

Fishery Management Report No. 08-25

**Annual Management Report for the Subsistence and
Commercial Fisheries of the Kuskokwim Area, 2004**

by

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May 2008

Alaska Department of Fish and Game

Divisions of Sport Fish and Commercial Fisheries



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Weights and measures (metric)		General		Measures (fisheries)	
centimeter	cm	Alaska Administrative Code	AAC	fork length	FL
deciliter	dL	all commonly accepted abbreviations	e.g., Mr., Mrs., AM, PM, etc.	mid-eye-to-fork	MEF
gram	g	all commonly accepted professional titles	e.g., Dr., Ph.D., R.N., etc.	mid-eye-to-tail-fork	METF
hectare	ha	at	@	standard length	SL
kilogram	kg	compass directions:		total length	TL
kilometer	km	east	E		
liter	L	north	N	Mathematics, statistics	
meter	m	south	S	<i>all standard mathematical signs, symbols and abbreviations</i>	
milliliter	mL	west	W	alternate hypothesis	H _A
millimeter	mm	copyright	©	base of natural logarithm	<i>e</i>
		corporate suffixes:		catch per unit effort	CPUE
Weights and measures (English)		Company	Co.	coefficient of variation	CV
cubic feet per second	ft ³ /s	Corporation	Corp.	common test statistics	(F, t, χ^2 , etc.)
foot	ft	Incorporated	Inc.	confidence interval	CI
gallon	gal	Limited	Ltd.	correlation coefficient (multiple)	R
inch	in	District of Columbia	D.C.	correlation coefficient (simple)	r
mile	mi	et alii (and others)	et al.	covariance	cov
nautical mile	nmi	et cetera (and so forth)	etc.	degree (angular)	°
ounce	oz	exempli gratia	e.g.	degrees of freedom	df
pound	lb	(for example)		expected value	<i>E</i>
quart	qt	Federal Information Code	FIC	greater than	>
yard	yd	id est (that is)	i.e.	greater than or equal to	≥
		latitude or longitude	lat. or long.	harvest per unit effort	HPUE
Time and temperature		monetary symbols		less than	<
day	d	(U.S.)	\$, ¢	less than or equal to	≤
degrees Celsius	°C	months (tables and figures): first three letters	Jan, ..., Dec	logarithm (natural)	ln
degrees Fahrenheit	°F	registered trademark	®	logarithm (base 10)	log
degrees kelvin	K	trademark	™	logarithm (specify base)	log ₂ , etc.
hour	h	United States (adjective)	U.S.	minute (angular)	'
minute	min	United States of America (noun)	USA	not significant	NS
second	s	U.S.C.	United States Code	null hypothesis	H ₀
		U.S. state	use two-letter abbreviations (e.g., AK, WA)	percent	%
Physics and chemistry				probability	P
all atomic symbols				probability of a type I error (rejection of the null hypothesis when true)	α
alternating current	AC			probability of a type II error (acceptance of the null hypothesis when false)	β
ampere	A			second (angular)	"
calorie	cal			standard deviation	SD
direct current	DC			standard error	SE
hertz	Hz			variance	
horsepower	hp			population	Var
hydrogen ion activity (negative log of)	pH			sample	var
parts per million	ppm				
parts per thousand	ppt, ‰				
volts	V				
watts	W				

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ABSTRACT

The Kuskokwim River salmon fishery was managed according to the Kuskokwim River Salmon Rebuilding Management Plan (5 AAC 07.365). The subsistence fishing schedule was developed to allow escapement of Chinook and chum salmon throughout the run, provide the necessary opportunity for fishers to achieve amounts reasonably necessary for subsistence use, spread the subsistence harvest out across the run and allow fish to pass through the lower river giving fishers in the upper river greater opportunity to meet their subsistence needs. The Kuskokwim River Salmon Management Working Group served as a public forum for Federal and State fisheries managers to meet with local salmon resource users to review run assessment information toward a consensus on how to proceed with management of Kuskokwim River salmon fisheries. Kuskokwim Bay salmon fisheries were managed according to associated management plans and regulations (5 AAC 01.275 and 5 AAC 07.367).

The 2004 subsistence salmon harvest estimates for the Kuskokwim Area were 85,086 Chinook *Oncorhynchus tshawytscha*, 55,575 chum *O. keta*, 34,892 sockeye *O. nerka*, and 39,406 coho *O. kisutch* for 214,959 salmon. Subsistence harvests of all salmon species fell within or surpassed amounts reasonably necessary for subsistence use ranges set under 5 AAC 01.286. A limited late June and early July sockeye and chum salmon directed fishery was established in the Kuskokwim River and a directed commercial coho fishery was implemented from late July through early September. Kuskokwim Bay commercial fisheries occurred on schedule. A total of 693,323 salmon were commercially harvested from the Kuskokwim Area. A total of 529 permit holders participated in the fishery with the exvessel value estimated at \$1,482,800. Limited processor capacity, low prices and low fishing effort dominated the season.

For the past two decades, a system has been maintained and improved annually to monitor salmon run timing and run strength through comparison of current year information to historic information. This system includes the evaluation of subsistence fishery information, sport fishery harvest information, test fish project catch rates, commercial harvest catch rates and-as fish begin reaching clear water tributary streams-weir passage, sonar passage and evaluation of the numbers of salmon on spawning grounds through aerial surveys. In recent years, mark-recapture and radiotelemetry studies have been employed to further the understanding of salmon run timing, distribution and abundance. Cooperative partnerships have been established with federal agencies and local organizations increasing the number of escapement monitoring projects. These cooperative efforts have added substantially to monitoring salmon escapements and evaluating the effectiveness of inseason management actions. Established salmon escapement goals were generally achieved during the 2004 season with marked improvement in escapement levels from the poor returns experienced during 1997 to 2001.

The 2004 Kuskokwim Area commercial herring harvest was 922 tons, all for sac roe. Herring were harvested commercially in all of the Kuskokwim Bay districts except Security Cove. Overall recoverable roe content by district ranged from 8.9% in the Goodnews Bay District to 12.0% in the Nelson Island District. The overall recoverable roe percentage for the Kuskokwim Bay districts was 10.6%. Estimated exploitation rates in the individual districts ranged from less than 1% in the Goodnews Bay District to 16.2% in the Nelson Island District. Exvessel values ranged from \$3,600 in the Goodnews Bay District to \$165,300 in the Nelson Island District. The exvessel value for the entire Kuskokwim Area was \$179,800.

Key words: Kuskokwim River Salmon Management Working Group, subsistence fishing, commercial fishing, recreational fishing, salmon fishery management, Bethel, Kuskokwim River, pacific herring, Chinook, *Oncorhynchus tshawytscha*, sockeye, *O. nerka*, chum, *O. keta*, coho, *O. kisutch*, salmon

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 2004 season and provides information on the 2005 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 1960–1974 appear in the Arctic-Yukon-Kuskokwim (AYK) Area report series under the section described as Kuskokwim District. Reports for 1975–1986 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 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. A list of indigenous fish found in the area is provided in Appendix A1.

SECTION I. MANAGEMENT AREA OVERVIEW AND FISHERY BACKGROUND

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).

SUBSISTENCE SALMON FISHERIES

There are 38 communities consisting of approximately 4,500 households within the Kuskokwim Area. Approximately 75% of the approximate 4,500 households in the region are situated within the drainage of the Kuskokwim River (Fall et al. 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.

COMMERCIAL SALMON FISHERIES

There are four commercial salmon fishing Districts: 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; Appendix A2). The downstream boundary has been in effect since 1986, and the upstream boundary was established in 1994 (Appendix A3). District 1 was divided into two 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, the Middle Kuskokwim River, consists of the 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 A3).

The District 4 commercial salmon fishery was established in 1960. The boundaries of District 4 extend from the northern-most edge of the mouth of Weelung Creek to the southern-most tip of the south mouth of the Arolik River, and expand 3 mi 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 A3). The boundaries of District 5 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.

SPORT FISHERIES

Kuskokwim Area sport fisheries are divided between two management areas. The lower Kuskokwim Area (LKMA) includes waters including and downstream of Aniak and all drainages in Kuskokwim Bay (Lafferty 2004). The Upper Kuskokwim Area (UKMA) includes all waters of the Kuskokwim River upstream of Aniak (Burr 2004).

COMMERCIAL HERRING FISHERIES

The Kuskokwim Area includes all waters of Alaska that flow into the Bering Sea between Cape Newenham and the Naskonat Peninsula to 3 miles seaward as well as the waters surrounding Nunivak and St. Matthew Islands to 3 miles seaward (Figure 6) (5 AAC 27.870). There are five commercial gillnet sac roe districts and a significant subsistence herring fishery in the Kuskokwim Area.

The Security Cove District includes all waters between the latitude of Cape Newenham and the latitude of the Salmon River.

The Goodnews Bay District includes the waters of Goodnews Bay inside of a line between the north and south spits at the mouth of the bay and a line between Ukfigag Creek and Tunulik River at the head of the bay.

The Cape Avinof District consists of all waters landward of Kikegtek, Pingurbek and Kwigluk Islands and northward of a line from the southernmost tip of Kwigluk Island and westward of a line from the longitude of the Ishkowik River. The district also includes waters south of a line along the latitude of Tern Mountain to a point at 60° 42' N. lat., 164° 14' W. long. and landward of a line from that point to the northernmost point of Kikegtek Island.

The Nelson Island District consists of the waters north of Chinigyak Cape and east of Atrnak Point, all waters north of Talurarevuk Point and south of the southernmost tip of Chinit Point and east of 165° 30' W. long., and all waters north of the northernmost tip of Chinit Point and south of Kigigak Island and east of 165° 30' W. long.

The Nunivak Island District includes the waters extending 3 miles seaward of mean low water along the northern, eastern, and southern sides of Nunivak Island from Kikoojit Rocks to Cape Mendenhall (5 AAC 27.875).

OTHER FISHERIES

Kuskokwim Area residents also harvest freshwater and marine finfish for subsistence use. The contribution of non-salmon species to the overall subsistence fishery is not well quantified throughout the Kuskokwim Area. However, subsistence harvest estimates based on community specific harvest surveys are being developed in Aniak and have been developed for Kwethluk (Coffing 1991), Akiachak (Coffing 2001), Bethel (Coffing et al. 2001) and Quinhagak (Wagner 1991).

Commercial fresh water finfish fisheries are allowed in the Kuskokwim Area. The fishery has occurred sporadically with the primary harvest consisting of whitefish and burbot for local markets. A permit from the Commercial Fisheries Entry Commission and a permit from the department are required to commercially harvest whitefish, pike, smelt, burbot and lamprey. Those species may also be taken incidentally to commercial salmon fishing.

A poorly documented commercial fishery on Saffron cod, known locally as "Tom Cod" (*Eleginus gracilus*), has occurred in the Kuskokwim Area for some time. These fish are surplus to subsistence needs, and fishers and local stores are often unaware of the regulatory requirements for their commercial harvest and sale. From 1988 to 1997, the department documented sporadic information on the sale of these fish, which were harvested near coastal villages and sold in Bethel. The peak documented harvest occurred in 1991 when two fishers sold 1,356 pounds valued at \$2,600. Sales within the villages have never been documented.

DEPARTMENT STAFF

In 2004, permanent full-time ADF&G Commercial Fisheries staff assigned to the Kuskokwim Area included the Area Management Biologist, Assistant Area Biologist, the Research Project Biologist, and the Program Technician. There were additionally two long-term Fishery Biologists and approximately 25 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 (Table 1).

Subsistence Division (SD) staff includes a Subsistence Resource Specialist. The position was occupied year round. Additionally, several seasonal employees are employed annually to conduct harvest survey studies.

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

FISHERIES 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 fishers. 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 (*Oncorhynchus mykiss*), lake trout (*Salvelinus namaycush*), threespine stickleback (*Gasterosteus aculeatus*), ninespine stickleback (*Pungitius pungitius*), longnose sucker (*Catostomus catostomus*) and Saffron cod, known locally as "Tom Cod" (*Eleginus gracilus*).

ALASKA BOARD OF FISHERIES AND FEDERAL SUBSISTENCE PROGRAM ACTIVITIES

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 01, commercial fishing regulations in Chapter 07, 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 (Board) 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 Board, 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 four Fish and Game Advisory Committees; Central Bering Sea, Lower Kuskokwim, and Central Kuskokwim and McGrath. Under the current operating schedule, the Board meets on a 3-year cycle. Proposals regarding the Kuskokwim Area were most recently discussed during January 2001. The next regularly scheduled Board meeting to address Kuskokwim Area finfish issues is scheduled for January 2007.

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 2005–2006). 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 PLANS AND POLICIES

Salmon

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 Board made a positive finding for Customary and Traditional Use for all salmon in the entire Kuskokwim Area (Appendix A3). In 2001, the department recommended that the Board amend 5 AAC 01.286 to include a revised finding of the amount reasonably necessary for subsistence (ARNS) for the Kuskokwim Area using subsistence harvest data through 1999. After a thorough review of various options, the Board made a finding of the ARNS for the Kuskokwim River by species and for the remainder of the Kuskokwim Area by all species combined (Appendix A4) (Bergstrom and Whitmore 2004).

The ARNS 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 ARNS range for the remainder of the Kuskokwim Area is from 7,500 to 13,500 salmon. In establishing the ARNS range, the Board used harvest information that represents the pattern of use in the subsistence fishery. The approach captured the dynamic pattern of use within the recent decade by using the low and mean subsistence harvests for the most recent 10 years, rounded down to the nearest 500 fish for the low, and medium rounded up to the nearest 500 fish for the high.

The Kuskokwim River salmon fisheries are managed according to the Kuskokwim River Salmon Management Rebuilding Plan (Rebuilding Plan) (5 AAC 07.365) adopted by the Board in January 2001 (Burkey et al. 2000a; Ward et al. 2003) and amended in January 2004 (Bergstrom and Whitmore 2004). This management plan provides guidelines for the rebuilding and management of the Kuskokwim River salmon fishery that will result in the sustained yield of salmon stocks large enough to meet escapement goals, provide fishers with a reasonable opportunity to harvest amounts necessary for subsistence, and to provide for other fisheries. 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 step wise progression up the river consistent with salmon run timing and may be altered based on run strength to achieve escapement goals. Once escapement goals are assured for Chinook and chum salmon, subsistence fishing can be allowed 7 days per week. Implementation of the subsistence fishing schedule provided reasonable opportunity for fishers to harvest Chinook and chum salmon for subsistence use, attempted to spread the subsistence harvest out across the run and move fish through the lower river to spread subsistence fishing opportunity out to fishers in the upper river.

The fisheries associated with the 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. The primary fishery strategy since 1990 has been to delay the commercial opening until late June to increase Chinook salmon escapements into the Goodnews River drainage.

Resident Species

In association with sport fisheries, the Southwest Rainbow Trout Plan and the Aniak River Plan are in effect (Lafferty 2004).

Pacific Herring

Kuskokwim Area herring fisheries are managed according to 5 AAC 27.059. Management Guidelines for commercial herring sac roe fisheries and 5 AAC 27.060 Bering Sea Herring Fishery Management Plan. These management plans provide authority and direction to the department in establishing commercial fishing periods by emergency order to achieve the highest quality product, directs fishery management so that the exploitation rate does not exceed 20% of the biomass by stock and establishes minimum biomass thresholds below which fisheries may not be conducted. The Management Plan of the Gillnet and Cooperative Purse Seine Fishery in Nunivak Island District (5 AAC 27.894.) establishes the criteria necessary to allow for a herring gillnet and cooperative purse seine fishery in Nunivak Island District.

All Kuskokwim Area commercial herring fisheries are opened and closed by emergency order to provide for an orderly fishery and allow periodic assessment of herring biomass. The department 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%).

Cape Avinof District is a superexclusive use area. Nelson Island and Nunivak Island Districts are a combined superexclusive use area (5 AAC 27.899).

In 1990, Nelson and Nunivak Island Districts were given limited entry status by the Commercial Fisheries Entry Commission (CFEC). Goodnews Bay District was closed to new entry beginning in 1997 and given limited entry status with 182 limited entry permits being issued.

OTHER USER GROUPS

Salmon

Western Alaska salmon migrate as juveniles out of the rivers and into the Bering Sea. Where they go once they enter the ocean is only partly understood, but evidence from tagging studies and analysis of scale patterns indicate that these salmon spread throughout the Bering Sea and some move considerably south of the Aleutian Island chain into the Gulf of Alaska and North Pacific Ocean. While in the ocean, they mix with salmon stocks from Asia and elsewhere in North America (JTC 2005).

While in the ocean, some of these salmon are caught by commercial fisheries that take place in marine waters. Marine commercial fisheries that harvest migratory salmon that likely include

some salmon bound for western Alaska included: (1) the U.S. groundfish trawl fisheries in the Bering Sea-Aleutian Islands management area (BSAI) and in the Gulf of Alaska and (2) the South Peninsula June salmon purse seine and gill net fishery. Other commercial fisheries that operate in marine waters of the Bering Sea and Gulf of Alaska include: (1) the U.S. longline fisheries for Pacific halibut, Pacific cod, and other groundfish, (2) the U.S. pot fisheries for Pacific cod and other groundfish, and Dungeness, king, and Tanner crab, and (3) the U.S. purse seine and gillnet fisheries for Pacific herring.

Until 1992, five commercial fisheries in the ocean were known to catch salmon, some of which were likely bound for western Alaska. However, under international agreements, those fisheries no longer operate. They were (in order of decreasing overall salmon catches): (1) Japanese high-seas mothership and land-based salmon gill net fisheries; (2) high-seas squid gillnet fisheries in the North Pacific Ocean of Japan, the Republic of Korea, and the Republic of China (Taiwan); (3) foreign groundfish fisheries of the Bering Sea and Gulf of Alaska, (4) joint venture groundfish fisheries of the Bering Sea and the Gulf of Alaska, and (5) groundfish trawl fishery by many nations in the international waters area of the Bering Sea ("the Doughnut Hole").

Salmon harvested in the South Peninsula June fishery (South Unimak and Shumagin Islands) include stocks migrating to a wide range of locations such as Bristol Bay and the Arctic-Yukon-Kuskokwim (AYK) region (5 AAC 09.365 South Unimak and Shumagin Islands June Salmon Management Plan). The 1994–2003 South Peninsula June fishery average chum salmon harvest was 324,163 fish with a 2004 harvest of 482,309 fish (Appendix A5) (Burkey et al. 2005). Genetics samples were collected 1993 and 1994 from chum salmon harvested incidentally in sockeye fisheries along the south side of the Alaska Peninsula (Seeb and Crane 1999a). Stock of origin of Asian and North American chum salmon in these complex mixtures was estimated using a representative baseline of allozyme allele frequencies covering the entire range of chum salmon. Of the eight major regions (Japan, Russia, northwest Alaska summer run, Alaska Peninsula-Kodiak Island, southeast Alaska, British Columbia, and Washington) reported, northwest Alaska summer-run chum salmon predominated in the fishery with estimates ranging from 52 to 72%. Northwest Alaska summer-run chum salmon includes all stocks from the North Alaska Peninsula (Area M stocks) to Kotzebue.

Pacific Herring

Kuskokwim Area herring are harvested in U.S. groundfish trawl fisheries in the Bering Sea-Aleutian Islands management area (BSAI). Under the current management regime, targeted harvest and retention of Pacific herring is allowed only in state-managed inshore fisheries for herring sac roe and bait. Herring bycatch in groundfish fisheries may not be retained and herring bycatch amounts are limited by federal regulations. As part of the federal regulatory process, ADF&G provides an annual estimate of the biomass of herring in the Bering Sea to the North Pacific Fisheries Management Council (NPFMC). NPFMC then allocates 1% of this estimated biomass among various segments of the groundfish fishery as a "bycatch cap". Attainment of the bycatch cap triggers restrictive actions for that component of the groundfish fishery.

Kuskokwim Area herring may also be harvested in the Dutch Harbor food and bait fishery. Scale pattern analysis studies identified some herring harvested during the Aleutian Islands herring food bait fishery to be part of the Eastern Bering Seas herring biomass (Rogers and Schnepf 1985).

ESCAPEMENT GOALS AND GUIDELINE HARVEST LEVELS

SALMON

Kuskokwim Area provisional salmon spawning escapement objectives were first established in 1983 for aerial survey index areas of specific Kuskokwim Area streams and lakes. Salmon weir passages on the Kogrukluuk, Tuluksak, Kwethluk and Goodnews rivers, and salmon passage enumerated by sonar on the Aniak River (Francisco et al. 1993). The objectives were based on the average escapement counts obtained in these systems beginning in 1959. The objectives represented the average escapement levels over time and were believed to be the escapement needed to maintain the salmon stocks at past levels of abundance. Since the initial setting of salmon escapement objectives in the Kuskokwim Area in 1983, a few revisions and corrections were made over the years. Consistent with the escapement goal policy established by the Commissioner in October 1992, the established Kuskokwim Area escapement goals in effect during 1992 were documented and established as the official biological escapement goals during 1993–2000 (Buklis 1993).

Before adoption of the regulatory *Policy for Statewide Salmon Escapement Goals* (Escapement Goal Policy: 5 AAC 39.223) in 2001, all escapement goals established by the department for stocks in the Kuskokwim Area were termed biological escapement goals (ADF&G 2004). However, most of these goals did not meet the criteria for a BEG under the new policy definition. At the 2001 Board meeting, only select stocks were reviewed and goals were established consistent with the Escapement Goal Policy definitions.

An analysis of escapement goals for the major salmon stocks of the Kuskokwim Management Area was conducted in preparation for the January 2004 Board meeting. Escapement goals were evaluated, recommended and established by the department based on the *Policy for the Management of Sustainable Salmon Fisheries* (Sustainable Salmon Policy: 5 AAC 39.222) and the Escapement Goal Policy (ADF&G 2004).

The Sustainable Salmon Policy defines three types of escapement goals: (1) biological escapement goal (BEG), (2) sustainable escapement goal (SEG) and (3) sustainable escapement threshold (SET). BEG is defined as the escapement that provides the greatest potential for maximum sustained yield. SEG is defined as a level of escapement indicated by an index or an escapement estimate that is known to provide for sustained yield over a 5 to 10 year period, used in situations where a BEG cannot be estimated due to the absence of a stock specific catch estimate. SET is defined as a threshold level of escapement, below which the ability of the salmon stock to sustain itself is jeopardized; in practice, SET can be estimated based on lower ranges of historical escapement levels, for which the salmon stock has consistently demonstrated the ability to sustain itself. BEGs and SEGs are the primary management objectives for escapement unless the Board sets an optimal escapement goal (OEG) which takes into account socio-economic or other biological factors. BEGs are set to provide levels of escapement that will on average produce large returns with large harvestable surpluses. Escapements above or below these levels may be sustainable, but will, on average, produce less fish for people to catch. SEGs are set to provide levels of escapement that will produce runs and harvests similar to what has occurred in the past. Escapement goals in the Kuskokwim Area are SEGs because insufficient data exists to determine total escapement or total return for a given stock. This is

usually because it is not possible to apportion catches to river of origin or because escapement indices do not reflect total escapement. No SET was set for these stocks because the criteria for setting an SET suggests that it be estimated based on the lower ranges of historical escapement levels for which the stock has consistently demonstrated the ability to sustain itself and insufficient information exists to determine that point.

Prior to the 2004 Board meeting, stocks with previously established goals as well as stocks without previous goals were evaluated under the new criteria and escapement goal recommendations were made (ADF&G 2004). During the 2004 meeting, SEGs were recommended for establishment or modification for 12 Chinook salmon stocks, four chum salmon stocks, three coho salmon stocks and three sockeye salmon stocks (Appendix A7). Escapement goals were recommended to be discontinued for one Chinook salmon stock, four chum salmon stocks, two coho salmon stocks and one sockeye salmon stock. Sufficient data was not available to recommend goals consistent with definitions in the Escapement Goal Policy for several other Kuskokwim Area stocks which enumeration projects have been established in recent years. Continuation of these projects toward establishing a longer history of known escapement levels will allow these stocks to be evaluated in the future for assignment of escapement goals. Following the 2004 Board meeting, the Directors of the Divisions of Sport Fish and Commercial Fisheries formally adopted the recommended escapement goals.

PACIFIC HERRING

The Bering Sea Herring Fishery Management Plan (5 AAC 27.060) requires minimum spawning biomass thresholds for each district prior to commercial fishing. The thresholds are (in descending order): 3,000 short tons (st) for Nelson Island, 1,500 st for Nunivak Island, 1,200, st, for Security Cove, and Goodnews Bay, and 500 st for Cape Avinof. The maximum exploitation rate is established at 20% of the estimated spawning biomass for Security Cove, Goodnews Bay, Nunivak Island, and Nelson Island. Other regulations limit the maximum Nunivak Island exploitation rate to 15% if aerial surveys are inadequate (5 AAC 27.894), and the maximum 20% exploitation rate at Nelson Island must include a 200 st subsistence herring harvest estimate. Regulations set the maximum allowable exploitation rate in the Cape Avinof District at 15%.

OTHER SPECIES

There are no established escapement goals or guideline harvest levels for fish other than salmon and herring in the Kuskokwim Area. The Southwest Alaska Rainbow Trout Management Plan directs that the Kuskokwim Area rainbow trout fishery be managed to maintain historic size and age composition (Lafferty 2004).

RESEARCH PLANNING AND FUNDING INITIATIVES

Research planning is an ongoing task of government agencies and non-governmental organizations interested in making the best use of research funding. Research in support of sustainable salmon fisheries must be well planned and prioritized as information needs generally outpace available funds. Recently several funding initiatives have been available to support research and assessment projects on the Kuskokwim River. Kuskokwim stakeholders interested in salmon fisheries have responded to discuss and plan activities funded primarily by USFWS Office of Subsistence Management (OSM), Bering Sea Fishermen's Association (BSFA), and the AYK Sustainable Salmon Initiative (AYK SSI), though other minor funding opportunities also exist.

The Kuskokwim Fisheries Resource Coalition (KFRC) formed as a collective of federal, state, and tribal organizations that are actively involved in a variety of fishery research and management initiatives in the Kuskokwim Region. Participants meet under the title of KFRC to coordinate fishery research initiatives and grant proposal submissions. Participating organizations include, but are not limited to: ADF&G (Commercial Fisheries, Subsistence, and Sport Fish Divisions), Association of Village Council Presidents (AVCP), BSFA, Kuskokwim Native Association (KNA), Kuskokwim River Salmon Management Working Group, McGrath Native Village Council, Orutsararmiut Native Council (ONC), USFWS (Kenai Fish and Wildlife Resource Office, Togiak National Wildlife Refuge, and Yukon Delta National Wildlife Refuge), and Tanana Chiefs Conference (TCC). The KFRC does not presume to have any special authority regarding the proposal submission process for the Kuskokwim Region, but seeks to provide an open and cooperative forum that is inclusive of a broad range of stakeholder groups who want to work together to improve management of Kuskokwim Area fisheries. It is the intertwining of organizational strengths, and the valuing of mentoring and capacity building relationships, that offer the best opportunity for long-term success and public acceptance of fisheries management programs in the Kuskokwim Area.

The AYK SSI began with a memorandum of agreement signed following discussions between ADF&G and the “AYK Coalition” to form a body which would provide direction for research in response to salmon run failures in western Alaska. The AYK Coalition is comprised of three Alaska Native organizations in the AYK Region: AVCP, TCC and Kawerak, Inc. and BSFA. Representatives from the AYK Coalition lobbied Congress in 2001 seeking funding to understand the decline of salmon in the AYK Region. The lobbying effort was successful in obtaining a total appropriation of \$14 million for the AYK SSI by Congress for federal fiscal years 2002–2004 (as an earmark of the Pacific Coastal Salmon Recovery Fund).

The memorandum of agreement outlining a process for administering the AYK SSI research grant also specified that a research plan would be developed to guide research-funding decisions. The objective of the research plan was to address the decline of Chinook and chum salmon to the Yukon River, Kuskokwim River, and rivers draining into Norton Sound, (collectively known as the AYK Region) that led to severe restrictions on commercial and subsistence fisheries and to repeated disaster declarations by the state and federal governments. It was also implicit that the AYK SSI research plan would recognize regional or watershed research plans. Plans had been developed for the Yukon River and Norton Sound. The AYK SSI steering committee has tasked its Scientific Technical Committee (STC) to complete a research plan. The National Research Council, a part of the National Academies of Sciences, Engineering and Medicine, has also been contracted to assist the STC in background for and review of the final plan.

In response to the absence of a Kuskokwim watershed plan, and the initiation of the AYK SSI research planning process, the KFRC requested funds from the AYK SSI and USFWS OSM to develop a research plan. The science plan would be developed in conjunction with a gap analysis to guide long-term research and monitoring of the freshwater life history stages of the salmon resources of the Kuskokwim Area. The planning process began in 2003 and a draft of the plan is available for review.

FUNDING SOURCES

The USFWS OSM funds about \$7 million annually in research and monitoring projects. This Fisheries Monitoring Program was established to help provide information needed for effective

management of subsistence fisheries on Federal public lands in Alaska. The Program funds projects to address research priorities identified by management agencies and local users from around the state. In 2004, 16 projects were funded in the Kuskokwim area for about \$1.6 million. Two projects carried over from 2003 to the 2004 season.

Bering Sea Fisherman's Association, a non-profit organization, has been active in AYK fisheries issues, including research for decades. BSFA generally receives money from the Federal Government, primarily from the Bureau of Indian Affairs (BIA). These funds have been used in the Kuskokwim Area to support Native organizations that participate in research and assessment projects with ADF&G or USFWS.

The state supports its research and assessment programs using three types of funds: general, permit, and test fish. General fund is that appropriated by the legislature resulting from the state's taxes (oil, fish sales, etc). Permit funds are generated by the sale of fishing permits and crew member licenses. Test fish monies are derived from the sale of fish caught during operation of research and assessment projects to licensed buyers. The legislature approves the total dollar amount the ADF&G can receive for permit and test fish funds.

COOPERATIVE MANAGEMENT PROCESS

SALMON

The Kuskokwim River Salmon Management Working Group was formed in 1988 by the Board in response to requests from stakeholders in the Kuskokwim River drainage seeking a more active role in the management of salmon fishery resources. Since then, the Working Group has become increasingly active in the preseason, inseason, and postseason management of the Kuskokwim River drainage subsistence, commercial, and sport salmon fisheries. In 2001, the Working Group modified its charter in order to more effectively address the needs of the Federal Subsistence Program by including members of the Coordinating Fisheries Committee of the Yukon-Kuskokwim Delta and Western Interior (WI) Regional Advisory Councils (RAC). The Working Group now serves as a public forum for Federal and State fisheries managers to meet with local users of the salmon resource to review run assessment information and reach a consensus on how to proceed with management of Kuskokwim River salmon fisheries. Working Group meetings provide the forum for area fishers, user representatives, community representatives, RAC representatives, Fish and Game Advisory Committee members, and State and Federal managers to come together to discuss issues relevant to sustained yield fishery management and providing for the subsistence use priority.

Improvements have been made toward strengthening the cooperative management process of the Working Group through funding provided by the USFWS OSM in support of project FIS 01-116. The funding provided by OSM allowed ADF&G staff and Working Group members to more effectively keep area fishers informed of run abundance, fishery status, and management strategies through discussion, news releases, newspaper articles and radio talk shows. The funding allowed dedicated staff to more effectively prepare for meetings by providing complete and frequent distribution of updated fishery status information in a standardized format. The funding also allowed travel for Working Group members to participate in fishery meetings located outside the drainage. Although progress has been made toward strengthening cooperative management, it is an ongoing process that will require the continued unselfish participation by area fishers and basic funding for material preparation, communication and

travel to maintain the interaction of Working Group members with fishery managers, fishery project leaders, research planners, and policy makers. Unfortunately, dedicated funding from OSM FIS project 01-116 for the program ended in October of 2004 so other accommodations need to be provided to continue strengthening the cooperative management process of the Working Group.

OTHER SPECIES

Halibut and groundfish are managed by the North Pacific Management Council. Other fisheries are managed by the department according to established management plans, polices and regulations.

GENERAL DESCRIPTION OF MANAGEMENT AND RESEARCH ACTIVITIES

SALMON

The vast size, remoteness and geomorphic diversity of the Kuskokwim Area present tremendous challenges in assessing salmon run timing, implementing fisheries, establishing escapement goals and monitoring escapements toward sustained yield fishery management. For the past two decades, a system has been upgraded and improved annually to monitor salmon run timing and run strength through comparison of current year information to historic information. This system includes the evaluation of subsistence fishery information, sport fishery harvest information, test fish project catch rates, commercial harvest catch rates and, as fish begin reaching clear water tributary streams, weir passage, sonar passage and evaluation of the numbers of salmon on spawning grounds through aerial surveys. In recent years, mark recapture and radio telemetry studies have been used to further the understanding of salmon run timing, distribution and abundance. Cooperative partnerships have been established with federal agencies and local organizations that have increased the number of escapement monitoring projects (Table 1). These cooperative efforts have added substantially to our ability to monitor salmon escapements and to evaluate the effectiveness of inseason management actions.

During 2004 programs established toward assessing salmon escapements included salmon weirs operated on Takotna, Tatlawiksuk, George, Tuluksak and Kwethluk Rivers, plus mark–recapture and radio-telemetry projects operated on the main stem Kuskokwim and Holitna Rivers and a fall chum salmon program (Table 1; Figure 1). These projects received federal funding through grants obtained by the Bering Sea Fishermen’s Association (BSFA), Bureau of Indian Affairs (BIA), Federal Office of Subsistence Management (OSM) and National Marine Fisheries Service (NMFS). The department and/or USFWS staff worked jointly to provide varying levels of support to each project, including an on-site crew leader or crewmember.

Post Season Subsistence Harvest Surveys

The department conducts annual household surveys to collect information about the harvest and use of salmon in the Kuskokwim Area (Tables 2–5; Appendix A4 and A7, B1–B4, C1–C4, and D1–D5). Prior to statehood, subsistence salmon harvest information was collected periodically by various federal departments and bureaus. Since 1960, the department has been collecting subsistence salmon harvest information from fishers along the Kuskokwim River drainage through visits to fish camps by survey staff 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. Division of Subsistence took over the annual subsistence salmon harvest surveys in 1988 and has been responsible for collecting and analyzing the data since then. Division of Subsistence made several changes to the methodology, including starting the data collection in October, well after the late summer, early fall salmon harvest was completed. This was done primarily to improve estimates of the subsistence coho salmon harvest.

More recently, the department has collaborated in data collection with the USFWS and local tribal organizations including the Orutsarmiut Native Council (ONC) in Bethel and the Kuskokwim Native Association (KNA) in Aniak to complete these annual surveys. Subsistence harvest surveys have been aimed at 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. Although data for subsistence pink salmon harvests are not usually collected during the annual fall survey efforts, some data have been collected from the communities of Bethel and Aniak for the past couple of years in association with specific cooperative fisheries harvest assessment projects in those two communities funded by the Fisheries Information Service (FIS), OSM. Other Division of Subsistence community-baseline studies conducted in the region also include pink salmon harvest data.

Commercial Catch Statistics

Participation in the Kuskokwim Area salmon fisheries requires fishers to have a Commercial Fishery Entry Commission (CFEC) permit (Appendix A8). Fish tickets (landing receipts) are filled out at the time of each delivery by processors and a copy is provided to the department. Computer tabulations of fish ticket information provide the commercial catch data presented in this report. Division of Commercial Fisheries Computer Services section maintains the computer fish ticket software program and archives the fish ticket information, however, data entry is conducted during the season by department staff in the Bethel Area Office.

Evaluation of commercial catch statistics is a standard method for assessing salmon run strength within and between years (Tables 6–9; Appendix A9–A12, B5–B9, C5–C8, and D6–D9). Catch information is standardized by dividing the number of fish caught during a period by the product of the number of unique CFEC permits used in a fishing period and the total number of hours the district was open to commercial fishing. This catch statistic is referred to as the catch per unit of effort (CPUE). Many variables need to be considered when evaluating CPUE information. These variables include: an inconsistent number of fishers, fishing periods of different duration, changing river water level, weather conditions, and fish behavior.

Post Season Sport Fishing Harvest Surveys

Research and Technical Services (RTS) of the Division of Sport Fisheries has been surveying the angling public with postal questionnaires since 1977 and annually produce the Statewide Harvest Survey (SWHS) (Lafferty 2004). Questionnaire recipients are randomly selected from zip codes from angler license sales throughout the State of Alaska. Surveys are based on the calendar and a statewide report is often published the following September or October. Anglers are primarily asked locations of sport fish harvest, catch and effort-spent fishing by days and trips. This information is used to create a statewide database providing information on where sport fishing occurs, the extent of participation, preference of participants, and species and number of major game fishes being caught and harvested.

Inseason Subsistence Catch Reports

Historically, fishery managers have collected inseason subsistence harvest information ad hoc from a few subsistence fishers. During some years efforts were made to establish a systematic inseason subsistence monitoring program (Kuskokwim Fishermen's Cooperative 1989). However, the inseason subsistence salmon catch monitoring program initiated in 2001 increased the quality and consistency of information obtained from subsistence fishers (Table 10; Appendix B10) (Whitmore et al. 2004; Martz and Whitmore 2005). The inseason subsistence catch monitoring project has provided additional information to evaluate salmon run strength by obtaining the relative success of some subsistence fishers in achieving their harvest goals. Additionally, this project provided an avenue for local user input into the evaluation of salmon run abundance and corresponding management strategies. This project increased the number and frequency of fishing family interviews increasing the credibility of the salmon catch information. Comparisons of inseason subsistence catch information now can be made between weeks within a year and between years. Inseason subsistence catch information has been used in combination with other information to determine appropriate inseason management decisions.

Test Fish Projects

Daily inseason assessment of Kuskokwim River relative salmon run strength and timing is available from a drift gillnet test fishery operated near Bethel. 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 (Molyneaux 1997a; Bue 2005). From early June through late August the test fish crew conducts three or four systematic gillnet drifts beginning 1 hour after high tide. Drifts are done at three stations distributed across the width of the channel. Each drift is 20 minutes in duration. Two 50 fathom gillnets are used, one net is hung with 5-3/8 inch mesh web and the other with 8-inch mesh. Two gillnets are rotated between the three stations following a systematic schedule. Both mesh sizes are operated from early June through about 10 July 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 net continues until late August.

Test fish catch from each tide is tallied by species then distributed to charities or sold to a local fish buyer when available. Catch statistics for Chinook, sockeye, chum, and coho salmon are presented as daily catch-per-unit-effort data. Comparisons are made with test fish results from previous years to assess relative abundance and run timing. The comparisons are subjective because managers also 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 1984a); Eek test fishery, 1988–1994 (unpublished); 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, inconsistent methods; problems with catch disposition and ambiguous results.

Weirs and Towers

Kwethluk River Weir

Kwethluk River joins the Kuskokwim River at river mile 99 and the current weir is located about 55 river miles upstream of the confluence (Figure 1; Appendix A2). The USFWS operated a resistance board weir in that vicinity in 1992 (Harper 1998), but the project was discontinued because of concerns from some local residents. Association of Village Council President and Kwethluk Joint Council operated a counting tower in that same vicinity from 1996 to 1999, but success was limited (Cappiello and Sundown 1998; Chris and Cappiello 1999; and Hooper 2001). The weir project was re-establish in 2001 as a cooperative venture between USFWS and Organized Village of Kwethluk (Harper and Watry 2001; Roettiger et al. 2001; 2004) (Table 11; Appendix B11, B12).

Tuluksak River Weir

Tuluksak River joins the Kuskokwim River at river mile 136 and the weir is located about 47 river miles upstream of the confluence (Figure 1; Appendix A2). USFWS operated a resistance board weir in that vicinity from 1991 to 1994 (Harper 1995a, 1995b, 1995c, 1997). The project was discontinued after 1994 because of concerns from some local residents, but re-established in 2001 as a cooperative venture between USFWS and Tuluksak Traditional Council (Gates and Harper 2002, 2003) (Table 12; Appendix B11, B13).

George River Weir

George River joins the Kuskokwim River at river mile 309 and the weir is located about 4 river miles upstream of the confluence (Figure 1; Appendix A2). Salmon escapement monitoring began at the site in 1996 through the joint effort of Kuskokwim Native Association and ADF&G (Molyneaux et al. 1997). The original fixed-panel weir design was replaced with a resistance board weir in 1999, which improved performance in subsequent years (Linderman et al. 2004) (Table 13; Appendix B11 and B14).

Kogrukluk River Weir

Kogrukluk River is a tributary of the Holitna River sub-basin and has the most extensive history of salmon escapement monitoring in the Kuskokwim Area (Figure 1; Appendix A2). Holitna River joins Kuskokwim River at river mile 335, and Kogrukluk River weir is located an additional 138 river miles upstream (Baxter 1976a and 1976b). Salmon escapement monitoring began in that vicinity in 1969 with a counting tower located several miles upstream of the current weir site (Yanagawa 1972a). The tower was also upstream of Shotgun Creek, a productive salmon spawning area. The department tried to install a weir near the tower site in 1971, but was unsuccessful (Yanagawa 1972b). Operation of the counting tower continued through 1978 (Yanagawa 1972a and 1973; Kuhlmann 1973, 1974, 1975; Baxter 1976a, 1976b and 1977). Weir operation at the current site, located downstream of Shotgun Creek, began in 1976 (Baxter 1976a), and tower operation was discontinued after 1978 (Table 14; Appendix B11, B15).

Tatlawiksuk River Weir

Tatlawiksuk River joins the Kuskokwim River at river mile 383 and the weir is located about 2.5 river miles upstream of the confluence (Figure 1; Appendix A2). Salmon escapement monitoring began at the site in 1998 through the joint effort of Kuskokwim Native Association and ADF&G (Linderman et al. 2002). Operations in 1998 were incomplete and the fixed-panel

weir design was replaced with a resistance board weir, which improved performance in subsequent years (Table 15; Appendix B11 and B16).

Takotna River Weir

Takotna River joins Kuskokwim River across from McGrath at river mile 507, and the weir is located about 53 river miles upstream of the confluence, near the community of Takotna (Figure 1; Appendix A2). Salmon escapement monitoring began in that vicinity in 1995 with a counting tower located a few miles downstream of the current weir site (Molyneaux et al. 2000). The counting tower was operated by Iditarod Area School District (IASD) in consultation with ADF&G. The tower project was replaced in 2000 with the current resistance board weir, and project administration transferred from IASD to Takotna Tribal Council (Schwanke et al. 2001). With the adoption of the weir, project objectives were broadened in 2000 to include assessment of coho salmon escapement (Table 16; Appendix B11 and B16).

Kanektok River Weir

Counting towers were attempted from 1960–1962, and again from 1996–1999, but were limited by logistical problems, poor visibility into the water column, and difficulties in species identification (ADF&G 1960, 1961, 1962; Fox 1997; Menard and Caole 1999). In 1999, resources were redirected toward developing a resistance board-floating weir (Burkey et al. 2000a). Despite initial technical and logistical difficulties (Linderman 2000; Estensen 2002), the weir became a viable and accurate method to monitor salmon escapement in the Kanektok River. Objectives of the weir project were partially achieved in 2001, and a completely achieved since that time (Table 17; Appendix C9).

Middle Fork Goodnews River Weir

Middle Fork Goodnews River Weir (MFGR) weir enumerates Chinook, sockeye, chum, and coho salmon escapements into MFGR. This project is the third oldest continuing escapement monitoring project in the Kuskokwim Area. The project was initiated in 1981 as a counting tower and continued through 1990 (Burkey 1990). Though successful, the tower was limited by difficulties in species apportionment and high labor costs (Menard 1998). In 1991, resources were directed towards a fixed-panel weir. The fixed-panel weir greatly reduced labor costs and improved species identification. However, the fixed panel weir was susceptible to frequent high water levels that often exceeded the height of the panels, rendering the weir inoperable. In July of 1997, the fixed-panel weir was replaced with a resistance-board floating weir designed to withstand high water levels (Menard 1998). Use of the resistance-board floating weir has allowed the project to remain operational during high water events, and to operate into September, traditionally a period of high water levels in the Goodnews River drainage (Table 18; Appendix D10).

Other Weirs

Other weir projects operated in the Kuskokwim River basin have included South Fork Salmon River weir in 1981 and 1982 (Schneiderhan 1982b, d). This project was discontinued because of funding shortages, technical limitations and /or lack of local support.

Sonar

Aniak River Sonar

Aniak River joins Kuskokwim River near the community of Aniak at river mile 225 and the sonar site is located approximately 12 miles upstream of the confluence (Figure 1; Appendix A2). Salmon escapement monitoring began in that vicinity with the use of non-configurable sonar equipment in 1980 (Schneiderhan 1981, 1982c, 1984). A transducer was deployed from one bank and passage in the unensounded section of the river was estimated using an expansion factor (Schneiderhan 1989). Results from the 1995 sonar operations were considered unusable because of abnormalities in the operation that could not be resolved (Burkey et al. 1997), including the lack of documentation inherent with non-user configurable sonar. In 1996, the project was redesigned to incorporate user-configurable sonar technology (Vania 1998). At the same time the project was relocated to the current site about a mile downstream where a transducer was deployed from each bank to allow full channel ensounding.

Sonar passage estimates for the Aniak River include a mix of species; but the sonar counts are currently unapportioned to species. During the first few years of sonar use, investigators tried to apportion counts between Chinook, chum, and in 1 year, coho salmon (Schneiderhan 1981, 1982a, b, 1984). Apportionment was done using gillnet catches, but the practice was discontinued after 1986 because of inadequate sample sizes, gillnet selectivity problems, and the perceived dominance of chum salmon (Schneiderhan 1989). The overall dominance of chum salmon has generally been confirmed through periodic netting activities (Schneiderhan 1989, Vania 1998); however, other species, including residents such as longnose suckers, may periodically vie with chum salmon for dominance of the daily passage estimates. Continued interest in species apportionment initiated renewed investigations with gillnets in 2001 and 2002, but the practice was again found unfeasible (Sandall and Pfisterer 2006). The current project-operating period of mid-June through late July is when the majority of the fish passage is typically chum salmon (Table 19; Appendix B17).

Kuskokwim River Sonar

The department began developing a user-configurable sonar project in 1988 for deployment in the mainstem of Kuskokwim River near Bethel (Mesiar et al. 1994). Shortages in technical support and the restructuring of the regional sonar program precluded its operation after 1995. Since 1995, the original sonar site has degraded and is now considered unsuitable. In addition, two sloughs that bypass the site have enlarged enough to possibly allow significant salmon migration, which could compromise estimates of salmon passage. As part of the regional sonar-rebuilding program, ADF&G staff conducted limited site surveys in 1998 and began development of a redesigned sonar project in 1999 at a new site located 16 miles upriver of Bethel. Development, however, has been suspended indefinitely due to continued staffing shortages and technical challenges.

Other Sonar

Experimental sonar deployment occurred in the Kwethluk and Kasigluk Rivers in 1978 and 1979 (Schneiderhan 1979, 1980). These projects were discontinued because of funding shortages, technical limitations, and /or lack of local support.

On the Kanektok River, hydroacoustic sonar was attempted from 1982 through 1987, but this method was unsuccessful because of budget constraints, technical obstacles, and site limitations (Schultz and Carey 1982; Schultz and Williams 1984; Huttunen 1984b, 1985, 1986, 1988).

Aerial Surveys

Aerial surveys have been conducted in the Kuskokwim Area since 1962. Surveys are conducted using fixed wing aircraft and are ordinarily restricted to clear water streams and lakes, the distribution of which is geographically skewed towards the middle and lower Kuskokwim River basin and Kuskokwim Bay streams. Tributaries in the upper Kuskokwim River are often stained from organics or clouded by glacial runoff, which reduces fish visibility. Aerial survey escapement assessment is also subject to variability depending on viewing conditions and survey observers. However, when observers, timing, and methods are standardized to the extent feasible and survey conditions meet acceptable criteria, the resulting counts are taken as an index of escapement. Aerial surveys are numerically ranked on a scale of 1=good, 2=fair, and 3=poor. Ranking criteria are based on survey method, weather and water conditions, time of survey, and spawning stage. Aerial surveys are flown during peak spawning periods for each species in order to maximize the number of observable fish on the spawning grounds. Peak spawning periods were developed from run timing estimates and vary by species and geographic location within the Kuskokwim Area. Only surveys with rankings of fair and good (1 and 2), and conducted within the peak spawning period are included as part of the Kuskokwim Area aerial survey database.

Currently, aerial survey escapement goals have been established on nine Kuskokwim Area tributaries for Chinook salmon, seven tributaries for chum salmon, three tributaries for sockeye salmon, and two tributaries for coho salmon (Table 20; Appendix B18, C10, D11, Buklis 1993). Aerial surveys are best directed at indexing spawning populations of sockeye and Chinook salmon because these species are typically more visible than chum and coho salmon. Sockeye salmon aerial surveys are focused on Kuskokwim Bay populations in the Kanektok and Goodnews Rivers. Holitna River and Telaquana Lake at the headwaters of the Stony River drainage are the primary Kuskokwim River sockeye populations that have received sockeye directed aerial surveys but the historical database is inconsistent over time. Chum salmon have protracted run timing requiring multiple surveys throughout their runs to ensure accuracy of the index. Chum salmon aerial surveys have been discontinued as an escapement index until survey methods can be improved or funding can be secured to allow for multiple aerial surveys of chum salmon populations throughout the duration of their runs. Coho salmon are frequently difficult to survey because of poor fall weather conditions. Coho salmon aerial surveys have been conducted when funding and weather conditions allow.

Procedures established in recent years have increased the number streams surveyed on a consistent yearly basis through the creation of an aerial survey location database, intensive pre-flight planning, and establishment of a dedicated aerial survey project staff. Additionally, variability between observers and methods has been addressed through standardized training and consistency of the observers, pilots, and aircraft used. Efforts have also been made to increase the number of survey streams in the Kuskokwim Area. Exploratory surveys have been conducted since the late nineties in the middle and upper Kuskokwim drainage to increase the number of Chinook and chum salmon aerial survey streams and evaluate Chinook and chum salmon spawning distribution (Schwanke et al. 2001; Schwanke and Molyneaux 2002). Aerial surveys have been conducted in the middle and upper Kuskokwim River to determine spawn

timing and distribution of late spawning chum salmon as part of an emerging fall chum salmon investigation. Additionally, efforts are made each season to conduct aerial surveys on streams having more intensive escapement monitoring projects such as weirs. This generates paired data between the aerial survey index and escapement counts for use in verifying the accuracy of aerial surveys and establishing a correlation between aerial survey indices and escapement in the event these weir projects are discontinued in the future.

Mark–Recapture

Mark–recapture experiments have been performed to estimate the abundance of coho salmon during 2001 and chum, sockeye, and coho salmon during 2002, 2003 and 2004 upstream from the village of Kalskag on the Kuskokwim River (Appendix B16) (Kerkvliet and Hamazaki 2003; Kerkvliet et al. 2003; 2004; Pawluk et al. 2006). Adult salmon were captured with fish wheels and gillnets deployed near Kalskag (river mile 192) and Birch Tree Crossing (river mile 221), and marked with uniquely numbered spaghetti tags. Fish wheels and drift gillnets were used for capturing salmon from June 6 to September 8 at the Kalskag site and from June 6 to September 10 at the Birch Tree Crossing site. The recapture event was considered from two aspects: the recovery of tags from catches in the fish wheels and gillnets fished at Birch Tree Crossing, and the observation of tagged fish at Aniak River sonar and at George, Tatlawiksuk, Kogrukluuk and Takotna River weirs (Figure 1).

Radio Telemetry

Kuskokwim River Chinook Radio Telemetry

Radio telemetry studies have been conducted annually since 2001 to estimate the total passage of Chinook salmon in the mainstem Kuskokwim River, upstream of Birch Tree Crossing at river mile 221 (Figure 1; Appendix A2). Total passage estimates were not achieved during the 2001. Estimated passage during the 2002 and 2003 seasons excluding Aniak River, were, 100,733 (+/- 24,267) and 103,161 (+/- 18,720) Chinook salmon (Stuby 2003, 2004). The 2004 estimated passage was 146,839 (+/- 21,980) (Stuby 2005; Appendix B16). Aniak River estimate was excluded due to suspected sampling bias.

Holitna River Radio Telemetry

Radio telemetry studies have been conducted to estimate the annual escapements of Chinook, chum and coho salmon in the Holitna River drainage since 2001 (Wuttig and Evenson 2002; Chythlook and Evenson 2003; Stroka and Brase 2004; Stroka and Reed 2005), which joins the Kuskokwim River at river mile 335 (Appendix A2). In 2004, there was an estimated 81,961 Chinook salmon in the Holitna River drainage (SE=11,722) (Stroka and Reed 2005). By comparison, the estimated abundance of Chinook salmon in the Holitna River drainage for 2001, 2002 and 2003 was 22,405 (SE=6,207), 42,902 (SE=6,334) and 42,013 (SE=4,981) respectively. In 2004, total abundance of chum salmon in the Holitna River drainage was estimated at 996,216 (SE=640,754) (Stroka and Reed 2005). By comparison, the estimated abundance of chum salmon in the Holitna River drainage for 2002 (the only other year an abundance estimate was achieved) was 542,172 (SE=285,925) (Appendix B16).

Biological Sampling

Other information collected at ground based projects may include salmon sex and length composition, scales for age determination, statistics on the occurrence of gillnet marks on fish,

samples for genetic stock identification, data on resident species, and information from the recovery of tagged fish in coordination with the mark–recapture and radio telemetry projects (Appendix B19–B25, C11–C18 and D12–D19).

Ages of fish in this report are presented as total age, year spawned to year recorded and in the European notation. In the European system, the number of winters in fresh water after hatching is followed by the number of winters in salt water. The fresh and salt-water winters are separated by a decimal point. To derive total age from the European system you must add the fresh and salt water winters and add 1 for the year of spawning. For example an age-1.3 Chinook salmon has a total age of 5 years: $1+3+1=5$.

Genetics

Since the early 1990s, several genetics studies have been initiated that either focused on or included Kuskokwim Area Chinook, sockeye, chum, and coho salmon populations. Objectives of these studies have included: 1) establishing a genetic baseline for Kuskokwim Area salmon populations, 2) identifying genetic units for improved conservation and management, and 3) standardizing and contributing data to Pacific Rim salmon genetics databases and research including the Bering-Aleutian Salmon International Survey (BASIS). Salmon genetics sampling and analysis is ongoing in the Kuskokwim Area with the objectives of: 1) increasing the resolution of genetic markers to identify genetic variability between populations, and 2) establishing genetic baseline information and methodologies that allow for identification of specific populations within the mixed stock fisheries of the Kuskokwim Area, Western Alaska, and the Pacific Rim. Current findings of these studies and ongoing genetics research in the Kuskokwim Area are a valuable contribution towards effective sustained yield management of Kuskokwim Area salmon stocks.

Chinook Salmon

Genetic baseline sample collections for Chinook salmon were begun by ADF&G in 1992, with the majority being collected since 2001. A total of 1,399 samples have been collected from 15 tributaries and river systems ranging from Kuskokwim Bay to the Upper Kuskokwim River region (Templin et al. 2004). Significant genetic variation was found between Kuskokwim Bay and middle Kuskokwim River populations; however, enough genetic similarity remained between the 15 populations to preclude adequate population identification through mixed stock analysis. The 15 sample populations were grouped into four regions based on genetic diversity and geographic location: 1) Goodnews and Kanektok rivers (Kuskokwim Bay), 2) sample tributaries between the Eek and Kogrukluks rivers (Lower Kuskokwim River), 3) Stony, Cheeneetnuks, and Tatlawiksuk rivers (middle Kuskokwim River), and 4) Takotna River and Pitka Fork of the Salmon River (upper Kuskokwim River). Significant genetic variation was found between the four regional groups and was adequate to differentiate between these groups through mixed stock analysis. Genetic analyses provided adequate distinction within the Kuskokwim River to estimate composition and run timing of regional groups from mixed stock inriver fisheries. Additionally, these findings can be used to identify Kuskokwim River Chinook salmon through mixed stock analysis of high seas harvest or bycatch. Chinook salmon genetics research is ongoing in the Kuskokwim Area with the goals of further increasing the baseline and increasing the resolution of genetic markers to differentiate between Chinook salmon populations.

Chum Salmon

Genetic baseline sample collections of Kuskokwim Area chum salmon populations were begun by ADF&G in 1991. A total of 2,033 samples have been collected from 18 Kuskokwim River tributaries and river systems ranging from Kuskokwim Bay to the upper Kuskokwim River regions, and an additional 3,322 mixed stock samples have been collected from within the Kuskokwim River drainage. The primary goal of these and other chum salmon collections was to increase the genetic baseline of Pacific Rim chum salmon populations in order to partition genetic variation and estimate overall stock components through mixed stock analysis. Several Pacific Rim mixed stock analysis studies have been conducted which included Kuskokwim Area chum salmon genetics collections (Crane and Seeb 2000; Seeb and Crane 1999a, b; Seeb et al. 1997; 1995). To date, analysis of genetic markers has been inadequate to differentiate between Kuskokwim Area populations and the whole of North Western Alaska chum salmon stocks (defined as stocks from Bristol Bay to Kotzebue Sound, excluding Yukon River Fall chum). However, genetic analysis specific to 16 Kuskokwim River populations indicated two genetically distinct populations within the drainage. Three Kuskokwim River populations from the Stony River, South Fork of the Kuskokwim, and Big River were found to be genetically distinct from each other and genetically distinct from the remaining 13 genetically similar populations from the middle and lower Kuskokwim River regions (ADF&G, Gene Conservation Laboratory, unpublished data). Aerial surveys, genetics sample collections, and local traditional ecological knowledge also indicated these three genetically distinct populations had a later spawning period and morphological differences. These findings were analogous to the divergent genetic, run timing, and morphological characteristics between summer and fall run chum salmon populations in the Yukon River. A study was initiated in 2004 to investigate the occurrence of Kuskokwim River fall chum salmon populations in greater detail (Gilk et al. 2005). In addition to genetic and spawning timing differences, preliminary findings of the 2004 study have indicated that Kuskokwim River fall chum salmon are distinct from summer chum salmon by exhibiting a younger average age, a less robust body shape, and a spawning distribution limited to upper river tributaries.

Sockeye Salmon

Kuskokwim Area sockeye salmon genetics information is limited compared to other salmon species. A total of 849 samples have been collected by ADF&G and USFWS from four tributaries and river systems ranging from Kuskokwim Bay to middle Kuskokwim River regions (Goodnews, Kanektok, and Kogruklu Rivers, and Telaquana Lake (Stony River)). The primary goal of these and other sockeye salmon collections was increasing the genetic baseline of Pacific Rim sockeye salmon populations for use in identifying sockeye salmon stock compositions in mixed stock fisheries (Habicht et al. 2001). Ninety five of the Kuskokwim Area samples have been analyzed and contributed to the Pacific Rim baseline and more are expected to be analyzed and included in coming years. Kuskokwim Area sockeye salmon genetics collections have contributed to the high seas BASIS studies used to identify migration and utilization patterns of sockeye salmon in the Bering Sea (Habicht et al. 2005). Analysis of sockeye salmon genetics markers groups the majority of Kuskokwim Area populations as genetically similar to Western Bristol Bay stocks; however, the Telaquana Lake population has been shown to be genetically unique compared to other Bristol Bay and Kuskokwim Area populations. Findings from the recent migration and utilization study have shown that the majority of Western Bristol Bay stocks, inclusive of Kuskokwim Area populations, migrate to and utilize the Southeastern Bering

Sea, Western Bristol Bay, and the Northern Aleutian regions throughout their ocean life cycle and a minority migrate to and utilize regions off the Kamchatka Peninsula and the Northern Russian coast. Sockeye salmon genetics studies are ongoing and new information is expected to emerge in coming years.

Coho Salmon

Genetic baseline sample collections for Coho salmon were begun in 1997, with the majority being collected since 2001. Samples were collected by ADF&G and USFWS from seven tributaries and river systems ranging from Kuskokwim Bay to the upper Kuskokwim River region. Significant genetic variation was found between these seven populations and the variation increased with distance between populations; however, the level of variation was less than found in other Alaskan coho salmon populations and was inadequate to identify individual populations through mixed stock analysis (Crane et al. 2004). Similar to Chinook salmon analysis, the seven sample populations were grouped into four regions based on genetic diversity and geographic location 1) Arolik and Kanektok rivers (Kuskokwim Bay), 2) Kisaralik and George rivers (lower and middle Kuskokwim River), 3) Kogrukluuk and Tatlawiksuk rivers (middle Kuskokwim River), and 4) Takotna River (Upper Kuskokwim River). A higher level of genetic variation was found between the four regional groups and mixed stock analysis was adequate to differentiate between combinations of three of the four groups: 1) Kuskokwim Bay, 2) lower-mid Kuskokwim River, and 3) upper Kuskokwim River. Increasing the number of baseline sample populations is expected to increase the resolution of genetic markers and allow for more detailed identification of stock compositions through mixed stock analysis. Coho salmon genetics research is ongoing in the Kuskokwim Area and coho salmon genetics collections were continued in 2004.

RESIDENT FISH SPECIES

The Kuskokwim Area is rich in a diverse assortment of resident fish species spread throughout the Management Area. The Division of Commercial Fisheries does not monitor the status of the freshwater species in the Kuskokwim Area, however, Sport Fish Division has conducted a variety of studies investigating sheefish, pike, whitefish and conducting angler surveys (Alt 1970, 1972, 1977a, b, 1980, 1981, 1987; Burr 1999; Dunaway 1997; Lafferty 2004; and Lafferty and Bingham 2002). FWS began operating a weir in the river below Whitefish Lake to monitor whitefish in 2001.

There is continued concern by area residents in the Kuskokwim River drainage that beaver dams are impacting freshwater finfish stocks. In addition, residents of Kasigluk, Atmautluak and Nunapitchuk have expressed concerns that subsistence fishers are overexploiting the whitefish stocks in Nunavakpak Lake (near Kasigluk).

Subsistence Fishery

Gear used for harvesting subsistence freshwater finfish includes set and drift gillnets, seines, fish wheels, long lines, dip nets, jigging devices (hook and line through the ice), rod-and-reels, and pots (locally called "traps"). Subsistence harvests occur year round; and fish may be eaten fresh, dried, smoked, or frozen. Most are used for human consumption, but 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 freshwater commercial finfish fishery has targeted primarily whitefish and burbot for local markets. Some of the harvest has occurred under the ice in the winter. A permit from the Commercial Fisheries Entry Commission and a permit from the department are required to for fishery participation. The department permits stipulate that only whitefish (excluding sheefish), 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 by subsistence and sport fishers. Species caught in a commercial operation, which are prohibited for sale, may be utilized for subsistence use.

All waters of the Kuskokwim Area, excluding the Johnson River drainage and Whitefish Lake/Ophir Creek drainage southwest of Aniak, are open to the commercial harvest of freshwater finfish. Legal commercial fishing gear may be used. Gillnets may not be less than 2 ½ inches nor greater than 5 inches stretch mesh. Long lines and setlines must use hooks with a gap between the point and shank larger than ¾ of an inch. Freshwater finfish taken incidentally during the open commercial salmon fishery may be sold.

Fishing effort has ranged from no participation to 14 fishers in a single year since 1977. In 2004, no commercial landings were made (Appendix A13).

HERRING

The remoteness of the Kuskokwim Area herring fishing Districts present challenges in assessing abundance, implementing fisheries, and monitoring escapements toward 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 factors affecting survey quality are additionally recorded. Test fishing with variable mesh gill nets and sampling commercial landings have been conducted as funding has allowed to determine age, size and sexual maturity of herring and to estimate occurrence and relative abundance of other schooling fish. When possible, the department coordinates test fishing by volunteer fishers providing samples to commercial roe technicians to determine roe quality toward achievement of highest roe percentage and corresponding value possible from the fisheries (Tables 21–27; Appendix E1–E4).

SECTION II. MAJOR FISHERIES OVERVIEW

SALMON

BACKGROUND AND HISTORICAL PERSPECTIVE

Kuskokwim River and Kuskokwim Bay salmon fisheries compose the Kuskokwim Area salmon fisheries. The immense size of the Kuskokwim drainage 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 (Appendix A2). 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 more timely 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 two 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 Board 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 Board in January 2001 (Burkey et al. 2000a; Ward et al. 2003) and amended in January 2004 (Bergstrom and Whitmore 2004).

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. Since 1990, there has been no directed Chinook salmon commercial fishery in District 5. Regulations do provide for subsistence fishing closures prior to, during and after commercial fishing periods.

Kuskokwim River (District 1 and 2) and Goodnews River (District 5) Chinook salmon are harvested primarily for subsistence use (Figure 1; Appendix B1, D1). Directed Chinook salmon commercial fishing in the Kuskokwim River was discontinued in 1987 by regulation. A primary management strategy for District 5 (Goodnews Bay) since 1990 has been to initiate the commercial fishing season after the majority of Chinook salmon pass into the river. Chinook salmon in the Kuskokwim River and in District 5 are harvested incidentally in the commercial salmon fishery during late June and July. The only directed Chinook salmon fishery in the Kuskokwim Area is in District 4; targeting Chinook salmon bound for the Kanektok and Arolik Rivers (Appendix C1). 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.

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 A3). An appeal was made by Kuskokwim area residents prior to and during the 2000 to 2002 seasons to undertake conservation measures for Chinook and chum salmon in subsistence and sport fisheries. This appeal was made through news releases issued by ADF&G, USFWS, AVCP, KNA, Working Group, Kwethluk Indian Reorganization Act Tribal Council, MNVC, and ONC during 2000 and 2001. During 2002, ADF&G did not participate in the appeal, as the action was considered to be allocative in nature requiring Board authority (Appendix A3).

In 2002, salmon returns to the Kuskokwim River began to rebound and were substantially improved during the 2003 and 2004 seasons. 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 (JTC 2005).

Subsistence Fishery

The Kuskokwim Area has long supported an important subsistence salmon fishery. 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 region annually harvest salmon for subsistence use (Tables 2–5; Appendix A4, A7, and A14). 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). Division of Subsistence studies in the region 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). 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 (Figure 7).

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, B1–B4, C1–C4, and D1–D4). Subsistence salmon fishing season is open unless the subsistence fishing schedule closure is in effect as a result of the Kuskokwim River Salmon Rebuilding Management Plan, or if closures to the fishery are implemented by emergency order prior to, during and after commercial fishing periods (5 AAC 07.360 and 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. Rod and reel subsistence fishing has only been allowed in the Kuskokwim Area since 2001. Initially it was restricted in the Association of Village Council Presidents Region of the Kuskokwim Area prior to 2000, when use was expanded to this area. 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.

Lower river fishers generally recognize the need for the subsistence fishing schedule to spread their harvest across the run to allow fish to pass up river for use by other fishers and to meet spawning ground escapement goals. In general, middle and upper river fishers are in strong support of the subsistence-fishing schedule as they see the benefit of fish passing through the lower river fishery becoming available to them. Many lower river subsistence users also participate in the commercial fishery. Opportunity to commercial fish may allow them income to afford to participate in subsistence activities. Middle and upper river fishers do not have the

same opportunity to commercial fish and generally do not support the incidental harvest of Chinook salmon that occurs when a commercial fishery is prosecuted in the lower Kuskokwim River fishery. Not all fishers approve of the subsistence fishing schedule and they report that the subsistence fishing closures breaks the rhythm of their subsistence harvest and disrupts fish camp activities.

Commercial Fishery

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 (Appendix A3).

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 (Appendix A7). 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. Since 1985 commercial fishing regulations have limited gill net length to 50 fathoms, mesh size to 6 inches, and depth to 45 meshes for all districts in the Kuskokwim Area (Appendix A3).

The Kuskokwim Area commercial fishery was stable from 1985 to 1996 with the harvest ranging from 975,000 to 1.25 million salmon (Appendix A8–A12). Effort ranged from 724 to 813 permits fished (Appendix A11). During these years, the value of the fishery ranged from \$2.9 in 1996 to \$12.5 in 1988. Beginning in 1996, prices began to decline. This was followed by a decline in effort and number of fish harvested. Poor salmon returns from 1997 through 2001 resulted in the Kuskokwim River having only one commercial fishery opening during 1999 and 2000 and no commercial openings in 2001 (Appendix B8, B9). There was no market for Kuskokwim River chum salmon during the 2002 and 2003 seasons. Low prices and poor salmon returns in 2002 resulted in a record low participation of 407 permits fished and a fishery value of \$323,000. The number of permits fishing increased to 438 in 2003 and 467 in 2004. Value of the fishery began a rebound in 2003 to \$900,000 and increasing further in 2004 to \$1.5 million. Kuskokwim Area fishers owned 96% of the 765 commercial permits renewed in 2004 while non-local Alaskan residents owned just over 4% or 23 permits. Non-Alaskan residents owned 5 permits (Appendix A8).

Kuskokwim River coho salmon commercial fishing in recent years has accounted for the largest number of salmon harvested of greatest value. Following coho salmon in decreasing number are sockeye, chum and Chinook salmon. In Kuskokwim Bay commercial fisheries, harvest of coho

salmon exceeds harvest of sockeye salmon in number, but value of the sockeye salmon harvest exceeds the value of coho salmon. Similar numbers of chum and Chinook salmon are harvested in Kuskokwim Bay fisheries; however, the value of Chinook salmon harvested is approximately five times greater. Pink salmon are the least valuable species in Kuskokwim Area commercial fishery and have not been purchased by Area fish buyers in recent years (Table 6).

Sport Fisheries

Historically, sport-fishing effort within the Kuskokwim Area rarely exceeded 10,000 angler days of effort (Lafferty 2004; Burr 2004). In general about 75% of the sport anglers are guided and 70% are non-residents. The majority of sport salmon fishing effort and harvest occurs within the Kuskokwim Bay streams, particularly the Kanektok and Goodnews Rivers. Over 75% of the sport fishing within the Kuskokwim River occurs in tributaries downstream of and including the Aniak River.

STOCK STATUS

Chinook Salmon

Kuskokwim River Chinook salmon stock is considered the second most abundant in Alaska. Although total return estimates are unavailable (largely due to the inability to thoroughly estimate spawning escapement), it is estimated that the collective annual Chinook salmon return to the Kuskokwim River is between 200,000 to 300,000 fish.

Total utilization of Chinook salmon (all harvests combined) in the Kuskokwim River drainage has ranged from 24,856 to 140,389 fish since 1960 (Appendix B1). Recent 5-year average total utilization (2000–2004) was 73,538 fish; harvest ranged from 65,500 to approximately 84,000 fish. Prior 10-year average harvest (1990–1999) was 107,800 fish; harvest ranged from 87,200 to 140,400 fish. Reduction in average harvest between the recent 5 (2000–2004) and the previous 10-year average (1990–1999) was 34,262.

Chinook salmon escapements are evaluated by aerial surveys in portions of at least 13 drainages of the Kuskokwim River, by weirs on six tributary streams, and by a radio telemetry mark–recapture program during the last two seasons (Appendix B12–B16, B18). Review of escapement information indicates Chinook salmon escapements from 1998 through 2000 were below average and escapements for most other years were average or better. Weather conditions precluded aerial survey evaluation of Chinook salmon escapements in many streams during 1998 and 1999 (Appendix B18). The existing sustainable escapement goal for Kogruklu River weir was met in 2002, 2003, 2004 and nearly met in 2001 (Appendix A6, B15). The radio telemetry mark–recapture program estimate of Chinook salmon passage upstream of the confluence of the Kuskokwim River with the Aniak River was approximately 146,839 fish (Appendix B16).

