14,444	19,966	3,898	3,233	323	971	18,665	24,170
2004	25,365	19,832	3,726	3,286	228	902	29,319	24,020
2005	24,195	21,512	3,083	3,259	520	850	27,798	25,621
2006	19,184	20,074	3,521	3,293	754	828	23,459	24,194
2007	19,575	20,575	3,412	3,337	633	835	23,620	24,747
2008	13,812	18,984	3,962 [d]	3,335	220	735	17,994	23,053
2009	13,920	18,049	3,030 [d]	3,327		609		21,985
10-yr Avg [e]	18,049		3,327		609		21,985	

[a] Quinhagak District commercial harvest. Source: Burkey et al. 2000

[b] Subsistence harvest by the community of Quinhagak. Source: Burkey et al. 2000

[c] Beginning in 1988, estimates are based on a new formula so data since 1988 is not comparable with previous years.

[d] Numbers reported here are preliminary subsistence harvest estimates generated by Commercial Fisheries Division. Methodology to estimate harvest has changed slightly since 2007 with the incorporation of stratified sampling. A revision of historical estimates published by Division of Subsistence from 1990–2007 using the current methodology is pending review. Comparison of 2008 and 2009 estimates with those prior to 2007 should be done cautiously.

[e] Historical 10-yr Avg (1999–2008)

Appendix C4.–Sockeye salmon total utilization, District W-4 Quinhagak, Kuskokwim Bay, 1960–2009.

	Commercial Harvest[a]		Subsistence Harvest[b]		Sport Fish		Total	10-Year
Year	Annual	10-yr Avg	Annual	10-yr Avg	Annual	10-yr Avg	Utilization	Average
1960	5,649						5,649	
1961	2,308						2,308	
1962	10,313						10,313	
1963	0						0	
1964	13,422						13,422	
1965	1,886						1,886	
1966	1,030						1,030	
1967	652						652	
1968	5,884						5,884	
1969	3,784						3,784	
1970	5,393	4,493					5,393	4,493
1971	3,118	4,467					3,118	4,467
1972	3,286	4,548					3,286	4,548
1973	2,783	3,846					2,783	3,846
1974	19,510	4,124					19,510	4,124
1975	8,584	4,733					8,584	4,733
1976	6,090	5,402					6,090	5,402
1977	5,519	5,908					5,519	5,908
1978	7,589	6,395					7,589	6,395
1979	18,828	6,566					18,828	6,566
1980	13,221	8,070					13,221	8,070
1981	17,292	8,853					17,292	8,853
1982	25,685	10,270					25,685	10,270
1983	10,263	12,510					10,263	12,510
1984	17,255	13,258			143		17,398	13,258
1985	7,876	13,033	106		12		7,994	13,047
1986	21,484	12,962	423		200		22,107	12,988
1987	6,489	14,501	1,067		153		7,709	14,590
1988	21,574	14,598	1,261 [c]		109		22,944	14,809
1989	20,582	15,997	633		101		21,316	16,344
1990	83,681	16,172	1,950		462		86,093	16,593
1991	53,657	23,218	1,772		88		55,517	23,880
1992	60,929	26,855	1,264		66		62,259	27,703
1993	80,878	30,379	1,082		331		82,291	31,360
1994	72,314	37,441	1,000		313	167	73,627	38,563
1995	68,194	42,946	573	1,056	148	184	68,915	44,186
1996	57,665 [d]	48,978	1,467	1,103	335	197	59,467	50,278
1997	69,508	52,596	1,264	1,207	607	211	71,379	54,014
1998	41,382	58,898	1,702	1,227	942	256	44,026	60,381

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	Commercial Harvest[a]		Subsistence Harvest[b]		Sport Fish		Total	10-Year
Year	Annual	10-yr Avg	Annual	10-yr Avg	Annual	10-yr Avg	Utilization	Average
1999	41,315	60,879	2,021	1,271	496	339	43,832	62,489
2000	68,557	62,952	1,088	1,410	694	379	70,339	64,741
2001	33,807	61,440	1,525	1,323	83	402	35,415	63,165
2002	17,802	59,455	1,099	1,299	73	402	18,974	61,155
2003	33,941	55,142	1,622	1,282	107	402	35,670	56,827
2004	34,627	50,449	1,086	1,336	112	380	35,825	52,164
2005	68,801	46,680	1,633	1,345	156	360	70,590	48,384
2006	106,308	46,741	2177	1,451	523	361	109,008	48,552
2007	109,343	51,605	1,143	1,522	385	379	110,871	53,506
2008	69,743	55,588	2,599 [d]	1,510	654	357	72,996	57,455
2009	112,153	58,424	1,940 [d]	1,599		328		60,352
10 Yr Avg [e]	58,424		1,599		328		60,352	

[a] District 4, Quinhagak commercial harvest.

[b] Subsistence harvest by the community of Quinhagak.

[c] Beginning in 1988, estimates are based on a new formula so data since 1988 is not comparable with previous years.

[d] Numbers reported here are preliminary subsistence harvest estimates generated by Division of Commercial Fisheries. Methodology to estimate harvest has changed slightly since 2007 with the incorporation of stratified sampling. A revision of historical estimates published by Division of Subsistence from 1990 to 2007 using the current methodology is pending review. Comparison of 2008 and 2009 estimates with those prior to 2007 should be done cautiously.

[e] Historical 10-yr Avg (1999–2008).

Appendix C5.–Chum salmon total utilization, District W-4 Quinhagak, Kuskokwim Bay, 1960–2009.

	Commercial Harvest[a]		Subsistence Harvest[b]		Sport Fish		Total	10-Year
Year	Annual	10-yr Avg	Annual	10-yr Avg	Annual	10-yr Avg	Utilization	Average
1960	0						0	
1961	18,864						18,864	
1962	45,707						45,707	
1963	0						0	
1964	707						707	
1965	4,242						4,242	
1966	2,610						2,610	
1967	8,087						8,087	
1968	19,497						19,497	
1969	38,206						38,206	
1970	46,556						46,556	
1971	30,208	18,448					30,208	18,448
1972	17,247	19,582					17,247	19,582
1973	19,680	16,736					19,680	16,736
1974	15,298	18,704					15,298	18,704
1975	35,233	20,163					35,233	20,163
1976	43,659	23,262					43,659	23,262
1977	43,707	27,367					43,707	27,367
1978	24,798	30,929					24,798	30,929
1979	25,995	31,459					25,995	31,459
1980	65,984	30,238					65,984	30,238
1981	53,334	32,181					53,334	32,181
1982	34,346	34,494					34,346	34,494
1983	23,090	36,203			315		23,405	36,203
1984	50,422	36,544			376		50,798	36,576
1985	20,418	40,057	901		149		21,468	40,126
1986	29,700	38,575	808		777		31,285	38,749
1987	8,557	37,179	1,084		111		9,752	37,512
1988	29,247	33,664	1,065[c]		618		30,930	34,117
1989	39,395	34,109	1,568		537		41,500	34,730
1990	47,717	35,449	3,234		202		51,153	36,280
1991	54,493	33,623	1,593		80		56,166	34,797
1992	73,383	33,739	1,833		251		75,467	35,080
1993	40,924	37,642	1,008		183	342	42,115	39,192
1994	61,301	39,426	1,452		156	328	62,909	41,063
1995	81,462	40,514	686	1,455	213	306	82,361	42,275
1996	83,505[d]	46,618	930	1,433	200	313	84,635	48,364
1997	38,435	51,998	600	1,445	212	255	39,247	53,699
1998	45,095	54,986	1,448	1,397	213	265	46,756	56,648
1999	38,091	56,571	1,810	1,435	293	225	40,194	58,231

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Year	Commercial Harvest[a] Annual	Commercial Harvest[a] 10-yr Avg	Subsistence Harvest[b] Annual	Subsistence Harvest[b] 10-yr Avg	Sport Fish Annual	Sport Fish 10-yr Avg	Total Utilization	10-Year Average
2000	30,553	56,441	912	1,459	231	200	31,696	58,100
2001	17,209	54,724	747	1,227	43	203	17,999	56,155
2002	29,252	50,996	1,839	1,143	446	200	31,537	52,338
2003	27,868	46,583	1,129	1,143	14	219	29,011	47,945
2004	25,820	45,277	1,112	1,155	33	202	26,965	46,635
2005	13,529	41,729	915	1,121	108	190	14,552	43,040
2006	39,151	34,936	1,865	1,144	145	179	41,161	36,259
2007	61,228	30,500	1,725	1,238	15	174	62,968	31,912
2008	57,033	32,780	1,632 [e]	1,350	48	154	58,713	34,284
2009	48,115	33,973	1,271 [e]	1,369		138		35,480
10-yr Avg [f]	33,973		1,369		138		35,480	

[a] District 4, Quinhagak commercial harvest.

[b] Subsistence harvest by the community of Quinhagak.

[c] Beginning in 1988, estimates are based on a new formula so data since 1988 is not comparable with previous years.

[d] Estimate of chum roe included.

[e] Numbers reported here are preliminary subsistence harvest estimates generated by Division of Commercial Fisheries. Methodology to estimate harvest has changed slightly since 2007 with the incorporation of stratified sampling. A revision of historical estimates published by Division of Subsistence from 1990 to 2007 using the current methodology is pending review. Comparison of 2008 and 2009 estimates with those prior to 2007 should be done cautiously.

[f] Historical 10-yr Avg (1999–2008).

Appendix C6.–Coho salmon total utilization, District W-4 Quinhagak, Kuskokwim Bay, 1960–2009.

Year	Commercial Harvest[a] Annual	Commercial Harvest[a] 10-yr Avg	Subsistence Harvest[b] Annual	Subsistence Harvest[b] 10-yr Avg	Sport Fish Annual	Sport Fish 10-yr Avg	Total Utilization	10-Year Average
1960	3,000						3,000	
1961	46						46	
1962	0						0	
1963	0						0	
1964	379						379	
1965	0						0	
1966	0						0	
1967	1,926						1,926	
1968	21,511						21,511	
1969	15,077						15,077	
1970	16,850	4,194					16,850	4,194
1971	2,982	5,579					2,982	5,579
1972	376	5,873					376	5,873
1973	16,515	5,910					16,515	5,910
1974	10,979	7,562					10,979	7,562
1975	10,742	8,622					10,742	8,622
1976	13,777	9,696					13,777	9,696
1977	9,028	11,074					9,028	11,074
1978	20,114	11,784					20,114	11,784
1979	47,525	11,644					47,525	11,644
1980	62,610	14,889					62,610	14,889
1981	47,551	19,465					47,551	19,465
1982	73,652	23,922					73,652	23,922
1983	32,442	31,249			367		32,809	31,249
1984	132,151	32,842			1,895		134,046	32,879
1985	29,992	44,959	67		622		30,681	45,185
1986	57,544	46,884	41		2,010		59,595	47,179
1987	50,070	51,261	125		2,300		52,495	51,761
1988	68,605	55,365	4,317 [c]		1,837		74,759	56,108
1989	44,607	60,214	3,787		1,096		49,490	61,572
1990	26,926	59,922	4,174		644		31,744	61,769
1991	42,571	56,354	3,232		358		46,161	58,682
1992	86,404	55,856	2,958		275		89,637	58,543
1993	55,817	57,131	2,152		734	1,140	58,703	60,142
1994	83,912	59,469	2,739		675	1,177	87,326	62,731
1995	66,203	54,645	2,561	2,359	970	1,055	69,734	58,059
1996	118,718 [d]	58,266	1,467	2,609	875	1,090	121,060	61,964
1997	32,862	64,383	1,264	2,751	1,220	976	35,346	68,111
1998	80,183	62,663	1,702	2,865	751	868	82,636	66,396
1999	6,184	63,820	2,021	2,604	1,091	760	9,296	67,184

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Year	Commercial Harvest[a] Annual	Commercial Harvest[a] 10-yr Avg	Subsistence Harvest[b] Annual	Subsistence Harvest[b] 10-yr Avg	Sport Fish Annual	Sport Fish 10-yr Avg	Total Utilization	10-Year Average
2000	30,529	63,650	1,088	2,427	799	759	32,416	63,164
2001	18,531	60,338	1,525	2,118	2,448	775	22,504	63,232
2002	26,695	57,934	1,099	1,948	1,784	984	29,578	60,866
2003	49,833	51,963	2,047	1,762	1,076	1,135	52,956	54,860
2004	82,398	51,365	1,209	1,751	1,362	1,169	84,969	54,285
2005	51,780	51,214	1,443	1,598	1,006	1,238	54,229	54,050
2006	26,831	49,771	1,019	1,487	1,742	1,241	29,592	52,499
2007	34,710	40,583	1,143	1,442	1,087	1,328	36,940	43,352
2008	94,257	40,767	2,228 [d]	1,430	1,541	1,315	98,026	43,512
2009	48,115	42,175	1,725 [d]	1,482		1,394		45,051
10-yr Avg [e]	42,175		1,482		1,394		45,051	

[a] District 4, Quinhagak commercial harvest.

[b] Subsistence harvest by the community of Quinhagak.

[c] Beginning in 1988, estimates are based on a new formula so data since 1988 is not comparable with previous years.

[d] Numbers reported here are preliminary subsistence harvest estimates generated by Division of Commercial Fisheries. Methodology to estimate harvest has changed slightly since 2007 with the incorporation of stratified sampling. A revision of historical estimates published by Division of Subsistence from 1990 to 2007 using the current methodology is pending review. Comparison of 2008 and 2009 estimates with those prior to 2007 should be done cautiously.

[e] Historical 10-yr Avg (1999–2008).

Appendix C7.–Commercial salmon fishing exvessel value, District W-4 Quinhagak, Kuskokwim Bay, 1990–2009.

Year	Chinook	Sockeye	Coho	Pink[a]	Chum	Total
1990	$ 253,562	$ 542,485	$ 123,936	$ 4,146	$ 89,343	$ 1,013,472
1991	$ 94,950	$ 246,734	$ 144,379	$ 52	$ 106,321	$ 592,436
1992	$ 166,471	$ 368,310	$ 303,740	$ 15,875	$ 139,268	$ 993,664
1993	$ 143,506	$ 402,763	$ 246,746	$ 4	$ 105,236	$ 898,255
1994	$ 67,584	$ 253,922	$ 420,802	$ 10,454	$ 84,395	$ 837,157
1995	$ 418,067	$ 323,104	$ 201,413	$ 81	$ 104,523	$ 1,047,188
1996	$ 61,004	$ 165,100	$ 246,930	$ 6	$ 61,686	$ 534,726
1997	$ 171,688	$ 204,190	$ 91,584	$ -	$ 29,609	$ 497,071
1998	$ 82,168	$ 150,631	$ 197,676	$ 871	$ 36,497	$ 467,843
1999	$ 94,880	$ 140,846	$ 14,997	$ -	$ 28,368	$ 279,091
2000	$ 131,351	$ 249,382	$ 31,898	$ 1	$ 23,929	$ 436,561
2001	$ 93,697	$ 89,334	$ 32,577	$ -	$ 13,007	$ 228,615
2002	$ 56,356	$ 40,368	$ 47,651	$ -	$ 23,374	$ 167,749
2003	$ 69,201	$ 107,287	$ 108,804	$ -	$ 19,261	$ 304,553
2004	$ 107,700	$ 77,394	$ 201,879	$ -	$ 18,372	$ 405,345
2005	$ 221,854	$ 241,478	$ 101,776	$ 4	$ 6,853	$ 571,965
2006	$ 147,802	$ 327,917	$ 61,433	$ -	$ 14,030	$ 551,182
2007	$ 163,248	$ 374,004	$ 102,569	$ -	$ 21,044	$ 660,865
2008	$ 140,580	$ 272,427	$ 317,143	$ -	$ 20,581	$ 750,731
2009	$ 130,561	$ 384,209	$ 136,562	$ -	$ 95,993	$ 747,325
10 Yr Avg (99-08)	$ 122,667	$ 192,044	$ 102,073	$ 1	$ 18,882	$ 435,666
Hist Avg (90-08)	$ 141,351	$ 240,930	$ 157,786	$ 1,658	$ 49,774	$ 591,498

[a] Even years only.

Appendix C8.–Commercial salmon harvest by period, District W-4 Quinhagak, Kuskokwim Bay, 1994–2009.

		Permits	Hours	Permit	Chinook		Sockeye		Chum		Coho	
Year	Date	Fished	Fished	Hours	Catch	CPUE	Catch	CPUE	Catch	CPUE	Catch	CPUE
1994	Jun 15	111	12	1,332	1,165	0.87	62	0.05	253	0.19	0	0.00
	Jun 20	95	12	1,140	746	0.65	187	0.16	286	0.25	0	0.00
	Jul 1	118	12	1,416	2,534	1.79	6,512	4.60	13,544	9.56	0	0.00
	Jul 4	171	12	2,052	836	0.41	5,555	2.71	3,120	1.52	0	0.00
	Jul 6	127	12	1,524	692	0.45	6,749	4.43	4,094	2.69	0	0.00
	Jul 8	131	12	1,572	756	0.48	9,304	5.92	8,296	5.28	0	0.00
	Jul 11	140	12	1,680	393	0.23	5,800	3.45	2,313	1.38	3	0.00
	Jul 13	111	12	1,332	362	0.27	13,450	10.10	9,794	7.35	17	0.01
	Jul 15	80	12	960	279	0.29	6,687	6.97	5,791	6.03	24	0.03
	Jul 18	93	12	1,116	187	0.17	5,842	5.23	3,023	2.71	19	0.02
	Jul 20	63	12	756	159	0.21	4,611	6.10	4,684	6.20	75	0.10
	Jul 22	83	12	996	131	0.13	3,537	3.55	2,696	2.71	250	0.25
	Jul 25	52	12	624	103	0.17	1,545	2.48	1,103	1.77	538	0.86
	Jul 27	43	12	516	40	0.08	963	1.87	834	1.62	557	1.08
	Jul 29	25	12	300	36	0.12	447	1.49	190	0.63	712	2.37
	Aug 1	49	12	588	51	0.09	368	0.63	334	0.57	2,577	4.38
	Aug 3	51	12	612	23	0.04	288	0.47	268	0.44	1,294	2.11
	Aug 5	48	12	576	25	0.04	183	0.32	277	0.48	3,103	5.39
	Aug 8	72	12	864	15	0.02	93	0.11	234	0.27	12,298	14.23
	Aug 10	19	12	228	0	0.00	10	0.04	9	0.04	1,237	5.43
	Aug 12	49	12	588	12	0.02	46	0.08	51	0.09	2,710	4.61
	Aug 15	59	12	708	2	0.00	20	0.03	43	0.06	10,609	14.98
	Aug 17	42	12	504	1	0.00	4	0.01	0	0.00	9,897	19.64
	Aug 19	74	12	888	9	0.01	16	0.02	37	0.04	3,624	4.08
	Aug 22	63	12	756	3	0.00	17	0.02	18	0.02	8,437	11.16
	Aug 24	40	12	480	1	0.00	1	0.00	1	0.00	6,399	13.33
	Aug 26	29	12	348	1	0.00	3	0.01	4	0.01	5,732	16.47
	Aug 29	54	12	648	1	0.00	6	0.01	0	0.00	2,162	3.34
	Aug 31	50	12	600	0	0.00	4	0.01	3	0.01	7,145	11.91
	Sept 2	33	12	396	0	0.00	4	0.01	1	0.00	933	2.36
	Sept 5	27	12	324	1	0.00	0	0.00	0	0.00	2,243	6.92
	Sept 7	13	12	156	0	0.00	0	0.00	0	0.00	1,317	8.44
Total			384	26,580	8,564		72,314		61,301		83,912	
1995	Jun 13	116	12	1,392	7,621	5.47	55	0.04	182	0.13	0	0.00
	Jun 17	239	12	2,868	8,190	2.86	356	0.12	1,916	0.67	0	0.00
	Jun 20	215	12	2,580	7,341	2.85	485	0.19	2,760	1.07	0	0.00
	Jun 24	173	12	2,076	6,073	2.93	3,266	1.57	5,990	2.89	0	0.00
	Jun 26	70	6	420	1,506	3.59	805	1.92	2,851	6.79	0	0.00
	Jun 29	70	12	840	2,048	2.44	4,765	5.67	8,231	9.80	0	0.00
	Jul 3	37	12	444	1,096	2.47	7,045	15.87	8,074	18.18	0	0.00
	Jul 5	107	12	1,284	1,073	0.84	4,366	3.40	7,481	5.83	0	0.00
	Jul 7	57	12	684	676	0.99	4,812	7.04	7,138	10.44	0	0.00
	Jul 10	85	12	1,020	804	0.79	9,894	9.70	5,667	5.56	0	0.00
	Jul 12	98	12	1,176	516	0.44	6,827	5.81	9,074	7.72	0	0.00
	Jul 14	112	12	1,344	438	0.33	5,738	4.27	5,381	4.00	0	0.00
	Jul 17	127	12	1,524	287	0.19	5,166	3.39	4,193	2.75	0	0.00
	Jul 19	79	12	948	140	0.15	3,532	3.73	3,184	3.36	2	0.00
	Jul 21	57	12	684	162	0.24	2,523	3.69	2,086	3.05	7	0.01
	Jul 24	52	12	624	156	0.25	2,610	4.18	2,713	4.35	93	0.15

