Fishery Management Report No. 12-27

Annual Management Report Yukon and Northern Areas 2007

by

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Alaska Department of Fish and Game **Divisions of Sport Fish and Commercial Fisheries**

Symbols and Abbreviations

The following symbols and abbreviations, and others approved for the Système International d'Unités (SI), are used without definition in the following reports by the Divisions of Sport Fish and of Commercial Fisheries: Fishery Manuscripts, Fishery Data Series Reports, Fishery Management Reports, and Special Publications. All others, including deviations from definitions listed below, are noted in the text at first mention, as well as in the titles or footnotes of tables, and in figure or figure captions.

Weights and measures (metric)

centimeter	cm
deciliter	dL
gram	g
hectare	ha
kilogram	kg
kilometer	km
liter	L
meter	m
milliliter	mL
millimeter	mm

Weights and measures (English)

cubic feet per second	ft^3/s
foot	ft
gallon	gal
inch	in
mile	mi
nautical mile	nmi
ounce	oz
pound	lb
quart	qt
yard	yd

Time and temperature

day	d
degrees Celsius	°C
degrees Fahrenheit	°F
degrees kelvin	K
hour	h
minute	min
second	s

Physics and chemistry

all atomic symbols	
alternating current	AC
ampere	A
calorie	cal
direct current	DC
hertz	Hz
horsepower	hp
hydrogen ion activity (negative log of)	pH
parts per million	ppm
parts per thousand	ppt, ‰
volts	V
watts	W

General

Alaska Administrative Code	AAC
all commonly accepted abbreviations	e.g., Mr., Mrs., AM, PM, etc.
all commonly accepted professional titles	e.g., Dr., Ph.D., R.N., etc.
at	@
compass directions:	
east	E
north	N
south	S
west	W
copyright	©
corporate suffixes:	
Company	Co.
Corporation	Corp.
Incorporated	Inc.
Limited	Ltd.
District of Columbia	D.C.
et alii (and others)	et al.
et cetera (and so forth)	etc.
exempli gratia (for example)	e.g.
Federal Information Code	FIC
id est (that is)	i.e.
latitude or longitude	lat. or long.
monetary symbols (U.S.)	$, ¢
months (tables and figures): first three letters	Jan,...,Dec
registered trademark	®
trademark	™
United States (adjective)	U.S.
United States of America (noun)	USA
U.S.C.	United States Code
U.S. state	use two-letter abbreviations (e.g., AK, WA)

Mathematics, statistics

all standard mathematical signs, symbols and abbreviations	
alternate hypothesis	H_A
base of natural logarithm	e
catch per unit effort	CPUE
coefficient of variation	CV
common test statistics (F, t, χ^2, etc.)	
confidence interval	CI
correlation coefficient (multiple)	R
correlation coefficient (simple)	r
covariance	cov
degree (angular)	°
degrees of freedom	df
expected value	E
greater than	>
greater than or equal to	≥
harvest per unit effort	HPUE
less than	<
less than or equal to	≤
logarithm (natural)	ln
logarithm (base 10)	log
logarithm (specify base)	$\log_2$, etc.
minute (angular)	'
not significant	NS
null hypothesis	H_O
percent	%
probability	P
probability of a type I error (rejection of the null hypothesis when true)	α
probability of a type II error (acceptance of the null hypothesis when false)	β
second (angular)	"
standard deviation	SD
standard error	SE
variance	
population	Var
sample	var

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

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PREFACE

This report summarizes the 2007 season and historical information concerning management of the subsistence, commercial and personal use fisheries of the Yukon–Northern Area of the Arctic-Yukon-Kuskokwim (AYK) Region. Data from selected management and research projects are included in this report. A more complete documentation of project results is presented in separate reports.

Data in this report supersedes information found in previous management reports. An attempt has been made to update information and correct errors in earlier reports.

This report is organized into major sections:

1. Salmon Fishery
2. Marine Fisheries Information
3. Cape Romanzof District Herring Fishery
4. Other Marine and Freshwater Finfish Fisheries
5. Northern Area

Yukon Area salmon information is provided in Appendix A, Cape Romanzof herring information is provided in Appendix B, Yukon Area freshwater finfish information is provided in Appendix C, and Northern Area information is provided in Appendix D.