Kuskokwim River parent years (1992–1995 escapements) of the poor runs from 1998 to 2000 were not over harvested and it is likely that they did not contribute to the poor runs. Parent year escapements of the poor salmon returns (1998–2000) were average to above average. Recent poor runs did not result from poor parent year escapement, but were likely a result of poor ocean conditions. Poor wild stock runs have occurred through time throughout Western Alaska and Pacific Rim countries.

Significant runs of Chinook salmon return the Kanektok, Goodnews and Arolik rivers annually. The Kanektok River Chinook salmon run is believed to range in size from 30,000 to 60,000 fish

with returns in some years of up to 100,000 fish. The Goodnews River Chinook salmon run is believed to range from 10,000 to 20,000 fish. Less information is available on the Arolik River Chinook salmon run, however, the run is believed to be smaller than the return to the Goodnews River.

Total utilization of Chinook salmon (all harvests combined) in the Kuskokwim Bay River drainages (Kanektok, Goodnews and Arolik rivers) ranged from 278 to 65,652 fish since 1960 (Appendix C1, D1). Recent 5-year average total utilization (2000–2004) was 24,084 fish; harvest ranged from 16,794 to approximately 30,556 fish. Prior 10-year average harvest (1990–1999) was 28,633 fish; harvest ranged from 15,344 to 45,915 fish. Reduction in average harvest between the recent 5-year average (1999–2003) and the previous 10-year average (1989–1998) was 4,549.

Escapement of Chinook salmon to the Kanektok River weir in 2004 was 19,405 fish with a corresponding aerial survey count of 28,375 on 01 August (Table 17; Appendix C9 and C10). Evaluation of Kanektok River aerial survey information indicates that Chinook salmon returns have been average in recent years. The aerial survey escapement goal was achieved in 2004 and in four of five Kanektok River surveys since 1995. Escapement goals have not been set for the Kanektok River weir because of the relative infancy of the project. Escapement of Chinook salmon to the Middle Fork Goodnews River weir in 2004 was 4,266 with corresponding aerial survey counts of 2,617 for the Middle Fork and 7,462 for the Main Stem Goodnews River (Table 18; Appendix D10, D11). The weir count did achieve the escapement goal while the two aerial surveys achieved their respective goals. Chinook salmon escapements to the Goodnews River drainage have been average to above average in recent years with aerial survey escapement goals being achieved in 4 of 7 years on the Main Stem and 5 of 6 years on the Middle fork Goodnews River since 1995. Although Chinook salmon have only achieved the Middle Fork Goodnews River weir escapement goal in 3 years since 1995, the overall trend in escapement since the mid-1990s has been above average compared to historical data. In total the Kuskokwim Bay Chinook salmon returns from 1997 through 2001 did not indicate the decline in abundance experienced in Kuskokwim River.

Chum Salmon

Kuskokwim River chum salmon are the largest salmon stock in the Kuskokwim Area. The total run is believed to range in size from 1 to 1.5 million fish annually. Total utilization of chum salmon in the Kuskokwim River drainage since 1960 has ranged from 46,137 to 1,538,734 fish (Appendix B2). Recent 5-year average total utilization (2000–2004) was 64,997 fish; harvest ranged from 47,850 to 81,461 fish. Previous 10-year average harvest (1990–1999) was 343,141 fish; harvest ranged from 67,349 to 691,479 fish. Reduction in average harvests between the recent 5 (2000–2004) and the previous 10-year average (1990–1999) was 278,143.

Chum salmon escapements were evaluated through enumeration at weirs on six tributary streams and sonar in the Aniak River (Table 11–16 and 19; Appendix B11–B17). Review of escapement information indicates chum salmon escapements from 1999 through 2001 were below average. During other recent years, escapements were average or better. Aniak River sustainable escapement goal was met from 2001 through 2004 (Appendix A6). Kogrukluk River sustainable escapement goal was met in 2001 and 2002. The 2003 chum salmon estimated abundance estimate upstream of Kalskag, based on findings from the mark and recapture project was approximately 507,800 fish.

Significant runs of chum salmon return to the Kanektok, Goodnews and Arolik rivers annually. The Kanektok chum salmon run is believed to range in size from 100,000 to 170,000 fish. The Goodnews chum salmon run is believed to range from 60,000 to 160,000 fish. Less information is available regarding the Arolik River chum salmon run, however, the run is believed to be smaller than the return to the Goodnews River.

Total utilization of chum salmon in the Kuskokwim Bay drainage since 1960 has ranged from 707 to 102,348 fish (Appendix C2, D2). Recent 5-year average total utilization (2000–2004) was 33,236 fish; harvest ranged from 21,658 to approximately 39,522 fish. Previous 10-year average harvest (1990–1999) was 73,937 fish; harvest ranged from 51,143 to 102,348 fish. Reduction in average harvests between the recent 5 (2000–2004) and the previous 10-year average (1990–1999) was 21,204.

Escapement of chum salmon to the Kanektok River weir in 2004 was 46,194 (Tables 17, 20; Appendix C9 and C10). Evaluation of Kanektok River aerial survey information suggests that chum salmon returns have been below average in recent years and the chum salmon aerial survey escapement goal has not been achieved since the goal was set in 1993. However, the inherent deficiencies in evaluating chum salmon escapement from single aerial surveys and the lack of consistent annual surveys in recent years complicate this assessment. Additionally, District 4 chum salmon commercial harvest peaked in 1997 and has declined sharply through 2004, but this is likely a function of the declining chum salmon market and reduced effort as opposed to declining chum salmon abundance in the Kanektok River. Chum salmon escapement to the Kanektok River weir was similar between 2003 and 2004 at approximately 40,000 fish, but escapement goals have not been set for the Kanektok River weir because of the relative infancy of the project.

Escapement of chum salmon to the Middle Fork Goodnews River weir in 2004 was 29,991 (Tables 18 and 20; Appendix D10 and D11). The weir count achieved the escapement goal. Chum salmon escapements at the Middle Fork Goodnews River weir have been average to above average in recent years and every year except 2000 has achieved the escapement goal since 1994. Aerial survey escapement goals have not been achieved on the Main Stem since 1985 and only once on the Middle Fork Goodnews River since 1988. The discrepancy between weir and aerial survey results can be attributed to the inherent deficiencies in evaluating chum salmon escapement from single aerial surveys and the lack of consistent annual surveys in recent years. Overall Kuskokwim Bay chum salmon returns from 1997 through 2001 did not indicate the decline in abundance experienced in the Kuskokwim River.

Sockeye Salmon

Sockeye salmon are generally enumerated in low numbers by established Kuskokwim River escapement projects. Total utilization of sockeye salmon in the Kuskokwim River drainage since 1989 has ranged from 29,196 to 161,968 fish (Appendix B3). Prior to 1989, subsistence harvest surveys combined sockeye and chum salmon harvests; therefore the total utilization of sockeye salmon is unknown prior to 1989. Recent 5-year average total utilization (2000–2004) was 40,978 fish; harvest ranged from 29,196 to 50,890 fish. Previous 10-year average harvest (1990–1999) was 98,269 fish; harvest ranged from 62,509 to 162,000 fish. Reduction in average harvests between the recent 5 (2000–2004) and the previous 10-year average (1990–1999) was 57,292.

Sockeye salmon escapements are evaluated through enumeration at weirs on six tributary streams and, during the last two seasons, by a mainstem mark-recapture project located near

Upper Kalskag (Table 11–16; Appendix B12–B16). Sockeye salmon escapements are monitored at all weir sites. The sockeye salmon estimated abundance upstream of Kalskag based on the finding of the mark and recapture project during 2004 was approximately 90,500 fish. Escapements during 2003 were at historic high levels. It is believed the majority of Kuskokwim River sockeye salmon spawn and rear in Telaquana Lake in the Stony River drainage.

Significant runs of sockeye salmon return to the Kanektok and Goodnews rivers annually. The Kanektok sockeye salmon run is believed to range in size from 100,000 to 160,000 fish annually. The Goodnews sockeye salmon run is believed to range from 100,000 to 200,000 fish annually.

Total utilization of sockeye salmon in the Kuskokwim Bay drainages since 1989 has ranged from 29,196 to 161,968 fish (Appendix C3, D3). Prior to 1989, subsistence harvest surveys combined sockeye and chum salmon harvests; therefore the total utilization of sockeye salmon is unknown prior to 1989. Recent 5-year average total utilization (2000–2004) was 63,866 fish; harvest ranged from 25,724 to 108,190 fish. Previous 10-year average harvest (1990–1999) was 104,894 fish; harvest ranged from 67,885 to 143,957 fish. Reduction in average harvests between the recent 5 (2000–2004) and the previous 10-year average (1990–1999) was 41,027.

Escapement of sockeye salmon at the Kanektok River weir in 2004 was 102,434 with a corresponding aerial survey count of 28,375 on 01 August (Tables 17, 20; Appendix C9, C10). Evaluation of Kanektok River aerial survey information indicates that sockeye salmon returns have been average in recent years. The aerial survey escapement goal was achieved in 2004 and in five of six Kanektok River surveys since 1995. Escapement goals have not been set for the Kanektok River weir because of the relative infancy of the project.

Escapement of Sockeye salmon to the Middle Fork Goodnews River weir in 2004 was 52,760 fish with corresponding aerial survey counts of 33,670 for the Middle Fork and 31,695 for the Main Stem Goodnews River on 02 August (Tables 18 and 20; Appendix D10 and D11). The weir count and aerial surveys achieved their respective escapement goals. Sockeye salmon escapements to the Goodnews River drainage have been average in recent years. Although sockeye salmon escapement goals were not achieved at the Middle Fork Goodnews River weir in 2001 and 2002, weir escapement goals were achieved every year prior to 2001 (since 1990). Aerial survey escapement goals were achieved in 1 of 6 years on the Main Stem and 5 of 6 years on the Middle fork Goodnews River since 1992. It is unclear why such a discrepancy exists between aerial survey results, however, the trend in weir escapement since 1990 correlate well with the trend in Middle Fork Goodnews aerial surveys. The overall trend in Goodnews River drainage sockeye abundance based on total run estimates indicates high and low decadal fluctuations in abundance (Appendix D5).

Coho Salmon

Kuskokwim River coho salmon is the second largest stock in the Kuskokwim Area. The total run is believed to range in size from 500,000 to 1.5 million fish annually. Total utilization of coho salmon in the Kuskokwim River drainage since 1989 has ranged from approximately 50,800 to 973,463 fish (Appendix B4). Recent 5-year average total utilization (2000–2004) was 290,155 fish; harvest ranged from 123,941 to 476,799 fish. Previous 10-year average harvest (1990–1999) was 695,277 fish; harvest ranged from 50,807 to 973,463 fish. Reduction in average harvests between the recent 5 (2000–2004) and the previous 10-year average (1990–1999) was 290,155.

Coho salmon escapements are evaluated through enumeration at weirs on six tributary streams and, during the last two seasons, by a mainstem mark-recapture project near Upper Kalskag (Tables 11–16; Appendix B12–16). Coho escapements are monitored at all weir sites. The coho salmon estimated abundance upstream of Kalskag, based on the finding of the mark and recapture project during 2003, was approximately 850,000 fish. Escapements during the 2003 season were at historic high levels. Coho salmon escapements were below average in only 2 recent years, 1999 and 2000.

Significant runs of coho salmon return to the Kanektok, Goodnews and Arolik rivers annually. The Kanektok chum salmon run is believed to range in size from 100,000 to 170,000 fish. The Goodnews chum salmon run is believed to range from 60,000 to 160,000 fish. Less information is available regarding the Arolik River chum salmon run, however, the run is believed to be smaller than the return to the Goodnews River.

Total utilization of coho salmon in the Kuskokwim Bay drainage since 1960 has ranged from 379 to 205,222 fish (Appendix C4, D4). Recent 5-year average total utilization (2000–2004) was 54,450 fish; harvest ranged from 36,261 to approximately 99,627 fish. Previous 10-year average harvest (1990–1999) was 91,001 fish; harvest ranged from 39,581 to 165,714 fish. Reduction in average harvests between the recent 5 (2000–2004) and the previous 10-year average (1990–1999) was 36,552.

Escapement of coho salmon to the Kanektok River weir in 2004 was 85,922 which was approximately 10,000 more than the previous high escapement of 72,448 in 2003. (Table 17; Appendix C9). No aerial survey was conducted for coho salmon on the Kanektok River in 2003. Available information indicates average Kanektok River coho salmon abundance in recent years; however, evaluating Kanektok River coho salmon escapement is complicated by the lack of consistent aerial surveys and the relative infancy of the weir project and resultant lack of a coho salmon escapement goal. Poor survey conditions characteristic of late fall in the Kuskokwim Area have resulted in only seven aerial surveys conducted since 1981 with only 2 years achieving the escapement goal in 1981 and 1985 (Appendix C10).

Escapement of coho salmon to the Middle Fork Goodnews River weir in 2004 was 43,744 fish, which is the second highest escapement since coho salmon enumeration was incorporated into the project in 1997 (Table 18; Appendix D10). No coho salmon aerial surveys were conducted on the Goodnews River in 2004. No escapement goals have been established for Goodnews River coho salmon, which complicates abundance assessment, however, the available information indicates coho salmon escapements to the Goodnews River drainage have been above average in recent years with an overall trend of increasing weir escapements since 1997. Similar to the Kanektok River, poor survey conditions in late fall have resulted in only two coho salmon aerial surveys conducted on the main stem Goodnews River in 1984 and 1987 and no surveys have been conducted on the Middle Fork (Appendix D11). Additional weir escapement data in coming years will improve assessment of Goodnews River coho salmon abundance and may result in the establishment of coho salmon escapement goals for the Middle Fork Goodnews River weir.

RECENT BOARD OF FISHERIES ACTIVITIES

At the January 2004 Board meeting the board accepted the Department's recommendation to continue the classification of yield concern for Kuskokwim River Chinook and chum salmon as described by the Sustainable Salmon Policy and initially established during the September 2000

Board meeting. This determination was made because the identified surplus of Chinook and chum salmon available for commercial harvest from 1999 to 2001 (3 of the last 5 years) was below expected levels. Therefore, it was determined there has been a chronic inability to maintain near average yields despite specific management actions taken annually (Bergstrom and Whitmore 2004).

The Kuskokwim River Salmon Rebuilding Management Plan was amended during the January 2004 meeting (Appendix A3). Language in the plan was modified to provide explicit instructions for relaxing the subsistence fishing schedule when it is determined that Chinook and chum salmon escapement goals will be achieved and opportunity is provided for fishers to achieve amounts necessary for subsistence. Specifically, the language does not require a commercial fishery to be initiated as a requirement for providing 7 days per week subsistence fishing. Additionally, the plan was modified to provide a guideline harvest for sockeye salmon of 0–50,000 fish, rather than describing the commercial harvest of sockeye salmon to be incidental to a directed chum salmon fishery. The subsistence salmon fishing regulations were also modified to provide more subsistence fishing opportunity around commercial fishing periods. The section of the lawful gear regulations applying to subsistence fishing was repealed. The northern district boundary of District 4 Quinhagak was moved from Oyak Creek back to the northernmost edge of Weelung Creek to the location it was prior to the 2001 Board meeting (Figure 4). Seaward boundaries of District 5 Goodnews Bay were moved from the northern most tip of South Spit and southern most tip of North Spit to a line connecting points approximately 2 miles north and south of the bay entrance (Figure 5). Additionally, 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.

In an October 2004 Board Work Session, the Board addressed three agenda change requests for the Kuskokwim Area all dealing with the duration of the subsistence fishing schedule. The Board stated the department could use emergency order authority to address the objectives of the requests; therefore, the Board did not take up any of the Agenda Change Requests. In response to the direction provided by the Board the 2004 Kuskokwim Area Salmon Outlook and Management Strategy explains that it is anticipated that the subsistence-fishing schedule will only be in effect during the first 3 weeks of June during the 2004 season.

RECENT FEDERAL SUBSISTENCE BOARD ACTIONS

The FSB took action during their annual board meeting to remove the red color requirement for kegs or buoys used in the Kuskokwim River subsistence fishery. Fishers may use kegs or buoys of any color on any permitted gear in the Kuskokwim Area. During April 2004, the FSB held a public meeting considering extraterritorial jurisdiction in the Alaska Peninsula/Aleutian Islands commercial salmon fisheries in response to several petitions from fishers in western Alaska, including Kuskokwim Area residents. The FSB determined that criteria were not met to extend extraterritorial jurisdiction. During RAC and FSB meetings regarding Kuskokwim Area fisheries, issues were discussed at length, however, no regulatory action was implemented.

2004 SEASON OUTLOOK AND MANAGEMENT STRATEGY

The department expected the 2004 Chinook, chum, and sockeye salmon runs to be similar to the 2003 salmon runs or slightly stronger. In 2003, Chinook and chum salmon run sizes provided

for adequate escapements and subsistence harvests throughout most of the drainage. Salmon runs during the 2004 season were expected to be large enough to achieve escapement goals and amounts reasonably necessary for subsistence with a harvestable surplus available for fisheries other than subsistence (Whitmore et al. 2005).

As directed by the Kuskokwim River Salmon Rebuilding Management Plan, the Kuskokwim River commercial fishery can only be conducted in June and July if it is determined that escapement goals and amounts reasonably necessary for subsistence would be achieved. It was not anticipated that there would be chum or sockeye salmon directed fishing in late June or July since there appeared to be no market for chum salmon and no processors had expressed interest in buying salmon during that time frame. A directed coho salmon fishery was anticipated in late July and August. It was anticipated that the commercial harvestable surplus of salmon would range from 5,000 to 15,000 Chinook salmon, 150,000 to 300,000 chum salmon, 20,000 to 40,000 sockeye salmon and 200,000 to 600,000 coho salmon.

It was anticipated that the District 4 Quinhagak fishery would be managed according to the District 4 Management Plan and that the commercial harvestable surplus of salmon would be approximately 14,000–20,000 Chinook salmon, 30,000–50,000 sockeye salmon, 20,000–40,000 chum salmon and 30,000 to 60,000 coho salmon. It was anticipated that the District 5 commercial salmon fishery would be initiated in late June after the majority of the Chinook salmon moved through the district with an anticipated harvest of 1,000–2,000 Chinook salmon, 30,000–50,000 sockeye salmon, 5,000–10,000 chum salmon and 20,000–40,000 coho salmon.

RECENT FISHERY PERFORMANCE

The 2004 Kuskokwim River salmon fisheries were managed according to the Kuskokwim River Salmon Rebuilding Management Plan with Chinook and chum salmon stocks identified as stocks of yield concern and the subsistence salmon fishery schedule put into effect on June 6. Kuskokwim Bay salmon fisheries were managed according to their associated management plans and regulations.

Amounts of salmon reasonably necessary for subsistence were achieved throughout all drainages of the Area. Subsistence fishers were generally satisfied with subsistence fishing opportunity, however, not all fishers were satisfied with the subsistence fishing schedule.

A total of 688,000 salmon were commercially harvested from the Kuskokwim Area (Table 6). A total of 467 permit holders participated in the fishery with the exvessel value estimated at \$1,482,800 (Appendix A10 and A11).

Kuskokwim River

The purpose of the Kuskokwim River Salmon Rebuilding Management Plan is to provide guidelines for the rebuilding and management of the Kuskokwim River salmon fishery that will result in the sustained yield of salmon stocks large enough to meet escapement goals, subsistence and for fisheries other than subsistence. The subsistence-fishing schedule was implemented according to the Kuskokwim River Salmon Rebuilding Management Plan being put into effect June 6 downstream of Bogus Creek and June 13 downstream of Chuathbaluk. The subsistence-fishing schedule was rescinded on June 20, when it was scheduled to go into effect for the entire drainage. Therefore, there were 6 days in which subsistence fishing was restricted downstream of Bogus Creek and 3 days in which subsistence fishing was restricted between Bogus Creek and Chuathbaluk. There was no subsistence fishing restrictions upstream of Chuathbaluk. During

the time period the Wednesday-Saturday fishing schedule was in effect it allowed passage of Chinook and chum salmon during the subsistence fishery closures, provided the necessary opportunity for fishers to achieve amounts necessary of Chinook and chum salmon for their subsistence use, spread the subsistence harvest out across the run and moved fish through the lower river giving those fishers in the upper river greater opportunity to meet their subsistence needs.

The Kuskokwim River Salmon Management Working Group met 18 times during 2004, twice prior to the season, 15 times during the season and post season (Table 28). Fishery management information discussed during the season included reports from members, state and federal staff, native organizations, fishery partners, and people to be heard. Information discussed included subsistence harvest reports by species; test fish project summaries, and as fish began reaching clear water tributaries, reports from weir, sonar and aerial survey programs. In summary, from the beginning of the season there was a good showing of Chinook and chum salmon, which allowed going off the subsistence fishing schedule on June 20. Sockeye and chum salmon arrived in good numbers with early to average run timing.

Kuskokwim River District 1 includes all waters from the southern most tip of Eek Island upstream to Bogus Creek. Subdistrict 1-A includes that portion of District 1 upstream from Bethel and Subdistrict 1-B includes that portion of District 1 downstream of Bethel.

The Department and the Kuskokwim River Salmon Management Working Group remained in consensus in conducting management of the fishery. The commercial fishery was conducted in two components. Initially four commercial fishing periods occurred between June 30 to July 7 harvesting Chinook, chum and sockeye salmon. There were two periods in Subdistrict 1-A and two periods in Subdistrict 1-B. The second component of the fishery was initiated July 28 directed at coho salmon with the coho fishery continuing through September 8 during which 22 commercial fishing periods occurred (Table 29). Announcement of these fishing periods was established bi-weekly or weekly following Working Group meetings at which time processor capacity was verified. Coho salmon run strength allowed Subdistrict 1-A openings to be conducted on Mondays and Thursdays and Subdistrict 1-B openings to be conducted on Tuesdays and Friday's through August 20. District 1 fishing periods (Subdistrict 1-A and 1-B) were conducted three times per week during the week of August 23 and August 30 and only two periods were conducted during the week of September 7 when the season ended. A total of two companies purchased fish during the entire season (Table 30). A single tender was on the grounds.

Subsistence fishing was allowed during the commercial fishing season, with the exception of 6 hours prior to, during and 3 hours after commercial fishing periods within the Subdistrict open to commercial fishing and a buffer zone of the adjacent Subdistrict. During Subdistrict 1-A opening the buffer zone in 1-B closed to subsistence fishing extended downstream from Subdistrict 1-A to a line between Oscarville to Napaskiak Slough. During Subdistrict 1-B openings the buffer zone closed to subsistence fishing in Subdistrict 1-A extended upstream from Subdistrict 1-B to a line at the upper end of Straight Slough perpendicular across the Kuskokwim River. During District 1 openings subsistence fishing was closed in all waters of District 1 6 hours prior to, during and 3 hours after commercial fishing periods.

A total of 390 individual permit holders recorded landings during the 2004 season (Appendix B6). This level of fishing effort was 28% below the recent 10-year average of 539

fishers. The 2004 salmon harvest by species, with the exception of coho salmon, was below the recent 10-year average (Appendix B1–B4). The harvest of coho salmon was 25% greater than the recent 10-year average. The Chinook, chum, sockeye and coho salmon harvest was 2,300, 20,429, 9,748 and 433,809 fish, respectively. The total value of the fishery to fishers was \$942,566, 82% of the recent 10-year average value.

Chinook salmon escapements are evaluated by weirs on six tributary streams, by aerial surveys of up to 13 index streams, and by the recent addition of radio telemetry programs (Tables 11–16; Appendix B12–B16, B18). The 2004 Chinook salmon escapements ranged from above average to record highs at all monitored locations, with the exception of the Salmon River (Pitka Fork drainage) where the escapement was average. The improved escapements in 2004 were consistent with the general trend of increasing Chinook salmon abundance in the Kuskokwim River since the low abundance years of 1998, 1999 and 2000. Chinook salmon escapements since 2001 have been within or above escapement goal ranges, as per the revised ranges recommended prior to the 2004 season.

Chum salmon escapements are evaluated through enumeration at weirs on six tributary streams, sonar in the Aniak River, and the recent addition of a mainstem mark and recapture project near Upper Kalskag (Tables 11–16 and 19, Appendix B11–B17). Formal escapement goals exist for the KogrukluK and Aniak Rivers, and these goals were revised as ranges prior to the 2004 season. The 2004 chum escapements were average to above average, with the exception of the Takotna River where escapement was second lowest out of 7 years of monitoring. Escapements were within or above the escapement goal ranges for the KogrukluK and Aniak Rivers in 2004. Chum escapements were exceptionally low in 1999 and 2000, and nearly all chum salmon escapements observed since that time has been above those years.

Coho salmon escapements are evaluated by weirs on six tributary streams (Tables 11–16; Appendix B12–B16), and a formal escapement goal exists for KogrukluK River, which was revised as a range prior to the 2004 season. Coho escapements were above average at all monitored locations in 2004, with the exception of Takotna River where the escapement was second lowest in the 5 years of monitoring. Escapement at KogrukluK River was within the formal escapement goal range in 2004. Coho abundance in the Kuskokwim River was extremely low in the late 1990s, but has generally improved since that time with record highs occurring at all monitored locations in 2003.

Sockeye escapements are monitored at all six of the rivers with weir projects, but sockeye are not a prominent species in any of these rivers. Among these locations, KogrukluK and Kwethluk Rivers have the largest sockeye escapements, and passage in 2004 was below average at KogrukluK River, but above average at Kwethluk River.

Kuskokwim Bay

District 4 Quinhagak

District 4 is made up of the marine waters along the Kuskokwim Bay coast from Weelung Creek south to the southern mouth of the Arolik River. The northern boundary of District 4 was extended approximately 3 miles in 2004 from Oyak Creek to Weelung Creek. District 4 is managed according to the District 4 Management Plan. The fishery commenced June 15 with 12 hour fishing periods established on Tuesdays and Thursdays. Chinook salmon catches were

below average and catch rates were above average for the first two commercial openings. This trend remained constant through early July (Appendix C8).

In response to an increase in sockeye salmon abundance, 12 hour fishing periods were established on a Monday, Wednesday, Friday fishing schedule beginning July 5. Sockeye salmon catches were average to above average, and catch rates were above average through the first 2 weeks in July. The fishery was closed from July 17 to August 1 as fish abundance was declining and there was no market for the fish. A coho salmon directed fishery occurred from August 2 until August 27 on a Monday, Wednesday, Friday fishing schedule with 12-hour fishing periods. Coho salmon catches and catch rates were above average for the majority of the fishery. Chum salmon catch was below average for the majority of the season.

District 4 harvests in 2004 were 25,465 Chinook, 34,627 sockeye, 25,820 chum, and 82,398 coho salmon (Appendix C5). Fishing effort in 2004 was similar to the increased effort seen in 2003, but remained well below the high effort seen from the mid-1980s through the mid-1990s. Chinook and coho salmon harvests were above the recent 10-year averages and sockeye and chum salmon harvests were below the recent 10-year averages. Total value of the fishery was estimated at \$404,986, which is 84% of the recent 10-year average value. This represents the highest value of the District 4 commercial fishery since 2000. A single fish processor operated in District 4. As a result of limited processing capacity, the buyer imposed a 2,000 lb limit per fisher during the first week in July.

Preliminary salmon escapement counts at Kanektok River weir were 19,406 Chinook salmon, 102,443 sockeye salmon, 87,827 coho salmon, and 46,194 chum salmon (Table 17). No escapement goals have been established yet based on the weir counts. An aerial survey for Chinook and sockeye salmon was flown over the Kanektok River drainage on August 1. A total of 28,375 Chinook salmon and 78,380 sockeye salmon were observed. This represents the highest Chinook salmon aerial survey count on record. The Chinook salmon aerial survey escapement goal range of 3,500–8,000 fish was exceeded as was the sockeye salmon escapement goal range of 14,000–34,000 fish.

District 5 Goodnews Bay

District 5 is made up of waters within and adjacent to Goodnews Bay. There is no management plan that directs the fishery, however, the primary fishery strategy since 1990 has been to delay the commercial opening until late June to afford Chinook salmon escapement into the Goodnews River drainage and provide opportunity to harvest amounts reasonably necessary for subsistence. The western boundary of District 5 was extended in 2004 to a line between points approximately 2 miles along the outside shoreline of the north and south spits at the entrance to Goodnews Bay.

The District 5 commercial fishery was opened Thursday, June 24 on a Tuesday, Thursday schedule. In response to increasing sockeye salmon abundance a Monday, Wednesday, Friday fishing schedule was established on July 5 and maintained through July 19. All fishing periods were 12 hours in duration (Table 9; Appendix D6). Sockeye salmon harvests were average at the beginning of the season then fell below average in the first week of July while catch rates remained above average throughout. The fishery was closed from July 17 to August 1 as fish abundance was low and there was no market for the fish.

The fishery was reopened August 2 on a Monday, Wednesday, Friday schedule of 12 hour fishing periods. Coho salmon catches were below average through the second week of August,

and then catches were above average through the last commercial opening on August 27 (Appendix D6). Coho salmon catch rates were above average throughout August. There is no Chinook or chum salmon directed fishery in the district. Chinook and chum salmon catches ranged from average to below average for the entire season.

District 5 commercial harvest in 2004 was 2,565 Chinook salmon, 20,922 sockeye salmon, 6,014 chum salmon, and 23,690 coho salmon (Table 9). Fishing effort in 2004 was similar to 2003, but remained well below the high effort seen from the mid-1980s through the mid-1990s. Chinook and coho salmon harvests were above the recent 10-year averages and sockeye and chum salmon harvests were below the recent 10-year averages. Total value of the fishery was estimated at \$135,246 which is 68% of the recent 10-year average value and similar to the fishery value in 2003 (Appendix D8).

A single fish processor operated in District 5. As a result of limited processing capacity, the buyer imposed a 2,000 lb limit per fisher during the first week in July. The processor was unable to get a tender to the district during the commercial fishing period scheduled on August 13. No landings were reported during this period.

Preliminary salmon escapement counts at the Middle Fork Goodnews River weir were 4,244 Chinook, 53,532 sockeye, 47,916 coho, and 30,422 chum salmon (Table 18). Chinook salmon escapement achieved the upper end of the 2,000–4,500 escapement goal range and sockeye salmon escapement achieved the upper end of the 23,000–58,000 escapement goal range. Chum and coho salmon escapement exceeded their escapement goal thresholds of greater than 12,000 fish for each species.

Aerial surveys for Chinook and sockeye salmon were flown over the Goodnews River drainage on July 31. A total of 2,617 Chinook and 33,670 sockeye salmon were observed on the Middle Fork Goodnews River and 7,462 Chinook and 31,695 sockeye salmon were observed on the mainstem Goodnews River. For the mainstem Goodnews River, the upper end of Chinook salmon aerial survey escapement goal range of 640–3,300 was exceeded as was the sockeye salmon aerial survey escapement goal range of 5,500–19,500. Aerial Survey escapement goals were discontinued for the Middle Fork Goodnews River in 2004.

POSTSEASON SUBSISTENCE HARVEST SURVEYS

Postseason subsistence salmon harvest estimates are made by community and fishing area (Tables 2–5). The 2004 subsistence salmon harvest estimates for the Kuskokwim Area were 85,086 Chinook, 55,575 chum, 34,892 sockeye and 39,406 coho for 214,959 salmon. Subsistence harvests of all salmon species fell within or surpassed amounts reasonably necessary for subsistence use ranges set under 5 AAC 01.286 (Appendix A4). Lower Kuskokwim Area communities accounted for 74% of the 2004 subsistence salmon harvests in the Kuskokwim area and 78% of the entire Chinook subsistence catch. Residents of Bethel accounted for 30% of the Kuskokwim Area subsistence harvests and 32% and 38% of all subsistence caught Chinook and coho salmon respectively (Simon et al. 2007).

Subsistence salmon harvests in the Kuskokwim area in 2004 varied from previous years. The 2004 Chinook salmon estimated subsistence harvest was increased from 2003 and the recent 5 and 10-year averages, and 2% above the 1989–2003 average (Appendix B01). The 2004 chum salmon subsistence harvest estimate was below the recent 5 and 10-year averages and 41% below the 1989–2002 average. The 2003 sockeye salmon harvest estimate was 13% and 9%

below recent 5 and 10-year averages but 33% higher than the 2002 subsistence harvest. Coho salmon subsistence harvests were 24% and 16% higher than recent 5 and 10-year averages and nearly equal to the 1989–2002 average.

Kuskokwim area subsistence salmon harvest demographics vary between regions (i.e., South Kuskokwim Bay, Lower, Middle, and Upper Kuskokwim) year to year. Chinook salmon harvest estimates in the South Kuskokwim Bay communities increased 39% while Lower Kuskokwim communities showed a 3% increase in estimated Chinook subsistence from 2002. Although Bay and Lower Kuskokwim River communities showed increased Chinook salmon harvests, Middle and Upper Kuskokwim communities experienced decreases of 11% and 25%, respectively, from 2002. The 2003 chum salmon subsistence harvests were down for North and South Kuskokwim Bay by 51% and 42% while Lower, Middle, and Upper Kuskokwim communities saw chum salmon subsistence harvest decreases of 37, 32, and 41% from 2002. Sockeye salmon subsistence harvests were much improved from 2002. The South Kuskokwim Bay, Lower, Middle, and Upper Kuskokwim areas saw increases of 20% (Middle) to 36% (Lower). Coho salmon subsistence harvest estimates in the Kuskokwim area were the most improved compared to recent years. South Kuskokwim Bay communities saw subsistence harvest increases of roughly two and a half times that of 2002 while the Lower, Middle, and Upper Kuskokwim area communities saw increases of 8% (Upper) to 36% (Middle) (ADF&G 2004).

INSEASON SUBSISTENCE CATCH MONITORING

Lower Kuskokwim River Inseason Subsistence Catch Monitoring Reports

During the 2004 season, inseason subsistence catch monitoring occurred in the lower Kuskokwim River from June to August. ONC staff conducted inseason subsistence catch monitoring surveys from May 31 to August 21. Each week between 31 to 58 individual fishing families were interviewed regarding their subsistence fishing activities for the week. A total of 520 interviews were conducted in 2004 and 12 weekly summaries were prepared and presented at Working Group meetings (Martz and Whitmore 2005).

The most intense fishing activity, in the Bethel area, occurred during June, as this is the period of greatest Chinook salmon abundance. In June, 150 individual families were interviewed. During this period, 32% to 90% of families interviewed each week reported fishing. By the end of June, Chinook salmon fishing was described as very good in 69% of the interviews, normal by 29%, and poor by 2% of the interviewed fishing families. Chum salmon fishing was described as very good in 45% of the interviews while 55% of the interviews had reports of fishing as normal. There were no reports of poor chum salmon fishing by interviewed fishing families. In June, 15% of interviewed fishing families described sockeye salmon fishing as very good, 79% of the interviews had reports that fishing for sockeye salmon was normal, and 6% reported sockeye salmon fishing as poor. All interviewed fishing families in June reported using gillnets. Drift gillnet gear was reported used in 96% of interviews conducted with individual fishing families in June, while set gillnet gear use was reported by 16% of interviewed fishers. Gillnets with mesh size greater than 6 inches are primarily utilized to target Chinook salmon; 77% of interviewed fishers used gillnets with this mesh size during the month of June. During a June 18 Working Group meeting, a decision was reached to go to 7 days per week subsistence fishing beginning June 20 (Whitmore and Martz 2005). An important source of information used by the Working Group was the most recent inseason harvest report from June 14 (Table 10) where 73% of the

individual fishing families interviewed described Chinook fishing as very good and 22% as normal.

Participation in the subsistence fishery by interviewed fishing families declined in July after the majority of the Chinook salmon run had migrated past the lower Kuskokwim River area. During this period, fisher participation ranged from 15% to 50% of families interviewed each week. Chinook salmon fishing was described as very good by 7% of reporting fishers and normal by 80%. There were no reports of Chinook salmon fishing being poor. Chum salmon fishing was described as very good in 43% of the interviews and normal in 44% of interviews. There were no reports of chum salmon fishing being poor, and there were no reports during the month of July that sockeye salmon fishing was good. Of interviewed fishers, 56% described sockeye fishing as normal while 32% described it as poor. Drift gillnets were used in July by 71% of the fishers interviewed, while 7% and 21% of those interviewed reported subsistence fishing with set gillnets and rod and reel gear, respectively. Approximately 79% of the interviewed fishers reported using gillnets with 6-inch or less mesh size suggesting that most were targeting chum and sockeye salmon.

Fishing participation by interviewed families was low during the August interviews as fish were abundant and easy to catch. Coho salmon fishing was reported to be good by 93% of participating fishers with 7% of the interviewed fishers reporting coho salmon fishing as normal. Drift gillnets were used by 70% of the interviewed fishers and rod and reel gear by 30%. One family reported using a set gillnets and all reports on mesh size were for the use of mesh size 6 inches or less.

Survey summaries were presented at each Working Group meeting in 2004. Whitmore and Martz (2005) documented the Working Group's inclusion of this information in their discussions and recommendations. Of particular note was the action on June 18 from Whitmore and Martz (2005):

“During the June 18 meeting, a consensus was reached to liberalize the Kuskokwim River subsistence fishing schedule and go to a 7-day per week subsistence fishing schedule. It was noted that the BTF index for Chinook salmon was the highest on record and reports from the inseason subsistence monitoring program indicated that Chinook salmon catches were good and chum salmon catches were average for this time of year.”

The majority of families interviewed during 2004 inseason subsistence surveys in the Bethel area indicated that Chinook, chum, and sockeye salmon fishing were at least normal or very good. The majority ($\geq 60\%$) of interviewed fishers for each of the 4 years of the survey reported Chinook salmon fishing as ‘Very Good’ for the first 2 to 3 weeks of the survey. The percentage of interviewed families still fishing was greater than 50% (with the exception of 2002) for the first 4 weeks of the survey each year, suggesting that interviewed fishers near Bethel are targeting the majority of the Chinook salmon run (Appendix B10). Consistent with this, Bethel test fish postseason catch numbers have estimated that 50% of the Chinook salmon run had passed Bethel during the 17 to 23 of June in the years 2001 to 2004 (Bue 2005), after which catch numbers have dropped as well as participation in the subsistence salmon fishery near Bethel by interviewed families. The average passage date for Chinook salmon in the Bethel test fishery from 1984 to 2004 was estimated to occur on June 21 (Bue 2005).

Chum, sockeye, and coho subsistence fishing descriptions from the inseason subsistence survey are difficult to compare between years because the number of interviewed families fishing vary from week to week, between years. Chum salmon fishing in the 2004 season was similar to the 2002 season by responses from interviewed fishing families (Appendix B10) and Bethel test fish cumulative catch per unit effort comparisons (Bue and Martz 2006). Comparing descriptions of sockeye salmon fishing for the same years indicates that sockeye salmon fishing during 2004 was better than the 2002 season (Appendix B10).

TEST FISH

The first Chinook salmon of the 2004 season was caught in the Bethel test fishery on June 1. The 2004 cumulative daily CPUE index for Chinook salmon was the highest in the history of the project surpassing the previous record high year of 2003 (Bue and Martz 2006). Based on the cumulative index, the central 50% of the run passed the test-fish site between June 14 and June 27 with 50% of the passage occurring on June 21 (Bue and Martz 2006). The Chinook salmon run timing was average based on historical data. The 2004 cumulative daily CPUE index for Chinook salmon was well above the contemporary years with similar water levels of 1998, 2000, 2002 and 2003 (Bue and Martz 2006). Additionally the cumulative daily CPUE index was well above all years when the Kogruklu River Chinook salmon escapement goal of 10,000 fish was not achieved (Bue and Martz 2006).

The first sockeye salmon of the 2004 season was caught in the test fishery on June 9. The 2004 cumulative daily CPUE index was above all historical years. Based on the cumulative daily CPUE index, the central 50% of the sockeye salmon run passed the test-fish site between June 23 and July 5 with 50% of the passage occurring on June 27 which was average based on historical run timing data. The 2004, cumulative daily CPUE index for sockeye salmon was well above the more recent years with similar water levels of 1998, 2000, 2002 and 2003 Bue and Martz 2006).

The first chum salmon of the 2004 season was caught in the test fishery on June 2. The 2004 chum salmon cumulative daily CPUE index was above all historic years except 1996 and 2002. Based on the cumulative daily CPUE index, the central 50% of the chum salmon run passed the test-fish site between June 25 and July 11 with 50% of the passage occurring on June 30 about 4 days earlier than the historical mean peak passage date of July 4. The 2004 cumulative daily CPUE index for chum salmon was above the more recent years with similar water levels of 1998, 1999, 2000, 2001, and 2003 but below the 2002 index. With the exception of 1987, the 2004 cumulative index was above all years when the chum salmon escapement goals of 30,000 fish and 250,000 fish were not achieved at the Kogruklu River weir and Aniak River sonar projects, respectively (Bue and Martz 2006).

The first coho salmon of the 2004 season was caught in the test fishery on July 6 and catches continued through the project termination date of August 29. The 2004 coho salmon cumulative daily CPUE index exceeded all historical years. Based on the cumulative daily CPUE indices the central 50% of the run passed the test-fish site between August 1 and August 15 with 50% of the passage occurring by August 8. The cumulative daily CPUE index was above all years when the coho salmon escapement of 25,000 fish was not achieved at the Kogruklu River weir (Bue and Martz 2006).

WEIRS

Kwethluk River Weir

The 2004 Kwethluk River salmon escapements included 27,129 Chinook, 3,302 sockeye, 37,109 chum, and 64,143 coho salmon during the 25 June through 10 September operational period (Appendix B12; Roettiger et al. 2004). Currently no escapement goals have been established for the project; however, the 2004 Chinook and sockeye salmon runs ranked the highest and chum and coho salmon escapements ranked second highest among the 5 years annual escapements were determined.

Tuluksak River Weir

The 2004 Tuluksak River salmon escapements included 1,479 Chinook, 11,794 chum and 20,336 coho salmon during the 20 June through 10 September operational period (Table 12; Appendix B13; Zabkar et al. 2005). Currently no escapement goals have been established for the project; however, among the 7 years for which annual escapements were determined, the 2004 Chinook and coho salmon escapements ranked third while chum salmon escapements were fourth.

George River Weir

The 2004 George River salmon escapements included 5,335 Chinook, 13,170 chum and 12,522 coho salmon during the 15 June through 18 September operational period (Table 13; Appendix B14; Stewart et al. 2005). Currently no escapement goals have been established for the river; however, the 2004 Chinook, chum, and coho salmon escapement were the third highest of 6 years of annual escapement records.

Kogrukluk River Weir

The 2004 Kogrukluk River salmon escapements included 19,503 Chinook, 6,671 sockeye, 24,179 chum and 24,718 coho salmon during the 21 June through 18 September operational period (Table 14; Appendix B15; Sheldon et al. 2005). The sustainable escapement goal (SEG) ranges of 5,300–14,000 Chinook salmon, 15,000–49,000 chum salmon, and 13,000–28,000 coho salmon were achieved. The 2004 Chinook salmon escapement was the second highest on record for the Kogrukluk River weir, behind only 1995 when 20,630 Chinook salmon were enumerated. Escapement goals were revised in 2004 into SEG ranges (ADF&G 2004). Previous escapement goals were based on historic average passage coupled with some subjective weighting determined by Area biologists in the early 1980s (Burkey et al. 2000b; Buklis 1993). Sockeye are considered incidental at the site and currently do not have an escapement goal range.

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 B16; Stewart and Molyneaux 2005).

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 B16; Costello et al. 2005). 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 June 29 through September 19, 2004. Salmon escapement at the weir was 19,405 Chinook, 102,434 sockeye, 46,194 chum, 85,922 coho, and 98,060 pink salmon (Table 17; Appendix C9; Linderman 2005a). Because of the location of the weir (approximately mile 40), 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. Thus, escapement counts of Chinook, sockeye, and chum salmon may not reflect the total number of spawners in the drainage.

Middle Fork Goodnews River Weir

Chinook, sockeye, chum and coho salmon passage as monitored through the Middle Fork Goodnews River weir were 2,389, 44,390, 21,637 and 52,810 fish, respectively (Table 18; Appendix D11; Linderman 2005b). Sockeye and chum salmon escapements exceeded their respective escapement goals of 25,000 and 15,000 fish, respectively. The Chinook salmon escapement goal of 3,500 fish was not achieved.

Aniak River Sonar

In 2004, total estimated fish passage at the Aniak River sonar site was 672,880 fish, during the 26 June through 31 July operational period (Table 19; Appendix B 17; McEwen 2005). This was the first full field season that DIDSON sonar was operational; it is estimated that there is a 20% increase from previous BioSonics counts as individual fish are more easily counted (Sandal and Pfisterer 2006). In 2004, the Aniak River escapement goal was revised as an SEG range of 210,000 to 370,000 fish.

AERIAL SURVEYS

Lower Kuskokwim River

Kuskokwim River Chinook salmon aerial survey escapement goals were reviewed and revised to SEGs in 2004 (ADF&G 2004). The revised Chinook salmon aerial survey SEGs for lower Kuskokwim River tributaries are presented as ranges of 580 to 1,800 on the Kwethluk River and 400 to 1,200 on the Kisaralik River. Chinook salmon aerial survey counts in 2004 were 6,801 fish on the Kwethluk River on July 31, 6,913 fish on the Kisaralik River on 29 July, and 1,196 fish on the Tuluksak River on 24 July (Table 20; Appendix B18). Chinook salmon have been within or in excess of the revised SEG ranges on 10 of 13 (76.9%) acceptable Kwethluk River surveys since 1960 and 13 of 15 (86.6%) acceptable Kisaralik River surveys since 1960. Five of 10 (50.0%) acceptable Tuluksak River surveys were above the 1977 through 1994 median count

of 280 Chinook salmon. No chum or coho salmon aerial surveys were flown on any lower Kuskokwim River streams in 2004.

An additional lower Kuskokwim River stream surveyed for Chinook salmon in 2004 was the Eek River with a count of 4,653 fish on 30 July (Table 20; Appendix B18). Eek River has been surveyed for Chinook salmon 10 times since 1980 with a median count of 1,312 from 1975 through 1994. Paired data sets between weir and aerial survey counts were achieved on Kwethluk and Tuluksak Rivers in 2004.

Middle Kuskokwim River

The revised Chinook salmon aerial survey SEGs for middle Kuskokwim River tributaries are presented as ranges of 1,200 to 2,300 fish on the Aniak River, 330 to 1,200 fish on the Salmon River of the Aniak, and 970 to 2,100 fish on the upper Holitna River (ADF&G 2004). Chinook salmon aerial survey counts in 2004 were 5,569 fish on the Aniak River between 25 and 27 July, 2,177 fish on the Salmon River of the Aniak between 27 and 28 July, and 4,842 fish on the upper Holitna River on 23 July (Table 20; Appendix B18). Chinook salmon have been within or in excess of the revised SEG ranges on 15 of 20 (75.0%) acceptable Aniak River surveys since 1960, 18 of 24 (75.0%) acceptable Salmon River of the Aniak surveys since 1959, and 10 of 13 (76.9%) acceptable upper Holitna River surveys since 1976. No chum or coho salmon aerial surveys were flown on any middle Kuskokwim River streams in 2004.

Additional middle Kuskokwim River streams surveyed for Chinook salmon in 2004 were Kipchuk River of the Aniak with a count of 1,868 fish on 28 July, Holokuk River with a count of 539 fish on 23 July, Oskowalik River with a count of 293 fish on 23 July, George River with a count of 838 fish on 24 July, Shotgun Creek with a count of 1,817 fish on 23 July, and Kogrukuk River with a count of 7,252 fish on 23 July (Table 20; Appendix B18). Kipchuk River has been surveyed for Chinook salmon 19 times since 1960 with a median count of 778 from 1975 through 1994. Holokuk River has been surveyed for Chinook salmon 18 times since 1977 with a median count of 82 from 1975 through 1994. Oskowalik River has been surveyed for Chinook salmon 12 times since 1987 with a median count of 103 from 1975 through 1994. Paired data sets between weir and aerial survey counts were achieved on the George and Kogrukuk Rivers in 2004.

Upper Kuskokwim River

The revised Chinook salmon aerial survey SEGs for upper Kuskokwim River tributaries are presented as ranges of 470 to 1,600 fish on the Salmon River of the Pitka Fork, and two aerial survey SEGs were established in 2004 at 340 to 1,300 fish on the Cheeneetnu River and 300 to 830 fish on the Gagarayah River (ADF&G 2004). Chinook salmon aerial survey counts in 2004 were 1,138 fish on the Salmon River of the Pitka Fork on 20 July, 918 fish on the Cheeneetnu River on 22 July, and 670 fish on the Gagarayah River on 22 July (Table 20; Appendix B18). Chinook salmon have been within or in excess of the revised or established SEG ranges on 17 of 20 (85.0%) acceptable surveys on the Salmon River of the Pitka Fork since 1977, 11 of 13 (84.6%) acceptable surveys on the Cheeneetnu River since 1968, and 10 of 13 (76.9%) acceptable surveys on the Gagarayah River since 1968. No chum or coho salmon aerial surveys were flown on any upper Kuskokwim River streams in 2004.

Additional upper Kuskokwim River streams surveyed for Chinook salmon in 2004 were Fourth of July Creek on the Takotna River with a count of 73 fish on 21 July, Bear Creek with a count

of 206 fish on 22 July, and the upper Pitka Fork with a count of 290 fish on 19 July (Table 20; Appendix B18). Bear Creek was initially surveyed as part of exploratory aerial survey work done in the late 1990s and efforts are being made to survey this and other upper Kuskokwim River streams for Chinook salmon on a consistent yearly basis.

Kuskokwim Bay

Kanektok River aerial survey escapement goals were reviewed and revised to SEGs in 2004 (ADF&G 2004). The revised aerial survey SEGs are presented as ranges or thresholds of 3,500 to 8,000 Chinook salmon, 14,000 to 34,000 sockeye salmon, greater than 5,200 chum salmon, and 7,700 to 36,000 coho salmon. Aerial survey counts in 2004 were 28,375 Chinook salmon and 78,380 sockeye salmon on 1 August (Table 20; Appendix C10). Chinook salmon have been within or in excess of the revised SEG range on 20 of 24 (83.3%) acceptable surveys since 1966. Sockeye salmon have been within or in excess of the revised SEG range on 18 of 24 (75.0%) acceptable surveys flown since 1968. Chum salmon aerial surveys have been discontinued because their protracted run timing requires multiple surveys throughout their runs to ensure accuracy of the index. Aerial surveys for coho salmon have been sporadic because of the difficulties in conducting aerial surveys in late September. Most of the Chinook salmon observed were centered above and below the weir, approximately 15 mi in each direction. The majority of sockeye salmon were observed in feeder tributaries draining into Kagati and Pegati Lakes. Lake tributaries should be observed on a consistent annual basis to ensure the majority of observable sockeye salmon are counted during aerial surveys (Linderman 2005a).

Goodnews River aerial survey escapement goals were reviewed and revised to SEGs in 2004 (ADF&G 2004). The revised North Fork Goodnews River aerial survey SEGs are presented as ranges or thresholds of 640 to 3,300 Chinook salmon and 5,500 to 19,500 sockeye salmon (Appendix A6). Aerial Survey escapement goals for North Fork Goodnews River chum and coho salmon, and Middle Fork Goodnews River Chinook, sockeye, chum, and coho salmon were discontinued in 2004 because of poor chum and coho salmon data quality and in deference to Middle Fork Goodnews River weir based escapement goals for all four species. North Fork and Middle Fork Goodnews River aerial surveys are still conducted annually to assess North Fork Chinook and sockeye salmon escapements and for use in estimating Goodnews River Chinook, sockeye, and coho salmon drainage escapement and exploitation rates. In 2004, Goodnews River drainage aerial surveys were flown on 31 July. North Fork Goodnews River aerial survey counts were 7,462 Chinook and 31,695 sockeye salmon (Table 20; Appendix D11). Middle Fork Goodnews River aerial survey counts were 2,617 Chinook and 33,670 sockeye salmon. No coho salmon aerial surveys were flown on the Goodnews River drainage in 2004 because of poor survey conditions in late September. In the North Fork Goodnews River since 1980, Chinook salmon have been within or in excess of the revised SEG range on 15 of 18 (83.3%) acceptable surveys and sockeye salmon have been within or in excess of the revised SEG range on 13 of 17 (76.4%) acceptable surveys. Aerial surveys of coho salmon in the Goodnews River drainage have been sporadic because of the difficulties in conducting aerial surveys in late September (Linderman 2005b).

MARK-RECAPTURE

Fish wheels and drift gillnets were used to capture, tag and recapture sockeye, chum and coho salmon (Pawluk et al. 2006). Salmon were tagged at Lower Kalskag with uniquely numbered spaghetti tags while a secondary mark was used to assess tag loss. At the Lower Kalskag site,

1,885 sockeye, 5,276 chum, and 2,971 coho salmon were tagged. At the Aniak site, a total of 1,052 sockeye, 18,083 chum, and 10,544 coho salmon were inspected for tags or secondary marks, and of those 108 sockeye, 632 chum, and 81 coho salmon were recaptured. Abundance of coho salmon was estimated in 2004 representing salmon upstream from Lower Kalskag (approximately 249 river km (rkm)) on the Kuskokwim River using a two-part mark recapture experiment. Coho salmon abundance was estimated at 386,743 (95% CI=303,995; 469,492 SE=42,806) using the Darroch estimator (Appendix B16).

Tags were recovered or observed at six escapement projects located upstream and downstream of the tagging sites. A total of 52 sockeye salmon, 78 chum salmon, and 115 coho salmon with tags were observed upstream of the tag sites and 8 sockeye salmon, 19 chum salmon, and 3 coho salmon with tags were observed downstream of the tag sites. Cumulative percentages for tagged sockeye, chum, and coho salmon recovered at escapement projects above the tagging sites indicate that fish tagged earlier traveled further upstream than fish tagged later in the season. Travel speed of tagged sockeye, chum, and coho salmon recovered at upstream escapement projects were progressively faster for fish traveling further upstream.

RADIO TELEMETRY

Kuskokwim River Chinook Radio Telemetry

A radio telemetry study was conducted in 2004 to estimate the total passage of Chinook salmon in the mainstem Kuskokwim River, upstream of Kalskag at river mile 192 (Figure 1; Appendix A2). Estimated passage of Chinook salmon in the Kuskokwim River upstream from the confluence with the Aniak River, is 146,839 (SE=21,980) (Stuby 2005). By comparison, the 2003 estimate for Chinook salmon for the Kuskokwim River upstream of its confluence with the Aniak River was 103,161 (SE=18,720) (Stuby 2004). Aniak River was excluded due to suspected sampling bias. ADF&G Division of Sport Fish operated the project with assistance from Kuskokwim Native Association. Details of the study will be reported by the ADF&G Division of Sport Fish in the Fishery Data Series.

Holitna Radio Telemetry

For the third consecutive year and the final season of the study, a radio telemetry study was conducted to estimate the escapement of Chinook and chum salmon in the Holitna River drainage, which joins Kuskokwim River at river mile 335 (Figure 1; Stroka and Reed 2005). Estimated abundance of Chinook salmon in the Holitna River drainage for 2004 was 81,961 (SE=11,722). In 2003, there was an estimated 42,013 Chinook salmon in the Holitna River drainage (SE=4,981) (Stroka and Brase 2004). By comparison, the estimated abundance of Chinook salmon in the Holitna River drainage for 2001 and 2002 was 22,405 (SE=6,207) and 42,902 (SE=6,334), respectively (Wuttig and Evenson 2002; Chythlook and Evenson 2003).

BIOLOGICAL SAMPLING

Kuskokwim Area salmon were sampled from subsistence catch, commercial catch, and escapement monitoring programs during the 2004 season. Age-sex-length (ASL) composition estimates were produced following procedures described in DuBois and Molyneaux (2000). Results are summarized in this report to show 2004 age and sex composition estimates and general trends in salmon age and sex composition over time (Appendix B19–B25, C11–C18, and D12–D19).

PACIFIC HERRING

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 fishers were contacted in each surveyed village. No subsistence herring surveys have been conducted in 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 (Pete 1992; 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. Initially fisheries were managed through open seasons and guideline harvest levels. In 1980 emergency order authority was established to open and close fisheries. Guideline harvest levels were established not to exceed 20% of estimated herring biomass and gillnet length was established at 100 fathoms. Spawn on kelp fisheries were prohibited in 1978 before fisheries were established.

In 1985, commercial herring fishing was initiated in Nelson and Nunivak Island Districts with gillnets up to 100 fathoms in length and fishery openings and closures established by emergency order. Minimum threshold herring abundance was established before implementation of the fishery with a guideline harvest level set at 10% of estimated abundance. Beginning in 1985, mechanical shakers were eliminated in Nelson and Nunivak Island fisheries, vessel length was limited to 30 feet, and a combined super exclusive use area for the two districts was established. The commercial guideline harvest level was increased from 10% to a maximum of 15% of estimated biomass. The Nelson Island and Nunivak Island herring fisheries were designated limited entry status in 1987. A moratorium on new entry to the Goodnews Bay fishery started in 1997. In December 1997, the Alaska Board of Fisheries approved a proposal that raised the Nelson Island harvest level to 20% of the available biomass minus 200 tons allocated for subsistence use. Regulations went into effect beginning in the 2001 season for a cooperative purse seine fishery in Nunivak Island District.

In 1988, the Cape Avinof 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 super exclusive use designation was established. The guideline harvest level was established not to exceed 15% of estimated biomass.

During the January 2004 Board meeting, the super exclusive use area registration for the Goodnews Bay herring fishery was repealed.

The Goodnews Bay District will become a limited-entry fishery and there is a moratorium on new permits. As of March 2001, 169 limited entry permits have been issued; another 21 are awaiting final determination. In 2004, the number of permits that could be issued is expected to be around 190. This will eventually be cut back to a total of 182 limited entry herring permits (Appendix E2).

Implementation of the super exclusive use designation with vessel length restrictions and prohibition of mechanical shakers was in response to requests from fishers living in communities adjacent to the fisheries. These fishers 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 fishers to only participate in one herring fishery.

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 fishers harvested 1,400 tons 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 fishers harvesting an average of 2,200 tons of herring with an average value of \$1.33 million during 1985 to 1989. During the 1990 and 1991 seasons, fisher 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 fishers harvested over 5,000 tons 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 2004 season, during which 72 fishers harvested 922 tons of herring valued at \$180,000 (Appendix E3).

RECENT BOARD OF FISHERIES ACTIVITIES

During the January 2004 Board meeting, the super exclusive area registration for Goodnews Bay district was repealed.

2004 OUTLOOK AND MANAGEMENT STRATEGY

Total 2004 guideline harvest level for the Kuskokwim Area was expected to be approximately 5,800 tons. Preseason projected potential allowable harvest by district was 1,900 tons in Security Cove District, 1,500 tons in Goodnews Bay District, 500 tons in Cape Avinoff District, 800 tons in Nelson Island District and 900 tons in Nunivak Island District. Total herring biomass on the Kuskokwim herring fishery grounds during 2004 was expected to be approximately 30,600 tons.

RECENT FISHERY PERFORMANCE

The 2004 Kuskokwim Bay commercial herring sac roe fishery season began with commercial openings in the Goodnews Bay and Cape Avinof Districts on May 13 (Table 21). The season closed on May 27 with the last commercial opening in the Nelson Island District. Sac roe herring was harvested commercially in three of the five districts. A total of 922 tons of sac roe herring with an overall recoverable roe percentage of 10.6% was harvested (Table 22). The overall recoverable roe content by district ranged from 8.9% in the Goodnews Bay District to 10.9% in the Nelson Island District. Estimated exploitation rates in the individual districts

ranged from less than 1% in the Goodnews Bay District to 16.2% in the Nelson Island District (Appendix E4). Exvessel values ranged from \$3,600 in Goodnews Bay District to \$165,300 in Nelson Island District. Exvessel value for the entire Kuskokwim Bay Area was \$179,800.

Nunivak Island District opened as a commercial herring bait fishery on May 12 and closed on June 15 (Table 22). Due to a lack of processor interest in a sac roe fishery in the district, the local Nunivak Island fisheries Coastal Development Quota group's halibut processing plant requested an opportunity to harvest up to 12 tons of herring for bait fish. The fishery remained open for 35 days; however, no commercial sales were documented.

Timing of the herring runs in the Kuskokwim Bay Area was among the earliest on record based on timing of peak biomass documentation in Security Cove and Goodnews Bay Districts. The early arrival of herring may have been the result of abnormally warm climatic conditions in southwestern Alaska during the winter of 2003–2004.

Aerial surveys were flown under acceptable to unsatisfactory conditions in Security Cove, Goodnews Bay, and Nelson Island Districts. Aerial surveys were not flown in Nunivak Island and Cape Avinof Districts as poor weather conditions did not allow for crossing Etolin Strait and contributed to unsatisfactory water clarity for viewing herring at Cape Avinof. Poor weather in the Kuskokwim Bay Area limited the number of aerial surveys flown in the Nelson Island District.

The department maintained field camps and test-fishery crews at two of the five Kuskokwim Bay districts. Department personnel collected commercial harvest data and conducted variable-mesh gillnet (VMG) test-fisheries at Goodnews Bay and Nelson Island. There were no department personnel on the grounds at Security Cove, Cape Avinof or Nunivak Island.

SECURITY COVE DISTRICT

There were no commercial openings in Security Cove District in 2004. Permit holders participating in the Security Cove fishery historically have come from Togiak District once that fishery concludes. In most recent years, the Togiak fishery typically is completed prior to the opening of the commercial fishery in Security Cove. The 2004 Togiak fishery overlapped with the peak spawning activity in the district. As a result, there was no interest expressed from buyers or fishers in prosecuting a commercial fishery.

Five aerial surveys were flown over Security Cove District (Table 23). The first survey was flown on April 28 as an observation flight to see if herring were on the grounds. Herring were observed within the district although no biomass estimate was calculated. On May 4, 12,400 tons of herring biomass and two spawns for a combined 5 miles in length were documented. Survey conditions were rated as good. On May 5, a total of 18,000 tons of herring biomass and two spawns for 7 miles in length were documented. On May 6, a total of 29,000 tons of herring biomass and four spawns for a combined length of 15 miles were documented under poor survey conditions. The increase of herring biomass from the previous survey appeared to be fish from Goodnews Bay District. Therefore, the May 5 survey with an estimated 18,000 tons of herring biomass represents the peak biomass that spawned in Security Cove District. On May 19 the fifth and final survey of the district was flown documenting 1,400 tons of herring biomass and one spawn of 3 miles in length. The herring biomass documented on May 4, May 5 and May 6 was well above the projected preseason herring spawning biomass of 9,698 tons.

GOODNEWS BAY DISTRICT

Goodnews Bay District had its first commercial opening on May 13 (Table 22). A second opening was announced on May 17. The fishery was allowed to remain open until May 21. A season total of 34 tons of sac roe herring with an overall recoverable roe content of 8.9% was harvested during 96 hours of fishing time. Although the fishery remained open for 4 consecutive days the majority of fishing occurred during the period adjacent to high water. Ten permit holders and one processor participated in the fishery. The exploitation rate was less than 1% of the preseason-projected biomass of 7,744 tons (Appendix E4). The fishery closed on May 21 when it was determined that there was insufficient biomass of marketable value present in the district.

Five aerial surveys were flown over the Goodnews Bay District (Table 26). The first survey was flown on April 28 as an observation flight to see if herring were on the grounds. There was no herring biomass documented during that survey. On May 4, a survey flown under good conditions documented 8,900 tons of herring biomass in the district. On May 5, the season peak biomass estimate of 13,500 tons of herring biomass was documented in the district. The survey condition during that flight was rated as good. On May 6, 8,700 tons of herring biomass and six spawns for a combined length of 12 miles was documented under poor survey conditions. On May 19, the fifth and final survey of the district was flown documenting 1,400 tons of herring biomass present in the district. Herring biomass documented on May 4, May 5 and May 6 was well above the projected preseason herring spawning biomass of 7,744 tons.

A total of 584 commercially caught herring were collected and sampled for AWL determination. Based on age-by-scale analysis, 99% of the fish sampled were 6 years old and older with 40% of the sample comprised of 8 year old or older fish (Table 31). Minimum to maximum ranges of lengths and weights within age class of the herring sampled is presented in Table 32 and Table 33.

A total of 910 herring captured with VMG were sampled for AWL determination (Table 31). Based on age-by-scale analysis, 83% of the fish sampled were 6 years old and older with 15% of the sample comprised of 8 year old or older fish. Minimum to maximum ranges of lengths and weights within age classes of the herring sampled is presented in Table 32 and Table 33.

CAPE AVINOF DISTRICT

Cape Avinof District opened to commercial herring fishing on May 13 and remained open until May 25 (Table 22). Twenty-three permit holders harvested 62.7 tons of sac roe herring with an overall recoverable roe content of 10.5% in 288.5 hours of fishing time. Although the fishery remained open for 12 consecutive days, the majority of fishing occurred during the time periods adjacent to high water. One processor participated in the fishery. Exploitation rate was less than 2% of the preseason projected biomass of 3,369 tons and 12% of the guideline harvest level of 505 tons (Appendix E4).

No aerial surveys of Cape Avinof District were flown. Aerial survey conditions in this district are typically classified as poor because of turbid water conditions. Estimated total returning biomass was based on the preseason projection of 3,369 tons. The corresponding preseason guideline harvest level of 505 tons was used for the season.

NELSON ISLAND DISTRICT

Nelson Island District had its first commercial opening on May 18 (Table 22). A second opening was announced on May 19 at which time the fishery was allowed to remain open until May 27.

A season total of 825.3 tons of sac roe herring with an overall recoverable roe content of 10.9% was harvested during 194.5 hours of fishing time. Although the fishery remained open for 7 consecutive days, the majority of fishing occurred during the time periods adjacent to high water. Thirty-nine permit holders and one processor participated in the fishery. Exploitation rate was 16% of the preseason projected biomass of 5,085 tons (Appendix E4). The fishery closed on May 27 when the season's harvest exceeded the guideline harvest level of 817 tons.

Aerial surveys were flown over the district on May 20 and May 26 (Table 27). Survey conditions were rated as poor to unsatisfactory. Peak observed herring biomass of 756 tons and one spawn for a length of one quarter mile was documented on May 20 under poor survey conditions. Prior to May 20 aerial surveys of the district were not possible due to unfavorable weather conditions. The management strategy for Nelson Island district is to prosecute the commercial fishery once a threshold biomass of 3,000 tons is observed. In the absence of aerial surveys, the commercial fishery was prosecuted and the guideline harvest was based on the preseason biomass estimate.

A total of 824 commercially harvested herring were sampled for AWL determination (Table 31). Based on age-by-scale analysis, 100% of the fish sampled were 6 years old and older with 82% of the sample comprised of 8 year old or older fish. Minimum to maximum ranges of lengths and weights within age class of the herring sampled is presented in Table 32 and Table 33.

A total of 900 herring captured with VMG were sampled in Nelson Island district (Table 31). Over 79% of the fish were 6 years old and older with 13% of the sample comprised of 8 year old or older fish. Minimum to maximum ranges of lengths and weights within age classes of the herring sampled is presented in Table 32 and Table 33.

ENFORCEMENT

The Division of Fish and Wildlife Protection (FWP) was present in the Goodnews Bay, Nelson Island, and Cape Avinof Districts this year. Participation was primarily through flying fishery opening and closures. No citations were issued.

SECTION III. 2005 OUTLOOK AND MANAGEMENT STRATEGY

SALMON

Management of the Kuskokwim Area salmon fisheries will follow the Kuskokwim River Salmon Rebuilding Management Plan (Rebuilding Plan) and the District 4 Salmon Management Plan. Kuskokwim Area has no formal forecast for salmon returns. Broad expectations for salmon runs are developed based on an evaluation of parent-year escapements and trends in harvest and productivity.

Kuskokwim River

The department expects the 2005 Chinook and chum salmon runs to be similar to the 2004 salmon runs. In 2004, Chinook and chum salmon run sizes provided for adequate escapements and subsistence harvests throughout most of the drainage. Salmon runs during the 2005 season are expected to be large enough to achieve escapement goals and amounts necessary for subsistence with a harvestable surplus available for fisheries other than subsistence. It is anticipated that the commercial harvestable surplus of salmon will range from 150,000 to 300,000 chum salmon, 20,000 to 50,000 sockeye salmon, 300,000 to 500,000 coho salmon, and an incidental catch of 5,000 to 20,000 Chinook salmon (Table 34). Markets and processor capacity may limit harvest particularly for chum salmon.

Kuskokwim River Management Strategy

State and federal staff will continue to follow the guidelines in the Kuskokwim River Salmon Rebuilding Management Plan. Salmon runs will be managed to achieve established escapement goals, amounts necessary for subsistence, and to allow commercial fishing on harvestable surpluses. Based on the preseason salmon run outlook it is anticipated that the subsistence-fishing schedule will only be in effect during June through June 21, after which subsistence fishing will be allowed 7 days per week. It is anticipated that chum and sockeye salmon directed commercial fishing will be limited to approximately the last week of June and the first week of July, since the chum salmon market remains weak. It is anticipated that a coho directed commercial fishery will occur from approximately late July through August. The fishery will likely be scheduled to allow commercial fishing periods in Subdistrict 1-A twice per week and in Subdistrict 1-B twice per week. The Alaska Board of Fisheries during their January 2004 meeting liberalized subsistence fishing regulations to provide subsistence fishers greater opportunity to fish during the commercial salmon fishing season. During the 2005 season, as implemented in the 2004 season, when one subdistrict is open to commercial fishing, subsistence fishing will be allowed in the majority of the other subdistrict.

Subsistence Fishery

The Kuskokwim River Salmon Rebuilding Management Plan directs that the subsistence salmon-fishing schedule provide 4 consecutive days of subsistence salmon fishing per week during June and July in the entire drainage for gillnet and fish wheel gear. Since it is anticipated

that Chinook and chum salmon runs will be large enough to achieve established escapement goals and provide amounts necessary for subsistence it is anticipated that the subsistence-fishing schedule will only be in effect through June 21. Having the subsistence fishing schedule in effect early in the run will afford protection to early run Chinook salmon that travel furthest up the drainage. If Chinook or chum salmon runs return in lower numbers than expected, it may be necessary to extend the subsistence fishing schedule through June and into July.

**ANTICIPATED 2005 JUNE SUBSISTENCE SALMON FISHING SCHEDULE
TO BE IN EFFECT THROUGH TUESDAY JUNE 21, 2005**

AREA	SCHEDULE BEGINS	SALMON FISHING CLOSED
From the mouth of the Kuskokwim River upstream to Bogus Creek (9 miles upriver of Tuluksak), tributaries included. ^a	June 5	SUNDAY, MONDAY, & TUESDAY 12:01 AM Sunday to 11:59 PM Tuesday
From Bogus Creek upstream to Chuathbaluk, tributaries included. ^a	June 12	SUNDAY, MONDAY, & TUESDAY 12:01 AM Sunday to 11:59 PM Tuesday
The Kuskokwim River drainage, including waters upstream of Chuathbaluk, tributaries included. ^a	June 19	SUNDAY, MONDAY, & TUESDAY 12:01 AM Sunday to 11:59 PM Tuesday

^a Non-salmon streams that remain open 7 days per week with any gillnet mesh size that are not affected by this schedule include the following systems 100 yards upstream from their confluence with the Kuskokwim River: the Whitefish Lake drainage near Aniak; Discovery, Birch, and Swift Creeks; and the Gweek, Johnson, Kinak, Kaliak, and Tagayarak Rivers.