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Year	Date	Permits Fished	Hours Fished	Permit Hours	Chinook Catch	Chinook CPUE	Sockeye Catch	Sockeye CPUE	Chum Catch	Chum CPUE	Coho Catch	Coho CPUE
1995	Jul 26	52	12	624	71	0.11	1,404	2.25	1,279	2.05	116	0.19
(cont.)	Jul 28	43	12	516	63	0.12	879	1.70	975	1.89	390	0.76
	Jul 31	51	12	612	54	0.09	730	1.19	715	1.17	954	1.56
	Aug 2	59	12	708	30	0.04	583	0.82	459	0.65	3,706	5.23
	Aug 4	65	12	780	37	0.05	387	0.50	262	0.34	4,293	5.50
	Aug 7	100	12	1,200	49	0.04	481	0.40	260	0.22	4,614	3.85
	Aug 9	79	12	948	36	0.04	307	0.32	166	0.18	9,133	9.63
	Aug 11	90	12	1,080	31	0.03	192	0.18	110	0.10	5,471	5.07
	Aug 14	112	12	1,344	25	0.02	194	0.14	98	0.07	4,252	3.16
	Aug 16	48	12	576	10	0.02	133	0.23	47	0.08	2,515	4.37
	Aug 18	68	12	816	10	0.01	146	0.18	49	0.06	5,879	7.20
	Aug 21	82	12	984	11	0.01	139	0.14	26	0.03	4,816	4.89
	Aug 23	75	12	900	11	0.01	102	0.11	27	0.03	8,588	9.54
	Aug 25	77	12	924	3	0.00	114	0.12	25	0.03	2,440	2.64
	Aug 28	67	12	804	4	0.00	68	0.08	17	0.02	4,176	5.19
	Aug 30	67	12	804	9	0.01	58	0.07	18	0.02	2,193	2.73
	Sept 1	41	12	492	3	0.01	32	0.07	8	0.02	2,565	5.21
Total			390	34,020	38,584		68,194		81,462		66,203	
1996	Jun 22	69	12	828	4,752	5.74	1,146	1.38	6,984	8.43	0	0.00
	Jun 25	73	8	584	2,125	3.64	3,043	5.21	6,662	11.41	0	0.00
	Jun 29	120	12	1,440	2,378	1.65	6,304	4.38	8,441	5.86	0	0.00
	Jul 03	101	8	808	1,787	2.21	4,558	5.64	8,573	10.61	0	0.00
	Jul 06	76	4	304	618	2.03	6,045	19.88	5,073	16.69	0	0.00
	Jul 09	96	6	576	541	0.94	7,510	13.04	8,768	15.22	0	0.00
	Jul 11	73	12	876	453	0.52	6,525	7.45	7,947	9.07	3	0.00
	Jul 13	96	8	768	361	0.47	5,707	7.43	4,748	6.18	38	0.05
	Jul 15	94	12	1,128	332	0.29	5,283	4.68	6,567	5.82	19	0.02
	Jul 17	59	12	708	216	0.31	5,203	7.35	8,308	11.73	251	0.35
	Jul 20	70	12	840	150	0.18	2,849	3.39	3,355	3.99	398	0.47
	Jul 24	41	12	492	105	0.21	944	1.92	1,571	3.19	2,295	4.66
	Jul 27	60	12	720	88	0.12	698	0.97	1,885	2.62	4,483	6.23
	Jul 29	52	12	624	64	0.10	548	0.88	1,034	1.66	7,989	12.80
	Jul 31	53	12	636	29	0.05	225	0.35	607	0.95	5,597	8.80
	Aug 02	53	12	636	43	0.07	257	0.40	405	0.64	12,478	19.62
	Aug 05	70	12	840	32	0.04	156	0.19	114	0.14	19,091	22.73
	Aug 07	49	12	588	15	0.03	128	0.22	89	0.15	7,766	13.21
	Aug 09	59	12	708	13	0.02	82	0.12	102	0.14	11,553	16.32
	Aug 12	77	12	924	18	0.02	125	0.14	102	0.11	7,825	8.47
	Aug 14	33	12	396	8	0.02	26	0.07	25	0.06	5,938	14.99
	Aug 16	57	12	684	16	0.02	83	0.12	55	0.08	8,299	12.13
	Aug 19	71	12	852	10	0.01	48	0.06	35	0.04	12,931	15.18
	Aug 21	57	12	684	4	0.01	81	0.12	22	0.03	3,315	4.85
	Aug 23	52	12	624	2	0.00	58	0.09	18	0.03	5,091	8.16
	Aug 26	51	12	612	5	0.01	33	0.05	15	0.02	3,358	5.49
Total			286	18,880	14,165		57,665		81,505		118,718	
1997	Jun 13	115	12	1,380	6,669	4.83	216	0.16	72	0.05	0	0.00
	Jun 16	95	12	1,140	6,358	5.58	411	0.36	279	0.24	0	0.00
	Jun 19	123	12	1,476	6,405	4.34	1,678	1.14	788	0.53	0	0.00
	Jun 23	67	12	804	3,338	4.15	1,623	2.02	1,129	1.40	0	0.00
	Jun 26	132	12	1,584	3,578	2.26	2,777	1.75	1,199	0.76	0	0.00
	Jun 30	159	12	1,908	2,523	1.32	9,717	5.09	2,488	1.30	0	0.00
	Jul 2	178	12	2,136	1,955	0.92	10,007	4.68	2,935	1.37	0	0.00
	Jul 4	161	12	1,932	1,381	0.71	8,757	4.53	2,839	1.47	0	0.00

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Year	Date	Permits Fished	Hours Fished	Permit Hours	Chinook Catch	Chinook CPUE	Sockeye Catch	Sockeye CPUE	Chum Catch	Chum CPUE	Coho Catch	Coho CPUE
1997	Jul 7	124	12	1,488	1,042	0.70	6,771	4.55	3,552	2.39	0	0.00
(cont.)	Jul 9	153	12	1,836	722	0.39	6,806	3.71	4,638	2.53	0	0.00
	Jul 11	102	12	1,224	331	0.27	6,236	5.09	3,997	3.27	0	0.00
	Jul 14	4	12	48	26	0.54	279	5.81	134	2.79	0	0.00
	Jul 16	75	12	900	196	0.22	3,315	3.68	2,546	2.83	0	0.00
	Jul 18	76	12	912	190	0.21	3,005	3.29	2,590	2.84	2	0.00
	Jul 21	65	12	780	197	0.25	2,452	3.14	2,503	3.21	7	0.01
	Jul 23	56	12	672	106	0.16	1,370	2.04	2,210	3.29	36	0.05
	Jul 25	53	12	636	78	0.12	974	1.53	1,281	2.01	62	0.10
	Jul 28	47	12	564	45	0.08	645	1.14	714	1.27	71	0.13
	Jul 30	46	12	552	78	0.14	483	0.88	718	1.30	335	0.61
	Aug 1	14	12	168	28	0.17	331	1.97	359	2.14	389	2.32
	Aug 4	58	12	696	59	0.08	442	0.64	652	0.94	1,946	2.80
	Aug 6	54	12	648	58	0.09	321	0.50	381	0.59	1,589	2.45
	Aug 8	53	12	636	23	0.04	176	0.28	134	0.21	1,602	2.52
	Aug 13	62	12	744	31	0.04	205	0.28	100	0.13	4,382	5.89
	Aug 15	70	12	840	27	0.03	166	0.20	106	0.13	5,095	6.07
	Aug 18	56	12	672	13	0.02	66	0.10	28	0.04	6,931	10.31
	Aug 20	61	12	732	10	0.01	97	0.13	26	0.04	5,551	7.58
	Aug 22	62	12	744	11	0.01	75	0.10	12	0.02	2,493	3.35
	Aug 25	47	12	564	9	0.02	50	0.09	13	0.02	1,036	1.84
	Aug 28	35	12	420	5	0.01	57	0.14	12	0.03	1,335	3.18
Total			360	28,836	35,492		69,508		38,435		32,862	
1998	Jun 15	64	12	768	2,314	3.01	99	0.13	189	0.25	0	0.00
	Jun 18	56	12	672	2,913	4.33	117	0.17	290	0.43	0	0.00
	Jun 22	69	12	828	3,642	4.40	762	0.92	1,531	1.85	0	0.00
	Jun 25	68	12	816	3,122	3.83	1,682	2.06	2,230	2.73	0	0.00
	Jun 29	57	12	684	1,919	2.81	2,681	3.92	5,269	7.70	0	0.00
	Jul 2	75	12	900	1,745	1.94	2,374	2.64	3,209	3.57	0	0.00
	Jul 6	79	12	948	1,699	1.79	3,445	3.63	5,211	5.50	10	0.01
	Jul 8	116	12	1,392	1,740	1.25	6,008	4.32	5,272	3.79	0	0.00
	Jul 10	112	12	1,344	956	0.71	4,622	3.44	5,555	4.13	0	0.00
	Jul 13	112	12	1,344	740	0.55	3,738	2.78	3,182	2.37	5	0.00
	Jul 15	75	12	900	482	0.54	4,214	4.68	3,811	4.23	0	0.00
	Jul 17	98	12	1,176	443	0.38	3,609	3.07	3,260	2.77	10	0.01
	Jul 20	83	12	996	370	0.37	2,517	2.53	1,590	1.60	20	0.02
	Jul 22	51	12	612	223	0.36	1,661	2.71	1,128	1.84	42	0.07
	Jul 24	54	12	648	252	0.39	1,266	1.95	1,123	1.73	93	0.14
	Jul 27	43	12	516	165	0.32	884	1.71	742	1.44	505	0.98
	Jul 29	52	12	624	98	0.16	777	1.25	538	0.86	763	1.22
	Jul 31	40	12	480	63	0.13	282	0.59	259	0.54	602	1.25
	Aug 3	40	12	480	68	0.14	167	0.35	341	0.71	2,657	5.54
	Aug 5	46	12	552	75	0.14	159	0.29	174	0.32	4,011	7.27
	Aug 7	47	12	564	26	0.05	92	0.16	43	0.08	3,847	6.82
	Aug 10	75	12	900	47	0.05	112	0.12	63	0.07	6,111	6.79
	Aug 12	56	12	672	14	0.02	25	0.04	29	0.04	7,968	11.86
	Aug 14	59	12	708	17	0.02	28	0.04	13	0.02	10,424	14.72
	Aug 17	42	12	504	6	0.01	16	0.03	15	0.03	5,954	11.81
	Aug 21	57	12	684	5	0.01	22	0.03	20	0.03	9,161	13.39
	Aug 24	44	12	528	3	0.01	2	0.00	0	0.00	6,074	11.50
	Aug 26	51	12	612	4	0.01	5	0.01	5	0.01	2,534	4.14
	Aug 28	36	12	432	2	0.00	4	0.01	2	0.00	1,917	4.44
	Aug 31	29	12	348	0	0.00	1	0.00	1	0.00	3,929	11.29
	Sept 2	34	12	408	1	0.00	6	0.01	0	0.00	5,148	12.62

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Year	Date	Permits Fished	Hours Fished	Permit Hours	Chinook Catch	Chinook CPUE	Sockeye Catch	Sockeye CPUE	Chum Catch	Chum CPUE	Coho Catch	Coho CPUE
1998	Sept 4	31	12	372	4	0.01	5	0.01	0	0.00	4,442	11.94
(cont.)	Sept 7	25	12	300	0	0.00	0	0.00	0	0.00	3,956	13.19
Total			396	23,712	23,158		41,382		45,095		80,183	
1999	Jun 21	93	12	1,116	4,075	3.65	396	0.35	766	0.69	0	0.00
	Jun 24	106	12	1,272	3,476	2.73	688	0.54	1,500	1.18	0	0.00
	Jun 28	125	12	1,500	5,468	3.65	2,497	1.66	4,559	3.04	0	0.00
	Jul 1	79	12	948	1,916	2.02	2,803	2.96	4,191	4.42	0	0.00
	Jul 5	116	12	1,392	1,246	0.90	4,367	3.14	5,038	3.62	0	0.00
	Jul 9	107	12	1,284	677	0.53	4,515	3.52	2,239	1.74	0	0.00
	Jul 14	107	12	1,284	548	0.43	5,787	4.51	6,668	5.19	0	0.00
	Jul 16	70	12	840	220	0.26	6,311	7.51	4,359	5.19	1	0.00
	Jul 19	86	12	1,032	168	0.16	2,684	2.60	1,764	1.71	12	0.01
	Jul 21	85	12	1,020	182	0.18	3,360	3.29	1,479	1.45	0	0.00
	Jul 23	63	12	756	152	0.20	3,567	4.72	2,060	2.72	4	0.01
	Jul 26	58	12	696	93	0.13	1,580	2.27	1,460	2.10	25	0.04
	Jul 28	41	12	492	62	0.13	959	1.95	889	1.81	29	0.06
	Jul 30	36	12	432	47	0.11	815	1.89	550	1.27	103	0.24
	Aug 2	28	12	336	35	0.10	441	1.31	337	1.00	200	0.60
	Aug 4	23	12	276	17	0.06	144	0.52	83	0.30	168	0.61
	Aug 11	44	12	528	23	0.04	250	0.47	109	0.21	2,458	4.66
	Aug 16	59	12	708	15	0.02	78	0.11	28	0.04	1,790	2.53
	Aug 18	48	12	576	6	0.01	73	0.13	12	0.02	1,394	2.42
Total			228	16,488	18,426		41,315		38,091		6,184	
2000	Jun 15	55	12	660	3,015	4.57	104	0.16	385	0.58	0	0.00
	Jun 19	86	12	1,032	4,700	4.55	893	0.87	1,397	1.35	0	0.00
	Jun 22	101	12	1,212	4,893	4.04	1,466	1.21	1,457	1.20	0	0.00
	Jun 26	115	12	1,380	3,147	2.28	1,863	1.35	2,360	1.71	0	0.00
	Jun 29	87	12	1,044	1,410	1.35	8,067	7.73	4,194	4.02	0	0.00
	Jul 03	128	12	1,536	1,398	0.91	4,699	3.06	3,239	2.11	0	0.00
	Jul 06	84	12	1,008	576	0.57	12,133	12.04	4,321	4.29	0	0.00
	Jul 08	116	12	1,392	578	0.42	7,165	5.15	2,845	2.04	0	0.00
	Jul 11	102	12	1,224	351	0.29	8,320	6.80	1,914	1.56	0	0.00
	Jul 13	117	12	1,404	361	0.26	6,556	4.67	2,844	2.03	4	0.00
	Jul 15	46	12	552	143	0.26	2,927	5.30	1,048	1.90	2	0.00
	Jul 17	70	12	840	191	0.23	4,570	5.44	1,024	1.22	19	0.02
	Jul 19	64	12	768	103	0.13	2,288	2.98	778	1.01	51	0.07
	Jul 21	70	12	840	131	0.16	2,626	3.13	1,172	1.40	182	0.22
	Jul 24	48	12	576	75	0.13	1,004	1.74	417	0.72	285	0.49
	Jul 26	36	12	432	36	0.08	898	2.08	328	0.76	704	1.63
	Jul 28	51	12	612	23	0.04	837	1.37	259	0.42	1,257	2.05
	Jul 31	46	12	552	30	0.05	548	0.99	222	0.40	2,533	4.59
	Aug 02	37	12	444	12	0.03	240	0.54	63	0.14	2,544	5.73
	Aug 05	43	12	516	16	0.03	256	0.50	59	0.11	1,899	3.68
	Aug 07	54	12	648	10	0.02	299	0.46	104	0.16	3,761	5.80
	Aug 10	50	12	600	2	0.00	238	0.40	34	0.06	5,146	8.58
	Aug 12	63	12	756	12	0.02	200	0.26	33	0.04	4,683	6.19
	Aug 14	51	12	612	9	0.01	113	0.18	25	0.04	3,427	5.60
	Aug 16	43	12	516	4	0.01	161	0.31	20	0.04	2,434	4.72
	Aug 21	34	12	408	1	0.00	34	0.08	5	0.01	833	2.04
	Aug 24	24	12	288	2	0.01	52	0.18	6	0.02	765	2.66
Total			324	21,852	21,229		68,557		30,553		30,529	