ABSTRACT

The 2007 Yukon and Northern management report summarizes management activities of the Alaska Department of Fish and Game, Division of Commercial Fisheries in the Yukon and Northern Areas of Alaska. The report provides the Yukon Area status of salmon stocks (Chinook *Oncorhynchus tshawytscha*, coho *O. kisutch*, summer and fall chum *O. keta*) in 2007, provides data on the utilization of salmon species by commercial, subsistence, personal use, and sport fisheries, and presents an outlook for the 2008 fishing season. Alaska and Canada fisheries are summarized as the Yukon River is a transboundary river. The report further compiles summaries of selected Yukon River projects and a review of salmon bycatch in groundfish fisheries of the Bering Sea and the Gulf of Alaska. Complete documentation of these projects and results may appear in separate reports. Fisheries data in this report supersedes information in previous annual management reports. Some data are preliminary and may be presented with minor differences in future reports. The Yukon Area report is organized into 5 sections: 1) *Salmon Fishery*: a description of the Yukon Area, fishery resources, and fisheries management practices, 2) *Marine Fisheries Information*: a description of the Yukon Area, fishery resources, and fishery management practices, including a comprehensive report of the 2007 Yukon Area salmon fisheries by summer and fall season, which makes comparisons with previous years. 3) *Cape Romanzof District Herring Fishery:* a description of the area, fisheries, and management practices, and summary of the 2007 herring fishery, 4) *Other Marine and Freshwater Finfish Fisheries:* a description of the fishery resources and freshwater finfish fisheries other than salmon and herring and 5) Northern Area which includes a description of the area and documentation of the Colville River commercial freshwater finfish fishery.

Keywords: Yukon River, Yukon River Salmon Agreement, Chinook salmon, *Oncorhynchus tshawytscha*, chum salmon, *O. keta*, coho salmon, *O. kisutch*, Pacific herring, *Clupea pallasii*, fisheries management, escapement, commercial harvest, subsistence harvest, season outlook, Yukon Area, Annual Management Report (AMR).

YUKON AREA

INTRODUCTION

The Division of Commercial Fisheries of the Alaska Department of Fish and Game (ADF&G) is responsible for the management of state subsistence, personal use, and commercial fisheries in the Yukon Area of the Arctic-Yukon-Kuskokwim (AYK) Region. This annual management report details the activities of ADF&G in the Yukon Area during 2007. The Yukon River is a transboundary river and as such, information is provided on fishery management, harvests, and projects in the Canadian portion of the drainage. Much of the information related to salmon in this report is directly taken from the annual Joint Technical Committee of the U.S. Canada Panel report, *Yukon River salmon 2007 season summary and 2008 season outlook* (JTC 2008). Historical salmon harvest and escapement data are provided in JTC 2008. For a more historical perspective pertaining to the Yukon Area fisheries, see the *Annual management report for the Yukon and Northern Areas 2002–2004* (Hayes et al. 2008).

The Yukon Area includes all waters of the Yukon River drainage in Alaska and all coastal waters of Alaska from Point Romanof southward to the Naskonat Peninsula (Figure 1). Important commercial and subsistence fisheries include salmon and herring. Other marine and freshwater finfish are harvested primarily for subsistence use. A list of indigenous fishes found in the Yukon Area is provided in Appendix A1.

SALMON FISHERY

DESCRIPTION OF AREA AND DISTRICT BOUNDARIES

The Yukon River is the largest river in Alaska and the fifth largest drainage in North America. The river originates in British Columbia, Canada, within 30 miles of the Gulf of Alaska, and flows over 2,300 miles to its terminus at the Bering Sea. It drains an area of approximately 330,000 square miles and approximately 222,000 square miles of the state. With the possible exception of a few fish taken near the mouth or in the adjacent coastal waters, only salmon of Yukon River origin are harvested in the Yukon Area.

Excluding the greater Fairbanks area (approximately 84,000 residents), there are approximately 21,000 rural residents in the Alaska portion of the drainage (U.S. Census 2000), the majority of whom reside in 43 small communities scattered along the coast and major river systems. Most of these people are dependent to varying degrees on fish and game resources for their livelihood.

Commercial salmon fishing is allowed along the entire 1,200 mile length of the mainstem Yukon River in Alaska, the lower 225 miles of the Tanana River, and lower 12 miles of the Anvik River. The Yukon Area is divided into 7 districts and 10 subdistricts for management and regulatory purposes (Figure 2). The district boundaries were originally established in 1961 and redefined in 1962, 1974, 1978, 1994 and 1996. The Lower Yukon Area includes the Yukon River drainage from the mouth to Old Paradise Village, river mile 301 (Districts 1, 2, and 3). The Coastal District was established in 1994, redefined in 1996 and is open only to subsistence fishing. The Upper Yukon Area is that portion of the Yukon River drainage upstream of Old Paradise Village to the border with Canada (Districts 4, 5, and 6). The districts and subdistricts are further divided into 28 statistical areas for management and reporting purposes (Figures 3–9). Yukon River mileages at specific locations are listed in Appendix A2.

In addition to the U.S. fisheries, Aboriginal, commercial, sport, and domestic salmon fisheries also occur in the Canadian portion of the Yukon River drainage. Department of Fisheries and Oceans, Canada (DFO) conducts the corresponding fishery management activities in Canada.

FISHERY RESOURCES

Five species of Pacific salmon are found in the Yukon River drainage: Chinook salmon *Oncorhynchus tshawytscha*, chum salmon *O. keta*, coho salmon *O. kisutch*, pink salmon *O. gorbuscha*, and sockeye salmon *O. nerka*. Chinook salmon are the largest salmon found in the Yukon River, ranging from 2 to 90 pounds. Spawning populations of Chinook salmon have been documented throughout the Yukon River drainage from the Archuelinguk River, located approximately 80 miles from the mouth, to as far upstream as the headwaters of the drainage in Canada, nearly 2,000 miles from the mouth. Chinook salmon begin entering the mouth of the Yukon River soon after ice breakup, during late May or early June, and continue through mid-July.