In each area, subsistence fishing is open 7 days per week until the schedule begins. During closures in all Kuskokwim River salmon streams, all gillnets with mesh greater than 4 inches must be removed from the water and all fish wheels must be stopped. During subsistence salmon fishing closures, subsistence fishing for fish other than salmon will be allowed with gillnets up to 60 feet in length with mesh size of 4 inches or less.

Subsistence fishing with hook and line for any species of salmon will be allowed 7 days per week, except in that portion of the Aniak River drainage upstream of Doestock Creek. Upstream of Doestock Creek when fishing with hook and line gear from June 1 through August 31 there is a daily bag and possession limit of three salmon, only two of which can be Chinook salmon.

Commercial Fishery

As directed by the Rebuilding Plan the commercial fishery can only be conducted in June and July if it is determined that escapement goals and amounts necessary for subsistence will be achieved. As it is expected this criteria will be met, a limited chum and sockeye salmon fishery is anticipated in late June and early July similar to the 2004 season. In 2004, there were two commercial fishing periods in Subdistrict 1-A and two commercial fishing periods in Subdistrict 1-B during June 30-July 7. A directed coho salmon fishery is anticipated in late July and August.

Sport Fishery

According to the Rebuilding Plan, sport fisheries for Chinook and chum salmon are to be managed based on abundance. There is no expectation of preseason emergency orders further restricting the sport fishery since it is anticipated that Chinook and chum salmon escapement goals will be achieved. Opportunity will be provided for fishers to achieve amounts necessary for subsistence and 7 day per week subsistence fishing will occur beginning Wednesday June 22. The Kuskokwim drainage Chinook salmon sport fishing season will close by regulation July 26. Existing conservative sport fishing regulations in the Aniak River drainage remain in effect, including the annual bag limit of 2 Chinook salmon greater than 20 inches per year and no-retention of chum salmon. If necessary, further restrictions to the salmon sport fisheries will be implemented based on abundance if run strength is not as great as anticipated. If below average run performance of either Chinook or chum salmon is apparent prior to the closure, then as a conservation measure, the bag and possession limit will be reduced from 3 Chinook to 1; or 3 chum salmon to 1.

Inseason Run Strength Indicators and Research

Inseason indicators of salmon run strength include the Bethel Test Fishery, subsistence harvest reports, tributary escapement monitoring projects, and Kalskag tagging project fishwheel catch rates. Cooperative efforts have been made to survey Bethel area subsistence fishers to monitor the subsistence salmon fishery as a tool to help gauge salmon run timing and abundance. Salmon escapement will be assessed with weir projects operated in the Kwethluk, Tuluksak, George, Kogrukuk, Tatlawiksuk, and Takotna Rivers and a sonar project on the Aniak River. In addition, tagging and radio telemetry studies are planned on the main stem of the Kuskokwim River near Kalskag.

KUSKOKWIM BAY

Kuskokwim Bay Outlook

The Kuskokwim Bay area has no formal forecast for salmon returns. Broad expectations for salmon runs are developed based on an evaluation of parent-year escapements and trends in harvest and productivity. It is anticipated that the commercial harvestable surplus of salmon will range from 22,000 to 39,000 Chinook salmon; 29,000 to 50,000 chum salmon; 50,000 to 85,000 sockeye salmon and 340,000 to 604,000 coho salmon. The harvest may be affected by fishing effort, and prices. Market conditions and processor capacity may further limit harvest.

Kuskokwim Bay Management Strategy

Subsistence Fishery

Department staff will be in contact with Kuskokwim Bay subsistence fishers to assure that fishers are achieving amounts necessary for subsistence prior to initiating a commercial fishery. Subsistence fishing will be allowed 7 days per week prior to the commercial salmon season. Once the commercial fishing season begins there will be subsistence fishery closures before, during, and after commercial fishing periods. Fishers will be informed of subsistence fishing closures through radio announcement.

Commercial Fishery

The department will work closely with buyers and fishers to manage the Kuskokwim Bay commercial fisheries by timing harvests for fish quality and processor capacity to the extent feasible within biological constraints. The Alaska Board of Fisheries during their January 2004 meeting moved the northern boundary of District 4 from Oyak Creek to Weelung Creek; moved the District 5 boundaries to regulatory markers outside the entrance to Goodnews Bay and provided the department emergency order authority to increase gill net length from 50 fathoms to 100 fathoms in both districts when fish abundance warrants.

District 4 Quinhagak

The District 4 commercial fishery will be managed in accordance to the District 4 Salmon Management Plan. It is anticipated that the commercial fishing season will begin prior to July 16 with a schedule of two 12-hour periods per week. As the abundance of Chinook salmon tapers off and sockeye salmon become more available a commercial fishing schedule of three 12-hour periods per week will be initiated and continued through the coho salmon season. It is anticipated that during the last week or 10 days in July, the fishery will be closed, similar to recent years when the single buyer stopped purchasing fish.

District 5 Goodnews Bay

District 5 will be open to commercial fishing in late June to allow Chinook salmon escapements to be achieved and to provide amounts necessary for subsistence. The commercial fishing schedule will be three 12-hour periods per week from late June through September targeting sockeye and coho salmon. Fishing time may be reduced if such action is necessary to achieve salmon escapement objectives. It is anticipated that during the last week or 10 days in July the fishery will be closed, similar to recent years when the single buyer stopped purchasing fish.

Sport Fishery

Within the District 4 Salmon Management Plan, sport fisheries are managed based on abundance and commercial fishery performance. If necessary, additional inseason restrictions will be implemented in accordance with District 4 Salmon Management Plan. Sport fishing daily bag and possession limits for Chinook salmon is three per day with only two over 28 inches. The Kuskokwim Bay Chinook salmon sport-fishing season will close by regulation July 26.

Inseason Run Strength Indicators and Research

Inseason indicators of salmon run strength in the Kuskokwim Bay Districts include weir escapement projects, commercial harvest statistics, and verbal subsistence catch reports. Weirs will be operated at the Kanektok River and the Middle Fork Goodnews River to monitor salmon escapements and to gather biological data.

HERRING

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 2005 Kuskokwim Area spawning biomass will be approximately 44,201 tons. The projected harvest guidelines applying appropriate exploitation rates by district is 8,471 tons (Table 35).

MANAGEMENT OVERVIEW

Commercial fishing periods are opened by emergency order. Fishing periods will be announced in the Security Cove district during regularly scheduled broadcasts on VHF channel 8 in order not to interfere with the Togiak fishery. Fishing periods will be announced on VHF channel 7 in the Goodnews Bay, Cape Avinof, Nelson Island, and Nunivak Island districts during regularly scheduled broadcasts. The commercial fishery may be opened when observed herring biomass exceeds the district's threshold. If aerial surveys are not possible, the opening will be based on the test fishing results and the presence of herring with adequate roe quality. Buyers are required to report their deliveries as soon as possible after each opening. Additional openings will not occur until the Department receives catch reports from all buyers. The Department will ask commercial fishers to conduct test fishing and buyers to provide roe technicians for determining roe quality. If commercial fishers do not participate in the test fishery, openings may be delayed or will be based on the Department's limited test fishing. The Department thanks all the fishers who have participated in the past in this program and hope to see them again this year. Waste can occur when the processors refuse unmarketable herring with poor roe quality. Unmarketable fish can be used for subsistence. To minimize waste during commercial fishing, fishers should set a short length of gillnet for a short period of time, and check for roe quality. If roe quality is acceptable, fishers can then set all their gear. The estimated weight of discarded herring (not sold or used for subsistence) is included in the total harvest.

The Department will conduct aerial surveys as regularly as possible. Guideline harvests may be increased or decreased accordingly based on inseason aerial survey observations. If aerial surveys are not adequate due to weather or water conditions, harvest guidelines based on the preseason projection will remain unchanged.

Department technicians will be stationed in the Goodnews Bay and Nelson Island districts to sample herring caught in the commercial fishery and from the Department's variable-mesh gillnets. The herring are sampled for age, sex, length, and weight. This sampling program is extremely important for determining herring stock status and for making biomass projections. These technicians will also assist with vessel and buyer registrations, catch monitoring, news releases, and opening announcements.

The Alaska Department of Public Safety, Bureau of Wildlife Enforcement, conducts fishery enforcement. Period openings and closures are patrolled, licenses and photographic IDs required of card holders and crewmembers "spot checked", and other enforcement duties accomplished as warranted.

Concerning general regulatory provisions (5 AAC 27.888.), gillnet specifications and operation for Kuskokwim Area) set the maximum mesh size of a herring gillnet at 3.5 inches stretch measure and the minimum mesh size at 2.5 inches. No more than two gillnets with an aggregate length of 100 fathoms may be on board or operated from any commercially licensed vessel, except that no more than 50 fathoms and one gillnet may be on board or operated from any vessel attempting to take herring during periods specified by emergency order for reduced gear length. There must be a red buoy attached to one end of the gillnet, legibly marked with the permit holder's CFEC license number. There must be no writing on the buoy other than the CFEC numbers. Copies of the current regulations (2004–2005)-which include the Bering Sea Herring Management Plan-are available at all Fish and Game area offices. Selected regulations specific to each district are stated below.

Security Cove District

The 2005 preseason guideline harvest for the Security Cove District is 3,638 tons (Table 35). A minimum biomass threshold of 1,200 tons or significant spawning activity must be observed to open the fishery. The exploitation rate will be up to 20% of the available biomass. Projections from postseason escapement estimates indicate that the 2005 spawning biomass is 18,192 tons. Ages 7, 8, and 9 are expected to comprise 67% of the returning biomass (11%, 39%, and 17%, respectively). Age 9 and older herring are expected to comprise 32% of the biomass. The 2004 estimated biomass was 18,000 tons.

Goodnews Bay District

The 2005 preseason guideline harvest in the Goodnews Bay District is 2,682 tons (Table 35). To open the fishery a minimum biomass threshold of 1,200 tons or significant spawning activity must be observed. Projected 2005 spawning biomass is 13,410 tons. The exploitation rate will be up to 20% of the available biomass. Ages 7, 8, and 9 herring are expected to dominate the biomass, contributing 12%, 39%, and 18%, respectively. Age 9 and older herring are expected to comprise 34% of the biomass. The 2004 estimated biomass was 13,500 tons.

Cape Avinof District

The 2005 preseason guideline harvest in Cape Avinof District is 507 tons (Table 35). Projected total biomass is 3,377 tons. To open the fishery, a minimum herring biomass threshold of 500 tons or significant spawning activity must be observed. Exploitation rate of Cape Avinof herring stocks will be no greater than 15%. This exploitation rate was established by the Board of Fisheries at the request of local residents to protect the subsistence fishery and because the abundance of these stocks is not well known. Estimated 2005 herring age composition was calculated using a combination of the 2004 data from the Goodnews Bay and Nelson Island districts. Ages 7, 8, and 9 are expected to comprise 67% of the returning biomass (11%, 39%, and 17%, respectively). Age 9 and older herring are expected to comprise 32% of the biomass. Estimated biomass for 2004 was 3,369 tons.

Nunivak Island District

The 2005 preseason guideline harvest for Nunivak Island District is 956 tons (Table 35). Projected herring biomass returning to the district in 2005 is 4,782 tons. The biomass threshold is 1,500 tons. Exploitation rate will be up to 20% of the available biomass. Estimated 2005 herring age composition was calculated using 2004 data from Goodnews Bay and Nelson Island districts. Ages 7, 8, and 9 are expected to dominate the returning population, contributing 11%, 39%, and 17%, respectively. Age 9 and older herring are expected to comprise 32% of the biomass. Total biomass estimate in 2004 was 4,739 tons.

Nelson Island District

The 2005 preseason guideline harvest in the Nelson Island District is 688 tons (Table 35). The projected 2005 spawning biomass is 4,440 tons. In December 1997, the Board of Fisheries approved a proposal that raised the harvest level to 20% of the available biomass minus 200 tons allocated for subsistence. Therefore, the preliminary commercial exploitation rate in 2005 will be up to 16% of the estimated biomass. The biomass threshold is 3,000 tons. Ages 7, 8, and 9 are expected to dominate the returning population, contributing 10%, 40%, and 16%, respectively. Age 9 and older herring are expected to comprise 31% of the biomass. The biomass estimate in 2004 was 5,085 tons.

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TABLES AND FIGURES

Table 1.—Salmon run assessment programs, Kuskokwim Area during 2004.

Project Name	Location	Primary Objectives	Duration	Agency	Responsibility
Salmon Management	Kuskokwim Area	- develop a comprehensive plan for managing salmon stocks of the Kuskokwim Area.	All Year	ADFG/CF	all aspects
		- define goals and objectives.		ADFG/SF	all aspects
		- identify potential opportunities and concerns.		OSM	monitor regulations and inseason actions
		- recommend appropriate procedures.		KRSMWG	make recommendations
Post-season 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.	Post-season	ADFG/S	all aspects
		- Household surveys in Bethel		ONC	survey crew
		- Household surveys in Aniak.		KNA	survey crew
Age-Sex-Length 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, commercial and subsistence samples.	All Year	ADFG/CF	all aspects
				OSM	funding
Escapement Sampling	Kuskokwim Area	- sample collection for age, sex and length information about of Chinook, sockeye, chum and coho salmon from selected tributary spawning populations.	June - Sept	ADFG/CF	all aspects
				OSM	funding
Aerial Surveys	Kuskokwim Area	- index relative abundance of Chinook salmon spawning escapement in selected streams throughout the Kuskokwim Area.	July - Aug	ADFG/CF	all aspects
		- index relative abundance of sockeye salmon spawning escapement in the Kanektok and Goodnews Rivers.		NMFS	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
Chinook Genetic Sampling	Kuskokwim Area	- collect genetic baseline samples from discreet spawning populations	June - July post-season	ADFG/CF	all aspects
				USFWS	sample collection
				OSM	funding
Coho Genetic Sampling	Kuskokwim Area	- collect genetic baseline samples from discreet spawning populations	August - July post-season	USFWS	all aspects
				ADFG/CF	sample collection
				OSM	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

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Table 1.–Page 2 of 3.

Project Name	Location	Primary Objectives	Duration	Agency	Responsibility
Commercial Catch Sampling	Districts 1, 4 and 5	- determine age, sex, and length of salmon harvested in the commercial fisheries.	June - Sept	ADFG/CF	all aspects
In-Season Subsistence Harvest Monitoring	Kuskokwim River	- weekly interviews with subsistence fishers to assess adequacy and quality of harvest - collect age-sex-length samples from subsistence caught Chinook salmon to determine composition of Kuskokwim River subsistence harvest.	June- August	ADFG/S ADFG/CF ONC KNA MNVC OSM	fisher interviews Chinook ASL collection all aspects - Bethel all aspects - middle Kusko all aspects - upper Kusko funding
Kuskokwim River Mark-Recapture	RM. 179	- estimate passage of coho salmon passing Lower Kalskag -estimate stock run timing of chum , sockeye and coho salmon passing Lower Kalskag	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 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 NMFS BSFA	all aspects crew support funding funding AVCP crew

-continued-

Table 1.–Page 3 of 3.

Project Name	Location	Primary Objectives	Duration	Agency	Responsibility
George River Weir	mile 4	- estimate daily escapement of Chinook, sockeye, chum, pink, and coho salmon into the George River.	June - Sept	KNA	all aspects
	George River			ADFG/CF	all aspects
	RM. 309	- estimate age, sex and length composition of Chinook, chum, and coho salmon escapement. - collect environmental / habitat information		BSFA OSM NMFS	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	all aspects crew support
				ADFG/CF OSM	tag recovery funding
KogrukluK River Weir	mile 138	- estimate daily escapement of Chinook, sockeye, chum, and coho salmon into the KogrukluK River.	June - Sept	ADFG/CF	all aspects
	Holitna River			ONC	crew support
	Drainage RM. 335	- estimate age, sex and length composition of Chinook, chum, and coho salmon escapement		NMFS OSM	funding
Tatlawiksuk River Weir	mile 2.5	- estimate daily escapement of Chinook, sockeye, chum, pink, and coho salmon into the Tatlawiksuk River.	June - Sept	KNA	all aspects
	Tatlawiksuk River			ADFG/CF	all aspects
	RM. 383	- estimate age, sex and length composition of Chinook, chum, and coho salmon escapement. - collect environmental / habitat information		BSFA NMFS OSM	funding
Takotna River Weir	mile 53	- estimate daily escapement of Chinook, chum, and coho salmon into the Takotna River.	June - Sept	TATC	all aspects
	Takotna River			ADFG/CF	planning & supplies
	RM. 507	- estimate age, sex and length composition of Chinook, chum, and coho salmon escapement. - collect environmental / habitat information		BSFA NMFS OSM	funding
Kanektok River Weir	mile 13	- estimate daily escapement of Chinook, sockeye, chum, pink, and coho salmon into the Kanektok River.	June - Sept	NVK	all aspects
	Kanektok River			ADFG/CF	planning & supplies
	Kuskokwim Bay	- estimate age, sex and length composition of Chinook and chum salmon escapement.		OSM BSFA	funding funding
Middle Fork Goodnews River Weir	mile 5	- estimate daily escapement of Chinook, sockeye, chum, pink, and coho salmon into the Middle Fork Goodnews River.	June - Sept	ADFG/CF	all aspects
	Middle Fork			OSM	funding for
	Goodnews River	- estimate age, sex and length composition of Chinook, sockeye, chum, and coho salmon escapement			coho extension
	Kuskokwim Bay				

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

NMFS = National Marine Fisheries Service
 NVK = Native Village of Kwinhagak
 ONC = Orutsarmiut 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

Table 2.—Subsistence salmon harvest summary, Kuskokwim Area, 2004.

			Chinook		Chum		Sockeye		Coho		Total	
	Total	HH's	Reported	Est	Reported	Est	Reported	Est	Reported	Est	Reported	Est
	HH's	Contacted	Harvest	Total	Harvest	Total	Harvest	Total	Harvest	Total	Harvest	Total
Kipnuk	175	10	49	49	156	156	89	89	250	250	544	544
Kwigillingok	95	2	345	345	160	160	70	70	55	55	630	630
Kongiganak	84	37	1,105	1,478	1,184	1,587	654	876	412	551	3,355	4,492
N. KUSKOKWIM BAY	354	49	1,499	1,872	1,500	1,903	813	1,035	717	856	4,529	5,666
Tuntutuliak	82	66	2,850	3,402	1,914	2,262	1,223	1,446	1,029	1,205	7,016	8,315
Eek	81	61	2,212	2,636	495	587	393	472	633	764	3,733	4,459
Kasigluk	129	13	1,229	1,526	780	906	283	336	671	690	2,963	3,458
Nunapitchuk	109	74	3,340	4,104	3,435	4,200	1,145	1,381	344	416	8,264	10,101
Atmaultluak	63	45	1,494	1,701	1,575	1,793	766	874	492	561	4,327	4,929
Napakiak	85	58	1,888	2,060	1,594	1,746	973	1,068	1,143	1,259	5,598	6,133
Napaskiak	85	52	2,650	3,220	2,123	2,569	727	883	499	613	5,999	7,285
Oscarville	13	8	665	998	570	855	236	354	204	306	1,675	2,513
Bethel	1,874	980	16,032	27,504	7,085	12,162	6,154	10,598	8,773	15,068	38,044	65,332
Kwethluk	164	113	5,045	6,119	2,933	3,597	2,256	2,741	2,365	2,907	12,599	15,364
Akiachak	124	88	5,508	6,647	3,001	3,635	2,386	2,894	1,767	2,130	12,662	15,306
Akiak	72	51	2,675	3,653	2,444	3,211	854	1,162	896	1,236	6,869	9,262
Tuluksak	81	58	2,657	3,117	1,715	2,017	1,186	1,397	740	870	6,298	7,401
LOWER KUSKOKWIM	2,962	1,667	48,245	66,687	29,664	39,540	18,582	25,606	19,556	28,025	116,047	159,858
Lower Kalskag	67	51	1,630	1,918	1,107	1,225	593	673	266	295	3,596	4,111
Upper Kalskag	65	40	1,888	2,442	1,187	1,559	465	603	984	1,288	4,524	5,892
Aniak	139	117	2,241	2,606	2,008	2,331	745	867	1,434	1,655	6,428	7,459
Chuathbaluk	34	21	774	1,041	1,315	1,815	282	385	181	249	2,552	3,490
MIDDLE KUSKOKWIM	305	229	6,533	8,007	5,617	6,930	2,085	2,528	2,865	3,487	17,100	20,952

-continued-

Table 2.—Page 2 of 2.

	Total HH's	HH's Contacted	Chinook		Chum		Sockeye		Coho		Total	
			Reported Harvest	Est Total								
Crooked Creek	40	24	614	1,003	1,023	1,662	467	760	403	670	2,507	4,095
Red Devil	13	11	130	165	81	103	78	97	42	54	331	419
Sleetmute	30	23	530	618	740	863	518	604	279	325	2,067	2,410
Stony River	18	16	580	621	625	670	750	804	571	612	2,526	2,707
Lime Village	15	11	54	66	155	189	680	831	180	220	1,069	1,306
McGrath	131	104	427	500	218	254	144	168	924	1,079	1,713	2,001
Takotna	19	19	16	16	-	-	-	-	51	51	67	67
Nikolai	40	31	388	510	198	260	-	-	119	156	705	926
Telida	2	1	-	-	-	-	-	-	200	200	200	200
UPPER KUSKOKWIM	308	240	2,739	3,499	3,040	4,001	2,637	3,264	2,569	3,167	10,985	13,931
KUSKOKWIM RIVER	3,929	2,185	59,016	80,065	39,821	52,374	24,117	32,433	25,707	35,535	148,661	200,407
Quinhagak	147	96	3,077	3,726	924	1,112	903	1,086	986	1,209	5,890	7,133
Goodnews Bay	64	50	698	851	185	221	674	805	1,200	1,411	2,757	3,288
Platinum	16	13	96	103	33	36	144	155	191	206	464	500
S. KUSKOKWIM BAY	227	159	3,871	4,680	1,142	1,369	1,721	2,046	2,377	2,826	9,111	10,921
Mekoryuk	79	8	3	3	881	881	8	8	126	126	1,018	1,018
Newtok	79	1	-	-	-	-	-	-	-	-	-	-
Nightmute	46	1	-	-	-	-	10	10	-	-	10	10
Toksook Bay	115	70	322	327	923	938	353	359	649	661	2,247	2,285
Tununak	104	5	5	5	-	-	10	10	40	40	55	55
BERING SEA COAST	423	85	330	335	1,804	1,819	381	387	815	827	3,330	3,368
Chefornak	91	3	6	6	13	13	26	26	18	18	63	63
TOTALS	4,670	2,432	63,223	85,086	42,780	55,575	26,245	34,892	28,917	39,206	161,165	214,759

Note: Includes harvests using rod and reel and the removal of salmon from commercial harvests as well as subsistence nets. If less than 30 or 50% of households in a stratum in a community were contacted, then reported harvest is used for estimated harvest.

Table 3.—Subsistence Salmon Harvest Sampling Summary, Kuskokwim Area, 2004.

Community	Total	Calendars		Postcards			Total	Subsistence	Harvest
	HH'S	Mailed	Returned	Mailed	Returned	Surveyed	Contacts ^a	Fished ^a	Data ^b
Kipnuk	175	1	0	10	10	0	10	7	10
Kwigillingok	95	0	0	2	2	0	2	2	2
Kongiganak	84	67	2	44	0	37	37	31	37
N. KUSKOKWIM BAY	354	68	2	56	12	37	49	40	49
Tuntutuliak	82	66	12	14	0	66	66	58	66
Eek	81	60	18	1	1	58	61	51	61
Kasigluk	129	8	2	12	12	0	13	9	13
Nunapitchuk	109	79	13	5	3	69	74	59	74
Atmaultluak	63	39	3	2	2	42	45	35	44
Napakiak	85	56	6	6	1	57	58	49	58
Napaskiak	85	61	9	6	0	50	52	41	52
Oscarville	13	11	5	0	0	8	8	8	7
Bethel	1874	835	75	0	0	956	980	388	968
Kwethluk	164	124	16	13	6	105	113	90	113
Akiachak	124	100	10	1	1	87	88	78	88
Akiak	72	50	6	2	2	47	51	45	50
Tuluksak	81	64	3	2	0	57	58	49	58
LOWER KUSKOKWIM	2,962	1,553	178	64	28	1,602	1,667	960	1,652
Lower Kalskag	67	42	6	2	2	48	51	36	51
Upper Kalskag	65	37	6	21	0	39	40	35	40
Aniak	139	108	29	0	0	108	117	90	99
Chuathbaluk	34	20	1	2	1	21	21	15	21
MIDDLE KUSKOKWIM	305	207	42	25	3	216	229	176	211
Crooked Creek	40	27	3	15	0	24	24	21	24
Red Devil	13	9	2	0	0	10	11	8	11
Sleetmute	30	21	7	2	2	21	23	17	23
Stony River	18	13	0	1	0	16	16	13	15
Lime Village	15	10	0	2	0	11	11	5	11
McGrath	131	69	7	26	7	96	104	40	104
Takotna	19	6	0	0	0	19	19	8	19
Nikolai	40	23	1	15	6	25	31	19	31
Telida	2	0	0	0	0	1	1	1	1
UPPER KUSKOKWIM	308	178	20	61	15	223	240	132	239
Quinhagak	147	98	13	3	2	92	96	75	96
Goodnews Bay	64	44	13	14	1	47	50	39	50
Platinum	16	12	2	2	1	12	13	10	12
S. KUSKOKWIM BAY	227	154	28	19	4	151	159	124	158
Mekoryuk	79	22	3	7	7	0	8	8	8
Newtok	79	4	0	1	1	0	1	0	1
Nightmute	46	2	0	1	1	0	1	1	1
Toksook Bay	115	5	2	23	2	68	70	56	69
Tununak	104	5	0	5	5	0	5	3	5
Chefornak	91	1	0	3	3	0	3	3	3
BERING SEA COAST	514	39	5	40	19	68	88	71	87
TOTALS	4,670	2,199	275	265	81	2,297	2,432	1,503	2,396

^a Households directly contacted by returning a calendar or postcard or by being interviewed in a face-to-face survey.

^b Households that did not fish and those households which did fish and provided harvest numbers.

Table 4.—Subsistence salmon harvest gear types, Kuskokwim Area, 2004.

Community	Fishing HH'S ^a	Gear Types ^{ab}						Not Reported
		Setnet	Drift Net	Fish Wheel	Rod and Reel	Seine	Spear	
Kipnuk	7	1	6	0	0	0	0	0
Kwigillingok	2	2	2	0	0	0	0	0
Kongiganak	31	1	25	0	0	0	0	6
N KUSKOKWIM BAY	40	4	33	0	0	0	0	6
Tuntutuliak	58	1	45	0	0	0	0	13
Eek	51	11	30	0	8	0	0	6
Kasigluk	9	0	8	0	0	0	0	1
Nunapitchuk	59	1	45	0	0	0	0	14
Atmautluak	35	3	27	0	1	0	0	7
Napakiak	49	16	30	0	1	0	0	14
Napaskiak	41	14	27	0	5	1	0	11
Oscarville	8	3	6	0	0	0	0	0
Bethel	388	10	299	0	67	0	0	45
Kwethluk	90	28	67	0	31	0	0	12
Akiachak	78	13	71	0	12	0	0	3
Akiak	45	15	33	0	13	0	0	10
Tuluksak	49	17	35	0	21	0	0	6
LOWER KUSKOKWIM	960	132	723	0	159	1	0	142
Lower Kalskag	36	9	22	0	3	0	0	11
Upper Kalskag	35	8	24	0	7	0	0	8
Aniak	90	10	42	0	56	0	1	15
Chuathbaluk	15	3	11	0	7	0	0	1
MIDDLE KUSKOKWIM	176	30	99	0	73	0	1	35
Crooked Creek	21	8	17	0	7	0	0	3
Red Devil	8	3	2	0	2	0	0	3
Sleetmute	17	3	13	0	7	0	0	1
Stony River	13	6	3	0	8	0	0	0
Lime Village	5	5	1	0	3	0	0	0
McGrath	40	18	3	0	18	0	0	6
Takotna	8	0	0	0	8	0	0	0
Nikolai	19	10	1	1	7	0	0	3
Telida	1	1	0	0	1	0	0	0
UPPER KUSKOKWIM	132	54	40	1	61	0	0	16
Quinhagak	75	9	38	0	31	0	0	15
Goodnews Bay	39	12	20	0	18	0	0	7
Platinum	10	4	6	0	8	0	0	0
S KUSKOKWIM BAY	124	25	64	0	57	0	0	22
Mekoryuk	8	4	1	0	3	0	0	1
Newtok	0	0	0	0	0	0	0	0
Nightmute	1	0	1	0	1	0	0	0
Toksook Bay	56	8	41	0	11	0	0	11
Tununak	3	2	1	0	0	0	0	0
BERING SEA COAST	68	14	44	0	15	0	0	12
Chefornak	3	2	1	0	1	0	0	0
OTHER	3	2	1	0	1	0	0	0
TOTAL	1,503	261	1,004	1	366	1	1	233

^a Data on households which subsistence fished based upon in-person surveys, returned postcards, or returned calendars.

^b A household may use multiple gear types.

Table 5.—Subsistence salmon harvest reported retained from commercial catches, Kuskokwim Area, 2004.

Community	Households							
	Face-to-face Surveys	Commercial Fishing	Retaining Catch	Fish Retained from Commercial Catch				
				Chinook	Chum	Sockeye	Coho	Total
Kipnuk	-	-	-	-	-	-	-	-
Kwigillingok	-	-	-	-	-	-	-	-
Kongiganak	35	6	-	-	-	-	-	-
N. KUSKOKWIM BAY	35	6	-	-	-	-	-	-
Tuntutuliak	66	24	8	10	-	3	51	64
Eek	51	23	5	13	33	5	17	68
Kasigluk	-	-	-	-	-	-	-	-
Nunapitchuk	76	22	6	1	1	1	95	98
Atmautluak	44	11	2	-	-	-	2	2
Napakiak	55	14	3	-	-	-	22	22
Napaskiak	59	14	3	-	-	-	7	7
Oscarville	11	3	-	-	-	-	-	-
Bethel	1,057	-	-	-	-	-	-	-
Kwethluk	101	34	2	-	-	-	4	4
Akiachak	78	53	4	14	-	9	13	36
Akiak	50	17	1	-	-	2	-	2
Tuluksak	45	17	2	2	-	-	45	47
LOWER KUSKOKWIM	1,693	232	36	40	34	20	256	350
Lower Kalskag	45	-	-	-	-	-	-	-
Upper Kalskag	37	-	-	-	-	-	-	-
Aniak	112	1	-	-	-	-	-	-
Chuathbaluk	25	-	-	-	-	-	-	-
MIDDLE KUSKOKWIM	219	1	-	-	-	-	-	-
Crooked Creek	26	-	-	-	-	-	-	-
Red Devil	11	-	-	-	-	-	-	-
Sleetmute	26	-	-	-	-	-	-	-
Stony River	11	-	-	-	-	-	-	-
Lime Village	13	-	-	-	-	-	-	-
McGrath	98	-	-	-	-	-	-	-
Takotna	-	-	-	-	-	-	-	-
Nikolai	-	-	-	-	-	-	-	-
Telida	-	-	-	-	-	-	-	-
UPPER KUSKOKWIM	185	-	-	-	-	-	-	-
Quinhagak	101	39	9	48	5	22	45	120
Goodnews Bay	41	19	6	11	10	28	24	73
Platinum	15	4	2	17	-	-	-	17
S. KUSKOKWIM BAY	157	62	17	76	15	50	69	210
Mekoryuk	-	-	-	-	-	-	-	-
Newtok	-	-	-	-	-	-	-	-
Nightmute	-	-	-	-	-	-	-	-
Toksook Bay	-	16	2	2	-	20	-	22
Tununak	-	-	-	-	-	-	-	-
BERING SEA COAST	-	16	2	2	-	20	-	22
Chefornak	-	-	-	-	-	-	-	-
TOTAL	2,289	317	55	118	49	90	325	582

Note: Data are based upon surveyed households only without expansion to the community as a whole.

Table 6.—Commercial salmon harvest and ex-vessel value by District, Kuskokwim Area, 2004.

	Chinook	Sockeye	Coho	Pink	Chum	Total
Lower Kuskokwim River, District W-1, 2004						
Fish	2,300	9,748	433,809	0	20,429	466,286
Pounds	28,062	64,653	2,900,998	0	133,785	3,127,498
Price	0.35	0.34	0.31		0.05	
Value	\$9,822	\$21,685	\$903,915	\$0	\$7,144	\$942,566
Average 1994-2003						
Fish	8,449	27,725	325,996	3,275	132,318	497,763
Value	\$56,687	\$111,215	\$833,276	\$1,006	\$152,558	\$1,154,742
Quinhagak, District W-4, 2004						
Fish	25,465	34,627	82,398	0	25,820	168,310
Pounds	307,886	222,792	616,884	0	181,561	1,329,123
Price	0.35	0.35	0.33		0.10	
Value	\$107,700	\$77,913	\$203,572	\$0	\$18,371	\$404,986
Average 1994-2003						
Fish	19,832	50,443	51,365	3,834	11,713	137,187
Value	\$124,596	\$172,412	\$142,433	\$1,141	\$11,515	\$452,097
Goodnews Bay, District W-5, 2004						
Fish	2,565	20,922	23,690	0	6,014	53,191
Pounds	31,022	145,391	192,255	0	42,438	411,106
Price	0.35	0.35	0.36		0.10	
Value	\$10,857	\$50,873	\$69,272	\$0	\$4,244	\$135,246
Average 1994-2003						
Fish	2,282	31,771	17,642	1,850	11,713	65,258
Value	\$13,946	\$111,466	\$61,057	\$567	\$11,515	\$198,551
Kuskokwim Area Total, 2004						
Fish	30,330	65,297	539,897	0	52,263	687,787
Pounds	366,970	432,836	3,710,137	0	357,784	4,867,727
Price	0.35	0.35	0.32	0.00	0.08	
Value	\$128,379	\$150,471	\$1,176,759	\$0	\$29,759	\$1,485,368
Average 1994-2003 ^a						
Fish	30,844	110,203	400,908	8,960	191,058	741,972
Value	\$198,124	\$396,387	\$1,055,690	\$2,713	\$208,931	\$1,861,845
Avg. weight	12.1	6.6	6.9		6.8	

^a Including Middle Kuskokwim River, District 2.

Table 7.—Commercial salmon harvest, District 1, Kuskokwim Area, 2004.

Period	Date	Permits	Hours	No. Del	Chinook				Sockeye				Coho				Chum			
					Catch	Lbs	\$/Lb	Value	Catch	Lbs	\$/Lb	Value	Catch	Lbs	\$/Lb	Value	Catch	Lbs	\$/Lb	Value
1	6/30	52	2	52	520	5,469	0.35	1,914	1,781	12,176	0.3	4,140	-	-	0.31	-	2,798	19,335	0.1	967
2	7/2	44	3	44	488	5,304	0.35	1,856	1,890	12,667	0.3	4,307	-	-	0.31	-	2,416	16,128	0.1	806
3	7/6	38	3	38	235	2,801	0.35	980	1,853	11,821	0.3	4,019	2	17	0.31	5	1,946	12,719	0.1	636
4	7/7	50	4	50	384	4,582	0.35	1,604	1,780	11,692	0.3	3,975	16	100	0.31	31	5,076	32,613	0.1	1,631
5	7/28	90	4	90	127	1,904	0.35	666	70	479	0.3	163	6,004	38,382	0.31	11,898	2,343	14,216	0.1	711
6	7/30	99	4	99	61	793	0.35	278	271	1,705	0.3	580	9,464	64,787	0.31	20,084	587	3,569	0.1	178
7	8/2	105	6	109	75	1,253	0.35	439	189	1,328	0.3	452	16,148	101,430	0.31	31,443	850	5,214	0.1	261
8	8/3	115	6	121	68	964	0.35	337	192	1,198	0.3	407	23,957	157,034	0.31	48,681	646	4,242	0.1	212
9	8/5	120	6	121	39	531	0.35	186	41	309	0.3	105	19,235	124,733	0.31	38,667	586	3,827	0.1	191
10	8/6	144	6	149	59	850	0.35	298	673	4,593	0.3	1,562	27,941	181,936	0.31	56,400	768	5,274	0.1	264
11	8/9	139	6	159	54	954	0.35	334	168	1,165	0.3	396	47,151	307,131	0.31	95,211	504	3,342	0.1	167
12	8/10	151	6	152	18	218	0.35	76	457	2,880	0.3	979	19,549	132,736	0.31	41,148	280	1,823	0.1	91
13	8/12	152	6	155	29	438	0.35	153	50	280	0.3	95	28,691	192,010	0.31	59,523	371	2,600	0.1	130
14	8/13	91	6	101	16	228	0.35	80	8	49	0.3	17	20,353	136,712	0.31	42,381	94	608	0.1	30
15	8/16	144	6	146	22	354	0.35	124	14	99	0.3	34	29,909	198,155	0.31	61,428	140	953	0.1	48
16	8/17	113	6	114	8	97	0.35	34	33	231	0.3	79	8,764	58,176	0.31	18,035	44	290	0.1	15
17	8/19	118	6	118	5	58	0.35	20	9	68	0.3	23	6,834	44,478	0.31	13,788	110	814	0.1	41
18	8/20	82	6	82	11	130	0.35	46	30	212	0.3	72	9,254	61,687	0.31	19,123	103	660	0.1	33
19	8/23	206	8	225	26	378	0.35	132	23	169	0.3	57	32,542	219,961	0.31	68,188	306	2,205	0.1	110
20	8/24	211	8	216	24	331	0.35	116	174	1,249	0.3	425	32,010	219,452	0.31	68,030	179	1,368	0.1	68
21	8/27	224	8	237	9	126	0.35	44	22	155	0.3	53	31,395	222,018	0.31	68,826	124	885	0.1	44
22	8/30	186	8	187	9	174	0.35	61	13	80	0.3	27	23,648	160,279	0.31	49,686	83	544	0.1	27
23	9/2	163	6	163	2	18	0.35	6	5	33	0.3	11	14,563	99,005	0.31	30,692	32	236	0.1	12
24	9/4	122	6	122	6	66	0.35	23	-	-	0.3	-	11,948	82,496	0.31	25,574	13	100	0.1	5
25	9/6	115	6	115	2	15	0.35	5	2	15	0.3	5	8,406	55,038	0.31	17,062	15	109	0.1	5
26	9/8	80	6	80	3	26	0.35	9	-	-	0.3	-	6,025	43,245	0.31	13,406	15	111	0.1	6
Totals		359	148	3,245	2,300	28,062		9,822	9,748	64,653		21,685	433,809	2,900,998		903,915	20,429	133,785		7,144

Table 8.—Commercial salmon harvest, District 4, Kuskokwim Area, 2004.

Period	Date	Permits	Hours	No. Del	Chinook				Sockeye				Chum					Coho			
					Catch	Lbs	\$/Lbs	Value	Catch	Lbs	\$/Lbs	Value	Catch	Lbs	CPUE	\$/Lbs	Value	Catch	Lbs	\$/Lbs	Value
1	6/15	40	12	53	3,788	44,042	0.35	15,415	124	858	0.35	300	203	1,549	0.3	0.10	155	0	0	0.33	-
2	6/17	44	12	63	3,179	34,923	0.35	12,223	258	1,741	0.35	609	619	4,420	0.8	0.10	442	0	0	0.33	-
3	6/22	50	12	64	2,625	31,118	0.35	10,891	1,508	11,000	0.35	3,850	1,404	10,790	1.8	0.10	1,079	0	0	0.33	-
4	6/24	72	12	85	3,429	41,236	0.35	14,433	2,555	18,030	0.35	6,311	3,074	23,508	3.0	0.10	2,351	0	0	0.33	-
5	6/29	59	12	82	3,424	42,394	0.35	14,838	2,897	19,464	0.35	6,812	1,678	12,233	1.7	0.10	1,223	0	0	0.33	-
6	7/1	45	12	68	1,959	23,784	0.35	8,324	3,156	21,243	0.35	7,435	1,908	14,370	2.3	0.10	1,437	0	0	0.33	-
7	7/5	63	12	88	2,269	27,261	0.35	9,541	6,099	39,437	0.35	13,803	2,876	20,324	2.7	0.10	2,032	0	0	0.33	-
8	7/7	54	12	68	1,562	20,122	0.35	7,043	4,742	29,153	0.35	10,204	1,909	13,088	2.3	0.10	1,309	0	0	0.33	-
9	7/9	56	12	62	811	10,448	0.35	3,657	4,836	30,300	0.35	10,605	2,549	17,254	3.4	0.10	1,725	0	0	0.33	-
10	7/12	53	12	68	699	9,798	0.35	3,429	3,011	18,142	0.35	6,350	3,367	22,976	4.1	0.10	2,298	0	0	0.33	-
11	7/14	41	12	56	881	10,646	0.35	3,726	2,533	15,109	0.35	5,288	3,243	21,345	4.8	0.10	2,135	0	0	0.33	-
12	7/16	31	12	39	412	5,720	0.35	2,002	1,444	9,478	0.35	3,317	1,562	10,175	3.3	0.10	1,018	0	0	0.33	-
13	8/2	35	12	46	89	1,210	0.35	424	375	1,977	0.35	692	447	2,881	0.8	0.10	288	4,131	30,043	0.33	9,914
14	8/4	36	12	53	83	1,146	0.35	401	226	1,250	0.35	438	325	2,054	0.5	0.10	205	4,876	35,575	0.33	11,740
15	8/6	36	12	40	38	550	0.35	193	174	996	0.35	349	195	1,356	0.4	0.10	136	2,534	18,474	0.33	6,096
16	8/9	44	12	49	50	920	0.35	322	133	839	0.35	294	118	866	0.2	0.10	87	8,977	66,717	0.33	22,017
17	8/11	41	12	64	44	638	0.35	223	103	606	0.35	212	96	659	0.1	0.10	66	10,267	76,374	0.33	25,203
18	8/13	30	12	44	31	360	0.35	126	56	348	0.35	122	26	161	0.0	0.10	16	5,618	41,308	0.33	13,632
19	8/16	53	12	77	28	406	0.35	142	49	307	0.35	107	48	322	0.1	0.10	32	9,861	72,880	0.33	24,050
20	8/18	53	12	77	21	289	0.35	101	220	1,648	0.35	577	63	435	0.1	0.10	44	8,966	67,291	0.33	22,206
21	8/20	46	12	67	14	245	0.35	86	92	631	0.35	221	51	378	0.1	0.10	38	6,736	51,434	0.33	16,973
22	8/23	37	12	49	9	160	0.35	56	17	109	0.35	38	20	155	0.0	0.10	16	7,284	55,225	0.33	18,224
23	8/25	44	12	53	9	207	0.35	72	13	90	0.35	32	27	179	0.0	0.10	18	6,113	46,408	0.33	15,315
24	8/27	39	12	64	11	263	0.35	92	6	36	0.35	13	12	83	0.0	0.10	8	7,035	55,155	0.33	18,201
Totals		116	288	1,479	25,465	307,886		107,760	34,627	222,792		77,977	25,820	181,561			18,156	82,398	616,884		203,572

Table 9.—Commercial salmon harvest, District 5, Kuskokwim Area, 2004.

Period	Date	Permits	Hours	No.. Del	Chinook				Sockeye				Chum				Coho			
					Catch	Lbs	\$/Lbs	Value	Catch	Lbs	\$/Lbs	Value	Catch	Lbs	\$/Lbs	Value	Catch	Lbs	\$/Lbs	Value
1	6/24	19	12	27	791	8,992	0.35	3,147	1,873	13,684	0.35	4,789	788	6,012	0.10	601	0	0.36	-	
2	6/29	21	12	28	373	3,983	0.35	1,394	2,938	20,635	0.35	7,222	668	4,814	0.10	481	0	0.36	-	
3	7/1	19	12	24	310	3,821	0.35	1,337	3,512	24,426	0.35	8,549	1,060	7,656	0.10	766	0	0.36	-	
4	7/5	21	12	24	265	3,351	0.35	1,173	3,098	21,304	0.35	7,456	710	5,094	0.10	509	0	0.36	-	
5	7/7	21	12	25	206	2,754	0.35	964	2,133	15,000	0.35	5,250	522	3,728	0.10	373	0	0.36	-	
6	7/9	20	12	25	159	2,112	0.35	739	2,021	13,794	0.35	4,828	455	3,216	0.10	322	0	0.36	-	
7	7/12	20	12	22	112	1,473	0.35	516	1,395	9,422	0.35	3,298	1,066	7,111	0.10	711	0	0.36	-	
8	7/14	14	12	17	104	1,323	0.35	463	1,063	7,012	0.35	2,454	414	2,700	0.10	270	0	0.36	-	
9	7/16	10	12	11	78	1,044	0.35	365	347	2,374	0.35	831	161	991	0.10	99	0	0.36	-	
10	8/2	10	12	12	35	509	0.35	178	400	2,746	0.35	961	51	339	0.10	34	194	1,362	0.36	490
11	8/4	12	12	12	39	535	0.35	187	305	2,021	0.35	707	48	316	0.10	32	311	2,365	0.36	851
12	8/6	13	12	13	24	313	0.35	110	295	1,988	0.35	696	9	60	0.10	6	428	3,210	0.36	1,156
13	8/9	14	12	16	12	151	0.35	53	167	1,093	0.35	383	14	83	0.10	8	804	6,081	0.36	2,189
14	8/11	14	12	16	22	251	0.35	88	287	2,012	0.35	704	21	137	0.10	14	1,335	10,896	0.36	3,923
15	8/13	^a	12				0.35	-			0.35	-			0.10	-			0.36	-
16	8/16	19	12	26	8	84	0.35	29	255	1,763	0.35	617	10	67	0.10	7	2,752	22,524	0.36	8,109
17	8/18	18	12	23	7	93	0.35	33	160	1,093	0.35	383	4	24	0.10	2	2,918	23,924	0.36	8,613
18	8/20	18	12	25	8	87	0.35	30	162	1,096	0.35	384	10	68	0.10	7	3,240	27,173	0.36	9,782
19	8/23	17	12	28	2	19	0.35	7	56	363	0.35	127	0	0	0.10	-	2,860	23,830	0.36	8,579
20	8/25	18	18	29	7	102	0.35	36	177	1,386	0.35	485	3	22	0.10	2	4,527	37,334	0.36	13,440
21	8/27	19	12	23	3	25	0.35	9	278	2,179	0.35	763	0	0	0.10	-	4,321	33,556	0.36	12,080
Totals		114	258		2,565	31,022		10,858	20,922	145,391		50,887	6,014	42,438		4,244	23,690	192,255		69,212

^a No commercial harvest - no tender.

Table 10.—Kuskokwim River subsistence summary report, summary of salmon fishing, 2004.

Summary of Subsistence Salmon Information Collected by ONC Technicians ^a																
Week Ending	Number of Families			Chinook salmon			Chum salmon			Sockeye salmon			Coho salmon			
	Interviewed	Fishing	Not Fishing	Very Good	Normal	Poor	Very Good	Normal	Poor	Very Good	Normal	Poor	Very Good	Normal	Poor	
Jun 05	31	10	21	6	4	0										
Jun 12	41	37	4	27	8	2										
Jun 19	35	31	4	23	8	0	4	27	0	4	27	0				
Jun 26	43	31	12	19	12	0	24	7	0	5	22	4				
Jul 03	44	22	22	3	17	0	10	10	0	0	13	7				
Jul 10	44	13	31	0	10	0	8	2	0	0	4	6				
Jul 17	35	6	29	0	6	0	0	6	0	0	6	0	0	6	0	
Jul 24	46	8	38										0	8	0	
Jul 31	47	7	40										7	0	0	
Aug 07	58	22	36										19	3	0	
Aug 14	44	16	28										16	0	0	
Aug 21	52	8	44										8	0	0	
Total ^b	520															
Average	43	18	26	11	9	0	9	10	0	2	14	3	8	3	0	

^a Represents responses from the question “Compared with this time in a “Normal” year how were catch rates for salmon this week?”

^b Represents the total number of interviews conducted during the survey year, most families were interviewed more than once.

Table 11.—Daily and cumulative salmon passage through the Kwethluk River weir, Kuskokwim River drainage, 2004.

Date	Chinook		Sockeye		Chum		Pink		Coho	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
25-Jun	41	41	105	105	124	124	8	8	0	0
26-Jun	286	327	92	197	311	435	5	13	0	0
27-Jun	1,201	1,528	453	650	886	1,321	5	18	0	0
28-Jun	794	2,322	302	952	468	1,789	0	18	0	0
29-Jun	538	2,860	289	1,241	932	2,721	0	18	0	0
30-Jun	2,600	5,460	483	1,724	1,385	4,106	3	21	0	0
1-Jul	2,314	7,774	164	1,888	929	5,035	4	25	0	0
2-Jul	1,483 ^a	9,257	224 ^a	2,112	1,168 ^a	6,203	16	41	0	0
3-Jul	694	9,951	184	2,296	1,811	8,014	33	74	0	0
4-Jul	1,853	11,804	152	2,448	1,246	9,260	42	116	0	0
5-Jul	896	12,700	74	2,522	705	9,965	11	127	0	0
6-Jul	921	13,621	101	2,623	688	10,653	12	139	0	0
7-Jul	339	13,960	15	2,638	197	10,850	2	141	0	0
8-Jul	1,008	14,968	22	2,660	771	11,621	9	150	8	8
9-Jul	2,326	17,294	92	2,752	873	12,494	27	177	5	13
10-Jul	2,195	19,489	129	2,881	2,185	14,679	40	217	0	13
11-Jul	947	20,436	75	2,956	1,323	16,002	33	250	0	13
12-Jul	1,043	21,479	49	3,005	1,149	17,151	22	272	0	13
13-Jul	643	22,122	38	3,043	938	18,089	24	296	0	13
14-Jul	652	22,774	58	3,101	1,603	19,692	22	318	0	13
15-Jul	161	22,935	10	3,111	410	20,102	7	325	0	13
16-Jul	43	22,978	8	3,119	241	20,343	0	325	0	13
17-Jul	156	23,134	11	3,130	1,019	21,362	3	328	0	13
18-Jul	659	23,793	37	3,167	2,035	23,397	53	381	16	29
19-Jul	806	24,599	33	3,200	1,237	24,634	41	422	13	42
20-Jul	196	24,795	14	3,214	886	25,520	42	464	12	54
21-Jul	523	25,318	39	3,253	1,013	26,533	32	496	18	72
22-Jul	371 ^a	25,689	18 ^a	3,271	953 ^a	27,486	62	558	37 ^a	109
23-Jul	258	25,947	5	3,276	629	28,115	71	629	20	129
24-Jul	192	26,139	3	3,279	1,147	29,262	91	720	42	171
25-Jul	248	26,387	15	3,294	808	30,070	94	814	50	221
26-Jul	139	26,526	7	3,301	599	30,669	38	852	28	249
27-Jul	181	26,707	6	3,307	671	31,340	41	893	17	266
28-Jul	319	27,026	15	3,322	806	32,146	58	951	78	344
29-Jul	237	27,263	7	3,329	844	32,990	93	1,044	105	449
30-Jul	168	27,431	11	3,340	770	33,760	83	1,127	157	606
31-Jul	192	27,623	11	3,351	647	34,407	92	1,219	152	758
1-Aug	195	27,818	7	3,358	537	34,944	85	1,304	169	927
2-Aug	74	27,892	6	3,364	298	35,242	36	1,340	182	1,109
3-Aug	79	27,971	2	3,366	153	35,395	26	1,366	86	1,195
4-Aug	65	28,036	2	3,368	187	35,582	20	1,386	83	1,278
5-Aug	65	28,101	4	3,372	366	35,948	61	1,447	352	1,630
6-Aug	96	28,197	6	3,378	531	36,479	125	1,572	845	2,475
7-Aug	72	28,269	0	3,378	401	36,880	109	1,681	352	2,827
8-Aug	31	28,300	5	3,383	165	37,045	64	1,745	180	3,007

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Table 11.–Page 2 of 2.

Date	Chinook		Sockeye		Chum		Pink		Coho	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
9-Aug	12	28,312	4	3,387	225	37,270	51	1,796	396	3,403
10-Aug	21	28,333	4	3,391	188	37,458	49	1,845	227	3,630
11-Aug	32	28,365	9	3,400	269	37,727	174	2,019	1,731	5,361
12-Aug	37	28,402	7	3,407	162	37,889	155	2,174	810	6,171
13-Aug	40	28,442	5	3,412	133	38,022	138	2,312	1,933	8,104
14-Aug	41	28,483	8	3,420	101	38,123	140	2,452	1,590	9,694
15-Aug	12	28,495	3	3,423	95	38,218	76	2,528	1,105	10,799
16-Aug	8	28,503	2	3,425	43	38,261	17	2,545	422	11,221
17-Aug	21	28,524	4	3,429	53	38,314	101	2,646	3,094	14,315
18-Aug	16	28,540	7	3,436	55	38,369	75	2,721	1,443	15,758
19-Aug	17	28,557	5	3,441	40	38,409	52	2,773	1,499	17,257
20-Aug	7	28,564	2	3,443	32	38,441	22	2,795	519	17,776
21-Aug	9	28,573	13	3,456	30	38,471	57	2,852	2,598	20,374
22-Aug	6	28,579	3	3,459	28	38,499	27	2,879	2,268	22,642
23-Aug	6	28,585	3	3,462	12	38,511	12	2,891	801	23,443
24-Aug	2	28,587	2	3,464	16	38,527	13	2,904	1,041	24,484
25-Aug	2	28,589	1	3,465	12	38,539	14	2,918	2,386	26,870
26-Aug	3	28,592	3	3,468	8	38,547	11	2,929	2,912	29,782
27-Aug	1	28,593	4	3,472	7	38,554	7	2,936	1,494	31,276
28-Aug	3	28,596	0	3,472	4	38,558	10	2,946	715	31,991
29-Aug	3	28,599	0	3,472	9	38,567	10	2,956	912	32,903
30-Aug	-	28,599	1	3,473	14	38,581	10	2,966	1,328	34,231
31-Aug	1	28,600	4	3,477	15	38,596	12	2,978	1,025	35,256
1-Sep	1	28,601	0	3,477	5	38,601	10	2,988	3,494	38,750
2-Sep	-	28,601	2	3,479	12	38,613	21	3,009	6,006	44,756
3-Sep	-	28,601	2	3,481	8	38,621	10	3,019	3,201	47,957
4-Sep	-	28,601	1	3,482	0	38,621	2	3,021	242	48,199
5-Sep	1	28,602	0	3,482	7	38,628	12	3,033	4,225	52,424
6-Sep	1	28,603	1	3,483	7	38,635	6	3,039	3,332	55,756
7-Sep	-	28,603	1	3,484	5	38,640	4	3,043	2,836	58,592
8-Sep	1	28,604	3	3,487	3	38,643	3	3,046	1,438	60,030
9-Sep	1	28,605	2	3,489	2	38,645	2	3,048	1,357	61,387
10-Sep	-	28,605	1	3,490	1	38,646	6	3,054	2,829	64,216

^a = Daily passage was estimated due to the occurrence of a hole in the weir.

Table 12.—Daily and cumulative salmon passage through the Tuluksak River weir, Kuskokwim River drainage, 2004.

Date	Chinook		Sockeye		Chum		Pink		Coho	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
15-Jun	0	0	0	0	0	0	0	0	0	0
16-Jun	0	0	0	0	0	0	0	0	0	0
17-Jun	0	0	0	0	0	0	0	0	0	0
18-Jun	0	0	0	0	0	0	0	0	0	0
19-Jun	0	0	0	0	0	0	0	0	0	0
20-Jun	0	0	0	0	0	0	0	0	0	0
21-Jun	0	0	0	0	0	0	0	0	0	0
22-Jun	0	0	0	0	0	0	0	0	0	0
23-Jun	0	0	0	0	4	4	0	0	0	0
24-Jun	0	0	0	0	9	13	0	0	0	0
25-Jun	0	0	0	0	69	82	0	0	0	0
26-Jun	1	1	0	0	85	167	0	0	0	0
27-Jun	5	6	0	0	123	290	0	0	0	0
28-Jun	74	80	0	0	322	612	1	1	0	0
29-Jun	34	114	0	0	160	772	1	2	0	0
30-Jun	66	180	0	0	796	1,568	3	5	0	0
1-Jul	75	255	0	0	138	1,706	0	5	0	0
2-Jul	4	259	0	0	1	1,707	0	5	0	0
3-Jul	93	352	0	0	152	1,859	0	5	0	0
4-Jul	118	470	4	4	477	2,336	5	10	0	0
5-Jul	19	489	6	10	490	2,826	2	12	0	0
6-Jul	10	499	4	14	395	3,221	4	16	0	0
7-Jul	28	527	14	28	312	3,533	10	26	0	0
8-Jul	165	692	18	46	363	3,896	2	28	0	0
9-Jul	16	708	1	47	151	4,047	5	33	0	0
10-Jul	141	849	3	50	75	4,122	5	38	0	0
11-Jul	72	921	3	53	303	4,425	2	40	0	0
12-Jul	12	933	3	56	339	4,764	0	40	0	0
13-Jul	29	962	7	63	243	5,007	2	42	0	0
14-Jul	21	983	4	67	349	5,356	4	46	1	1
15-Jul	19	1,002	1	68	154	5,510	0	46	1	2
16-Jul	23	1,025	2	70	114	5,624	6	52	0	2
17-Jul	21	1,046	3	73	270	5,894	13	65	2	4
18-Jul	69	1,115	12	85	685	6,579	37	102	0	4
19-Jul	10	1,125	8	93	461	7,040	14	116	3	7
20-Jul	22	1,147	9	102	388	7,428	24	140	14	21
21-Jul	29	1,176	4	106	583	8,011	34	174	9	30
22-Jul	27	1,203	2	108	361	8,372	19	193	3	33
23-Jul	111	1,314	1	109	473	8,845	18	211	2	35
24-Jul	14	1,328	0	109	341	9,186	7	218	5	40
25-Jul	19	1,347	2	111	266	9,452	8	226	3	43
26-Jul	2	1,349	0	111	108	9,560	5	231	1	44
27-Jul	0	1,349	1	112	83	9,643	5	236	5	49
28-Jul	9	1,358	3	115	352	9,995	20	256	38	87
29-Jul	14	1,372	2	117	203	10,198	17	273	56	143
30-Jul	22	1,394	1	118	161	10,359	7	280	33	176

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Date	Chinook		Sockeye		Chum		Pink		Coho	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
31-Jul	16	1,410	3	121	188	10,547	15	295	61	237
1-Aug	13	1,423	0	121	153	10,700	10	305	44	281
2-Aug	2	1,425	0	121	95	10,795	5	310	43	324
3-Aug	5	1,430	1	122	102	10,897	5	315	75	399
4-Aug	4	1,434	0	122	81	10,978	9	324	64	463
5-Aug	11	1,445	0	122	64	11,042	5	329	58	521
6-Aug	1	1,446	1	123	116	11,158	10	339	316	837
7-Aug	5	1,451	1	124	57	11,215	9	348	270	1,107
8-Aug	4	1,455	0	124	34	11,249	2	350	74	1,181
9-Aug	0	1,455	0	124	63	11,312	5	355	258	1,439
10-Aug	2	1,457	0	124	37	11,349	6	361	247	1,686
11-Aug	5	1,462	0	124	55	11,404	7	368	1,164	2,850
12-Aug	2	1,464	0	124	42	11,446	5	373	157	3,007
13-Aug	1	1,465	1	125	41	11,487	6	379	204	3,211
14-Aug	1	1,466	1	126	64	11,551	6	385	843	4,054
15-Aug	1	1,467	1	127	27	11,578	8	393	956	5,010
16-Aug	4	1,471	1	128	24	11,602	3	396	731	5,741
17-Aug	0	1,471	1	129	27	11,629	3	399	806	6,547
18-Aug	0	1,471	0	129	38	11,667	14	413	1,900	8,447
19-Aug	2	1,473	1	130	31	11,698	8	421	2,142	10,589
20-Aug	1	1,474	0	130	13	11,711	8	429	266	10,855
21-Aug	1	1,475	0	130	15	11,726	13	442	1,958	12,813
22-Aug	0	1,475	0	130	1	11,727	1	443	227	13,040
23-Aug	0	1,475	0	130	3	11,730	1	444	74	13,114
24-Aug	0	1,475	1	131	8	11,738	4	448	593	13,707
25-Aug	0	1,475	0	131	7	11,745	7	455	1,329	15,036
26-Aug	0	1,475	0	131	7	11,752	4	459	647	15,683
27-Aug	0	1,475	1	132	4	11,756	0	459	203	15,886
28-Aug	0	1,475	1	133	6	11,762	2	461	34	15,920
29-Aug	0	1,475	0	133	7	11,769	2	463	9	15,929
30-Aug	0	1,475	0	133	4	11,773	4	467	53	15,982
31-Aug	0	1,475	0	133	4	11,777	3	470	127	16,109
1-Sep	0	1,475	2	135	6	11,783	2	472	925	17,034
2-Sep	0	1,475	0	135	1	11,784	9	481	1,419	18,453
3-Sep	0	1,475	0	135	4	11,788	1	482	340	18,793
4-Sep	0	1,475	0	135	1	11,789	3	485	5	18,798
5-Sep	0	1,475	0	135	1	11,790	3	488	207	19,005
6-Sep	0	1,475	0	135	4	11,794	5	493	277	19,282
7-Sep	0	1,475	1	136	1	11,795	0	493	282	19,564
8-Sep	0	1,475	0	136	0	11,795	1	494	198	19,762
9-Sep	0	1,475	0	136	0	11,795	2	496	150	19,912
10-Sep	0	1,475	0	136	1	11,796	0	496	424	20,336
11-Sep	-	-	-	-	-	-	-	-	-	-
12-Sep	-	-	-	-	-	-	-	-	-	-
13-Sep	-	-	-	-	-	-	-	-	-	-
14-Sep	-	-	-	-	-	-	-	-	-	-

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Table 12.–Page 3 of 3.

Date	Chinook		Sockeye		Chum		Pink		Coho	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
15-Sep	-	-	-	-	-	-	-	-	-	-
16-Sep	-	-	-	-	-	-	-	-	-	-
17-Sep	-	-	-	-	-	-	-	-	-	-
18-Sep	-	-	-	-	-	-	-	-	-	-
19-Sep	-	-	-	-	-	-	-	-	-	-
20-Sep	-	-	-	-	-	-	-	-	-	-

Table 13.—Daily and cumulative salmon passage through the George River weir, Kuskokwim River drainage, 2004.

Date	Chinook		Sockeye		Chum		Pink		Coho	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
15-Jun	0 ^a	0	0	0	6 ^a	6	0	0	0	0
16-Jun	1 ^a	1	0	0	14 ^a	20	0	0	0	0
17-Jun	2 ^a	4	0	0	63 ^a	83	0	0	0	0
18-Jun	2 ^a	6	0	0	78 ^a	161	0	0	0	0
19-Jun	4 ^a	10	0	0	92 ^a	253	0	0	0	0
20-Jun	7 ^a	17	0	0	45 ^a	297	0	0	0	0
21-Jun	9 ^a	26	0	0	138 ^a	435	0	0	0	0
22-Jun	8 ^a	34	0	0	116 ^a	552	0	0	0	0
23-Jun	4 ^a	38	0	0	120 ^a	672	0	0	0	0
24-Jun	2 ^a	40	0	0	20 ^a	692	0	0	0	0
25-Jun	7 ^a	47	0	0	158 ^a	851	0	0	0	0
26-Jun	52 ^a	99	0	0	502 ^a	1,353	0	0	0	0
27-Jun	310	409	0	0	883	2,236	0	0	0	0
28-Jun	230	639	0	0	602	2,838	0	0	0	0
29-Jun	305	944	0	0	567	3,405	0	0	0	0
30-Jun	220	1,164	0	0	360	3,765	0	0	0	0
1-Jul	100	1,264	0	0	148	3,913	0	0	0	0
2-Jul	25	1,289	0	0	179	4,092	1	1	0	0
3-Jul	409	1,698	0	0	543	4,635	0	1	0	0
4-Jul	161	1,859	0	0	472	5,107	0	1	0	0
5-Jul	539	2,398	0	0	444	5,551	0	1	0	0
6-Jul	375	2,773	0	0	685	6,236	0	1	0	0
7-Jul	152	2,925	0	0	972	7,208	1	2	0	0
8-Jul	398	3,323	0	0	514	7,722	2	4	0	0
9-Jul	194	3,517	1	1	311	8,033	0	4	0	0
10-Jul	69	3,586	0	1	305	8,338	0	4	0	0
11-Jul	244	3,830	0	1	467	8,805	3	7	0	0
12-Jul	240	4,070	1	2	272	9,077	2	9	0	0
13-Jul	108	4,178	0	2	412	9,489	1	10	0	0
14-Jul	99	4,277	0	2	381	9,870	0	10	0	0
15-Jul	75	4,352	0	2	298	10,168	0	10	0	0
16-Jul	89	4,441	0	2	182	10,350	0	10	0	0
17-Jul	86	4,527	0	2	194	10,544	0	10	0	0
18-Jul	97	4,624	0	2	311	10,855	0	10	0	0
19-Jul	114	4,738	2	4	308	11,163	0	10	0	0
20-Jul	66	4,804	0	4	197	11,360	1	11	0	0
21-Jul	40	4,844	6	10	268	11,628	1	12	1	1
22-Jul	22	4,866	1	11	208	11,836	0	12	0	1
23-Jul	40	4,906	1	12	258	12,094	0	12	0	1
24-Jul	38	4,944	1	13	251	12,345	1	13	0	1
25-Jul	29	4,973	1	14	210	12,555	1	14	5	6
26-Jul	49	5,022	0	14	229	12,784	2	16	3	9
27-Jul	16	5,038	0	14	133	12,917	1	17	0	9
28-Jul	20	5,058	1	15	118	13,035	1	18	0	9
29-Jul	6	5,064	0	15	111	13,146	0	18	4	13

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Date	Chinook		Sockeye		Chum		Pink		Coho	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
30-Jul	3	5,067	2	17	110	13,256	0	18	2	15
31-Jul	19	5,086	4	21	108	13,364	3	21	10	25
1-Aug	16	5,102	5	26	97	13,461	1	22	17	42
2-Aug	14	5,116	1	27	46	13,507	0	22	10	52
3-Aug	13	5,129	0	27	45	13,552	1	23	6	58
4-Aug	8	5,137	2	29	46	13,598	0	23	43	101
5-Aug	5	5,142	0	29	60	13,658	2	25	42	143
6-Aug	2	5,144	1	30	36	13,694	0	25	38	181
7-Aug	10	5,154	0	30	55	13,749	0	25	69	250
8-Aug	7	5,161	13	43	161	13,910	0	25	72	322
9-Aug	1	5,162	4	47	71	13,981	1	26	69	391
10-Aug	7	5,169	28	75	56	14,037	0	26	445	836
11-Aug	4	5,173	5	80	35	14,072	0	26	77	913
12-Aug	2	5,175	8	88	41	14,113	0	26	82	995
13-Aug	0	5,175	3	91	15	14,128	0	26	61	1,056
14-Aug	3	5,178	3	94	5	14,133	0	26	57	1,113
15-Aug	2	5,180	13	107	41	14,174	0	26	712	1,825
16-Aug	6	5,186	14	121	16	14,190	0	26	316	2,141
17-Aug	3	5,189	11	132	20	14,210	0	26	207	2,348
18-Aug	4	5,193	9	141	8	14,218	0	26	155	2,503
19-Aug	0	5,193	2	143	5	14,223	0	26	96	2,599
20-Aug	4	5,197	2	145	3	14,226	0	26	299	2,898
21-Aug	1	5,198	1	146	24	14,250	0	26	489	3,387
22-Aug	0	5,198	1	147	10	14,260	0	26	168	3,555
23-Aug	0	5,198	1	148	12	14,272	0	26	201	3,756
24-Aug	2	5,200	3	151	19	14,291	0	26	147	3,903
25-Aug	0	5,200	3	154	12	14,303	0	26	149	4,052
26-Aug	1	5,201	0	154	6	14,309	0	26	88	4,140
27-Aug	1	5,202	3	157	12	14,321	0	26	162	4,302
28-Aug	0	5,202	2	159	7	14,328	0	26	108	4,410
29-Aug	1	5,203	3	162	9	14,337	0	26	413	4,823
30-Aug	1	5,204	2	164	15	14,352	1	27	733	5,556
31-Aug	0	5,204	9	173	8	14,360	2	29	672	6,228
1-Sep	2	5,206	1	174	18	14,378	2	31	1,487	7,715
2-Sep	0	5,206	1	175	4	14,382	2	33	479	8,194
3-Sep	0	5,206	0	175	4	14,386	0	33	366	8,560
4-Sep	0	5,206	0	175	2	14,388	0	33	301	8,861
5-Sep	0	5,206	0	175	6	14,394	0	33	413	9,274
6-Sep	0	5,206	0	175	4	14,398	0	33	310	9,584
7-Sep	1	5,207	0	175	5	14,403	3	36	397	9,981
8-Sep	0	5,207	0	175	1	14,404	0	36	139	10,120
9-Sep	0	5,207	0	175	2	14,406	0	36	133	10,253
10-Sep	0	5,207	1	176	0	14,406	0	36	371	10,624
11-Sep	0	5,207	0	176	1	14,407	0	36	414	11,038
12-Sep	0	5,207	0	176	0	14,407	0	36	389	11,427

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Table 13.—Page 3 of 3.

Date	Chinook		Sockeye		Chum		Pink		Coho	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
13-Sep	0	5,207	1	177	0	14,407	0	36	222	11,649
14-Sep	0	5,207	0	177	0	14,407	0	36	267	11,916
15-Sep	0	5,207	0	177	1	14,408	0	36	245	12,161
16-Sep	0	5,207	0	177	0	14,408	0	36	116	12,277
17-Sep	0	5,207	0	177	0	14,408	0	36	94	12,371
18-Sep	0	5,207	0	177	0	14,408	0	36	81	12,452
19-Sep	0	5,207	0	177	1	14,409	0	36	36	12,488
20-Sep	0	5,207	0	177	0	14,409	0	36	11	12,499
21-Sep	0	5,207	0	177	0	14,409	0	36	23	12,522
22-Sep	0	5,207	0	177	1	14,410	1	37	256	12,778
23-Sep	0	5,207	0	177	1	14,411	0	37	422	13,200
24-Sep	0	5,207	0	177	0	14,411	0	37	48	13,248
25-Sep	0	5,207	0	177	0	14,411	0	37	0	13,248

^a The weir was not operational due to high water; daily passage was estimated.

Table 14.—Daily and cumulative salmon passage through the Kogrukluk River weir, Kuskokwim River drainage, 2004.