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		Permits	Hours	Permit	Chinook		Sockeye		Chum		Coho	
Year	Date	Fished	Fished	Hours	Catch	CPUE	Catch	CPUE	Catch	CPUE	Catch	CPUE
2001	Jun 21	52	12	624	4,024	6.45	1,225	1.96	154	0.25	0	0.00
	Jun 25	108	12	1,296	3,137	2.42	3,382	2.61	1,463	1.13	0	0.00
	Jun 28	106	12	1,272	2,490	1.96	5,222	4.11	2,486	1.95	0	0.00
	Jul 2	86	12	1,032	934	0.91	6,656	6.45	2,292	2.22	0	0.00
	Jul 5	80	12	960	828	0.86	7,638	7.96	2,275	2.37	0	0.00
	Jul 9	86	6	516	432	0.84	3,317	6.43	1,794	3.48	0	0.00
	Jul 12	61	9	549	318	0.58	2,831	5.16	2,060	3.75	0	0.00
	Jul 16	48	12	576	267	0.46	1,678	2.91	1,767	3.07	0	0.00
	Jul 18	42	12	504	138	0.27	977	1.94	1,316	2.61	0	0.00
	Jul 23	25	12	300	89	0.30	380	1.27	938	3.13	41	0.14
	Aug 01	28	12	336	34	0.10	180	0.54	278	0.83	1,005	2.99
	Aug 03	23	12	276	20	0.07	57	0.21	94	0.34	913	3.31
	Aug 06	31	12	372	23	0.06	62	0.17	141	0.38	1,828	4.91
	Aug 10	28	12	336	11	0.03	58	0.17	46	0.14	2,570	7.65
	Aug 13	31	12	372	9	0.02	37	0.10	24	0.06	3,130	8.41
	Aug 15	31	12	372	6	0.02	28	0.08	28	0.08	3,612	9.71
	Aug 18	37	12	444	5	0.01	34	0.08	26	0.06	3,844	8.66
	Aug 20	7	12	84	0	0.00	2	0.02	1	0.01	201	2.39
	Aug 22	24	12	288	4	0.01	28	0.10	21	0.07	955	3.32
	Aug 24	15	12	180	6	0.03	15	0.08	5	0.03	432	2.40
Total			231	10,689	12,775		33,807		17,209		18,531	
2002	Jun 14	51	12	612	1,727	2.82	160	0.26	1,000	1.63	0	0.00
	Jun 17	46	12	552	2,070	3.75	288	0.52	1,047	1.90	0	0.00
	Jun 20	53	12	636	1,352	2.13	477	0.75	1,653	2.60	0	0.00
	Jun 26	61	12	732	1,782	2.43	972	1.33	2,287	3.12	0	0.00
	Jul 1	62	12	744	959	1.29	2,187	2.94	3,824	5.14	0	0.00
	Jul 3	51	12	612	759	1.24	2,177	3.56	4,257	6.96	0	0.00
	Jul 5	56	12	672	602	0.90	2,806	4.18	3,183	4.74	0	0.00
	Jul 8	59	12	708	601	0.85	2,530	3.57	3,754	5.30	0	0.00
	Jul 10	52	12	624	569	0.91	2,081	3.33	1,883	3.02	0	0.00
	Jul 12	52	12	624	429	0.69	1,373	2.20	2,168	3.47	0	0.00
	Jul 15	39	12	468	243	0.52	753	1.61	1,615	3.45	0	0.00
	Jul 17	32	12	384	168	0.44	888	2.31	1,036	2.70	0	0.00
	Jul 19	19	12	228	71	0.31	701	3.07	832	3.65	0	0.00
	Aug 1	24	12	288	32	0.11	114	0.40	162	0.56	360	1.25
	Aug 5	25	12	300	20	0.07	85	0.28	164	0.55	1,610	5.37
	Aug 7	32	12	384	32	0.08	59	0.15	130	0.34	2,719	7.08
	Aug 9	32	12	384	15	0.04	53	0.14	110	0.29	2,317	6.03
	Aug 12	37	12	444	15	0.03	35	0.08	58	0.13	3,260	7.34
	Aug 14	38	12	456	10	0.02	27	0.06	51	0.11	2,649	5.81
	Aug 16	49	12	588	13	0.02	26	0.04	40	0.07	4,516	7.68
	Aug 19	30	12	360	3	0.01	8	0.02	25	0.07	3,156	8.77
	Aug 21	34	12	408	7	0.02	7	0.02	13	0.03	2,490	6.10
	Aug 23	29	12	348	6	0.02	10	0.03	18	0.05	2,495	7.17
	Aug 26	28	12	336	1	0.00	3	0.01	9	0.03	1,123	3.34
Total			288	11,892	11,486		17,820		29,319		26,695	

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Year	Date	Permits Fished	Hours Fished	Permit Hours	Chinook Catch	Chinook CPUE	Sockeye Catch	Sockeye CPUE	Chum Catch	Chum CPUE	Coho Catch	Coho CPUE
Total			288	11,892	11,486		17,820		29,319		26,695	
2003	Jun 14	54	12	648	2,657	4.10	186	0.29	81	0.13	0	0.00
	Jun 17	53	12	636	2,797	4.40	735	1.16	232	0.36	0	0.00
	Jun 19	60	12	720	1,732	2.41	760	1.06	209	0.29	0	0.00
	Jun 24	62	12	744	2,209	2.97	690	0.93	252	0.34	0	0.00
	Jul 1	35	12	420	571	1.36	2,890	6.88	1,626	3.87	0	0.00
	Jul 4	56	12	672	1,010	1.50	8,246	12.27	3,780	5.63	0	0.00
	Jul 7	70	12	840	771	0.92	4,974	5.92	1,442	1.72	1	0.00
	Jul 9	62	12	744	800	1.08	4,311	5.79	3,065	4.1196	3	0.00
	Jul 11	60	12	720	647	0.90	4,350	6.04	3,335	4.63	1	0.00
	Jul 14	48	12	576	434	0.75	2,607	4.53	4,501	7.81	16	0.03
	Jul 16	45	12	540	384	0.71	2,156	3.99	3,474	6.43	66	0.12
	Jul 18	43	12	516	164	0.32	1,100	2.13	3,082	5.97	136	0.26
	Aug 1	39	12	468	72	0.15	254	0.54	1,233	2.63	3,090	6.60
	Aug 4	42	12	504	27	0.05	162	0.32	550	1.09	2,189	4.34
	Aug 6	43	12	516	36	0.07	142	0.28	379	0.73	5,594	10.84
	Aug 8	47	12	564	34	0.06	141	0.25	270	0.48	3,894	6.90
	Aug 11	55	12	660	31	0.05	79	0.12	163	0.25	9,882	14.97
	Aug 13	51	12	612	24	0.04	25	0.04	54	0.09	4,931	8.06
	Aug 15	43	12	516	12	0.02	23	0.04	16	0.03	4,846	9.39
	Aug 18	46	12	552	9	0.02	39	0.07	57	0.10	4,514	8.18
	Aug 20	34	12	408	10	0.02	20	0.05	27	0.07	3,924	9.62
	Aug 22	33	12	396	6	0.02	25	0.06	22	0.06	3,174	8.02
	Aug 25	20	12	240	3	0.01	3	0.01	5	0.02	1,518	6.33
	Aug 27	24	12	288	4	0.01	23	0.08	13	0.05	2,054	7.13
Total			288	13,500	14,444		33,941		27,868		49,833	
2004	Jun 15	40	12	480	3,788	7.89	124	0.26	203	0.42	0	0.00
	Jun 17	44	12	528	3,079	5.83	258	0.49	619	1.17	0	0.00
	Jun 22	50	12	600	2,625	4.38	1,508	2.51	1,404	2.34	0	0.00
	Jun 24	72	12	864	3,429	3.97	2,565	2.97	3,104	3.59	0	0.00
	Jun 29	59	12	708	3,424	4.84	2,897	4.09	1,678	2.37	0	0.00
	Jul 1	45	12	540	1,959	3.63	3,156	5.84	1,908	3.53	0	0.00
	Jul 5	63	12	756	2,269	3.00	6,099	8.07	2,876	3.80	0	0.00
	Jul 7	54	12	648	1,562	2.41	4,742	7.32	1,909	2.95	0	0.00
	Jul 9	56	12	672	811	1.21	4,806	7.15	2,549	3.79	0	0.00
	Jul 12	53	12	636	699	1.10	3,045	4.79	3,367	5.29	0	0.00
	Jul 14	41	12	492	881	1.79	2,533	5.15	3,243	6.59	0	0.00
	Jul 16	31	12	372	412	1.11	1,454	3.91	1,562	4.20	0	0.00
	Aug 2	35	12	420	89	0.21	375	0.89	447	1.06	4,131	9.84
	Aug 4	36	12	432	83	0.19	223	0.52	318	0.74	4,756	11.01
	Aug 6	36	12	432	38	0.09	177	0.41	202	0.47	2,654	6.14
	Aug 9	44	12	528	50	0.09	133	0.25	118	0.22	8,977	17.00
	Aug 11	41	12	492	44	0.09	103	0.21	96	0.20	10,267	20.87
	Aug 13	30	12	360	31	0.09	56	0.16	26	0.07	5,618	15.61
	Aug 16	53	12	636	28	0.04	49	0.08	48	0.08	9,861	15.50
	Aug 18	53	12	636	21	0.03	63	0.10	63	0.10	9,123	14.34
	Aug 20	46	12	552	14	0.03	36	0.07	51	0.09	6,792	12.30
	Aug 23	37	12	444	9	0.02	17	0.04	19	0.04	7,281	16.40
	Aug 25	44	12	528	9	0.02	12	0.02	28	0.05	6,113	11.58
	Aug 27	39	12	468	11	0.02	6	0.01	12	0.03	7,137	15.25
Total			288	13,224	25,365		34,437		25,850		82,710	
2005	Jun 14	67	12	804	3,366	4.19	496	0.62	47	0.06	0	0.00
	Jun 16	85	12	1,020	2,554	2.50	564	0.55	51	0.05	0	0.00
	Jun 21	90	12	1,080	5,850	5.42	3,537	3.28	512	0.47	0	0.00

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Year	Date	Permits Fished	Hours Fished	Permit Hours	Chinook Catch	Chinook CPUE	Sockeye Catch	Sockeye CPUE	Chum Catch	Chum CPUE	Coho Catch	Coho CPUE
2005	Jun 23	100	12	1,200	3,826	3.19	2,907	2.42	564	0.47	0	0.00
(cont.)	Jun 28	82	12	984	2,700	2.74	9,920	10.08	3,239	3.29	0	0.00
	Jun 30	79	12	948	1,681	1.77	7,350	7.75	289	0.30	0	0.00
	Jul 5	77	12	924	1,480	1.60	10,587	11.46	480	0.52	0	0.00
	Jul 7	70	12	840	743	0.88	8,661	10.31	1,328	1.58	0	0.00
	Jul 12	63	12	756	705	0.93	8,760	11.59	1,672	2.21	0	0.00
	Jul 14	58	12	696	416	0.60	6,209	8.92	1,354	1.95	0	0.00
	Jul 19	44	12	528	317	0.60	4,199	7.95	1,187	2.25	0	0.00
	Aug 1	53	12	636	114	0.18	1,488	2.34	688	1.08	957	1.50
	Aug 3	46	12	552	115	0.21	1,059	1.92	567	1.03	1,888	3.42
	Aug 5	46	12	552	64	0.12	650	1.18	382	0.69	2,625	4.76
	Aug 8	55	12	660	69	0.10	716	1.08	444	0.67	5,505	8.34
	Aug 10	54	12	648	48	0.07	383	0.59	145	0.22	4,361	6.73
	Aug 12	65	12	780	44	0.06	415	0.53	209	0.27	5,721	7.33
	Aug 15	46	12	552	25	0.05	240	0.43	127	0.23	5,307	9.61
	Aug 17	60	12	720	31	0.04	202	0.28	85	0.12	7,786	10.81
	Aug 19	65	12	780	20	0.03	240	0.31	76	0.10	7,642	9.80
	Aug 22	56	12	672	10	0.01	94	0.14	46	0.07	5,035	7.49
	Aug 26	42	12	504	13	0.03	81	0.16	31	0.06	3,332	6.61
	Aug 30	29	12	348	4	0.01	43	0.12	6	0.02	1,549	4.45
Total			276	17,184	24,195		68,801		13,529		51,708	
2006	Jun 15	69	12	828	2,940	3.55	188	0.23	2,192	2.65	0	0.00
	Jun 20	87	12	1,044	4,246	4.07	993	0.95	5,091	4.88	0	0.00
	Jun 22	87	12	1,044	3,947	3.78	2,038	1.95	4,261	4.08	0	0.00
	Jun 27	59	12	708	1,381	1.95	4,838	6.83	3,039	4.29	0	0.00
	Jun 30	80	12	960	1,796	1.87	17,074	17.79	4,507	4.69	0	0.00
	Jul 3	77	12	924	1,162	1.26	10,445	11.30	2,063	2.23	0	0.00
	Jul 5	80	12	960	791	0.82	10,202	10.63	1,681	1.75	0	0.00
	Jul 7	90	12	1,080	855	0.79	14,061	13.02	1,514	1.40	23	0.02
	Jul 10	99	12	1,188	722	0.61	12,537	10.55	2,348	1.98	26	0.02
	Jul 17	73	12	876	286	0.33	8,012	9.15	1,983	2.26	48	0.05
	Jul 19	80	12	960	327	0.34	8,043	8.38	2,089	2.18	29	0.03
	Jul 21	67	12	804	236	0.29	7,508	9.34	2,041	2.54	47	0.06
	Jul 24	63	12	756	175	0.23	3,886	5.14	2,438	3.22	146	0.19
	Jul 26	37	12	444	82	0.18	1,979	4.46	1,243	2.80	323	0.73
	Jul 31	36	12	432	59	0.14	1,189	2.75	940	2.18	965	2.23
	Aug 2	30	12	360	29	0.08	737	2.05	435	1.21	452	1.26
	Aug 4	27	12	324	21	0.06	684	2.11	296	0.91	522	1.61
	Aug 7	34	12	408	19	0.05	447	1.10	283	0.69	1,631	4.00
	Aug 9	30	12	360	23	0.06	168	0.47	114	0.32	1,968	5.47
	Aug 11	43	12	516	25	0.05	334	0.65	206	0.40	4,208	8.16
	Aug 14	57	12	684	20	0.03	207	0.30	102	0.15	3,323	4.86
	Aug 16	36	12	432	7	0.02	188	0.44	48	0.11	1,628	3.77
	Aug 18	32	12	384	8	0.02	136	0.35	60	0.16	2,881	7.50
	Aug 21	36	12	432	9	0.02	98	0.23	64	0.15	1,804	4.18
	Aug 23	34	12	408	7	0.02	75	0.18	36	0.09	1,646	4.03
	Aug 25	30	12	360	2	0.01	96	0.27	32	0.09	2,027	5.63
	Aug 28	30	12	360	3	0.01	55	0.15	25	0.07	1,342	3.73
	Aug 30	19	12	228	1	0.00	38	0.17	11	0.05	823	3.61
	Sep 1	16	12	192	5	0.03	52	0.27	9	0.05	969	5.05
Total			348	18,456	19,184		106,308		39,151		26,831	

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Year	Date	Permits Fished	Hours Fished	Permit Hours	Chinook Catch	Chinook CPUE	Sockeye Catch	Sockeye CPUE	Chum Catch	Chum CPUE	Coho Catch	Coho CPUE
2007	Jun 14	88	12	1,056	1,308	1.24	66	0.06	250	0.24	0	0.00
	Jun 19	82	12	984	2,267	2.30	349	0.35	1,275	1.30	0	0.00
	Jun 21	80	12	960	3,356	3.50	1,533	1.60	2,530	2.64	0	0.00
	Jun 26	97	12	1,164	3,749	3.22	1,940	1.67	4,260	3.66	0	0.00
	Jun 28	87	12	1,044	2,375	2.27	5,150	4.93	1,186	1.14	0	0.00
	Jul 2	94	12	1,128	1,781	1.58	7,633	6.77	3,582	3.18	0	0.00
	Jul 4	85	12	1,020	971	0.95	8,970	8.79	2,723	2.67	0	0.00
	Jul 6	93	12	1,116	896	0.80	8,228	7.37	2,885	2.59	0	0.00
	Jul 8	49	12	588	382	0.65	7,494	12.74	1,109	1.89	0	0.00
	Jul 10	89	12	1,068	722	0.68	10,548	9.88	2,539	2.38	0	0.00
	Jul 12	89	12	1,068	489	0.46	13,170	12.33	2,292	2.15	0	0.00
	Jul 14	87	12	1,044	370	0.35	13,589	13.02	1,624	1.56	8	0.01
	Jul 16	82	12	984	250	0.25	9,483	9.64	1,584	1.61	40	0.04
	Jul 18	72	12	864	145	0.17	5,545	6.42	2,310	2.67	91	0.11
	Jul 20	69	12	828	183	0.22	5,077	6.13	6,109	7.38	117	0.14
	Jul 22	0	12	0	Commercial Opening, Processor not able to buy							
	Jul 24	54	12	648	96	0.15	3,608	5.57	6,333	9.77	477	0.74
	Jul 26	49	12	588	64	0.11	2,579	4.39	6,903	11.74	792	1.35
	Jul 31	48	12	576	31	0.05	821	1.43	3,462	6.01	2,207	3.83
	Aug 2	51	12	612	40	0.07	788	1.29	3,597	5.88	2,142	3.50
	Aug 4	53	12	636	22	0.03	354	0.56	1,628	2.56	1,714	2.69
	Aug 6	50	12	600	16	0.03	608	1.01	1,370	2.28	2,443	4.07
	Aug 8	50	12	600	14	0.02	301	0.50	766	1.28	2,849	4.75
	Aug 10	47	12	564	13	0.02	326	0.58	502	0.89	3,275	5.81
	Aug 13	46	12	552	9	0.02	225	0.41	433	0.78	3,298	5.97
	Aug 15	52	12	624	5	0.01	234	0.38	313	0.50	2,839	4.55
	Aug 17	40	12	480	7	0.01	187	0.39	194	0.40	2,394	4.99
	Aug 20	43	12	516	4	0.01	144	0.28	142	0.28	2,544	4.93
	Aug 22	45	12	540	1	0.00	151	0.28	73	0.14	2,353	4.36
	Aug 24	38	12	456	6	0.01	167	0.37	108	0.24	2,267	4.97
	Aug 27	37	12	444	2	0.00	105	0.24	51	0.11	1,103	2.48
	Aug 29	30	12	360	1	0.00	79	0.22	55	0.15	1,065	2.96
	Aug 31	22	12	264	0	0.00	65	0.25	44	0.17	692	2.62
Total			396	23,976	19,575		109,517		62,232		34,710	
2008	Jun 14	102	12	1,224	1,322	1.08	91	0.07	345	0.28	0	0.00
	Jun 17	99	12	1,188	1,293	1.09	354	0.30	640	0.54	0	0.00
	Jun 24	91	12	1,092	2,891	2.65	1,946	1.78	3,941	3.61	0	0.00
	Jun 26	101	12	1,212	3,359	2.77	2,150	1.77	4,430	3.66	0	0.00
	July 1	105	12	1,260	1,544	1.23	6,782	5.38	6,285	4.99	0	0.00
	July 5	99	12	1,188	1,015	0.85	6,484	5.46	3,018	2.54	0	0.00
	July 8	81	12	972	391	0.40	5,494	5.65	3,242	3.34	0	0.00
	July 10	86	12	1,032	340	0.33	7,361	7.13	2,901	2.81	1	0.00
	July 12	83	12	996	340	0.34	8,322	8.36	3,452	3.47	7	0.01
	July 14	89	12	1,068	368	0.34	10,141	9.50	6,246	5.85	61	0.06
	July 16	78	12	936	236	0.25	5,557	5.94	3,325	3.55	110	0.12
	July 18	88	12	1,056	225	0.21	5,368	5.08	4,032	3.82	122	0.12