The chum salmon return is made up of a genetically distinct early summer chum salmon run and a later fall chum salmon run. Summer chum salmon are characterized by: earlier run timing (early June to mid-July at the mouth), rapid maturation in freshwater, and smaller size (average 6

to 7 pounds). Summer chum salmon spawn primarily in run-off streams in the lower 700 miles of the drainage and in the Tanana River drainage. Fall chum salmon are distinguished by: later run timing (mid-July to early September at the mouth), robust body shape, and larger size (average 7 to 8 pounds). Fall chum salmon primarily spawn in the upper portion of the drainage in streams that are spring fed. Major fall chum salmon spawning areas include the Tanana, Porcupine and Chandalar River drainages, as well as various streams in Yukon Territory, Canada, including the mainstem Yukon River. Fall chum salmon run size is typically much smaller than that of summer chum salmon.

Coho salmon enter the Yukon River from late July through September and average approximately 7 pounds in weight. Coho salmon spawn discontinuously throughout the Alaska portion of the drainage, primarily in tributaries in the lower 700 miles of the drainage and in the Tanana River drainage. Major spawning populations of coho salmon have been documented in tributaries of the Tanana River drainage and in the Andreafsky River.

Pink salmon enter the lower river from late June to late July and average approximately 2 to 3 pounds in weight. Pink salmon primarily spawn in the lower portion of the drainage, downstream of the community of Grayling, river mile 336. However, pink salmon have been caught in the mainstem Yukon River upstream as far as Ruby, river mile 601 (ADF&G 1983). Pink salmon have exhibited a high and low abundance 2-year-cycle. High abundance has typically occurred during the even numbered years.

Sockeye salmon are present but uncommon in the Yukon River drainage, and only a few fish are caught each year. Sockeye salmon have been reported in the mainstem Yukon River upstream of Rampart, river mile 763. Observations of sockeye salmon have occurred in the Innoko (ADF&G 1986), Kantishna (L. Barton, Commercial Fisheries Biologist, ADF&G, Fairbanks, personal communication 1988), Tanana River upstream of confluence with Kantishna River (B. Borba, Commercial Fisheries Biologist, ADF&G, Fairbanks, personal communication 2004), Anvik (M. Erickson, Commercial Fisheries Biologist, ADF&G, Anchorage, personal communication 1989), and Gisasa (Wiswar 1999) river drainages. Sockeye salmon are annually counted at the Andreafsky River weir (Maschmann 2008).

MANAGEMENT

The policy of ADF&G is to manage the salmon runs to the extent possible for maximum sustained yield, unless otherwise directed by State regulation (*5 AAC 39.222. Policy for the Management of Sustainable Salmon Fisheries*). ADF&G has managed the salmon fisheries in the Yukon Area over the past few decades with the dual goal of maintaining important fisheries while at the same time achieving desired escapements consistent with the *Sustainable Salmon Fisheries Policy*. Management of the Yukon River salmon fishery is complex due to the inability to determine stock specific abundance and timing, overlapping multispecies salmon runs, the increasing efficiency of the fishing fleet, allocation issues, and the immense size of the Yukon River drainage. The Alaska State Legislature and the Alaska Board of Fisheries (BOF) have designated subsistence use as the highest priority among beneficial uses of the resource. To maintain the subsistence priority and to provide for spawning escapements to ensure sustainable yields, Yukon River salmon fisheries must be managed conservatively.

For management purposes, the summer season refers to the fishing associated with the Chinook and summer chum salmon migrations and fall season refers to the fishing associated with the fall chum and coho salmon migrations. Salmon fisheries within the Yukon River drainage may

harvest stocks that are up to several weeks and over a thousand miles from their spawning grounds. Since the Yukon River commercial fishery is a mixed stock fishery, some tributary populations may be under or over exploited in relation to their actual abundance. Based on current knowledge, it is not possible to manage for individual stocks in most areas where commercial fishing occurs. Within the Yukon River drainage only stocks within the Tanana and Anvik rivers can be managed as terminal harvest areas.

ADF&G uses an adaptive management strategy that evaluates run strength inseason to determine a harvestable surplus above escapement requirements and subsistence uses. Primary tools used to manage the commercial salmon fisheries are management plans, guideline harvest ranges established by the BOF, and emergency order (EO) authority, which is used to implement time and area openings or closures and mesh size restrictions. Guideline harvest ranges have been established for Chinook, summer chum, and fall chum salmon commercial fisheries throughout the Alaska portion of the drainage. ADF&G attempts to manage the commercial salmon fisheries so the harvest in each district, or subdistrict, is proportionally similar within their respective guideline harvest ranges. Management of commercial fisheries for coho salmon is conditionally based on the abundance of fall chum salmon and typically the harvest is incidental to the fall chum fishery. In 1983, a Set Gillnet Only Area (Figure 10) along the coastal area of District 1 was established where only set gillnets are allowed during commercial fishing periods. In general, more commercial fishing time has been allowed in the coastal Set Gillnet Only Area due to the influence of tides on gear efficiency.