	Chinook		Sockeye		Chum		Pink		Coho	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
15-Jun	0	0	0	0	0	0	0	0	0	0
16-Jun	0	0	0	0	0	0	0	0	0	0
17-Jun	0	0	0	0	0	0	0	0	0	0
18-Jun	0	0	0	0	0	0	0	0	0	0
19-Jun	0	0	0	0	0	0	0	0	0	0
20-Jun	0	0	0	0	0	0	0	0	0	0
21-Jun	0	0	0	0	0	0	0	0	0	0
22-Jun	0	0	0	0	15	15	0	0	0	0
23-Jun	9	9	0	0	54	69	0	0	0	0
24-Jun	0	9	0	0	30	99	0	0	0	0
25-Jun	47	56	0	0	97	196	0	0	0	0
26-Jun	51	107	0	0	93	289	0	0	0	0
27-Jun	108	215	3	3	149	438	0	0	0	0
28-Jun	87	302	6	9	114	552	0	0	0	0
29-Jun	428	730	13	22	460	1,012	0	0	0	0
30-Jun	281	1,011	42	64	548	1,560	0	0	0	0
1-Jul	297	1,308	42	106	516	2,076	0	0	0	0
2-Jul	350	1,658	51	157	431	2,507	0	0	0	0
3-Jul	662	2,320	52	209	505	3,012	0	0	0	0
4-Jul	578	2,898	142	351	720	3,732	0	0	0	0
5-Jul	856	3,754	183	534	809	4,541	0	0	0	0
6-Jul	699	4,453	323	857	892	5,433	0	0	0	0
7-Jul	1,571	6,024	601	1,458	1,022	6,455	0	0	0	0
8-Jul	1,324	7,348	370	1,828	1,202	7,657	0	0	0	0
9-Jul	1,062	8,410	413	2,241	949	8,606	0	0	0	0
10-Jul	1,072	9,482	502	2,743	1,261	9,867	0	0	0	0
11-Jul	1,169	10,651	507	3,250	1,126	10,993	0	0	0	0
12-Jul	927	11,578	362	3,612	450	11,443	0	0	0	0
13-Jul	467	12,045	186	3,798	221	11,664	0	0	0	0
14-Jul	572	12,617	220	4,018	398	12,062	0	0	0	0
15-Jul	550	13,167	207	4,225	422	12,484	0	0	0	0
16-Jul	342	13,509	125	4,350	500	12,984	0	0	0	0
17-Jul	671	14,180	211	4,561	630	13,614	0	0	0	0
18-Jul	516	14,696	184	4,745	635	14,249	0	0	0	0
19-Jul	485	15,181	388	5,133	902	15,151	0	0	0	0
20-Jul	619	15,800	245	5,378	872	16,023	0	0	0	0
21-Jul	657	16,457	233	5,611	817	16,840	0	0	0	0
22-Jul	474	16,931	167	5,778	663	17,503	0	0	3	3
23-Jul	286	17,217	82	5,860	437	17,940	0	0	3	6
24-Jul	185	17,402	58	5,918	348	18,288	0	0	3	9
25-Jul	221	17,623	138	6,056	533	18,821	0	0	3	12
26-Jul	197	17,820	63	6,119	437	19,258	0	0	3	15
27-Jul	485	18,305	143	6,262	859	20,117	0	0	17	32
28-Jul	295	18,600	178	6,440	889	21,006	0	0	14	46

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Table 14.—Page 2 of 3.

Date	Chinook		Sockeye		Chum		Pink		Coho	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
29-Jul	150	18,750	53	6,493	460	21,466	0	0	15	61
30-Jul	121	18,871	45	6,538	360	21,826	0	0	20	81
31-Jul	106	18,977	45	6,583	382	22,208	0	0	15	96
1-Aug	77	19,054	46	6,629	319	22,527	0	0	33	129
2-Aug	68	19,122	22	6,651	253	22,780	0	0	22	151
3-Aug	44	19,166	23	6,674	136	22,916	1	1	11	162
4-Aug	60	19,226	16	6,690	165	23,081	2	3	46	208
5-Aug	70	19,296	19	6,709	181	23,262	0	3	73	281
6-Aug	48	19,344	9	6,718	149	23,411	0	3	76	357
7-Aug	77	19,421	11	6,729	153	23,564	1	4	111	468
8-Aug	48	19,469	12	6,741	137	23,701	1	5	95	563
9-Aug	23	19,492	6	6,747	117	23,818	0	5	113	676
10-Aug	37	19,529	7	6,754	57	23,875	0	5	217	893
11-Aug	10	19,539	1	6,755	32	23,907	3	8	85	978
12-Aug	25	19,564	6	6,761	52	23,959	0	8	240	1,218
13-Aug	13	19,577	1	6,762	19	23,978	0	8	92	1,310
14-Aug	5	19,582	1	6,763	27	24,005	0	8	289	1,599
15-Aug	8	19,590	4	6,767	24	24,029	2	10	761	2,360
16-Aug	11	19,601	0	6,767	39	24,068	4	14	638	2,998
17-Aug	7	19,608	3	6,770	26	24,094	1	15	660	3,658
18-Aug	6	19,614	1	6,771	7	24,101	1	16	676	4,334
19-Aug	4	19,618	-2	6,769	10	24,111	0	16	748	5,082
20-Aug	3	19,621	2	6,771	9	24,120	0	16	369	5,451
21-Aug	4	19,625	2	6,773	3	24,123	0	16	708	6,159
22-Aug	7	19,632	1	6,774	8	24,131	0	16	839	6,998
23-Aug	3	19,635	0	6,774	9	24,140	0	16	999	7,997
24-Aug	4	19,639	0	6,774	1	24,141	0	16	689	8,686
25-Aug	1	19,640	0	6,774	6	24,147	0	16	1,391	10,077
26-Aug	2	19,642	0	6,774	7	24,154	0	16	841	10,918
27-Aug	2	19,644	0	6,774	7	24,161	0	16	282	11,200
28-Aug	0	19,644	0	6,774	3	24,164	0	16	172	11,372
29-Aug	0	19,644	0	6,774	3	24,167	0	16	451	11,823
30-Aug	0	19,644	0	6,774	6	24,173	0	16	1,365	13,188
31-Aug	0	19,644	0	6,774	3	24,176	0	16	388	13,576
1-Sep	0	19,644	0	6,774	3	24,179	0	16	1,294	14,870
2-Sep	2	19,646	0	6,774	4	24,183	0	16	1,408	16,278
3-Sep	2	19,648	0	6,774	4	24,187	0	16	934	17,212
4-Sep	0	19,648	0	6,774	0	24,187	0	16	780	17,992
5-Sep	2	19,650	0	6,774	2	24,189	0	16	919	18,911
6-Sep	0	19,650	0	6,774	1	24,190	0	16	1,029	19,940
7-Sep	1	19,651	0	6,774	2	24,192	0	16	835	20,775
8-Sep	0	19,651	0	6,774	2	24,194	0	16	814	21,589
9-Sep	0	19,651	1	6,775	0	24,194	0	16	157	21,746
10-Sep	0	19,651	0	6,775	1	24,195	0	16	573	22,319

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Table 14.–Page 3 of 3.

Date	Chinook		Sockeye		Chum		Pink		Coho	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
11-Sep	0	19,651	0	6,775	1	24,196	0	16	656	22,975
12-Sep	0	19,651	0	6,775	0	24,196	0	16	709	23,684
13-Sep	0	19,651	0	6,775	2	24,198	0	16	572	24,256
14-Sep	0	19,651	0	6,775	0	24,198	0	16	461	24,717
15-Sep	0	19,651	0	6,775	0	24,198	0	16	350	25,067
16-Sep	0	19,651	0	6,775	0	24,198	0	16	271	25,338
17-Sep	0	19,651	0	6,775	0	24,198	0	16	207	25,545
18-Sep	0	19,651	0	6,775	0	24,198	0	16	142	25,687
19-Sep	0	19,651	0	6,775	0	24,198	0	16	277	25,964
20-Sep	0	19,651	0	6,775	1	24,199	0	16	226	26,190
21-Sep	0	19,651	0	6,775	0	24,199	0	16	172	26,362
22-Sep	0	19,651	0	6,775	0	24,199	0	16	191	26,553
23-Sep	0	19,651	0	6,775	2	24,201	0	16	134	26,687
24-Sep	0	19,651	0	6,775	0	24,201	0	16	132	26,819
25-Sep	0	19,651	0	6,775	0	24,201	0	16	223	27,042

Table 15.—Daily and cumulative salmon passage through the Tatlawiksuk River weir, Kuskokwim River drainage, 2004.

Date	Chinook		Sockeye		Chum		Pink		Coho	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
15-Jun	2	2	0	0	9	9	0	0	0	0
16-Jun	2	4	0	0	15	24	0	0	0	0
17-Jun	0	4	0	0	7	31	0	0	0	0
18-Jun	4	8	0	0	22	53	0	0	0	0
19-Jun	8	16	0	0	75	128	0	0	0	0
20-Jun	3	19	0	0	105	233	0	0	0	0
21-Jun	2	21	0	0	53	286	0	0	0	0
22-Jun	1	22	0	0	81	367	0	0	0	0
23-Jun	0	22	0	0	71	438	0	0	0	0
24-Jun	11	33	0	0	169	607	0	0	0	0
25-Jun	74	107	0	0	594	1,201	0	0	0	0
26-Jun	241	348	0	0	450	1,651	0	0	0	0
27-Jun	21	369	0	0	175	1,826	0	0	0	0
28-Jun	84	453	0	0	176	2,002	0	0	0	0
29-Jun	75	528	0	0	266	2,268	0	0	0	0
30-Jun	43	571	0	0	378	2,646	0	0	0	0
1-Jul	315	886	0	0	462	3,108	0	0	0	0
2-Jul	131	1,017	0	0	690	3,798	0	0	0	0
3-Jul	86	1,103	0	0	660	4,458	0	0	0	0
4-Jul	165	1,268	0	0	525	4,983	0	0	0	0
5-Jul	243	1,511	0	0	482	5,465	0	0	0	0
6-Jul	7	1,518	0	0	235	5,700	0	0	0	0
7-Jul	84	1,602	0	0	638	6,338	0	0	0	0
8-Jul	106	1,708	0	0	811	7,149	0	0	0	0
9-Jul	229	1,937	0	0	836	7,985	0	0	0	0
10-Jul	165	2,102	0	0	627	8,612	0	0	0	0
11-Jul	43	2,145	0	0	425	9,037	0	0	0	0
12-Jul	16	2,161	0	0	502	9,539	0	0	0	0
13-Jul	98	2,259	0	0	967	10,506	0	0	0	0
14-Jul	29	2,288	0	0	759	11,265	0	0	0	0
15-Jul	31	2,319	0	0	642	11,907	0	0	0	0
16-Jul	47	2,366	0	0	829	12,736	0	0	0	0
17-Jul	161	2,527	0	0	863	13,599	0	0	0	0
18-Jul	53	2,580	0	0	800	14,399	0	0	0	0
19-Jul	17	2,597	1	1	655	15,054	0	0	0	0
20-Jul	12	2,609	0	1	573	15,627	0	0	1	1
21-Jul	22	2,631	0	1	557	16,184	0	0	0	1
22-Jul	21	2,652	0	1	495	16,679	0	0	3	4
23-Jul	26	2,678	0	1	513	17,192	0	0	6	10
24-Jul	19	2,697	0	1	463	17,655	0	0	7	17
25-Jul	13	2,710	0	1	474	18,129	0	0	3	20
26-Jul	14	2,724	0	1	359	18,488	0	0	19	39
27-Jul	26	2,750	0	1	421	18,909	0	0	31	70
28-Jul	19	2,769	0	1	344	19,253	0	0	22	92
29-Jul	9	2,778	0	1	304	19,557	0	0	18	110
30-Jul	2	2,780	0	1	123	19,680	0	0	15	125
31-Jul	15	2,795	1	2	322	20,002	0	0	106	231
1-Aug	0	2,795	0	2	151	20,153	0	0	55	286
2-Aug	1	2,796	0	2	124	20,277	0	0	93	379
3-Aug	2	2,798	0	2	85	20,362	0	0	98	477

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Table 15.—Page 2 of 2.

Date	Chinook		Sockeye		Chum		Pink		Coho	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
4-Aug	4	2,802	0	2	93	20,455	0	0	128	605
5-Aug	6	2,808	1	3	117	20,572	0	0	214	819
6-Aug	5	2,813	0	3	87	20,659	0	0	452	1,271
7-Aug	3	2,816	0	3	99	20,758	0	0	468	1,739
8-Aug	4	2,820	0	3	134	20,892	0	0	437	2,176
9-Aug	0	2,820	0	3	43	20,935	0	0	497	2,673
10-Aug	2	2,822	1	4	44	20,979	0	0	536	3,209
11-Aug	3	2,825	2	6	45	21,024	0	0	450	3,659
12-Aug	0	2,825	0	6	26	21,050	0	0	722	4,381
13-Aug	1	2,826	0	6	13	21,063	0	0	534	4,915
14-Aug	0	2,826	0	6	22	21,085	0	0	646	5,561
15-Aug	0	2,826	0	6	19	21,104	0	0	628	6,189
16-Aug	1	2,827	0	6	14	21,118	0	0	515	6,704
17-Aug	0	2,827	0	6	7	21,125	0	0	575	7,279
18-Aug	0	2,827	0	6	5	21,130	0	0	591	7,870
19-Aug	0	2,827	0	6	14	21,144	0	0	716	8,586
20-Aug	0	2,827	0	6	20	21,164	0	0	395	8,981
21-Aug	3	2,830	0	6	9	21,173	0	0	708	9,689
22-Aug	0	2,830	0	6	12	21,185	0	0	825	10,514
23-Aug	1	2,831	0	6	9	21,194	0	0	679	11,193
24-Aug	0	2,831	0	6	4	21,198	0	0	473	11,666
25-Aug	0	2,831	1	7	7	21,205	0	0	638	12,304
26-Aug	0	2,831	0	7	5	21,210	0	0	266	12,570
27-Aug	0	2,831	0	7	4	21,214	0	0	304	12,874
28-Aug	0	2,831	0	7	3	21,217	0	0	259	13,133
29-Aug	1	2,832	0	7	3	21,220	0	0	246	13,379
30-Aug	0	2,832	0	7	0	21,220	0	0	238	13,617
31-Aug	0	2,832	0	7	1	21,221	0	0	284	13,901
1-Sep	0	2,832	0	7	6	21,227	0	0	507	14,408
2-Sep	1	2,833	0	7	0	21,227	0	0	260	14,668
3-Sep	0	2,833	0	7	2	21,229	0	0	281	14,949
4-Sep	0	2,833	0	7	2	21,231	0	0	183	15,132
5-Sep	0	2,833	1	8	1	21,232	0	0	88	15,220
6-Sep	0	2,833	0	8	2	21,234	0	0	137	15,357
7-Sep	0	2,833	0	8	3	21,237	0	0	117	15,474
8-Sep	0	2,833	0	8	0	21,237	0	0	134	15,608
9-Sep	0	2,833	0	8	0	21,237	0	0	119	15,727
10-Sep	0	2,833	1	9	0	21,237	0	0	123	15,850
11-Sep	0	2,833	0	9	2	21,239	0	0	149	15,999
12-Sep	0	2,833	0	9	1	21,240	0	0	95	16,094
13-Sep	0	2,833	0	9	1	21,241	0	0	114	16,208
14-Sep	0	2,833	0	9	1	21,242	0	0	85	16,293
15-Sep	0	2,833	0	9	2	21,244	0	0	68	16,361
16-Sep	0	2,833	0	9	1	21,245	0	0	19	16,380
17-Sep	0	2,833	0	9	0	21,245	0	0	23	16,403
18-Sep	0	2,833	1	10	0	21,245	0	0	7	16,410
19-Sep	0	2,833	0	10	0	21,245	0	0	0	16,410
20-Sep	0	2,833	0	10	0	21,245	0	0	0	16,410

Table 16.—Daily and cumulative salmon passage through the Takotna River weir, Kuskokwim River drainage, 2004.

Date	Chinook		Sockeye		Chum		Coho	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
15-Jun	0	0	0	0	0	0	0	0
16-Jun	0	0	0	0	0	0	0	0
17-Jun	0	0	0	0	0	0	0	0
18-Jun	0	0	0	0	0	0	0	0
19-Jun	0	0	0	0	0	0	0	0
20-Jun	0	0	0	0	0	0	0	0
21-Jun	0	0	0	0	0	0	0	0
22-Jun	0	0	0	0	0	0	0	0
23-Jun	1	1	0	0	3	3	0	0
24-Jun	1	2	0	0	4	7	0	0
25-Jun	2	4	0	0	8	15	0	0
26-Jun	3	7	0	0	31	46	0	0
27-Jun	7	14	0	0	28	74	0	0
28-Jun	16	30	0	0	32	106	0	0
29-Jun	4	34	0	0	29	135	0	0
30-Jun	16	50	0	0	34	169	0	0
1-Jul	2	52	0	0	54	223	0	0
2-Jul	1	53	0	0	41	264	0	0
3-Jul	4	57	0	0	59	323	0	0
4-Jul	23	80	0	0	58	381	0	0
5-Jul	6	86	0	0	48	429	0	0
6-Jul	17	103	0	0	108	537	0	0
7-Jul	6	109	0	0	66	603	0	0
8-Jul	19	128	0	0	65	668	0	0
9-Jul	147	275	0	0	92	760	0	0
10-Jul	16	291	0	0	87	847	0	0
11-Jul	15	306	0	0	74	921	0	0
12-Jul	14	320	0	0	73	994	0	0
13-Jul	3	323	0	0	23	1,017	0	0
14-Jul	16	339	0	0	33	1,050	0	0
15-Jul	12	351	0	0	22	1,072	0	0
16-Jul	9	360	0	0	31	1,103	0	0
17-Jul	4	364	0	0	57	1,160	0	0
18-Jul	9	373	0	0	92	1,252	0	0
19-Jul	1	374	0	0	29	1,281	0	0
20-Jul	3	377	0	0	36	1,317	0	0
21-Jul	6	383	0	0	15	1,332	0	0
22-Jul	2	385	0	0	25	1,357	0	0
23-Jul	26	411	0	0	58	1,415	0	0
24-Jul	1	412	0	0	33	1,448	0	0
25-Jul	0	412	0	0	15	1,463	0	0
26-Jul	9	421	0	0	24	1,487	0	0
27-Jul	2	423	0	0	13	1,500	0	0
28-Jul	3	426	0	0	13	1,513	0	0
29-Jul	2	428	0	0	17	1,530	0	0
30-Jul	12	440	0	0	26	1,556	0	0
31-Jul	0	440	1	1	17	1,573	1	1
1-Aug	0	440	0	1	12	1,585	1	2
2-Aug	1	441	0	1	8	1,593	1	3
3-Aug	0	441	0	1	3	1,596	0	3

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Table 16.–Page 2 of 2.

Date	Chinook		Sockeye		Chum		Coho	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
4-Aug	1	442	0	1	5	1,601	3	6
5-Aug	6	448	0	1	4	1,605	4	10
6-Aug	2	450	0	1	5	1,610	16	26
7-Aug	1	451	0	1	4	1,614	14	40
8-Aug	0	451	0	1	2	1,616	19	59
9-Aug	2	453	0	1	3	1,619	24	83
10-Aug	1	454	1	2	1	1,620	18	101
11-Aug	0	454	0	2	2	1,622	28	129
12-Aug	0	454	0	2	4	1,626	78	207
13-Aug	2	456	0	2	2	1,628	20	227
14-Aug	0	456	1	3	1	1,629	61	288
15-Aug	1	457	0	3	0	1,629	60	348
16-Aug	0	457	4	7	0	1,629	92	440
17-Aug	0	457	2	9	1	1,630	182	622
18-Aug	1	458	0	9	1	1,631	124	746
19-Aug	1	459	0	9	1	1,632	56	802
20-Aug	1	460	1	10	0	1,632	74	876
21-Aug	0	460	0	10	0	1,632	57	933
22-Aug	0	460	1	11	0	1,632	61	994
23-Aug	0	460	0	11	0	1,632	88	1,082
24-Aug	1	461	0	11	0	1,632	57	1,139
25-Aug	0	461	1	12	0	1,632	137	1,276
26-Aug	1	462	2	14	0	1,632	572	1,848
27-Aug	0	462	0	14	0	1,632	73	1,921
28-Aug	0	462	0	14	0	1,632	44	1,965
29-Aug	0	462	0	14	0	1,632	74	2,039
30-Aug	0	462	1	15	0	1,632	46	2,085
31-Aug	0	462	0	15	0	1,632	37	2,122
1-Sep	0	462	0	15	0	1,632	398	2,520
2-Sep	0	462	0	15	0	1,632	330	2,850
3-Sep	0	462	0	15	0	1,632	70	2,920
4-Sep	0	462	1	16	1	1,633	11	2,931
5-Sep	0	462	0	16	0	1,633	20	2,951
6-Sep	0	462	0	16	0	1,633	3	2,954
7-Sep	0	462	0	16	0	1,633	6	2,960
8-Sep	0	462	0	16	0	1,633	23	2,983
9-Sep	0	462	0	16	0	1,633	18	3,001
10-Sep	0	462	0	16	0	1,633	192	3,193
11-Sep	0	462	0	16	0	1,633	0	3,193
12-Sep	0	462	0	16	0	1,633	0	3,193
13-Sep	0	462	0	16	0	1,633	0	3,193
14-Sep	0	462	0	16	0	1,633	9	3,202
15-Sep	0	462	0	16	0	1,633	3	3,205
16-Sep	0	462	1	17	0	1,633	2	3,207
17-Sep	0	462	0	17	0	1,633	0	3,207
18-Sep	0	462	0	17	0	1,633	0	3,207
19-Sep	0	462	0	17	0	1,633	0	3,207
20-Sep	0	462	0	17	0	1,633	0	3,207

Table 17.—Daily and cumulative salmon passage through the Kanektok River weir, Kuskokwim Bay drainage, 2004.

Date	Chinook		Sockeye		Chum		Pink		Coho	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
15-Jun	0	0	0	0	0	0	0	0	0	0
16-Jun	0	0	0	0	0	0	0	0	0	0
17-Jun	0	0	0	0	0	0	0	0	0	0
18-Jun	0	0	0	0	0	0	0	0	0	0
19-Jun	0	0	0	0	0	0	0	0	0	0
20-Jun	0	0	0	0	0	0	0	0	0	0
21-Jun	0	0	0	0	0	0	0	0	0	0
22-Jun	0	0	0	0	0	0	0	0	0	0
23-Jun	0	0	0	0	0	0	0	0	0	0
24-Jun	0	0	0	0	0	0	0	0	0	0
25-Jun	0	0	0	0	0	0	0	0	0	0
26-Jun	0	0	0	0	0	0	0	0	0	0
27-Jun	0	0	0	0	0	0	0	0	0	0
28-Jun	0	0	0	0	0	0	0	0	0	0
29-Jun	8	8	309	309	82	82	5	5	0	0
30-Jun	129	137	2,155	2,464	586	668	68	73	0	0
1-Jul	180	317	2,632	5,096	648	1,316	73	146	0	0
2-Jul	94	411	1,609	6,705	240	1,556	37	183	0	0
3-Jul	137	548	2,258	8,963	353	1,909	38	221	0	0
4-Jul	126	674	2,208	11,171	562	2,471	68	289	0	0
5-Jul	209	883	3,296	14,467	572	3,043	84	373	0	0
6-Jul	158	1,041	3,327	17,794	553	3,596	75	448	0	0
7-Jul	574	1,615	6,779	24,573	1,390	4,986	157	605	0	0
8-Jul	475	2,090	6,015	30,588	1,673	6,659	169	774	0	0
9-Jul	610	2,700	7,516	38,104	1,707	8,366	296	1,070	2	2
10-Jul	908	3,608	6,732	44,836	2,006	10,372	372	1,442	2	4
11-Jul	711	4,319	5,882	50,718	1,925	12,297	461	1,903	5	9
12-Jul	1,357	5,676	5,969	56,687	2,049	14,346	546	2,449	11	20
13-Jul	574	6,250	3,016	59,703	1,147	15,493	351	2,800	16	36
14-Jul	404	6,654	3,358	63,061	1,048	16,541	325	3,125	6	42
15-Jul	608 ^a	7,262	3,021 ^a	66,082	1,515 ^a	18,056	333 ^a	3,458	5 ^a	47
16-Jul	887	8,149	2,285	68,367	1,432	19,488	385	3,843	8	55
17-Jul	618	8,767	2,271	70,638	1,256	20,744	319	4,162	3	58
18-Jul	819	9,586	2,276	72,914	2,473	23,217	601	4,763	1	59
19-Jul	949 ^a	10,535	2,421 ^a	75,335	2,328 ^a	25,545	703 ^a	5,466	1 ^a	60
20-Jul	1,168	11,703	2,892	78,227	1,579	27,124	949	6,415	4	64
21-Jul	773	12,476	1,984	80,211	1,818	28,942	1,237	7,652	5	69
22-Jul	692	13,168	2,479	82,690	1,130	30,072	1,167	8,819	11	80
23-Jul	611	13,779	2,218	84,908	1,300	31,372	1,261	10,080	13	93
24-Jul	453	14,232	2,381	87,289	1,225	32,597	2,384	12,464	25	118
25-Jul	540	14,772	2,247	89,536	989	33,586	2,922	15,386	46	164
26-Jul	443	15,215	1,628	91,164	1,057	34,643	2,864	18,250	29	193
27-Jul	660	15,875	1,566	92,730	1,299	35,942	5,416	23,666	37	230
28-Jul	385	16,260	691	93,421	688	36,630	2,864	26,530	35	265
29-Jul	317	16,577	1,070	94,491	848	37,478	3,371	29,901	43	308
30-Jul	440	17,017	989	95,480	1,002	38,480	3,924	33,825	97	405
31-Jul	341	17,358	837	96,317	891	39,371	4,050	37,875	168	573
1-Aug	434	17,792	841	97,158	944	40,315	7,135	45,010	210	783
2-Aug	344	18,136	860	98,018	818	41,133	6,124	51,134	345	1,128
3-Aug	350	18,486	625	98,643	837	41,970	9,367	60,501	378	1,506

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Table 17.—Page 2 of 2.

Date	Chinook		Sockeye		Chum		Pink		Coho	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
4-Aug	151	18,637	480	99,123	442	42,412	4,493	64,994	236	1,742
5-Aug	137	18,774	367	99,490	455	42,867	2,959	67,953	317	2,059
6-Aug	60	18,834	343	99,833	351	43,218	1,496	69,449	315	2,374
7-Aug	143	18,977	391	100,224	575	43,793	4,731	74,180	491	2,865
8-Aug	68	19,045	228	100,452	285	44,078	2,086	76,266	386	3,251
9-Aug	60	19,105	276	100,728	376	44,454	2,504	78,770	721	3,972
10-Aug	39	19,144	155	100,883	305	44,759	1,788	80,558	389	4,361
11-Aug	85	19,229	224	101,107	299	45,058	2,089	82,647	1,148	5,509
12-Aug	42	19,271	141	101,248	255	45,313	2,334	84,981	693	6,202
13-Aug	37	19,308	122	101,370	200	45,513	2,003	86,984	1,370	7,572
14-Aug	31	19,339	121	101,491	159	45,672	1,292	88,276	2,083	9,655
15-Aug	13	19,352	102	101,593	95	45,767	862	89,138	1,494	11,149
16-Aug	26	19,378	155	101,748	150	45,917	1,679	90,817	2,182	13,331
17-Aug	23	19,401	128	101,876	123	46,040	1,459	92,276	2,671	16,002
18-Aug	18	19,419	62	101,938	75	46,115	954	93,230	2,522	18,524
19-Aug	8	19,427	45	101,983	33	46,148	399	93,629	1,156	19,680
20-Aug	18	19,445	52	102,035	56	46,204	715	94,344	2,412	22,092
21-Aug	7	19,452	79	102,114	42	46,246	520	94,864	1,986	24,078
22-Aug	4	19,456	50	102,164	38	46,284	384	95,248	1,645	25,723
23-Aug	7	19,463	36	102,200	26	46,310	277	95,525	1,240	26,963
24-Aug	5	19,468	62	102,262	33	46,343	480	96,005	1,830	28,793
25-Aug	9	19,477	58	102,320	13	46,356	509	96,514	2,212	31,005
26-Aug	8	19,485	72	102,392	24	46,380	277	96,791	4,103	35,108
27-Aug	3	19,488	21	102,413	6	46,386	109	96,900	1,875	36,983
28-Aug	3	19,491	21	102,434	3	46,389	122	97,022	782	37,765
29-Aug	3	19,494	39	102,473	4	46,393	170	97,192	576	38,341
30-Aug	9	19,503	21	102,494	8	46,401	109	97,301	1,144	39,485
31-Aug	6	19,509	33	102,527	8	46,409	155	97,456	2,543	42,028
1-Sep	5	19,514	39	102,566	7	46,416	162	97,618	3,466	45,494
2-Sep	1	19,515	31	102,597	5	46,421	164	97,782	3,818	49,312
3-Sep	1	19,516	28	102,625	2	46,423	75	97,857	2,974	52,286
4-Sep	1	19,517	21	102,646	2	46,425	28	97,885	1,989	54,275
5-Sep	0	19,517	19	102,665	0	46,425	25	97,910	1,640	55,915
6-Sep	3	19,520	27	102,692	4	46,429	38	97,948	2,376	58,291
7-Sep	0	19,520	19	102,711	2	46,431	30	97,978	2,030	60,321
8-Sep	2	19,522	20	102,731	0	46,431	24	98,002	2,982	63,303
9-Sep	1	19,523	27	102,758	5	46,436	17	98,019	3,577	66,880
10-Sep	2	19,525	20	102,778	1	46,437	12	98,031	2,897	69,777
11-Sep	0	19,525	18	102,796	1	46,438	8	98,039	2,789	72,566
12-Sep	0	19,525	13	102,809	0	46,438	8	98,047	2,827	75,393
13-Sep	0	19,525	8	102,817	0	46,438	3	98,050	1,439	76,832
14-Sep	0	19,525	4	102,821	1	46,439	3	98,053	1,294	78,126
15-Sep	2	19,527	12	102,833	2	46,441	2	98,055	1,546	79,672
16-Sep	0	19,527	10	102,843	1	46,442	1	98,056	1,517	81,189
17-Sep	0	19,527	3	102,846	0	46,442	1	98,057	1,220	82,409
18-Sep	0	19,527	5	102,851	1	46,443	3	98,060	1,573	83,982
19-Sep	0	19,527	7	102,858	1	46,444	0	98,060	1,941	85,923
20-Sep	1	19,528	9	102,867	0	46,444	0	98,060	1,905	87,828

^a Daily passage was partially estimated because of a breach in the weir.

Table 18.—Daily and cumulative Chinook, sockeye, chum, coho, and pink salmon passage, Middle Fork Goodnews River weir, 2004.

Date	Chinook		Sockeye		Chum		Coho		Pink	
	Daily	Cum..	Daily	Cum..	Daily	Cum..	Daily	Cum..	Daily	Cum..
6/21	3	3	55	55	0	0	0	0	0	0
6/22	11	14	619	674	1	1	0	0	0	0
6/23	31	45	810	1,484	24	25	0	0	3	3
6/24	35	80	1,055	2,539	30	55	0	0	2	5
6/25	27	107	1,309	3,848	67	122	0	0	3	8
6/26	50 ^a	157	681 ^a	4,529	93 ^a	215	0 ^a	0	1 ^b	9
6/27	248	405	2,488	7,017	343	558	0	0	78	87
6/28	130	535	1,888	8,905	211	769	0	0	6	93
6/29	132	667	1,674	10,579	519	1,288	0	0	40	133
6/30	242	909	2,060	12,639	465	1,753	0	0	51	184
7/01	235	1,144	2,233	14,872	584	2,337	0	0	59	243
7/02	119	1,263	2,344	17,216	337	2,674	0	0	40	283
7/03	32	1,295	1,777	18,993	170	2,844	0	0	52	335
7/04	190	1,485	2,968	21,961	1,411	4,255	0	0	125	460
7/05	96	1,581	4,018	25,979	678	4,933	0	0	140	600
7/06	46	1,627	1,975	27,954	267	5,200	0	0	31	631
7/07	79 ^a	1,706	3,619 ^a	31,573	908 ^a	6,108	0 ^a	0	52 ^b	683
7/08	179	1,885	2,919	34,492	817	6,925	0	0	140	823
7/09	176	2,061	2,927	37,419	1,467	8,392	0	0	147	970
7/10	455 ^a	2,515	2,698 ^a	40,117	1,775 ^a	10,167	0 ^a	0	179 ^b	1,149
7/11	286	2,801	1,896	42,013	2,137	12,304	0	0	204	1,353
7/12	163	2,964	2,391	44,404	1,319	13,623	0	0	285	1,638
7/13	20	2,984	1,257	45,661	484	14,107	0	0	209	1,847
7/14	14	2,998	953	46,614	462	14,569	0	0	88	1,935
7/15	83	3,081	1,219	47,833	914	15,483	0	0	77	2,012
7/16	125 ^a	3,206	939 ^a	48,772	1,391 ^a	16,874	0 ^a	0	109 ^b	2,121
7/17	17 ^a	3,223	232 ^a	49,004	204 ^a	17,077	1 ^a	1	81 ^b	2,202
7/18	115	3,338	773	49,777	1,067	18,144	6	7	163	2,365
7/19	72	3,410	837	50,614	1,434	19,578	0	7	184	2,549
7/20	172	3,582	874	51,488	1,753	21,331	2	9	392	2,941
7/21	84	3,666	598	52,086	884	22,215	4	13	354	3,295
7/22	67 ^a	3,733	451 ^a	52,537	527 ^a	22,742	0 ^a	13	114 ^b	3,409
7/23	15	3,748	410	52,947	401	23,143	0	13	80	3,489
7/24	6	3,754	132	53,079	481	23,624	0	13	67	3,556
7/25	70	3,824	466	53,545	714	24,338	2	15	237	3,793
7/26	48	3,872	233	53,778	869	25,207	3	18	231	4,024
7/27	14	3,886	138	53,916	332	25,539	0	18	70	4,094
7/28	55	3,941	174	54,090	428	25,967	14	32	136	4,230
7/29	37	3,978	98	54,188	449	26,416	19	51	66	4,296
7/30	28	4,006	127	54,315	474	26,890	16	67	83	4,379
7/31	20	4,026	179	54,494	665	27,555	30	97	89	4,468
8/01	46	4,072	132	54,626	578	28,133	21	118	155	4,623
8/02	31	4,103	140	54,766	458	28,591	47	165	175	4,798
8/03	34	4,137	89	54,855	671	29,262	57	222	722	5,520
8/04	20	4,157	70	54,925	220	29,482	40	262	411	5,931
8/05	39	4,196	91	55,016	300	29,782	54	316	363	6,294
8/06	29	4,225	77	55,093	408	30,190	98	414	237	6,531

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Table 18.—Page 2 of 2.

Date	Chinook		Sockeye		Chum		Coho		Pink	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
8/07	18	4,243	51	55,144	223	30,413	83	497	266	6,797
8/08	9	4,252	26	55,170	152	30,565	36	533	281	7,078
8/09	3	4,255	97	55,267	157	30,722	18	551	280	7,358
8/10	10	4,265	57	55,324	190	30,912	159	710	529	7,887
8/11	15	4,280	48	55,372	95	31,007	58	768	321	8,208
8/12	6	4,286	25	55,397	64	31,071	91	859	254	8,462
8/13	29	4,315	66	55,463	114	31,185	309	1,168	1,117	9,579
8/14	7	4,322	76	55,539	65	31,250	362	1,530	618	10,197
8/15	7	4,329	37	55,576	46	31,296	217	1,747	258	10,455
8/16	2	4,331	61	55,637	83	31,379	592	2,339	657	11,112
8/17	6	4,337	22	55,659	42	31,421	642	2,981	531	11,643
8/18	7	4,344	12	55,671	32	31,453	244	3,225	626	12,269
8/19	4	4,348	15	55,686	19	31,472	233	3,458	649	12,918
8/20	4	4,352	15	55,701	29	31,501	367	3,825	535	13,453
8/21	3	4,355	17	55,718	25	31,526	709	4,534	559	14,012
8/22	1	4,356	1	55,719	6	31,532	197	4,731	243	14,255
8/23	5	4,361	9	55,728	8	31,540	528	5,259	562	14,817
8/24	5	4,366	9	55,737	10	31,550	273	5,532	263	15,080
8/25	1	4,367	20	55,757	13	31,563	849	6,381	727	15,807
8/26	5	4,372	24	55,781	6	31,569	3,917	10,298	1,836	17,643
8/27	0	4,372	11	55,792	1	31,570	80	10,378	115	17,758
8/28	0	4,372	5	55,797	0	31,570	34	10,412	112	17,870
8/29	1	4,373	15	55,812	3	31,573	801	11,213	529	18,399
8/30	1	4,374	8	55,820	5	31,578	1,320	12,533	547	18,946
8/31	3	4,377	5	55,825	3	31,581	1,491	14,024	435	19,381
9/01	2	4,379	3	55,828	0	31,581	1,802	15,826	386	19,767
9/02	1	4,380	6	55,834	4	31,585	3,583	19,409	432	20,199
9/03	1	4,381	2	55,836	1	31,586	361	19,770	111	20,310
9/04	2	4,383	4	55,840	4	31,590	616	20,386	167	20,477
9/05	1	4,384	13	55,853	2	31,592	426	20,812	145	20,622
9/06	1	4,385	4	55,857	2	31,594	1,877	22,689	165	20,787
9/07	0	4,385	2	55,859	3	31,597	995	23,684	136	20,923
9/08	0	4,385	14	55,873	3	31,600	5,142	28,826	230	21,153
9/09	0	4,385	6	55,879	1	31,601	4,515	33,341	189	21,342
9/10	0	4,385	7	55,886	1	31,602	1,354	34,695	67	21,409
9/11	0	4,385	6	55,892	2	31,604	699	35,394	18	21,427
9/12	0	4,385	3	55,895	1	31,605	1,214	36,608	24	21,451
9/13	0	4,385	4	55,899	1	31,606	293	36,901	17	21,468
9/14	1	4,386	3	55,902	0	31,606	585	37,486	26	21,494
9/15	0	4,386	6	55,908	1	31,607	1,789	39,275	39	21,533
9/16	0	4,386	4	55,912	3	31,610	1,331	40,606	19	21,552
9/17	2	4,388	1	55,913	3	31,613	741	41,347	18	21,570
9/18	0	4,388	1	55,914	2	31,615	702	42,049	19	21,589
9/19	0	4,388	12	55,926	1	31,616	4,033	46,082	29	21,618
9/20	0	4,388	0	55,926	0	31,616	1,834	47,916	15	21,633
Total	4,388		55,926		31,616		47,916		21,633	
Observed	4,244		53,532		30,422		47,916		21,633	
Estimated	144		2,394		1,194		0		0	
% Obs.	96.7		95.7		96.2		100.0		100.0	

^a Daily passage was partially estimated because of a breach in the weir.

^b Partial day counts because of a breach in weir, no estimates were made.

Table 19.—Daily and cumulative salmon passage enumerated by Aniak River sonar, Kuskokwim River drainage, 2004.

Date	Left Bank	Right Bank	Daily Total	Cumulative Total	LB % Passage	RB % Passage	Daily % Passage	Cum. % Passage
6/25	118	396	514	514	23%	77%	0.1	0.1
6/26	2,207	1,567	3,774	4,288	58%	42%	0.6	0.6
6/27	6,727	5,382	12,108	16,396	56%	44%	1.8	2.4
6/28	7,542	9,412	16,954	33,350	44%	56%	2.5	5.0
6/29	7,739	9,485	17,224	50,574	45%	55%	2.6	7.5
6/30	6,167	7,131	13,297	63,872	46%	54%	2.0	9.5
7/1	6,524	7,618	14,142	78,013	46%	54%	2.1	11.6
7/2	2,622	3,361	5,982	83,995	44%	56%	0.9	12.5
7/3	4,790	6,476	11,266	95,261	43%	57%	1.7	14.1
7/4	6,610	10,046	16,656	111,917	40%	60%	2.5	16.6
7/5	4,664	8,083	12,747	124,664	37%	63%	1.9	18.5
7/6	5,142	5,018	10,160	134,824	51%	49%	1.5	20.0
7/7	13,274	12,688	25,962	160,786	51%	49%	3.9	23.9
7/8	10,712	10,714	21,426	182,212	50%	50%	3.2	27.1
7/9	13,322	9,824	23,146	205,358	58%	42%	3.4	30.5
7/10	9,936	9,104	19,040	224,398	52%	48%	2.8	33.3
7/11	11,294	11,042	22,336	246,734	51%	49%	3.3	36.6
7/12	10,468	13,842	24,310	271,045	43%	57%	3.6	40.2
7/13	10,831	15,787	26,618	297,662	41%	59%	4.0	44.2
7/14	11,498	16,240	27,738	325,400	41%	59%	4.1	48.3
7/15	8,916	15,218	24,134	349,534	37%	63%	3.6	51.9
7/16	12,976	14,354	27,330	376,864	47%	53%	4.1	56.0
7/17	7,930	8,972	16,902	393,766	47%	53%	2.5	58.5
7/18	10,791	12,991	23,782	417,549	45%	55%	3.5	62.0
7/19	15,722	15,224	30,946	448,495	51%	49%	4.6	66.6
7/20	14,351	13,190	27,541	476,036	52%	48%	4.1	70.7
7/21	17,344	12,072	29,416	505,452	59%	41%	4.4	75.1
7/22	11,466	9,668	21,134	526,586	54%	46%	3.1	78.2
7/23	12,626	8,996	21,622	548,208	58%	42%	3.2	81.4
7/24	13,282	9,871	23,153	571,361	57%	43%	3.4	84.8
7/25	9,096	7,792	16,888	588,249	54%	46%	2.5	87.3
7/26	5,754	4,943	10,698	598,947	54%	46%	1.6	88.9
7/27	6,259	5,024	11,283	610,230	55%	45%	1.7	90.6
7/28	10,477	7,030	17,507	627,737	60%	40%	2.6	93.2
7/29	10,702	7,816	18,518	646,255	58%	42%	2.7	96.0
7/30	8,218	4,436	12,654	658,909	65%	35%	1.9	97.8
7/31	9,614	4,922	14,536	673,445	66%	34%	2.2	100.0
Total	337,711	335,733	673,445					

Note: RB = right bank, LB = left bank.

Table 20.–Peak salmon spawning aerial survey index counts, Kuskokwim Area, 2004.

Location	Date	Chinook	Sockeye	Coho	Chum
KUSKOKWIM RIVER:					
Pitka Fork (Mainstem)	7/19	289	0	0	0
Bear Creek (Pitka Fork)	7/20	206	0	0	0
Little Tonzona River (S. Fork Kuskokwim) ^a	7/20	0	0	0	0
Salmon River (Pitka Fork)	7/20	1,138	0	0	0
Fourth of July Creek (Takotna River)	7/21	75	0	0	57
Cheeneetnu River (Swift River)	7/22	918	0	0	0
Gagaryah River (Swift River)	7/22	670	0	0	0
Holitna River	7/23	4,842	0	0	0
Holokuk River	7/23	539	0	0	0
Kogruklu River (Holitna River)	7/23	7,252	0	0	0
Oskawalik River	7/23	293	0	0	0
Shotgun Creek (Kogruklu River)	7/23	1,817	0	0	0
George River (Mainstem) ^b	7/24	838	0	0	0
Tatlawiksuk River ^a	7/24	307			
Aniak River	7/26	5,569	0	0	0
Salmon River (Aniak River)	7/27	2,177	0	0	0
Tuluksak River	7/27	1,196	0	0	0
Kipchuck River (Aniak River)	7/28	1,868	0	0	0
Kisaralik River	7/29	6,913	0	0	0
Eek River	7/30	4,653	0 ^b	0	0
Kwethluk River / Canyon Creek	7/31	6,801	0	0	0
KUSKOKWIM BAY:					
Middle Fork Goodnews River & Lakes	7/31	2,617	33,670	0	0
North Fork Goodnews River & Lake	7/31	7,462	31,695	0	0
Kanektok River	8/1	28,375	78,380	0	0

Note: Peak aerial salmon escapement index count. Aerial index counts do not represent total escapement, but reflect annual spawner abundance trends when using standard survey methods under acceptable conditions.

^a Survey was incomplete because of poor survey conditions.

^b Fish were observed and appeared to be abundant, but conditions prevented the surveyor from making a reliable count.

Table 21.–Herring Emergency Order summary, 2004.

EO#	DESCRIPTION	Effective Date - Expiration Date	Rescind EO#	EO Still In EFFECT
Cape Avinof				
3-H-WV-01-04	Opens the commercial season to	6:00 p.m.	None	None
	Issued May 13, 2004	Exp 12:00 a.m.		
3-H-WV-02-04	Closes the commercial season to	6:30 p.m.	3-H-WV-01-04	None
	Issued May 25, 2004	Exp 11:59 p.m.		
Goodnews Bay				
3-H-WW-01-04	Establishes a 4 hour herring fishing	3:00 p.m.	None	None
	Issued May 12, 2004	Exp 7:00 p.m.		
3-H-WW-02-04	Opens the commercial season to	6:00 p.m.	None	None
	Issued May 17, 2004	Exp 12:00 a.m.		
3-H-WW-03-04	Closes the commercial season to	2:00 p.m.	3-H-WW-02-04	None
	Issued May 21, 2004	Exp 11:59 p.m.		
Nelson Island				
3-H-WN-01-04	Establishes a 4 hour herring fishing	10:00 p.m.	None	None
	Issued May 18, 2004	Exp 2:00 a.m.		
3-H-WN-02-04	Opens the commercial season to	9:00 a.m.	None	None
	Issued May 19, 2004	Exp 12:00 a.m.		
3-H-WN-03-04	Closes the commercial season to	7:30 a.m.	3-H-WN-02-04	None
	Issued May 27, 2004	Exp 11:59 p.m.		
Nunivak Island				
3-H-WU-01-04	Opens the commercial season to	12:00 noon	None	None
	Issued May 12, 2004	Exp 11:59 p.m.		
3-H-WU-02-04	Closes the commercial season to	12:00 noon.	3-H-WU-01-04	None
	Issued June 15, 2004	Exp 11:59 p.m.		

Table 22.—Herring commercial fishing periods by district, Kuskokwim Bay, 2004.

District	Period	Date	Total hours	Harvest ^a (st)
Security Cove	No Commercial Fishery			
Goodnews Bay	1	5/13	4.0	0.5
	2	5/17- 5/21	92.0	33.4
	Total		96.0	33.9
Cape Avinof	1	5/13–5/25	288.5	62.7
	Total		288.5	62.7
Nelson Island	1	5/18–5/19	4.0	15.8
	2	5/19–5/27	190.5	809.5
	Total		194.5	825.3
Nunivak Island (Purse Seine)	1	5/12–6/15	816.0	0.0
	Total		816.0	0.0
Totals			1,395	921.9

^a Report includes estimated hopper weights for actual de-watered weights as reported by processor on fish tickets and in final catch reports. Hopper weight was estimated by adding 10%.

Table 23.—Herring aerial survey abundance estimates, Security Cove District, Kuskokwim Bay, 2004.

Date ^b	Flight		Spawn		Biomass Estimates by Index Area ^a						Total
	No.	Hours	No.	Length (mi)	SEC		CGV		SRM		
					Tons	Rating ^c	Tons	Rating ^c	Tons	Rating ^c	
28-Apr	1	0.5	0	0	No biomass estimate calculated						
4-May	2	na	2	5.0	7,500	2	4,900	2	n/s	n/a	12,400
5-May	3	na	2	7	3,200	2	12,600	2	3000	2	18,000
6-May	4	na	4	15	4,500	4	24,700	4	400	4	29,000
19-May	5	0.5	1	3.0	800	2	400	4	0	3	1,400

Note: 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 Aerial surveys were attempted on May 4, 6, 7, and 9, Poor weather prevented surveys from being flown.

^c 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 24.—Herring age class composition of number by district, Kuskokwim Bay, 2004.

District	Age (years)												Total weight (st)
	2	3	4	5	6	7	8	9	10	11	12	13+	
Commercial catch^a													
Security Cove													-
Goodnews Bay	0.0	0.0	0.3	0.7	5.7	32.2	21.2	13.7	8.6	6.5	4.3	6.8	34
Cape Avinof	0.0	0.0	0.1	0.3	2.7	19.5	19.1	12.6	15.0	11.2	8.7	10.9	63
Nelson Island	0.0	0.0	0.0	0.0	0.6	10.4	17.6	11.8	19.5	14.4	11.8	13.8	825
Nunivak Island													-
All Districts	0.0	0.0	0.0	0.0	1.0	12.0	17.9	11.9	18.7	13.9	11.2	13.3	922
Total Run^b													
Security Cove	0.2	5.9	10.6	2.4	12.4	39.1	15.1	4.8	3.3	2.0	1.5	2.7	18,000
Goodnews Bay	0.0	5.7	10.0	1.5	13.2	38.6	15.9	4.5	3.5	2.1	1.5	3.4	13,500
Cape Avinof	0.2	5.9	10.6	2.4	12.4	39.1	15.1	4.8	3.3	2.0	1.5	2.7	3,369
Nelson Island	0.4	5.5	10.0	2.9	10.4	36.5	14.7	5.7	4.7	3.3	2.6	3.2	5,085
Nunivak Island	0.2	5.9	10.6	2.4	12.4	39.1	15.1	4.8	3.3	2.0	1.5	2.7	4,739
All Districts	0.2	5.8	10.4	2.2	12.4	38.6	15.3	4.8	3.5	2.2	1.7	2.9	44,693

^a Commercial set gill net.

^b ADF&G variable mesh gill net.

Table 25.—Herring age class composition of biomass by district, Kuskokwim Bay, 2004.

Age	Security Cove		Goodnews Bay		Cape Avinof		Nelson Island		Nunivak Island		Kuskokwim Area	
	% by weight	tons	% by weight	tons	% by weight	tons	% by weight	tons	% by weight	tons	% by weight	tons
Run												
2	0.1	14	0.0	0	0.1	3	0.1	6	0.1	4	0.1	26
3	2.8	494	2.7	356	2.7	91	2.4	122	2.8	130	2.7	1,192
4	5.8	1,043	5.3	714	5.7	192	5.3	271	5.8	275	5.6	2,493
5	1.9	334	1.1	144	1.8	61	2.0	102	1.9	88	1.6	729
6	11.3	2,035	11.8	1,579	11.2	375	9.3	469	11.3	536	11.2	4,994
7	39.4	7,075	38.5	5,162	39.0	1,309	35.5	1,798	39.4	1,863	38.7	17,206
8	17.4	3,115	18.2	2,448	17.4	583	16.4	833	17.4	820	17.5	7,798
9	6.3	1,136	6.1	815	6.5	217	7.4	377	6.3	299	6.4	2,845
10	4.8	855	5.2	698	5.0	167	6.9	351	4.8	225	5.2	2,296
11	3.3	589	3.3	439	3.5	116	5.1	260	3.3	155	3.5	1,559
12	2.6	459	2.5	341	2.7	91	4.3	218	2.6	121	2.8	1,230
13+	4.4	795	5.4	723	4.6	153	5.2	265	4.4	209	4.8	2,146
Total	100.0	17,943	100.0	13,419	100.0	3,358	100.0	5,071	100.0	4,724	100.0	44,515
Commercial Harvest												
2	-	0	0.0	0	0.0	0	0.0	0	-	0	0.0	0
3	-	0	0.0	0	0.0	0	0.0	0	-	0	0.0	0
4	-	0	0.2	0	0.1	0	0.0	0	-	0	0.0	0
5	-	0	0.5	0	0.2	0	0.0	0	-	0	0.0	0
6	-	0	4.4	1	2.0	1	0.4	3	-	0	0.7	6
7	-	0	28.1	9	16.4	10	8.7	67	-	0	9.9	86
8	-	0	20.9	7	18.1	11	16.5	127	-	0	16.7	145
9	-	0	15.1	5	13.3	8	12.3	95	-	0	12.4	108
10	-	0	9.8	3	16.7	10	21.5	166	-	0	20.7	179
11	-	0	8.6	3	13.5	8	16.4	127	-	0	15.9	138
12	-	0	5.9	2	10.9	6	13.8	107	-	0	13.3	115
13+	-	0	6.5	2	8.8	5	10.4	80	-	0	10.1	87
Total	-	0	100.0	33	100.0	60	100.0	772	-	0	100.0	864
Escapement												
2	0.1	14	0.0	0	0.1	3	0.1	6	0.1	4	0.1	26
3	2.8	494	2.7	356	2.8	91	2.9	122	2.8	130	2.8	1,192
4	5.9	1,043	5.4	714	5.9	192	6.4	271	5.9	275	5.8	2,493
5	1.9	334	1.1	144	1.9	61	2.4	102	1.9	88	1.7	729
6	11.5	2,035	11.9	1,578	11.5	374	11.1	466	11.5	536	11.6	4,988
7	39.9	7,075	38.9	5,153	39.9	1,299	41.1	1,731	39.9	1,863	39.7	17,120
8	17.6	3,115	18.4	2,441	17.6	572	16.8	706	17.6	820	17.7	7,654
9	6.4	1,136	6.1	810	6.4	209	6.7	283	6.4	299	6.3	2,737
10	4.8	855	5.2	695	4.8	157	4.4	185	4.8	225	4.9	2,117
11	3.3	589	3.3	436	3.3	108	3.2	133	3.3	155	3.3	1,421
12	2.6	459	2.6	339	2.6	84	2.6	111	2.6	121	2.6	1,114
13+	3.4	601	4.5	594	3.4	110	2.2	92	3.4	158	3.6	1,556
Total	100.0	17,749	100.0	13,259	100.0	3,260	100.0	4,207	100.0	4,673	100.0	43,148

Table 26.—Herring aerial survey abundance estimates, Goodnews Bay District, Kuskokwim Bay, 2004.

Date ^b	Flight		Spawn		Biomass estimates by index area ^a								Total
	No.	Hours	No.	length (mi)	NRM		GBE		GNB		CRB		
					Tons	Rating ^c	Tons	Rating ^c	Tons	Rating ^c	Tons	Rating ^c	
28-Apr	1		0	0.0	No biomass estimate calculated								
4-May	2		0	0.0	0	2	1,972	2	6,900	2	n/s	n/a	8,900
5-May	3		0	0.0	3,000	2	3,100	2	10,051	2	400	2	13,551
6-May	4		6	12.0	1,300	4	100	4	5,000	4	2,300	4	8,700
19-May	5		0	0.0	0	3.5	18	3	21	3	163	3	1,425

Note: 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 Aerial surveys were attempted on May 4, 6, 7, and 9. Poor weather prevent surveys from being flown.

^c 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 27.—Herring aerial survey abundance estimates, Nelson Island District, Kuskokwim Bay, 2004.

Flight			Spawn		Biomass estimates by index area ^a								Total
Date	No.	Hours	No.	Length (mi)	KGB		CPV		TAB		NLK		
					Tons	Rating ^b	Tons	Rating ^b	Tons	Rating ^b	Tons	Rating ^b	
20-May	1		1	0.25	n/s	n/a	111	4	0	4	645	3.5	756
26-May	2		0	0.0	80	4	57	4.5	7	5	34	4.5	178

Note: 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 28.–Executive Summary of Working Group and ADF&G actions, 2004.

Date	Comment
22 April	<p>The Kuskokwim River Salmon Management Working Group (Working Group) met at 10:15 a.m. on Tuesday, April 20, at the US Fish & Wildlife Service (USFWS) conference room in Bethel. Seven of twelve Working Group Members were present a quorum was established. The Working Group adjourned at 2:25 p.m. LaMont Albertson was elected as the Sport Fish representative and Beverly Hoffman was elected as alternate. Alexie A. Alexie was introduced as the Lower River subsistence representative and Greg Roczicka as alternate. James Charles was selected as the Member at Large representative. Matt Nemeth of LGL provided a summary of the status of the Kuskokwim River research plan. Angela Matz a contaminates specialist with the USFWS and Lori Verbrugge of the Division of Public Health made a presentation and answered questions regarding the "Contaminants in Salmon" study that was conducted on salmon captured in the Kuskokwim River near Bethel, and the Yukon River near the Rapids and Beaver. A brief summary was provided of changes to the Kuskokwim commercial and subsistence fishing regulations at the 2004 Board of Fisheries (BOF) Arctic-Yukon-Kuskokwim (AYK) work session. A discussion took place regarding the new Kuskokwim River escapement goals and the controversy surrounding the goals as it was discussed at the BOF meeting. The 2004 Kuskokwim River salmon fishery outlook and management strategy was presented along with a summary of the April 2004 interagency meeting. The Kuskokwim Interagency meeting is an opportunity for project leaders, investigators, managers, and interested parties to get together and discuss the coming field season and provide updates on last season's projects.</p>
18 May	<p>The Working Group met at 10:10 a.m. on Tuesday, May 18 at the Fish and Game conference room in Bethel. Seven of twelve Working Group Members were present establishing a quorum. The Group adjourned at 1:10 p.m. The focus of the discussion was the action by the BOF liberalizing the Area M fishery and the potential of fishers boycotting the Kuskokwim subsistence-fishing schedule in protest. Several people spoke about the merits of boycotting the schedule. Points of discussion included: (1) The primary reason that Kuskokwim Area Fishers were willing to abide by a subsistence-fishing schedule during 2001-2003 was because of the conservation actions taken by the BOF in 2001 regarding the Area M fishery, which harvests Western Alaska chum salmon. (2) Since conservation measures were eliminated in the Area M fisheries during the 2004 BOF meeting, some Kuskokwim fishers feel they should not be held to the subsistence-fishing schedule. (3) Everyone should be held responsible for the conservation of chum salmon to protect the subsistence way of life. Several people spoke to the merits of maintaining the subsistence schedule regardless of the action taken to liberalize the Area M fishery. Points of discussion included: (1) That boycotting the schedule has the potential to hurt current and future king salmon runs. (2) A boycott would result in upriver fishers having a more difficult time harvesting the fish they need for subsistence. (3) The Area M fishery harvests few king salmon. (4) The subsistence schedule spreads the king salmon harvest across the run instead of disproportionately harvesting the early portion of the run. State and Federal enforcement staff informed the group that if the subsistence fishing schedule is boycotted, the action would be well documented in a respectful manner and citations would be issued. The working group previously supported the schedule and no motions were made to change that position.</p>
08 June	<p>The Working Group met for 4 hours Tuesday, June 8 and discussed the status of the Kuskokwim salmon run. Mike Williams from Akiak was appointed to the vacant Lower River subsistence representative seat. There was a great deal of discussion regarding the Area M fishery which harvests chum salmon bound for western Alaska, including those bound for the Kuskokwim. Working Group members indicated that they felt the action by the BOF provided a priority to Area M commercial fishermen over western Alaska subsistence fishermen. There was</p>

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Date	Comment
	<p>a discussion about boycotting the Kuskokwim subsistence schedule in protest of the action by the BOF. A press release by the Association of Village Council Presidents (AVCP): Alaska Native Tribes and Tribal Nonprofit called for a <u>postponing</u> of any civil disobedience subsistence salmon fishing prior to June 19. The request by AVCP and tribal representatives, who attended a recent meeting in Akiak, came in consideration of the first Chinook that enter the Kuskokwim and are not intercepted in the Area M fishery while chum salmon are. The Working Group action statement was to maintain the subsistence-fishing schedule with the next closed period to occur Sunday, June 13 to Tuesday, June 15.</p>
18 June	<p>The Working Group met for 3 hours on Friday, June 18 and discussed the status of Kuskokwim River salmon returns. All meeting participants agreed that the available information indicates king salmon escapement goals will be reached and that there is plenty of opportunity for fishers to harvest amounts necessary for subsistence. After evaluation of the available information there was consensus to lift the Kuskokwim River subsistence-fishing schedule and go to a 7-day per week schedule. The Working Group fish processor representative expressed interest in a commercial fishery as early as June 28 if it appears escapement goals will be achieved and fishers have the opportunity to fulfill their subsistence needs. A brief update regarding the Area M fishery was provided. The harvest in Area M though June 16, 2004 is reported at 703,000 sockeye salmon, 240,400 chum salmon, 138,000 pink salmon, and 2 coho salmon. Fishing effort was reported as similar to the last two seasons.</p>
25 June	<p>The Working Group met Friday, June 25 and discussed the status of Kuskokwim River salmon returns and the potential for commercial salmon fishing on the Kuskokwim River. Four of twelve members were in attendance a quorum was not established. Meeting participants agreed that the available information indicates Chinook salmon escapement goals will be reached and that the available information is encouraging for good returns of chum and sockeye salmon. Reports from lower river participants and the subsistence-monitoring program indicate the majority of subsistence fishers in their area have achieved their harvest needs for Chinook salmon. Middle river participants indicated that elders are reporting good subsistence catches indicative of average or normal salmon runs. The Working Group fish processor representative and another local processor expressed interest in a chum directed commercial fishery as early as June 29 with a combined total capacity of approximately 150,000 pounds. Other Working Group members expressed concern about a chum directed commercial salmon fishery citing limited processor capacity, ice availability, and limited transportation of the catch to market.</p>
28 June	<p>The Working Group met Monday, June 28 a quorum was established with nine of twelve members in attendance. It was noted that the Division of Sport Fisheries restored bag and possession limits for Chinook and chum salmon in the Kuskokwim River drainage, effective 12:01 A.M. Monday, June 28, 2004. With this emergency order, the bag and possession limit for king salmon was restored to three fish, of which only two may be over 28 inches in length. The bag and possession limit for chum salmon was restored to 5 fish, with no size limit. There was discussion that indicated that the Working Group felt that the Division of Sport Fish should have discussed this issue with them before taking the action. The processor report indicated that two companies were on the grounds and prepared to purchase fish beginning this week. One Working Group member expressed that he felt there was a greater value in putting fish on the spawning grounds to nourish the land and furbearers rather than have a commercial fishery.</p>

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Date	Comment
	<p><u>ADF&G Recommendation:</u> Have a 2-hour commercial fishery opening in Subdistrict 1-A on Tuesday, June 29 and a 2-hour commercial fishing period in Subdistrict 1-B on Wednesday, June 30.</p> <p><u>Working Group Recommendation:</u> A motion was made by the Working Group to have a 2-hour commercial fishing period in Subdistrict 1-B on Wednesday, June 30, leave the scheduling of additional commercial fishing periods to the Department until the next Working Group meeting scheduled for Tuesday, July 6 at 10:00 a.m. Discussion of the motion clarified that before additional fishing periods were scheduled the Department would evaluate run strength to be reasonably sure escapement goals would be met and that there was adequate processor capacity.</p> <p><u>Meeting Action Announcement:</u> Have a 2-hour commercial fishing period in Subdistrict 1-B on Wednesday, June 30 and leave the scheduling of additional commercial fishing periods to the Department until the next Working Group meeting on Tuesday, July 6 at 10:00 a.m.</p>
06 July	<p>The Working Group met Tuesday, July 6th for 2 hours. Representatives from seven of the twelve Working Group positions were present establishing a quorum. In total, four commercial fishing periods had been announced. Some members of the Working Group expressed concern that the Department was being too aggressive in the fishery by initiating additional commercial fishing periods without adequate consultation with the Working Group. Other Working Group members were supportive of the action taken by the Department in consideration of buyer limitations and the anticipated low effort. Through discussion it was apparent that there was a misunderstanding from the previous meeting on the direction provided by the Working Group to the Department in management of the fishery. Department staff agreed to contact the Working Group chairs prior to announcing additional fishing periods. Both processors indicated they would like commercial fisheries to pick up ice prior to the period so the catch could be put on ice immediately. It was noted that fishers would like to see an increase in price for bled and iced fish as it requires more work.</p> <p><u>Meeting Action Announcement:</u> The action statement of the Working Group was to allow scheduling of additional commercial fishing periods by the Department based on fish passage, escapements and processor capacity and meet again on Tuesday, July 13.</p>
13 July	<p>The Working Group met Tuesday, July 13 for 1 hour and 15 minutes. A quorum was established with eight of twelve Working Group representatives being present. To date, four commercial fishing periods have been announced for District 1 totaling 12 hours of fishing time. The Working Group fish processor representative indicated that both Inlet Fish Producers and Coastal Villages Seafood had discontinued operations after the July 7 opening. There was a brief discussion on Working Group representative alternates. It was agreed that all representatives should have an informed alternate to replace them if they are unable to attend a Working Group Meeting.</p> <p><u>Meeting Action Announcement:</u> The action statement of the Working Group was to meet again on Friday, July 23 at 10:00 a.m. at the Bethel Fish and Game office.</p>
23 July	<p>The Working Group met Friday, July 23 for 2 hours. A quorum was established with seven of twelve Working Group representatives being present. The lower Kuskokwim River subsistence representative reported that the coho salmon run has shown up early and their numbers appear to be increasing daily. The middle Kuskokwim River representative reported that most fishermen are waiting for coho salmon to appear in their area to resume fishing. The sport fishing representative reported that a trip on the Kisaralik River was performed and indicated that a good number of</p>

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Date	Comment
	<p>Chinook and sockeye were seen pooling in the upper Kisaralik River area. It was reported that both processors are prepared for a coho salmon commercial fishing season in the Kuskokwim area. Both representatives agreed that they would be able to begin processing around July 28 and could possibly continue through the first week of September. There was a brief discussion on Working Group representative alternates. It was agreed that all representatives should have an informed alternate to replace them if they are unable to attend a Working Group Meeting.</p> <p><u>Meeting Action Announcement:</u> The action statement of the Working Group was to meet again on again Monday, July 26 at 1:00 p.m. at the Bethel Fish and Game office.</p>
26 July	<p>The Working Group was called to order at 1:08 p.m. on Monday, July 26, 2004, at the Fish and Game conference room in Bethel. The Group adjourned at 2:17 p.m. Representatives from nine of the twelve Working Group organizations were present. There was a discussion regarding implementation of the commercial fishery directed toward coho salmon. One recommendation was: not to initiate the commercial fishery until August 30 to allow coho salmon to become distributed throughout the drainage. The point was made that fishing effort is down compared to historic levels. Comments were made that fishers would like to see a fishing schedule implemented similar to the 2003 season.</p> <p><u>ADF&G Recommendation:</u> The Department recommended that Kuskokwim River commercial salmon fishing periods be established for the Kuskokwim River in Subdistrict 1-A (upstream of Bethel) and Subdistrict 1-B (downstream of Bethel). Specifically, the recommendation was for a Subdistrict 1-A opening from 12:00 noon to 4:00 p.m. Wednesday, July 28, 2004 and a Subdistrict 1-B opening from 12:00 noon to 4:00 p.m. Friday, July 30, 2004.</p> <p><u>Working Group Motions:</u> The Working Group made a motion, which passed, to adopt the Department recommendation.</p> <p><u>Meeting Action Announcement:</u> Establish Kuskokwim River commercial salmon fishing periods in Kuskokwim River Subdistrict 1-A (upstream of Bethel) and Subdistrict 1-B (downstream of Bethel). Subdistrict 1-A will open to commercial salmon fishing from 12:00 noon to 4:00 p.m. Wednesday, July 28, 2004. Subdistrict 1-B will open to commercial salmon fishing from 12:00 noon to 4:00 p.m. Friday July 30, 2004. These are 4-hour commercial fishing periods.</p>
31 July	<p>The Working Group was called to order at 3:12 p.m. on Saturday, July 31, 2004, at the Fish and Game conference room in Bethel. The Group adjourned at 5:31 p.m. Seven of twelve Working Group representatives were present establishing a quorum. There was a discussion regarding implementation of a coho salmon directed commercial fisheries period. One recommendation was to close the river to commercial fishing no later than 7:00 p.m., which would allow all boats adequate time to transit home during hours of daylight.</p> <p><u>ADF&G Recommendation:</u> The Department recommended that two Kuskokwim River commercial salmon fishing periods be established on the Kuskokwim River in Subdistrict 1-A (upstream of Bethel) and Subdistrict 1-B (downstream of Bethel). Specifically, the recommendation was for a Subdistrict 1-A opening from 10:00 a.m. to 4:00 p.m. Monday, August 2, 2004, and a Subdistrict 1-B opening from 12:00 noon to 6:00 p.m. Tuesday, August 3, 2004, with the flexibility to announce further openings for Thursday and Friday, August 5 and 6, provided coho salmon run strength continues towards achieving escapement goals.</p> <p><u>Working Group Motions:</u> The Working Group made a motion, which failed by one vote, to adopt the Department’s recommendation regarding the openings on August 2 and August 3. A lengthy</p>

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Date	Comment
	<p>discussion took place regarding the restrictions on subsistence fishing associated with the commercial fishery. There are strong opinions within the group that indicate having restrictions on subsistence fishing prior to, during, and after commercial fishing periods are not providing adequate opportunity to fulfill subsistence needs. It was suggested that a method be employed to place a burden on commercial fishers that assures that no subsistence caught fish enter the commercial fishery. It was also suggested that the time periods closed to subsistence fishing prior to and after commercial fishing periods be reduced and that the size of the buffer zones adjacent to the Subdistrict open to commercial fishing be reduced. Another motion was made for a Subdistrict 1-A opening from 10:00 a.m. to 4:00 p.m. Monday, August 2, 2004, and a Subdistrict 1-B opening from 12:00 noon to 6:00 p.m. Tuesday, August 3, 2004 and for the Working Group to meet again at 10:00 a.m. Wednesday, August 4. The motion passed unanimously. The Department concurred with the Working Group recommendation.</p> <p><u>Meeting Action Announcement:</u> Establish commercial salmon fishing periods on the Kuskokwim River in Subdistrict 1-A (upstream of Bethel) and Subdistrict 1-B (downstream of Bethel).</p> <p>Subdistrict 1-A will open to commercial salmon fishing for 6 hours on Monday, August 2, from 10:00 a.m. to 4:00 p.m. Subdistrict 1-B will open to commercial salmon fishing for 6 hours on Tuesday, August 3, from 12:00 PM to 6:00 PM.</p>
04 August	<p>The Working Group was called to order at 3:12 p.m. on Wednesday, August 4, 2004, at the Fish and Game conference room in Bethel. The Group adjourned at 5:00 p.m. Eight of twelve Working Group representatives were present establishing a quorum. One elder reported that he completed his winter coho salmon harvest in one night using a whitefish set net. One lower river subsistence fisher did come in to the Fish and Game office to express that the commercial fishing schedule was making it difficult for him to achieve his families subsistence harvest needs.</p>
	<p><u>ADF&G recommendation:</u> The Department recommended that two Kuskokwim River commercial salmon fishing periods be established on the Kuskokwim River in Subdistrict 1-A (upstream of Bethel) and Subdistrict 1-B (downstream of Bethel). Specifically, the recommendation was for a Subdistrict 1-A opening from 10:00 a.m. to 4:00 p.m. Thursday, August 5, 2004, and a Subdistrict 1-B opening from 12:00 noon to 6:00 p.m. Friday, August 6, 2004 and to have the next Working Group meeting on Saturday, August 7.</p>
	<p><u>Working Group motions:</u> The Working Group made a motion to adopt the Department’s recommendation regarding the openings on August 5 and August 6 and for the Working Group to meet again at 10:00 a.m. Saturday, August 7. The motion passed seven votes to one.</p>
	<p><u>Other:</u> There was a brief discussion of the post season Working Group ‘Fish Summit’ meeting, to be scheduled in early October. A suggestion was made to form a committee to draft an agenda for the Working Group’s approval. Committee members identified to draft an agenda include: Mike Williams, Nathan Underwood and James Charles.</p>
	<p><u>Meeting Action Announcement:</u> Establish commercial salmon fishing periods for the Kuskokwim River in Subdistrict 1-A (upstream of Bethel) and Subdistrict 1-B (downstream of Bethel). Subdistrict 1-A will open to commercial salmon fishing for 6 hours on Thursday, August 5, from 10:00 a.m. to 4:00 p.m. Subdistrict 1-B will open to commercial salmon fishing for 6 hours on Friday, August 6, from 12:00 noon to 6:00 p.m.</p>
07 August	<p>The Working Group was called to order at 10:05 a.m. on Saturday, August 7, 2004, at the Fish and Game conference room in Bethel. The Group adjourned at 10:55 a.m. Five of twelve Working</p>

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Table 28.–Page 6 of 10.