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Year	Date	Permits Fished	Hours Fished	Permit Hours	Chinook Catch	Chinook CPUE	Sockeye Catch	Sockeye CPUE	Chum Catch	Chum CPUE	Coho Catch	Coho CPUE
2008	July 21	76	12	912	158	0.17	3,041	3.33	4,917	5.39	746	0.82
(cont.)	July 23	61	12	732	94	0.13	2,029	2.77	3,434	4.69	764	1.04
	July 25	54	12	648	58	0.09	1,140	1.76	2,216	3.42	1,453	2.24
	July 28	46	12	552	32	0.06	793	1.44	1,073	1.94	1,827	3.31
	July 30	56	12	672	38	0.06	800	1.19	1,291	1.92	4,332	6.45
	Aug 1	53	12	636	21	0.03	484	0.76	707	1.11	4,095	6.44
	Aug 4	55	12	660	20	0.03	287	0.43	436	0.66	4,805	7.28
	Aug 6	53	12	636	12	0.02	222	0.35	312	0.49	4,762	7.49
	Aug 8	50	12	600	12	0.02	174	0.29	186	0.31	3,549	5.92
	Aug 10	30	12	360	5	0.01	139	0.39	130	0.36	3,645	10.13
	Aug 12	66	12	792	10	0.01	127	0.16	134	0.17	8,209	10.36
	Aug 14	65	12	780	4	0.01	101	0.13	62	0.08	13,540	17.36
	Aug 16	77	12	924	8	0.01	121	0.13	80	0.09	10,175	11.01
	Aug 18	66	12	792	7	0.01	82	0.10	56	0.07	9,377	11.84
	Aug 20	65	12	780	2	0.00	65	0.08	43	0.06	9,568	12.27
	Aug 22	56	12	672	2	0.00	28	0.04	34	0.05	3,242	4.82
	Aug 25	38	12	456	2	0.00	42	0.09	27	0.06	3,204	7.03
	Aug 27	39	12	468	1	0.00	11	0.02	19	0.04	2,553	5.46
	Aug 29	40	12	480	2	0.00	7	0.01	19	0.04	4,110	8.56
Total			372	25,776	13,812		69,743		57,033		94,257	
2009	Jun 15	79	12	948	1,608	2.1	142	3.1	231	2.7	0	0.0
	Jun 17	73	12	876	1,878	1.5	245	9.3	183	5.7	0	0.0
	Jun 22	110	12	1,320	3,482	0.8	1,892	12.1	2005	7.6	0	0.0
	Jun 25	120	12	1,440	2,849	0.4	4,753	11.5	3931	7.9	0	0.0
	Jun 30	122	12	1,464	1,302	0.2	10,329	12.3	7391	5.8	0	0.0
	Jul 6	120	12	1,440	723	0.2	14,406	8.1	6171	4.0	0	0.0
	Jul 8	131	12	1,572	798	0.1	12,919	6.0	10633	5.1	0	0.0
	Jul 10	122	12	1,464	382	0.1	14,274	8.0	11026	6.0	2	0.0
	Jul 13	95	12	1,140	133	0.1	7,810	8.0	7256	5.9	0	0.0
	Jul 15	111	12	1,332	137	0.1	8,623	5.4	6323	5.0	3	0.0
	Jul 16	77	6	462	72	0.1	6,946	4.2	4579	3.2	4	0.0
	Jul 17	80	12	960	135	0.1	6,561	8.8	6732	2.8	3	0.1
	Jul 20	70	12	840	92	0.0	6,877	6.7	4557	1.8	110	0.1
	Jul 22	73	12	876	81	0.1	6,898	6.5	4710	1.8	211	0.1
	Jul 24	79	12	948	74	0.0	4,048	4.0	4268	0.9	548	0.2
	Jul 25	61	12	732	42	0.0	1,960	1.1	3794	0.3	610	0.2
	Jul 27	41	12	492	27	0.0	837	3.8	1868	1.0	618	1.3
	Jul 29	19	12	228	3	0.0	134	3.6	284	0.7	209	1.1
	Jul 31	38	12	456	17	0.0	847	3.4	2240	0.5	2,289	2.1
	Aug 3	53	12	636	22	0.0	470	3.3	866	0.3	3,733	1.6
	Aug 5	56	12	672	8	0.0	245	3.9	639	0.2	4,254	2.4
	Aug 7	69	12	828	11	0.0	239	2.8	562	0.1	4,952	4.1
	Aug 10	70	12	840	8	0.0	235	3.3	374	0.1	4,572	5.4
	Aug 12	58	12	696	4	0.0	92	2.2	169	0.1	4,076	9.8
	Aug 14	64	12	768	8	0.0	131	1.3	146	0.0	5,973	7.7
	Aug 17	66	12	792	9	0.0	96	0.6	99	0.0	5,507	4.7
	Aug 19	66	12	792	4	0.0	77	0.6	66	0.0	5,181	4.7
	Aug 21	56	12	672	5	0.0	51	0.6	31	0.0	3,930	4.7
	Aug 24	45	12	540	6	0.0	16	0.6	24	0.0	1,330	4.7
Total			342	24,222	13,920		112,153		91,158		48,115	
10 Yr Avg												
(99-08)			304	17,304	18,049		58,425		34,084		42,199	

Appendix C9.–Salmon spawning aerial survey index estimates, Kanektok River, Kuskokwim Bay, 1962–2009.

Year	Chinook	Sockeye	Coho	Chum
1962	935	43,108	[a]	[a]
1963	[a]	[a]	[a]	[a]
1964	[a]	[a]	[a]	[a]
1965	[a]	[a]	[a]	[a]
1966	3,718	[a]	[a]	28,800
1967	[a]	[a]	[a]	[a]
1968	4,170	8,000	[a]	14,000
1969	[a]	[a]	[a]	[a]
1970	3,112	11,375	[a]	[a]
1971	[a]	[a]	[a]	[a]
1972	[a]	[a]	[a]	[a]
1973	814	[a]	[a]	[a]
1974	[a]	[a]	[a]	[a]
1975	[a]	6,018	[a]	[a]
1976	[a]	22,936	[a]	8,697
1977	5,787	7,244	[a]	32,157
1978	19,180	44,215	[a]	229,290 [b]
1979	[a]	[a]	[a]	[a]
1980	[a]	[a]	[a]	[a]
1981	[a]	[a]	69,325	[a]
1982	15,900	49,175	[a]	71,840
1983	8,142	55,940	[a]	[a]
1984	8,890	2,340	[a]	9,360
1985	12,182	30,840	46,830	53,060
1986	13,465	16,270	[a]	14,385
1987	3,643	14,940	[a]	16,790
1988	4,223	51,753	20,056	9,420
1989	11,180	30,440	[a]	20,583
1990	7,914	14,735	[a]	6,270
1991	[a]	[a]	[a]	2,475
1992	2,100	44,436	4,330	19,052 [c]
1993	3,856	14,955	[a]	25,675
1994	4,670	23,128	[a]	1,285
1995	7,386	30,090	[a]	10,000
1996	[a]	[a]	[a]	[a]
1997	[a]	[a]	[a]	[a]
1998	6,107	22,020	23,656	7,040
1999	[a]	[a]	5,192	[a]
2000	1,118	11,670	10,120	10,000
2001	6,483	38,610	[a]	11,440
2002	[a]	[a]	[a]	[a]
2003	5,430	18,010	[a]	2,700
2004	27,873	7,838	[a]	[a]
2005	13,926	110,730	[a]	[a]
2006	4,875	367,300	[a]	[a]
2007	[a]	[a]	[a]	[a]
2008	3,659	43,900	[a]	[a]
2009	[a]	[a]	[a]	[a]
SEG	3,500-8,000	14,000-34,000		>5,200

Note: Aerial surveys are those rated as fair to good, obtained between 20 July and 5 August for Chinook and sockeye salmon, 20-31 July for chum salmon, and 20 August and 5 September for coho salmon.

[a] Survey either not flown or did not meet acceptable survey criteria.

[b] Chum salmon count excluded from escapement objective calculation due to exceptional magnitude.

[c] Some chum may have been sockeye salmon.

Appendix C10.–Salmon spawning escapement, Kanektok River, Kuskokwim Bay, 1996–2009.

Year	Operating Period [a]	Chinook	Sockeye	Chum	Pink [b]	Coho
Kanektok River						
Counting Tower						
1996	7/2-7/13; 7/20-7/25		[c]	[c]	[c]	
1997	06/11 to 08/21	16,731	96,348	51,180	7,872	[c]
1998	07/23 to 08/17		[c]	[c]	[c]	[c] [c]
1999			Not Operational			
2000			Not Operational			
Weir						
2001	08/10 to 10/03	132 [c]	739 [c]	1,056 [c]	19	35,650
2002	07/01 to 09/20	5,343 [d]	58,326 [d]	42,009 [d]	87,031	24,840
2003	06/24 to 09/18	8,231	127,471	40,066	2,443	72,448
2004	06/29 to 09/20	19,528	102,867	46,444	98,060	87,828
2005	06/25 to 09/18	14,331	242,208	53,580	3,530	26,343 [e]
2006			Not Operational			
2007	06/19 to 09/18	14,120	307,750	133,215	3,075	30,471
2008	07/17 to 08/21	6,578 [d]	141,388 [e]	54,024 [d]	142,430	24,490 [d]
2009	07/05 to 08/11	6,841	272,483 [d]	51,652 [d]	1,246	2,336 [c]

[a] The operational period is inclusive of days when passage was estimated; unless noted otherwise, less than 20% of the total annual escapement is estimated.

[b] Pink salmon numbers represent actual counts. No estimates of missed escapement, due to picket spacing allowing unmonitored for small pink salmon.

[c] Field operations were incomplete and total annual escapement was not estimated.

[d] Field operations were incomplete; sum of daily counts is an underestimate of total escapement, but considered reasonable. Additional estimates were not made.

[e] Field operations were incomplete; more than 20% of the total estimate is based on daily passage estimates.

APPENDIX D.

Appendix D1.–Commercial salmon fishing periods, hours, and permits fished, District W-5 Goodnews Bay, Kuskokwim Bay, 1970–2009.

Year	Number of Periods	Fishing Hours	Permits Fished[a]
1970	28	624	35
1971	3	156	16
1972	8	186	14
1973	24	288	21
1974	30	360	49
1975	24	288	50
1976	32	384	40
1977	24	288	34
1978	36	432	35
1979	36	432	30
1980	38	456	48
1981	34	492	48
1982	34	540	48
1983	28	336	79
1984	31	372	77
1985	22	264	69
1986	30	360	86
1987	21	252	69
1988	30	360	125
1989	28	336	88
1990	28	396	82
1991	27	432	72
1992	26	396	111
1993	28	336	114
1994	32	432	116
1995	25	396	118
1996	21	247	53
1997	23	276	54
1998	29	348	50
1999	20	240	73
2000	25	300	46
2001	16	183	32
2002	12	144	30
2003	23	216	34
2004	21	252	29
2005	21	252	29
2006	27	324	24
2007	33	396	28
2008	30	360	25
2009	26	306	39
10 Yr Avg (99-08)	23	267	35
Hist Avg (70-08)	26	337	56

[a] Permits that made at least one delivery during the year.

Appendix D2.–Commercial salmon harvests, District W-5 Goodnews Bay, Kuskokwim Bay, 1968–2009.

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1968	[a]	[a]	5,458	[a]	[a]	5,458
1969	3,978	6,256	11,631	298	5,006	27,169
1970	7,163	7,144	6,794	12,183	12,346	45,630
1971	477	330	1,771	0	301	2,879
1972	264	924	925	66	1,331	3,510
1973	3,543	2,072	5,017	324	15,781	26,737
1974	3,302	9,357	21,340	16,373	8,942	59,314
1975	2,156	9,098	17,889	419	5,904	35,466
1976	4,417	5,575	9,852	8,453	10,354	38,651
1977	3,336	3,723	13,335	29	6,531	26,954
1978	5,218	5,412	13,764	9,103	8,590	42,087
1979	3,204	19,581	42,098	201	9,298	74,382
1980	2,331	28,632	43,256	7,832	11,748	93,799
1981	7,190	40,273	19,749	11	13,642	80,865
1982	9,476	38,877	46,683	4,673	13,829	113,538
1983	14,117	11,716	19,660	0	6,766	52,259
1984	8,612	15,474	71,176	4,711	14,340	114,313
1985	5,793	6,698	16,498	8	4,784	33,781
1986	2,723	25,112	19,378	4,439	10,356	62,008
1987	3,357	27,758	29,057	54	20,381	80,607
1988	4,964	36,368	30,832	5,509	33,059	110,732
1989	2,966	19,299	31,849	82	13,622	67,818
1990	3,303	35,823	7,804	629	13,194	60,753
1991	912	39,838	13,312	29	15,892	69,983
1992	3,528	39,194	19,875	14,310	18,520	95,427
1993	2,117	59,293	20,014	0	10,657	92,081
1994	2,570	69,490	47,499	18,017	28,477	166,053
1995	2,922	37,351	17,875	39	19,832	78,019
1996	1,375	30,717	43,836	22	11,093	87,043
1997	2,039	31,451	2,983	0	11,729	48,202
1998	3,675	27,161	21,246	411	14,155	66,648
1999	1,888	22,910	2,474	0	11,562	38,834
2000	4,442	37,252	15,531	7	7,450	64,682
2001	1,519	25,654	9,275	0	3,412	39,860
2002	979	6,304	3,041	0	3,799	14,123
2003	1,412	29,423	12,658	0	5,593	49,086
2004	2,565	20,523	24,089	0	5,965	53,142
2005	2,035	23,933	11,735	0	2,568	40,271
2006	2,892	29,857	12,436	0	11,568	56,753
2007	3,126	43,766	13,697	6	7,853	68,448
2008	1,281	27,237	22,547	0	10,408	61,473
2009	1,509	32,544	8,406	0	16,985	59,444
10 Yr Avg (99-08)	2,214	26,686	12,748	1 [b]	7,018	48,667
Hist Avg (68-08)	3,579	23,921	19,511	2,706 [b]	11,016	59,728

[a] No harvest information available.

[b] Average of even years only.

Appendix D3.–Chinook salmon total utilization, District W-5 Goodnews Bay, Kuskokwim Bay, 1969–2009.

	Commercial Harvest[a]		Subsistence Harvest[b]		Sport Fish		Total	10-Year
Year	Annual	10-yr Avg	Annual	10-yr Avg	Annual	10-yr Avg	Utilization	Average
1969	3,978						3,978	
1970	7,163						7,163	
1971	477						477	
1972	264						264	
1973	3,543						3,543	
1974	3,302						3,302	
1975	2,156						2,156	
1976	4,417						4,417	
1977	3,336		574 [c]				3,910	
1978	5,218						5,218	
1979	3,204	3,385	338				3,542	3,443
1980	2,331	3,308	690				3,021	3,399
1981	7,190	2,825	1,409				8,599	2,985
1982	9,476	3,496	1,236				10,712	3,797
1983	14,117	4,417	1,066		31		15,214	4,842
1984	8,612	5,475	629				9,241	6,009
1985	5,793	6,006	426		323		6,542	6,603
1986	2,723	6,369	555				3,278	7,042
1987	3,357	6,200	816	769			4,173	6,928
1988	4,964	6,202	310 [d]	796			5,274	6,954
1989	2,966	6,177	468	748	68		3,502	6,960
1990	3,303	6,153	539	761			3,842	6,956
1991	912	6,250	917	745	26		1,855	7,038
1992	3,528	5,622	374	696	23		3,925	6,363
1993	2,117	5,028	708	610	81	94	2,906	5,685
1994	2,570	3,828	784	574	163	104	3,517	4,454
1995	2,922	3,223	883	590	41	114	3,846	3,881
1996	1,375	2,936	415	635	157	67	1,947	3,612
1997	2,039	2,801	449	621	86	80	2,574	3,479
1998	3,675	2,670	718	585	431	81	4,824	3,319
1999	1,888	2,541	871	626	223	120	2,982	3,274
2000	4,442	2,433	703	666	243	137	5,388	3,222
2001	1,519	2,547	895	682	147	147	2,561	3,376
2002	979	2,608	857	680	224	160	2,060	3,447
2003	1,412	2,353	737	728	10	180	2,159	3,261
2004	2,565	2,282	954	731	100	173	3,619	3,186
2005	2,035	2,282	868	748	0	166	2,903	3,196
2006	2,892	2,193	676	747	79	162	3,647	3,102
2007	3,126	2,345	24	773	177	154	3,327	3,272
2008	1,281	2,453	1177 [e]	730	78	163	2,536	3,347
2009	1,509	2,214	567 [e]	776		128		3,118
10-yr Avg [f]	2,214		776		128		3,118	

[a] District 5, Goodnews Bay commercial harvest.

[b] Subsistence harvest by the communities of Goodnews Bay and Platinum.

[c] Subsistence harvest estimate in 1977 was for Goodnews Bay only.

[d] Beginning in 1988, estimates are based on a new formula so data since 1988 is not comparable with previous years.

[e] Numbers reported here are preliminary subsistence harvest estimates generated by Division of Commercial Fisheries. Methodology to estimate harvest has changed slightly since 2007 with the incorporation of stratified sampling. A revision of historical estimates published by Division of Subsistence from 1990 to 2007 using the current methodology is pending review. Comparison of 2008 and 2009 estimates with those prior to 2007 should be done cautiously.

[f] Historical 10-yr Avg (1999–2008).

Appendix D4.–Sockeye salmon total utilization, District W-5 Goodnews Bay, Kuskokwim Bay, 1969–2009.

	Commercial Harvest[a]		Subsistence Harvest[b]		Sport Fish		Total	10-Year
Year	Annual	10-yr Avg	Annual	10-yr Avg	Annual	10-yr Avg	Utilization	Average
1969	6,256						6,256	
1970	7,144						7,144	
1971	330						330	
1972	924						924	
1973	2,072						2,072	
1974	9,357						9,357	
1975	9,098						9,098	
1976	5,575						5,575	
1977	3,723						3,723	
1978	5,412						5,412	
1979	19,581	4,989					19,581	4,989
1980	28,632	6,322					28,632	6,322
1981	40,273	8,470					40,273	8,470
1982	38,877	12,465					38,877	12,465
1983	11,716	16,260			14		11,730	16,260
1984	15,474	17,224					15,474	17,226
1985	6,698	17,836	704		75		7,477	17,838
1986	25,112	17,596	943		122		26,177	17,675
1987	27,758	19,550	955		266		28,979	19,736
1988	36,368	21,953	1,065 [c]				37,433	22,261
1989	19,299	25,049	861		146		20,306	25,463
1990	35,823	25,021	1,123				36,946	25,536
1991	39,838	25,740	1,282		63		41,183	26,367
1992	39,194	25,696	826		8		40,028	26,458
1993	59,293	25,728	836		53	99	60,182	26,573
1994	69,490	30,486	770		70	105	70,330	31,419
1995	37,351	35,887	253	937	34	100	37,638	36,904
1996	30,717	38,953	418	891	87	95	31,222	39,920
1997	31,451	39,513	609	839	61	91	32,121	40,425
1998	27,161	39,882	508	804	502	65	28,171	40,739
1999	22,910	38,962	872	749	561	114	24,343	39,813
2000	37,252	39,323	1,205	750	82	160	38,539	40,216
2001	25,654	39,466	974	758	108	152	26,736	40,376
2002	6,304	38,047	1,050	727	149	157	7,503	38,931
2003	29,423	34,758	783	750	42	171	30,248	35,679
2004	20,523	31,771	960	744	0	170	21,483	32,685
2005	23,933	26,875	1,233	763	0	163	25,166	27,800
2006	29,857	25,533	1,007	861	98	159	30,962	26,553
2007	43,766	25,447	36	920	84	160	43,886	26,527
2008	27,237	26,678	3,822 [d]	863	104	163	31,163	27,704
2009	32,544	26,686	966 [d]	1,194		123		28,003
10 Yr Avg [e]	26,686		1,194		123		28,003	

[a] District 5, Goodnews Bay commercial harvest.