During the fishing season, management is based on preseason projections and inseason run assessment. Inseason run assessment includes abundance indices from test fisheries, passage estimates from various sonar, mark–recapture projects, and spawning escapement and harvest data. Since 1995, the main river sonar project at Pilot Station has provided inseason estimates of salmon passage for fisheries management. The level of commercial, subsistence, and personal use harvests can be adjusted through the use of EOs to control time and area of openings and closures. News releases announcing emergency orders are broadcast on local radio stations and are transmitted by fax, posted on the state web site (http://www.adfg.alaska.gov/index.cfm?adfg=cfnews.main), and distributed by email to communities, processors, buyers, fishermen, and members of the public that register online to receive such announcements. Additionally, select processors, buyers, and fishermen are notified of the emergency order by telephone and VHF radio where available.

In response to the guidelines established in the *Sustainable Salmon Fisheries Policy*, the BOF classified the Yukon River Chinook and fall chum salmon stocks as yield concerns during the September 2000 work session. This determination was based on the inability, despite the use of specific management measures, to maintain expected yields, or harvestable surpluses, above the stock's escapement needs since 1998 and the anticipated low harvest level in 2001. In addition, the BOF classified the Yukon River summer chum and Toklat and Fishing Branch River fall chum salmon stocks as management concerns. The determination of the management concerns was based on the chronic inability to meet existing escapement goals for the summer chum stock since 1998 and for the Toklat and Fishing Branch rivers fall chum salmon stocks since 1997.

During the January 2001 BOF meeting, action plans were developed through public process to guide ADF&G in managing each stock of concern. The action plans contained goals, measurable and implementable objectives, and provisions including fishery management actions needed to

achieve rebuilding goals and objectives, in proportion to each fishery's use of, and hazards posed to, a salmon stock (Vania 2000).

Regulatory actions adopted by the BOF to protect the Yukon River stocks of concern included the adoption of the *Yukon River King Salmon Management Plan*, changes to the Yukon River summer chum and fall chum salmon management plans, and adoption of a subsistence salmon fishing schedule for the Yukon River. The BOF determined that the subsistence-fishing schedule should provide a reasonable opportunity for subsistence fishermen during years of normal to below average salmon run strength. The schedule was enacted to spread the harvest throughout the river, to reduce the impact on a particular stock, and spread subsistence harvest opportunity among users. The goal of the schedule is to provide windows of time during which salmon migrate upriver unexploited.

The subsistence salmon schedule is based on current, or past, fishing schedules and is implemented chronologically, consistent with migratory timing, as the salmon run progresses upstream. The commissioner may alter this schedule for conservation by EO, if preseason, or inseason, run indicators show this is necessary. The schedule for subsistence salmon fishing was adopted as follows:

(1) Coastal District, Koyukuk River and Subdistrict 5-D: 7 days per week;

(2) Districts 1 – 3: two 36-hour periods a week;

(3) District 4 and Subdistricts 5-A, 5-B, and 5-C: two 48-hour periods a week;

(4) District 6: two 42-hour periods a week; and

(5) District 6 Old Minto Area: 5 days per week.

If inseason run strength assessment projects indicate that there is sufficient surplus, above escapement and subsistence uses to allow a commercial fishery, the subsistence fishing schedule reverts to the pre-2001 subsistence fishing schedule.

During the January 2004 BOF meeting, Yukon River stocks of concern were re-evaluated. The Chinook salmon stock was continued as a yield concern, the summer chum salmon stock was continued as management concern, and the fall chum salmon stock was continued as a yield concern (Lingnau and Bergstrom 2003; Salomone and Bergstrom 2004; Bue et al. 2004). The Toklat River and Fishing Branch River fall chum salmon stocks were removed as stocks of management concern.

During the February 2007 BOF meeting, Yukon River summer and fall chum salmon were discontinued as stocks of concern based upon the guidelines established in the *Sustainable Salmon Fisheries Policy* (Clark et al. 2006; Bue et al. 2006). Beginning in 2002 and 2003, the Yukon River summer chum and fall chum salmon runs showed a marked improvement in abundance with the 2005 fall chum salmon the highest on record and the 2006 summer chum salmon the second largest recorded. The improved abundance led to discontinuing summer and fall chum salmon as stocks of concern. However, the most recent 5-year average (2002–2006) harvest of Chinook salmon remained approximately 40% below the historic long-term average (1989–1998) despite use of specific management measures. Thus, the Yukon River Chinook salmon stock was continued as a stock of yield concern based on the inability, despite the use of specific management measures, to maintain expected yields, or harvestable surpluses, above the stock's escapement needs since 1998 (Hayes et al. 2006).