Date	Comment
	<p>Group representatives were present; a quorum was not established. The Lower Kuskokwim subsistence representative commented that most of those people subsistence fishing use drift catch dinner and end up catching more than they want and that freezers are filling up with coho salmon. The Yukon-Kuskokwim RAC member reported that most subsistence fishers near Kalskag do not spend as much effort fishing for, or harvest as many, coho salmon as they do earlier running salmon. He also commented that those people who don't depend on subsistence caught salmon as a livelihood are harvesting more than amounts necessary. There was a general consensus that this year's coho salmon run is strong enough to sustain a twice-weekly commercial fishing schedule of 6 hour's duration in both sub-districts.</p> <p><u>ADF&G recommendation:</u> The Department recommended that two Kuskokwim River commercial salmon fishing periods be established for the Kuskokwim River in Subdistrict 1-A (upstream of Bethel) and Subdistrict 1-B (downstream of Bethel). Specifically, the recommendation was for a Subdistrict 1-A opening Monday, August 9, from 10:00 a.m. to 4:00 p.m. and a Subdistrict 1-B opening Tuesday, August 10, from 12:00 noon to 6:00 p.m. and to have the next Working Group meeting at 10:00 a.m. Wednesday, August 11.</p> <p><u>Other:</u> The ADF&G asked if there was a general consensus to the Department's recommendations. All attending were in favor of the recommendation.</p>
11 August	<p>The Working Group was called to order at 10:03 a.m. on Saturday, August 11, 2004, at the Fish and Game conference room in Bethel. The Working Group adjourned at 11:34 a.m. Seven of eleven Working Group representatives were present establishing a quorum. There was a general consensus that this year's coho salmon run is strong enough to sustain an alternating Subdistrict weekly commercial fishing schedule of twice weekly periods of 6 hour's duration.</p> <p><u>ADF&G recommendation:</u> (Prior to making the recommendation the Department entertained a discussion regarding the hours open to commercial fishing in each Subdistrict. There was a general consensus between commercial fishing representatives and fish processors that the schedule of opening the Kuskokwim River for commercial fishing at 10:00 a.m. in Subdistrict 1-A and 12:00 noon in Subdistrict 1-B is working well for both parties.) Open the Kuskokwim River to commercial salmon fishing periods in Subdistrict 1-A (upstream of Bethel) and Subdistrict 1-B (downstream of Bethel) on August 13 and 14, with the flexibility to announce further openings for Monday and Tuesday, August 16 and 17, provided coho salmon run strength maintains towards achieving escapements and processing capacities are capable of handling anticipated commercial harvests. Subdistrict 1-A will open to commercial salmon fishing for 6 hours on Thursday, August 12, from 10:00 a.m. to 4:00 p.m. Subdistrict 1-B will open to commercial salmon fishing for 6 hours on Friday, August 13, from 12:00 noon to 6:00 p.m.</p> <p><u>Working Group Motions:</u> The Working Group made a motion, which passed unanimously, to made and passed to accept Kelly Welch as the Working Group fish processor representative alternate.</p> <p><u>Other:</u> A brief summary of the preparatory meeting for the Working Group 'Fish Summit' conference in October was provided. It was mentioned that several preliminary concepts were laid out for the October meeting. A lengthy discussion took place regarding the Agenda Change Request (ACR) submission deadline to the BOF, specifically regarding any proposed changes to the Kuskokwim River subsistence fishing schedules and guidelines. It was mentioned that the BOF requires ACR forms to be submitted 45 days prior to their first meeting of the year and that some ACRs will be rejected while others will be considered. It was also commented that the BOF might consider ACR's dealing with subsistence issues if more user groups submitted individual ACR's that address similar concerns. A draft ACR will be written and submitted to the Working Group for their approval.</p>

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Date	Comment
18 August	<p>The Working Group was called to order at 10:05 a.m. on Wednesday, August 18, 2004, at the Fish and Game conference room in Bethel. The Working Group adjourned at 11:34 a.m. Seven of twelve Working Group representatives were present establishing a quorum. It was mentioned that many commercial fishermen have reported that most fish were caught near the lead line of their drift gillnet for the August 16 & 17 openings. Temperatures were very warm for these two openings, as a result, coho salmon may have been traveling at a greater depth, decreasing their chances of being caught in a drift gillnet. Both buyers were able to handle all fish delivered from the previous openings without incident and expect no problems handling fish for future commercial fishing periods. There was some concern expressed about the recent warm weather as it may cause heat damage to commercially caught salmon.</p>
	<p><u>ADF&G recommendation:</u> (Prior to making the recommendation the Department entertained a discussion on upcoming weather. It was reported that for Thursday and Friday, in the Kuskokwim Delta, highs in the mid to upper 70s are expected, similar to conditions on August 17.) Open the Kuskokwim River to commercial salmon fishing periods in Subdistrict 1-A (upstream of Bethel) and Subdistrict 1-B (downstream of Bethel) on August 19 and 20, with the flexibility to announce full-district openings for the following week on Monday, Tuesday, Thursday, and Friday, August 23, 24, 26 and 27, provided coho salmon run strength continues towards achieving escapements, fisher participation is adequate, and processors are capable and interested in handling anticipated commercial harvests. Subdistrict 1-A will open to commercial salmon fishing for 6 hours on Thursday, August 19, from 10:00 a.m. to 4:00 p.m. Subdistrict 1-B will open to commercial salmon fishing for 6 hours on Friday, August 20, from 12:00 noon to 6:00 p.m.</p>
	<p>A question was asked if ADF&G has any concerns that district wide commercial fishing would have any effect achieving escapement objectives. It was reported that the commercial fishing effort has decreased in recent years resulting in a relatively low exploitation rate.</p>
	<p><u>Working Group Motions:</u> The Working Group made a motion, which passed unanimously, to accept ADF&G’s recommendation. A second motion was made and passed to accept the ADF&G’s recommendation regarding a draft ACR form to be submitted before the BOF.</p>
	<p><u>Other:</u> There was a discussion regarding the ACR form draft submitted to the Working Group by ADF&G. It was reported that to make any changes to the subsistence-fishing schedule and harvest windows implemented by the BOF, an ACR form must be submitted to the BOF 45 days prior to their first meeting of the year. Subjects covered in the draft ACR form included: modifications to the subsistence schedule that applies to District W1 waters, areas included in such modifications (e.g. that area upstream of the Johnson River and downstream of Bogus Creek), and easing constraints on subsistence fishers as a result of commercial fishing periods. It was reported that the Working Group could become more specific with the details regarding subject modifications to the draft ACR during the ‘Fish Summit’ meeting in September, and, if the BOF accepts the draft ACR, they will reschedule a meeting to discuss issues regarding modifications to current regulations for December. It was reported that a final draft ACR form could be submitted to the BOF at that time. Terry Reeve, the Marine Advisory Program extension agent for the University of Alaska was introduced. He was appointed by a sea grant through the School of Fisheries and Ocean Sciences for the University of Alaska Fairbanks.</p>
	<p><u>Meeting Action Announcement:</u> Establish commercial salmon fishing periods on the Kuskokwim River in Subdistrict 1-A (upstream of Bethel) and Subdistrict 1-B (downstream of Bethel) on August 19 and 20, with the flexibility to announce further openings for the following week on Monday, Tuesday, Thursday, and Friday, August 23, 24, 26, and 27, provided coho salmon run strength continues towards achieving escapements, fisher participation is adequate, and processors are capable and interested in handling anticipated commercial harvests. Subdistrict 1-A will open to commercial salmon fishing for 6 hours on Thursday, August 19, from 10:00 a.m. to 4:00 p.m.</p>

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Date	Comment
	Subdistrict 1-B will open to commercial fishing for 6 hours on Friday, August 20, from 12 p.m. to 6:00 p.m.
25 August	<p>The Working Group was called to order at 10:06 a.m. on Wednesday, August 25, 2004, at the Fish and Game conference room in Bethel. The Working Group adjourned at 12:07 a.m. Six of twelve Working Group representatives were present; a quorum was not established. The Lower River Subsistence representative reported that the coho salmon run has picked up again after a brief period of decline. It was also mentioned that people are pleased with their harvest and that coho harvest activities are nearly completed. The Yukon-Kuskokwim Delta RAC member reported that not much has changed since last week and most people are looking forward to catching whitefish as they make their way upstream. A question was asked regarding what types of whitefish people are catching and it was also mentioned that people could report any tagged whitefish numbers to the ADF&G and USFWS offices in Bethel. The Western Interior RAC reported that subsistence fishing is proceeding well and that people are catching coho salmon both by net and by rod and reel. Both buyers were able to handle all fish delivered and expect no problems handling fish for the remainder of the season.</p> <p><u>ADF&G recommendation:</u> Several alternatives were discussed, and the final recommendation was to open District W1 (Subdistrict 1-A and Subdistrict 1-B) to commercial salmon fishing for 8 hours on Friday, August 27, from 10:00 a.m. to 6:00 p.m., and again on Monday, August 30, from 10:00 a.m. to 6:00 p.m. The Department also stated the intention of announcing further openings in early September, provided coho salmon run strength continues to be adequate and processors continue to be able and willing to buy the catch.</p> <p><u>Working Group Discussion:</u> Although a quorum was not established, Working Group members in attendance were in favor of ADF&G’s final recommendation.</p> <p><u>Other:</u> The Working Group entered a discussion about the proposed “Fish Summit” meeting and it was mentioned that the most accommodating dates for such a meeting would be Thursday and Friday, September 30 and October 01, in Bethel. This would allow the Working Group 3 days time to make any detailed changes to the draft ACR form before it must be submitted to the BOF (given that they accept the original) for their first meeting of the year on October 5 and 6. It was reported that the focus of the meeting would be to discuss ways to elevate the Kuskokwim commercial fishery, and bring State, Federal, and Tribal governments together to discuss Kuskokwim fishery management issues.</p> <p><u>Meeting Action Announcement:</u> District-1 of the lower Kuskokwim River will open to commercial fishing on Friday, August 27 and Monday, August 30. Both periods will be 8 hours in duration starting at 10:00 a.m. and ending at 6:00 p.m. Both periods will be full district openings (i.e., Subdistrict 1-A and Subdistrict 1-B). In addition, it is anticipated that commercial fishing periods will be announced through the early part of September provided coho salmon escapement continues to be adequate, and continued processors interest.</p>
31 August	<p>The Working Group was called to order at 10:09 a.m. on Wednesday, August 25, 2004, at the Fish and Game conference room in Bethel. The Working Group adjourned at 12:19 p. m. Six of twelve Working Group representatives were present; a quorum was not established. The Lower River Subsistence representative reported that people are filling up their freezers with coho salmon and that most people are satisfied with their coho salmon harvest. The Upper-Kuskokwim Subsistence representative reported that fish abundance has dropped off sharply, but most people have generally harvested what the need for subsistence. The apparent decline in coho salmon</p>

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Date	Comment
	<p>abundance seemed to have dropped off more quickly than usual for this time of year. The Western Interior RAC reported that subsistence fishers are using nets to catch chum and coho salmon but are not catching them in large numbers. It was reported that people have harvested what they need but are not seeing large numbers of coho salmon.</p>
	<p><u>Other:</u> It was suggested by the Western Interior RAC that they would like to see a cap on the commercial harvests. It was argued by the Working Group fish processor representative that such a cap is not feasible since there appears to be no correlation between escapements and future salmon returns. The Member at Large reported that during past commercial fishing seasons the coho salmon fishery was open until there was not enough coho salmon or a lack of fish buyers on the Kuskokwim.</p>
	<p><u>ADF&G recommendation:</u> The ADF&G recommendation was to open District W1 (Subdistrict 1-A and Subdistrict 1-B) for commercial salmon fishing for 8 hours on Thursday, September 2, from 10:00 a.m. to 6:00 p.m., and an intention of announcing further openings in early September, provided adequate coho salmon abundance and processors continue to be available. Following a discussion with the Working Group, ADF&G revised the recommendation to: open District W1 (Subdistrict 1-A and Subdistrict 1-B) to commercial salmon fishing for 6 hours on Thursday, September 2, from 10:00 a.m. to 4:00 p.m., and an intention of announcing further opening(s) in early September, provided an increase in coho salmon escapement and processor availability. It was reported that any decision to open the Kuskokwim after Thursday, September 2 would be announced at least 24 hours prior to any commercial opening.</p>
	<p><u>Working Group Discussion:</u> Although a quorum was not established, Working Group members in attendance entered a discussion about the ADF&G's first recommendation. Several Working Group representatives mentioned that they would like to see the length of the commercial opening is reduced from 8 to 6 hours and that attention is paid to coho salmon escapements at the Kuskokwim River weir projects. It was mentioned that there is a 70% chance that Inlet Salmon would be able to contract a fish tender to cover the lower Kuskokwim River for any openings after Thursday, September 2 and that they would be interested in maintaining operations for commercial catches of at least 3,000 to 4,000 coho salmon.</p>
	<p><u>Meeting Action Announcement:</u> District-1 of the lower Kuskokwim River will open to commercial fishing on Thursday, September 2, for 6 hours starting at 10:00 a.m. and ending at 4:00 p.m. This will be full-district opening (i.e., Subdistrict 1-A and Subdistrict 1-B). In addition, it is anticipated fishing periods will be announced for the week of September 6, provided coho salmon escapement increases, continued processor interest, and fisher participation.</p>
30 September	<p>The Working Group 'Fish Summit' meeting began at 9:00 a.m. in the Pacifica Guest House conference room in Bethel. Twelve Working Group representatives were present along with ADF&G staff, USFWS staff, and representatives from the AVCP, ONC, Kuskokwim Native Association, University of Alaska Fairbanks, Coastal Villages Regional Fund and Inlet Fish processors, the local media, and the general public.</p> <p>End of season fisheries summaries came from: (1) The Division of Subsistence Kuskokwim Area Post Season survey. (2) District W1, W4, & W5 commercial fishery summaries. (3) The Area M commercial fishery. (4) The Kuskokwim Area ADF&G Sport Fish Division. (5) Kuskokwim Area escapement monitoring projects.</p>

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Date	Comment
	<p><u>Meeting Action Items:</u> (1) The Working Group endorsed ONC’s ACR proposal that asks the BOF to change its regulation so that a graduated subsistence-fishing schedule be put in place only during the first 3 weeks in June. The Department would still maintain the ability to end the schedule early or prolong it after evaluations of salmon escapements are made. (2) A resolution was passed requesting the BOF include a Working Group representative on the Salmon Industry Restructuring Panel. A Working Group member (LaMont Albertson) was chosen to represent the Working Group before the Salmon Industry Restructuring Panel, a subcommittee of the Board. (3) The Working Group expressed interest in conducting a statewide ‘Fish Summit’ meeting with salmon user groups from the AYK Region to discuss interactions between the controversial Area M commercial fishery and fisheries in Western Alaska. (4) The Working Group expressed interest in pursuing funding avenues for the ONC in-season subsistence survey program and the Working Group operational budget. (5) The Rainbow trout, Customary and Traditional use proposal was presented and points of interest were discussed at the ‘Fish Summit’ meeting. (6) AVCP presented a resolution (04-04-01) at the ‘Fish Summit’ meeting “supporting salmon conservation and subsistence, but opposing any subsistence fishing schedules when the Alaska Board of Fisheries is expanding the Area M commercial fishery.” (7) The Working Group supported the AVCP Federal proposal <u>FP2005-06</u> to establish a subsistence fishing schedule regulation similar to the State regulation included in the Kuskokwim River Salmon Management Plan. (8) The Working Group passed a resolution to seek full funding for the Subsistence Division post-season subsistence harvest-monitoring program.</p>

Table 29.–Salmon emergency order summary, Kuskokwim Area, 2004.

EO#	DESCRIPTION	Effective Date - Expiration Date	Rescind EO#	EO Still In EFFECT
Kuskokwim River Salmon				
3-S-WR-01-04	Implements the subsistence salmon fishing schedule in the Kuskokwim River. Issued June 4, 2004	12:01 a.m. June 6, 2004 Exp 11:59 p.m. 07/27/04	None	None
3-S-WR-02-04	Provides for subsistence salmon fishing schedule 7 days per week in the Kuskokwim River. Issued June 18, 2004	12:01 a.m. June 20, 2004 Exp 11:59 p.m. December 31, 2004	3-S-WR-01-04	None
3-S-WR-03-04	Opens the Kuskokwim River salmon fishing season. Issued June 28, 2004	1:00 p.m. 06/30/04 Exp 12:01 a.m. September 1, 2004	None	None
3-S-WR-04-04	Establishes subsistence fishing closures in Subdistrict 1A and 1B. Issued June 28, 2004	7:00 a.m. 06/30/04 Exp 12:01 a.m. September 1, 2004	None	3-S-WR-03-04
3-S-WR-05-04	Establishes a commercial fishing period in Subdistrict 1B. Issued June 28, 2004	1:00 p.m. 06/30/04 Exp 3:00 p.m. 6/30/2004	None	3-S-WR-03-04
3-S-WR-06-04	Establishes a commercial fishing period in Subdistrict 1A. Issued July 1, 2004	9:00 a.m. 7/2/2004 Exp 12:00 noon 7/2/2004	None	3-S-WR-03-04
3-S-WR-07-04	Establishes a commercial fishing period in Subdistrict 1A. Issued July 4, 2004	9:00 a.m. 7/6/2004 Exp 12:00 noon 7/6/2004	None	3-S-WR-03-04 3-S-WR-04-04

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Table 29.–Page 2 of 5.

EO#	DESCRIPTION	Effective Date - Expiration Date	Rescind EO#	EO Still In EFFECT
3-S-WR-08-04	Establishes a commercial fishing period in Subdistrict 1B.	9:00 a.m. 7/7/2004	None	3-S-WR-03-04 3-S-WR-04-04
	Issued July 5, 2004	Exp 12:00 noon 7/7/2004		
3-S-WR-09-04	Establishes commercial fishing periods in Subdistricts 1A and 1B.	12:00 noon 7/28/2004	None	3-S-WR-03-04 3-S-WR-04-04
	Issued July 26, 2004	Exp 4:00 p.m. 7/30/2004		
3-S-WR-10-04	Establishes commercial fishing periods in Subdistricts 1A and 1B.	10:00 a.m. 8/02/04	None	3-S-WR-03-04 3-S-WR-04-04
	Issued July 31, 2004	Exp 6:00 p.m. 8/3/2004		
3-S-WR-11-04	Establishes commercial fishing periods in Subdistricts 1A and 1B.	10:00 a.m. 8/5/2004	None	3-S-WR-03-04 3-S-WR-04-04
	Issued August 4, 2004	Exp 6:00 p.m. 8/6/2004		
3-S-WR-12-04	Establishes commercial fishing periods in Subdistricts 1A and 1B.	10:00 a.m. 8/9/2004	None	3-S-WR-03-04 3-S-WR-04-04
	Issued August 7, 2004	Exp 6:00 p.m. 8/10/2004		
3-S-WR-13-04	Establishes commercial fishing periods in Subdistricts 1A and 1B.	10:00 a.m. 8/12/2004	None	3-S-WR-03-04 3-S-WR-04-04
	Issued August 11, 2004	Exp 6:00 p.m. 8/13/2004		
3-S-WR-14-04	Establishes commercial fishing periods in Subdistricts 1A and 1B.	10:00 a.m. 8/16/2004	None	3-S-WR-03-04 3-S-WR-04-04
	Issued August 14, 2004	Exp 6:00 p.m. 8/17/2004		

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EO#	DESCRIPTION	Effective Date - Expiration Date	Rescind EO#	EO Still In EFFECT
3-S-WR-15-04	Establishes commercial fishing periods in Subdistricts 1A and 1B.	10:00 a.m. 8/19/2004	None	3-S-WR-03-04 3-S-WR-04-04
	Issued August 18, 2004	Exp 6:00 p.m. 8/20/2004		
3-S-WR-16-04	Establishes commercial fishing periods in District 1.	10:00 a.m. 8/23/2004	None	3-S-WR-03-04 3-S-WR-04-04
	Issued August 21, 2004	Exp 6:00 p.m. 8/24/2004		
3-S-WR-17-04	Establishes commercial fishing periods in District 1.	10:00 a.m. 8/27/2004	None	3-S-WR-03-04 3-S-WR-04-04
	Issued August 25, 2004	Exp 6:00 p.m. 8/30/2004		
3-S-WR-18-04	Extends the commercial fishing season in District 1.	12:01 a.m. 9/1/2004	None	3-S-WR-03-04
	Issued August 31, 2004	Exp 11:59 p.m. 9/10/2004		
3-S-WR-19-04	Establishes subsistence salmon fishing closures in District 1.	12:01 a.m. 9/1/2004	None	3-S-WR-03-04 3-S-WR-18-04
	Issued August 31, 2004	Exp 11:59 p.m. 9/10/2004		
3-S-WR-20-04	Establishes commercial fishing periods in District 1.	10:00 a.m. 9/2/2004	None	3-S-WR-03-04 3-S-WR-18-04 3-S-WR-19-04
	Issued August 31, 2004	Exp 4:00 p.m. 9/2/2004		

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Table 29.–Page 4 of 5.

EO#	DESCRIPTION	Effective Date - Expiration Date	Rescind EO#	EO Still In EFFECT
3-S-WR-21-04	Establishes commercial fishing periods in District 1.	10:00 a.m. 9/4/2004	None	3-S-WR-03-04 3-S-WR-18-04 3-S-WR-19-04
	Issued September 3, 2004	Exp 4:00 p.m. 9/6/2004		
3-S-WR-22-04	Establishes commercial fishing periods in District 1.	10:00 a.m. 9/6/2004	None	3-S-WR-03-04 3-S-WR-18-04 3-S-WR-19-04
	Issued September 8, 2004	Exp 4:00 p.m. 9/8/2004		
Kuskokwim Bay Salmon				
3-S-WB-01-04	Opens the commercial salmon fishing season in District W-4, Quinhagak and establishes a Tuesday-Thursday fishing schedule.	9:00 a.m. 6/15/2004	None	None
	Issued June 11, 2004	Exp 9:01 p.m. 9/8/2004		
3-S-WB-02-04	Opens the commercial salmon fishing season in District W-5, Goodnews Bay and establishes a Tuesday-Thursday fishing schedule.	9:00 a.m. 6/24/2004	None	None
	Issued June 22, 2004	Exp 9:01 p.m. 9/8/2004		

-continued-

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EO#	DESCRIPTION	Effective Date - Expiration Date	Rescind EO#	EO Still In EFFECT
3-S-WB-03-04	Establishes a 3 day a week commercial salmon fishing schedule in District W-4, Quinhagak on Mondays, Wednesdays, and Fridays.	9:00 a.m. 7/5/2004	3-S-WB-01-04	None
	Issued July 2, 2004	Exp 9:01 p.m. 9/8/2004		
3-S-WB-04-04	Establishes a 3 day a week commercial salmon fishing schedule in District W-5, Goodnews Bay on Mondays, Wednesdays, and Fridays.	9:00 a.m. 7/5/2004	3-S-WB-02-04	None
	Issued July 2, 2004	Exp 9:01 p.m. 9/8/2004		
3-S-WB-05-04	Interrupts the commercial salmon fishing schedule in Districts W-4 and W-5 and establishes a Monday, Wednesday, Friday schedule.	9:01 p.m. 7/16/2004	3-S-WB-03-04 3-S-WB-04-04	3-S-WB-01-04 3-S-WB-02-04
	Issued July 16, 2004	Exp 9:01 p.m. 9/8/2004		

Table 30.—Processor summary, Kuskokwim Area, 2004

Company	Processor Code
SALMON	
Inlet Fish Producers	F 4682
Coastal Villages Seafoods, Inc	F 4240
HERRING	
Norquest Seafoods, Inc	F 1482

Table 31.—The age class composition based on age-by-scale analysis of herring sampled from the department test and commercial fisheries, Kuskokwim Area Districts, 2004.

District	Fishery	Age Composition			Sample Size
		(No. of Fish / Percent)			
		< 6	8-Jun	> 8	
Goodnews Bay	commercial	1-Jun	344 / 59	234 / 40	584
	VMG	157 / 17	616 / 68	137 / 15	910
Nelson Island	commercial	0 / 0	145 / 29	679 / 71	824
	VMG	190 / 21	589 / 66	121 / 13	900

Note: VMG = variable mesh gillnet.

Table 32.—Minimum, maximum, and average lengths within age class of herring sampled from the variable mesh gillnet and commercial fisheries, Kuskokwim Area Districts, 2004.

District	Fishery	Age Class								
		< 6			8-Jun			> 8		
		min	avg	max	min	avg	max	min	avg	max
Goodnews Bay	commercial	234	259	277	248	284	329	258	307	345
	VMG	194	227	296	216	274	326	260	309	347
Nelson Island	commercial	0	0	0	246	284	384	202	305	339
	VMG	163	223	273	150	267	304	260	296	335

Note: VMG = variable mesh gillnet.

Table 33.—Minimum, maximum, and average weights within age class of herring sampled from the variable mesh gillnet and commercial fisheries, Kuskokwim Area Districts, 2004.

District	Fishery	Age Class								
		< 6			8-Jun			> 8		
		min	avg	max	min	avg	max	min	avg	max
Goodnews Bay	commercial	155	207	250	166	306	457	255	408	560
	VMG	85	143	278	127	270	532	116	393	598
Nelson Island	commercial	0	0	0	217	339	481	295	434	638
	VMG	53	140	290	103	258	437	48	352	634

Note: VMG = variable mesh gillnet.

Table 34.—Preliminary commercial salmon harvest projections for the 2005 season, Kuskokwim Area, 2004.

Species	Management District						Kuskokwim		
	Districts 1 and 2 ^a			District 4 and 5 ^a			Area Total ^a		
Chinook	5	to	20	22	to	39	27	to	59
Sockeye	20	to	50	50	to	85	70	to	135
Coho	300	to	500	340	to	604	640	to	1,104
Pink ^b	0	to	1	0	to	1	0	to	2
Chum	150	to	300	29	to	50	179	to	350
TOTAL	475	to	871	441	to	779	916	to	1,650

^a In 1,000's of fish.

^b Projection is based on historic catches in odd years only.

Table 35.—Projections of herring spawning biomass and harvest levels for 2005 season, Kuskokwim Bay, 2004.

District	2005 Projection ^a			Exploitation
	Biomass (st)	Threshold (st) ^b	Harvest (st)	Rate (%)
Security Cove	18,192	1,200	3,638	20
Goodnews Bay	13,410	1,200	2,682	20
Cape Avinof	3,377	500	507	15
Nelson Island	4,440	3,000	688	15 ^c
Nunivak Island	4,782	1,500	956	20 ^d
Total	44,201		8,471	

^a Preseason projection. Projection may be adjusted based on inseason biomass estimates.

^b Threshold biomass needed to allow a commercial fishery from 5 AAC 27.060 Bering Sea Herring Fishery Management Plan.

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

^d Nunivak Island exploitation rate is 15% of projected biomass when inseason aerial survey estimate is not available.



Figure 1.—Kuskokwim Management Area and salmon run assessment projects.

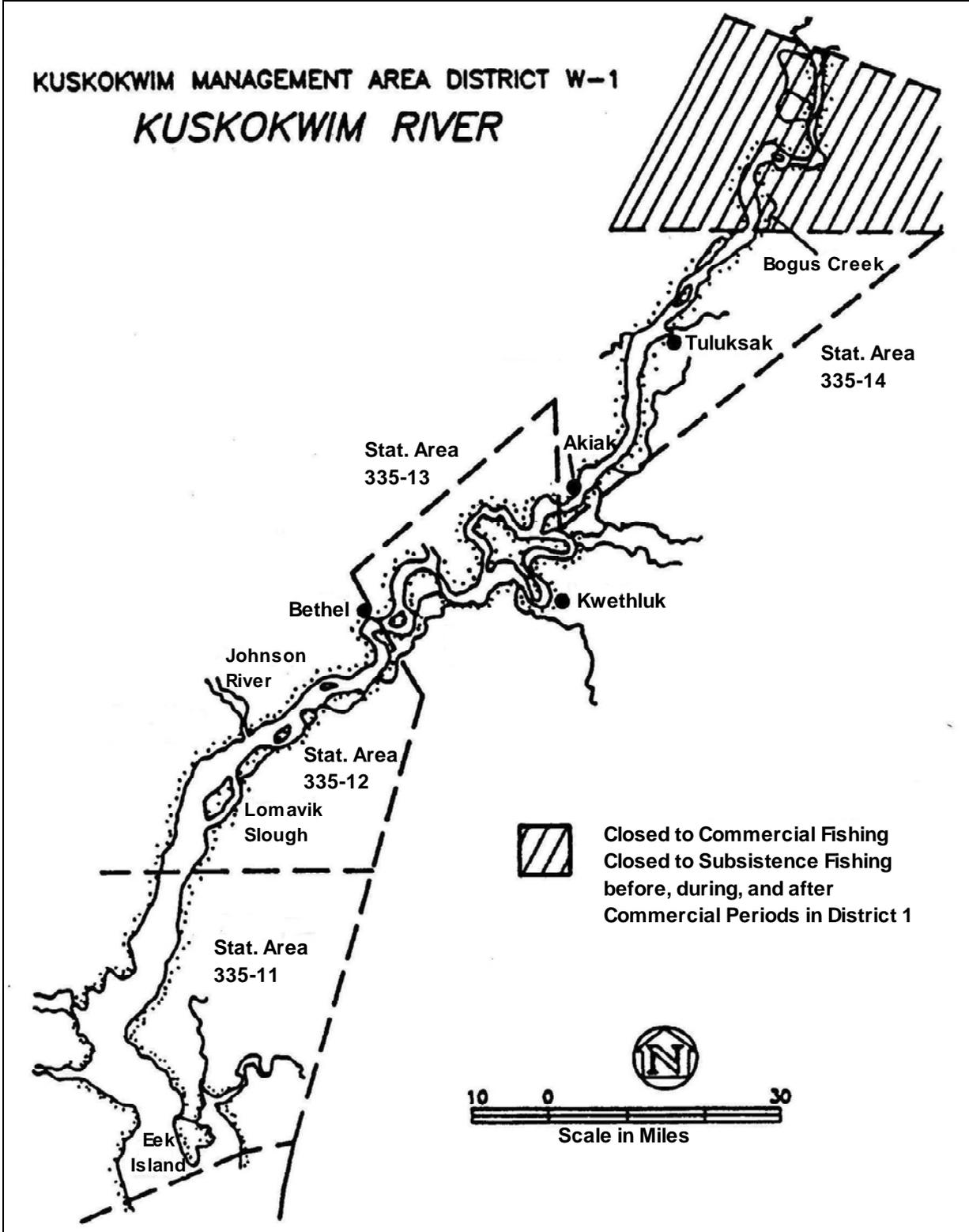


Figure 2.—Kuskokwim Management Area, District 1.

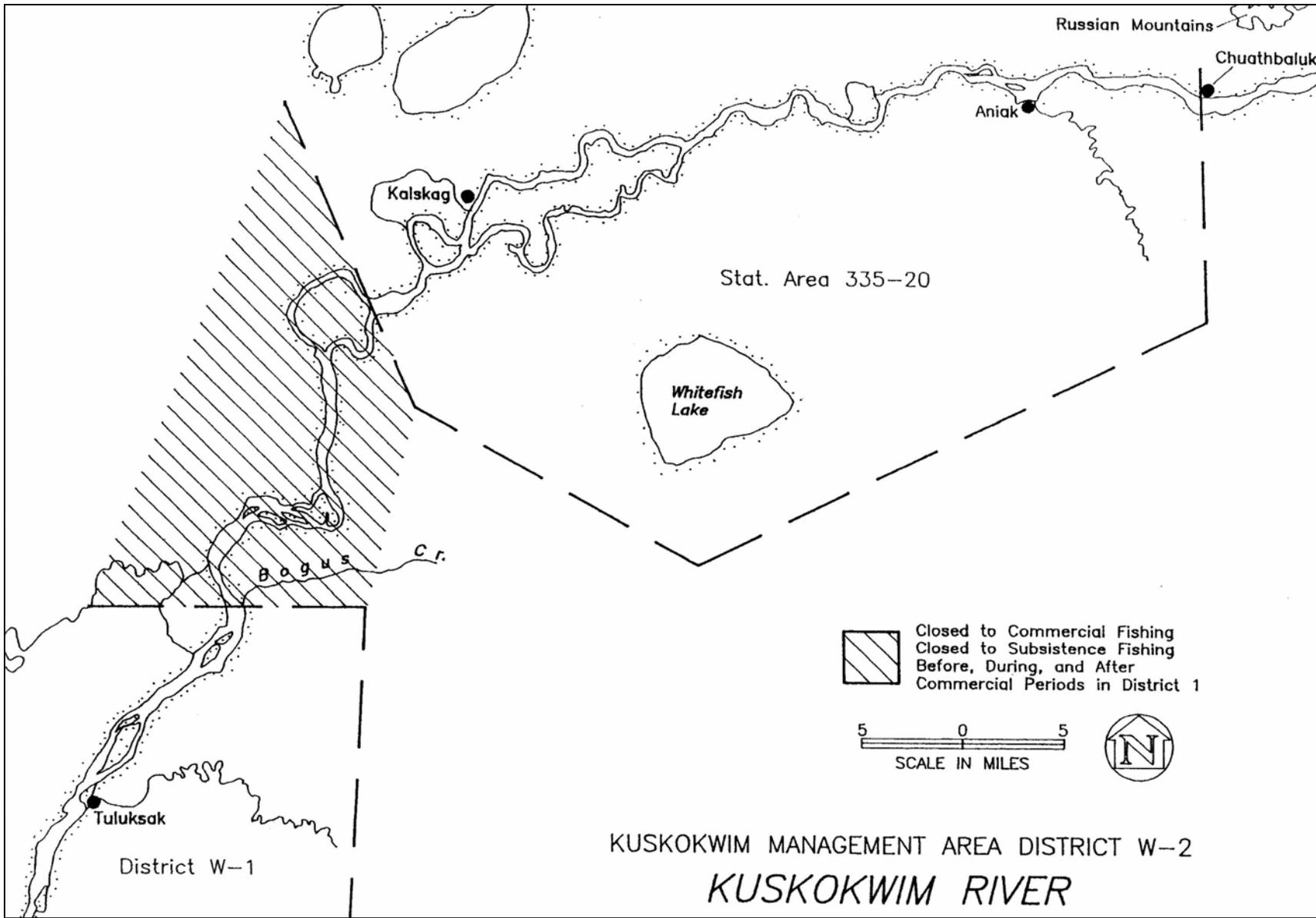


Figure 3.-Kuskokwim Management Area, District 2.

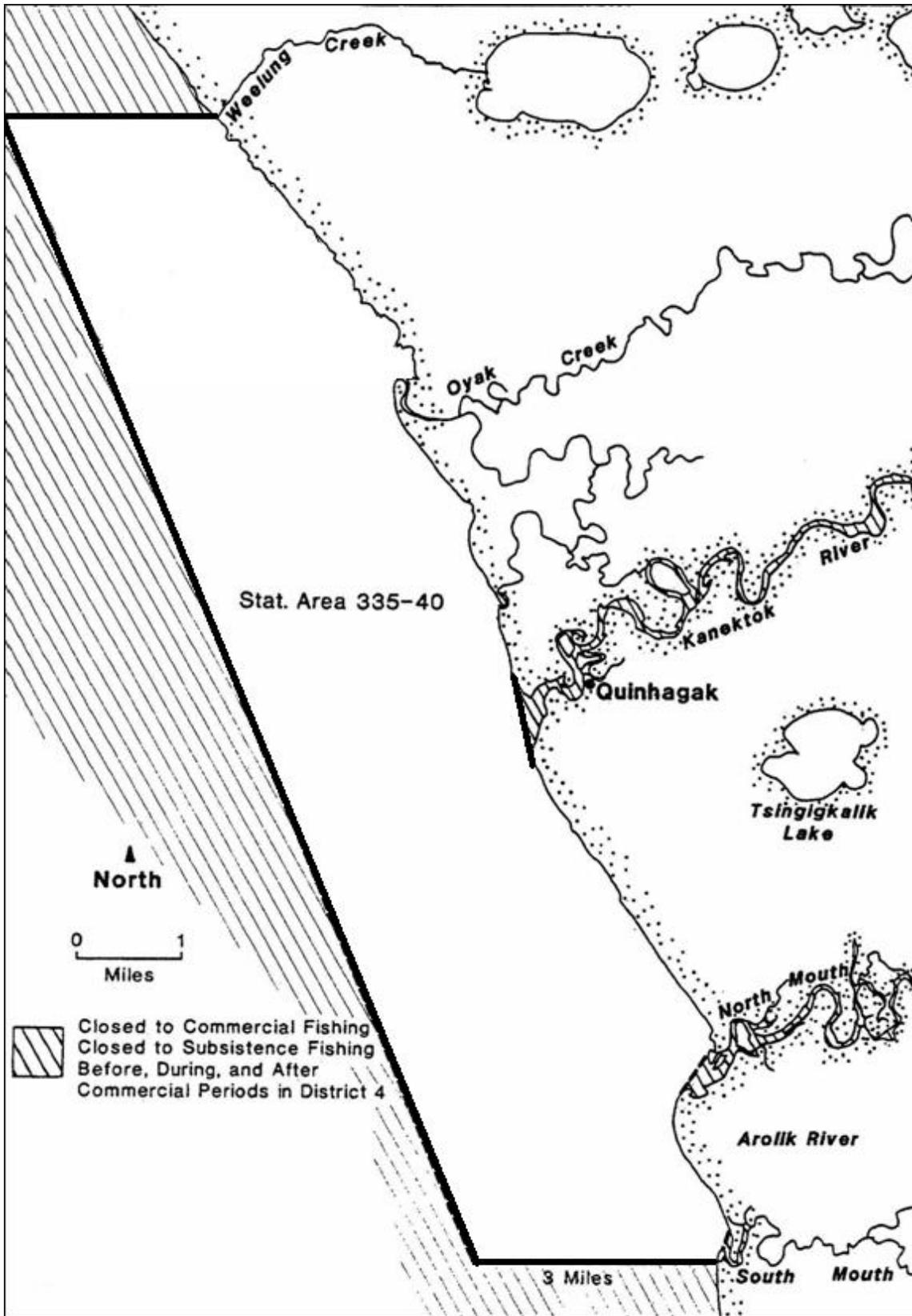


Figure 4.—Kuskokwim Management Area, District 4.

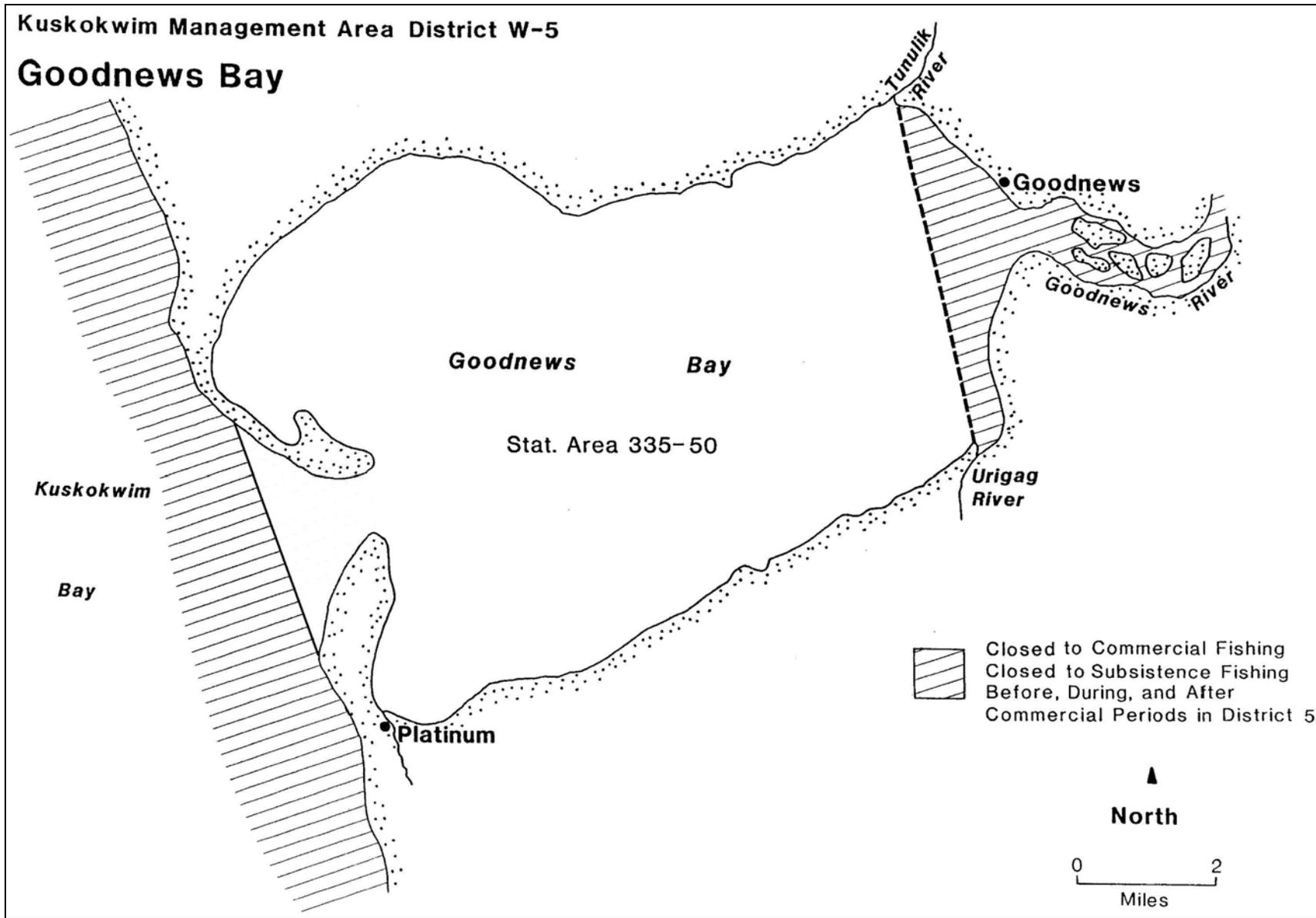


Figure 5.—Kuskokwim Management Area, District 5.

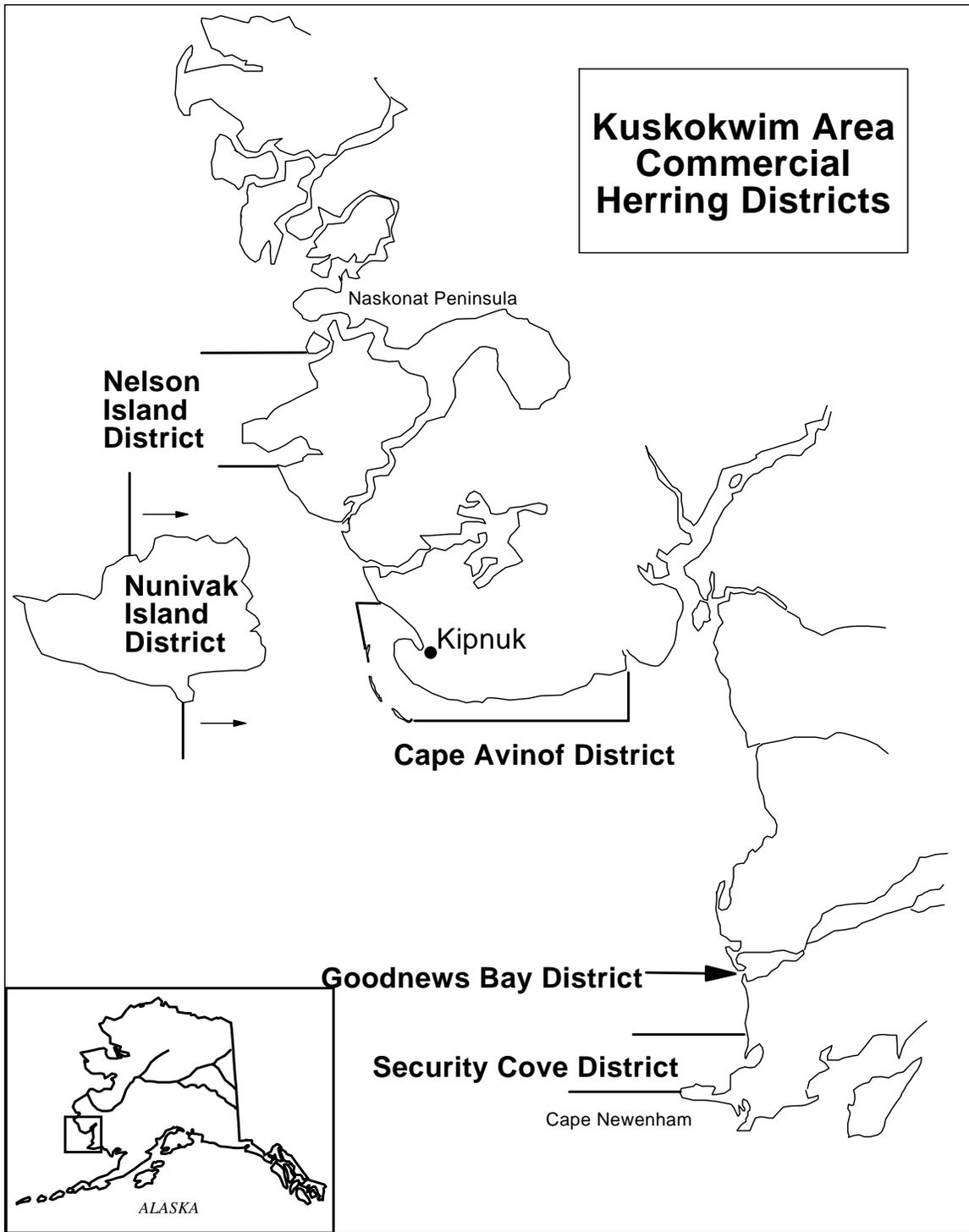


Figure 6.—Commercial herring fishing districts in the Kuskokwim Area.

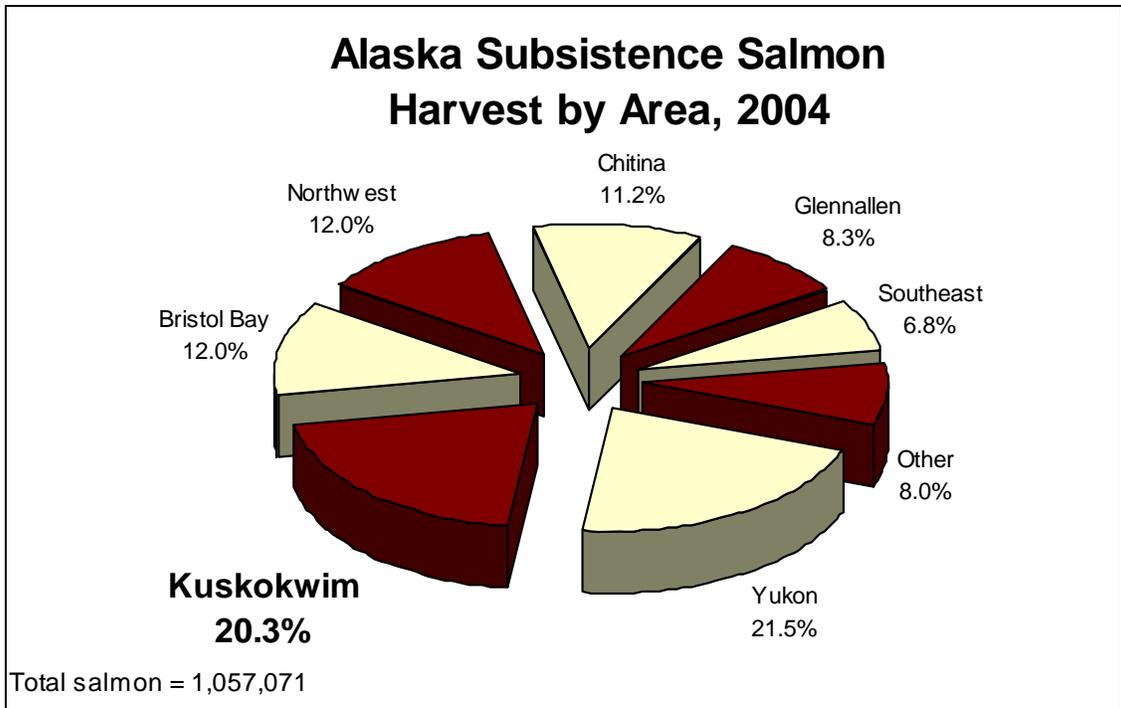


Figure 7.—Percentage of subsistence salmon harvest by Area or Region, State of Alaska, 2004.

APPENDIX A.

Appendix A1.—Fish species commonly found, Kuskokwim Area, 2004.

Species Code	Genus and Species ^a	Common Name ^a
110	<i>Gadus macrocephalus</i>	Pacific Cod
113	<i>Eleginus gracilis</i>	Saffron Cod
129	<i>Platichthys stellatus</i>	Starry Flounder
122	<i>Pleuronectes glacialis</i>	Arctic Flounder
127	<i>Pleuronectes aspera</i>	Yellowfin Sole
128	<i>Pleuronectes vetulus</i>	English Sole
162	<i>Cottus cognatus</i>	Slimy Sculpin
166	<i>Oligocottus maculosus</i>	Tidepool Sculpin
192	<i>Hexagrammos stelleri</i>	Whitespotted Greenling
200	<i>Hippoglossus stenolepis</i>	Pacific Halibut
230	<i>Clupea pallasii</i>	Pacific Herring
410	<i>Oncorhynchus tshawytscha</i>	Chinook Salmon
420	<i>Oncorhynchus nerka</i>	Sockeye Salmon
430	<i>Oncorhynchus kisutch</i>	Coho Salmon
440	<i>Oncorhynchus gorbuscha</i>	Pink Salmon
450	<i>Oncorhynchus keta</i>	Chum Salmon
500	<i>Esox lucius</i>	Northern Pike
513	<i>Osmerus mordax</i>	Rainbow Smelt
514	<i>Hypomesus olidus</i>	Pond Smelt
516	<i>Mallotus villosus</i>	Capelin
520	<i>Salvelinus alpinus</i>	Arctic Char
532	<i>Salvelinus malma</i>	Dolly Varden
541	<i>Oncorhynchus mykiss</i>	Rainbow Trout
550	<i>Salvelinus namaycush</i>	Lake Trout
570	<i>Stenodus leucichthys</i>	Inconnu
588	<i>Coregonus nasus</i>	Broad Whitefish
589	<i>Coregonus pidschian</i>	Humpback Whitefish
583	<i>Coregonus sardinella</i>	Least Cisco
584	<i>Coregonus autumnalis</i>	Arctic Cisco
586	<i>Prosopium cylindraceum</i>	Round Whitefish
590	<i>Lota lota</i>	Burbot
600	<i>Lampetra tridentata</i>	Pacific Lamprey
601	<i>Lampetra japonica</i>	Arctic Lamprey
610	<i>Thymallus arcticus</i>	Arctic Grayling
630	<i>Dallia pectoralis</i>	Alaska Blackfish
640	<i>Catostomus catostomus</i>	Longnose Sucker
660	<i>Gasterosteus aculeatus</i>	Threespine Stickleback
661	<i>Pungitius pungitius</i>	Ninespine Stickleback
670	<i>Percopsis omiscomaycus</i>	Trout Perch
NA	<i>Megalocottus platycephalus</i>	Belligerent Sculpin
NA	<i>Myoxocephalus quadricornis</i>	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.—Distance to selected locations from mouth of the Kuskokwim River, 2004.

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 Fishwheel (2004)	249	155	143	89
Kalskag Fishwheel (2002, 2003, and 2005)	270	168	163	102
Birchtree Fishwheel (2001 to 2004)	294	183	187	117
Aniak River	307	191	201	125
Aniak (community)	307	191	201	125
Aniak Receiver Site (upper)	310	191	201	125
Aniak Receiver Site (lower)	306	191	201	125
Aniak Sonar Site	323	201	217	135
Aniak Sonar Receiver 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-

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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
George Receiver Site	453	281	347	215
Red Devil (community)	472	293	365	227
Red Devil Receiver Site	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
Kogrukluk Receiver Site	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
Tatlawiksuk Receiver Site	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
Takotna Receiver Site	835	519	729	453
McGrath (community)	753	468	647	402
McGrath Receiver Site	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.

^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 southern most 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 A3.—Historical events, which have potential of actual influence on the salmon fisheries of the Kuskokwim Area, 1913–2004.

Year	Event ^a
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. Kogruklu 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).

-continued-

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Year	Event ^a
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	<i>Migratory timing of coho salmon in the Kuskokwim Area, 1979-1984.</i> 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 ^a
	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 ^a
	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 Kogruklu 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 Kogruklu 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).

-continued-

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Year	Event ^a
1998	<p>Sale of salmon roe is prohibited in Districts 1 and 2 (effective beginning December 1997).</p> <p>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).</p> <p>NVK and ADF&G operate a salmon counting tower on the Kanektok River (1997-1998).</p> <p>Kuskokwim River declared an economic disaster area for second straight year due to low chum and coho salmon returns, harvests and exvessel prices.</p> <p>KNA and ADF&G operate a salmon weir on the Tatlawiksuk River (1998-present).</p> <p>Second year of anomalous Bering Sea conditions: warm water, odd plankton blooms, sea bird die offs, etc.</p> <p>High water levels severely restrict operational period of many Kuskokwim Area escapement projects.</p> <p>Record low average water temperature measured at the Bethel test fish site.</p>
1999	<p>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.</p> <p>Federal government assumes control of subsistence fishery management in federal waters on October 1.</p> <p>KNA-operated salmon weirs on the Tatlawiksuk and George Rivers converted to resistance board (floating) weirs and operations extended through coho run.</p> <p>Kuskokwim River sonar project begins redevelopment using split-beam sonar and is relocated to a new site 1 mile above upstream end of Church Slough.</p>
2000	<p>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 fishers report that they were unable to meet their Chinook and chum salmon harvest goals.</p> <p>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.</p> <p>ADF&G and Federal Office of Subsistence Management (FOSM) restrict subsistence Chinook salmon fishery.</p> <p>Takotna Community Schools and ADF&G operate a resistance board weir on the Takotna River (2000-present).</p> <p>Kwethluk IRA and USFWS operate a resistance board weir on the Kwethluk River (2000-present).</p> <p>District W-1 divided into Subdistricts W-1A (above Bethel) and W-1B (below Bethel) and fishers 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.</p> <p>Commercial fishers required to identify vessels with either ADF&G or CFEC permit number.</p>

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Year	Event ^a
	<p>ADF&G Sport Fish Division creates Lower Yukon-Kuskokwim Management Area and stations Area Management Biologist in Bethel.</p> <p>Line attached to a pole (rod and reel) added to legal gear for subsistence fishing in AVCP area (prior to 2000 fishing season).</p> <p>Use of rod and reel for subsistence extended throughout the Kuskokwim Area (2000–2001 BOF meeting).</p>
2001	<p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>Native Community of Tuluksak and USFWS operate a resistance board weir on the Tuluksak River.</p> <p>NVK and ADF&G operate a salmon counting weir on the Kanektok River.</p> <p>ADF&G/CF and KNA operate fish wheels at Kalskag and Birch Tree Crossing to tag salmon and then make salmon population estimates.</p>
2002	<p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p>

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Year	Event ^a
2003	<p>ADF&G/SF and KNA operated salmon radio telemetry projects on the Kuskokwim main stem and on the Holitna River to estimate salmon abundance.</p> <p>Second consecutive season of no chum salmon (June or July) directed commercial fishery.</p> <p>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.</p> <p>Third consecutive season of no chum salmon (June or July) directed commercial fishery.</p> <p>ADF&G/SF and KNA operated salmon radio telemetry projects on the Kuskokwim main stem and on the Holitna River to estimate salmon abundance.</p> <p>Record high coho salmon escapements throughout the Kuskokwim Area.</p>
2004	<p>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 5 years did not have adequate harvestable surpluses beyond escapement and subsistence needs.</p> <p>The Alaska Board of Fisheries provided a commercial guideline harvest level of 0-50,000 sockeye salmon for the Kuskokwim River.</p> <p>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.</p> <p>The northern boundary of District W-4 (Quinhagak) was relocated approximately 1 mile north from Oyak Creek to the northernmost edge of the mouth of Weelung Creek.</p> <p>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 2 miles South on the seaward entrance of Goodnews Bay to approximately 2 miles North on the seaward entrance to Goodnews Bay.</p> <p>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</p> <p>The Goodnews Bay District herring superexclusive use regulations were repealed.</p> <p>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).</p> <p>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.</p> <p>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.</p>

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Year	Event ^a
	Water levels in rivers throughout the Kuskokwim 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.

^a For additional information on specific topics refer to the Region III report catalog or historical Area Management Reports for the Kuskokwim Area.

Appendix A4.—Estimated maximum, minimum, and mean subsistence salmon harvest from 1990 through 2003 and amounts reasonably necessary for subsistence uses (ARNS), Kuskokwim Area.

Species	Kuskokwim River Drainage					Remainder of Kuskokwim Area			
	District 1	District 2	Upstream of District 1	Upstream of District 2	All Kuskokwim River	District 4	District 5	All Non - Kuskokwim River	
Chinook	ARNS					64,500–83,000			
	Max Harvest	78,956	12,754	17,480	4,750	96,436	6,013	917	6,699
	Min Harvest	52,795	7,181	10,263	3,082	64,795	2,746	374	3,535
	Mean Harvest	69,207	9,357	13,554	4,197	82,762	3,698	666	4,511
Sockeye	ARNS					27,500 -39,500			
	Max Harvest	42,883	5,089	12,534	7,445	52,984	1,951	1,282	3,420
	Min Harvest	21,671	2,183	5,572	3,121	27,791	400	253	823
	Mean Harvest	30,733	3,315	8,471	5,156	39,204	1,173	750	2,073
Coho	ARNS					24,500–35,000			
	Max Harvest	43,362	4,448	10,295	7,112	50,370	4,174	1,828	5,922
	Min Harvest	18,979	2,010	4,986	2,976	24,864	1,264	305	1,682
	Mean Harvest	26,725	2,926	8,079	5,153	34,803	2,427	853	3,416
Chum	ARNS					39,500–75,500			
	Max Harvest	93,743	19,132	32,765	13,633	126,508	3,234	1,006	4,961
	Min Harvest	32,790	3,916	7,001	2,297	39,970	600	133	1,006
	Mean Harvest	58,001	10,304	17,142	6,837	75,143	1,459	325	3,004
All Species	ARNS					7,500–13,500			
	Max Harvest	233,946	34,691	65,274	30,583	293,554	15,372	4,176	20,968
	Min Harvest	153,722	16,097	31,299	15,202	188,476	5,853	1,404	7,588
	Mean Harvest	184,667	25,902	47,245	21,343	231,912	8,757	2,594	13,003

Note: Subsistence harvest information from the Alaska Department of Fish and Game, Division of Subsistence, Alaska Subsistence Fisheries Database. ARNS adopted by the BOF in January 2001 (5 AAC 01.286).

Appendix A5.—Commercial harvest of sockeye and chum salmon in the June South Peninsula Fishery, 1980–2004.

Year	Sockeye	Chum
1980	3,206,275	508,865
1981	1,820,965	563,947
1982	2,118,701	1,095,044
1983	1,961,569	785,631
1984	1,388,203	337,120
1985	1,791,400	433,829
1986	471,387	351,769
1987	792,964	443,019
1988	756,687	526,711
1989	1,744,505	455,163
1990	1,344,529	518,545
1991	1,548,930	772,705
1992	2,457,856	426,203
1993	2,973,744	532,247
1994	1,461,263	582,165
1995	2,105,321	537,433
1996	1,028,970	359,820
1997	1,628,181	322,325
1998	1,288,725	245,619
1999	1,375,399	245,306
2000	1,251,228	239,357
2001	150,632	48,350
2002	591,106	378,817
2003	453,147	282,438
2004	1,348,073	482,309

Appendix A6.—Salmon spawning escapement objectives, Kuskokwim Area, 2004.

Area	Escapement Objectives							
	Chinook		Sockeye		Coho		Chum	
	Goal	Enumeration Method	Goal	Enumeration Method	Goal	Enumeration Method	Goal	Enumeration Method
Kuskokwim River								
Kwethluk River	580-1,800	Aerial Survey	-	-	-	-	-	-
Kisaralik River	400-1,200	Aerial Survey	-	-	-	-	-	-
Aniak River	1,200-2,300	Aerial Survey	-	-	-	-	-	-
Salmon River (Aniak)	330-1,200	Aerial Survey	-	-	-	-	-	-
Aniak River	-	-	-	-	-	-	210,000-370,000	Sonar
Holitna River	970-2,100	Aerial Survey	-	-	-	-	-	-
Kogruklu Weir	5,300-14,000	Weir	-	-	13,000-28,000	Aerial Survey	15,000-49,000	Weir
Cheneetnu River	340-1,300	Aerial Survey	-	-	-	-	-	-
Gagaraya River	300-830	Aerial Survey	-	-	-	-	-	-
Salmon River (Pitka Fork)	470-1,600	Aerial Survey	-	-	-	-	-	-
Kuskokwim Bay								
Kanektok River to Kagati Lake	3,500-8,000	Aerial Survey	14,000-34,000	Aerial Survey	7,700-36,000	Aerial Survey	>5,200	Aerial Survey
Goodnews River (mainstem)	640-3,300	Aerial Survey	5,500-19,500	Aerial Survey	-	-	-	-
Middle Fork Goodnews River	2,000-4,500	Weir	23,000-58,000	Weir	>12,000	Weir	>12,000	Weir

Note: Sustainable Escapement Goals (SEG) established in 2004 (ADF&G 2004).

Appendix A7.—Historic subsistence salmon harvest, Kuskokwim Management Area, 1989–2004.

Year	Households		Estimated Salmon Harvest					Total
	Total	Surveyed	Chinook	Sockeye	Coho	Chum	Pink	
1989	3,422	2,135	85,323	37,088	57,846	145,106	0	325,363
1990	3,317	1,830	92,675	39,659	50,708	131,470	0	314,513
1991	3,347	2,024	90,226	56,401	55,620	96,314	0	298,561
1992	3,314	1,724	68,706	34,159	44,494	99,577	0	246,937
1993	3,274	1,816	91,722	51,362	35,295	61,724	0	240,103
1994	3,179	1,821	98,378	39,280	36,504	76,949	0	251,111
1995	3,652	1,894	100,157	28,622	39,165	68,941	0	236,885
1996	3,643	1,837	81,597	35,037	34,699	90,239	0	241,572
1997	3,510	1,831	85,506	41,251	30,717	40,993	0	198,466
1998	3,495	1,849	86,113	37,579	27,240	67,664	0	218,595
1999	4,180	2,523	77,660	49,388	27,753	47,612	0	202,413
2000	4,441	2,750	68,841	44,832	35,670	55,371	0	204,714
2001	4,483	2,297	77,570	51,965	31,686	51,117	0	212,338
2002	4,339	2,798	70,219	27,733	34,413	73,234	0	205,599
2003	4,535	2,375	72,498	36,894	38,791	42,291	0	194,474
2004	4,670	2,432	85,086	34,892	39,406	55,575	0	214,959
1995-2004 Average	3,946	2,198	81,854	39,258	33,664	61,441	0	216,617
1989-2004 Average	3,765	2,098	82,991	41,012	37,340	71,678	0	233,306

Source: Alaska Department of Fish and Game, Division of Subsistence, Alaska Subsistence Fisheries Database, Version 3.3.

Appendix A8.—Commercial salmon fishery entry permits by location, Kuskokwim Area, 1995–2004.

Village	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Akiachak	64	64	66	67	67	67	67	68	67	68
Akiak	24	23	23	24	23	23	23	24	24	22
Aniak	11	10	11	11	11	11	11	11	10	10
Atmautluak	28	28	28	27	26	27	27	26	26	24
Bethel	164	157	162	168	167	161	165	173	171	168
Chefornak	5	2	2	3	2	2	2	2	2	2
Chuathbaluk	2	2	2	2	2	1	2	2	2	0
Eek	39	40	37	37	36	39	38	39	36	37
Goodnews Bay	29	27	26	28	28	26	26	25	24	22
Hooper Bay	0	0	0	0	0	0	1	1	1	1
Kalskag	5	8	7	7	7	7	4	3	3	3
Kasigluk	45	44	44	43	44	44	45	42	42	41
Kipnuk	18	17	16	15	15	15	14	14	13	13
Kongiganak	21	21	21	19	20	18	16	15	14	12
Kwethluk	57	58	57	55	56	57	55	49	49	49
Kwigillingok	20	18	19	18	19	19	17	17	15	15
Napakiak	37	39	39	39	39	38	38	35	33	32
Napaskiak	33	35	36	36	34	33	33	34	32	30
Nunapitchuk	46	48	48	46	46	46	46	46	44	44
Oscarville	3	2	1	1	1	1	1	1	1	1
Platinum	5	4	4	4	4	5	4	4	3	3
Quinhagak	79	83	82	83	82	84	82	83	82	83
Sleetmute	1	1	1	1	1	1	1	1	1	1
Toksook Bay	0	0	0	0	0	0	0	1	1	1
Tuluksak	27	27	27	27	27	27	27	28	26	26
Tuntutuliak	43	44	45	43	42	42	43	43	41	41
Tununak	1	1	0	1	1	0	0	0	0	0
<i>Kuskokwim Area Subtotal</i>	<i>807</i>	<i>803</i>	<i>804</i>	<i>805</i>	<i>800</i>	<i>794</i>	<i>788</i>	<i>787</i>	<i>763</i>	<i>749</i>
Anchorage	8	12	11	11	13	16	16	16	17	18
Dillingham	1	1	1	1	1	1	1	1	0	0
Fairbanks	3	2	2	1	1	1	1	1	1	1

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Village	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Juneau	0	0	0	0	0	0	0	2	1	2
Kenai	0	0	0	0	1	1	2	2	2	1
Manokotak	2	2	1	1	1	1	1	1	1	0
Mekoryuk	2	2	1	1	0	0	0	0	0	0
Newtok	0	1	1	1	0	0	0	0	0	0
Noorvik	0	0	0	0	1	1	1	0	1	0
Sitka	0	0	0	0	0	0	1	0	0	0
Togiak	1	1	1	0	0	0	0	1	1	0
Twin Hills	0	0	0	0	1	1	1	1	1	1
Wasilla	0	0	0	1	1	1	1	1	0	1
Village	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
<i>Non-Local Alaska Resident Subtotal</i>	17	21	18	17	20	23	25	26	25	24
California	2	1	1	1	2	1	1	1	1	1
Oregon	1	1	1	1	1	1	1	1	1	1
Washington	1	1	1	1	1	1	1	1	1	1
Residents of other States	3	3	3	3	3	3	2	2	2	3
<i>Non-Resident Subtotal</i>	7	6	6	6	7	6	5	5	5	6
<i>Total Number of Permits</i>	831	830	828	828	827	823	818	818	793	779

Note: Only includes permits renewed.

Appendix A9.—Commercial fishing effort in permit-hours for the Kuskokwim Area, 1980–2004.

Year	District W-1	District W-2	District W-4	District W-5	Total
1980	35,370	714	21,636	9,504	67,224
1981	45,096	1,248	25,656	11,256	83,256
1982	46,200	1,128	22,632	14,556	84,516
1983	45,102	708	20,478	9,456	75,744
1984	62,643	1,050	31,488	14,004	109,185
1985	37,452	462	22,260	8,544	68,718
1986	46,944	606	25,740	10,572	83,862
1987	60,525	576	21,222	10,332	92,655
1988	81,724	912	27,276	13,764	123,676
1989	66,990	846	25,992	12,552	106,380
1990	51,236	1,051	44,520	10,548	107,355
1991	64,806	1,548	29,160	11,532	107,046
1992	54,488	1,164	35,280	15,180	106,112
1993	39,210	774	36,000	13,116	89,100
1994	53,808	758	26,580	16,188	97,334
1995	42,784	602	34,680	14,844	92,910
1996	37,015	132	18,880	6,518	62,545
1997	13,662	30	28,848	5,832	48,372
1998	28,212	18	23,712	7,896	59,838
1999	4,788	0	16,488	5,424	26,700
2000	13,936	36	21,852	5,808	41,632
2001	10,028	0	10,689	2,700	23,417
2002	3,756	0	12,210	1,632	17,598
2003	38,413	0	32,832	9,384	80,629
2004	57,720	0	33,408	7,308	98,436
10 Year Average (1994-2003)	24,640	158	22,677	7,623	55,098

Note: Number of permits that made deliveries times the number of hours in the period.

Appendix A10.—Commercial salmon fishing estimated exvessel value, Kuskokwim Area, 1980–2004.

Year	District 1		District 2		District 4		District 5		Total Value	Total Permits
	Value of Catch	Permits Fished ^a								
1980		663		43		169		48	0	
1981		679		153		186		48	0	
1982		686		60		177		48	0	
1983		679		43		226		79	0	
1984		654		58		263		77	0	774
1985		654		23		300		69	0	781
1986		688		43		324		86	0	789
1987		703		29		310		69	0	798
1988		744		29		288		125	0	811
1989	3,922,644	745	130,124	30	744,808	227	379,554	88	5,177,130	824
1990	3,398,718	743	120,959	22	1,014,238	390	360,664	82	4,894,579	824
1991	2,980,220	749	111,491	23	594,636	346	274,919	72	3,961,266	820
1992	3,092,457	741	148,840	22	989,721	349	405,447	111	4,636,465	814
1993	2,535,321	739	90,274	20	896,161	409	441,135	114	3,962,891	807
1994	3,559,114	706	129,555	17	837,157	307	591,903	116	5,117,729	797
1995	2,776,677	712	107,913	21	1,047,188	382	287,599	87	4,219,377	829
1996	2,108,418	620	11,015	11	534,726	218	222,388	54	2,876,547	713
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	167,613	114	28,703	30	323,524	407
2003	453,187	359	0	0	304,553	114	135,287	34	893,027	438
2004	942,566	390	0	0	407,465	116	135,246	29	1,485,277	467
10 year Average (1994-2003)	1,154,742		25,508		483,042		198,551		1,861,843	

^a Number of permits that made at least one delivery.

Appendix A11.—Commercial salmon fishing estimated exvessel value, number of permits fished, and average income, Kuskokwim Area, 1964–2004.

Year	Gross Value (\$ of Catch to Fishermen	No. 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		
1981	3,766,525		
1982	4,213,954		
1983	2,670,400		
1984	5,809,000	774	7,505
1985	3,248,089	781	4,159
1986	4,746,089	789	6,015
1987	6,392,822	798	8,011
1988	12,514,489	811	15,431
1989	5,171,860	824	6,277
1990	4,894,580	824	5,940
1991	3,971,423	820	4,843
1992	5,295,912	814	6,506
1993	3,962,890	807	4,911
1994	5,201,611	797	6,526
1995	4,209,752	829	5,078
1996	2,900,603	713	4,068
1997	1,058,808	702	1,508
1998	1,634,495	707	2,312
1999	551,725	604	913
2000	1,197,149	623	1,922
2001	749,916	514	1,459
2002	322,679	407	793
2003	893,027	438	2,039
2004	1,482,797	467	3,175
10 year Average (1994-2003)	1,871,977	633	2,662

^a Number of permits that made at least one delivery.