[b] Subsistence harvest by the communities of Goodnews Bay and Platinum.

[c] Beginning in 1988, estimates are based on a new formula so data since 1988 is not comparable with previous years.

[d] Numbers reported here are preliminary subsistence harvest estimates generated by Division of Commercial Fisheries. Methodology to estimate harvest has changed slightly since 2007 with the incorporation of stratified sampling. A revision of historical estimates published by Division of Subsistence from 1990 to 2007 using the current methodology is pending review. Comparison of 2008 and 2009 estimates with those prior to 2007 should be done cautiously.

[e] Historical 10-yr Avg (1999–2008).

Appendix D5.–Chum salmon total utilization, District W-5 Goodnews Bay, Kuskokwim Bay, 1969–2009.

	Commercial Harvest[a]		Subsistence Harvest[b]		Sport Fish		Total	10-Year
Year	Annual	10-yr Avg	Annual	10-yr Avg	Annual	10-yr Avg	Utilization	Average
1969	5,006						5,006	
1970	12,346						12,346	
1971	301						301	
1972	1,331						1,331	
1973	15,781						15,781	
1974	8,942						8,942	
1975	5,904						5,904	
1976	10,354						10,354	
1977	6,531						6,531	
1978	8,590						8,590	
1979	9,298	7,509					9,298	7,509
1980	11,748	7,938					11,748	7,938
1981	13,642	7,878					13,642	7,878
1982	13,829	9,212					13,829	9,212
1983	6,766	10,462			10		6,776	10,462
1984	14,340	9,560					14,340	9,561
1985	4,784	10,100	348		124		5,256	10,101
1986	10,356	9,988	191				10,547	10,036
1987	20,381	9,988	578				20,959	10,056
1988	33,059	11,373	448 [c]				33,507	11,499
1989	13,622	13,820	784		0		14,406	13,990
1990	13,194	14,253	332				13,526	14,501
1991	15,892	14,397	149		189		16,230	14,679
1992	18,520	14,622	1,006		0		19,526	14,938
1993	10,657	15,091	188		156	65	11,001	15,507
1994	28,477	15,481	470		15	94	28,962	15,930
1995	19,832	16,894	156	449	0	81	19,988	17,392
1996	11,093	18,399	219	430	0	60	11,312	18,865
1997	11,729	18,473	133	433	24	51	11,886	18,942
1998	14,155	17,608	316	389	50	48	14,521	18,034
1999	11,562	15,717	281	375	47	48	11,890	16,136
2000	7,450	15,511	364	325	12	53	7,826	15,884
2001	3,412	14,937	226	328	21	49	3,659	15,314
2002	3,799	13,689	407	336	99	33	4,305	14,057
2003	5,593	12,217	176	276	14	42	5,783	12,535
2004	5,965	11,710	257	275	0	28	6,222	12,013
2005	2,568	9,459	209	254	0	27	2,777	9,739
2006	11,568	7,733	648	259	0	27	12,216	8,018
2007	7,853	7,780	7	302	0	27	7,860	8,109
2008	10,408	7,393	959 [d]	289	26	24	11,393	7,706
2009	16,985	7,018	149 [d]	353		22		7,393
10-yr Avg [e]	7,018		353		22		7,393	

[a] District 5, Goodnews Bay commercial harvest.

[b] Subsistence harvest by the communities of Goodnews Bay and Platinum.

[c] Beginning in 1988, estimates are based on a new formula so data since 1988 is not comparable with previous years.

[d] Numbers reported here are preliminary subsistence harvest estimates generated by Division of Commercial Fisheries. Methodology to estimate harvest has changed slightly since 2007 with the incorporation of stratified sampling. A revision of historical estimates published by Division of Subsistence from 1990 to 2007 using the current methodology is pending review. Comparison of 2008 and 2009 estimates with those prior to 2007 should be done cautiously.

[e] Historical 10-yr Avg (1999–2008).

Appendix D6.–Coho salmon total utilization, District W-5 Goodnews Bay, Kuskokwim Bay, 1968–2009.

	Commercial Harvest[a]		Subsistence Harvest[b]		Sport Fish		Total	10-Year
Year	Annual	10-yr Avg	Annual	10-yr Avg	Annual	10-yr Avg	Utilization	Average
1968	5,458						5,458	
1969	11,631						11,631	
1970	6,794						6,794	
1971	1,771						1,771	
1972	925						925	
1973	5,017						5,017	
1974	21,340						21,340	
1975	17,889						17,889	
1976	9,852						9,852	
1977	13,335						13,335	
1978	13,764	9,401					13,764	9,401
1979	42,098	10,232					42,098	10,232
1980	43,256	13,279					43,256	13,279
1981	19,749	16,925					19,749	16,925
1982	46,683	18,723					46,683	18,723
1983	19,660	23,298			168		19,828	23,298
1984	71,176	24,763					71,176	24,779
1985	16,498	29,746	221		386		17,105	29,763
1986	19,378	29,607	8 [c]				19,386	29,685
1987	29,057	30,560	43 [c]				29,100	30,638
1988	30,832	32,132	1,162 [d]				31,994	32,215
1989	31,849	33,839	907		224		32,980	34,038
1990	7,804	32,814	1,646				9,450	33,126
1991	13,312	29,269	1,828		297		15,437	29,745
1992	19,875	28,625	1,353		138		21,366	29,314
1993	20,014	25,944	1,226		189	243	21,429	26,782
1994	47,499	25,980	512		170	247	48,181	26,942
1995	17,875	23,612	306	891	114	234	18,295	24,643
1996	43,836	23,750	352	899	466	189	44,654	24,762
1997	2,983	26,195	397	934	855	228	4,235	27,289
1998	21,246	23,588	331	969	574	307	22,151	24,802
1999	2,474	22,629	582	886	789	336	3,845	23,818
2000	15,531	19,692	517	853	795	399	16,843	20,904
2001	9,275	20,465	616	740	822	439	10,713	21,644
2002	3,041	20,061	297	619	429	491	3,767	21,171
2003	12,658	18,377	1,319	514	42	520	14,019	19,411
2004	24,089	17,642	1,617	523	622	506	26,328	18,670
2005	11,735	15,301	839	633	1,046	551	13,620	16,485
2006	12,436	14,687	704	687	553	644	13,693	16,018
2007	13,697	11,547	20	722	211	653	13,928	12,921
2008	22,547	12,618	1,900 [e]	684	220	588	24,667	13,891
2009	8,406	12,748	327 [e]	841		553		14,142
10-yr Avg [f]	12,748		841		553		14,142	

[a] District 5, Goodnews Bay commercial harvest.

[b] Subsistence harvest by the communities of Goodnews Bay and Platinum.

[c] Subsistence harvest estimates are for the community of Platinum only.

[d] Beginning in 1988, estimates are based on a new formula so data since 1988 is not comparable with previous years.

[e] Numbers reported here are preliminary subsistence harvest estimates generated by Division of Commercial Fisheries. Methodology to estimate harvest has changed slightly since 2007 with the incorporation of stratified sampling. A revision of historical estimates published by Division of Subsistence from 1990 to 2007 using the current methodology is pending review. Comparison of 2008 and 2009 estimates with those prior to 2007 should be done cautiously.

[f] Historical 10-yr Avg (1999–2008).

Appendix D7.–Commercial salmon fishing exvessel value, District W-5 Goodnews Bay, Kuskokwim Bay, 1990–2009.

Year	Chinook	Sockeye	Coho	Pink [a]	Chum	Total
1990	$32,135	$263,598	$38,910	$254	$25,767	$360,664
1991	$8,370	$187,622	$47,519	$14	$31,394	$274,919
1992	$30,688	$257,457	$75,278	$2,913	$39,111	$405,447
1993	$21,351	$296,437	$95,043	$0	$28,304	$441,135
1994	$21,732	$309,577	$271,687	$5,442	$41,309	$649,747
1995	$31,339	$175,552	$58,061	$19	$21,427	$286,398
1996	$5,952	$87,427	$120,191	$4	$9,015	$222,589
1997	$10,867	$93,146	$9,497	$0	$9,358	$122,868
1998	$13,685	$100,171	$59,102	$174	$11,133	$184,265
1999	$9,020	$78,800	$7,515	$0	$8,327	$103,662
2000	$25,614	$146,708	$34,689	$2	$6,001	$213,014
2001	$10,496	$68,678	$17,089	$0	$2,586	$98,849
2002	$343	$15,846	$5,634	$0	$2,979	$24,802
2003	$6,461	$95,818	$28,945	$0	$3,883	$135,107
2004	$10,857	$49,741	$70,404	$0	$4,244	$135,246
2005	$16,696	$91,135	$25,010	$0	$1,454	$134,295
2006	$21,314	$87,996	$27,587	$0	$4,368	$141,265
2007	$23,951	$156,802	$38,796	$0	$2,781	$222,330
2008	$13,181	$104,296	$76,683	$0	$3,910	$198,070
2009	$13,333	$134,244	$25,456	$0	$18,998	$192,031
10 Yr Avg (99-08)	$13,793	$89,582	$33,235	$0	$4,053	$140,664
Hist Avg (90-08)	$16,529	$140,358	$58,297	$464	$13,545	$229,193

[a] Even years only.

Appendix D8.–Commercial salmon harvest by period, District W-5 Goodnews Bay, Kuskokwim Bay, 1995–2009.

		Permits	Hours	Permit	Chinook		Sockeye		Chum		Coho	
Year	Date	Fished	Fished	Hours	Catch	CPUE	Catch	CPUE	Catch	CPUE	Catch	CPUE
1994	Jun 27	41	12	492	388	0.79	2,795	5.68	2,364	4.80	0	0.00
	Jun 30	53	12	636	349	0.55	4,651	7.31	2,907	4.57	0	0.00
	Jul 4	40	12	480	637	1.33	7,674	15.99	4,075	8.49	0	0.00
	Jul 6	43	12	516	243	0.47	7,886	15.28	4,076	7.90	0	0.00
	Jul 8	52	12	624	139	0.22	6,261	10.03	2,669	4.28	0	0.00
	Jul 12	88	12	1,056	313	0.30	16,753	15.86	5,498	5.21	1	0.00
	Jul 15	78	12	936	138	0.15	8,860	9.47	3,296	3.52	2	0.00
	Jul 19	42	12	504	71	0.14	2,693	5.34	1,470	2.92	11	0.02
	Jul 21	29	12	348	53	0.15	2,385	6.85	563	1.62	9	0.03
	Jul 23	27	12	324	26	0.08	1,273	3.93	446	1.38	19	0.06
	Jul 25	25	12	300	16	0.05	1,206	4.02	281	0.94	188	0.63
	Jul 27	18	12	216	19	0.09	1,057	4.89	138	0.64	96	0.44
	Jul 29	24	12	288	26	0.09	810	2.81	166	0.58	343	1.19
	Aug 2	31	12	372	13	0.03	969	2.60	153	0.41	1,491	4.01
	Aug 3	25	12	300	18	0.06	761	2.54	100	0.33	1,136	3.79
	Aug 5	28	12	336	19	0.06	849	2.53	77	0.23	1,146	3.41
	Aug 8	35	12	420	13	0.03	749	1.78	60	0.14	3,090	7.36
	Aug 10	31	12	372	14	0.04	391	1.05	44	0.12	1,854	4.98
	Aug 12	24	12	288	26	0.09	288	1.00	31	0.11	2,699	9.37
	Aug 15	31	12	372	14	0.04	422	1.13	23	0.06	3,724	10.01
	Aug 17	29	12	348	7	0.02	151	0.43	11	0.03	4,248	12.21
	Aug 19	29	12	348	8	0.02	195	0.56	11	0.03	4,522	12.99
	Aug 22	33	12	396	6	0.02	131	0.33	2	0.01	6,126	15.47
	Aug 24	32	12	384	2	0.01	41	0.11	0	0.00	5,520	14.38
	Aug 26	2	12	24	0	0.00	1	0.04	0	0.00	147	6.13
	Aug 29	30	12	360	9	0.03	90	0.25	5	0.01	2,557	7.10
	Aug 31	24	12	288	0	0.00	50	0.17	4	0.01	3,097	10.75
	Sept 2	29	12	348	0	0.00	44	0.13	2	0.01	2,149	6.18
	Sept 5	21	12	252	2	0.01	37	0.15	4	0.02	1,014	4.02
	Sept 7	23	12	276	1	0.00	17	0.06	1	0.00	2,310	8.37
Total			360	12,204	2,570		69,490		28,477		47,499	
1995	Jun 29	30	12	360	914	2.54	1,412	3.92	1,242	3.45	0	0.00
	Jul 3	32	12	384	264	0.69	1,427	3.72	2,540	6.61	0	0.00
	Jul 5	33	12	396	229	0.58	2,380	6.01	1,324	3.34	0	0.00
	Jul 7	38	12	456	274	0.60	2,476	5.43	2,207	4.84	0	0.00
	Jul 8	43	12	516	202	0.39	4,362	8.45	2,090	4.05	0	0.00
	Jul 10	59	36	2,124	326	0.15	8,140	3.83	4,835	2.28	0	0.00
	Jul 13	67	36	2,412	182	0.08	4,291	1.78	1,361	0.56	0	0.00
	Jul 17	57	36	2,052	156	0.08	3,642	1.77	2,115	1.03	0	0.00
	Jul 20	36	36	1,296	109	0.08	2,601	2.01	1,187	0.92	1	0.00
	Jul 24	26	12	312	54	0.17	829	2.66	355	1.14	4	0.01
	Jul 26	30	12	360	41	0.11	852	2.37	226	0.63	6	0.02
	Jul 28	16	12	192	22	0.11	578	3.01	81	0.42	3	0.02
	Jul 31	23	12	276	17	0.06	667	2.42	77	0.28	30	0.11
	Aug 2	23	12	276	20	0.07	634	2.30	66	0.24	109	0.39
	Aug 7	23	12	276	17	0.06	692	2.51	62	0.22	520	1.88
	Aug 11	21	12	252	20	0.08	146	0.58	11	0.04	1,289	5.12
	Aug 14	26	12	312	13	0.04	353	1.13	15	0.05	2,455	7.87
	Aug 16	29	12	348	17	0.05	310	0.89	14	0.04	1,290	3.71
	Aug 18	30	12	360	10	0.03	318	0.88	9	0.03	2,378	6.61
	Aug 21	34	12	408	11	0.03	373	0.91	5	0.01	2,147	5.26
	Aug 25	35	12	420	11	0.03	353	0.84	8	0.02	2,039	4.85
	Aug 28	29	12	348	11	0.03	186	0.53	1	0.00	2,322	6.67
	Aug 30	31	12	372	1	0.00	171	0.46	0	0.00	2,173	5.84
	Sept 1	25	12	300	1	0.00	158	0.53	1	0.00	1,109	3.70
Total			384	14,808	2,922		37,351		19,832		17,875	

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Appendix D8.–Page 2 of 8.

Year	Date	Permits Fished	Hours Fished	Permit Hours	Chinook Catch	Chinook CPUE	Sockeye Catch	Sockeye CPUE	Chum Catch	Chum CPUE	Coho Catch	Coho CPUE
1996	Jun 28	26	12	312	307	0.98	2,008	6.44	1,605	5.14	0	0.00
	Jul 02	31	8	248	223	0.90	4,777	19.26	2,208	8.90	0	0.00
	Jul 05	26	4	104	154	1.48	4,900	47.12	1,717	16.51	0	0.00
	Jul 08	40	6	240	125	0.52	4,366	18.19	1,809	7.54	0	0.00
	Jul 11	32	12	384	187	0.49	3,651	9.51	1,009	2.63	0	0.00
	Jul 15	35	8	280	65	0.23	3,080	11.00	1,279	4.57	13	0.05
	Jul 18	34	12	408	78	0.19	1,962	4.81	709	1.74	18	0.04
	Jul 25	28	12	336	53	0.16	1,678	4.99	262	0.78	632	1.88
	Jul 27	25	12	300	74	0.25	1,271	4.24	173	0.58	715	2.38
	Jul 30	19	12	228	19	0.08	790	3.46	116	0.51	1,461	6.41
	Aug 05	25	12	300	17	0.06	301	1.00	54	0.18	2,069	6.90
	Aug 08	23	12	276	13	0.05	307	1.11	44	0.16	1,978	7.17
	Aug 10	26	12	312	14	0.04	218	0.70	16	0.05	3,169	10.16
	Aug 12	29	12	348	10	0.03	458	1.32	50	0.14	6,488	18.64
	Aug 14	28	12	336	7	0.02	234	0.70	17	0.05	4,644	13.82
	Aug 16	30	12	360	7	0.02	223	0.62	10	0.03	7,321	20.34
	Aug 19	28	12	336	3	0.01	173	0.51	4	0.01	5,628	16.75
	Aug 21	29	12	348	9	0.03	119	0.34	3	0.01	4,967	14.27
	Aug 23	27	12	324	5	0.02	135	0.42	8	0.02	2,824	8.72
	Aug 26	13	12	156	5	0.03	66	0.42	0	0.00	1,909	12.24
Total			218	5,936	1,375		30,717		11,093		43,836	
1997	Jun 27	25	12	300	359	1.20	1,664	5.55	540	1.80	0	0.00
	Jun 30	22	12	264	299	1.13	4,290	16.25	997	3.78	0	0.00
	Jul 2	26	12	312	292	0.94	4,325	13.86	1,284	4.12	0	0.00
	Jul 4	22	12	264	177	0.67	2,154	8.16	798	3.02	0	0.00
	Jul 7	29	12	348	145	0.42	2,868	8.24	1,389	3.99	0	0.00
	Jul 9	36	12	432	128	0.30	2,994	6.93	1,180	2.73	0	0.00
	Jul 11	38	12	456	162	0.36	3,285	7.20	1,036	2.27	0	0.00
	Jul 14	42	12	504	125	0.25	2,812	5.58	1,180	2.34	0	0.00
	Jul 16	22	12	264	74	0.28	1,262	4.78	582	2.20	0	0.00
	Jul 18	32	12	384	74	0.19	1,673	4.36	824	2.15	0	0.00
	Jul 21	30	12	360	68	0.19	1,300	3.61	820	2.28	1	0.00
	Jul 23	23	12	276	34	0.12	767	2.78	591	2.14	3	0.01
	Jul 25	17	12	204	23	0.11	411	2.01	206	1.01	0	0.00
	Jul 28	9	12	108	9	0.08	254	2.35	94	0.87	5	0.05
	Aug 1	12	12	144	12	0.08	245	1.70	108	0.75	19	0.13
	Aug 4	7	12	84	8	0.10	142	1.69	41	0.49	35	0.42
	Aug 8	11	12	132	16	0.12	174	1.32	17	0.13	97	0.73
	Aug 11	10	12	120	7	0.06	100	0.83	14	0.12	163	1.36
	Aug 15	17	12	204	7	0.03	210	1.03	13	0.06	735	3.60
	Aug 20	21	12	252	11	0.04	214	0.85	4	0.02	828	3.29
	Aug 22	18	12	216	6	0.03	155	0.72	4	0.02	629	2.91
	Aug 25	17	12	204	3	0.01	152	0.75	7	0.03	468	2.29
Total			264	5,832	2,039		31,451		11,729		2,983	
1998	Jun 30	27	12	324	924	2.85	2,156	6.65	1,641	5.06	0	0.00
	Jul 3	26	12	312	1,065	3.41	2,541	8.14	2,485	7.96	0	0.00
	Jul 6	26	12	312	496	1.59	2,952	9.46	1,500	4.81	0	0.00
	Jul 8	27	12	324	302	0.93	2,652	8.19	1,894	5.85	0	0.00
	Jul 10	33	12	396	233	0.59	3,119	7.88	2,063	5.21	0	0.00
	Jul 13	37	12	444	126	0.28	2,785	6.27	1,423	3.20	0	0.00
	Jul 15	34	12	408	90	0.22	2,801	6.87	1,088	2.67	1	0.00
	Jul 17	34	12	408	76	0.19	1,598	3.92	680	1.67	0	0.00
	Jul 20	32	12	384	81	0.21	1,451	3.78	507	1.32	2	0.01
	Jul 22	27	12	324	52	0.16	1,604	4.95	308	0.95	4	0.01
	Jul 24	26	12	312	44	0.14	1,106	3.54	164	0.53	19	0.06
	Jul 27	21	12	252	28	0.11	534	2.12	132	0.52	56	0.22
	Jul 29	15	12	180	20	0.11	342	1.90	54	0.30	58	0.32