In addition to stock of concern designations, the BOF adopted several regulation changes in February 2007 summarized as follows:

> 5 AAC 01.240 *Marking and Use of Subsistence-taken Salmon.* The BOF adopted new language defining the time period and changing the marking requirement for subsistence taken Chinook salmon in Districts 1–3. In Districts 1–3, from June 1 to July 15 a person may not possess king salmon taken for subsistence uses unless both tips (lobes) of the tail fin have been removed (Figure 11) before the person conceals the salmon from plain view or transfers the salmon from the fishing site. Previously the marking requirement was to remove the dorsal fin during the open commercial fishing season;
>
> 5 AAC 05.369 *Yukon River Coho Salmon Management Plan*. The BOF modified the plan by reducing the threshold required to allow a directed coho salmon commercial fishery from a run size of 625,000 fall chum salmon down to 550,000 fall chum salmon. The closure of the directed coho salmon commercial season was extended to September 10 in Districts 1, 2, and 3 and Subdistrict 4-A was included with the remainder of District 4 to close no later than October 5. The BOF considered but made no changes to harvest allocation; and
>
> 5 AAC 70.015. Seasons, Bag, Possession, and Size Limits, and Methods and Means in the Tanana River Management Area. Although the Goodpaster River drainage is closed to sport fishing for salmon, the BOF adopted an exception to allow sport fishing for Chinook salmon to catch-and-release fishing only from department markers located approximately 25 miles upstream from the confluence with the Tanana River. Further, Chinook salmon may not be removed from the water and must be released immediately and returned to the water unharmed and only one unbaited, single-hook artificial lure may be used.

Various government and non-government agencies operate many projects in the Yukon Area and in Canada to obtain the biological information necessary for management of the salmon runs in 2007 (Appendices A3 and A4). ADF&G's Division of Commercial Fisheries permanent full time staff assigned to the Yukon Area includes 14 positions: 2 area management biologists (one summer, one fall), 2 assistant area management biologists, 9 research biologists, and one field office assistant. In addition, approximately 30 seasonal employees annually assist in conducting various management and research projects. ADF&G staff assist with enforcement of regulations in cooperation with the Department of Public Safety, Division of Alaska Wildlife Troopers.

State of Alaska funding for the Yukon Area salmon management and research program from July 1, 2007 through June 30, 2008 was approximately $1.1 million annually. Approximately $1 million was received annually for the same time period by ADF&G through a federal U.S./Canada grant for Yukon River Salmon Negotiation Studies, which includes support for participation in related meetings. Additional projects were funded through federal funding for Yukon River Salmon Treaty Implementation.

Federal Subsistence Management

Title VIII of the Alaska National Interest Lands Conservation Act (ANILCA) of 1980 mandated that rural subsistence users have a priority over other users to take wildlife on federal public lands where recognized customary and traditional use patterns exist and required the creation of Regional Advisory Councils (RAC) to enable rural residents to have a meaningful role in federal subsistence management. The RACs provide recommendations and information to the Federal

Subsistence Board (FSB), review policies and management plans, provide a public forum and deal with other matters relating to subsistence uses. There are 3 RACs that cover separate portions of the Yukon River drainage. On October 1, 1999, the Secretaries of Interior and Agriculture published regulations to expand the federal management program to Alaska rivers, lakes, and limited marine waters within, and adjacent to, Federal public lands in which there is a federal reserved water right. In the Yukon River drainage this resulted in a patchwork of federal public lands and waters in which there is a federal reserved water right. The Secretary of Interior and the Secretary of Agriculture delegated their authority in Alaska to the FSB to adopt subsistence harvest regulations on federal public land, including waters running through, or next to, these lands. The FSB or USFWS may close fishing for other uses in these waters and implement a priority for federally qualified rural subsistence users if it is determined necessary to provide for the priority or because of conservation concerns.

Because of the complexity of land status and fisheries in the Yukon Area, ADF&G and the Federal Office of Subsistence Management developed the *Yukon River Drainage Subsistence Salmon Fishery Management Protocol* in 2002 to coordinate subsistence fisheries management. This protocol falls under the umbrella Memorandum of Agreement between the State and Federal Agencies and formalizes the working relationships between State and Federal agencies. State managers are responsible for management of State subsistence, commercial, recreational, and personal use fisheries in all waters. The Federal subsistence program is responsible for providing a priority for subsistence harvest by qualified rural residents in waters where federal rules are applicable. The protocol also directs State and Federal agencies to work with the Yukon River Drainage Fisheries Association (YRDFA), the Yukon River Coordinating Fisheries Committee (YRCFC), which is made up of selected members from the 3 RACs covering the Yukon drainage and other affected public to solicit input to the decision-making process.