Appendix A12.—Commercial salmon average mean weights and prices paid, Kuskokwim Area, 1967–2004.

Year	Average Weight (lb)					Average Price (\$)				
	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
10-Year Average (1994-2003)	15.8	7.0	7.3	3.4	7.4	0.4	0.5	0.1	0.1	0.3

^a Information unavailable.

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

^c Information was not available for District 4.

Appendix A13.—Commercial freshwater finfish harvest, Kuskokwim Area, 1977–2004.

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

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

^b Does not include fishers who delivered catches incidental to the commercial salmon fishery.

^c Includes cisco, pike, and blackfish.

^d Data not available.

Appendix A14.—Subsistence, personal use and commercial salmon harvests, Kuskokwim Area, 2004.

Year	Commercial Harvest						Subsistence Harvest						Total Harvest	
	Chinook	Sockeye	Chum	Pink	Coho	Subtotal	Chinook	Sockeye	Chum	Other ^a	Pink	Coho ^b		Subtotal
1913	7,800					7,800								7,800
1914		2,667				2,667								2,667
1915														0
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														0
1946	2,288				674	2,962								2,962
1947	5,356					5,356								5,356

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Year	Commercial Harvest						Subsistence Harvest						Total Harvest	
	Chinook	Sockeye	Chum	Pink	Coho	Subtotal	Chinook	Sockeye	Chum	Other ^a	Pink	Coho ^b		Subtotal
1948														0
1949														0
1950														0
1951	4,210					4,210								4,210
1952														0
1953														0
1954	57					57								57
1955														0
1956														0
1957														0
1958														0
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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Year	Commercial Harvest						Subsistence Harvest						Total Harvest		
	Chinook	Sockeye	Chum	Pink	Coho	Subtotal	Chinook	Sockeye	Chum	Other ^a	Pink	Coho ^b		Subtotal	
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	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	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 ^{d,e}	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 ^d	66,914	82,365	801,355	819	554,411	1,505,864	85,322	37,088	145,106			57,847	325,363	1,831,227	
1990	84,451	203,919	521,023	16,050	443,783	1,269,226	92,678	39,662	131,469			50,713	314,522	1,583,748	
1991	48,170	202,441	502,187	522	556,818	1,310,138	90,224	56,404	96,308			55,581	298,517	1,608,655	
1992	67,597	192,341	436,506	85,978	772,449	1,554,871	68,665	34,159	99,576			44,496	246,896	1,801,767	
1993	26,636	167,235	94,937	71	686,570	975,449	91,721	51,363	61,726			35,295	240,105	1,215,554	
1994	27,345	191,169	360,893	84,870	856,100	1,520,377	98,378	39,279	76,951			36,504	251,112	1,771,489	
1995	72,352	198,045	707,212	318	555,539	1,533,466	100,159	28,622	68,942			39,165	236,888	1,770,354	
1996	22,959	122,260	301,975	1,663	1,099,865	1,548,722	81,598	35,036	90,238			34,698	241,570	1,790,292	
1997	47,990	123,002	67,200	7	166,648	404,847	85,506	41,270	40,976			30,714	198,466	603,313	
1998	44,402	130,074	268,199	2,720	312,517	757,912	86,115	37,578	67,665			27,240	218,598	976,510	
1999	25,019	81,201	72,659	2	32,251	211,132	77,659	49,388	47,612			27,754	202,413	413,545	
2000	26,115	109,939	49,574	17	307,439	493,084	68,841	44,832	55,371			35,670	204,714	697,798	
2001	14,384	59,545	21,893	0	220,804	316,626	77,570	51,965	51,117			31,686	212,338	528,964	
2002	12,531	24,190	34,951	0	113,199	184,871	70,219	27,733	73,234			34,413	205,599	390,470	
2003	16,014	63,646	36,225	0	346,555	462,440	72,498	36,894	46,291			38,791	194,474	656,914	
2004	30,330	65,297	52,263	0	539,897	687,787	85,086	34,892	55,575			39,206	214,759	902,546	
10 -Yr.															
Avg. ^f	30,911	110,307	192,078	8,960	401,092	743,348	81,854	39,260	61,840			33,664	216,617	959,965	

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

^b Includes sockeye, pink and chum salmon.

^c The personal use catch is included with the subsistence catch.

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

^e Even years only.

^f 10-year average from 1994-2003.

APPENDIX B.

Appendix B1.—Chinook salmon total utilization, Kuskokwim River, 1960–2004.

Year	Commercial Harvest ^a		Subsistence Harvest ^{b,c}		Test-Fish Harvest	Sport Fish Harvest	Total Utilization	10-Year Average
	Annual	10 yr Avg	Annual	10 yr Avg				
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	22,519	40,617	33,240	833		85,447	56,008
1970	39,290	25,851	69,612	38,312	857		109,759	64,498
1971	40,274	27,987	43,242	39,743	756		84,272	68,140
1972	39,454	30,398	40,396	42,424	756		80,606	73,308
1973	32,838	32,480	39,093	42,885	577		72,508	75,909
1974	18,664	32,632	27,139	42,698	1,236		47,039	75,997
1975	22,135	32,646	48,448	45,073	704		71,287	78,457
1976	30,735	33,165	58,606	46,001	1,206		90,547	79,996
1977	35,830	33,750	56,580	45,668	1,264	33	93,707	80,300
1978	45,641	34,886	36,270	46,000	1,445	116	83,472	81,864
1979	38,966	34,383	56,283	47,567	979	74	96,302	82,950
1980	35,881	34,042	59,892	46,595	1,033	162	96,968	81,671
1981	47,663	34,781	61,329	48,404	1,218	189	110,399	84,284
1982	48,234	35,659	58,018	50,166	542	207	107,001	86,923
1983	33,174	35,692	47,412	50,998	1,139	420	82,145	87,887
1984	31,742	37,000	56,930	53,977	231	273	89,176	92,100
1985	37,889	38,576	43,874	53,519	79	85	81,927	93,164
1986	19,414	37,443	51,019	52,761	130	49	70,612	91,171
1987	36,179	37,478	67,325	53,835	384	355	104,243	92,225
1988 ^d	55,716	38,486	70,943	57,303	576	528	127,763	96,654
1989	43,217	38,911	81,176	59,792	543	1,218	126,154	99,639
1990	53,504	40,673	85,979	62,401	512	394	140,389	103,981
1991	37,778	39,685	85,554	64,823	117	401	123,850	105,326
1992	46,872	39,549	64,795	65,501	1,380	367	113,414	105,967
1993	8,735	37,105	87,512	69,511	2,483	587	99,317	107,685
1994	16,211	35,552	93,242	73,142	1,937	1,139	112,529	110,020
1995	30,846	34,847	96,436	78,398	1,421	541	129,244	114,752
1996	7,419	33,648	78,063	81,103	247	1,432	87,161	116,406

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Year	Commercial Harvest ^a		Subsistence Harvest ^{b,c}		Test-Fish Harvest	Sport Fish Harvest	Total Utilization	10-yr Avg.
	Annual	10 yr Avg	Annual	10 yr Avg				
1997	10,441	31,074	81,577	82,528	332	1,227	93,577	115,340
1998	17,359	27,238	81,265	83,560	210	1,434	100,268	112,590
1999	4,705	23,387	73,194	82,762	98	252	78,249	107,800
2000	444	18,081	64,893	80,653	64	105	65,506	100,312
2001	90	14,312	73,610	79,459	86	290	74,076	95,334
2002	72	9,632	74,778	80,457	288	300	75,438	91,537
2003	158	8,775	67,788	78,485	409	401	68,756	88,480
2004	2,300	7,383	80,065	77,167	691	857	83,913	85,619
10-yr Avg.								
(1994-2003)	8,775		78,485		509	712	88,480	

^a Districts 1 and 2; also includes harvests in District 3 from 1960 to 1965.

^b Estimated subsistence harvest expanded from villages surveyed.

^c Discrepancies in subsistence harvest numbers by area may be attributable changes in geographic area definitions over time.

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

Appendix B2.—Chum salmon total utilization, Kuskokwim River, 1960–2005.

Year	Commercial Harvest ^a		Subsistence Harvest ^{b,c}		Test-Fish Harvest	Sport Fish Harvest	Total Utilization	10-Year Average
	Annual	10 yr Avg	Annual	10 yr Avg				
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	750	204,105 ^d		384		211,654	209,443
1970	1,664	916	246,810 ^d	203,020	1,139 ^e		249,613	204,229
1971	68,914	7,808	116,391 ^d	196,706	254		185,559	204,832
1972	78,619	15,670	120,316 ^d	192,553	486		199,421	208,589
1973	148,746	30,544	179,259 ^d	196,714	675		328,680	227,692
1974	171,887	47,733	277,170 ^d	205,412	2,021		451,078	253,781
1975	184,171	66,150	176,389 ^d	197,963	1,062		361,622	264,855
1976	177,864	83,937	223,792 ^d	202,769	2,101		403,757	287,607
1977	248,721	108,794	198,355 ^d	201,760	576	125	447,777	311,492
1978	248,656	133,641	118,809 ^d	186,140	2,153	555	370,173	320,933
1979	261,874	159,112	161,239 ^d	181,853	412	259	423,784	342,146
1980	483,751	207,320	165,172 ^d	173,689	2,058	324	651,305	382,316
1981	418,677	242,297	157,306 ^d	177,781	1,793	598	578,374	421,597
1982	278,306	262,265	190,011 ^d	184,750	504	1,125	469,946	448,650
1983	276,698	275,061	146,876 ^d	181,512	1,069	922	425,565	458,338
1984	423,718	300,244	142,542 ^d	168,049	1,186	520	567,966	470,027
1985	199,478	301,774	94,750	159,885	616	150	294,994	463,364
1986	309,213	314,909	141,931 ^d	151,699	1,693	245	453,082	468,297
1987	574,336	347,471	70,709	138,935	2,302	566	647,913	488,310
1988 ^f	1,381,674	460,773	151,967	142,250	4,379	764	1,538,784	605,171
1989	749,182	509,503	139,687	140,095	2,082	2,023	892,974	652,090
1990	461,624	507,291	126,508	136,229	2,107	533	590,772	646,037
1991	431,802	508,603	93,075	129,806	931	378	526,186	640,818
1992	344,603	515,233	96,491	120,454	15,330	608	457,032	639,527
1993	43,337	491,897	59,396	111,706	8,451	359	111,543	608,125
1994	271,115	476,636	72,025	104,654	11,998	1,280	356,418	586,970
1995	605,918	517,280	67,862	101,965	17,473	226	691,479	626,618
1996	207,877	507,147	88,965	96,669	2,864	280	299,986	611,309

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Year	Commercial Harvest ^a		Subsistence Harvest ^{b,c}		Test-Fish Harvest	Sport Fish Harvest	Total Utilization	10-Year Average
	Annual	10 yr Avg	Annual	10 yr Avg				
1997	17,026	451,416	39,970	93,595	790	86	57,872	552,305
1998	207,809	334,029	63,537	84,752	1,140	291	272,777	425,704
1999	23,006	261,412	43,601	75,143	562	180	67,349	343,141
2000	11,570	216,406	55,371	68,029	1,038	26	68,005	290,865
2001	1,272	173,353	49,874	63,709	1,743	112	53,001	243,546
2002	1,900	139,083	76,842	61,744	2,666	53	81,461	205,989
2003	2,764	135,026	43,320	60,137	1,713	53	47,850	199,620
2004	20,429	109,957	52,347	58,169	1,810	84	74,670	171,445
10-yr Avg. (1994-2003)	135,026		60,137		4,199	259	199,620	

^a Districts 1 and 2 only; no chum harvests were reported in District 3.

^b Estimated subsistence harvest expanded from villages surveyed.

^c Discrepancies in subsistence harvest numbers by area may be attributable changes in geographic area definitions over time.

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

^e Includes small numbers of sockeye.

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

Appendix B3.—Sockeye salmon total utilization, Kuskokwim River, 1960–2005.

Year	Commercial Harvest ^a		Subsistence Harvest ^{b,c}		Test-Fish Harvest	Sport Fish Harvest	Total Utilization	10-Year Average
	Annual	10 yr Avg	Annual	10 yr Avg				
1960								
1961								
1962								
1963								
1964								
1965								
1966								
1967								
1968								
1969	322	322					322	
1970	117	220					117	
1971	2,606	1,015					2,606	
1972	102	787					102	
1973	369	703					369	
1974	136	609					136	
1975	23	525					23	
1976	2,971	831					2,971	
1977	9,379	1,781					9,379	
1978	733	1,676					733	
1979	1,054	1,749					1,054	
1980	360	1,773					360	
1981	48,375	6,350					48,375	
1982	33,154	9,655					33,154	
1983	68,855	16,504				41	68,896	16,508
1984	48,575	21,348					48,575	21,352
1985	106,647	32,010				72	106,719	32,022
1986	95,433	41,257				196	95,629	41,287
1987	136,602	53,979				217	136,819	54,031
1988 ^b	92,025	63,108				291	92,316	63,190
1989	42,747	67,277	35,224			33	78,004	70,885
1990	84,870	75,728	36,276			61	121,207	82,969
1991	108,946	81,785	52,984			38	161,968	94,329
1992	92,218	87,692	32,066			131	124,415	103,455
1993	27,008	83,507	49,347			348	76,703	104,236
1994	49,365	83,586	37,159			359	86,883	108,066
1995	92,500	82,171	27,791			95	120,386	109,433
1996	33,878	76,016	34,213			315	68,406	106,711

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Year	Commercial Harvest ^a		Subsistence Harvest ^{b,c}		Test-Fish Harvest	Sport Fish Harvest	Total Utilization	10-Year Average
	Annual	10 yr Avg	Annual	10 yr Avg				
1997	21,989	64,555	40,097			423	62,509	99,280
1998	60,906	61,443	35,425	38,058		178	96,509	99,699
1999	16,976	58,866	46,677	39,204		54	63,707	98,269
2000	4,130	50,792	41,783	39,754		46	45,959	90,745
2001	84	39,905	50,065	39,462	510	231	50,890	79,637
2002	84	30,692	28,858	39,142	228	26	29,196	70,115
2003	282	28,019	34,452	37,652	646	140	35,520	65,997
2004	9,748	24,058	32,433	37,179	742	400	43,323	61,641
10-yr Avg.								
(1994-2003)	28,019		37,652		461	187	65,997	

^a Estimated subsistence harvest expanded from villages surveyed.

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

^c Discrepancies in subsistence harvest numbers by area may be attributable changes in geographic area definitions over time.

Appendix B4.—Coho salmon total utilization, Kuskokwim River, 1960–2005.

Year	Commercial Harvest ^a		Subsistence Harvest ^{b,c}		Test-Fish Harvest	Sport Fish Harvest	Total Utilization	10-Year Average
	Annual	10 yr Avg	Annual	10 yr Avg				
1960	2,498							
1961	5,044							
1962	12,432							
1963	15,660							
1964	28,613							
1965	12,191							
1966	22,985							
1967	56,313							
1968	127,306							
1969	83,765	36,681						
1970	38,601	40,291						
1971	5,253	40,312						
1972	22,579	41,327						
1973	130,876	52,848						
1974	147,269	64,714						
1975	81,945	71,689						
1976	88,501	78,241						
1977	241,364	96,746						
1978	213,393	105,355						
1979	219,060	118,884						
1980	222,012	137,225						
1981	211,251	157,825						
1982	447,117	200,279						
1983	196,287	206,820				1,375	197,662	
1984	623,447	254,438				1,442	624,889	
1985	335,606	279,804				136	335,742	
1986	659,988	336,953				1,222	661,210	
1987	399,467	352,763				1,767	401,234	
1988 ^b	524,296	383,853				927	525,223	
1989	479,856	409,933	52,918			2,459	535,233	
1990	410,332	428,765	44,791			581	455,704	
1991	500,935	457,733	50,331			1,003	552,269	
1992	666,170	479,638	40,168			1,692	708,030	
1993	610,739	521,084	31,737			980	643,456	
1994	724,689	531,208	33,050			1,925	759,664	
1995	471,461	544,793	36,277			1,497	509,235	
1996	937,299	572,524	32,741			3,423	973,463	

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Year	Commercial Harvest ^a		Subsistence Harvest ^{b,c}		Test-Fish Harvest	Sport Fish Harvest	Total Utilization	10-Year Average
	Annual	10 yr Avg	Annual	10 yr Avg				
1997	130,803	545,658	29,032		33,699 ^d	2,408	195,942	585,822
1998	210,481	514,277	24,864	37,591		2,419	237,764	557,076
1999	23,593	468,650	25,003	34,799	213 ^e	1,998	50,807	508,633
2000	261,379	453,755	33,786	33,699	2,828 ^e	1,689	299,682	493,031
2001	192,998	422,961	29,504	31,616	1,723 ^e	1,204	225,429	460,347
2002	83,463	364,691	35,964	31,196	2,484 ^e	2,030	123,941	401,938
2003	284,064	332,023	35,240	31,546	2,377 ^e	3,244	324,925	370,085
2004	433,809	302,935	35,735	31,815	2,259 ^e	4,996	476,799	341,799
10-yr Avg.								
(1994-2003)	332,023		31,546		7,221	2,184	370,085	

^a Estimated subsistence harvest expanded from villages surveyed.

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

^c Discrepancies in subsistence harvest numbers by area may be attributable changes in geographic area definitions over time.

^d Includes Bethel and Aniak test fisheries.

^e Bethel test fishery only.

Appendix B5.—Districts 1 and 2 commercial salmon harvests, Kuskokwim River, 1960–2004.

Year	Chinook	Sockeye	Chum	Pink	Coho	Total
1960	5,969	0	0	0	2,498	8,467
1961	18,918	0	0	0	5,044	23,962
1962	15,341	0	0	0	12,432	27,773
1963	12,016	0	0	0	15,660	27,676
1964	17,149	0	0	0	28,613	45,762
1965	21,989	0	0	0	12,191	34,180
1966	25,545	0	0	0	22,985	48,530
1967	29,986	0	148	0	56,313	86,447
1968	34,278	0	187	0	127,306	161,771
1969	43,997	322	7,165	0	83,765	135,249
1970	39,290	117	1,664	44	38,601	79,716
1971	40,274	2,606	68,914	0	5,253	117,047
1972	39,454	102	78,619	8	22,579	140,762
1973	32,838	369	148,746	33	130,876	312,862
1974	18,664	136	171,887	84	147,269	338,040
1975	22,135	23	184,171	10	81,945	288,284
1976	30,735	2,971	177,864	133	88,501	300,204
1977	35,830	9,379	248,721	203	241,364	535,497
1978	45,641	733	248,656	5,832	213,393	514,255
1979	38,966	1,054	261,874	78	219,060	521,032
1980	35,881	360	483,211	803	222,012	742,267
1981	47,663	48,375	418,677	292	211,251	726,258
1982	48,234	33,154	278,306	1,748	447,117	808,559
1983	33,174	68,855	276,698	211	196,287	575,225
1984	31,742	48,575	423,718	2,942	623,447	1,130,424
1985	37,889	106,647	199,478	75	335,606	679,695
1986	19,414	95,433	309,213	3,422	659,988	1,087,470
1987	36,179	136,602	574,336	43	399,467	1,146,627
1988	55,716	92,025	1,381,674	10,825	524,296	2,064,536
1989	43,217	42,747	749,182	464	479,856	1,315,466
1990	53,504	84,870	461,624	3,397	410,332	1,013,727
1991	37,778	108,946	431,802	378	500,935	1,079,839
1992	46,872	92,218	344,603	7,451	666,170	1,157,314
1993	8,735	27,008	43,337	64	610,739	689,883
1994	16,211	49,365	271,115	30,949	724,689	1,092,329
1995	30,846	92,500	605,918	93	471,461	1,200,818
1996	7,419	33,878	207,877	1,621	937,299	1,188,094
1997	10,441	21,989	17,026	2	130,803	180,261
1998	17,359	60,906	207,809	92	210,481	496,647
1999	4,705	16,976	23,006	2	23,593	68,282
2000	444	4,130	11,570	7	261,379	277,530
2001	90	84	1,272	0	192,998	194,444
2002	72	84	1,900	0	83,463	85,519
2003	158	282	2,764	0	284,064	287,268
2004	2,300	9,748	20,429	0	433,809	466,286
10-Year Average 1994-2003	8,775	28,019	135,026	3,641 ^a	332,023	507,119

Note: Includes harvests in District 3 from 1960 to 1965.

^a Even years only.

Appendix B6.—District 1 commercial salmon fishing effort, Kuskokwim River, 1970–2004.

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

Year	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	278	248	383	0	346	0	390
10 Year Average (1991-2000)	369	384	514	100	474	2	539

^a No commercial salmon season.

^b No unrestricted mesh season.

^c Fishery continued without interruption.

Appendix B7.—Commercial salmon harvest and exvessel value, District 1, Kuskokwim River, 1993–2004.

Year	Chinook		Sockeye		Pink		Chum		Coho		Total	
	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	2,300	\$ 9,822	9,748	\$ 21,685	-	\$ -	20,429	\$ 7,144	433,809	\$ 903,915	466,286	\$ 942,566
10-year Ave												
(1994-2003)	8,449	\$ 56,898	27,724	\$ 111,116	3,299	\$ 982	132,572	\$ 150,720	325,938	\$ 1,022,981	497,981	\$ 1,342,696

Appendix B8.—Commercial salmon harvest by period, District 1, Kuskokwim River, 1995–2004.

Year	Date	No.	Hours	Permit Hours	Chinook		Sockeye		Chum		Coho	
		Permits	Fished		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	Jun	245	2	490	2,045	4.17	1,850	3.78	11,560	23.59	0	0.00
	Jun	283	2	566	2,046	3.61	6,423	11.35	27,442	48.48	0	0.00
	Jun	240	1.5	360	666	1.85	4,420	12.28	19,438	53.99	0	0.00
	Jul	224	2	448	545	1.22	3,962	8.84	20,915	46.69	0	0.00
	Jul	194	2	388	316	0.81	3,481	8.97	17,651	45.49	2	0.01
	Jul	211	2	422	178	0.42	6,795	16.10	18,801	44.55	24	0.06
	Jul	237	2	474	230	0.49	3,781	7.98	26,468	55.84	1,608	3.39
	Jul	197	2	394	87	0.22	602	1.53	15,192	38.56	4,675	11.87
	Jul	267	3	801	164	0.20	298	0.37	13,390	16.72	14,746	18.41
	Jul	417	6	2,502	183	0.07	639	0.26	14,504	5.80	50,443	20.16
	Jul	487	8	3,896	124	0.03	256	0.07	9,024	2.32	113,637	29.17
	Jul	526	6	3,156	97	0.03	186	0.06	3,828	1.21	144,773	45.87
	Jul	464	6	2,784	52	0.02	92	0.03	1,541	0.55	122,946	44.16
	Aug	541	6	3,246	59	0.02	129	0.04	1,097	0.34	132,540	40.83
	Aug	514	6	3,084	43	0.01	73	0.02	581	0.19	94,332	30.59
	Aug	502	6	3,012	45	0.01	60	0.02	797	0.26	83,653	27.77
	Aug	471	6	2,826	25	0.01	82	0.03	296	0.10	70,053	24.79
	Aug	459	6	2,754	28	0.01	147	0.05	215	0.08	49,012	17.80
	Aug	400	6	2,400	19	0.01	83	0.03	51	0.02	25,870	10.78
	Aug	293	6	1,758	9	0.01	22	0.01	23	0.01	13,133	7.47
	Aug	209	6	1,254	11	0.01	23	0.02	13	0.01	8,684	6.93
Total		620	92.5	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	

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Year	Date	No. Permits	Hours Fished	Permit Hours	Chinook		Sockeye		Chum		Coho	
					Catch	CPUE	Catch	CPUE	Catch	CPUE	Catch	CPUE
1998	6/24	338	6	2,028	6,413	3.16	9,043	4.46	32,467	16.01		
	6/29	426	6	2,556	6,358	2.49	22,506	8.81	66,789	26.13		
	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
	Total		615	68	53,812	38,228		104,882		241,704		469,370
1999	6/30	409	6	2,454	4,668	1.90	16,772	6.83	22,700	9.25		
	8/7	389	6	2,334	37	0.02	204	0.09	306	0.13	23,593	10.1
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		
	8/1 ^a	248	6	1,488	12	0.01	94	0.06	156	0.10	25,642	17.2
	8/4 ^b	123	6	738	7	0.01	7	0.01	53	0.07	50,260	68.1
	8/5 ^a	270	6	1,620	8	0.00	73	0.05	43	0.03	32,056	19.8
	8/8 ^b	186	6	1,116	9	0.01	26	0.02	55	0.05	26,771	24.0
	8/9 ^a	217	6	1,302	13	0.01	57	0.04	128	0.10	20,905	16.1
	8/12 ^b	189	6	1,134	12	0.01	17	0.01	23	0.02	37,451	33.0
	8/14 ^a	224	6	1,344	6	0.00	75	0.06	33	0.02	16,766	12.5
	8/14 ^b	193	6	1,158	5	0.00	23	0.02	15	0.01	17,916	15.5
	8/18 ^a	199	6	1,194	6	0.01	58	0.05	16	0.01	14,697	12.3
	8/21 ^b	158	6	948	4	0.00	3	0.00	10	0.01	8,577	9.0
	8/22 ^a	143	6	858	1	0.00	32	0.04	4	0.00	4,489	5.2
	8/25 ^{a,b}	106	6	636	4	0.01	7	0.01	8	0.01	4,191	6.6
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	29.8
	8/6 ^b	108	4	432	8	0.02	5	0.01	101	0.23	20,089	46.5
	8/8 ^{a,b}	262	6	1,572	23	0.01	11	0.01	356	0.23	46,369	29.5
	8/11 ^b	175	6	1,050	20	0.02	10	0.01	218	0.21	41,643	39.7
	8/13 ^a	143	4	572	5	0.01	4	0.01	37	0.06	9,647	16.9
	8/15 ^{a,b}	296	6	1,776	5	0.00	15	0.01	122	0.07	28,893	16.3
	8/17 ^{a,b}	259	6	1,554	12	0.01	9	0.01	65	0.04	11,064	7.1
	8/20 ^{a,b}	149	6	894	6	0.01	5	0.01	17	0.02	5,440	6.1
	8/22 ^{a,b}	149	6	894	0	0.00	3	0.00	4	0.00	8,149	9.1
	8/25 ^{a,b}	118	6	708	2	0.00	0	0.00	5	0.01	4,530	6.4
Total		412	54	10,028	90		84		1,272		192,998	

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Year	Date	No. Hours		Permit Hours	Chinook		Sockeye		Chum		Coho	
		Permits	Fished		Catch	CPUE	Catch	CPUE	Catch	CPUE	Catch	CPUE
2002	8/2 ^a	40	2	80	7	0.09	3	0.04	134	1.68	2,492	31.2
	8/5 ^{a,b}	175	4	700	18	0.03	41	0.06	573	0.82	11,164	15.9
	8/8 ^{a,b}	119	6	714	22	0.03	20	0.03	541	0.76	22,890	32.1
	8/9 ^a	132	6	792	8	0.01	9	0.01	254	0.32	13,749	17.4
	8/12 ^{a,b}	136	6	816	9	0.01	8	0.01	292	0.36	22,962	28.1
	8/13 ^a	109	6	654	8	0.01	3	0.00	106	0.16	10,206	15.6
	Total		318	30	9,540	72		84		1,900		83,463
2003	7/31 ^b	57	2	114	11	0.10	13	0.11	405	3.55	7,717	67.7
	8/1 ^a	95	4	380	30	0.08	69	0.18	545	1.43	9,707	25.5
	8/4 ^b	91	4	364	7	0.02	10	0.03	310	0.85	14,308	39.3
	8/5 ^a	119	4	476	13	0.03	69	0.14	214	0.45	12,233	25.7
	8/7 ^b	123	6	738	16	0.02	3	0.00	374	0.51	30,162	40.9
	8/8 ^a	118	4	472	12	0.03	41	0.09	200	0.42	15,800	33.5
	8/11 ^b	130	4	520	9	0.02	9	0.02	208	0.40	31,371	60.3
	8/12 ^a	107	4	428	12	0.03	10	0.02	116	0.27	18,703	43.7
	8/14 ^b	141	4	564	12	0.02	2	0.00	78	0.14	36,537	64.8
	8/15 ^a	116	4	464	15	0.03	12	0.03	67	0.14	16,027	34.5
	8/18 ^b	105	3	315	3	0.01	3	0.01	40	0.13	14,219	45.1
	8/19 ^a	95	4	380	6	0.02	15	0.04	25	0.07	8,720	22.9
	8/21 ^b	111	6	666	2	0.00	3	0.00	27	0.04	18,804	28.2
	8/22 ^a	49	6	294	0	0.00	1	0.00	14	0.05	2,914	9.9
	8/25 ^b	109	6	654	1	0.00	5	0.01	32	0.05	12,789	19.6
	8/26 ^a	112	6	672	4	0.01	2	0.00	15	0.02	11,434	17.0
	8/28 ^b	100	6	600	3	0.01	7	0.01	40	0.07	8,228	13.7
	8/29 ^b	60	6	360	0	0.00	4	0.01	29	0.08	4,524	12.6
	9/1 ^b	44	8	352	1	0.00	1	0.00	12	0.03	3,504	10.0
	9/2 ^b	37	8	296	0	0.00	0	0.00	7	0.02	3,011	10.2
9/3 ^b	30	8	240	1	0.00	2	0.01	6	0.03	3,121	13.0	
Total		359	107		158		281		2,764		283,833	
2004	6/30 ^a	52	2	104	520	5.00	1,781	17.13	-	0.00	2,798	26.9
	7/2 ^b	44	3	132	488	3.70	1,890	14.32	-	0.00	2,416	18.3
	7/6 ^b	38	3	114	235	2.06	1,853	16.25	2	0.02	1,946	17.1
	7/7 ^a	50	4	200	384	1.92	1,780	8.90	16	0.08	5,076	25.4
	7/28 ^b	90	4	360	127	0.35	70	0.19	6,004	16.68	2,343	6.5
	7/30 ^a	99	4	396	61	0.15	271	0.68	9,464	23.90	587	1.5
	8/2 ^b	105	6	630	75	0.12	189	0.30	16,148	25.63	850	1.3
	8/3 ^a	115	6	690	68	0.10	192	0.28	23,957	34.72	646	0.9
	8/5 ^b	120	6	720	39	0.05	41	0.06	19,235	26.72	586	0.8
	8/6 ^a	144	6	864	59	0.07	673	0.78	27,941	32.34	768	0.9
	8/9 ^b	139	6	834	54	0.06	168	0.20	47,151	56.54	504	0.6
	8/10 ^a	151	6	906	18	0.02	457	0.50	19,549	21.58	280	0.3
	8/12 ^b	152	6	912	29	0.03	50	0.05	28,691	31.46	371	0.4
	8/13 ^a	91	6	546	16	0.03	8	0.01	20,353	37.28	94	0.2
	8/16 ^b	144	6	864	22	0.03	14	0.02	29,909	34.62	140	0.2
	8/17 ^a	113	6	678	8	0.01	33	0.05	8,764	12.93	44	0.1
8/19 ^b	118	6	708	5	0.01	9	0.01	6,834	9.65	110	0.2	
8/20 ^a	82	6	492	11	0.02	30	0.06	9,254	18.81	103	0.2	

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Year	Date	No.	Hours	Permit	Chinook		Sockeye		Chum		Coho	
		Permits	Fished	Hours	Catch	CPUE	Catch	CPUE	Catch	CPUE	Catch	CPUE
	8/23 ^{a,b}	206	8	1,648	26	0.02	23	0.01	32,542	19.75	306	0.2
	8/24 ^{a,b}	211	8	1,688	24	0.01	174	0.10	32,010	18.96	179	0.1
	8/27 ^{a,b}	224	8	1,792	9	0.01	22	0.01	31,395	17.52	124	0.1
	8/30 ^{a,b}	186	8	1,488	9	0.01	13	0.01	23,648	15.89	83	0.1
	9/2 ^{a,b}	163	6	978	2	0.00	5	0.01	14,563	14.89	32	0.0
	9/4 ^{a,b}	122	6	732	6	0.01	-	0.00	11,948	16.32	13	0.0
	9/6 ^{a,b}	115	6	690	2	0.00	2	0.00	8,406	12.18	15	0.0
	9/8 ^{a,b}	80	6	480	3	0.01	-	0.00	6,025	12.55	15	0.0
Total		390	148		2,300		9,748		433,809		20,429	

^a Subdistrict W-1A (above Bethel) opening.

^b Subdistrict W-1B (below Bethel) opening.

Appendix B9.—Commercial harvest by period, District 2, Kuskokwim River, 1994–2004.

Year	Date	No. 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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Year	Date	No. Permits	Hours Fished	Chinook		Sockeye		Chum		Coho	
				Catch	CPUE	Catch	CPUE	Catch	CPUE	Catch	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										

Appendix B10.—Inseason subsistence report summaries, Kuskokwim River, 2001–2004.

2001 Summary of Subsistence Salmon Information Collected by ONC Technicians^{a,b}

Week ending	Number of Families			Chinook			Chum			Sockeye			Coho		
	Interviewed	Fishing	Not Fishing	Good	Normal	Poor	Good	Normal	Poor	Good	Normal	Poor	Good	Normal	Poor
Jun 09	16	16	0	6	6	4									
Jun 16	39	39	0	18	15	6	1	6	15	13	24	1			
Jun 23	35	35	0	27	7	1	0	2	20	24	11	0	0	0	0
Jun 30	40	25	15	8	7	8	5	12	8	19	6	0	0	0	0
Jul 07	44	7	37	0	1	5	5	1	1	0	5	2	0	0	0
Jul 14	44	6	38	0	0	4	4	2	0	0	0	4	0	0	0
Jul 21	44	0	44	0	0	0	0	0	0	0	0	0	0	0	0
Jul 28	44	9	35	0	0	0	1	7	0	0	0	0	0	7	1
Aug 04	42	20	22				0	1	17				18	2	0
Aug 11	37	2	35				0	0	0				2	1	0
Aug 18	37	3	34				0	0	3				1	2	0
Aug 25	44	3	34		0	0	0	0	3				3	0	0
Total ^c	466	165	294	59	36	28	16	31	67	56	46	7	24	12	1
Average	39	14	25	7	4	3	1	3	6	8	7	1	2	1	0

2001 Summary of Subsistence Salmon Information Collected by KNA Technicians^{b,d}

Week ending	Number of Families			Chinook			Chum			Sockeye			Coho		
	Interviewed	Fishing	Not Fishing	Good	Normal	Poor	Good	Normal	Poor	Good	Normal	Poor	Good	Normal	Poor
Jun 09	4			1	2	1	1	0	0	0	0	0	0	0	0
Jun 16	14			4	11	1	2	7	3	0	7	1	0	0	0
Jun 23	14			4	11	1	2	7	3	8	7	1	0	0	0
Jun 30	14			1	10	3	0	5	6	10	2	0	0	0	0
Jul 07	3	3	0	0	3	0	0	0	3	0	2	1	0	0	0
Jul 21	2			0	0	0	1	1	0	0	0	0	0	0	0
Total ^c	51	3	0	10	37	6	6	20	15	18	18	3	0	0	0
Average	9	3	0	2	6	1	1	3	3	3	3	1	0	0	0

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2001 Summary of Subsistence Salmon Information Collected by MNC Technicians^{b,f}

Week ending	Number of Families			Chinook			Chum			Sockeye			Coho		
	Interviewed	Fishing	Not	Good	Normal	Poor	Good	Normal	Poor	Good	Normal	Poor	Good	Normal	Poor
Jun 23	3	3	0		3										
Jun 30	1	1	0		1										
Jul 07	6			3	3					2					
Jul 14	7			3	4			2							
Total ^c	17	4	0	6	11	0	0	2	0	2	0	0	0	0	0
Average	4	2	0	3	3	0	0	2	0	2	0	0	0	0	0

2002 Summary of Subsistence Salmon Information Collected by ONC Technicians^{a,b}

Week ending	Number of Families			Chinook			Chum			Sockeye			Coho		
	Interviewed	Fishing	Not	Good	Normal	Poor	Good	Normal	Poor	Good	Normal	Poor	Good	Normal	Poor
Jun 15	27	23	4	21	2	0	3	8	7	3	11	3	0	0	0
Jun 22	33	25	8	17	5	3	12	9	3	2	10	10	0	0	0
Jun 29	34	22	12	16	6	0	21	0	0	0	3	16			
Jul 06	34	5	29	0	2	3	3	2	0	0	0	5			
Jul 13	36	10	26	0	3	5	8	0	0	0	0	8	0	0	0
Jul 20	40	9	31	0	9	0	1	7	1	0	0	9	0	0	0
Jul 27	35	31	4	0	31	0	0	31	0	0	31	0	9	22	0
Aug 03	37	13	24	0	0	0	0	10	2	0	0	0	9	4	0
Aug 10	37	0	0												
Total ^c	313	138	138	54	58	11	48	67	13	5	55	51	18	26	0
Average	35	15	15	7	7	1	6	8	2	1	7	6	3	4	0

2002 Summary of Subsistence Salmon Information Collected by KNA Technicians^{b,d}

Week ending	Number of Families			Chinook			Chum			Sockeye			Coho		
	Interviewed	Fishing	Not	Good	Normal	Poor	Good	Normal	Poor	Good	Normal	Poor	Good	Normal	Poor
Jun 08 ^c	3	2	1	0	1	1	1	0	0	0	0	0	0	0	0
Jun 15	16	11	5	0	4	7	0	0	11	0	0	0	0	0	0
Jun 22	15	15	0	4	10	1	3	9	0	0	10	1	0	0	0
Jun 29	17	15	2	4	5	6	8	4	0	0	5	5	1	0	0
Jul 06	3	2	1	0	1	1	1	0	0	0	0	0	0	0	0
Jul 13	5	3	2	1	1	1	0	0	0	0	0	0	0	0	0
Total ^c	59	48	11	9	22	17	13	13	11	0	15	6	1	0	0
Average	10	8	2	2	4	3	2	2	2	0	3	1	0	0	0

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2002 Summary of Subsistence Salmon Information Collected by MNVC Technicians ^{b, f}																
Week ending	Number of Families			Chinook			Chum			Sockeye			Coho			
	Interviewed	Fishing	Not Fishing	Good	Normal	Poor	Good	Normal	Poor	Good	Normal	Poor	Good	Normal	Poor	
Jun 15 ^c	2	2	0	1	0	0	0	0	0	0	0	0	0	0	0	
Jun 22 ^c	2			1	0	1	0	0	0	0	0	0	0	0	0	
Jun 29	6			2	1	3	0	0	0	0	0	0	0	0	0	
Jul 06	9			1	4	3	0	0	0	0	0	1	0	0	0	
Jul 13	9			2	4	3	1	0	0	0	0	1	0	0	0	
Jul 20	5	5		0	4	1	0	0	0	0	0	0	0	0	0	
Jul 27	5	4	1	0	1	4	0	0	0	0	0	0	0	0	0	
Aug 17	10			0	0	0	0	0	2	0	0	0	5	4	1	
Total ^c	48	11	1	7	14	15	1	0	2	0	0	2	5	4	1	
Average	6	4	1	1	2	2	0	0	0	0	0	0	1	1	0	

2003 Summary of Subsistence Salmon Information Collected by ONC Technicians ^{a, b}																
Week ending	Number of Families			Chinook			Chum			Sockeye			Coho			
	Interviewed	Fishing	Not Fishing	Good	Normal	Poor	Good	Normal	Poor	Good	Normal	Poor	Good	Normal	Poor	
Jun 07	18	9	9	7	2	0										
Jun 14	33	24	9	22	2	0	0	2	0	0	3	0				
Jun 21	48	32	14	30	2	1	1	0	0	7	18	3				
Jun 28	50	34	16	30	4	0	3	9	13	27	7	0				
Jul 05	45	21	24	16	5	0	8	13	0	16	5	0				
Jul 12	46	14	32	0	12	2	13	1	0	0	12	2				
Jul 19	48	5	43	0	5	0	5	0	0	0	5	0	2	3	0	
Jul 26	48	7	41	0	7	0	4	3	0	0	7	0	6	1	0	
Aug 09	49	11	38	0	0	0	0	0	0	0	0	0	10	1	0	
Aug 16	48	10	38	0	0	0	0	0	0	0	0	0	9	1	0	
Total ^c	433	167	264	0	105	39	3	0	34	28	13	0	50	57	5	0
Average	43	17	26	11	4	0	4	3	1	6	6	1	7	2	0	

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2003 Summary of Subsistence Salmon Information Collected by KNA Technicians ^{b,d}																
Week ending	Number of Families			Chinook			Chum			Sockeye			Coho			
	Interviewed	Fishing	Not Fishing	Good	Normal	Poor	Good	Normal	Poor	Good	Normal	Poor	Good	Normal	Poor	
Jun 07 ^c																
Jun 14	19			0	11	7	0	10	6	0	4	6	0	0	0	
Jun 21	27			3	15	9	1	13	10	0	18	8	0	0	0	
Jun 28	17			3	9	4	0	13	3	0	15	2	0	0	0	
Jul 05	17			0	8	0	3	4	0	2	4	2	0	0	0	
Jul 12	27			2	5	0	8	0	1	5	4	1	0	0	0	
Jul 19	7			0	4	0	1	5	0	0	6	0	0	0	0	
Jul 26 ^c																
Aug 02 ^c																
Aug 09	13			0	0	0	0	1	1	0	0	0	0	4	0	
Aug 16 ^c																
Total ^c	127	0	0	8	52	20	13	46	21	7	51	19	0	4	0	
Average	18	0	0	1	7	3	2	7	3	1	7	3	0	1	0	

2003 Summary of Subsistence Salmon Information Collected by MNVC Technicians ^{b,f}																
Week ending	Number of Families			Chinook			Chum			Sockeye			Coho			
	Interviewed	Fishing	Not Fishing	Good	Normal	Poor	Good	Normal	Poor	Good	Normal	Poor	Good	Normal	Poor	
Jun 07 ^c																
Jun 14 ^c																
Jun 21	3			2	0	1	0	1	0	1	0	0	0	0	0	
Jun 28	11			3	1	7	0	0	2	1	0	0	0	0	0	
Jul 05	9			1	6	2	0	0	0	0	0	0	0	0	0	
Jul 12	11			3	5	0	1	2	0	3	0	0	0	0	0	
Jul 19	9	3	6	1	0	2	0	0	0	0	0	0	0	0	0	
Jul 26	12	3	9	2	0	1	0	0	0	0	0	0	0	0	0	
Aug 02 ^c																
Aug 09	9	3	6	0	0	0	0	1	2	0	0	0	0	2	1	
Aug 16 ^c																
Total ^c	64	9	21	12	12	13	1	4	4	5	0	0	0	2	1	
Average	9	3	7	2	2	2	0	1	1	1	0	0	0	0	0	

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2004 Summary of Subsistence Salmon Information Collected by ONC Technicians ^{a,b}

Week ending	Number of Families			Chinook			Chum			Sockeye			Coho		
	Interviewed	Fishing	Not Fishing	Good	Normal	Poor	Good	Normal	Poor	Good	Normal	Poor	Good	Normal	Poor
Jun 05	31	10	21	6	4	0									
Jun 12	41	37	4	27	8	2									
Jun 19	35	31	4	23	8	0	4	27	0	4	27	0			
Jun 26	43	31	12	19	12	0	24	7	0	5	22	4			
Jul 03	44	22	22	3	17	0	10	10	0	0	13	7			
Jul 10	44	13	31	0	10	0	8	2	0	0	4	6			
Jul 17	35	6	29	0	6	0	0	6	0	0	6	0	0	6	0
Jul 24	46	8	38										0	8	0
Jul 31	47	7	40										7	0	0
Aug 07	58	22	36										19	3	0
Aug 14	44	16	28										16	0	0
Aug 21	52	8	44										8	0	0
Total ^e	520														
Average	43	18	26	11	9	0	9	10	0	2	14	3	8	3	0

^a Surveys in the Lower Kuskokwim River were conducted from Oscarville to the mouth of the Kwethluk River.

^b Represents responses from the question “Compared with this time in a “Normal” year how were catch rates for salmon this week?”

^c Surveys not conducted.

^d Represents the total number of interviews conducted during the survey year, most families were interviewed more than once.

^e Surveys in the Middle Kuskokwim River were conducted from Lower Kalskag to Chuathbaluk.

^f Surveys in the Upper Kuskokwim River were conducted from Georgetown to Nikolai.

Appendix B11.—Select chum salmon spawning escapement estimates, Kuskokwim River drainage, 1976–2004.

Year	Lower Kuskokwim		Middle Kuskokwim		Upper Kuskokwim		
	Kwethluk Weir	Tuluksak Weir	Aniak Sonar	KogrukluK Weir	George Weir	Tatlawiksuk Weir	Takotna Weir
1976				8,177			
1977				19,443 ^a			
1978				48,125			
1979				18,198 ^a			
1980			1,132,077				
1981			570,444	57,365			
1982			428,314	64,063 ^a			
1983			125,231	9,407 ^a			
1984			258,440	41,484			
1985			244,960	15,005			
1986			202,395 ^b	14,693 ^c			
1987			186,842				
1988			388,673	39,540 ^a			
1989			236,123 ^b	39,549 ^a			
1990			224,834	26,765			
1991		697	304,121 ^b	24,188 ^c			
1992	9,675	1,083	81,575	34,105			
1993		2,218	13,427	31,899 ^c			
1994		2,917	375,752 ^b	46,635 ^a			
1995				31,265 ^b			
1996	7,415		302,106	48,495	7,716 ^c		
1997	10,395		262,522	7,958	7,823		1,779
1998		^b	279,430	36,442 ^a	^b	^b	^b
1999		^b	177,771 ^b	13,820	3,548 ^a	9,599	
2000	3,547		144,157	11,491	2,960	7,044	1,254
2001		^b	326,013 ^b	30,569 ^a	3,309	23,718	5,414
2002	8,502	1,346	362,812	51,570	2,444	24,542	4,377
2003	14,470	1,070	359,423	23,400	1,453	^b	3,120
2004	38,646	11,796	672,931	197,723	14,409	21,245	1,630
SEG			210,000-370,000	15,000-49,000			

^a Estimates are from "peak" aerial surveys conducted between 20 and 31 July under fair, good, or excellent viewing conditions.

^b Median of years 1975 through 1994.

^c Formally established BEG (Buklis 1993).

Appendix B12.—Salmon spawning escapement estimates, Kwethluk River, Kuskokwim River drainage, 1992–2004.

Year	Operating Period ^a	Chinook	Sockeye	Chum	Pink	Coho
<i>Kwethluk River</i>						
<i>Weir</i>						
1992	06/20 to 09/12	9,675	1,316	30,595	45,952	45,605
<i>Counting Tower</i>						
1996	06/21 to 07/27	7,415	1,801 ^b	26,049 ^b	2,853 ^b	189 ^b
1997	06/20 to 08/12	10,395	1,374	10,659	1,008 ^b	1,110 ^b
1998	07/24 to 08/18	120 ^b	120 ^b	720 ^b	4,398 ^b	2,367 ^b
1999	07/15 to 08/18	873 ^b	234 ^b	702 ^b	678 ^b	693 ^b
<i>Weir</i>						
2000	06/22 to 09/15	3,547	358	11,691	1,407	25,610
2001	08/08 to 09/14	69 ^b	32 ^b	324 ^b	634 ^b	22,904 ^b
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	27,129	3,302	37,109	3,025	64,143

^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 Field operations were incomplete and no total annual escapement was estimated.

Appendix B13.—Salmon spawning escapement estimates, Tuluksak River, Kuskokwim River drainage, 1991–2004.

Year	Operating Period ^a	Chinook	Sockeye	Chum	Pink	Coho
Tuluksak River Weir						
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 ^b
2001	06/29 to 09/10	997 ^b	137	19,321	48	23,768 ^b
2002	06/10 to 09/10	1,346	82	9,958	27	11,487
2003	06/15 to 09/20	1,064	288	11,724	662	41,071
2004	06/20 to 09/10	1,479	258	11,794	496	20,336

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

Appendix B14.—Salmon spawning escapement estimates, George River, Kuskokwim River drainage, 1996–2004.

Year	Operating Period ^a	Chinook	Sockeye	Chum	Pink	Coho
George River Weir						
1996	06/15 to 09/20	7,716 ^b	98 ^c	21,670 ^c	644 ^d	173 ^d
1997	06/15 to 09/20	7,823	445	5,907	17	9,210
1998	06/22 to 08/02	2,505 ^d	9 ^d	6,391 ^d	4 ^d	52 ^d
1999	06/15 to 09/20	3,548 ^b	39 ^d	11,552 ^b	97 ^d	8,914
2000	06/15 to 09/20	2,960	22	3,492	61	11,262
2001	06/15 to 09/20	3,309	24	11,601	83	14,398 ^b
2002	06/15 to 09/20	2,444	17	6,543	630	6,759
2003	06/15 to 09/20	4,693 ^b	16	33,666 ^b	158	33,280
2004	06/27 to 09/19	5,335	174	13,170	29	12,522

^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 Field operations were incomplete and no total annual escapement was estimated.

^c Field operations were incomplete; 10 to 20% of the total annual escapement is based on daily passage estimates.

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

Appendix B15.—Salmon spawning escapement estimates, Kogrukluk River, Kuskokwim River drainage, 1969–2004.

Year	Operating Period ^a	Chinook	Sockeye	Chum	Pink	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	^c	^c	^c	^c	
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	5,579	2,326	8,117	0 ^c	^c
1977	07/14 to 07/27	1,385 ^d	1,637 ^d	19,443 ^d	2 ^c	^c
1978	06/28 to 07/31	13,667	1,670	48,125	2 ^c	^c
1979	07/01 to 07/24	11,338 ^e	2,628	18,198 ^d	1 ^c	^c
1980	07/01 to 07/11	6,572 ^c	3,200 ^c	41,777 ^c	1 ^c	^c
1981	06/27 to 10/05	16,655	18,066	57,365	6 ^c	11,455
1982	07/09 to 09/14	10,993 ^d	17,297 ^d	64,063 ^d	19 ^c	37,796
1983	06/23 to 09/27	3,009 ^d	1,176 ^d	9,407 ^d	0 ^c	8,538
1984	06/19 to 09/15	4,928	4,133	41,484	0 ^c	27,595
1985	07/06 to 09/24	4,619	4,359	15,005	0 ^c	16,441 ^e
1986	06/29 to 09/07	5,038 ^d	4,244 ^d	14,693 ^e	0 ^c	22,506 ^d
1987	07/15 to 09/24	4,063 ^c	973 ^c	17,422 ^c	0 ^c	22,821 ^e
1988	07/05 to 09/17	8,505	4,397	39,540 ^d	0 ^c	13,512 ^e
1989	07/07 to 08/24	11,940 ^d	5,811 ^d	39,549 ^d	0 ^c	1,272 ^c
1990	06/28 to 09/07	10,218	8,406	26,765	1 ^c	6,132 ^d
1991	07/04 to 09/15	7,850 ^d	16,455 ^e	24,188 ^e	4 ^c	9,964 ^d
1992	07/01 to 08/21	6,755	7,540	34,105	11 ^c	26,057 ^d
1993	07/02 to 09/06	12,332 ^e	29,358	31,899 ^e	0 ^c	20,517 ^d
1994	07/02 to 09/14	15,227 ^d	14,192 ^d	46,635 ^d	23 ^c	34,695 ^d
1995	07/02 to 09/06	20,630	10,996	31,265	2 ^c	27,861 ^d
1996	06/29 to 09/15	14,199	15,385	48,495	6 ^c	50,555

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Year	Operating Period ^a	Chinook	Sockeye	Chum	Pink	Coho
1997	06/28 to 09/21	13,286	13,078	7,958	0 ^c	12,237
1998	07/18 to 09/19	12,107 ^d	16,773 ^d	36,442 ^d	1 ^c	24,348
1999	07/06 to 09/18	5,570	5,864	13,820	0 ^c	12,609 ^e
2000	07/02 to 09/20	3,310	2,867	11,491	2 ^c	33,135
2001	06/21 to 09/25	9,298 ^d	8,773 ^d	30,569 ^d	9 ^c	19,387 ^d
2002	06/26 to 09/24	10,104	4,050	51,570	15 ^c	14,516
2003	06/15 to 09/20	11,771	9,164	23,413	3 ^c	74,604
2004	06/21 to 09/18	19,503	6,671	24,179	14	24,718

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

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

^d Field operations were incomplete; 10 to 20% of the total annual escapement is based on daily passage estimates.

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

Appendix B16.—Salmon spawning escapement estimates from select projects, Kuskokwim River drainage, 1995–2004.

Year	Operating Period ^a	Chinook	Sockeye	Chum	Coho
Holitna River Radiotelemetry Mark-Recapture					
2001	06/16 to 09/10	25,405		n.a.	63,442
2002	06/14–09/10	42,902		542,172	157,277
2003	06/10–07/29	42,013		n.a.	n.a.
2004	06/10-08/07	81,961		996,216	n.a.
Tatlawiksuk River Weir					
1998	06/15 to 07/07	970 ^b	0 ^b	5,726 ^b	0 ^b
1999	06/15 to 09/20	1,490	6	9,599	3,455 ^c
2000	06/15 to 09/20	817	0	7,044	5,756 ^b
2001	06/15 to 09/20	2,010	3	23,718	10,539 ^d
2002	06/15 to 09/20	2,237	1	24,542	11,345
2003	06/15 to 07/02	1,683 ^d			
2004	06/15 to 09/18	2,849	10	21583	16408
Takotna River					
<i>Counting Tower</i>					
1995	07/07 to 09/01	156 ^b	0 ^b	1,685 ^b	0 ^b
1996	06/24 to 07/25	402 ^b	0 ^b	2,794 ^b	0 ^b
1997	06/24 to 08/04	1,161	0 ^b	1,779	0 ^b
1998	06/28 to 07/05	21 ^b	0 ^b	45 ^b	0 ^b
1999					
<i>Weir</i>					
2000	06/24 to 09/20	345	4	1,254	3,957
2001	06/24 to 09/20	721	1	5,479	2,606
2002	06/24 to 09/20	316	1	4,366	3,984
2003	06/15 to 09/20	378	4	3,393	7,171
2004	06/24 to 09/18	463	18	1,620	3,207
Kuskokwim River Fish Wheel Mark-Recapture (at Kalskag-Birch Tree Crossing) ^e					
2001	07/22 to 09/10				
2002		n.a.	^f	675,659	316,068
2003			90,444	412,443	849,494
2004					
Kuskokwim River Radiotelemetry Mark-Recapture (at Kalskag-Birch Tree Crossing) ^e					
2002		100,733			
2003		103,161			
2004		146,839			

^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 Field operations were incomplete and no total annual escapement was estimated.

^c Field operations were incomplete; 10 to 20% of the total annual escapement is based on daily passage estimates.

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

^e Reported numbers are for the estimated passage at Kalskag-Birch Tree Crossing and do not account for upstream harvest. Estimate supplied for the mainstem Kuskokwim River upstream from the confluence with the Aniak River.

^f Abundance was not estimated because few fish were captured, tagged and recovered.

Appendix B17.—Salmon spawning escapement estimates, Aniak River, Kuskokwim River drainage, 1980–2004.

Year	Operating Period ^a	Chinook	Sockeye	Chum	Pink	Coho
Aniak River Sonar ^b						
Escapement Goal:				250,000		
<i>Non user-configurable, one-bank expanded estimates</i>						
1980	06/22 to 07/30	56,469		1,169,470		
	08/16 to 09/12					81,556
1981	06/16 to 08/06	42,060		589,286		
1982	06/21 to 08/01	33,864		442,461		
1983	06/18 to 07/28	4,911		129,367		
1984	06/16 to 07/30			266,976		
1985	06/22 to 07/28			253,051		
1986	06/26 to 07/24			209,080 ^c		
1987	06/22 to 07/31			193,013		
1988	06/22 to 07/31			401,511		
1989	06/21 to 07/24			243,922 ^c		
1990	06/23 to 08/06			232,260		
1991	06/29 to 07/29			314,166 ^c		
1992	06/22 to 07/29			84,269		
1993	06/24 to 07/28			13,870		
1994	06/28 to 07/28			388,163 ^c		
1995	06/23 to 07/23			n.a. ^c		
<i>User-configurable, two-bank estimates</i>						
1996	06/21 to 07/28			302,106		
1997	06/16 to 08/03			262,522		
1998	06/24 to 07/31			279,431		
1999	06/30 to 08/03			178,129 ^c		
2000	06/26 to 07/31			144,157		
2001	07/11 to 07/31			222,231 ^c		
2002	06/26 to 07/31			362,812		
2003	06/28 to 07/31			363,396		
2004	06/26 to 07/31			672,880		

^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 B18.—Chinook salmon spawning aerial survey index estimates, Kuskokwim River drainage, 1979–2004.

Year	Lower Kuskokwim				Middle Kuskokwim						Upper Kuskokwim			
	Eek	Kwethluk	Kisaralik	Tuluksak	Aniak	Kipchuk (Aniak)	Salmon (Aniak)	Holokuk	Oskawalik	Holitna	Kogrukluk Weir	Gagarayah	Cheeneetnuk	Salmon (Pitka)
1979										45				682
1980	2,378			1,035			1,186							1,450
1981		2,034	672		9,074									1,439
1982		471	81							42	521			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
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
Median ^b	1,312			1,800		778		82	103					

Note: Estimates are from "peak" aerial surveys conducted between 20 and 31 July with fair or good overall rankings.

^a Formally established SEG (ADF&G 2004).

^b Median of years 1975 through 1994.

Appendix B19.—Chinook salmon commercial fishery age and sex composition information, District 1, Kuskokwim River, 1993–2004.

Year	Project	Sample Size	Sex	Age Class								Total	
				1.2		1.3		1.4		1.5		Harvest	%
				Harvest	%	Harvest	%	Harvest	%	Harvest	%		
1993	Season ^a	102	M										
			F										
			Total									8,714	
1994	Season ^a	208	M										
			F										
			Total									16,201	
1995	Season	578	M	9,318	33.2	3,601	12.8	6,273	22.4	79	0.3	19,307	68.8
			F	268	1.0	868	3.1	7,459	26.6	150	0.5	8,745	31.2
			Total	9,586	34.2	4,470	15.9	13,733	49.0	229	0.8	28,054	100.0
1996	Season	592	M	1,924	27.6	2,651	38.0	692	9.9	243	3.5	5,537	79.4
			F	10	0.1	316	4.5	692	9.9	409	5.9	1,435	20.6
			Total	1,934	27.7	2,967	42.6	1,384	19.9	652	9.4	6,972	100.0
1997	Season ^a	162	M										
			F										
			Total									10,436	
1998	Season	437	M	4,055	23.4	8,399	48.4	821	4.7	72	0.4	13,541	78.0
			F	79	0.4	1,841	10.6	1,590	9.2	305	1.8	3,815	22.0
			Total	4,134	23.8	10,240	59.0	2,411	13.9	377	2.2	17,356	100.0
1999	Season ^a	190	M										
			F										
			Total									4,705	
2000	Season ^a		M										
			F										
			Total										
2001	Season ^a		M										
			F										
			Total										
2003	Season ^a		M										
			F										
			Total										
2004	6/30	219	M	566	56.2	267	26.5	83	8.2	0	0.0	925	91.8
	(6/30, 7/2)		F	0	0.0	18	1.8	60	6.0	5	0.5	83	8.2
			Subtotal	566	56.2	285	28.3	143	14.2	5	0.5	1,008	100.0

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Year	Project	Sample Size	Sex	Age Class								Total	
				1.2		1.3		1.4		1.5		Harvest	%
				Harvest	%	Harvest	%	Harvest	%	Harvest	%		
2004	7/6	134	M	762	59.0	280	21.6	48	3.7	0	0.0	1,109	85.8
(Cont.)	(7/6–9/8)		F	9	0.7	19	1.5	145	11.2	10	0.7	183	14.2
			Subtotal	771	59.7	299	23.1	193	14.9	10	0.7	1,292	100.0
	Season	353	M	1,328	57.8	546	23.8	131	5.7	0	0.0	2,034	88.4
			F	9	0.4	38	1.6	205	8.9	14	0.6	266	11.6
			Total	1,337	58.2	584	25.4	336	14.6	14	0.6	2,300	100.0
	Grand	1,960	M	16,625	30.4	15,197	27.8	7,917	14.5	395	0.7	40,419	73.9
	Total		F	366	0.7	3,064	5.6	9,947	18.2	878	1.6	14,261	26.1
			Total	16,991	31.1	18,261	33.4	17,864	32.7	1,272	2.3	54,682	100.0

Note: Age classes representing less than 1% of the Grand Total are excluded, discrepancies in sums are attributed to excluded age classes.

^a Sampling dates do not meet criteria for estimating harvest percentages for some or all of the strata; "Season" is not included in the "Grand Total".

Appendix B20.—Chinook salmon escapement project age and sex composition information, Kuskokwim River drainage, 1993–2004.

Year	Project ^a	Sample Size	Sex	Age Class									
				1.2		1.3		1.4		1.5		Total	
				Esc.	%	Esc.	%	Esc.	%	Esc.	%	Esc.	%
1993	Drainage	619	M		51.5		26.1		5.4		0.3		86.2
	Composite		F		0.5		2.1		10.5		0.7		13.8
			Total		52.0		28.2		15.9		0.9		100.0
Drainage Composite includes: Tuluksak River													
1994	Drainage	475	M		16.8		44.7		7.5		0.0		76.9
	Composite		F		2.0		8.2		10.4		0.5		23.1
			Total		18.8		52.9		17.9		0.5		100.0
Drainage Composite includes: Tuluksak River													
1995	Drainage	533	M		18.1		18.3		20.6		0.0		57.1
	Composite		F		1.0		7.2		34.5		0.2		42.9
			Total		19.1		25.5		55.1		0.2		100.0
Drainage Composite includes: Kogrukluk River													
1996	Drainage	671	M		8.9		32.6		14.0		6.1		61.8
	Composite		F		0.8		5.5		18.4		13.5		38.2
			Total		9.6		38.1		32.4		19.6		100.0
Drainage Composite includes: Kogrukluk and George rivers													
1997	Drainage	741	M		27.3		13.3		16.8		0.0		57.4
	Composite		F		6.9		2.8		32.8		0.2		42.7
			Total		34.2		16.1		49.6		0.2		100.0
Drainage Composite includes: Kogrukluk and George rivers													
1998	Drainage	101	M										
	Composite ^b		F										
			Total										
1999	Drainage	305	M		5.4		21.4		19.5		0.0		46.8
	Composite		F		0.0		3.8		47.8		1.0		53.2
			Total		5.4		25.2		67.3		1.5		100.0
Drainage Composite includes: Kogrukluk River													

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Year	Project ^a	Sample		Age Class								Total	
				1.2		1.3		1.4		1.5			
				Esc.	%	Esc.	%	Esc.	%	Esc.	%		
2000	Drainage	176	M		20.4		39.2		9.6		0.3		67.2
	Composite		F		<u>0.0</u>		<u>5.0</u>		<u>32.3</u>		<u>0.9</u>		<u>32.9</u>
			Total		20.4		44.2		41.9		1.2		100.0
Drainage Composite includes: Kogrukluk, and Takotna rivers													
2001	Drainage	459	M		0.0		33.3		21.1		1.7		69.3
	Composite		F		<u>0.8</u>		<u>1.6</u>		<u>25.2</u>		<u>3.2</u>		<u>30.8</u>
			Total		13.9		34.9		46.3		4.8		100.0
Drainage Composite includes: Kogrukluk and George rivers													
2002	Drainage	2,153	M		23.4		26.9		16.4		0.8		68.1
	Composite		F		<u>2.8</u>		<u>3.5</u>		<u>23.4</u>		<u>2.3</u>		<u>31.9</u>
			Total		26.3		30.3		39.8		3.1		100.0
Drainage Composite includes: Kwethluk, Tuluksak, George, Kogrukluk, Tatlawiksuk, and Takotna rivers													
2003	Drainage	1,731	M		27.6		37.5		7.9		0.2		73.3
	Composite ^c		F		<u>0.0</u>		<u>4.4</u>		<u>19.3</u>		<u>3.0</u>		<u>26.7</u>
			Total		27.6		41.9		27.2		3.2		100.0
Drainage Composite includes: Kwethluk, Tuluksak, and Kogrukluk rivers													
2004	Takotna Weir ^b	69	M										
			F										
			Total										
2004	Tatlawiksuk Weir	580		1,216	24.0	1,278	25.2	795	15.7	20	0.4	3,322	65.5
				<u>52</u>	<u>1.0</u>	<u>312</u>	<u>6.2</u>	<u>1,320</u>	<u>26.0</u>	<u>61</u>	<u>1.2</u>	<u>1,746</u>	<u>34.5</u>
				1,269	25.0	1,591	31.4	2,115	41.7	81	1.6	5,068	100.0
2004	Kogrukluk Weir	731	M	8,670	44.1	6,594	33.6	1,174	6.0	0	0.0	16,438	83.6
			F	<u>112</u>	<u>0.6</u>	<u>511</u>	<u>2.6</u>	<u>2,469</u>	<u>12.5</u>	<u>121</u>	<u>0.6</u>	<u>3,213</u>	<u>16.4</u>
			Total	8,782	44.7	7,105	36.2	3,643	18.5	121	0.6	19,651	100.0
2004	George Weir	269	M	1,313	25.2	906	17.4	923	17.8	64	1.2	3,242	62.3
			F	<u>36</u>	<u>0.7</u>	<u>197</u>	<u>3.8</u>	<u>1,657</u>	<u>31.8</u>	<u>75</u>	<u>1.5</u>	<u>1,965</u>	<u>37.7</u>
			Total	1,349	25.9	1,103	21.2	2,580	49.6	139	2.7	5,207	100.0
2004	Tuluksak Weir	255	M	326	22.1	511	34.6	95	6.5	6	0.4	949	64.4
			F	<u>37</u>	<u>2.5</u>	<u>115</u>	<u>7.8</u>	<u>365</u>	<u>24.7</u>	<u>9</u>	<u>0.6</u>	<u>526</u>	<u>35.6</u>
			Total	363	24.6	626	42.4	460	31.2	15	1.0	1,475	100.0

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Project	Sample Size	Sex	Age Class								Total	
			1.2		1.3		1.4		1.5		Esc.	%
			Esc.	%	Esc.	%	Esc.	%	Esc.	%		
Kwethluk Weir	1,151	M	16,032	56.1	6,061	21.2	1,484	5.2	24	0.1	23,826	83.3
		F	5	0.0	431	1.5	4,196	14.7	140	0.5	4,779	16.7
		Total	16,037	56.1	6,492	22.7	5,680	19.9	164	0.6	28,605	100.0
Drainage Composite	2,986	M		34.3		26.4		10.2		0.4		71.8
		F		1.0		4.4		21.9		0.9		28.2
		Total		35.3		30.8		32.2		1.3		100.0

^a Percents reported in the Drainage Composite are averages in which each contributing project is weighted equally.

^b Sampling dates do not meet criteria for estimating harvest percentages for some or all of the strata; "Season" is not included in the "Grand Total".

^c Age classes representing less than 1% of the Grand Total are excluded, discrepancies in sums are attributed to excluded age classes.

Appendix B21.—Chum salmon commercial fishery age and sex composition information, District 1, Kuskokwim River, 1993–2004.

Year	Project	Sample Size	Sex	Age Class								Total	
				0.2		0.3		0.4		0.5		Harvest	%
				Harvest	%	Harvest	%	Harvest	%	Harvest	%		
1993	Season	318	M	275	0.6	6,581	15.4	14,862	34.8	1,399	3.3	23,117	54.1
			F	<u>308</u>	<u>0.7</u>	<u>7,178</u>	<u>16.8</u>	<u>10,851</u>	<u>25.4</u>	<u>1,264</u>	<u>3.0</u>	<u>19,601</u>	<u>45.9</u>
			Total	583	1.4	13,759	32.2	25,712	60.2	2,663	6.2	42,718	100.0
1994	Season	1,389	M	826	0.3	79,194	29.4	33,186	12.3	3,489	1.3	116,694	43.3
			F	<u>1,111</u>	<u>0.4</u>	<u>116,192</u>	<u>43.1</u>	<u>33,437</u>	<u>12.4</u>	<u>2,001</u>	<u>0.7</u>	<u>152,741</u>	<u>56.7</u>
			Total	1,937	0.7	195,386	72.5	66,622	24.7	5,489	2.0	269,426	100.0
1995	Season	1,811	M	12,535	2.1	161,807	27.5	96,934	16.5	7,089	1.2	267,600	45.5
			F	<u>8,607</u>	<u>1.5</u>	<u>179,495</u>	<u>30.5</u>	<u>120,819</u>	<u>20.5</u>	<u>968</u>	<u>0.2</u>	<u>320,637</u>	<u>54.5</u>
			Total	21,142	3.6	341,302	58.0	217,753	37.0	8,056	1.4	588,250	100.0
1996	Season	2,169	M	146	0.1	68,941	34.0	22,556	11.1	2,301	1.1	93,944	46.3
			F	<u>439</u>	<u>0.2</u>	<u>78,985</u>	<u>38.9</u>	<u>27,161</u>	<u>13.4</u>	<u>2,249</u>	<u>1.1</u>	<u>108,834</u>	<u>53.7</u>
			Total	585	0.3	147,975	73.0	49,716	24.5	4,551	2.2	202,827	100.0
1997	Season	355	M	291	1.7	4,872	28.7	3,442	20.2	303	1.8	8,909	52.4
			F	<u>269</u>	<u>1.6</u>	<u>3,983</u>	<u>23.4</u>	<u>3,733</u>	<u>22.0</u>	<u>110</u>	<u>0.6</u>	<u>8,094</u>	<u>47.6</u>
			Total	560	3.3	8,855	52.1	7,175	42.2	413	2.4	17,003	100.0
1998	Season	1,433	M	909	0.4	77,700	37.4	10,362	5.0	170	0.1	89,141	42.9
			F	<u>815</u>	<u>0.4</u>	<u>103,516</u>	<u>49.8</u>	<u>14,192</u>	<u>6.8</u>	<u>34</u>	<u>0.0</u>	<u>118,557</u>	<u>57.1</u>
			Total	1,724	0.8	181,216	87.2	24,554	11.8	204	0.1	207,698	100.0
1999	Season	268	M	0	0.0	6,838	29.7	4,495	19.5	0	0.0	11,332	49.3
			F	<u>5</u>	<u>0.0</u>	<u>6,517</u>	<u>28.3</u>	<u>5,151</u>	<u>22.4</u>	<u>0</u>	<u>0.0</u>	<u>11,674</u>	<u>50.7</u>
			Total	5	0.0	13,355	58.0	9,646	41.9	0	0.0	23,006	100.0
2000	Season	253	M	197	1.7	4,025	34.8	1,200	10.4	57	0.5	5,479	47.4
			F	<u>85</u>	<u>0.7</u>	<u>4,486</u>	<u>38.8</u>	<u>1,464</u>	<u>12.6</u>	<u>56</u>	<u>0.5</u>	<u>6,091</u>	<u>52.6</u>
			Total	282	2.4	8,511	73.6	2,664	23.0	113	1.0	11,570	100.0
2001	Season ^a	118	M										
			F										
			Total									<u>1,272</u>	
2002	Season ^a		M										
			F										
			Total									<u>1,900</u>	

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Year	Project	Sample Size	Sex	Age Class								Total	
				0.2		0.3		0.4		0.5		Harvest	%
				Harvest	%	Harvest	%	Harvest	%	Harvest	%		
2003	Season ^a	118	M										
			F										
			Subtotal									2,764	
2004	6/30	177	M	589	11.3	1,355	26.0	884	16.9	0	0.0	2,828	54.2
	(6/30-7/2)		F	236	4.5	1,208	23.2	942	18.1	0	0.0	2,386	45.8
			Subtotal	825	15.8	2,563	49.2	1,826	35.0	0	0.0	5,214	100.0
	7/6	200	M	1,018	14.5	1,861	26.5	983	14.0	0	0.0	3,862	55.0
	(7/6-7/7)		F	422	6.0	1,439	20.5	1,299	18.5	0	0.0	3,160	45.0
			Subtotal	1,440	20.5	3,300	47.0	2,282	32.5	0	0.0	7,022	100.0
	7/28	178	M	1,210	32.0	467	12.4	319	8.4	0	0.0	1,996	52.8
	(7/28-8/2)		F	765	20.2	637	16.8	382	10.1	0	0.0	1,784	47.2
			Subtotal	1,975	52.2	1,104	29.2	701	18.5	0	0.0	3,780	100.0
	8/3	182	M	970	22.0	728	16.5	388	8.8	0	0.0	2,085	47.3
	(8/3-9/8)		F	1,067	24.2	921	20.9	339	7.7	0	0.0	2,328	52.7
			Subtotal	2,037	46.2	1,649	37.4	727	16.5	0	0.0	4,413	100.0
	Season	737	M	3,788	18.5	4,410	21.6	2,573	12.6	0	0.0	10,771	52.7
			F	2,488	12.2	4,206	20.6	2,964	14.5	0	0.0	9,658	47.3
			Total	6,276	30.7	8,616	42.2	5,537	27.1	0	0.0	20,429	100.0
	Grand Total	8,733	M	18,967	1.4	414,368	30.0	189,609	13.7	14,807	1.1	626,987	45.3
			F	14,127	1.0	504,559	36.5	219,771	15.9	6,682	0.5	755,887	54.7
			Total	33,094	2.4	918,976	66.5	409,380	29.6	21,490	1.6	1,382,927	100.0

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^a Sampling dates do not meet criteria for estimating harvest percentages for some or all of the strata; "Season" is not included in the "Grand Total".