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Year	Date	Permits Fished	Hours Fished	Permit Hours	Chinook Catch	Chinook CPUE	Sockeye Catch	Sockeye CPUE	Chum Catch	Chum CPUE	Coho Catch	Coho CPUE
1998	Jul 31	19	12	228	20	0.09	364	1.60	54	0.24	162	0.71
(Cont)	Aug 3	18	12	216	39	0.18	271	1.25	61	0.28	421	1.95
	Aug 5	17	12	204	17	0.08	162	0.79	36	0.18	954	4.68
	Aug 7	16	12	192	8	0.04	138	0.72	16	0.08	755	3.93
	Aug 10	20	12	240	20	0.08	197	0.82	12	0.05	1,095	4.56
	Aug 12	21	12	252	9	0.04	85	0.34	14	0.06	1,573	6.24
	Aug 14	23	12	276	7	0.03	72	0.26	9	0.03	1,819	6.59
	Aug 18	26	12	312	9	0.03	72	0.23	6	0.02	2,038	6.53
	Aug 21	20	12	240	0	0.00	27	0.11	0	0.00	1,862	7.76
	Aug 24	15	12	180	0	0.00	18	0.10	0	0.00	2,290	12.72
	Aug 26	23	12	276	3	0.01	23	0.08	0	0.00	1,629	5.90
	Aug 28	16	12	192	0	0.00	17	0.09	1	0.01	1,260	6.56
	Aug 31	15	12	180	1	0.01	13	0.07	4	0.02	1,727	9.59
	Sept 2	17	12	204	1	0.00	18	0.09	1	0.00	1,616	7.92
	Sept 4	14	12	168	4	0.02	19	0.11	2	0.01	1,044	6.21
	Sept 7	13	12	156	0	0.00	24	0.15	0	0.00	861	5.52
Total			348	7,896	3,675		27,161		14,155		21,246	
1999	Jul 2	28	12	336	672	2.00	2,026	6.03	2,324	6.92	0	0.00
	Jul 7	47	12	564	352	0.62	4,588	8.13	1,917	3.40	0	0.00
	Jul 9	42	12	504	248	0.49	3,566	7.08	1,620	3.21	0	0.00
	Jul 12	58	12	696	107	0.15	2,762	3.97	1,801	2.59	0	0.00
	Jul 14	48	12	576	178	0.31	2,969	5.15	1,127	1.96	0	0.00
	Jul 16	35	12	420	93	0.22	1,809	4.31	1,102	2.62	0	0.00
	Jul 19	14	12	168	33	0.20	888	5.29	270	1.61	0	0.00
	Jul 21	25	12	300	48	0.16	974	3.25	377	1.26	0	0.00
	Jul 23	26	12	312	52	0.17	1,314	4.21	517	1.66	1	0.00
	Jul 26	19	12	228	26	0.11	533	2.34	184	0.81	0	0.00
	Jul 28	6	12	72	7	0.10	338	4.69	81	1.13	3	0.04
	Jul 30	11	12	132	17	0.13	272	2.06	61	0.46	1	0.01
	Aug 2	10	12	120	15	0.13	222	1.85	45	0.38	13	0.11
	Aug 4	2	12	24	3	0.13	59	2.46	10	0.42	2	0.08
	Aug 6	9	12	108	4	0.04	148	1.37	47	0.44	23	0.21
	Aug 9	12	12	144	9	0.06	110	0.76	39	0.27	108	0.75
	Aug 11	8	12	96	6	0.06	62	0.65	14	0.15	127	1.32
	Aug 16	13	12	156	6	0.04	80	0.51	11	0.07	336	2.15
	Aug 18	15	12	180	6	0.03	101	0.56	11	0.06	455	2.53
	Aug 25	24	12	288	6	0.02	89	0.31	4	0.01	1,405	4.88
Total			240	5,424	1,888		22,910		11,562		2,474	
2000	Jun 26	16	12	192	1,247	6.49	1,984	10.33	1,174	6.11	0	0.00
	Jun 29	21	12	252	1,857	7.37	3,552	14.10	1,362	5.40	0	0.00
	Jul 03	28	12	336	475	1.41	4,712	14.02	1,222	3.64	0	0.00
	Jul 06	25	12	300	120	0.40	3,430	11.43	634	2.11	0	0.00
	Jul 08	26	12	312	393	1.26	4,655	14.92	1,330	4.26	0	0.00
	Jul 11	27	12	324	90	0.28	3,247	10.02	444	1.37	0	0.00
	Jul 13	28	12	336	65	0.19	1,954	5.82	483	1.44	0	0.00
	Jul 15	2	12	24	2	0.08	39	1.63	0	0.00	0	0.00
	Jul 17	19	12	228	41	0.18	1,777	7.79	201	0.88	0	0.00
	Jul 21	19	12	228	24	0.11	1,936	8.49	225	0.99	6	0.03
	Jul 24	19	12	228	36	0.16	2,138	9.38	133	0.58	17	0.07
	Jul 26	20	12	240	15	0.06	1,550	6.46	66	0.28	65	0.27
	Jul 28	20	12	240	14	0.06	1,743	7.26	41	0.17	142	0.59
	Jul 31	20	12	240	19	0.08	1,180	4.92	50	0.21	335	1.40
	Aug 05	18	12	216	4	0.02	479	2.22	29	0.13	593	2.75
	Aug 07	12	12	144	9	0.06	382	2.65	13	0.09	881	6.12

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Year	Date	Permits Fished	Hours Fished	Permit Hours	Chinook Catch	Chinook CPUE	Sockeye Catch	Sockeye CPUE	Chum Catch	Chum CPUE	Coho Catch	Coho CPUE
2000	Aug 10	22	12	264	9	0.03	529	2.00	12	0.05	2,138	8.10
(Cont)	Aug 12	22	12	264	4	0.02	427	1.62	13	0.05	2,349	8.90
	Aug 14	29	12	348	2	0.01	409	1.18	7	0.02	3,205	9.21
	Aug 16	23	12	276	5	0.02	395	1.43	4	0.01	1,539	5.58
	Aug 18	19	12	228	3	0.01	229	1.00	3	0.01	1,309	5.74
	Aug 21	27	12	324	6	0.02	207	0.64	2	0.01	1,361	4.20
	Aug 24	22	12	264	2	0.01	298	1.13	2	0.01	1,591	6.03
Total			276	5,808	4,442		37,252		7,450		15,531	
2001	Jun 29	17	12	204	1,022	5.01	4,286	21.01	680	3.33	0	0.00
	Jul 6	26	12	312	147	0.47	6,790	21.76	925	2.96	0	0.00
	Jul 10	25	12	300	132	0.44	4,039	13.46	300	1.00	0	0.00
	Jul 13	26	6	156	60	0.38	5,014	32.14	702	4.50	0	0.00
	Jul 20	15	9	135	59	0.44	1,236	9.16	337	2.50	0	0.00
	Jul 23	18	12	216	36	0.17	1,635	7.57	341	1.58	4	0.02
	Aug 1	12	12	144	23	0.16	859	5.97	72	0.50	326	2.26
	Aug 6	14	12	168	10	0.06	518	3.08	18	0.11	497	2.96
	Aug 08	9	12	108	6	0.06	407	3.77	8	0.07	596	5.52
	Aug 10	14	12	168	7	0.04	377	2.24	8	0.05	671	3.99
	Aug 15	22	12	264	4	0.02	225	0.85	14	0.05	2,468	9.35
	Aug 18	18	12	216	3	0.01	144	0.67	3	0.01	2,637	12.21
	Aug 22	15	12	180	7	0.04	68	0.38	1	0.01	1,085	6.03
	Aug 24	13	12	156	3	0.02	56	0.36	3	0.02	991	6.35
Total			159	2,727	1,519		25,654		3,412		9,275	
2002	Jun 27	19	12	228	584	2.56	836	3.67	853	3.74	0	0.00
	Jul 1	18	12	216	148	0.69	958	4.44	816	3.78	0	0.00
	Jul 5	15	12	180	103	0.57	1,373	7.63	978	5.43	0	0.00
	Jul 10	19	12	228	71	0.31	1,435	6.29	821	3.60	0	0.00
	Jul 12	19	12	228	57	0.25	891	3.91	289	1.27	0	0.00
	Aug 1	7	12	84	8	0.10	357	4.25	17	0.20	41	0.49
	Aug 7	7	12	84	3	0.04	135	1.61	13	0.15	451	5.37
	Aug 10	6	12	72	1	0.01	103	1.43	0	0.00	253	3.51
	Aug 15	5	12	60	1	0.02	75	1.25	5	0.08	578	9.63
	Aug 17	8	12	96	1	0.01	44	0.46	2	0.02	404	4.21
	Aug 20	6	12	72	2	0.03	49	0.68	4	0.06	518	7.19
	Aug 24	7	12	84	0	0.00	48	0.57	1	0.01	796	9.48
Total			144	1,632	979		6,304		3,799		3,041	
2003	Jun 26	13	12	156	389	2.49	2,726	17.47	342	2.19	0	0.00
	Jun 30	19	12	228	186	0.82	4,718	20.69	468	2.05	0	0.00
	Jul 2	10	12	120	64	0.53	2,002	16.68	344	2.87	0	0.00
	Jul 4	23	12	276	114	0.41	3,727	13.50	617	2.24	0	0.00
	Jul 7	27	12	324	123	0.38	4,082	12.60	432	1.33	0	0.00
	Jul 9	26	12	312	118	0.38	3,230	10.35	759	2.43	0	0.00
	Jul 11	28	12	336	176	0.52	2,652	7.89	1,209	3.60	2	0.01
	Jul 14	25	12	300	84	0.28	2,048	6.83	826	2.75	5	0.02
	Jul 16	15	12	180	47	0.26	1,127	6.26	391	2.17	3	0.02
	Jul 18	3	12	36	5	0.14	144	4.00	44	1.22	0	0.00
	Aug 1	15	12	180	41	0.23	898	4.99	73	0.41	546	3.03
	Aug 4	13	12	156	18	0.12	904	5.79	26	0.17	548	3.51
	Aug 6	12	12	144	8	0.06	321	2.23	19	0.13	490	3.40
	Aug 8	13	12	156	20	0.13	394	2.53	31	0.20	1,213	7.78
	Aug 13	16	12	192	8	0.04	176	0.92	4	0.02	2,182	11.36
	Aug 15	16	12	192	1	0.01	35	0.18	0	0.00	1,739	9.06
	Aug 20	16	12	192	9	0.05	149	0.78	5	0.03	3,534	18.41
	Aug 25	14	12	168	1	0.01	90	0.54	3	0.02	2,396	14.26
Total			216	3,648	1,412		29,423		5,593		12,658	

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Year	Date	Permits Fished	Hours Fished	Permit Hours	Chinook Catch	Chinook CPUE	Sockeye Catch	Sockeye CPUE	Chum Catch	Chum CPUE	Coho Catch	Coho CPUE
2004	Jun 24	19	12	228	791	3.47	1,873	8.21	788	3.46	0	0.00
	Jun 29	21	12	252	373	1.48	2,938	11.66	668	2.65	0	0.00
	Jul 1	19	12	228	310	1.36	3,512	15.40	1,060	4.65	0	0.00
	Jul 5	21	12	252	265	1.05	3,098	12.29	710	2.82	0	0.00
	Jul 7	21	12	252	206	0.82	2,133	8.46	522	2.07	0	0.00
	Jul 9	20	12	240	159	0.66	2,021	8.42	455	1.90	0	0.00
	Jul 12	20	12	240	112	0.47	1,395	5.81	1,016	4.23	0	0.00
	Jul 14	14	12	168	104	0.62	1,063	6.33	414	2.46	0	0.00
	Jul 16	10	12	120	78	0.65	347	2.89	161	1.34	0	0.00
	Aug 2	10	12	120	35	0.29	400	3.33	51	0.43	194	1.62
	Aug 4	12	12	144	39	0.27	305	2.12	48	0.33	311	2.16
	Aug 6	13	12	156	24	0.15	295	1.89	9	0.06	428	2.74
	Aug 9	14	12	168	12	0.07	167	0.99	14	0.08	804	4.79
	Aug 11	14	12	168	22	0.13	193	1.15	21	0.13	1,429	8.51
	Aug 13		12	No Commercial Harvest/No Tender								
	Aug 16	19	12	228	8	0.04	255	1.12	10	0.04	2,752	12.07
	Aug 18	18	12	216	7	0.03	160	0.74	4	0.02	2,918	13.51
	Aug 20	18	12	216	8	0.04	162	0.75	11	0.05	3,240	15.00
	Aug 23	17	12	204	2	0.01	56	0.27	0	0.00	2,860	14.02
	Aug 25	18	12	216	7	0.03	81	0.38	3	0.01	4,623	21.40
	Aug 27	19	12	228	3	0.01	69	0.30	0	0.00	4,530	19.87
Total			252	4,044	2,565		20,523		5,965		24,089	
2005	Jun 21	16	12	192	584	3.04	1,196	6.23	237	1.23	0	0.00
	Jun 23	16	12	192	481	2.51	2,229	11.61	395	2.06	0	0.00
	Jun 28	21	12	252	332	1.32	3,756	14.90	790	3.13	0	0.00
	Jun 30		12	No Commercial Harvest/No Tender								
	Jul 5	19	12	228	122	0.54	3,080	13.51	96	0.42	0	0.00
	Jul 7	19	12	228	76	0.33	2,805	12.30	61	0.27	0	0.00
	Jul 12	18	12	216	71	0.33	2,991	13.85	239	1.11	0	0.00
	Jul 14	19	12	228	82	0.36	3,059	13.42	232	1.02	0	0.00
	Jul 19	20	12	240	60	0.25	1,456	6.07	215	0.90	1	0.00
	Aug 1	16	12	192	34	0.18	580	3.02	84	0.44	54	0.28
	Aug 3	16	12	192	44	0.23	495	2.58	84	0.44	191	0.99
	Aug 5	14	12	168	27	0.16	462	2.75	28	0.17	248	1.48
	Aug 8	16	12	192	21	0.11	341	1.78	17	0.09	503	2.62
	Aug 10	13	12	156	16	0.10	188	1.21	15	0.10	712	4.56
	Aug 12	16	12	192	24	0.13	285	1.48	24	0.13	994	5.18
	Aug 15	17	12	204	12	0.06	225	1.10	5	0.02	791	3.88
	Aug 17	16	12	192	11	0.06	253	1.32	8	0.04	1,469	7.65
	Aug 19	18	12	216	11	0.05	231	1.07	22	0.10	2,461	11.39
	Aug 22	15	12	180	10	0.06	104	0.58	5	0.03	1,852	10.29
	Aug 26	16	12	192	14	0.07	143	0.74	9	0.05	2,015	10.49
	Aug 30	11	12	132	3	0.02	54	0.41	2	0.02	444	3.36
Total			252	3,984	2,035		23,933		2,568		11,735	

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Year	Date	Permits Fished	Hours Fished	Permit Hours	Chinook Catch	Chinook CPUE	Sockeye Catch	Sockeye CPUE	Chum Catch	Chum CPUE	Coho Catch	Coho CPUE
2006	22 Jun	14	12	168	767	4.57	959	5.71	2,169	12.91	0	0.00
	27 Jun	16	12	192	477	2.48	2,509	13.07	2,282	11.89	0	0.00
	30 Jun	16	12	192	734	3.82	3,477	18.11	2,401	12.51	0	0.00
	3 Jul	17	12	204	154	0.75	2,864	14.04	244	1.20	0	0.00
	5 Jul	17	12	204	105	0.51	2,611	12.80	389	1.91	0	0.00
	7 Jul	16	12	192	124	0.65	2,773	14.44	487	2.54	0	0.00
	10 Jul	17	12	204	125	0.61	2,915	14.29	403	1.98	0	0.00
	17 Jul	12	12	144	34	0.24	1,596	11.08	266	1.85	3	0.02
	19 Jul	17	12	204	99	0.49	2,750	13.48	828	4.06	5	0.02
	21 Jul	18	12	216	86	0.40	2,494	11.55	894	4.14	7	0.03
	24 Jul	14	12	168	49	0.29	1,402	8.35	457	2.72	21	0.13
	26 Jul	10	12	120	24	0.20	605	5.04	253	2.11	13	0.11
	31 Jul	8	12	96	17	0.18	263	2.74	81	0.84	119	1.24
	2 Aug	6	12	72	13	0.18	182	2.53	53	0.74	131	1.82
	4 Aug	8	12	96	10	0.10	373	3.89	95	0.99	197	2.05
	7 Aug	11	12	132	10	0.08	289	2.19	60	0.45	480	3.64
	9 Aug	11	12	132	5	0.04	193	1.46	51	0.39	582	4.41
	11 Aug	10	12	120	8	0.07	225	1.88	40	0.33	1,321	11.01
	14 Aug	14	12	168	6	0.04	124	0.74	28	0.17	1,508	8.98
	16 Aug	14	12	168	8	0.05	171	1.02	28	0.17	1,280	7.62
	18 Aug	10	12	120	3	0.03	93	0.78	13	0.11	858	7.15
	21 Aug	16	12	192	6	0.03	145	0.76	5	0.03	817	4.26
	23 Aug	15	12	180	11	0.06	217	1.21	10	0.06	1,526	8.48
	25 Aug	15	12	180	4	0.02	197	1.09	6	0.03	985	5.47
	28 Aug	15	12	180	7	0.04	202	1.12	11	0.06	1,001	5.56
	30 Aug	12	12	144	3	0.02	136	0.94	7	0.05	917	6.37
	1 Sep	11	12	132	3	0.02	92	0.70	7	0.05	665	5.04
	Total		324	4,320	2,892		29,857		11,568		12,436	