Federal subsistence fishing schedules, openings, closures, and fishing methods are established in federal regulations (U. S. Department of Interior 2007-2008). In general, the regulations are the same as those adopted for the subsistence taking of fish under Alaska Statutes (AS 16.05.060). However, differences in regulations do exist in some cases. Federal rules allow customary trade, the sale of subsistence caught fish by federally qualified rural subsistence users. State regulations prohibit the sale of subsistence caught fish in the Yukon River drainage. A federal subsistence drift gillnet fishery is allowed in Subdistricts 4-B and 4-C, while state regulations do not allow the use of drift gillnet gear in these subdistricts. In 2005, the FSB adopted new regulations allowing a drift gillnet fishery between June 10 and July 14 during the last 18 hours of the each subsistence salmon fishing opening in waters where federal rules apply in Subdistricts 4-B and 4-C. Participation in this new fishery was open to qualified rural residents under a federal subsistence permit using gillnets limited to less than 150 feet in length, 35 meshes deep, and unrestricted mesh size to target Chinook salmon. Additionally, state regulations may be superseded inseason by a Federal Special Action.

U.S./Canada Yukon River Salmon Agreement and Panel

Negotiations were initiated in 1985 between the United States and Canada regarding a Yukon River salmon treaty. The purpose of these negotiations was to develop coordination of management between the U.S. and Canada of salmon stocks that spawn in the Canadian portion of the Yukon River drainage. The United States and Canada Joint Technical Committee (JTC) was established in 1985 and serves as a scientific advisory body to the Yukon River Panel. The

JTC meets semi-annually to discuss harvest and escapement goals, management trends, preseason outlooks and postseason reviews, and results of cooperative research projects.

In the mid-1990s, the realization was that while reaching a comprehensive long term agreement remained a formidable challenge given some of the key unresolved issues, there would be benefits that could be realized by more formally implementing the areas of agreement to date. In February 1995, an *Interim Yukon River Salmon Agreement* went into effect and a Yukon River Panel (Panel) was formed to implement the Interim Agreement.

A 6-year stabilization plan was completed in 1995 for Canadian Yukon River mainstem Chinook salmon. The objective of the 6-year stabilization plan was to prevent further declines in spawning escapement by achieving an escapement of at least 18,000 Chinook salmon for each year through 1995. In April 1996, the Panel agreed to the first 6 years of a rebuilding plan for Canadian mainstem Chinook salmon stocks. The Panel agreed to an interim minimum spawning escapement objective for Canadian mainstem Yukon River Chinook salmon of 28,000 fish for 6 years beginning in 1996. The U.S. contribution to this effort was to endeavor to deliver 44,800 to 47,800 Chinook salmon to the Canadian mainstem Yukon River. The Canadian contribution to this effort was to endeavor to manage the harvest of Chinook salmon in the mainstem Yukon River drainage in Canada by all user groups combined within a guideline harvest range of 16,800 to 19,800 Chinook salmon.

For Canadian Yukon River mainstem fall chum salmon, a 12-year rebuilding plan was agreed upon during the negotiation process beginning with the 1990 season. The objective of this plan was to rebuild the stock by achieving a spawning escapement of more than 80,000 fall chum salmon for all brood years in the 4-year cycle by 2001. The U.S. contribution to this effort was to attempt to allow a predetermined number of fall chum salmon to pass the U.S./Canada border on the mainstem Yukon River. This number varied by year based upon the rebuilding schedule. The Canadian contribution to this effort was to endeavor to manage the harvest of fall chum salmon in the mainstem Yukon River drainage in Canada by all user groups combined within a guideline harvest range of 23,600 to 32,600 fall chum salmon.

The Interim Agreement was in place through March 31, 1998. During negotiations in April 2000, most of the details were worked out on a framework agreement, with the exception of a harvest share proposal that was presented by the Canadian delegation. On March 29, 2001 the United States and Canada initialed an agreement which was later signed in December 2002 that is referred to as the *Yukon River Salmon Agreement, Attachment B, Annex IV, Chapter 8 of the Pacific Salmon Treaty*. The Agreement set salmon harvest share target ranges based on assessment of run strength and total allowable catch (TAC) for Chinook and fall chum salmon into the Canadian mainstem of the Yukon River. The escapement objective and harvest sharing of Canadian-origin Yukon River Chinook salmon is:

1. The Parties agree that the spawning escapement objective for the rebuilt Chinook salmon stock in the Mainstem Yukon River shall be 33,000 to 43,000 Chinook salmon.
2. Harvest of Mainstem Yukon River Chinook salmon shall be shared beginning in 2001, and continuing until amended by the Parties, on the following basis:
    a. when the Total Allowable Catch (TAC) is between zero and 110,000 Chinook salmon, the guideline harvest range for Canada shall be between 20% and 26% of the TAC;

b. when the TAC is above 110,000 Chinook salmon, the guideline harvest range for Canada shall be between 20% and 26% of 110,000, i.e., 22,000 and 28,600 Chinook salmon, plus 50% of the portion of TAC greater than 110,000 Chinook salmon.

The escapement objective and harvest sharing of Canadian-origin Yukon River fall chum salmon is:

1. The Parties agree that the escapement objective for the rebuilt chum salmon stock:
    a. in the Mainstem Yukon River in Canada shall be greater than 80,000 chum salmon; and
    b. upstream from the Fishing Branch River weir site shall be 50,000 to 120,000 chum salmon.