Appendix B22.—Chum salmon escapement project age and sex composition information, Kuskokwim River drainage, 1993–2004.

Year	Project ^a	Sample Size (n)	Sex	Age Class								Total	
				0.2		0.3		0.4		0.5		Num.	%
				Num.	%	Num.	%	Num.	%	Num.	%		
1993	Drainage Composite	1,524	M	2	0.1	436	21.8	807	40.4	68	3.4	1,314	65.7
			F	18	0.9	268	13.4	367	18.4	33	1.6	686	34.3
			Total	21	1.0	704	35.2	1,175	58.7	101	5.1	2,000	100.0
Drainage Composite includes: KogrukluK and Tuluksak rivers.													
1994	Drainage Composite	851	M	1	0.1	231	23.1	232	23.2	26	2.6	490	49.0
			F	5	0.5	267	26.7	217	21.7	21	2.1	510	51.0
			Total	6	0.6	498	49.8	449	44.9	47	4.7	1,000	100.0
Drainage Composite includes: Tuluksak River.													
1995	Drainage Composite	848	M	12	1.2	394	39.4	453	45.3	8	0.8	867	86.7
			F	2	0.2	65	6.5	66	6.6	0	0.0	133	13.3
			Total	14	1.4	459	45.9	518	51.8	8	0.8	1,000	100.0
Drainage Composite includes: KogrukluK River.													
1996	Drainage Composite	2,051	M	17	0.6	1,148	38.3	585	19.5	43	1.4	1,793	59.8
			F	35	1.2	785	26.2	382	12.7	6	0.2	1,207	40.2
			Total	52	1.7	1,931	64.4	968	32.3	49	1.6	3,000	100.0
Drainage Composite includes: KogrukluK George and Aniak rivers.													
1997	Drainage Composite	2,135	M	8	0.3	1,004	33.5	995	33.2	20	0.7	2,029	67.6
			F	17	0.6	594	19.8	352	11.7	8	0.3	971	32.4
			Total	25	0.8	1,598	53.3	1,347	44.9	28	0.9	3,000	100.0
Drainage Composite includes: KogrukluK George and Aniak rivers.													
1998	Drainage Composite	1,044	M	2	0.2	412	41.2	66	6.6	2	0.2	482	48.2
			F	1	0.1	461	46.1	54	5.4	2	0.2	518	51.8
			Total	3	0.3	873	87.3	120	12.0	4	0.4	1,000	100.0
Drainage Composite includes: Aniak River.													
1999	Drainage Composite	2,480	M	0	0.0	1,031	34.4	823	27.4	7	0.2	1,861	62.0
			F	2	0.1	679	22.6	355	11.8	2	0.1	1,139	38.0
			Total	2	0.1	1,810	60.3	1,178	39.3	9	0.3	3,000	100.0
Drainage Composite includes: Tatlawiksuk, KogrukluK, and Aniak rivers.													
2000	Drainage Composite	3,614	M	51	0.9	1,941	32.4	1,289	21.5	28	0.5	3,309	55.2
			F	47	0.8	1,759	29.3	875	14.6	10	0.2	2,691	44.9
			Total	98	1.6	3,700	61.7	2,164	36.1	38	0.6	6,000	100.0
Drainage Composite includes: Takotna, Tatlawiksuk, KogrukluK, George, Aniak and Kwethluk rivers.													
2001	Drainage Composite	4,429	M	3	0.1	2,308	38.5	1,075	17.9	6	0.1	3,387	56.5
			F	17	0.3	1,910	31.8	682	11.4	0	0.0	2,613	43.6
			Total	20	0.3	4,218	70.3	1,757	29.3	6	0.1	6,000	100.0
Drainage Composite includes: Takotna, Tatlawiksuk, KogrukluK, George, Aniak and Tuluksak rivers.													
2002	Drainage Composite	6,923	M	150	2.1	2,423	34.6	1,394	19.9	45	0.6	4,149	59.3
			F	164	2.3	1,855	26.5	942	13.5	28	0.4	2,851	40.7
			Total	314	4.5	4,278	61.1	2,336	33.4	73	1.0	7,000	100.0
Drainage Composite includes: Takotna, Tatlawiksuk, KogrukluK, George, Aniak, Tuluksak and Kwethluk rivers.													

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Year	Project ^a	Sample		Age Class									
		Size (n)	Sex	0.2		0.3		0.4		0.5		Total	
				Num.	%	Num.	%	Num.	%	Num.	%	Num.	%
2003	Drainage Composite	5,738	M		0.5		48.8		10.9		0.6		61.0
			F		<u>1.5</u>		<u>33.3</u>		<u>4.0</u>		<u>0.2</u>		<u>39.0</u>
			Total		2.0		82.2		14.9		0.7		100.0
Drainage Composite includes: Takotna, Kogrukluk, George, Aniak, Tuluksak and Kwethluk rivers.													
2004	Takotna Weir	343	M	99	6.1	359	22.0	361	22.1	0	0.0	818	50.1
			F	<u>137</u>	<u>8.4</u>	<u>416</u>	<u>25.5</u>	<u>261</u>	<u>16.0</u>	<u>0</u>	<u>0.0</u>	<u>815</u>	<u>49.9</u>
			Total	236	14.5	775	47.5	622	38.1	0	0.0	1,633	100.0
2004	Kogrukluk Weir	1,033	M	2,069	8.5	13,003	53.7	6,816	28.2	89	0.4	21,977	90.8
			F	<u>161</u>	<u>0.7</u>	<u>1,371</u>	<u>5.7</u>	<u>662</u>	<u>2.7</u>	<u>31</u>	<u>0.1</u>	<u>2,224</u>	<u>9.2</u>
			Total	2,230	9.2	14,374	59.4	7,478	30.9	120	0.5	24,201	100.0
2004	George Weir	923	M	636	4.4	2,325	16.1	4,526	31.4	19	0.1	7,506	52.1
			F	<u>689</u>	<u>4.8</u>	<u>3,234</u>	<u>22.5</u>	<u>2,972</u>	<u>20.6</u>	<u>10</u>	<u>0.1</u>	<u>6,905</u>	<u>47.9</u>
			Total	1,325	9.2	5,559	38.6	7,498	52.0	29	0.2	14,411	100.0
2004	Aniak Weir	1,130	M	82,974	12.3	156,157	23.2	133,113	19.8	2,079	0.3	374,323	55.6
			F	<u>81,498</u>	<u>12.1</u>	<u>134,704</u>	<u>20.0</u>	<u>82,919</u>	<u>12.3</u>	<u>0</u>	<u>0.0</u>	<u>299,121</u>	<u>44.4</u>
			Total	164,472	24.4	290,861	43.2	216,032	32.1	2,079	0.3	673,444	100.0
2004	Tuluksak Weir	1,186	M	1093	9.3	2,078	17.6	3,559	30.2	30	0.3	6,760	57.3
			F	<u>1196</u>	<u>10.1</u>	<u>2,143</u>	<u>18.2</u>	<u>1,697</u>	<u>14.4</u>	<u>0</u>	<u>0.0</u>	<u>5,036</u>	<u>42.7</u>
			Total	2289	19.4	4,221	35.8	5,256	44.6	30	0.3	11,796	100.0
2004	Kwethluk Weir	1,309	M	3,717	9.6	8,631	22.4	9,705	25.1	0	0.0	22,053	57.1
			F	<u>3,374</u>	<u>8.7</u>	<u>7,079</u>	<u>18.3</u>	<u>6,095</u>	<u>15.8</u>	<u>45</u>	<u>0.1</u>	<u>16,593</u>	<u>42.9</u>
			Total	7,091	18.3	15,710	40.7	15,800	40.9	45	0.1	38,646	100.0
2004	Drainage Composite	5,924	M		8.4		25.8		26.1		0.2		60.5
			F		<u>7.5</u>		<u>18.4</u>		<u>13.6</u>		<u>0.1</u>		<u>39.5</u>
			Total		15.8		44.2		39.8		0.2		100.0
Drainage Composite includes: Takotna, Kogrukluk, George, Aniak, Tuluksak and Kwethluk rivers.													
	Grand Total	37,561	M		1.7		35.1		22.1		0.7		59.9
			F		<u>1.9</u>		<u>26.1</u>		<u>11.9</u>		<u>0.3</u>		<u>40.1</u>
			Total		3.6		61.4		34.0		0.9		100.0

^a Percents reported in the Drainage Composite are averages in which each contributing project is weighted equally.

Appendix B23.—Sockeye salmon commercial fishery age and sex composition information, District 1, Kuskokwim River, 1993–2004.

Year	Project	Sample Size	Sex	Age Class								Total	
				1.2		1.3		1.4		2.3		Harvest	%
				Harvest	%	Harvest	%	Harvest	%	Harvest	%	Harvest	%
1993	Season ^a	186	M										
			F										
			Total									27,003	
1994	Season ^a	173	M										
			F										
			Total									49,362	
1995	Season	419	M	2,960	3.3	28,334	31.5	1,961	2.2	2,404	2.7	37,566	41.7
			F	4,089	4.5	45,343	50.4	305	0.3	1,218	1.4	52,460	58.3
			Total	7,048	7.8	73,677	81.8	2,267	2.5	3,621	4.0	90,026	100.0
1996	Season	520	M	740	2.2	16,167	48.4	280	0.8	725	2.2	19,091	57.2
			F	416	1.2	11,266	33.7	218	0.7	833	2.5	14,318	42.9
			Total	1,156	3.5	27,433	82.1	498	1.5	1,559	4.7	33,404	100.0
1997	Season ^a	89	M										
			F										
			Total									21,988	
1998	Season	493	M	1,440	2.3	18,769	30.8	764	1.2	6,152	10.1	30,677	50.4
			F	2,177	3.6	19,337	31.8	164	0.3	5,215	8.6	30,229	49.6
			Total	3,617	5.9	38,106	62.6	928	1.5	11,367	18.7	60,906	100.0
1999	Season ^a	189	M										
			F										
			Total									16,976	
2000	Season ^a	170	M										
			F										
			Total									4,130	
2001	Season ^a	0	M										
			F										
			Total										
2002	Season ^a	0	M										
			F										
			Total										

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Year	Project	Sample		Age Class								Total	
		Size	Sex	1.2		1.3		1.4		2.3		Total	
				Harvest	%	Harvest	%	Harvest	%	Harvest	%	Harvest	%
2003	Season ^a	0	M										
			F										
			Total										
2004	6/30	199	M	387	10.6	1,162	31.7	74	2.0	37	1.0	1,845	50.3
	(6/30-7/2)		F	369	10.0	1,144	31.1	0	0.0	55	1.5	1,826	49.7
			Subtotal	756	20.6	2,306	62.8	74	2.0	92	2.5	3,671	100.0
	7/6	217	M	756	12.4	980	16.1	84	1.4	112	1.8	2,212	36.4
	(7/6-9/8)		F	1,372	22.6	1,876	30.9	84	1.4	168	2.8	3,865	63.6
			Subtotal	2,128	35.0	2,856	47.0	168	2.8	280	4.6	6,077	100.0
	Season ^a	416	M										
			F										
			Total									9,748	
	Grand	1,432	M	5,140	2.8	63,269	34.3	3,005	1.6	9,281	5.0	87,335	47.4
	Total		F	6,682	3.6	75,947	41.2	687	0.4	7,266	3.9	97,008	52.6
			Total	11,822	6.4	139,216	75.5	3,693	2.0	16,547	9.0	184,336	100.0

Note: Age classes representing less than 1% of the Grand Total are excluded, discrepancies in sums are attributed to excluded age classes.

^a Sampling dates do not meet criteria for estimating harvest percentages for some or all of the strata; "Season" is not included in the "Grand Total".

Appendix B24.—Coho salmon commercial fishery age and sex composition information, District 1, Kuskokwim River, 1993–2004.

Year	Project	Sample Size	Sex	Age Class						Total	
				1.1		2.1		3.1		Harvest	%
				Harvest	%	Harvest	%	Harvest	%		
1993	Season	540	M	17,418	3.0	275,115	46.9	11,915	2.0	304,448	51.9
			F	16,689	2.8	259,731	44.3	5,463	0.9	281,882	48.1
			Total	34,107	5.8	534,845	91.2	17,378	3.0	586,330	100.0
1994	Season	826	M	29,268	4.2	349,647	50.6	38,679	5.6	417,594	60.5
			F	16,795	2.4	228,286	33.1	27,721	4.0	272,802	39.5
			Total	46,063	6.7	577,933	83.7	66,400	9.6	690,396	100.0
1995	Season	565	M	38,581	8.5	196,322	43.1	17,041	3.7	251,944	55.3
			F	17,424	3.8	164,635	36.2	21,266	4.7	203,325	44.7
			Total	56,005	12.3	360,957	79.3	38,307	8.4	455,269	100.0
1996	Season	666	M	20,111	2.2	451,313	48.5	6,315	0.7	477,739	51.4
			F	20,138	2.2	426,562	45.9	5,692	0.6	452,392	48.6
			Total	40,248	4.3	877,875	94.4	12,007	1.3	930,131	100.0
1997	Season ^a	324	M								
			F								
			Total							129,601	
1998	Season	1,194	M	4,579	2.2	99,072	47.1	2,413	1.1	106,083	50.5
			F	5,678	2.7	96,460	45.9	1,944	0.9	104,085	49.5
			Total	10,258	4.9	195,532	93.0	4,357	2.1	210,168	100.0
1999	Season ^a	151	M								
			F								
			Total							23,593	
2000	Season	2,616	M	4,328	1.7	114,661	44.2	2,572	1.0	121,547	46.8
			F	4,697	1.8	130,473	50.2	2,971	1.1	138,156	53.2
			Total	9,026	3.5	245,134	94.4	5,543	2.1	259,703	100.0
2001	Season	422	M	7,647	4.0	67,803	35.2	7,901	4.1	83,350	43.2
			F	5,251	2.7	91,523	47.4	12,873	6.7	109,648	56.8
			Total	12,898	6.7	159,326	82.6	20,774	10.8	192,998	100.0
2002	Season	428	M	469	0.6	37,467	44.9	2,401	2.9	40,337	48.3
			F	354	0.4	40,362	48.3	2,410	2.9	43,126	51.7
			Total	823	1.0	77,829	93.2	4,811	5.8	83,463	100.0

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Year	Project	Sample Size	Sex	Age Class							
				1.1		2.1		3.1		Total	
				Harvest	%	Harvest	%	Harvest	%	Harvest	%
2003	Season ^a	0	M								
			F								
			Total								
2004	7/28	95	M	333	1.1	17,648	55.8	1,665	5.3	19,646	62.1
	(6/30-8/2)		F	0	0.0	11,655	36.8	333	1.0	11,988	37.9
			Subtotal	333	1.1	29,303	92.6	1,998	6.3	31,634	100.0
	8/3	144	M	0	0.0	41,000	57.7	3,458	4.8	44,458	62.5
	(8/3-6)		F	494	0.7	23,217	32.6	2,964	4.2	26,675	37.5
			Subtotal	494	0.7	64,217	90.3	6,422	9.0	71,133	100.0
	8/10	141	M	821	0.7	60,745	52.5	5,746	5.0	67,312	58.2
	(8/9-13)		F	3,283	2.8	45,148	39.0	0	0.0	48,432	41.8
			Subtotal	4,104	3.5	105,893	91.5	5,746	5.0	115,744	100.0
	8/23	140	M	0	0.0	46,873	39.3	8,522	7.1	55,395	46.4
	(8/16-24)		F	0	0.0	53,691	45.0	10,227	8.6	63,918	53.6
			Subtotal	0	0.0	100,564	84.3	18,749	15.7	119,313	100.0
	8/30	142	M	0	0.0	35,150	36.6	2,704	2.8	37,853	39.4
	(8/27-9/8)		F	0	0.0	51,372	53.5	6,759	7.1	58,132	60.6
			Subtotal	0	0.0	86,522	90.1	9,463	9.9	95,985	100.0
	Season	662	M	1,154	0.2	201,416	46.4	22,095	5.1	224,665	51.8
			F	3,777	0.9	185,083	42.7	20,283	4.7	209,144	48.2
			Total	4,931	1.1	386,499	89.1	42,378	9.8	433,809	100.0
	Grand	7,919	M	123,556	3.2	1,792,815	46.7	111,333	2.9	2,027,707	52.8
	Total		F	90,803	2.4	1,623,115	42.2	100,623	2.6	1,814,560	47.2
			Total	214,359	5.6	3,415,930	88.9	211,955	5.5	3,842,267	100.0

^a Sampling dates do not meet criteria for estimating harvest percentages for some or all of the strata, "Season" is not included in the "Grand Total".

Appendix B25.—Coho salmon escapement project age and sex composition information, Kuskokwim River drainage, 1993–2004.

Year	Project ^a	Sample Size	Sex	Age Class							
				1.1		2.1		3.1		Total	
				Esc.	%	Esc.	%	Esc.	%	Esc.	%
1993	Drainage	818	M		1.2		53.6		3.6		58.5
	Composite		F		0.4		40.1		1.1		41.6
			Total		1.6		93.6		4.7		100.0
Drainage Composite includes: Kogrukluk and Tuluksak rivers.											
1994	Drainage	775	M		1.6		49.9		5.8		57.3
	Composite		F		0.5		37.3		4.8		42.7
			Total		2.1		87.2		10.6		100.0
Drainage Composite includes: Kogrukluk and Tuluksak rivers.											
1995	Drainage	364	M		3.1		53.3		4.0		60.9
	Composite		F		1.0		35.2		2.9		39.1
			Total		4.1		88.5		7.0		50.0
Drainage Composite includes: Kogrukluk River.											
1996	Drainage	639	M		2.5		59.3		1.2		63.0
	Composite		F		0.5		35.6		0.9		37.0
			Total		3.0		94.9		2.1		100.0
Drainage Composite includes: Kogrukluk River.											
1997	Drainage	205	M		2.2		54.9		0.7		57.8
	Composite		F		0.0		41.0		1.2		42.2
			Total		2.2		95.9		1.9		100.0
Drainage Composite includes: George River.											
1998	Drainage	455	M		0.8		55.4		2.8		59.1
	Composite		F		0.8		38.7		1.4		40.9
			Total		1.6		94.1		4.2		100.0
Drainage Composite includes: Kogrukluk River.											
1999	Drainage	968	M		2.9		53.4		9.9		66.3
	Composite		F		1.5		25.6		6.6		33.7
			Total		4.4		79.0		16.6		100.0
Drainage Composite includes: Tatlawiksuk, Kogrukluk, and George rivers.											
2000	Drainage	2,221	M		1.0		55.9		0.6		57.5
	Composite		F		0.9		41.1		0.5		42.5
			Total		1.9		97.0		1.2		100.0
Drainage Composite includes: Takotna, Tatlawiksuk, Kogrukluk, George, and Kwethluk rivers.											
2001	Drainage	2,155	M		1.9		44.5		5.5		52.0
	Composite		F		1.0		41.5		5.6		48.0
			Total		2.9		86.1		11.0		100.0
Drainage Composite includes: Takotna, Tatlawiksuk, Kogrukluk, George, Tuluksak and Kwethluk rivers.											
2002	Drainage	1,991	M		0.4		50.8		3.8		55.0
	Composite		F		0.5		39.6		4.9		45.0
			Total		0.9		90.4		8.7		100.0
Drainage Composite includes: Takotna, Tatlawiksuk, Kogrukluk, Tuluksak and Kwethluk rivers.											

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Year	Project ^a	Sample Size	Sex	Age Class							
				1.1		2.1		3.1		Total	
				Esc.	%	Esc.	%	Esc.	%	Esc.	%
2003	Drainage Composite	919	M		2.0		43.8		4.5		50.3
			F		1.3		43.0		5.4		49.7
			Total		3.2		86.8		9.9		100.0
Drainage Composite includes: Takotna, Kogrukuk, George, Tuluksak and Kwethluk rivers.											
2004	Takotna Weir	380	M	8	0.3	1,844	57.5	44	1.4	1,896	59.1
			F	0	0.0	1,302	40.6	8	0.2	1,311	40.9
			Total	8	0.3	3,146	98.1	52	1.6	3,207	100.0
2004	Tatlawiksuk Weir	361	M	247	1.5	7,679	46.8	174	1	8,098	49.4
			F	263	1.6	7,806	47.6	242	1.5	8,312	50.6
			Total	510	3.1	15,485	94.4	416	2.5	16,410	100.0
2004	Kogrukuk Weir	176	M	166	0.6	16,510	61.0	2,297	8.5	18,972	70.2
			F	0	0.0	7,190	26.6	878	3.2	8,069	29.8
			Total	166	0.6	23,700	87.6	3,175	11.7	27,041	100.0
2004	George Weir	191	M	87	0.7	7,476	56.4	843	6.4	8,405	63.4
			F	84	0.6	4,421	33.4	338	2.5	4,843	36.6
			Total	171	1.3	11,897	89.8	1,181	8.9	13,248	100.0
2004	Tuluksak Weir	184	M	69	0.4	12,453	61.2	606	3.0	13,127	64.6
			F	69	0.3	6,975	34.3	164	0.8	7,209	35.4
			Total	138	0.7	19,428	95.5	770	3.8	20,336	100.0
2004	Kwethluk Weir	185	M	1,846	2.9	33,460	52.1	788	1.2	36,094	56.2
			F	1,835	2.8	25,810	40.2	477	0.8	28,122	43.8
			Total	3,681	5.7	59,270	92.3	1,265	2.0	64,216	100.0
2004	Drainage Composite ^a	1,477	M		1.1		55.8		3.6		60.5
			F		0.9		37.1		1.5		39.5
			Total		2.0		93.0		5.1		100.0
Drainage Composite includes: Takotna, Tatlawiksuk, Kogrukuk, George, Tuluksak and Kwethluk rivers.											
Grand Total	Total	12,987	M		1.5		51.2		4.1		56.9
			F		0.9		38.7		3.5		43.1
			Total		2.4		89.9		7.6		100.0

^a Percents reported in the Drainage Composite are averages in which each contributing project is weighted.

APPENDIX C.

Appendix C1.—Chinook salmon total utilization, District 4 Quinhagak, Kuskokwim Bay, 1960–2004.

Year	Commercial Harvest ^a		Subsistence Harvest ^b		Sport Fish		Total Utilization	10-Year Average
	Annual	10-yr Ave	Annual	10-yr Ave	Annual	10-yr Ave		
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	4,943					16,802	5,353
1970	18,269	6,769					18,269	7,180
1971	4,185	6,755					4,185	7,166
1972	15,880	7,791					15,880	8,201
1973	14,993	8,634					14,993	9,045
1974	8,704	9,097					8,704	9,507
1975	3,928	9,192					3,928	9,602
1976	14,110	10,575					14,110	10,986
1977	19,090	12,484	2,012				21,102	12,961
1978	12,335	12,830	2,328				14,663	13,264
1979	11,144	12,264	1,420				12,564	12,840
1980	10,387	11,476	1,940				12,327	12,246
1981	24,524	13,510	2,562				27,086	14,536
1982	22,106	14,132	2,402				24,508	15,399
1983	46,385	17,271	2,542		1,511		50,438	18,943
1984	33,633	19,764	3,109		922		37,664	21,839
1985	30,401	22,412	2,341		672		33,414	24,788
1986	22,835	23,284	2,682	2,334	938		26,455	26,022
1987	26,022	23,977	3,663	2,499	508		30,193	26,931
1988	13,883	24,132	3,690 ^c	2,635	1,910		19,483	27,413
1989	20,820	25,100	3,542	2,847	884		25,246	28,681
1990	27,644	26,825	6,013	3,255	503		34,160	30,865
1991	9,480	25,321	3,693	3,368	316		13,489	29,505
1992	17,197	24,830	3,447	3,472	656	882	21,300	29,184
1993	15,784	21,770	3,368	3,555	1,006	832	20,158	26,156
1994	8,564	19,263	3,995	3,643	751	814	13,310	23,721

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Year	Commercial Harvest ^a		Subsistence Harvest ^b		Sport Fish		Total Utilization	10-Year Average
	Annual	10-yr Ave	Annual	10-yr Ave	Annual	10-yr Ave		
1995	38,584	20,081	2,746	3,684	739	821	42,069	24,586
1996	14,165	19,214	3,075	3,723	689	796	17,929	23,734
1997	35,510	20,163	3,433	3,700	1,632	909	40,575	24,772
1998	23,158	21,091	4,041	3,735	1,475	865	28,674	25,691
1999	18,426	20,851	3,167	3,698	854	862	22,447	25,411
2000	21,229	20,210	3,106	3,407	833	895	25,168	24,512
2001	12,775	20,539	2,923	3,330	947	958	16,645	24,828
2002	11,480	19,968	2,475	3,233	779	971	14,734	24,171
2003	14,444	19,834	3,898	3,286	323	902	18,665	24,022
2004	25,465	21,524	3,726	3,259	228	850	29,419	25,633
10-Yr. Ave.								
(1994-2003)	19,834		3,286		902		24,022	

^a Quinhagak District commercial harvest. Source: Whitmore et al. 2005.

^b Subsistence harvest by the community of Quinhagak. Source: Whitmore et al. 2005.

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

Appendix C2.—Chum salmon total utilization, District 4 Quinhagak, Kuskokwim Bay, 1960–2004.

Year	Commercial Harvest ^a		Subsistence Harvest ^b		Sport Fish		Total Utilization	10-Year Average
	Annual	10-yr Ave	Annual	10-yr Ave	Annual	10-yr Ave		
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	13,792					38,206	13,792
1970	46,556	18,448					46,556	18,448
1971	30,208	19,582					30,208	19,582
1972	17,247	16,736					17,247	16,736
1973	19,680	18,704					19,680	18,704
1974	15,298	20,163					15,298	20,163
1975	35,233	23,262					35,233	23,262
1976	43,659	27,367					43,659	27,367
1977	43,707	30,929					43,707	30,929
1978	24,798	31,459					24,798	31,459
1979	25,995	30,238					25,995	30,238
1980	65,984	32,181					65,984	32,181
1981	53,334	34,494					53,334	34,494
1982	34,346	36,203					34,346	36,203
1983	23,090	36,544			315		23,405	36,576
1984	50,422	40,057			376		50,798	40,126
1985	20,418	38,575	901		149		21,468	38,749
1986	29,700	37,179	808		777		31,285	37,512
1987	8,557	33,664	1,084		111		9,752	34,117
1988	29,220	34,107	1,065 ^c		618		30,903	34,727
1989	39,395	35,447	1,568		537		41,500	36,278
1990	47,717	33,620	3,234		202		51,153	34,794
1991	54,493	33,736	1,593		80		56,166	35,078
1992	73,383	37,640	1,833		251	342	75,467	39,190
1993	40,943	39,425	1,008		183	328	42,134	41,063
1994	61,301	40,513	1,452	1,455	156	306	62,909	42,274
1995	81,462	46,617	686	1,433	213	313	82,361	48,363
1996	83,005 ^d	51,948	930	1,445	200	255	84,135	53,648
1997	38,445	54,936	600	1,397	212	265	39,257	56,599
1998	45,095	56,524	1,448	1,435	213	225	46,756	58,184
1999	38,091	56,394	1,810	1,459	293	200	40,194	58,053

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Year	Commercial Harvest ^a		Subsistence Harvest ^b		Sport Fish		Total Utilization	10-Year Average
	Annual	10-yr Ave	Annual	10-yr Ave	Annual	10-yr Ave		
2000	30,553	54,677	912	1,227	231	203	31,696	56,108
2001	17,209	50,949	747	1,143	43	200	17,999	52,291
2002	29,252	46,536	1,839	1,143	446	219	31,537	47,898
2003	27,868	45,228	1,129	1,155	14	202	29,011	46,586
2004	25,820	41,680	1,112	1,121	33	190	26,965	42,991
10-Yr. Ave. (1994-2003)	45,228		1,155		202		46,586	

^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.

Appendix C3.—Sockeye salmon total utilization, District 4 Quinhagak, Kuskokwim Bay, 1960–2004.

Year	Commercial Harvest ^a		Subsistence Harvest ^b		Sport Fish		Total Utilization	10-Year Average
	Annual	10-yr Ave	Annual	10-yr Ave	Annual	10-yr Ave		
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	4,493					3,784	4,493
1970	5,393	4,467					5,393	4,467
1971	3,118	4,548					3,118	4,548
1972	3,286	3,846					3,286	3,846
1973	2,783	4,124					2,783	4,124
1974	19,510	4,733					19,510	4,733
1975	8,584	5,402					8,584	5,402
1976	6,090	5,908					6,090	5,908
1977	5,519	6,395					5,519	6,395
1978	7,589	6,566					7,589	6,566
1979	18,828	8,070					18,828	8,070
1980	13,221	8,853					13,221	8,853
1981	17,292	10,270					17,292	10,270
1982	25,685	12,510					25,685	12,510
1983	10,263	13,258			0		10,263	13,258
1984	17,255	13,033			143		17,398	13,047
1985	7,876	12,962	106		12		7,994	12,988
1986	21,484	14,501	423		200		22,107	14,590
1987	6,489	14,598	1,067		153		7,709	14,809
1988	21,556	15,995	1,261 ^c		109		22,926	16,342
1989	20,582	16,170	633		101		21,316	16,591
1990	83,681	23,216	1,951		462		86,094	23,878
1991	53,657	26,853	1,772		88		55,517	27,701
1992	60,929	30,377	1,264		66	133	62,259	31,358
1993	80,934	37,444	1,082		331	167	82,347	38,567
1994	72,314	42,950	1,000	1,056	313	184	73,627	44,190
1995	68,194	48,982	573	1,103	148	197	68,915	50,282
1996	57,665 ^d	52,600	1,467	1,207	335	211	59,467	54,018
1997	69,562	58,907	1,264	1,227	607	256	71,433	60,390
1998	41,382	60,890	1,702	1,271	942	339	44,026	62,500
1999	41,315	62,963	2,021	1,410	496	379	43,832	64,752

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Year	Commercial Harvest ^a		Subsistence Harvest ^b		Sport Fish		Total Utilization	10-Year Average
	Annual	10-yr Ave	Annual	10-yr Ave	Annual	10-yr Ave		
2000	68,557	61,451	1,088	1,323	694	402	70,339	63,176
2001	33,807	59,466	1,525	1,299	83	402	35,415	61,166
2002	17,802	55,153	1,099	1,282	73	402	18,974	56,838
2003	33,941	50,454	1,622	1,336	107	380	35,670	52,170
2004	34,627	46,685	1,086	1,345	112	360	35,825	48,390
10-Yr. Ave. (1994-2003)	50,454		1,336		380		52,170	

^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.

Appendix C4.—Coho salmon total utilization, District 4 Quinhagak, Kuskokwim Bay, 1960–2004.

Year	Commercial Harvest ^a		Subsistence Harvest ^b		Sport Fish		Total Utilization	10-Year Average
	Annual	10-yr Ave	Annual	10-yr Ave	Annual	10-yr Ave		
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	4,194					15,077	4,194
1970	16,850	5,579					16,850	5,579
1971	2,982	5,873					2,982	5,873
1972	376	5,910					376	5,910
1973	16,515	7,562					16,515	7,562
1974	10,979	8,622					10,979	8,622
1975	10,742	9,696					10,742	9,696
1976	13,777	11,074					13,777	11,074
1977	9,028	11,784					9,028	11,784
1978	20,114	11,644					20,114	11,644
1979	47,525	14,889					47,525	14,889
1980	62,610	19,465					62,610	19,465
1981	47,551	23,922					47,551	23,922
1982	73,652	31,249					73,652	31,249
1983	32,442	32,842			367		32,809	32,879
1984	132,151	44,959			1,895		134,046	45,185
1985	29,992	46,884	67		622		30,681	47,179
1986	57,544	51,261	41		2,010		59,595	51,761
1987	50,070	55,365	125		2,300		52,495	56,108
1988	68,605	60,214	4,317 ^c		1,837		74,759	61,572
1989	44,607	59,922	3,787		1,096		49,490	61,769
1990	26,926	56,354	4,174		644		31,744	58,682
1991	42,571	55,856	3,232		358		46,161	58,543
1992	86,404	57,131	2,958		275	1,140	89,637	60,142
1993	55,817	59,469	2,152		734	1,177	58,703	62,731
1994	83,912	54,645	2,739	2,359	675	1,055	87,326	58,059
1995	66,203	58,266	2,561	2,609	970	1,090	69,734	61,964
1996	118,718 ^d	64,383	1,467	2,751	875	976	121,060	68,111
1997	32,862	62,663	1,264	2,865	1,220	868	35,346	66,396
1998	80,183	63,820	1,702	2,604	751	760	82,636	67,184
1999	6,184	59,978	2,021	2,427	1,091	759	9,296	63,164

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Year	Commercial Harvest ^a		Subsistence Harvest ^b		Sport Fish		Total Utilization	10-Year Average
	Annual	10-yr Ave	Annual	10-yr Ave	Annual	10-yr Ave		
2000	30,529	60,338	1,088	2,118	799	775	32,416	63,232
2001	18,531	57,934	1,525	1,948	2,448	984	22,504	60,866
2002	26,695	51,963	1,099	1,762	1,784	1,135	29,578	54,860
2003	49,833	51,365	2,047	1,751	1,076	1,169	52,956	54,285
2004	82,398	51,214	1,209	1,598	1,362	1,238	84,969	54,050
10-Yr. Ave.								
(1994-2003)	51,365		1,751		1,169		54,285	

^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.

Appendix C5.—Commercial salmon harvest District 4, Quinhagak, Kuskokwim Bay, 1960–2004.

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	13,883	21,556	68,605	21,310	29,220	154,574
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	80,934	55,817	7	40,943	193,485
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	35,510	69,562	32,862	5	38,445	176,384
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	11,480	17,802	26,695	0	29,252	85,229
2003	14,444	33,941	49,833	0	27,868	126,086
2004	25,465	34,627	82,398	0	25,820	168,310
10 Year Average (1994-2003)	19,834	50,454	51,365	3,834 ^b	45,228	170,714
Historical Average (1960-2003)	15,717	24,343	34,441	9,501 ^b	33,263	117,264

^a Estimate of chum roe included.

^b Even years only.

Appendix C6.—Commercial salmon fishing periods, hours, and permits fished, District 4 Quinhagak, Kuskokwim Bay, 1970–2004.

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	144
2003	24	288	114
2004	24	288	116
10 year avg (1994-2003)	27	324	227
Historical avg (1970-2003)	28	393	228

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

Appendix C7.—Commercial salmon fishing exvessel value, District 4, Quinhagak, Kuskokwim Bay, 1990–2004.

Year	Chinook	Sockeye	Coho	Pink ^a	Chum	Total
1990	251,304	544,008	123,815	4,179	90,941	1,014,247
1991	95,800	247,117	144,455	36	107,228	594,636
1992	165,310	368,598	303,371	15,086	137,356	989,721
1993	142,918	402,910	245,982	4	104,347	896,161
1994	66,918	256,091	423,612	10,237	84,351	841,209
1995	417,029	322,113	202,834	83	106,041	1,048,100
1996	61,296	165,318	245,662	6	61,323	533,605
1997	168,933	206,562	92,396	1	30,769	498,661
1998	81,566	150,261	198,041	850	35,254	465,972
1999	93,886	141,492	14,800	0	28,116	278,294
2000	131,001	249,473	61,763	1	23,929	466,167
2001	92,423	11,832	88,957	0	32,577	225,789
2002	56,316	40,325	47,653	0	23,321	167,615
2003	69,201	107,287	108,804	0	19,261	304,553
2004	107,760	77,977	203,572	0	18,156	407,465
10-year avg (1994-2003)	\$123,857	\$165,075	\$148,452	\$1,118	\$44,494	\$482,997

^a Even years only.

Appendix C8.—Commercial salmon harvest by period, District 4, Quinhagak, Kuskokwim Bay, 1994–2004.

Year	Date	Permits	Hours	Permit	Chinook		Sockeye		Chum		Coho	
		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	252	0.19	0	0.00
	Jun 20	95	12	1,140	746	0.65	187	0.16	287	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	79	0.07
	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	36	2	0.06	447	12.42	190	5.28	712	19.78
	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	12	0.01	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	4	0.01	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	26,316	8,530		72,314		61,301		83,972	
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 03	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

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Year	Date	Permits	Hours	Permit	Chinook		Sockeye		Chum		Coho	
		Fished	Fished	Hours	Catch	CPUE	Catch	CPUE	Catch	CPUE	Catch	CPUE
1995	Jul 24	52	12	624	156	0.25	2,610	4.18	2,713	4.35	93	0.15
(cont.)	Jul 26	52	12	624	71	0.11	1,404	2.25	1,279	2.05	116	0.19
	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	10,073	12.47	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		83,005		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

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Year	Date	Permits	Hours	Permit	Chinook		Sockeye		Chum		Coho	
		Fished	Fished	Hours	Catch	CPUE	Catch	CPUE	Catch	CPUE	Catch	CPUE
1997	Jun 26	132	12	1,584	3,578	2.26	2,777	1.75	1,199	0.76	0	0.00
(cont.)	Jun 30	160	12	1,920	2,541	1.32	9,771	5.09	2,498	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
	Jul 7	124	12	1,488	1,042	0.70	6,771	4.55	3,552	2.39	0	0.00
	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	43	12	516	78	0.15	483	0.94	718	1.39	335	0.65
	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	28,812	35,510		69,562		38,445		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	3,151	3.86	1,727	2.12	2,305	2.82	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	78	12	936	1,670	1.78	3,400	3.63	5,134	5.49	0	0.00
	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	221	0.36	1,661	2.71	1,128	1.84	42	0.07
	Jul 24	55	12	660	254	0.38	1,266	1.92	1,123	1.70	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	540	0.87	773	1.24
	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	4,050	7.34
	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

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Year	Date	Permits	Hours	Permit	Chinook		Sockeye		Chum		Coho	
		Fished	Fished	Hours	Catch	CPUE	Catch	CPUE	Catch	CPUE	Catch	CPUE
1998	Aug 14	59	12	708	17	0.02	28	0.04	13	0.02	10,424	14.72
(cont.)	Aug 17	42	12	504	6	0.01	16	0.03	15	0.03	5,915	11.74
	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
	Sept 4	31	12	372	4	0.01	5	0.01	0	0.00	4,442	11.94
	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	1257	2.05
	Jul 31	46	12	552	30	0.05	548	0.99	222	0.40	2533	4.59
	Aug 02	37	12	444	12	0.03	240	0.54	63	0.14	2,544	5.73

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Year	Date	Permits	Hours	Permit	Chinook		Sockeye		Chum		Coho	
		Fished	Fished	Hours	Catch	CPUE	Catch	CPUE	Catch	CPUE	Catch	CPUE
2000	Aug 05	43	12	516	16	0.03	256	0.50	59	0.11	1,899	3.68
(cont.)	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	
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	4	0.01	21	0.07	955	3.32
	Aug 24	15	12	180	6	0.03	6	0.03	5	0.03	432	2.40
Total			231	10,689	12,775		33,774		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	596	0.89	2,788	4.15	3,116	4.64	0	0.00
	Jul 8	58	12	696	577	0.83	2,447	3.52	3,645	5.24	0	0.00
	Jul 10	52	12	624	593	0.95	2,164	3.47	1,992	3.19	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	161	0.42	839	2.18	942	2.45	0	0.00
	Jul 19	20	12	240	78	0.33	750	3.13	926	3.86	0	0.00
	Aug 1	24	12	288	32	0.11	631	2.19	162	0.56	360	1.25
	Aug 5	25	12	300	20	0.07	413	1.38	164	0.55	1,610	5.37
	Aug 7	32	12	384	31	0.08	290	0.76	125	0.33	2,653	6.91
	Aug 9	33	12	396	16	0.04	332	0.84	858	2.17	2,383	6.02
	Aug 12	37	12	444	15	0.03	214	0.48	58	0.13	3,260	7.34
	Aug 14	38	12	456	10	0.02	172	0.38	51	0.11	2,649	5.81
	Aug 16	49	12	588	13	0.02	162	0.28	40	0.07	4,516	7.68

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Year	Date	Permits	Hours	Permit	Chinook		Sockeye		Chum		Coho	
		Fished	Fished	Hours	Catch	CPUE	Catch	CPUE	Catch	CPUE	Catch	CPUE
2002	Aug 19	30	12	360	3	0.01	59	0.16	25	0.07	3,156	8.77
(cont.)	Aug 21	34	12	408	7	0.02	38	0.09	13	0.03	2,490	6.10
	Aug 23	29	12	348	6	0.02	61	0.18	18	0.05	2,495	7.17
	Aug 26	28	12	336	1	0.00	26	0.08	9	0.03	1,123	3.34
Total			288	11,904	11,480		19,773		29,995		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	4.12	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	3,179	6.02	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	2,555	2.96	3,074	3.56	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	4,836	7.20	2,549	3.79	0	0.00
	Jul 12	53	12	636	699	1.10	3,011	4.73	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	1,444	3.88	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	226	0.52	325	0.75	4,876	11.29
	Aug 6	36	12	432	38	0.09	174	0.40	195	0.45	2,534	5.87
	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	220	0.35	63	0.10	8,966	14.10

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Year	Date	Permits	Hours	Permit	Chinook		Sockeye		Chum		Coho	
		Fished	Fished	Hours	Catch	CPUE	Catch	CPUE	Catch	CPUE	Catch	CPUE
2004	Aug 20	46	12	552	14	0.03	92	0.17	51	0.09	6,736	12.20
(cont.)	Aug 23	37	12	444	9	0.02	17	0.04	20	0.05	7,284	16.41
	Aug 25	44	12	528	9	0.02	13	0.02	27	0.05	6,113	11.58
	Aug 27	39	12	468	11	0.02	6	0.01	12	0.03	7,035	15.03
Total			288	13,224	25,465		34,627		25,820		82,398	
10 Year Average (1994–2003)					19,830		50,648		45,302		51,371	

Appendix C9.—Salmon spawning escapement, Kanektok River, Kuskokwim Bay, 1996–2004.

Year	Operating Period ^a	Chinook	Sockeye	Chum	Pink	Coho
Kanektok River						
<i>Counting Tower</i>						
1996	7/2-7/13; 7/20-7/25	6,827 ^b	71,637 ^b	70,617 ^b		
1997	06/11 to 08/21	16,731	96,348	51,180	7,872 ^b	23,172 ^b
1998	07/23 to 08/17	^b	^b	^b	^b	^b
1999	Not Operational					
2000	Not Operational					
<i>Weir</i>						
2001	08/10 to 10/03	132 ^b	733 ^b	1,058 ^b	21 ^b	36,440
2002	07/01 to 09/20	5,343 ^b	58,367 ^b	42,014 ^b	87,036	24,883
2003	06/24 to 09/18	8,231	127,471	40,066	2,443	72,448
2004	06/29 to 09/19	19,405	102,434	46,194 [#]	98,060	85,922

^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 Field operations were incomplete and total annual escapement was not estimated.

Appendix C10.—Salmon spawning aerial survey index estimates, Kanektok River, Kuskokwim Bay drainage, 1962–2004

Year	Chinook	Sockeye	Coho	Chum
1962	935	43,108	a	
1963	a	a	a	
1964	a	a	a	
1965	a	a	a	
1966	3,718	a	a	28,800
1967	a	a	a	
1968	4,170	8,000	a	14,000
1969	a	a	a	
1970	3,112	11,375	a	
1971	a	a	a	
1972	a	a	a	
1973	814	a	a	
1974	a	a	a	
1975	a	6,018	a	
1976	a	22,936	a	8,697
1977	5,787	7,244	a	32,157
1978	19,180	44,215	a	229,290
1979	a	a	a	
1980	a	a	a	
1981	a	a	69,325	
1982	15,900	49,175	a	71,840
1983	8,142	55,940	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
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	
1997	a	a	a	
1998	6,107	22,020	23,656	7,040
1999	a	a	5,192	
2000	1,118	11,670	10,120	10,000
2001	6,483	38,610	a	11,440
2002	a	a	a	
2003	5,430	18,010	a	2,700
2004	28,375	78,380		
GOAL	5,800	15,000	25,000	30,500

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.

Appendix C11.—Chinook salmon commercial fishery age and sex composition information, District 4, Quinhagak, Kuskokwim Bay drainage, 1993–2004.

Year	Project	Sample Size	Sex	Age Class								Total	
				1.2		1.3		1.4		1.5		Harvest	%
				Harvest	%	Harvest	%	Harvest	%	Harvest	%		
1993	Season	337	M	5,531	35.0	2,562	16.2	1,319	8.4	92	0.6	9,709	61.5
			F	216	1.4	1,835	11.6	3,560	22.6	431	2.7	6,076	38.5
			Total	5,747	36.4	4,397	27.9	4,879	30.9	523	3.3	15,785	100.0
1994	Season	326	M	1,304	15.2	2,103	24.6	1,040	12.1	137	1.6	4,704	54.9
			F	171	2.0	1,349	15.7	2,097	24.5	243	2.8	3,861	45.1
			Total	1,475	17.2	3,452	40.3	3,137	36.6	380	4.4	8,565	100.0
1995	Season	603	M	7,595	19.7	3,879	10.1	9,897	25.7	78	0.2	21,449	55.6
			F	1,499	3.9	2,215	5.7	13,269	34.4	153	0.4	17,135	44.4
			Total	9,094	23.6	6,093	15.8	23,166	60.0	231	0.6	38,584	100.0
1996	Season ^a	399	M										
			F										
			Total									14,165	
1997	Season	573	M	12,398	34.9	3,584	10.1	6,660	18.7	7	0.0	23,065	65.0
			F	108	0.3	661	1.9	11,461	32.3	215	0.6	12,445	35.0
			Total	12,506	35.2	4,245	12.0	18,121	51.0	222	0.6	35,510	100.0
1998	Season	724	M	5,482	23.7	9,859	42.6	2,061	8.9	244	1.1	18,356	79.3
			F	106	0.4	2,023	8.7	2,437	10.5	235	1.0	4,802	20.7
			Total	5,588	24.1	11,882	51.3	4,498	19.4	479	2.1	23,158	100.0
1999	Season	662	M	5,402	29.3	3,702	20.1	3,535	19.2	92	0.5	12,865	69.8
			F	98	0.5	385	2.1	4,873	26.4	205	1.1	5,561	30.2
			Total	5,500	29.8	4,087	22.2	8,408	45.6	297	1.6	18,426	100.0
2000	Season	480	M	2,828	13.3	8,050	37.9	3,583	16.9	162	0.7	14,770	69.6
			F	0	0.0	1,088	5.1	5,014	23.6	357	1.7	6,459	30.4
			Total	2,828	13.3	9,138	43.0	8,597	40.5	519	2.4	21,229	100.0
2001	Season	570	M	1,230	9.6	1,474	11.5	4,921	38.5	80	0.6	7,727	60.5
			F	0	0.0	250	2.0	4,703	36.8	74	0.6	5,048	39.5
			Total	1,230	9.6	1,724	13.5	9,624	75.3	154	1.2	12,775	100.0
2002	Season	436	M	3,442	29.9	2,951	25.6	2,078	18.0	236	2.1	8,818	76.7
			F	98	0.9	229	2.0	2,102	18.3	257	2.2	2,686	23.3
			Total	3,540	30.8	3,180	27.6	4,180	36.3	493	4.3	11,504	100.0

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Year	Project	Sample Size	Sex	Age Class								Total	
				1.2		1.3		1.4		1.5		Harvest	%
				Harvest	%	Harvest	%	Harvest	%	Harvest	%		
2003	Season	547	M	3,513	24.3	4,481	31.0	2,536	17.5	138	0.9	11,020	76.3
			F	476	3.3	467	3.3	2,179	15.1	229	1.6	3,424	23.7
			Total	3,989	27.6	4,948	34.3	4,715	32.6	367	2.5	14,444	100.0
2004	6/17 (6/15-17)	59	M	3,188	45.8	2,244	32.2	827	11.8	236	3.4	6,495	93.2
			F	0	0.0	0	0.0	472	6.8	0	0.0	472	6.8
			Subtotal	3,188	45.8	2,244	32.2	1,299	18.6	236	3.4	6,967	100.0
	6/24 (6/22-24)	61	M	2,382	39.3	1,886	31.1	893	14.7	0	0.0	5,161	85.2
			F	0	0.0	198	3.3	695	11.5	0	0.0	893	14.8
			Subtotal	2,382	39.3	2,084	34.4	1,588	26.2	0	0.0	6,054	100.0
	7/1 (6/29-7/5)	64	M	3,587	46.9	1,554	20.3	478	6.3	120	1.6	5,859	76.6
			F	119	1.5	598	7.8	957	12.5	119	1.5	1,793	23.4
			Subtotal	3,706	48.4	2,152	28.1	1,435	18.8	239	3.1	7,652	100.0
	7/12 (7/7-8/27)	24	M	2,596	54.2	998	20.8	799	16.7	0	0.0	4,393	91.7
			F	0	0.0	0	0.0	399	8.3	0	0.0	399	8.3
			Subtotal	2,596	54.2	998	20.8	1,198	25.0	0	0.0	4,792	100.0
	Season	208	M	11,753	46.1	6,682	26.3	2,997	11.8	356	1.4	21,907	86.0
			F	119	0.5	796	3.1	2,523	9.9	119	0.5	3,558	14.0
			Total	11,872	46.6	7,478	29.4	5,520	21.7	475	1.9	25,465	100.0
	Grand Total	5,466	M	60,477	26.8	49,327	21.9	40,628	18.0	1,621	0.7	154,390	68.5
			F	2,891	1.3	11,298	5.0	54,218	24.0	2,518	1.1	71,055	31.5
			Total	63,369	28.1	60,625	26.9	94,846	42.1	4,139	1.8	225,445	100.0

Note: Age classes representing less than 1% of the Grand Total are excluded, discrepancies in sums are attributed to excluded age classes.

^a Sampling dates do not meet criteria for estimating harvest percentages for some or all of the strata, "Season" is not included in the "Grand Total".

Appendix C12.—Chinook salmon escapement project age and sex composition information, Kanektok River, Kuskokwim Bay drainage, 1997–2004.

Year	Project	Sample Size	Sex	Age Class								Total	
				1.2		1.3		1.4		1.5		Esc.	%
				Esc.	%	Esc.	%	Esc.	%	Esc.	%		
1997	Season	85	M	6,187	37.0	1,053	6.3	1,763	10.5	0	0.0	9,357	55.9
			F	1,762	10.5	355	2.1	5,268	31.5	0	0.0	7,386	44.1
			Total	7,949	47.5	1,408	8.4	7,031	42.0	0	0.0	16,743	100.0
2002	Season	188	M	1,222	22.9	1,231	23.0	729	13.6	37	0.7	3,341	62.5
			F	0	0.0	111	2.1	1,574	29.5	317	5.9	2,002	37.5
			Total	1,222	22.9	1,342	25.0	1,303	43.1	354	6.6	5,343	100.0
2003	Season	174	M	1,944	23.6	2,364	28.7	981	11.9	61	0.7	5,542	67.3
			F	0	0.0	543	6.6	2,041	24.8	105	1.3	2,689	32.7
			Total	1,944	23.6	2,907	35.3	3,022	36.7	166	2.0	8,231	100.0
2004	7/6-11 (6/29-7/12)	183	M	3,257	57.4	1,303	23.0	310	5.4	31	0.5	4,932	86.9
			F	0	0.0	155	2.7	589	10.4	0	0.0	744	13.1
			Subtotal	3,257	57.4	1,458	25.7	899	15.8	31	0.5	5,676	100.0
	7/14-17 (7/13-18)	125	M	1,958	50.4	901	23.2	435	11.2	0	0.0	3,294	84.8
			F	31	0.8	155	4.0	373	9.6	31	0.8	590	15.2
			Subtotal	1,989	51.2	1,056	27.2	808	20.8	31	0.8	3,884	100.0
	7/19-8/11 (7/19-9/20)	120	M	6,022	60.9	2,145	21.7	413	4.2	0	0.0	8,579	86.7
			F	82	0.8	247	2.5	907	9.1	82	0.8	1,320	13.3
			Subtotal	6,104	61.7	2,392	24.2	1,320	13.3	82	0.8	9,899	100.0
	Season	428	M	11,236	57.7	4,348	22.3	1,158	6.0	31	0.1	16,804	86.4
			F	114	0.6	558	2.9	1,869	9.6	114	0.6	2,655	13.6
			Total	11,350	58.3	4,906	25.2	3,027	15.6	145	0.7	19,459	100.0
	Grand Total	875	M	20,589	41.4	8,996	18.1	4,631	9.3	129	0.3	35,044	70.4
			F	1,876	3.8	1,567	3.1	10,752	21.6	536	1.1	14,732	29.6
			Total	22,465	45.1	10,563	21.2	14,383	28.9	665	1.3	49,776	100.0

Note: Age classes representing less than 1% of the Grand Total are excluded, discrepancies in sums are attributed to excluded age classes.

Appendix C13.—Chum salmon commercial fishery age and sex composition information, District 4, Quinhagak, Kuskokwim Bay drainage, 1993–2004.

Year	Project	Sample Size	Sex	Age Class								Total	
				0.2		0.3		0.4		0.5		Harvest	%
				Harvest	%	Harvest	%	Harvest	%	Harvest	%		
1993	Season	398	M	250	0.6	8,849	21.6	9,661	23.6	1,270	3.1	20,031	48.9
			F	122	0.3	8,435	20.6	9,617	23.5	2,740	6.7	20,914	51.1
			Total	372	0.9	17,285	42.2	19,278	47.1	4,010	9.8	40,943	100.0
1994	Season ^a	547	M										
			F										
			Total									61,301	
1995	Season	598	M	1,975	2.4	12,704	15.6	14,278	17.5	309	0.4	29,267	35.9
			F	4,245	5.2	26,803	32.9	20,818	25.6	335	0.4	52,202	64.1
			Total	6,221	7.6	39,507	48.5	35,097	43.1	644	0.8	81,462	100.0
1996	Season ^a	615	M										
			F										
			Total									83,005	
1997	Season	1,221	M	371	1.0	6,498	16.9	10,414	27.1	248	0.6	17,531	45.6
			F	189	0.5	7,905	20.6	12,630	32.8	190	0.5	20,914	54.4
			Total	560	1.5	14,403	37.5	23,044	59.9	438	1.1	38,445	100.0
1998	Season	857	M	48	0.1	16,619	36.9	1,962	4.3	101	0.2	18,729	41.5
			F	272	0.6	23,506	52.1	2,389	5.3	198	0.5	26,366	58.5
			Total	320	0.7	40,125	89.0	4,351	9.6	299	0.7	45,095	100.0
1999	Season	814	M	64	0.2	11,230	29.5	4,793	12.6	12	0.0	16,099	42.3
			F	0	0.0	15,432	40.5	6,493	17.0	67	0.2	21,992	57.7
			Total	64	0.2	26,662	70.0	11,286	29.6	79	0.2	38,091	100.0
2000	Season	1,043	M	122	0.4	6,971	22.8	6,801	22.2	67	0.2	13,961	45.7
			F	22	0.1	9,519	31.2	6,926	22.7	124	0.4	16,592	54.3
			Total	144	0.5	16,490	54.0	13,727	44.9	191	0.6	30,553	100.0
2001	Season	576	M	0	0.0	3,725	21.7	3,338	19.4	0	0.0	7,063	41.0
			F	77	0.4	4,857	28.2	5,184	30.1	29	0.2	10,146	59.0
			Total	77	0.4	8,582	49.9	8,522	49.5	29	0.2	17,209	100.0
2002	Season	449	M	654	2.2	6,308	21.5	3,143	10.7	523	1.8	10,629	36.2
			F	524	1.8	10,412	35.4	7,668	26.1	129	0.4	18,732	63.8
			Total	1,178	4.0	16,720	56.9	10,811	36.8	652	2.2	29,361	100.0

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Year	Project	Sample Size	Sex	Age Class								Total	
				0.2		0.3		0.4		0.5		Harvest	%
				Harvest	%	Harvest	%	Harvest	%	Harvest	%		
2003	Season	243	M	148	0.6	11,571	41.5	1,635	5.9	0	0.0	13,354	47.9
			F	147	0.5	12,959	46.5	1,059	3.8	349	1.3	14,514	52.1
			Total	295	1.1	24,530	88.0	2,694	9.7	349	1.3	27,868	100.0
2004	6/17 (6/15-22)	74	M	0	0.0	271	12.2	963	43.3	0	0.0	1,233	55.4
			F	0	0.0	150	6.7	842	37.8	0	0.0	993	44.6
			Subtotal	0	0.0	421	18.9	1,805	81.1	0	0.0	2,226	100.0
	6/24 (6/24-7/7)	72	M	318	2.8	2,384	20.8	4,133	36.1	159	1.4	6,994	61.1
			F	0	0.0	795	7.0	3,656	32.0	0	0.0	4,451	38.9
			Subtotal	318	2.8	3,179	27.8	7,789	68.1	159	1.4	11,445	100.0
	7/12 (7/9-8/27)	79	M	615	5.0	3,076	25.3	2,461	20.3	0	0.0	6,151	50.6
			F	154	1.3	3,691	30.4	2,153	17.7	0	0.0	5,998	49.4
			Subtotal	769	6.3	6,767	55.7	4,614	38.0	0	0.0	12,149	100.0
	Season	225	M	933	3.6	5,731	22.2	7,556	29.3	159	0.6	14,379	55.7
			F	154	0.6	4,636	18.0	6,651	25.7	0	0.0	11,441	44.3
			Total	1,087	4.2	10,367	40.2	14,207	55.0	159	0.6	25,820	100.0
Grand Total	6,026	M	4,315	1.3	81,357	24.4	53,920	16.1	1,419	0.4	141,012	42.2	
		F	5,630	1.7	116,029	34.7	69,818	20.9	1,421	0.4	192,899	57.8	
		Total	9,946	3.0	197,386	59.1	123,739	37.1	2,840	0.9	333,904	100.0	

^a Sampling dates do not meet criteria for estimating harvest percentages for some or all of the strata; "Season" is not included in the "Grand Total".

Appendix C14.—Chum salmon escapement project age and sex composition information, Kanektok River, Kuskokwim Bay drainage, 1997–2004.

Year	Project	Sample Size (n)	Sex	Age Class								Total	
				0.2		0.3		0.4		0.5		Esc.	%
				Esc.	%	Esc.	%	Esc.	%	Esc.	%	Esc.	%
1997	Season	1,096	M	217	0.4	9,023	17.6	20,180	39.4	607	1.2	30,027	58.7
			F	253	0.5	8,697	17.0	12,063	23.6	141	0.3	21,153	41.3
			Total	470	0.9	17,720	34.6	32,243	63.0	748	1.5	51,180	100.0
2002	Season	738	M	329	0.8	7,288	17.4	9,935	23.6	323	0.7	17,875	42.5
			F	708	1.7	10,800	25.7	12,349	29.4	282	0.7	24,139	57.5
			Total	1,037	2.5	18,088	43.1	22,284	53.0	605	1.4	42,014	100.0
2003	Season	733	M	57	0.1	17,476	43.6	2,164	5.4	515	1.3	20,212	50.4
			F	280	0.7	17,301	43.2	2,008	5.0	265	0.6	19,854	49.6
			Total	337	0.8	34,777	86.8	4,172	10.4	780	1.9	40,066	100.0
2004	7/6-11 (6/29-7/13)	126	M	0	0.0	1,967	12.7	6,025	38.9	0	0.0	7,992	51.6
			F	369	2.4	3,566	23.0	3,443	22.2	123	0.8	7,501	48.4
			Subtotal	369	2.4	5,533	35.7	9,468	61.1	123	0.8	15,493	100.0
	7/14-19 (7/14-20)	99	M	347	3.1	3,240	28.3	3,703	32.3	0	0.0	7,290	63.6
			F	232	2.0	2,083	18.2	1,851	16.2	0	0.0	4,165	36.4
			Subtotal	579	5.1	5,323	46.5	5,554	48.5	0	0.0	11,455	100.0
	7/22–24 (721-26)	169	M	178	2.4	2,269	30.2	1,112	14.8	0	0.0	3,559	47.3
			F	267	3.5	2,847	37.8	846	11.2	0	0.0	3,960	52.7
			Subtotal	445	5.9	5,116	68.0	1,958	26.0	0	0.0	7,519	100.0
	7/28-31 (7/27-8/2)	185	M	280	4.3	1,754	27.0	807	12.4	0	0.0	2,842	43.8
			F	316	4.9	2,245	34.6	1,087	16.8	0	0.0	3,648	56.2
			Subtotal	596	9.2	3,999	61.6	1,894	29.2	0	0.0	6,490	100.0
	8/4-13 (8/3-9/20)	157	M	169	3.2	1,218	22.9	879	16.6	0	0.0	2,266	42.7
			F	474	8.9	1,894	35.7	677	12.7	0	0.0	3,045	57.3
			Subtotal	643	12.1	3,112	58.6	1,556	29.3	0	0.0	5,311	100.0
	Season	736	M	975	2.1	10,448	22.6	12,526	27.1	0	0.0	23,949	51.8
			F	1,656	3.6	12,636	27.3	7,904	17.1	123	0.3	22,319	48.2
			Total	2,631	5.7	23,084	49.9	20,430	44.2	123	0.3	46,268	100.0
	Grand Total	3,303	M	1,578	0.9	44,235	24.6	44,805	25.0	1,445	0.8	92,063	51.3
			F	2,897	1.6	49,434	27.5	34,324	19.1	811	0.5	87,465	48.7
			Total	4,475	2.5	93,669	52.2	79,129	44.1	2,256	1.3	179,528	100.0

Appendix C15.—Sockeye salmon commercial fishery age and sex composition information, District 4, Quinhagak, Kuskokwim Bay drainage, 1993–2004.

Year	Project	Sample Size	Sex	Age Class								Total	
				1.2		1.3		1.4		2.3		Harvest	%
				Harvest	%	Harvest	%	Harvest	%	Harvest	%		
1993	Season	535	M	12,533	15.5	24,431	30.2	1,667	2.1	728	0.9	46,472	57.4
			F	7,064	8.7	20,297	25.1	2,184	2.7	820	1.0	34,463	42.6
			Total	19,597	24.2	44,728	55.3	3,851	4.8	1,548	1.9	80,934	100.0
1994	Season	527	M	4,787	6.6	28,264	39.1	1,495	2.1	587	0.8	38,911	53.8
			F	5,324	7.4	21,189	29.3	1,675	2.3	1,268	1.8	33,393	46.2
			Total	10,111	14.0	49,453	68.4	3,170	4.4	1,855	2.6	72,314	100.0
1995	Season	620	M	13,199	18.6	18,946	26.6	2,169	3.1	100	0.1	37,791	53.2
			F	13,498	19.0	16,454	23.1	860	1.2	846	1.2	33,295	46.8
			Total	26,698	37.6	35,395	49.8	3,029	4.3	946	1.3	71,094	100.0
1996	Season	509	M	2,991	5.2	17,229	29.9	65	0.1	1,960	3.4	24,784	43.0
			F	6,592	11.4	22,052	38.2	267	0.5	1,401	2.4	32,868	57.0
			Total	9,583	16.6	39,281	68.1	332	0.6	3,361	5.8	57,665	100.0
1997	Season	952	M	6,384	9.2	18,885	27.1	3,824	5.5	2,694	3.9	34,027	48.9
			F	6,069	8.7	19,516	28.1	3,426	4.9	3,225	4.6	35,535	51.1
			Total	12,453	17.9	38,401	55.2	7,250	10.4	5,919	8.5	69,562	100.0
1998	Season	757	M	5,107	12.3	11,761	28.4	248	0.6	782	1.9	19,447	47.0
			F	4,574	11.1	15,245	36.9	239	0.6	420	1.0	21,935	53.0
			Total	9,681	23.4	27,006	65.3	487	1.2	1,202	2.9	41,382	100.0
1999	Season	539	M	11,039	26.7	9,947	24.1	1,225	2.9	526	1.3	23,321	56.4
			F	8,036	19.5	8,797	21.3	276	0.7	160	0.4	17,994	43.6
			Total	19,075	46.2	18,744	45.4	1,501	3.6	686	1.7	41,315	100.0
2000	Season	880	M	6,970	10.2	22,865	33.4	133	0.2	893	1.3	30,996	45.2
			F	8,432	12.3	27,911	40.7	28	0.0	434	0.6	37,561	54.8
			Total	15,402	22.5	50,776	74.1	161	0.2	1,327	1.9	68,557	100.0
2001	Season	713	M	501	1.5	17,212	50.9	284	0.8	919	2.7	18,938	56.0
			F	396	1.2	13,150	38.9	341	1.0	599	1.8	14,869	44.0
			Total	897	2.7	30,362	89.8	625	1.8	1,518	4.5	33,807	100.0
2002	Season	307	M	5,002	27.9	3,492	19.5	184	1.1	345	2.0	9,632	53.9
			F	3,895	21.8	3,312	18.5	184	1.0	344	1.9	8,253	46.1
			Total	8,897	49.7	6,804	38.0	368	2.1	689	3.9	17,885	100.0

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Year	Project	Sample Size	Sex	Age Class								Total	
				1.2		1.3		1.4		2.3		Harvest	%
				Harvest	%	Harvest	%	Harvest	%	Harvest	%		
2003	Season	365	M	5,316	15.6	11,726	34.5	408	1.2	365	1.1	18,421	54.3
			F	3,694	10.9	10,749	31.7	193	0.6	467	1.4	15,520	45.7
			Total	9,010	26.5	22,475	66.2	601	1.8	832	2.5	33,941	100.0
2004	6/24 (6/15-29)	77	M	1,049	14.3	3,337	45.4	191	2.6	0	0.0	4,672	63.6
			F	286	3.9	2,098	28.6	190	2.6	0	0.0	2,670	36.4
			Subtotal	1,335	18.2	5,435	74.0	381	5.2	0	0.0	7,342	100.0
	7/1 (7/1-7)	72	M	1,555	11.1	3,305	23.6	389	2.8	0	0.0	6,026	43.1
			F	972	7.0	6,026	43.1	583	4.1	194	1.4	7,971	56.9
			Subtotal	2,527	18.1	9,331	66.7	972	6.9	194	1.4	13,997	100.0
	7/12 (7/9-8/27)	68	M	3,908	29.4	3,322	25.0	391	2.9	0	0.0	7,621	57.4
			F	2,931	22.1	2,345	17.6	195	1.5	0	0.0	5,667	42.6
			Subtotal	6,839	51.5	5,667	42.6	586	4.4	0	0.0	13,288	100.0
	Season	217	M	6,513	18.8	9,964	28.8	971	2.8	0	0.0	18,320	52.9
			F	4,189	12.1	10,469	30.2	969	2.8	194	0.6	16,307	47.1
			Total	10,702	30.9	20,433	59.0	1,940	5.6	194	0.6	34,627	100.0
	Grand Total	6,921	M	80,342	12.9	194,723	31.3	12,673	2.0	9,899	1.6	321,060	51.6
			F	71,764	11.5	189,140	30.4	10,642	1.7	10,178	1.6	301,993	48.7
			Total	152,107	24.4	383,858	61.6	23,314	3.7	20,077	3.2	623,083	100.3

Note: Age classes representing less than 1% of the Grand Total are excluded, discrepancies in sums are attributed to excluded age classes.

Appendix C16.—Sockeye salmon escapement project age and sex composition information, Kanektok River, Kuskokwim Bay drainage, 1997–2004.