Year	Date	Permits Fished	Hours Fished	Permit Hours	Chinook Catch	Chinook CPUE	Sockeye Catch	Sockeye CPUE	Chum Catch	Chum CPUE	Coho Catch	Coho CPUE
2007	6/19	13	12	156	324	2.08	426	2.73	322	2.06	0	0.00
	6/21	16	12	192	362	1.89	936	4.88	480	2.50	0	0.00
	6/25	21	12	252	647	2.57	2,818	11.18	674	2.67	0	0.00
	6/27	20	12	240	506	2.11	2,888	12.03	944	3.93	0	0.00
	6/29	20	12	240	312	1.30	2,224	9.27	201	0.84	0	0.00
	7/2	18	12	216	149	0.69	2,530	11.71	116	0.54	1	0.00
	7/4	16	12	192	63	0.33	1,940	10.10	355	1.85	0	0.00
	7/6	19	12	228	112	0.49	2,341	10.27	384	1.68	0	0.00
	7/8	20	12	240	95	0.40	3,012	12.55	387	1.61	0	0.00
	7/10	18	12	216	108	0.50	2,895	13.40	385	1.78	1	0.00
	7/12	19	12	228	59	0.26	2,911	12.77	327	1.43	2	0.01
	7/14	18	12	216	102	0.47	3,039	14.07	262	1.21	5	0.02
	7/16	18	12	216	62	0.29	2,359	10.92	470	2.18	7	0.03
	7/18	18	12	216	33	0.15	2,070	9.58	381	1.76	10	0.05
	7/20	16	12	192	46	0.24	1,685	8.78	599	3.12	25	0.13
	7/22	0	12	0	Commercial Opening, Processor not able to buy							
	7/24	16	12	192	44	0.23	1,704	8.88	443	2.31	133	0.69
	7/26	18	12	216	22	0.10	1,874	8.68	448	2.07	217	1.00
	7/31	16	12	192	19	0.10	806	4.20	222	1.16	419	2.18
	8/2	13	12	156	8	0.05	340	2.18	98	0.63	296	1.90

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Year	Date	Permits Fished	Hours Fished	Permit Hours	Chinook Catch	Chinook CPUE	Sockeye Catch	Sockeye CPUE	Chum Catch	Chum CPUE	Coho Catch	Coho CPUE
2007	8/4	0	12	0	Commercial Opening, Processor not able to buy							
	8/6	12	12	144	9	0.06	371	2.58	95	0.66	852	5.92
	8/8	15	12	180	21	0.12	586	3.26	78	0.43	1,129	6.27
	8/10	16	12	192	6	0.03	686	3.57	40	0.21	1,686	8.78
	8/13	15	12	180	3	0.02	401	2.23	24	0.13	1,161	6.45
	8/15	0	12	0	Commercial Opening, Processor not able to buy							
	8/17	15	12	180	2	0.01	334	1.86	21	0.12	1,269	7.05
	8/20	14	12	168	4	0.02	506	3.01	16	0.10	1,246	7.42
	8/22	15	12	180	3	0.02	438	2.43	14	0.08	1,221	6.78
	8/24	14	12	168	1	0.01	509	3.03	9	0.05	1,643	9.78
	8/27	15	12	180	3	0.02	523	2.91	21	0.12	1,102	6.12
	8/29	12	12	144	1	0.01	354	2.46	23	0.16	797	5.53
	8/31	12	12	144	0	0.00	260	1.81	14	0.10	475	3.30
Total			396	5,856	3,126		43,766		7,853		13,697	

Year	Date	Permits Fished	Hours Fished	Permit Hours	Chinook Catch	Chinook CPUE	Sockeye Catch	Sockeye CPUE	Chum Catch	Chum CPUE	Coho Catch	Coho CPUE
2008	6/19	18	12	216	170	0.79	873	4.04	399	1.85	0	0.00
	6/24	18	12	216	310	1.44	1,368	6.33	1,337	6.19	0	0.00
	6/26	19	12	228	290	1.27	2,533	11.11	1,762	7.73	0	0.00
	7/1	20	12	240	115	0.48	2,490	10.38	1,716	7.15	0	0.00
	7/5	20	12	240	52	0.22	2,314	9.64	101	0.42	0	0.00
	7/8	19	12	228	67	0.29	2,363	10.36	278	1.22	0	0.00
	7/10	16	12	192	39	0.20	1,809	9.42	301	1.57	0	0.00
	7/12	0	12	0	Commercial Opening, Processor not able to buy							
	7/14	21	12	252	60	0.24	3,070	12.18	1,277	5.07	0	0.00
	7/16	16	12	192	39	0.20	1,609	8.38	374	1.95	0	0.00
	7/18	0	12	0	Commercial Opening, Processor not able to buy							
	7/21	19	12	228	30	0.13	1,971	8.64	785	3.44	27	0.12
	7/23	18	12	216	22	0.10	1,610	7.45	625	2.89	57	0.26
	7/25	15	12	180	10	0.06	870	4.83	431	2.39	69	0.38
	7/28	16	12	192	15	0.08	872	4.54	352	1.83	235	1.22
	7/30	12	12	144	8	0.06	724	5.03	247	1.72	281	1.95
	8/1	14	12	168	12	0.07	570	3.39	150	0.89	386	2.30
	8/4	16	12	192	6	0.03	513	2.67	68	0.35	392	2.04
	8/6	13	12	156	5	0.03	242	1.55	36	0.23	452	2.90
	8/8	12	12	144	3	0.02	311	2.16	27	0.19	426	2.96
	8/10	13	12	156	7	0.04	307	1.97	21	0.13	1,050	6.73
	8/12	14	12	168	3	0.02	159	0.95	29	0.17	1,582	9.42
	8/14	16	12	192	7	0.04	144	0.75	14	0.07	2,009	10.46
	8/16	15	12	180	6	0.03	108	0.60	12	0.07	3,203	17.79
	8/18	17	12	204	1	0.00	134	0.66	27	0.13	3,102	15.21
	8/20	16	12	192	0	0.00	68	0.35	6	0.03	2,271	11.83
	8/22	15	12	180	3	0.02	66	0.37	6	0.03	2,027	11.26
	8/25	13	12	156	0	0.00	55	0.35	13	0.08	1,161	7.44
	8/27	12	12	144	0	0.00	27	0.19	7	0.05	2,648	18.39
	8/29	14	12	168	1	0.01	57	0.34	7	0.04	1,169	6.96
Total			360	5364	1,281		27,237		10,408		22,547	

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Year	Date	Permits Fished	Hours Fished	Permit Hours	Chinook Catch	Chinook CPUE	Sockeye Catch	Sockeye CPUE	Chum Catch	Chum CPUE	Coho Catch	Coho CPUE
2009	Jun 22	20	12	240	511	2.13	736	3.07	658	2.74	0	0.00
	Jun 25	20	12	240	361	1.50	2,243	9.35	1,374	5.73	0	0.00
	Jun 30	22	12	264	221	0.84	3,207	12.15	1,996	7.56	0	0.00
	Jul 6	26	12	312	110	0.35	3,578	11.47	2,466	7.90	0	0.00
	Jul 8	24	12	288	53	0.18	3,545	12.31	1,680	5.83	0	0.00
	Jul 10	31	12	372	63	0.17	3,001	8.07	1,506	4.05	0	0.00
	Jul 13	24	12	288	21	0.07	1,719	5.97	1,477	5.13	1	0.00
	Jul 15	23	12	276	30	0.11	2195	7.95	1654	5.99	0	0.00
	Jul 16	17	6	102	10	0.10	814	7.98	600	5.88	0	0.00
	Jul 17	22	12	264	31	0.12	1,413	5.35	1,313	4.97	0	0.00
	Jul 20	16	12	192	20	0.10	815	4.24	606	3.16	9	0.05
	Jul 22	13	12	156	17	0.11	1,368	8.77	432	2.77	15	0.10
	Jul 24	14	12	168	6	0.04	1,120	6.67	309	1.84	13	0.08
	Jul 25	14	12	168	10	0.06	1,095	6.52	304	1.81	25	0.15
	Jul 27	12	12	144	7	0.05	583	4.05	125	0.87	28	0.19
	Jul 29	6	12	72	1	0.01	79	1.10	24	0.33	15	0.21
	Jul 31	10	12	120	4	0.03	456	3.80	119	0.99	153	1.28
	Aug 3	11	12	132	4	0.03	481	3.64	86	0.65	151	1.14
	Aug 5	15	12	180	5	0.03	614	3.41	83	0.46	376	2.09
	Aug 7	16	12	192	9	0.05	624	3.25	61	0.32	314	1.64
	Aug 10	15	12	180	0	0.00	693	3.85	43	0.24	427	2.37
	Aug 12	16	12	192	5	0.03	536	2.79	22	0.11	796	4.15
	Aug 14	19	12	228	1	0.00	746	3.27	25	0.11	1,229	5.39
	Aug 19	17	12	204	5	0.02	440	2.16	12	0.06	1,991	9.76
	Aug 21	20	12	240	2	0.01	303	1.26	3	0.01	1,840	7.67
	Aug 24	18	12	216	2	0.01	140	0.65	7	0.03	1,023	4.74
Total			306	5430	1,509		32,544		16,985		8,406	
10 Yr Avg (99-08)			262	4,281	2,214		26,686		7,018		12,748	

Appendix D9.–Salmon spawning aerial survey index estimates, Goodnews rivers and lakes, Kuskokwim Bay drainage, 1980–2009.

	Goodnews River and Lakes				Middle Fork Goodnews River and Lakes			
Year	Chinook	Sockeye	Chum	Coho	Chinook	Sockeye	Chum	Coho
1980	1,228	75,639	1,975	a	1,164	18,926	3,782	a
1981	a	a	a	a	a	a	a	a
1982	1,990	19,160	9,700	a	1,546	2,327	6,300	a
1983	2,600	9,650	a	a	2,500	5,900	a	a
1984	3,245	9,240	17,250	43,925	1,930	12,897	9,172	a
1985	3,535	2,843	4,415	a	2,050	5,470	3,593	a
1986	1,068	8,960	11,850	a	1,249	16,990	7,645	a
1987	2,234	19,786	12,103	11,122	2,222	34,585	9,696	a
1988	637	5,820	3,846	a	1,024	5,831	5,814	a
1989	651	3,605	a	a	1,277	8,044	2,922	a
1990	626	27,689	a	a	a	a	a	a
1991	a	a	a	a	a	a	a	a
1992	875	10,397	1,950	a	1,012	7,200	3,270	a
1993	a	a	a	a	a	a	a	a
1994	a	a	a	a	a	a	a	a
1995	3,314	a	a	a	a	a	a	a
1996	a	a	a	a	a	a	a	a
1997	3,611	12,610	a	a	1,447	19,843	a	a
1998	578	3,497	2,743	a	731	11,632	3,619	a
1999	a	a	a	a	a	a	a	a
2000	a	a	a	a	a	a	a	a
2001	3,561	29,340	7,330	a	2,799	12,383	6,945	a
2002	1,195	2,626	1,208	a	1,470	3,475	3,075	a
2003	2,015	27,380	3,370	a	1,210	21,760	2,310	a
2004	7,462	31,695	a	a	2,617	33,670	a	a
2005	a	a	a	a	a	a	a	a
2006	4,159	78,100	a	a	1,342	a	a	a
2007	a	a	a	a	a	a	a	a
2008	2,371	32,500			1,940	13,935		
2009	a	a	a	a	a	a	a	a
SEG	640 - 3,300	5,500 - 19,500	b	b	b	b	b	b

[a] Survey was either not flown or not rated as acceptable.

[b] Aerial survey escapement goal was discontinued in 2004.

Appendix D10.–Salmon spawning escapement, Middle Fork Goodnews River, Kuskokwim Bay drainage, 1981–2009.

Year	Operating Period [a]	Chinook	Sockeye	Chum	Pink [b]	Coho
BEG:		1,500-2,900	18,000-40,000			
SEG:				>12,000		>12,000
Counting Tower						
1981	06/13 to 08/15	3,688	49,108	21,827	1,327	[c]
1982	06/23 to 08/03	1,395	56,255	6,767	13,855	[c]
1983	06/11 to 07/28	6,027	25,816	15,548	102	[c]
1984	06/15 to 07/31	3,260	32,053	19,003	13,744	[c]
1985	06/27 to 07/31	2,831	24,131	10,367	144	[c]
1986	06/16 to 07/24	2,080	51,069	14,764	8,134	[c]
1987	06/22 to 07/30	2,272	28,871	17,517	71	[c]
1988	06/23 to 07/30	2,712	15,799	20,799	6,781	[c]
1989	06/29 to 07/31	1,915	21,186	10,380	246	[c]
1990	06/19 to 07/24	3,636	31,679	6,410	3,378	[c]
Weir						
1991	06/29 to 08/24	1,952	47,397 [d]	31,644	1,694	[c]
1992	06/29 to 08/25	1,905 [d]	27,268	22,023	22,155	[c]
1993	06/22 to 08/18	2,349	26,452 [e]	14,952	318	[c]
1994	06/23 to 08/08	3,856	50,801	34,849 [d]	38,710	[c]
1995	06/19 to 08/28	4,836	39,009	33,699	322	[c]
1996	06/19 to 08/23	2,931 [d]	58,290	40,450 [d]	20,105	[c]
1997	06/11 to 09/17	2,937	35,530	17,369	970	13,413
1998	07/04 to 09/13	4,584	49,513 [d]	28,832	10,376	36,596
1999	06/26 to 09/26	3,221	48,205	19,513	914	11,545
2000	07/02 to 09/22	3,295 [e]	32,341 [e]	13,791 [e]	2,529	13,907 [e]
2001	06/26 to 09/30	5,391 [e]	21,024 [e]	26,829 [e]	1,328	19,626 [e]
2002	06/22 to 09/18	3,085	22,101	30,300	3,034	27,364
2003	06/18 to 09/18	2,389	44,387	21,637	1,881	52,810
2004	06/21 to 09/20	4,388	55,926	31,616	21,633	47,916
2005	6/26 to 9/20	4,633	113,809	26,690	5,926	15,683
2006	6/26 to9/18	4,559	126,772	54,699	18,432	15,969
2007	6/25 to 9/18	3,852	72,282	48,285	4,919	20,975 [d]
2008	7/02 to 9/15	2,158	51,763 [d]	44,310 [d]	9,807	36,663
2009	6/28 to 9/21	1,630	25,465	19,715	767	19,992

[a] The operational period is inclusive of days when passage was estimated; unless noted otherwise, less than 20% of the total annual escapement is estimated.

[b] Pink salmon passage is not estimated because they are small enough to pass between weir pickets.

[c] Field operations were incomplete and total annual escapement was not estimated.

[d] Field operations were incomplete; more than 20% of the total annual escapement is based on daily passage estimates.

[e] Field operations were incomplete; sum of daily counts is an underestimate of total escapement, but considered reasonable. Additional estimates were not made.

APPENDIX E.

Appendix E1.–Subsistence herring harvest (tons) and effort from select Bering Sea areas, Kuskokwim Management Area, 1983–1996.

Village	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Nelson Island														
Tununak	94	-	43	63	48	49	47	54	21	32	45	42	30	26
Umkumiut	-	-	-	-	[a]	[a]	[a]	[a]	[a]	[a]	-	-	-	-
Toksook Bay	-	-	46	70	51	58	52	46	40	43	23	53	46	42
Nightmute	-	-	3[b]	21	15	16	15	18	8	10	9	13	13	16
Newtok	-	-	7[b]	13	10	12	10	8	1	7	6	9	9	12
Total	94	-	99	167	124	136	124	126	70	92	82	117	98	95
No. Fishing Families	43	-	65[b]	72[b]	96	104	[b]	100	85	97	89	-	91	96
Nunivak Island														
Mekoryuk	-	-	<1	<1	-	-	-	5	4	4	2	-	-	-
No. Fishing Families	-	-	11	6[b]	-	-	-	19	20	17	16	-	-	-
Other Kuskokwim Delta Communities														
Chefornak	-	-	13[b]	-	14	-	-	-	-	-	-	-	-	-
Kipnuk	-	-	9	-	14	-	-	-	-	-	-	-	-	-
Kongiganak	-	-	3	2[b]	-	-	-	-	-	-	-	-	-	-
Kwigillingok	-	-	5	-	-	-	-	-	-	-	-	-	-	-
Total	-	-	30	2	28	-	-	-	-	-	-	-	-	-
No. Fishing Families	-	-	55[b]	12[b]	49	-	-	-	-	-	-	-	-	-

Note: Survey results are believed to accurately reflect harvest trends, however, reported catches reflect minimum figures since all fishermen cannot be contacted. Dashes indicate no data.

[a] Umkumiut effort was included with Tununak.

[b] Fishing families were not interviewed or only a portion of fishing families were interviewed as harvest was enumerated while on drying racks.

Appendix E2.–Commercial harvest, effort and value of Pacific herring by fishing district, Kuskokwim Management Area, 1981–2009.

Year	District	Harvest (st)	Number of permits	Hours fished	CPUE (st)	Estimated Value [a]	Average Income Per Permit
2009	Security Cove	0	0	0		$0	$0
	Goodnews Bay	0	0	0		$0	$0
	Cape Avinof	0	0	0		$0	$0
	Nelson Is.	0	0	0		$0	$0
	Nunivak Is.	0	0	0		$0	$0
2008	Security Cove	0	0	0		$0	$0
	Goodnews Bay	0	0	0		$0	$0
	Cape Avinof	0	0	0		$0	$0
	Nelson Is.	0	0	0		$0	$0
	Nunivak Is.	0	0	0		$0	$0
2007	Security Cove	0	0	0		$0	$0
	Goodnews Bay	0	0	0		$0	$0
	Cape Avinof	0	0	0		$0	$0
	Nelson Is.	0	0	0		$0	$0
	Nunivak Is.	0	0	0		$0	$0
2006	Security Cove	64	2	156		$7,878	$3,939
	Goodnews Bay	64	5	96		$8,935	$1,787
	Cape Avinof	0	0	0		$0	$0
	Nelson Is.	262	25	169		$53,225	$2,129
	Nunivak Is.	0	0	0		$0	$0
2005	Security Cove	2,031	30	198		$317,153	$10,572
	Goodnews Bay	49	6	123		$4,321	$720
	Cape Avinof	149	14	160		$37,631	$2,688
	Nelson Is.	665	27	277		$119,193	$4,415
	Nunivak Is.	0	0	0.0		$0	$0
2004	Security Cove	0	0	0		$0	$0
	Goodnews Bay	34	10	96.0		$3,600	$360
	Cape Avinof	63	23	288.5		$10,900	$474
	Nelson Is.	825	39	194.5		$165,300	$4,238
	Nunivak Is.	0	0	816.0		$0	$0
2003	Security Cove	0	0	0		$0	$0
	Goodnews Bay	36	12	50.5		$4,600	$383
	Cape Avinof	176	22	74.5		$36,100	$1,641
	Nelson Is.	816	44	78.0		$187,500	$4,261
	Nunivak Is.	229	19	204.0		$7,200	$379
2002	Security Cove	109	25	17.0		$10,000	$400
	Goodnews Bay	13	5	28.5		$1,000	$200
	Cape Avinof	79	37	97.0		$8,000	$216
	Nelson Is.	950	54	80.5		$101,000	$1,870
	Nunivak Is.	175	29	243.0		$19,000	$655
2001	Security Cove	1,024	56	17.5		$110,000	$1,964
	Goodnews Bay	45	23	16.0		$6,000	$261
	Cape Avinof	231	45	63.0		$23,000	$511
	Nelson Is.	678	49	25.5		$66,000	$1,347
	Nunivak Is.	0	0	0		$0	$0

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Appendix E2.–Page 2 of 3.