2. Harvest of Mainstem Yukon River chum salmon shall be shared beginning in 2001, and continuing until amended by the Parties, on the following basis:
    a. when the Total Allowable Catch (TAC) is between zero and 120,000 chum salmon, the guideline harvest range for Canada shall be between 29% and 35% of the TAC;
    b. when the TAC is above 120,000 chum salmon, the guideline harvest range shall be between 29% and 35% of 120,000, i.e., 34,800 and 42,000 chum salmon, plus 50% of the portion of the TAC greater than 120,000 chum salmon.

The Yukon River Panel was re-established to implement the Agreement. The focus of the Panel is on the salmon stocks that spawn in the Canadian portion of the Yukon River drainage. The Panel makes recommendations to the management agencies in Alaska and Canada and also administers a Restoration and Enhancement Fund (R&E Fund). A key component of the Agreement is administration of the R&E Fund by the Panel to address the restoration and enhancement of Canadian spawned salmon stocks. The U.S. contributes $1,200,000 per year into the R&E Fund. Applicants have included regional organizations, Native groups, private consultants and others, primarily in Canada. Monies from the R&E Fund shall be disbursed by the Yukon River Panel according to the following rules:

1. 50% of the annual available funds shall be disbursed on Canadian programs and projects approved by the Canadian section of the Yukon River Panel based on recommendations by the Canadian section of the JTC and found by the Panel as a whole to be consistent with the *Principles and Guidelines for Restoration, Conservation and Enhancement Programs and Projects* until amended by the parties; and

2. The balance of annual available funds shall be disbursed at the direction of the Panel as a whole based on recommendations by the JTC as a whole.

The Yukon River Panel meets each fall and spring to develop management recommendations and advise the United States and Canadian Governments on conservation and management of the salmon originating in the Canadian portion of the Yukon River. Since 2002, in recognition of the

changing dynamics of the fishery and the spirit of the agreement, interim management escapement objectives are reviewed and agreed upon jointly each spring prior to the salmon returns.

AREA SALMON REPORT 2007

TOTAL YUKON DRAINAGE SALMON HARVEST 2007

The total 2007 harvest for the Yukon River drainage, including Canada, was 94,649 Chinook, 275,445 summer chum, 205,667 fall chum, and 65,323 coho salmon (Appendix A5). The 2007 total Yukon River drainage harvests compared to the recent 5-year averages (2002–2006) were as follows: Chinook, 7% below average; summer chum, 126% above average; fall chum, 40% above average; and coho salmon, 15% above average. An additional 1,198 Chinook, 16,121 summer chum, 234 fall chum, and 110 coho salmon were caught for subsistence use in the Coastal District outside the drainage (Appendix A24).

COMMERCIAL FISHERY–ALASKA

TOTAL COMMERCIAL SALMON HARVEST 2007

A total of 367,087 salmon were harvested. The harvest by species was 33,634 Chinook, 198,201 summer chum, 90,667 fall chum, and 44,575 coho salmon taken by 596 permit holders in the Yukon Area in Alaska (Appendices A6 and A7). The 2007 Yukon Area commercial harvests compared to the recent 5-year averages (2002–2006) were as follows: Chinook, 15% below average; summer chum, 438% above average; fall chum, right on average; and coho salmon, 32% above average (JTC 2008). Harvest by statistical area for 2007 in the Yukon Area and by gear type in the Upper Yukon Area is shown in Appendices A7–A10. Total exvessel value was approximately $2.5 million, which is 3% below the recent 5-year average (Appendix A11). Salmon buyers, processors and catcher–sellers operating in the Yukon Area in 2007 are listed in Appendix A12. The salmon harvest was processed as a fresh or frozen product.

CHINOOK AND SUMMER CHUM SALMON

The Yukon River drainage is divided into fishery districts and subdistricts for management purposes (Figure 1). ADF&G uses an adaptive management strategy that evaluates run strength inseason to determine a harvestable surplus above escapement requirements and subsistence uses. A preseason management strategy was developed in cooperation with federal subsistence managers that outlined run and harvest outlooks along with the regulatory subsistence salmon fishing schedule described in an information sheet. The 2007 strategy was to implement the subsistence salmon fishing schedule as salmon began to arrive in each district or sub-district in a stepwise manner (Table 1).

Table 1.–Yukon Area regulatory subsistence salmon fishing schedule, 2007.

Area	Regulatory subsistence salmon fishing periods	Schedule to begin	Days of the week
Coastal District	7 days/week	by regulation	M/T/W/TH/F/SA/SU – 24 hours
District 1	Two 36-hour periods/week	May 28, 2007	Mon 8 pm to Wed 8 am /Thu 8 pm to Sat 8 am
District 2	Two 36-hour periods/week	May 30, 2007	Wed 8 pm to Fri 8 am / Sun 8 pm to Tue 8 am
District 3	Two 36-hour periods/week	June 1, 2007	Tue 8 am to Wed 8 pm / Fri 8 am to Sat 8 pm
District 4	Two 48-hour periods/week	June 10, 2007	Sun 6 pm to Tue 6 pm / Wed 6 pm to Fri 6 pm
Koyukuk River	7 days/week	By Regulation	M/T/W/TH/F/SA/SU – 24 hours
Subdistricts 5-A, B, C	Two 48-hour periods/week	June 19, 2007	Tue 6 pm to Thu 6 pm /Fri 6 pm to Sun 6 pm
Subdistrict 5-D	7 days/week	By Regulation	M/T/W/TH/F/SA/SU – 24 hours
District 6	Two 42-hour periods/week	By Regulation	Mon 6 pm to Wed Noon /Fri 6 pm to Sun Noon
Old Minto Area	5 days/week	By Regulation	Friday 6 pm to Wednesday 6 pm