Year	Project	Sample Size	Sex	Age Class								Total	
				1.2		1.3		1.4		2.3		Esc.	%
				Esc.	%	Esc.	%	Esc.	%	Esc.	%		
1997	Season	740	M	8,914	9.2	28,286	29.3	1,725	1.8	2,844	2.9	47,386	49.1
			F	<u>14,552</u>	<u>15.1</u>	<u>24,531</u>	<u>25.4</u>	<u>2,346</u>	<u>2.4</u>	<u>3,362</u>	<u>3.5</u>	<u>49,142</u>	<u>50.9</u>
			Total	23,466	24.3	52,817	54.7	4,071	4.2	6,206	6.4	96,528	100.0
2002	Season	663	M	13,036	22.3	8,481	14.5	947	1.6	1,419	2.4	24,692	42.3
			F	<u>19,756</u>	<u>33.9</u>	<u>11,789</u>	<u>20.2</u>	<u>422</u>	<u>0.7</u>	<u>990</u>	<u>1.7</u>	<u>33,675</u>	<u>57.7</u>
			Total	32,792	56.2	20,270	34.7	1,369	2.3	2,409	4.1	58,367	100.0
2003	Season	403	M	16,191	12.7	44,489	34.9	1,302	1.0	724	0.6	62,965	49.4
			F	<u>17,708</u>	<u>13.9</u>	<u>43,509</u>	<u>34.1</u>	<u>1,264</u>	<u>1.0</u>	<u>1,765</u>	<u>1.4</u>	<u>64,506</u>	<u>50.6</u>
			Total	33,899	26.6	87,998	69.0	2,566	2.0	2,489	2.0	127,471	100.0
2004	7/6-11 (6/29-7/12)	172	M	11,206	19.8	21,752	38.4	659	1.1	330	0.6	34,935	61.6
			F	<u>10,546</u>	<u>18.6</u>	<u>10,546</u>	<u>18.6</u>	<u>330</u>	<u>0.6</u>	<u>0</u>	<u>0.0</u>	<u>21,752</u>	<u>38.4</u>
			Subtotal	21,752	38.4	32,298	57.0	989	1.7	330	0.6	56,687	100.0
	7/14-24 (7/13-26)	173	M	9,315	27.2	6,342	18.5	0	0.0	198	0.6	16,846	49.1
			F	<u>10,702</u>	<u>31.2</u>	<u>5,747</u>	<u>16.8</u>	<u>0</u>	<u>0.0</u>	<u>0</u>	<u>0.0</u>	<u>17,440</u>	<u>50.9</u>
			Subtotal	20,017	58.4	12,089	35.3	0	0.0	198	0.6	34,286	100.0
	7/28-8/13 (7/26-9/20)	125	M	3,932	33.6	2,153	18.4	0	0.0	0	0.0	6,273	53.6
			F	<u>3,932</u>	<u>33.6</u>	<u>1,217</u>	<u>10.4</u>	<u>0</u>	<u>0.0</u>	<u>0</u>	<u>0.0</u>	<u>5,430</u>	<u>46.4</u>
			Subtotal	7,864	67.2	3,370	28.8	0	0.0	0	0.0	11,703	100.0
	Season	470	M	24,452	23.8	30,247	29.5	659	0.7	528	0.1	58,054	56.5
			F	<u>25,181</u>	<u>24.5</u>	<u>17,511</u>	<u>17.0</u>	<u>330</u>	<u>0.3</u>	<u>0</u>	<u>0.0</u>	<u>44,622</u>	<u>43.5</u>
			Total	49,633	48.3	47,758	46.5	989	1.0	528	0.5	102,676	100.0
Grand Total	2,276	M	62,593	16.3	111,503	29.0	4,633	1.2	5,515	1.4	193,097	50.1	
		F	<u>77,197</u>	<u>20.0</u>	<u>97,340</u>	<u>25.3</u>	<u>4,362</u>	<u>1.1</u>	<u>6,117</u>	<u>1.6</u>	<u>191,945</u>	<u>49.9</u>	
		Total	139,790	36.3	208,843	54.2	8,995	2.3	11,632	3.0	385,042	100.0	

Note: Age classes representing less than 1% of the Grand Total are excluded, discrepancies in sums are attributed to excluded age classes.

Appendix C17.—Coho salmon commercial fishery age and sex composition information, District 4, Quinhagak, Kuskokwim Bay drainage, 1993–2004.

Year	Project	Sample Size	Sex	Age Class						Total	
				1.1		2.1		3.1		Harvest	%
				Harvest	%	Harvest	%	Harvest	%		
1993	Season	300	M	463	2.3	9,977	49.8	506	2.5	10,945	54.7
			F	261	1.3	8,542	42.7	265	1.3	9,069	45.3
			Total	724	3.6	18,519	92.5	771	3.9	20,014	100.0
1994	Season	429	M	545	2.7	8,785	43.9	125	0.6	9,455	47.2
			F	777	3.9	9,175	45.8	607	3.0	10,559	52.8
			Total	1,322	6.6	17,960	89.7	732	3.7	20,014	100.0
1995	Season	653	M	4,117	6.2	29,388	44.4	2,885	4.4	36,390	55.0
			F	1,573	2.4	26,392	39.9	1,849	2.8	29,814	45.0
			Total	5,690	8.6	55,780	84.3	4,735	7.2	66,203	100.0
1996	Season	556	M	3,641	3.1	62,974	53.0	915	0.8	67,530	56.9
			F	3,430	2.9	46,868	39.5	890	0.7	51,188	43.1
			Total	7,071	6.0	109,842	92.5	1,805	1.5	118,718	100.0
1997	Season ^a	359	M								
			F								
			Total							32,862	
1998	Season	446	M	2,048	2.6	31,769	39.6	313	0.4	34,131	42.6
			F	2,738	3.4	42,939	53.6	376	0.5	46,052	57.4
			Total	4,786	6.0	74,708	93.2	689	0.9	80,183	100.0
1999	Season ^a	0	M								
			F								
			Subtotal							6,184	
2000	Season	285	M	358	1.2	14,940	49.0	213	0.7	15,511	50.8
			F	68	0.2	14,660	48.0	290	0.9	15,018	49.2
			Total	426	1.4	29,600	97.0	503	1.6	30,529	100.0
2001	Season	415	M	807	4.3	9,541	51.5	896	4.8	11,244	60.7
			F	642	3.5	6,241	33.7	405	2.2	7,287	39.3
			Total	1,449	7.8	15,782	85.2	1,301	7.0	18,531	100.0
2002	Season	460	M	174	0.7	11,783	44.2	1,322	5.0	13,278	49.7
			F	188	0.7	11,994	44.9	1,234	4.6	13,417	50.3
			Total	362	1.4	23,777	89.1	2,556	9.6	26,695	100.0

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Year	Project	Sample Size	Sex	Age Class							
				1.1		2.1		3.1		Total	
				Harvest	%	Harvest	%	Harvest	%	Harvest	%
2003	Season	153	M	1,448	2.9	30,227	60.7	2,058	4.1	33,733	67.7
			F	2,065	4.2	11,075	22.2	2,960	6.0	16,100	32.3
			Total	3,513	7.1	41,302	82.9	5,018	10.1	49,833	100.0
2004	8/4 (8/2-9)	54	M	1,140	5.6	9,499	46.3	380	1.9	11,019	53.7
			F	380	1.8	8,739	42.6	380	1.8	9,499	46.3
			Subtotal	1,520	7.4	18,238	88.9	760	3.7	20,518	100.0
	8/18 (8/11-18)	62	M	560	1.6	21,835	62.9	0	0.0	22,395	64.5
			F	1,120	3.2	11,197	32.3	0	0.0	12,317	35.5
			Subtotal	1,680	4.8	33,032	95.2	0	0.0	34,712	100.0
	8/25 (8/20-27)	70	M	388	1.5	10,479	38.6	0	0.0	10,867	40.0
			F	388	1.4	15,913	58.5	0	0.0	16,301	60.0
			Subtotal	776	2.9	26,392	97.1	0	0.0	27,168	100.0
	Season	186	M	2,088	2.5	41,813	50.8	380	0.5	44,281	53.7
			F	1,888	2.3	35,849	43.5	380	0.4	38,117	46.3
			Total	3,976	4.8	77,662	94.3	760	0.9	82,398	100.0
Grand Total	3,883	M	15,688	3.1	251,196	49.0	9,614	1.9	276,498	53.9	
		F	13,630	2.7	213,736	41.7	9,256	1.8	236,621	46.1	
		Total	29,318	5.7	464,932	90.6	18,870	3.7	513,118	100.0	

^a Sampling dates do not meet criteria for estimating harvest percentages for some or all of the strata; "Season" is not included in the "Grand Total".

Appendix C18.—Coho salmon escapement project age and sex composition information, Kanektok River, Kuskokwim Bay drainage, 1997–2004.

Year	Project	Sample Size	Sex	Age Class						Total		
				1.1		2.1		3.1		Esc.	%	
				Esc.	%	Esc.	%	Esc.	%			
1997	Season ^a	115	M F Total								23,172	
2001	Season	432	M F Total	1,349 615 1,964	3.8 1.7 5.5	15,274 15,405 30,679	42.9 43.2 86.1	1,235 1,772 3,007	3.4 5.0 8.4	17,858 17,792 35,650	50.1 49.9 100.0	
2002	Season	440	M F Total	207 191 398	0.8 0.8 1.6	13,057 9,956 23,013	52.5 40.0 92.5	544 929 1,473	2.2 3.7 5.9	13,807 11,076 24,883	55.5 44.5 100.0	
2003	Season	195	M F Total	381 1,127 1,508	0.5 1.6 2.1	29,503 30,802 60,305	40.7 42.5 83.2	4,447 6,188 10,635	6.1 8.6 14.7	34,331 38,117 72,448	47.4 52.6 100.0	
2004	8/4-11 (6/29-8/12)	55	M F Subtotal	113 0 113	1.8 0.0 1.8	1,804 3,834 5,638	29.1 61.8 90.9	0 451 451	0.0 7.3 7.3	1,917 4,285 6,202	30.9 69.1 100.0	
	8/13-21 (8/13-26)	77	M F Subtotal	0 0 0	0.0 0.0 0.0	13,515 14,265 27,780	46.8 49.3 96.1	375 751 1,126	1.3 2.6 3.9	13,890 15,016 28,906	48.1 51.9 100.0	
	8/30-31 (8/27-9/4)	69	M F Subtotal	556 0 556	2.9 0.0 2.9	9,167 8,333 17,500	47.8 43.5 91.3	1,111 0 1,111	5.8 0.0 5.8	10,834 8,333 19,167	56.5 43.5 100.0	
	9/9 (9/5-20)	56	M F Subtotal	0 0 0	0.0 0.0 0.0	14,979 17,975 32,954	44.6 53.6 98.2	0 599 599	0.0 1.8 1.8	14,979 18,574 33,553	44.6 55.4 100.0	
	Season	257	M F Total	668 0 668	0.8 0.0 0.8	39,464 44,408 83,872	44.9 50.6 95.5	1,487 1,801 3,288	1.7 2.0 3.7	41,619 46,209 87,828	47.4 52.6 100.0	
	Grand Total	1,324	M F Total	2,605 1,933 4,538	1.2 0.9 2.1	97,298 100,571 197,869	44.1 45.5 89.6	7,713 10,690 18,403	3.5 4.8 8.3	107,615 113,194 220,809	48.7 51.3 100.0	

^a Sampling dates do not meet criteria for estimating escapement percentages for some or all of the strata; "Season" is not included in the "Grand Total".

APPENDIX D.

Appendix D1.—Chinook salmon total utilization, District 5, Goodnews Bay, Kuskokwim Bay, 1969–2004.

Year	Commercial Harvest ^a		Subsistence Harvest ^b		Sport Fish		Total Utilization	10-Year Average
	Annual	10-yr Ave	Annual	10-yr Ave	Annual	10-yr Ave		
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	3,385					5,218	3,443
1979	3,204	3,308	338				3,542	3,399
1980	2,331	2,825	690				3,021	2,985
1981	7,190	3,496	1,409				8,599	3,797
1982	9,476	4,417	1,236				10,712	4,842
1983	14,117	5,475	1,066		31		15,214	6,009
1984	8,612	6,006	629				9,241	6,603
1985	5,793	6,369	426		323		6,542	7,042
1986	2,723	6,200	555				3,278	6,928
1987	3,357	6,202	816				4,173	6,954
1988	4,964	6,177	310 ^d	748			5,274	6,960
1989	2,966	6,153	467	760	68		3,501	6,956
1990	3,303	6,250	539	745			3,842	7,038
1991	912	5,622	917	696	26		1,855	6,363
1992	3,528	5,028	374	610	23		3,925	5,685
1993	2,117	3,828	708	574	81		2,906	4,454
1994	2,570	3,223	784	590	163		3,517	3,881
1995	2,922	2,936	883	635	41		3,846	3,612
1996	1,375	2,801	415	621	157		1,947	3,479
1997	2,039	2,670	449	585	86		2,574	3,319
1998	3,675	2,541	718	625	431		4,824	3,274
1999	1,888	2,433	871	666	223		2,982	3,222
2000	4,442	2,547	703	682	243	147	5,388	3,376
2001	1,519	2,608	895	680	147	160	2,561	3,447
2002	979	2,353	857	728	224	180	2,060	3,261
2003	1,412	2,282	737	731	10	173	2,159	3,186
2004	2,565	2,282	954	748	100	166	3,619	3,196
10-Yr. Ave. (1994-2003)	2,282		731		173		3,186	

^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.

Appendix D2.—Chum salmon total utilization, District 5, Goodnews Bay, Kuskokwim Bay, 1969–2004.

Year	Commercial Harvest ^a		Subsistence Harvest ^b		Sport Fish		Total Utilization	10-Year Average
	Annual	10-yr Ave	Annual	10-yr Ave	Annual	10-yr Ave		
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	7,509					8,590	7,509
1979	9,298	7,938					9,298	7,938
1980	11,748	7,878					11,748	7,878
1981	13,642	9,212					13,642	9,212
1982	13,829	10,462					13,829	10,462
1983	6,766	9,560			10		6,776	9,561
1984	14,340	10,100					14,340	10,101
1985	4,784	9,988	348		124		5,256	10,036
1986	10,355	9,988	191				10,546	10,056
1987	20,381	11,373	578				20,959	11,498
1988	33,059	13,820	448 ^c				33,507	13,990
1989	13,622	14,253	784		0		14,406	14,501
1990	13,194	14,397	332				13,526	14,679
1991	15,892	14,622	149		189		16,230	14,938
1992	18,520	15,091	1,006		0		19,526	15,507
1993	10,657	15,480	188		156		11,001	15,930
1994	28,477	16,894	470	449	15		28,962	17,392
1995	19,832	18,399	155	430	0		19,987	18,865
1996	11,093	18,473	219	433	0		11,312	18,942
1997	11,729	17,608	133	388	24		11,886	18,034
1998	14,155	15,717	316	375	50		14,521	16,136
1999	11,562	15,511	281	325	47		11,890	15,884
2000	7,450	14,937	364	328	12	49	7,826	15,314
2001	3,412	13,689	226	336	21	33	3,659	14,057
2002	3,799	12,217	407	276	99	42	4,305	12,535
2003	5,593	11,710	176	275	0	27	5,769	12,012
2004	6,014	9,464	257	253	0	25	6,271	9,743
10-Yr. Ave. (1994-2003)	11,710		275		27		12,012	

^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.

Appendix D3.—Sockeye salmon total utilization, District 5, Goodnews Bay, Kuskokwim Bay, 1969–2004.

Year	Commercial Harvest ^a		Subsistence Harvest ^b		Sport Fish		Total Utilization	10-Year Average
	Annual	10-yr Ave	Annual	10-yr Ave	Annual	10-yr Ave		
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	4,989					5,412	4,989
1979	19,581	6,322					19,581	6,322
1980	28,632	8,470					28,632	8,470
1981	40,273	12,465					40,273	12,465
1982	38,877	16,260					38,877	16,260
1983	11,716	17,224			14		11,730	17,226
1984	15,474	17,836					15,474	17,838
1985	6,698	17,596	704		75		7,477	17,675
1986	25,112	19,550	943		122		26,177	19,736
1987	27,758	21,953	955		266		28,979	22,261
1988	36,368	25,049	1,065 ^c				37,433	25,463
1989	19,299	25,021	861		146		20,306	25,536
1990	35,823	25,740	1,123				36,946	26,367
1991	39,838	25,696	1,282		63		41,183	26,458
1992	39,194	25,728	827		8		40,029	26,573
1993	59,293	30,486	835		53		60,181	31,419
1994	69,490	35,887	770	937	70		70,330	36,904
1995	37,351	38,953	253	891	34		37,638	39,920
1996	30,717	39,513	352	832	87		31,156	40,418
1997	31,451	39,882	397	777	61		31,909	40,711
1998	27,161	38,962	331	703	502		27,994	39,767
1999	22,910	39,323	582	675	561		24,053	40,142
2000	37,252	39,466	517	615	82	152	37,851	40,232
2001	25,654	38,047	616	548	108	157	26,378	38,752
2002	6,304	34,758	297	495	149	171	6,750	35,424
2003	29,423	31,771	783	490	42	170	30,248	32,431
2004	20,922	26,915	960	509	0	163	21,882	27,586
10-Yr. Ave. (1993-2002)	31,771		490		170		32,431	

^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.

Appendix D4.—Coho salmon total utilization, District 5, Goodnews Bay, Kuskokwim Bay, 1968–2004.

Year	Commercial Harvest ^a		Subsistence Harvest ^b		Sport Fish		Total Utilization	10-Year Average
	Annual	10-yr Ave	Annual	10-yr Ave	Annual	10-yr Ave		
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	9,401					13,335	9,401
1978	13,764	10,232					13,764	10,232
1979	42,098	13,279					42,098	13,279
1980	43,256	16,925					43,256	16,925
1981	19,749	18,723					19,749	18,723
1982	46,683	23,298					46,683	23,298
1983	19,660	24,763			168		19,828	24,779
1984	71,176	29,746					71,176	29,763
1985	16,498	29,607	221		386		17,105	29,685
1986	19,378	30,560	8 ^c				19,386	30,638
1987	29,057	32,132	43 ^c				29,100	32,215
1988	30,832	33,839	1,162 ^d				31,994	34,038
1989	31,849	32,814	907		224		32,980	33,126
1990	7,804	29,269	1,646				9,450	29,745
1991	13,312	28,625	1,828		297		15,437	29,314
1992	19,875	25,944	1,353		138		21,366	26,782
1993	20,014	25,980	1,226		189		21,429	26,942
1994	47,499	23,612	512	891	170		48,181	24,643
1995	17,875	23,750	305	899	114		18,294	24,762
1996	43,836	26,195	352	933	466		44,654	27,289
1997	2,983	23,588	397	969	855		4,235	24,802
1998	21,246	22,629	331	886	574		22,151	23,818
1999	2,474	19,692	582	853	789		3,845	20,904
2000	15,531	20,465	517	740	795	439	16,843	21,644
2001	9,275	20,061	616	619	822	491	10,713	21,171
2002	3,041	18,377	297	514	429	520	3,767	19,411
2003	12,658	17,642	1,319	523	681	570	14,658	18,734
2004	23,690	15,261	1,617	633	622	615	25,929	16,509
10-Yr. Ave. (1994-2003)	17,642		523		570		18,734	

^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.

Appendix D5.—Chinook, sockeye, chum, and coho salmon run size and exploitation rate, Goodnews River drainage, Kuskokwim Bay, 1995–2004.

Year	Species	MFGR	North Fork	Subsistence Harvest	Commercial Harvest	Sport Harvest ^b	Total Run Size	Exploitation ^c (%)
		Tower/weir Estimate ^a	Goodnews R. Escapement					
1995	Chinook	4,836	9,865 ^d	552	2,922	55	18,230	19
	Sockeye	39,009	80,749 ^d	787	37,351	53	157,949	24
	Chum	33,699	88,628 ^d	329	19,832	16	142,504	14
1996	Chinook	2,930	5,977 ^d	526	1,375	213	11,021	19
	Sockeye	58,264	120,606 ^d	763	30,717	143	210,493	15
	Chum	40,450	106,384 ^d	326	11,093	18	158,271	7
1997	Chinook	2,937	7,216	449	2,039	164	12,641	20
	Sockeye	35,530	23,462	609	31,451	142	91,052	35
	Chum	17,296	45,488 ^d	133	11,729	80	74,646	16
	Coho	9,611	^e	397	2,983	855	13,846	
1998	Chinook	4,584	3,797	718	3,675	590	13,364	37
	Sockeye	47,951	14,693	508	27,161	672	90,985	31
	Chum	28,905	24,940	316	14,155	198	68,514	21
	Coho	34,441	^e	331	21,246	574	56,592	
1999	Chinook	3,221	6,565 ^d	871	1,888	414	12,959	24
	Sockeye	48,205	99,727 ^d	872	22,910	661	172,375	14
	Chum	19,533	51,361 ^d	281	11,562	425	83,162	15
	Coho	11,545	^e	582	2,474	789	15,390	
2000	Chinook	3,295	6,458 ^d	601	4,442	319	15,115	35
	Sockeye	42,197	73,845 ^d	1,028	37,252	132	154,454	25
	Chum	14,720	35,475 ^d	280	7,450	224	58,149	14
	Coho	19,676	^e	517	15,531	795	36,519	
2001	Chinook	5,404	8,128	853	1,519	285	16,189	16
	Sockeye	22,495	137,364	914	25,654	164	186,591	14
	Chum	26,829	33,902	181	3,412	130	64,454	6
	Coho	19,626	^e	616	9,275	822	30,339	
2002	Chinook	3,076	4,096	857	979	224	9,008	20
	Sockeye	21,127	31,476	1,050	6,304	149	59,957	12
	Chum	29,905	110,215	407	3,799	99	144,326	3
	Coho	27,364	^e	297	3,041	429	30,702	
2003	Chinook	2,389	4,985	737	1,412	10	9,523	23
	Sockeye	44,387	55,877	783	29,423	42	130,470	23
	Chum	21,637	33,039	176	5,593	0	60,445	10
	Coho	52,810	^e	1,319	12,658	681	66,787	
2004	Chinook	4,388	12,512	851	2,565	100	20,416	17
	Sockeye	55,926	52,646	221	20,922	0	129,715	16
	Chum	31,616	^e	805	6,014	0		
	Coho	47,916	^e	1,411	23,690	622		

^a Goodnews Tower Project changed to weir project in 1991.

^b Sport fish harvest is the number of fish harvested plus 5 % of the total fish caught, to account for a 5 % delayed mortality.

^c Commercial, subsistence, and sport harvest exploitation.

^d Average Middle Fork/Goodnews River escapement estimate ratio for 1983-1989 used to estimate Goodnews River escapement in years when no aerial survey of the Goodnews River was flown.

^e Survey was not flown for this species, no escapement estimate is available.

Appendix D6.—Commercial salmon harvests, District 5, Goodnews Bay, Kuskokwim Bay, 1968–2004.

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	4,447	10,355	62,015
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	20,922	23,690	0	6,014	53,191
10-year avg. (1994-2003)	2,282	31,771	17,642	1,850 ^b	11,710	65,255
Historical avg (1968-2003)	3,751	23,187	19,873	3,093 ^b	11,494	60,243

^a No harvest information available.^b Average of even years only.

Appendix D7.—Commercial salmon fishing periods, hours, and permits fished, District 5, Goodnews Bay, Kuskokwim Bay, 1970–2004.

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
10-year avg (1994-2003)	23	278	61
Historical avg (1970-2003)	26	340	60

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

Appendix D8.—Commercial salmon fishing ex vessel value, District 5, Goodnews Bay, Kuskokwim Bay, 1990–2004.

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	50,873	69,272	0	4,244	135,246
10-year avg (1994-2003)	\$13,551	\$117,172	\$61,241	\$564	\$11,602	\$204,130
Historical avg (1990-2003)	\$16,290	\$155,488	\$62,083	\$630	\$17,185	\$251,676

^a Even years only.

Appendix D9.—Commercial salmon harvest by period, District 5, Goodnews Bay, Kuskokwim Bay, 1994–2004.

Year	Date	Permits Fished	Hours Fished	Permit Hours	Chinook		Sockeye		Chum		Coho	
					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	39	0.06	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
	Jul 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	2,260		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 03	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	68	36	2,448	182	0.07	4,291	1.75	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

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Year	Date	Permits Fished	Hours Fished	Permit Hours	Chinook		Sockeye		Chum		Coho	
					Catch	CPUE	Catch	CPUE	Catch	CPUE	Catch	CPUE
1995	Aug 11	21	12	252	20	0.08	146	0.58	11	0.04	1,289	5.12
(cont.)	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	14,844	2,922		37,351		19,832		17,875	
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	4,628	13.77
	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		42,836	
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	2	0.01
	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

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Year	Date	Permits Fished	Hours Fished	Permit Hours	Chinook		Sockeye		Chum		Coho	
					Catch	CPUE	Catch	CPUE	Catch	CPUE	Catch	CPUE
1997	Aug 8	11	12	132	16	0.12	174	1.32	17	0.13	97	0.73
(cont.)	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	24	12	288	11	0.04	214	0.74	4	0.01	828	2.88
	Aug 22	19	12	228	6	0.03	155	0.68	4	0.02	629	2.76
	Aug 25	20	12	240	3	0.01	152	0.63	7	0.03	468	1.95
Total			264	5,916	2,039		31,451		11,729		2,985	
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	1,435	3.74	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
	Jul 31	19	12	228	20	0.09	380	1.67	54	0.24	162	0.71
	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	29	0.13

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Year	Date	Permits Fished	Hours Fished	Permit Hours	Chinook		Sockeye		Chum		Coho	
					Catch	CPUE	Catch	CPUE	Catch	CPUE	Catch	CPUE
1999 (cont.)	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		2,503	
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
	Aug 10	22	12	264	9	0.03	529	2.00	12	0.05	2,138	8.10
	Aug 12	22	12	264	4	0.02	414	1.57	174	0.66	2,188	8.29
	Aug 14	29	12	348	2	0.01	409	1.18	90	0.26	3,122	8.97
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		37,239		7,694		15,287	
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

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Year	Date	Permits Fished	Hours Fished	Permit Hours	Chinook		Sockeye		Chum		Coho	
					Catch	CPUE	Catch	CPUE	Catch	CPUE	Catch	CPUE
2001 (cont.)	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	598	2.62	892	3.91	948	4.16	0	0.00
	Jul 1	17	12	204	134	0.66	902	4.42	721	3.53	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	102	1.21	41	0.49
	Aug 7	7	12	84	3	0.04	135	1.61	98	1.17	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	1,620	979		6,304		3,969		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	2.433	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	
2004	Jun 24	19	12	228	791	3.47	1,873	8.21	0	0.00	788	3.46
	Jun 29	21	12	252	373	1.48	2,938	11.66	0	0.00	668	2.65
	Jul 1	19	12	228	310	1.36	3,512	15.40	0	0.00	1,060	4.65
	Jul 5	21	12	252	265	1.05	3,098	12.29	0	0.00	710	2.82
	Jul 7	21	12	252	206	0.82	2,133	8.46	0	0.00	522	2.07
	Jul 9	20	12	240	159	0.66	2,021	8.42	0	0	455	1.90
	Jul 12	20	12	240	112	0.47	1,395	5.81	0	0.00	1,066	4.44
	Jul 14	14	12	168	104	0.62	1,063	6.33	0	0.00	414	2.46
	Jul 16	10	12	120	78	0.65	347	2.89	0	0.00	161	1.34
	Aug 2	10	12	120	35	0.29	400	3.33	194	1.62	51	0.43
	Aug 4	12	12	144	39	0.27	305	2.12	311	2.16	48	0.33

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Year	Date	Permits	Hours	Permit	Chinook		Sockeye		Chum		Coho	
		Fished	Fished	Hours	Catch	CPUE	Catch	CPUE	Catch	CPUE	Catch	CPUE
	Aug 6	13	12	156	24	0.15	295	1.89	428	2.74	9	0.06
	Aug 9	14	12	168	12	0.07	167	0.99	804	4.79	14	0.08
	Aug 11	14	12	168	22	0.13	287	1.71	1,335	7.95	21	0.13
	Aug 13	No Commercial Harvest/No Tender										
	Aug 16	19	12	228	8	0.04	255	1.12	2,752	12.07	10	0.04
	Aug 18	18	12	216	7	0.03	160	0.74	2,918	13.51	4	0.02
	Aug 20	18	12	216	8	0.04	162	0.75	3,240	15.00	10	0.05
	Aug 23	17	12	204	2	0.01	56	0.27	2,860	14.02	0	0.00
	Aug 25	18	12	216	7	0.03	177	0.82	4,527	20.96	3	0.01
	Aug 27	19	12	228	3	0.01	278	1.22	4,321	18.95	0	0.00
Total			240	4,044	2,565		20,922		23,690		6,014	
10 Year Average (1994–2003)					2,251		31,770		11,752		17,521	

Appendix D10.—Salmon spawning escapement, Middle Fork Goodnews River, Kuskokwim Bay drainage, 1981–2004.

Year	Operating Period ^a	Chinook	Sockeye	Chum	Pink	Coho
Middle Fork Goodnews River						
Escapement Goal:		3,500	25,000	15,000		
<i>Counting Tower</i>						
1981	06/13 to 08/15	3,688	49,108	21,827	1,327 ^b	356 ^b
1982	06/23 to 08/03	1,395	56,255	6,767	13,855 ^b	91 ^b
1983	06/11 to 07/28	6,022	25,813	15,548	34 ^b	0 ^b
1984	06/15 to 07/31	3,260	32,053	19,003	13,744 ^b	249 ^b
1985	06/27 to 07/31	2,831	24,131	10,367	144 ^b	282 ^b
1986	06/16 to 07/24	2,092	51,069	14,764	8,133 ^b	163 ^b
1987	06/22 to 07/30	2,272	28,871	17,517	62 ^b	62 ^b
1988	06/23 to 07/30	2,712	15,799	20,799	6,781 ^b	6 ^b
1989	06/29 to 07/31	1,915	21,186	10,380	24 ^b	1,212 ^b
1990	06/19 to 07/24	3,636	31,679	6,410	3,378 ^b	0 ^b
<i>Weir</i>						
1991	06/29 to 08/24	1,952	47,397	27,525	1,694 ^b	1,978 ^b
1992	06/29 to 08/25	1,903	27,268	22,023	23,030 ^b	150 ^b
1993	06/22 to 08/18	2,317	26,044	14,472	253 ^b	1,374 ^b
1994	06/23 to 08/08	3,856	55,751	34,849	38,705 ^b	309 ^b
1995	06/19 to 08/28	4,836	39,009	33,699	330 ^b	5,415 ^b
1996	06/19 to 08/23	2,930	58,264	40,450	14,509 ^b	9,699 ^b
1997	06/11 to 09/17	2,937	35,530	17,296	940	9,619
1998	07/04 to 09/13	4,584	47,951	28,905	10,367	35,441
1999	06/26 to 09/26	3,221	48,205	19,533	914	11,545
2000	07/02 to 09/22	3,295	42,197	14,720	2,530	19,676
2001	06/26 to 09/30	5,398	22,487	26,829	1,323	19,630
2002	06/25 to 09/18	3,076	22,019	30,233	1,328	27,364
2003	06/18 to 09/18	2,389	44,387	21,637	1,917	54,477
2004	06/21 to 09/18	4,266	52,760	29,991	19,966	43,744

^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 Field operations were incomplete and total annual escapement was not estimated.

Appendix D11.—Salmon spawning aerial survey index estimates, Goodnews rivers and lakes, Kuskokwim Bay drainage, 1980–2004.

Year	Goodnews River and Lakes				Middle Fork Goodnews River and Lakes			
	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	2,799	12,383	6,945	a	3,561	29,340	7,330	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
Goal	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 D12.—Chinook salmon commercial fishery age and sex composition information, District 5, Goodnews Bay, Kuskokwim Bay, 1993–2004.

Year	Project	Sample Size	Sex	Age Class								Total	
				1.2		1.3		1.4		1.5		Harvest	%
				Harvest	%	Harvest	%	Harvest	%	Harvest	%		
1993	Season ^a	152	M										
			F										
			Total									2,117	
1994	Season ^a	150	M										
			F										
			Total									2,570	
1995	Season ^a	196	M										
			F										
			Total									2,922	
1996	Season ^a	0	M										
			F										
			Total									1,375	
1997	Season	471	M	908	44.5	215	10.5	233	11.5	9	0.5	1,384	67.9
			F	42	2.1	37	1.8	557	27.3	20	0.9	655	32.1
			Total	950	46.6	252	12.3	790	38.8	29	1.4	2,039	100.0
1998	Season	404	M	594	16.2	1,675	45.6	365	10.0	40	1.1	2,728	74.2
			F	0	0.0	443	12.0	454	12.3	50	1.3	947	25.8
			Total	594	16.2	2,118	57.6	819	22.3	90	2.4	3,675	100.0
1999	Season ^a	312	M										
			F										
			Total									1,888	
2000	Season	376	M	878	19.7	1,102	24.8	140	3.2	25	0.6	2,145	48.3
			F	30	0.7	1,493	33.6	724	16.3	50	1.1	2,297	51.7
			Total	908	20.4	2,595	58.4	864	19.5	75	1.7	4,442	100.0
2001	Season	262	M	153	10.1	159	10.5	282	18.6	9	0.6	606	39.9
			F	37	2.4	181	11.9	677	44.5	18	1.2	913	60.1
			Total	190	12.5	340	22.4	959	63.1	27	1.8	1,519	100.0
2002	Season	164	M	374	38.2	263	26.9	114	11.6	5	0.5	763	78.0
			F	0	0.0	44	4.5	160	16.3	12	1.2	216	22.0
			Total	374	38.2	307	31.4	274	27.9	17	1.7	979	100.0

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Year	Project	Sample Size	Sex	Age Class								Total	
				1.2		1.3		1.4		1.5		Harvest	%
				Harvest	%	Harvest	%	Harvest	%	Harvest	%		
2003	Season ^a	142	M										
			F										
			Total									1,412	
2004	6/29	67	M	924	62.7	242	16.4	110	7.5	22	1.5	1,298	88.1
	(6/24-7/1)		F	0	0.0	22	1.5	132	8.9	22	1.5	176	11.9
			Subtotal	924	62.7	264	17.9	242	16.4	44	3.0	1,474	100.0
	7/7	62	M	440	40.3	370	33.9	88	8.1	0	0.0	897	82.3
	(7/5-8/27)		F	0	0.0	35	3.2	88	8.0	70	6.5	194	17.7
			Subtotal	440	40.3	405	37.1	176	16.1	70	6.5	1,091	100.0
	Season ^a	129	M										
			F										
			Total									2,565	
Grand	1,677	M		2,907	23.0	3,414	27.0	1,134	9.0	88	0.7	7,626	60.3
Total		F		109	0.9	2,198	17.4	2,572	20.3	150	1.2	5,028	39.7
		Total		3,016	23.8	5,612	44.3	3,706	29.3	238	1.9	12,654	100.0

Note: Age classes representing less than 1% of the Grand Total are excluded, discrepancies in sums are attributed to excluded age classes.

^a Sampling dates do not meet criteria for estimating harvest percentages for some or all of the strata; "Season" is not included in the "Grand Total".

Appendix D13.—Chinook salmon escapement project age and sex composition information, Goodnews Bay, Kuskokwim Bay, 1993–2004.

Year	Project	Sample Size	Sex	Age Class								Total	
				1.2		1.3		1.4		1.5		Esc.	%
				Esc.	%	Esc.	%	Esc.	%	Esc.	%		
1993	Season ^a	31	M										
			F										
			Total									2,317	
1994	Season ^a	208	M										
			F										
			Total									3,856	
1995	Season	308	M	842	17.4	665	13.7	1,191	24.6	20	0.4	2,718	56.2
			F	0	0.0	180	3.7	1,918	39.7	20	0.4	2,117	43.8
			Total	842	17.4	844	17.5	3,109	64.3	40	0.8	4,836	100.0
1996	Season ^a	42	M										
			F										
			Total									2,882	
1997	Season	121	M	1,716	58.4	174	5.9	295	10.1	0	0.0	2,202	75.0
			F	56	1.9	95	3.2	585	19.9	0	0.0	735	25.0
			Total	1,772	60.3	269	9.1	880	30.0	0	0.0	2,937	100.0
1998	Season ^a	0	M										
			F										
			Total									4,584	
1999	Season ^a	28	M										
			F										
			Subtotal									3,221	
2000	Season	214	M	298	11.9	1,131	44.9	244	9.7	10	0.4	1,712	68.0
			F	0	0.0	477	19.0	314	12.5	13	0.5	804	32.0
			Total	298	11.9	1,608	63.9	558	22.2	23	0.9	2,516	100.0
2001	Season ^a	39	M										
			F										
			Total									5,351	
2002	Season	199	M	957	31.0	683	22.1	428	13.9	13	0.4	2,091	67.8
			F	0	0.0	48	1.6	839	27.2	118	3.8	994	32.2
			Total	957	31.0	731	23.7	1,267	41.1	131	4.2	3,085	100.0

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Year	Project	Sample		Age Class								Total	
				1.2		1.3		1.4		1.5			
				Esc.	%	Esc.	%	Esc.	%	Esc.	%	Esc.	%
2003	Season	241	M	324	13.6	724	30.3	240	10.0	31	1.3	1,394	58.4
			F	<u>0</u>	<u>0.0</u>	<u>329</u>	<u>13.8</u>	<u>582</u>	<u>24.4</u>	<u>80</u>	<u>3.4</u>	<u>992</u>	<u>41.6</u>
			Total	324	13.6	1,053	44.1	822	34.4	111	4.7	2,386	100.0
2004	6/28-7/1 (6/21-7/4)	49	M	574	38.8	272	18.4	91	6.1	0	0.0	998	67.3
			F	<u>212</u>	<u>14.3</u>	<u>121</u>	<u>8.1</u>	<u>151</u>	<u>10.2</u>	<u>0</u>	<u>0.0</u>	<u>484</u>	<u>32.7</u>
			Subtotal	786	53.1	393	26.5	242	16.3	0	0.0	1,482	100.0
	7/8-10 (7/5-18)	110	M	857	47.3	263	14.5	132	7.3	0	0.0	1,285	70.9
			F	<u>148</u>	<u>8.2</u>	<u>99</u>	<u>5.5</u>	<u>280</u>	<u>15.4</u>	<u>0</u>	<u>0.0</u>	<u>527</u>	<u>29.1</u>
			Subtotal	1,005	55.5	362	20.0	412	22.7	0	0.0	1,812	100.0
	7/29-8/23 (7/19-9/20)	15	M		20.0		20.0		6.7		0.0		66.7
			F		<u>0.0</u>		<u>20.0</u>		<u>6.6</u>		<u>0.0</u>		<u>33.3</u>
			Subtotal		20.0		40.0		13.3		0.0		100.0
Season ^a		174	M										
			F										
			Total										<u>4,348</u>
Grand Total		1,083	M	4,137	26.3	3,377	21.4	2,398	15.2	74	0.5	10,117	64.2
			F	<u>56</u>	<u>0.4</u>	<u>1,129</u>	<u>7.2</u>	<u>4,238</u>	<u>26.9</u>	<u>231</u>	<u>1.5</u>	<u>5,642</u>	<u>35.8</u>
			Total	4,193	26.6	4,505	28.6	6,636	42.1	305	1.9	15,760	100.0

Note: Age classes representing less than 1% of the Grand Total are excluded, discrepancies in sums are attributed to excluded age classes.

^a Sampling dates do not meet criteria for estimating escapement percentages for some or all of the strata; "Season" is not included in the "Grand Total".

Appendix D14.—Chum salmon commercial fishery age and sex composition information, District 5, Goodnews Bay, Kuskokwim Bay, 1993–2004.

Year	Project	Sample		Age Class								Total	
				0.2		0.3		0.4		0.5			
				Harvest	%	Harvest	%	Harvest	%	Harvest	%	Harvest	%
1993	Season ^a	191	M										
			F										
			Total									10,657	
1994	Season ^a	512	M										
			F										
			Total									28,477	
1995	Season ^a	355	M										
			F										
			Total									19,832	
1996	Season ^a	190	M										
			F										
			Total									11,093	
1997	Season	805	M	72	0.6	1,808	15.4	3,725	31.8	38	0.3	5,643	48.1
			F	0	0.0	1,710	14.6	4,368	37.2	8	0.1	6,086	51.9
			Total	72	0.6	3,518	30.0	8,093	69.0	46	0.4	11,729	100.0
1998	Season	469	M	25	0.2	6,447	45.5	779	5.5	21	0.2	7,272	51.4
			F	46	0.3	5,685	40.2	1,106	7.8	46	0.3	6,883	48.6
			Total	71	0.5	12,132	85.7	1,885	13.3	67	0.5	14,155	100.0
1999	Season	455	M	23	0.2	4,193	36.3	954	8.2	31	0.3	5,200	45.0
			F	0	0.0	4,712	40.7	1,650	14.3	0	0.0	6,362	55.0
			Total	23	0.2	8,905	77.0	2,604	22.5	31	0.3	11,562	100.0
2000	Season	598	M	0	0.0	1,327	17.8	1,614	21.7	9	0.1	2,950	39.6
			F	0	0.0	1,840	24.7	2,639	35.4	22	0.3	4,500	60.4
			Total	0	0.0	3,167	42.5	4,253	57.1	31	0.4	7,450	100.0
2001	Season	647	M	5	0.2	576	19.6	556	18.9	0	0.0	1,138	38.6
			F	0	0.0	1,099	37.3	708	24.0	0	0.0	1,806	61.4
			Total	5	0.2	1,675	56.9	1,264	42.9	0	0.0	2,944	100.0
2002	Season	234	M	12	0.3	949	25.0	697	18.4	12	0.3	1,669	43.9
			F	0	0.0	962	25.3	1,122	29.5	46	1.2	2,130	56.1
			Total	12	0.3	1,911	50.3	1,819	47.9	58	1.5	3,799	100.0

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Year	Project	Sample		Age Class								Total		
				0.2		0.3		0.4		0.5				
				Harvest	%	Harvest	%	Harvest	%	Harvest	%	Harvest	%	
2003	Season	296	M	0	0.0	2,744	49.0	318	5.7	62	1.1	3,125	55.9	
				0	0.0	2,180	39.0	201	3.6	87	1.6	2,468	44.1	
				Total	0	0.0	4,924	88.0	519	9.3	149	2.7	5,593	100.0
2004	6/29 (6/24-7/5)	63	M	51	1.6	1,229	38.1	922	28.6	0	0.0	2,202	68.3	
				0	0.0	614	19.0	409	12.7	0	0.0	1,024	31.7	
				Subtotal	51	1.6	1,843	57.1	1,331	41.3	0	0.0	3,226	100.0
	7/7 (7/7-8/27)	13	M											
				Subtotal	F									
													2,788	
	Season ^a	76	M		4.4		31.1		26.0		0.0		61.6	
					0.0		24.5		14.0		0.0		38.4	
				Total		4.4		55.6		40.0		0.0		6,014
Grand Total	3,504	M		137	0.2	18,044	31.5	8,643	15.1	173	0.3	26,997	47.2	
				46	0.1	18,188	31.8	11,794	20.6	209	0.4	30,235	52.8	
			Total	183	0.3	36,232	63.3	20,437	35.7	382	0.7	57,232	100.0	

^a Sampling dates do not meet criteria for estimating harvest percentages for some or all of the strata; "Season" is not included in the "Grand Total".

Appendix D15.—Chum salmon escapement project age and sex composition information, Goodnews Bay, Kuskokwim Bay, 1993–2004.

Year	Project	Sample Size (n)	Sex	Age Class								Total	
				0.2		0.3		0.4		0.5		Esc.	%
				Esc.	%	Esc.	%	Esc.	%	Esc.	%		
1993	Season ^a	236	M										
			F										
			Total										14,472
1994	Season ^a	207	M										
			F										
			Total										35,134
1995	Season ^a	280	M										
			F										
			Total										33,699
1996	Season ^a	311	M										
			F										
			Total										40,125
1997	Season	526	M	42	0.3	2,836	16.4	6,691	38.7	42	0.2	9,611	55.6
			F	25	0.1	2,619	15.1	5,041	29.1	0	0.0	7,685	44.4
			Total	67	0.4	5,455	31.5	11,732	67.8	42	0.2	17,296	100.0
1998	Season	505	M	54	0.2	12,354	42.7	2,077	7.2	0	0.0	14,485	50.1
			F	35	0.1	12,520	43.3	1,805	6.2	60	0.2	14,420	49.9
			Total	89	0.3	24,874	86.1	3,882	13.4	60	0.2	28,905	100.0
1999	Season	672	M	0	0.0	6,273	32.1	3,462	17.7	55	0.3	9,791	50.1
			F	0	0.0	6,496	33.3	3,247	16.6	0	0.0	9,742	49.9
			Total	0	0.0	12,769	65.4	6,709	34.3	55	0.3	19,533	100.0
2000	Season ^a	418	M										
			F										
			Total										13,803
2001	Season	768	M	86	0.3	8,300	31.0	3,518	13.1	24	0.1	11,928	44.5
			F	95	0.4	10,628	39.6	4,178	15.6	0	0.0	14,901	55.5
			Total	181	0.7	18,928	70.6	7,696	28.7	24	0.1	26,829	100.0
2002	Season	725	M	475	1.6	4,301	14.2	8,499	28.0	376	1.2	13,650	45.0
			F	399	1.3	6,944	22.9	9,262	30.6	44	0.2	16,650	55.0
			Total	874	2.9	11,245	37.1	17,761	58.6	420	1.4	30,300	100.0
2003	Season	566	M	55	0.3	9,449	43.7	1,904	8.8	366	1.7	11,774	54.4
			F	86	0.4	8,825	40.8	827	3.8	124	0.6	9,863	45.6
			Total	141	0.7	18,274	84.5	2,731	12.6	490	2.3	21,637	100.0

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Year	Project	Sample		Age Class									
				0.2		0.3		0.4		0.5		Total	
				Esc.	%	Esc.	%	Esc.	%	Esc.	%	Esc.	%
2004	6/28 -7/1 (6/21–7/4)	180	M	0	0.0	1,180	27.8	1,251	29.5	0	0.0	2,431	57.2
			F	0	0.0	1,133	26.6	684	16.1	0	0.0	1,817	42.8
		Subtotal		0	0.0	2,313	54.4	1,935	45.6	0	0.0	4,248	100.0
	7/6–9 (7/5–11)	211	M	37	0.5	2,520	32.2	1,853	23.7	0	0.0	4,409	56.4
			F	74	0.9	1,630	20.9	1,704	21.8	0	0.0	3,409	43.6
		Subtotal		111	1.4	4,150	53.1	3,557	45.5	0	0.0	7,818	100.0
	7/13–15 (7/12–17)	161	M	28	0.6	1,321	29.2	1,096	24.2	0	0.0	2,445	54.0
			F	113	2.5	1,461	32.3	506	11.2	0	0.0	2,080	46.0
		Subtotal		141	3.1	2,782	61.5	1,602	35.4	0	0.0	4,525	100.0
	7/20–22 (7/18–25)	185	M	199	2.7	1,946	26.5	1,112	15.1	40	0.5	3,297	44.9
			F	238	3.2	2,503	34.0	1,311	17.9	0	0.0	4,052	55.1
		Subtotal		437	5.9	4,449	60.5	2,423	33.0	40	0.5	7,349	100.0
	7/28–31 (7/26–8/2)	190	M	67	1.6	1,030	24.2	515	12.1	0	0.0	1,612	37.9
			F	202	4.7	1,723	40.5	716	16.8	0	0.0	2,641	62.1
		Subtotal		269	6.3	2,753	64.7	1,231	28.9	0	0.0	4,253	100.0
	8/3, 5–6 (8/3–7)	193	M	47	2.6	387	21.3	104	5.7	0	0.0	538	29.5
			F	113	6.2	840	46.1	330	18.1	0	0.0	1,284	70.5
		Subtotal		160	8.8	1,227	67.4	434	23.8	0	0.0	1,822	100.0
8/9,11,16, 23 (8/8–9/20)	100	M	36	3.0	204	17.0	84	7.0	0	0.0	325	27.0	
		F	156	13.0	626	52.0	96	8.0	0	0.0	878	73.0	
	Subtotal		192	16.0	830	69.0	180	15.0	0	0.0	1,203	100.0	
Season	1,220	M	414	1.3	8,588	27.5	6,015	19.3	40	0.1	15,057	48.2	
		F	896	2.9	9,917	31.8	5,348	17.1	0	0.0	16,161	51.8	
	Total		1,310	4.2	18,505	59.3	11,363	36.4	40	0.1	31,218	100.0	
Grand Total	4,982	M	1,126	0.6	52,101	29.7	32,166	18.3	903	0.5	86,296	49.1	
		F	1,536	0.9	57,949	33.0	29,708	16.9	228	0.1	89,422	50.9	
	Total		2,662	1.5	110,050	62.6	61,874	35.2	1,131	0.6	175,718	100.0	

^a Sampling dates do not meet criteria for estimating escapement percentages for some or all of the strata; "Season" is not included in the "Grand Total".

Appendix D16.—Sockeye salmon commercial fishery age and sex composition information, Goodnews Bay, Kuskokwim Bay, 1993–2004.

Year	Project	Sample Size	Sex	Age Class								Total	
				1.2		1.3		1.4		2.3		Harvest	%
				Harvest	%	Harvest	%	Harvest	%	Harvest	%		
1993	Season	489	M	8,243	13.9	12,888	21.7	496	0.8	2,841	4.8	27,012	45.6
			F	7,666	12.9	18,702	31.5	472	0.8	1,951	3.3	32,283	54.4
			Total	15,908	26.8	31,590	53.3	968	1.6	4,791	8.1	59,293	100.0
1994	Season	485	M	905	1.3	25,844	37.2	878	1.3	2,646	3.8	32,399	46.6
			F	311	0.4	32,136	46.2	363	0.5	2,112	3.0	37,095	53.4
			Total	1,216	1.8	57,980	83.4	1,241	1.8	4,758	6.8	69,490	100.0
1995	Season ^a	369	M										
			F										
			Total									37,351	
1996	Season ^a	343	M										
			F										
			Total									30,717	
1997	Season	833	M	2,618	8.3	8,991	28.6	825	2.6	2,474	7.9	16,156	51.4
			F	1,730	5.5	8,753	27.8	1,312	4.2	2,216	7.0	15,295	48.6
			Total	4,348	13.8	17,744	56.4	2,137	6.8	4,690	14.9	31,451	100.0
1998	Season	740	M	1,317	4.9	10,529	38.8	77	0.3	1,582	5.8	14,741	54.3
			F	1,087	4.0	9,271	34.1	53	0.2	1,241	4.6	12,420	45.7
			Total	2,404	8.9	19,800	72.9	130	0.5	2,823	10.4	27,161	100.0
1999	Season	532	M	2,978	13.0	8,675	37.9	364	1.6	823	3.6	13,442	58.7
			F	1,264	5.5	7,102	31.0	428	1.9	478	2.1	9,468	41.3
			Total	4,242	18.5	15,777	68.9	792	3.5	1,301	5.7	22,910	100.0
2000	Season	715	M	1634	4.4	18,311	49.1	0	0.0	1,173	3.2	22,271	59.8
			F	1144	3.1	12,287	33.0	0	0.0	415	1.1	14,981	40.2
			Total	2778	7.5	30,598	82.1	0	0.0	1,588	4.3	37,252	100.0
2001	Season	576	M	375	1.5	10,937	42.7	360	1.4	839	3.3	12,580	49.0
			F	184	0.7	12,217	47.6	196	0.8	449	1.7	13,074	51.0
			Total	559	2.2	23,154	90.3	556	2.2	1,288	5.0	25,654	100.0
2002	Season	539	M	761	12.1	1671	26.5	357	5.7	411	6.5	3,570	56.6
			F	460	7.3	1579	25.1	204	3.2	261	4.2	2,734	43.4
			Total	1,221	19.4	3250	51.6	561	8.9	672	10.7	6,304	100.0

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Year	Project	Sample Size	Sex	Age Class									
				1.2		1.3		1.4		2.3		Total	
				Harvest	%	Harvest	%	Harvest	%	Harvest	%	Harvest	%
2003	Season	329	M	1,337	4.5	14,272	48.5	302	1.0	3,210	10.9	19,872	67.5
			F	783	2.7	6,878	23.4	108	0.4	1,674	5.7	9,551	32.5
			Total	2,120	7.2	21,150	71.9	410	1.4	4,884	16.6	29,423	100.0
2004	6/29 (6/24-7/1)	74	M	675	8.1	3,824	45.9	225	2.7	0	0.0	4,949	59.5
			F	450	5.4	2,587	31.1	0	0.0	225	2.7	3,374	40.5
			Subtotal	1,125	13.5	6,411	77.0	225	2.7	225	2.7	8,323	100.0
	7/7 (7/5-9)	58	M	1,626	22.4	3,126	43.1	125	1.7	250	3.4	5,251	72.4
			F	375	5.2	1,625	22.4	0	0.0	0	0.0	2,001	27.6
			Subtotal	2,001	27.6	4,751	65.5	125	1.7	250	3.4	7,252	100.0
	8/17 (7/12-8/27)	50	M	1,176	22.0	1,497	28.0	0	0.0	1,069	20.0	4,491	84.0
			F	107	2.0	428	8.0	0	0.0	107	2.0	856	16.0
			Subtotal	1,283	24.0	1,925	36.0	0	0.0	1,176	22.0	5,347	100.0
	Season	182	M	3,477	16.6	8,447	40.4	350	1.7	1,319	6.3	14,692	70.2
			F	932	4.5	4,640	22.2	0	0.0	332	1.6	6,230	29.8
			Total	4,409	21.1	13,087	62.6	350	1.7	1,651	7.9	20,922	100.0
Grand Total	5,420	M	23,645	7.2	120,565	36.6	4,009	1.2	17,318	5.2	176,735	55.1	
		F	15,561	4.7	113,565	34.4	3,136	1.0	11,129	3.4	153,131	44.9	
		Total	39,206	11.9	234,130	71.0	7,145	2.2	28,446	8.6	329,860	100.0	

Note: Age classes representing less than 1% of the Grand Total are excluded, discrepancies in sums are attributed to excluded age classes.

^a Sampling dates do not meet criteria for estimating harvest percentages for some or all of the strata; "Season" is not included in the "Grand Total".

Appendix D17.—Sockeye salmon escapement project age and sex composition information, Goodnews Bay, Kuskokwim Bay, 1993–2004.

Year	Project	Sample Size	Sex	Age Class								Total	
				1.2		1.3		1.4		2.3		Esc.	%
				Esc.	%	Esc.	%	Esc.	%	Esc.	%		
1993	Season ^a	312	M										
			F										
			Total										26,244
1994	Season ^a	160	M										
			F										
			Total										46,877
1995	Season	454	M	1,762	4.5	15,844	40.6	797	2.0	508	1.3	19,351	49.6
			F	3,577	9.2	14,132	36.2	256	0.7	965	2.5	19,661	50.4
			Total	5,340	13.7	29,976	76.8	1,053	2.7	1,473	3.8	39,009	100.0
1996	Season ^a	246	M										
			F										
			Total										57,504
1997	Season	733	M	2,357	6.6	10,920	30.7	367	1.0	1,917	5.4	16,339	46.0
			F	5,081	14.3	11,528	32.5	515	1.5	994	2.8	19,191	54.0
			Total	7,438	20.9	22,448	63.2	882	2.5	2,911	8.2	35,530	100.0
1998	Season ^a	542	M										
			F										
			Total										47,951
1999	Season	789	M	2,460	5.1	20,220	41.9	594	1.2	1,188	2.5	24,884	51.6
			F	3,117	6.5	17,332	36.0	227	0.5	1,269	2.6	23,321	48.4
			Total	5,577	11.6	37,552	77.9	821	1.7	2,457	5.1	48,205	100.0
2000	Season	607	M	142	0.4	13,511	41.4	324	1.0	658	2.0	14,962	45.9
			F	509	1.6	16,235	49.8	141	0.4	232	0.7	17,670	54.1
			Total	651	2.0	29,746	91.2	465	1.4	890	2.7	32,632	100.0
2001	Season	432	M	196	1.0	8,448	40.7	1,010	4.9	864	4.2	10,612	51.1
			F	231	1.1	7,993	38.5	985	4.7	725	3.5	10,154	48.9
			Total	427	2.1	16,441	79.2	1,995	9.6	1,589	7.7	20,766	100.0
2002	Season	485	M	4,527	20.5	2,905	13.1	390	1.8	875	4.0	9,783	44.3
			F	7,523	34.0	3,200	14.5	185	0.8	322	1.4	12,318	55.7
			Total	12,050	54.5	6,105	27.6	575	2.6	1,197	5.4	22,101	100.0

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Year	Project	Sample Size	Sex	Age Class								Total	
				1.2		1.3		1.4		2.3		Esc.	%
				Esc.	%	Esc.	%	Esc.	%	Esc.	%		
2003	Season	657	M	1,429	3.2	21,363	48.1	491	1.1	594	1.3	24,136	54.4
			F	2,343	5.3	17,075	38.5	272	0.6	417	1.0	20,251	45.6
			Total	3,772	8.5	38,438	86.6	763	1.7	1,011	2.3	44,387	100.0
2004	6/24-29 (6/21-7/3)	218	M	786	4.1	6,553	34.4	961	5.1	262	1.4	9,087	47.7
			F	2,359	12.4	6,640	34.9	612	3.2	87	0.4	9,960	52.3
			Subtotal	3,145	16.5	13,193	69.3	1,573	8.3	349	1.8	19,047	100.0
	7/6-8 (7/4-11)	169	M	2,540	11.2	6,818	30.2	668	2.9	535	2.4	11,095	49.1
			F	3,876	17.2	6,416	28.4	535	2.4	267	1.2	11,496	50.9
			Subtotal	6,416	28.4	13,234	58.6	1,203	5.3	802	3.6	22,591	100.0
	7/13-14 (7/12-17)	172	M	1,561	19.8	1,285	16.3	46	0.6	46	0.6	3,167	40.1
			F	2,754	34.9	1,423	18.0	184	2.3	46	0.6	4,728	59.9
			Subtotal	4,315	54.7	2,708	34.3	230	2.9	92	1.2	7,895	100.0
	7/20-23 (7/18-25)	130	M	560	12.3	1,085	23.8	35	0.8	105	2.3	1,820	40.0
			F	1,751	38.5	840	18.5	70	1.5	35	0.8	2,731	60.0
			Subtotal	2,311	50.8	1,925	42.3	105	2.3	140	3.1	4,551	100.0
	7/28-8/24 (7/26-9/20)	117	M	224	9.4	224	9.4	20	0.9	20	0.9	529	22.2
			F	1,546	65.0	224	9.4	41	1.7	0	0.0	1,852	77.8
			Subtotal	1,770	74.4	448	18.8	61	2.6	20	0.9	2,381	100.0
	Season	806	M	5,671	10.0	15,965	28.3	1,731	3.1	968	1.7	25,698	45.5
			F	12,286	21.8	15,543	27.5	1,440	2.5	436	0.8	30,767	54.5
			Total	17,957	31.8	31,508	55.8	3,171	5.6	1,404	2.5	56,465	100.0
Grand Total	4,963	M	18,544	6.2	109,176	36.5	5,704	1.9	7,572	2.5	145,765	48.7	
			F	34,667	11.6	103,038	34.4	4,021	1.3	5,360	1.8	153,333	51.3
			Total	53,212	17.8	212,214	71.0	9,725	3.3	12,932	4.3	299,095	100.0

Note: Age classes representing less than 1% of the Grand Total are excluded, discrepancies in sums are attributed to excluded age classes.

^a Sampling dates do not meet criteria for estimating escapement percentages for some or all of the strata; "Season" is not included in the "Grand Total".

Appendix D18.—Coho salmon commercial fishery age and sex composition information, District 5, Goodnews Bay, Kuskokwim Bay, 1993–2004.

Year	Project	Sample Size	Sex	Age Class							
				1.1		2.1		3.1		Total	
				Harvest	%	Harvest	%	Harvest	%	Harvest	%
1993	Season	429	M	346	1.7	8,583	42.9	602	3.0	9,532	47.6
			F	239	1.2	9,925	49.6	320	1.6	10,484	52.4
			Total	585	2.9	18,509	92.5	922	4.6	20,014	100.0
1994	Season	415	M	2,460	5.2	21,064	44.3	1,114	2.3	24,638	51.9
			F	1,803	3.8	20,030	42.2	1,027	2.2	22,860	48.1
			Total	4,263	9.0	41,094	86.5	2,141	4.5	47,499	100.0
1995	Season	299	M	237	1.3	8,542	47.8	237	1.3	9,017	50.4
			F	326	1.8	7,967	44.6	570	3.2	8,862	49.6
			Total	563	3.1	16,509	92.4	808	4.5	17,875	100.0
1996	Season	457	M	1,968	4.5	18,266	41.7	680	1.6	20,913	47.7
			F	803	1.8	21,262	48.5	857	2.0	22,923	52.3
			Total	2,771	6.3	39,528	90.2	1,537	3.5	43,836	100.0
1997	Season ^a	271	M								
			F								
			Total							2,983	
1998	Season	315	M	1,022	4.8	8,743	41.2	330	1.6	10,095	47.5
			F	1,080	5.1	9,880	46.5	191	0.9	11,151	52.5
			Subtotal	2,102	9.9	18,623	87.7	521	2.5	21,246	100.0
1999	Season	205	M	145	5.8	1,101	44.5	47	1.9	1,293	52.3
			F	111	4.5	999	40.4	71	2.9	1,181	47.7
			Total	256	10.3	2,100	84.9	118	4.8	2,474	100.0
2000	Season	439	M	84	0.6	7,270	46.8	84	0.6	7,439	47.9
			F	21	0.1	7,882	50.8	190	1.2	8,092	52.1
			Total	105	0.7	15,152	97.6	274	1.8	15,531	100.0
2001	Season	414	M	118	1.3	4,492	48.4	272	2.9	4,883	52.6
			F	331	3.5	3,823	41.2	239	2.6	4,392	47.4
			Total	449	4.8	8,315	89.6	511	5.5	9,275	100.0
2002	Season ^a	0	M								
			F								
			Total								
2003	Season ^a	109	M								
			F								
			Total							12,658	

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Year	Project	Sample Size	Sex	Age Class							
				1.1		2.1		3.1		Total	
				Harvest	%	Harvest	%	Harvest	%	Harvest	%
2004	8/6 (8/2-11)	51	M	301	9.8	1,506	49.0	301	9.8	2,108	68.6
			F	0	0.0	964	31.4	0	0.0	964	31.4
			Subtotal	301	9.8	2,470	80.4	301	9.8	3,072	100.0
8/16 (8/13-20)	55	M	486	5.5	5,184	58.2	324	3.7	5,994	67.3	
		F	324	3.6	2,430	27.3	162	1.8	2,916	32.7	
		Subtotal	810	9.1	7,614	85.5	486	5.5	8,910	100.0	
8/25 (8/23-27)	57	M	1,233	10.5	5,135	43.9	0	0.0	6,368	54.4	
		F	616	5.3	4,724	40.3	0	0.0	5,340	45.6	
		Subtotal	1,849	15.8	9,859	84.2	0	0.0	11,708	100.0	
Season	163	M	2,020	8.5	11,825	49.9	625	2.6	14,470	61.1	
		F	940	4.0	8,118	34.3	162	0.7	9,220	38.9	
		Total	2,960	12.5	19,943	84.2	787	3.3	23,690	100.0	
Grand Total	3,136	M	8,400	4.2	89,886	44.6	3,992	2.0	102,280	50.8	
		F	5,653	2.8	89,886	44.6	3,627	1.8	99,164	49.2	
		Total	14,054	7.0	179,773	89.2	7,618	3.8	201,440	100.0	

^a Sampling dates do not meet criteria for estimating harvest percentages for some or all of the strata; "Season" is not included in the "Grand Total".

Appendix D19.—Coho salmon escapement project age and sex composition information, Goodnews Bay, Kuskokwim Bay, 1993–2004.

Year	Project	Sample Size	Sex	Age Class						Total	
				1.1		2.1		3.1		Esc.	%
				Esc.	%	Esc.	%	Esc.	%		
1995	Season	191	M	117	2.2	2,948	54.4	78	1.4	3,143	58.0
			F	19	0.4	2,136	39.5	117	2.2	2,272	42.0
			Total	136	2.5	5,084	93.9	195	3.6	5,415	100.0
1996	Season ^a	150	M	141	1.3	6,445	59.3	217	2.0	6,880	63.3
			F	76	0.7	3,695	34.0	217	2.0	3,989	36.7
			Total	217	2.0	10,141	93.3	435	4.0	10,869	100.0
1997	Season ^a	0	M								
			F								
			Total							9,619	
1998	Season	429	M	1,208	3.4	13,396	37.8	322	0.9	14,926	42.1
			F	1,779	5.0	18,358	51.8	378	1.1	20,515	57.9
			Total	2,987	8.4	31,574	89.6	700	2.0	35,441	100.0
1999	Season	411	M	653	5.7	4,303	37.3	143	1.2	5,099	44.2
			F	496	4.3	5,858	50.7	92	0.8	6,446	55.8
			Total	1,149	10.0	10,161	88.0	235	2.0	11,545	100.0
2000	Season	419	M	0	0.0	10,215	51.9	0	0.0	10,215	51.9
			F	304	1.5	9,046	46.0	112	0.6	9,461	48.1
			Total	304	1.5	19,261	97.9	112	0.6	19,676	100.0
2001	Season	439	M	1,061	5.4	8,423	42.9	210	1.1	9,694	49.4
			F	327	1.7	9,048	46.1	557	2.8	9,932	50.6
			Total	1,388	7.1	17,471	89.0	767	3.9	19,626	100.0
2002	Season	564	M	207	0.8	14,579	53.3	1,160	4.2	15,947	58.3
			F	178	0.6	10,757	39.3	483	1.8	11,417	41.7
			Total	385	1.4	25,336	92.6	1,643	6.0	27,364	100.0
2003	Season	167	M	1,976	3.7	24,995	47.3	2,587	4.9	29,558	56.0
			F	665	1.3	21,006	39.8	1,581	3.0	23,252	44.0
			Total	2,641	5.0	46,001	87.1	4,168	7.9	52,810	100.0
2004	8/1-9	23	M	75	8.7	523	60.9	0	0.0	598	69.6
	(6/21-8/12)		F	0	0.0	261	30.4	0	0.0	261	30.4
			Subtotal	75	8.7	784	91.3	0	0.0	859	100.0

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Year	Project	Sample Size	Sex	Age Class						Total	
				1.1		2.1		3.1		Esc.	%
				Esc.	%	Esc.	%	Esc.	%		
2004	8/16-17	59	M	151	5.1	1,860	62.7	0	0.0	2,011	67.8
(Cont.)	(8/13-20)		F	50	1.7	804	27.1	101	3.4	955	32.2
			Subtotal	201	6.8	2,664	89.8	101	3.4	2,966	100.0
	8/23-24	56	M	156	1.8	3,421	39.3	0	0.0	3,577	41.1
	(8/21-30)		F	0	0.0	4,821	55.3	311	3.6	5,131	58.9
			Subtotal	156	1.8	8,242	94.6	311	3.6	8,708	100.0
	8/31-9/1	59	M	2,399	6.8	12,594	35.6	0	0.0	14,993	42.4
	(8/31-9/20)		F	2,998	8.5	16,192	45.8	1,199	3.4	20,390	57.6
			Subtotal	5,397	15.3	28,786	81.4	1,199	3.4	35,383	100.0
	Season	197	M	2,780	5.8	18,398	38.4	0	0.0	21,178	44.2
			F	3,049	6.4	22,078	46.1	1,611	3.4	26,738	55.8
			Total	5,829	12.2	40,476	84.5	1,611	3.4	47,916	100.0
	Grand	2,817	M	8,002	3.6	97,257	44.2	4,500	2.0	109,760	49.9
	Total		F	6,817	3.1	98,287	44.7	4,931	2.2	110,033	50.1
			Total	14,819	6.7	195,364	88.9	9,431	4.3	219,793	100.0

^a Sampling dates do not meet criteria for estimating escapement percentages for some or all of the strata; "Season" is not included in the "Grand Total".

APPENDIX E.

Appendix E1.—Subsistence herring harvest (tons) and effort data from select Bering Sea areas, Alaska, 1983–2004.

Village	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
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																						
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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Yukon Delta																						
Scammon Bay	3	4	2	2	1	2	1	2	1	1	3	1	1	1	1	<1	6	4	2	<1	3	
Chevak	1	3	2	1	1	2	<1	1	<1	<1	<1	2	1	<1	<1	<1	2	1	1	<1	1	
Hooper Bay	5	4	4	4	1	4	2	6	2	2	2	3	4	2	2	1	4	1	<1	1	2	
Total	9	11	8	6	3	7	3	8	3	4	5	6	6	3	3	2	13	6	3	2	6	
No. Fishing Families	37	47	44	40	23	32	24	32	18	30	42	48	42	29	34	15	67	50	23	20	34	

Note: Survey results are believed to accurately reflect harvest trends, however, reported catches reflect minimum figures since all fishermen cannot be contacted.

^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 herring fishing number of buyer, fishers and deliveries, Kuskokwim Area, 1997–2004.

Year	District	Number of Buyers	Number of Fishers		Totals
			Gillnet	Purse Seine ^a	
2004	Security Cove	0	0	0	0
	Goodnews Bay	1	10	0	10
	Cape Avinof	1	23	0	23
	Nelson Island	1	39	0	39
	Nunivak Island	0	0	0	0
2003	Security Cove	0	0	0	0
	Goodnews Bay	1	12	0	12
	Cape Avinof	1	22	0	22
	Nelson Island	1	44	0	44
	Nunivak Island	1	0	22	22
2002	Security Cove	5	25	0	25
	Goodnews Bay	1	5	0	5
	Cape Avinof	1	37	0	37
	Nelson Island	1	54	0	54
	Nunivak Island	1	0	29	29
2001	Security Cove	6	56	0	56
	Goodnews Bay	1	23	0	23
	Cape Avinof	1	45	0	45
	Nelson Island	1	49	0	49
	Nunivak Island	0	0	0	0
2000	Security Cove	10	79	0	79
	Goodnews Bay	2	57	0	57
	Cape Avinof	1	86	0	86
	Nelson Island	4	86	0	86
	Nunivak Island	1	0	35	35
1999	Security Cove	8	87	0	87
	Goodnews Bay	5	94	0	94
	Cape Avinof	3	117	0	117
	Nelson Island	4	94	0	94
	Nunivak Island	0	0	0	0
1998	Security Cove	9	78	0	78
	Goodnews Bay	2	84	0	84
	Cape Avinof	2	109	0	109
	Nelson Island	2	86	0	86
	Nunivak Island	1	7	1 ^b	8
1997	Security Cove	14	222	0	222
	Goodnews Bay	3	139	0	139
	Cape Avinof	2	145	0	145
	Nelson Island	3	105	0	105
	Nunivak Island	1	12	0	12

^a In 2000, regulation was adopted for the development of a cooperative purse seine herring fishery only in the Nunivak Island District. Number represents permit holders registered to participate.

^b Department purse seine fishery feasibility study.

Appendix E3.—Commercial herring fishery harvest, effort and value, Kuskokwim Area, 1996–2004.

Year	District	Harvest (st)	No. Permits	Hours fished	Estimated Value ^a	Average Income Per Permit
2004	Security Cove			No Commercial Opening		
	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			No Commercial Opening		
	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.			No Commercial Opening		
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.			No Commercial Opening		
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.	-	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

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

Appendix E4.—Herring aerial survey estimated biomass and commercial harvest, Kuskokwim Area, 1995–2004.

District	Estimated Biomass (st)	Harvest					Estimated Value (\$1,000's)	Exploitation Rate (%)
		Sac-roe	Bait	Waste	Total	Roe%		
2004								
Security Cove	9,698	-	-	-	-	-	-	0.0
Goodnews Bay	7,744	34	-	-	34	8.9	4	0.4
Cape Avinof	3,369	63	-	-	63	15.5	11	1.9
Nelson Is.	5,085	825	-	-	825	10.9	165	16.2
Nunivak Is.	4,739	-	-	-	-	-	-	0.0
Total	30,635	922	-	-	922	10.6	180	3.0
2003								
Security Cove	10,600	-	-	-	-	-	-	0.0
Goodnews Bay	8,300	36	-	-	36	9.0	5	4.0
Cape Avinof	3,812	176	-	-	176	10.5	36	4.6
Nelson Is.	6,130	816	-	-	816	10.8	187	13.3
Nunivak Is.	5,182	229	-	-	229	8.4	7	4.4
Total	34,024	1,257	-	-	1,257	38.7	235	26.3
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	10.0	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
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

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District	Estimated Biomass (st)	Harvest					Estimated Value (\$1000's)	Exploitation Rate (%)
		Sac-roe	Bait	Waste	Total	Roe%		
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
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
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	12.1	3,523	17.6
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