Year	District	Harvest (st)	Number of permits	Hours fished	CPUE (st)	Estimated Value [a]	Average Income Per Permit
2000	Security Cove	284	79	16.0		$54,386	$688
	Goodnews Bay	20	57	27.0		$3,318	$58
	Cape Avinof	366	86	59.0		$68,532	$797
	Nelson Is.	813	86	20.0		$154,280	$1,794
	Nunivak Is.	40	34	93.0		$11,880	$349
1999	Security Cove	1,072	97	9.0		$338,000	$3,485
	Goodnews Bay	1,366	94	49.0		$301,000	$3,202
	Cape Avinof	533	117	51.0		$185,000	$1,581
	Nelson Is.	1,366	94	22.0		$430,000	$4,574
	Nunivak Is.	0	0	0		$0	$0
1998	Security Cove	1,012	78	28.5		$202,340	$2,594
	Goodnews Bay	831	84	79.0		$166,220	$1,979
	Cape Avinof	656	109	44.0		$131,120	$1,203
	Nelson Is.	1,250	86	76.0		$235,900	$2,743
	Nunivak Is.	202	7	6.0		$440	$63
1997	Security Cove	892	222	10.5		$221,000	$995
	Goodnews Bay	805	139	65.0		$228,000	$1,640
	Cape Avinof	687	145	26.0		$157,000	$1,083
	Nelson Is.	778	105	10.0		$198,000	$1,886
	Nunivak Is.	0	12	70.0		$0	$0
1996	Security Cove	1,859	326	5.5		$1,252,270	$3,841
	Goodnews Bay	1,204	182	45.0		$893,900	$4,912
	Cape Avinof	820	161	57.0		$659,280	$4,095
	Nelson Is.	1,031	109	25.0		$676,624	$6,208
	Nunivak Is.	101	24	256.0		$38,234	$1,593
1995	Security Cove	1,292	106	12.0		$956,000	$9,019
	Goodnews Bay	1,054	127	56.0		$848,000	$6,677
	Cape Avinof	485	93	48.0		$363,000	$3,903
	Nelson Is.	1,113	100	28.0		$710,000	$7,100
	Nunivak Is.	41	13	387.0		$22,000	$1,692
1994	Security Cove	0	0	0		$0	$0
	Goodnews Bay	1,062	103	38.0		$391,000	$3,796
	Cape Avinof	427	85	62.0		$156,000	$1,835
	Nelson Is.	717	104	26.0		$235,000	$2,260
	Nunivak Is.	14	12	6.0		$4,000	$333
1993	Security Cove	5	9	24.5		$2,000	$222
	Goodnews Bay	954	63	123.0		$293,000	$4,651
	Cape Avinof	215	97	106.0		$75,000	$773
	Nelson Is.	739	73	63.5		$198,000	$2,712
	Nunivak Is.	0	0	0		$0	$0
1992	Security Cove	834	58	34.0		$285,000	$4,914
	Goodnews Bay	740	78	29.0		$286,000	$3,667
	Cape Avinof	452	121	12.0		$178,000	$1,471
	Nelson Is.	246	85	10.0		$78,000	$918
	Nunivak Is.	27	14	6.0		$4,000	$286
1991	Security Cove	570	52	12.0		$208,000	$4,000
	Goodnews Bay	263	103	4.0		$93,000	$903
	Cape Avinof	267	137	28.0		$94,000	$686
	Nelson Is.	0	0	0		$0	$0
	Nunivak Is.	59	17	12.0		$9,000	$529

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Year	District	Harvest (st)	Number of permits	Hours fished	CPUE (st)	Estimated Value [a]	Average Income Per Permit
1990	Security Cove	234	52	7.0		$94,000	$1,808
	Goodnews Bay	455	126	32.0		$314,000	$2,492
	Cape Avinof	50	101	3.0		$35,000	$347
	Nelson Is.	0	0	0		$0	$0
	Nunivak Is.	0	0	0		$0	$0
1989	Security Cove	554	104	4.0		$256,000	$2,462
	Goodnews Bay	616	138	50.0		$335,000	$2,428
	Cape Avinof	129	147	194.0		$54,000	$367
	Nelson Is.	233	162	15.0		$57,000	$352
	Nunivak Is.	116	45	186.0		$42,000	$933
1988	Security Cove	324	31	23.5		$362,000	$11,677
	Goodnews Bay	483	60	40.0		$463,000	$7,717
	Cape Avinof	348	98	88.5		$264,000	$2,694
	Nelson Is.	775	174	7.5		$713,000	$4,098
	Nunivak Is.	0	0	0		$0	$0
1987	Security Cove	313	65	13.0		$242,000	$3,723
	Goodnews Bay	321	117	11.0		$133,000	$1,137
	Nelson Is.	923	235	6.0		$661,000	$2,813
	Nunivak Is.	414	61	39.0		$231,000	$3,787
1986	Security Cove	751	88	73.0		$535,000	$6,080
	Goodnews Bay	557	104	53.0		$325,000	$3,125
	Nelson Is.	886	163	40.0		$428,000	$2,626
	Nunivak Is.	511	36	156.0		$213,000	$5,917
1985	Security Cove	733	107	125.0		$335,000	$3,131
	Goodnews Bay	724	83	130.0		$309,000	$3,723
	Nelson Is.	977	143	44.0		$527,000	$3,685
	Nunivak Is.	358	37	228.0		$146,000	$3,946
1984	Security Cove	335	38	345.0		$110,000	$2,895
	Goodnews Bay	717	130	139.0		$168,000	$1,292
1983	Security Cove	1,073	94	87.0		$443,000	$4,713
	Goodnews Bay	435	84	278.0		$185,000	$2,202
1982	Security Cove	813	107	302.0		$271,000	$2,533
	Goodnews Bay	486	84	314.0		$188,000	$2,238
1981	Security Cove	1,173	113	90.0		$347,000	$3,071
	Goodnews Bay	657	175	133.0		$196,000	$1,120

[a] Purse seine harvest is not a reflection of permit holder effort.

Appendix E3.–Herring aerial survey biomass estimates and commercial harvest, Kuskokwim Management Area, 1995–2009.

District	Estimated Biomass (st)	Harvest				Roe%	Estimated Value ($1000's)	Exploitation Rate (%)
		Sac-roe	Bait	Waste	Total			
2009								
Security Cove	5,686 [a]	0	0	0	0	0.0	0	0.0
Goodnews Bay	6,143	0	0	0	0	0.0	0	0.0
Cape Avinof	2,251 [a]	0	0	0	0	0.0	0	0.0
Nelson Is.	5,152 [a]	0	0	0	0	0.0	0	0.0
Nunivak Is.	3,141 [a]	0	0	0	0	0.0	0	0.0
Total	22,373	0	0	0	0	0.0	0	0.0
2008								
Security Cove	6,442	0	0	0	0	0.0	0	0.0
Goodnews Bay	3,259	0	0	0	0	0.0	0	0.0
Cape Avinof	806	0	0	0	0	0.0	0	0.0
Nelson Is.	3,424	0	0	0	0	0.0	0	0.0
Nunivak Is.	3,688	0	0	0	0	0.0	0	0.0
Total	17,619	0	0	0	0	0.0	0	0.0
2007								
Security Cove	7,081	0	0	0	0	0.0	0	0.0
Goodnews Bay	3,683	0	0	0	0	0.0	0	0.0
Cape Avinof	878	0	0	0	0	0.0	0	0.0
Nelson Is.	3,614	0	0	0	0	0.0	0	0.0
Nunivak Is.	4,054	0	0	0	0	0.0	0	0.0
Total	19,310	0	0	0	0	0.0	0	0.0
2006								
Security Cove	7,477	59	5	0	64	10.8	9	0.9
Goodnews Bay	4,111	64	0	0	64	9.8	9	1.6
Cape Avinof	702	0	0	0	0	0.0	0	0.0
Nelson Is.	3,809	262	0	0	262	11.1	53	6.9
Nunivak Is.	4,260	0	0	0	0	0.0	0	0.0
Total	20,359	385	5	0	390	10.8	71	1.9
2005								
Security Cove	18,192	2,031	0	0	2,031	10.9	317	11.2
Goodnews Bay	13,410	49	0	0	49	8.8	4	0.4
Cape Avinof	3,377	149	0	0	149	11.5	38	4.4
Nelson Is.	4,440	665	0	0	665	10.5	119	15.0
Nunivak Is.	4,782	0	0	0	0	0.0	0	0.0
Total	44,201	2,894	0	0	2,894	10.8	478	6.5
2004								
Security Cove	9,698	0	0	0	0	0.0	0	0.0
Goodnews Bay	7,744	34	0	0	34	8.9	4	0.4
Cape Avinof	3,369	63	0	0	63	15.5	11	1.9
Nelson Is.	5,085	825	0	0	825	10.9	165	16.2
Nunivak Is.	4,739	0	0	0	0	0.0	0	0.0
Total	30,635	922	0	0	922	11.1	180	3.0
2003								
Security Cove	10,600	0	0	0	0	0.0	0	0.0
Goodnews Bay	8,300	36	0	0	36	9.0	5	4.0
Cape Avinof	3,812	176	0	0	176	10.5	36	4.6
Nelson Is.	6,130	816	0	0	816	10.8	187	13.3
Nunivak Is.	5,182	229	0	0	229	8.4	7	4.4
Total	34,024	1,257	0	0	1,257	10.3	235	26.3

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District	Estimated Biomass (st)	Harvest					Estimated Value ($1000's)	Exploitation Rate (%)
		Sac-roe	Bait	Waste	Total	Roe%		
2002								
Security Cove	4,748	106	3	0	109	10.1	10	2.3
Goodnews Bay	5,529	13	0	0	13	9.7	1	0.2
Cape Avinof	3,491	79	0	0	79	9.6	8	2.3
Nelson Is.	6,130	950	0	0	950	10.4	101	15.5
Nunivak Is.	5,422	176	0	0	175	7.5	19	3.2
Total	25,320	1,324	3	0	1,326	9.9	139	5.2
2001								
Security Cove	5,206	1,024	0	0	1,024	10.7	110	19.7
Goodnews Bay	5,755	45	0	0	45	11.3	6	0.8
Cape Avinof	3,486	231	0	0	231	9.8	23	6.6
Nelson Is.	6,057	678	0	0	678	10.4	71	11.2
Nunivak Is.	5,657	0	0	0	0	0.0	0	0.0
Total	26,161	1,978	0	0	1,978	10.5	209	7.6
2000								
Security Cove	5,237	284	15	0	299	10.7	62	5.7
Goodnews Bay	6,348	19	1	1	20	9.2	3	0.3
Cape Avinof	3,210	370	7	0	377	9.6	71	11.8
Nelson Is.	4,672	754	52	1	807	9.8	150	17.3
Nunivak Is.	3,487	41	0	0	41	9.9	12	1.2
Total	22,954	1,468	75	2	1,544	9.9	299	6.7
1999								
Security Cove	5,261	1,016	56	1	1,072	11.0	338	20.4
Goodnews Bay	6,896	1,332	33	0	1,366	11.3	301	19.8
Cape Avinof	3,555	516	18	0	533	11.0	185	15.0
Nelson Is.	6,655	1,267	97	2	1,366	11.2	430	20.5
Nunivak Is.	3,319	0	0	0	0	0.0	0	0.0
Total	25,686	4,131	204	3	4,337	11.1	1,254	16.9
1998								
Security Cove	4,017	1,012	0	0	1,012	11.5	232	25.2
Goodnews Bay	4,064	831	0	0	831	11.3	188	20.5
Cape Avinof	4,287	656	0	0	656	11.6	152	15.3
Nelson Is.	7,136	1,250	0	0	1,250	11.8	296	17.5
Nunivak Is.	3,778	2	0	0	2	9.8	0	0.1
Total	23,282	3,751	0	0	3,751	11.6	868	16.1
1997								
Security Cove	4,640	884	3	5	892	12.5	221	19.2
Goodnews Bay	4,752	805	0	0	805	14.2	228	16.9
Cape Avinof	4,616	687	0	0	687	11.5	157	14.9
Nelson Is.	7,909	778	0	0	778	12.7	198	9.8
Nunivak Is.	3,801	0	0	0	0	0.0	0	0.0
Total	25,718	3,154	3	5	3,163	12.7	804	12.3
1996								
Security Cove	6,867	1,795	59	5	1,859	11.6	1,251	27.1
Goodnews Bay	6,315	1,191	13	0	1,204	12.5	895	19.1
Cape Avinof	4,500	820	0	0	820	13.4	659	18.2
Nelson Is.	6,638	986	44	0	1,030	11.4	679	15.5
Nunivak Is.	4,197	61	40	0	101	9.9	39	2.4
Total	28,517	4,854	156	5	5,014	12.0	3,523	17.6

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District	Estimated Biomass (st)	Harvest Sac-roe	Bait	Waste	Total	Roe%	Estimated Value ($1000's)	Exploitation Rate (%)
1995								
Security Cove	6,702	1,292	0	0	1,292	12.3	956	19.3
Goodnews Bay	4,224	1,051	0	3	1,054	13.5	848	25.0
Cape Avinof	3,627	485	0	0	485	12.5	363	13.4
Nelson Is.	7,754	1,113	0	0	1,113	10.6	711	14.4
Nunivak Is.	4,579	33	7	0	41	11.0	22	0.9
Total	26,886	3,975	7	3	3,985	12.2	2,900	14.8
1994								
Security Cove	7,638	0	0	0	0	0.0	0	0.0
Goodnews Bay	5,679	1,061	0	1	1,062	12.3	391	18.7
Cape Avinof	2,827	427	0	0	427	12.2	156	15.1
Nelson Is.	5,564	713	4	0	717	11.0	235	12.9
Nunivak Is.	4,921	14	0	0	14	8.6	4	0.3
Total	26,629	2,215	4	1	2,220	11.8	786	8.3
1993								
Security Cove	6,995	5	0	0	5	12.8	2	0.1
Goodnews Bay	6,211	945	9	0	954	10.3	293	15.4
Cape Avinof	2,837	206	9	0	215	12.0	75	7.6
Nelson Is.	4,944	613	52	74	739	10.6	198	14.9
Nunivak Is.	5,176	0	0	0	0	0.0	0	0.0
Total	26,163	1,769	70	74	1,913	10.6	568	7.3
1992								
Security Cove	7,773	697	127	10	834	9.2	285	10.7
Goodnews Bay	5,572	711	29	0	740	9.5	286	13.3
Cape Avinof	3,446	443	9	0	452	9.9	178	13.1
Nelson Is.	5,275	188	52	6	246	8.3	78	4.7
Nunivak Is.	5,703	7	20	0	27	8.5	4	0.5
Total	27,769	2,046	237	16	2,299	9.4	830	8.3
1991								
Security Cove	4,434	561	9	0	570	9.3	208	12.9
Goodnews Bay	4,387	259	4	0	263	8.9	93	6.0
Cape Avinof	2,083	240	27	0	267	9.5	94	12.8
Nelson Is.	2,385	0	0	0	0	0.0	0	0.0
Nunivak Is.	3,903	17	42	0	59	7.5	9	0.0
Total	17,192	1,077	82	0	1,159	9.2	404	6.7
1990								
Security Cove	2,650	174	60	0	234	8.7	94	8.8
Goodnews Bay	2,577	427	28	0	455	12.2	314	17.7
Cape Avinof	2,020	49	1	0	50	12.0	35	2.5
Nelson Is.	2,705	0	0	0	0	0.0	0	0.0
Nunivak Is.	422	0	0	0	0	0.0	0	0.0
Total	10,374	650	89	0	739	11.2	443	7.1
1989								
Security Cove	2,830	544	10	0	554	9.4	256	19.6
Goodnews Bay	4,044	453	162	0	616	8.4	335	15.2
Cape Avinof	2,777	90	39	0	129	8.0	54	4.6
Nelson Is.	3,316	122	100	11	233	8.5	57	7.0
Nunivak Is.	617	79	37	0	116	9.4	42	18.8
Total	13,584	1,289	347	11	1,647	8.9	744	12.1

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District	Estimated Biomass (st)	Harvest					Estimated Value ($1000's)	Exploitation Rate (%)
		Sac-roe	Bait	Waste	Total	Roe%		
1988								
Security Cove	4,906	324	0	0	324	9.3	362	6.6
Goodnews Bay	4,479	473	10	0	483	8.0	463	10.8
Cape Avinof	4,108	348	0	0	348	8.6	264	8.5
Nelson Is.	7,152	760	15	0	775	9.2	713	10.8
Nunivak Is.	2,800	0	0	0	0	0.0	0	0.0
Total	23,445	1,905	25	0	1,930	8.8	1,802	8.2
1987								
Security Cove	2,300	312	1	0	313	9.7	242	13.6
Goodnews Bay	2,000	179	142	0	321	7.3	133	16.1
Nelson Is.	8,100	915	8	0	923	9.2	661	11.4
Nunivak Is.	4,400	254	160	0	414	7.8	231	9.4
Total	16,800	1,660	311	0	1,971	8.9	1,267	11.7
1986								
Security Cove	3,700	747	4	0	751	11.2	535	20.3
Goodnews Bay	3,000	554	3	0	557	10.4	325	18.6
Nelson Is.	7,300	852	34	0	886	10.3	428	12.1
Nunivak Is.	6,000	469	42	0	511	10.1	213	8.5
Total	20,000	2,622	83	0	2,705	10.5	1,501	13.5
1985								
Security Cove	4,900	703	0	30	733	10.1	355	15.0
Goodnews Bay	4,300	711	0	13	724	8.7	309	16.8
Nelson Is.	9,500	967	10	0	977	10.6	527	10.3
Nunivak Is.	5,700	349	9	0	358	8.9	146	6.3
Total	24,400	2,730	19	43	2,792	9.8	1,337	11.4
1984								
Security Cove	5,100	325	0	10	335	11.8	110	6.6
Goodnews Bay	4,100	667	0	50	717	10.1	168	17.5
Total	9,200	992	0	60	1,052	10.7	278	11.4
1983								
Security Cove	6,400	966	107	0	1,073	9.4	443	16.8
Goodnews Bay	3,200	426	9	0	435	9.4	185	13.6
Total	9,600	1,392	116	0	1,508	9.4	628	15.7
1982								
Security Cove	5,100	707	106	0	813	9.3	271	15.9
Goodnews Bay	2,600	437	49	0	486	9.5	188	18.7
Total	7,700	1,144	155	0	1,299	9.4	459	16.9
1981								
Security Cove	8,300	1,150	23	0	1,173	8.1	347	14.1
Goodnews Bay	4,300	558	99	0	657	7.7	196	15.3
Total	12,600	1,708	122	0	1,830	8.0	543	14.5

[a] Estimated biomass is the 2009 projection. Aerial surveys were inadequate or not flown.