The schedule was subject to change depending on salmon run strength. Before implementing this schedule, subsistence fishing would be allowed 7 days a week to provide opportunity to harvest resident species, such as whitefish, sheefish, pike, and suckers. Additionally, an informational sheet was used to prepare fishermen for possible reductions to the subsistence salmon fishing schedule or to allow for a small commercial fishery contingent on how the runs developed. The information sheet was mailed to Yukon River commercial permit holders and approximately 2,800 families identified from ADF&G's survey and permit databases. State and federal staff presented the management strategy to the YRDFA, State of Alaska Fish and Game Advisory Committees, Federal Regional Advisory Councils, and other interested and affected parties.

Chinook Salmon

In 2002–2005, preseason management strategies were developed to not allow commercial fishing until near the midpoint of the Chinook salmon run. This interim strategy was designed to pass fish upstream for escapement, cross-border commitments to Canada, and subsistence uses in the event of a very poor run as occurred in 2000. However, 2 drawbacks to this approach are that harvest is not spread out over the entire run and commercial fishing is concentrated on only those stocks migrating during the latter half of the run. Furthermore, if the run is strong, delaying commercial fishing can result in foregone commercial harvest opportunities. The preferred strategy for managing commercial fisheries is to spread the harvest over the middle 50% of the run, starting near the first quarter point of the run. This strategy was in place before the decline in 1998. Additional harvest after the third quarter point can occur late in the season based on information from escapement projects. Beginning in 2006, an earlier opening to commercial fishing was established on June 15 in District 2. In 2007, based on the preseason projections, a short commercial fishing period was scheduled on the historic first quarter point (June 15) to target Chinook salmon, while the majority of the commercial harvest was spread over the middle 50% of the run.

Lower Yukon Test Fishery (LYTF) indices, subsistence harvest reports, and Pilot Station sonar passage estimates provide information ADF&G uses to assess the inseason salmon run. As the run progresses upriver, other projects provide additional run assessment information.

Yukon River Chinook salmon return primarily as age-5 and age-6 fish, although age-4 and age-7 fish also contribute to the run. The age-4 component in 2006 was below average, whereas the age-5 component was above average. The previous 2 years (2005 and 2006) runs have been near average indicating good production from the poor runs of 2000 and 2001. In 2001, the brood year producing age-6 fish returning in 2007, successful aerial survey observations were made in all 8 Yukon River index tributaries used for escapement assessment. Minimum aerial survey sustainable escapement goals (SEGs) have been established in the East and West Fork Andreafsky, Anvik, North and South Fork Nulato, and Gisasa rivers. With the exception of the East and West Fork Andreafsky rivers, all aerial survey goals were met. Upper ranges of the biological escapement goals for the Chena and Salcha rivers were exceeded. The Canadian Yukon River mainstem spawning escapement in 2001 was the second largest on record.

Assuming an approximately normal return of age-5 and age-6 fish, the 2007 run was expected to be average to below average and similar in abundance to the 2006 run. It was anticipated the run would provide for escapements, support a normal subsistence harvest, and a below average commercial harvest. Therefore, ADF&G developed a conservative preseason management strategy in 2007 with a potential harvest ranging from 30,000 to 60,000 Chinook salmon.

Ice breakup in the lower river occurred on May 18, 4 days earlier than the historic average of May 22 (1979–2006). River conditions in the lower river early in the season were characterized as having lower than normal water levels. The first subsistence catch of Chinook salmon was reported near Emmonak on June 2. ADF&G's LYTF recorded the first Chinook salmon catch on June 3. Although ice breakup was earlier than average, there was a delay in salmon entering the river likely because of ice offshore of the river mouth. The subsistence salmon fishing schedule (Table 1) was initiated on May 28 in District 1 and implemented upriver chronologically as set out preseason consistent with migratory timing as the run progressed upstream.

Early run assessment indicated the Chinook and summer chum salmon runs were of adequate strength to allow subsistence salmon fishing to continue on the regulatory fishing schedule. Further assessment indicated that a surplus of Chinook and summer chum salmon was available for other uses. Once it is projected that there is a surplus beyond escapement requirements and subsistence uses, the schedule typically reverts to the pre-2001 BOF subsistence fishing regulations and the commercial season is opened. However, despite a short commercial opening on June 15 in District 2 occurring earlier in the run, the subsistence schedule was not terminated until June 19, 4 days after the opening of the commercial season in that district and on June 18 in District 1. The schedule was relaxed in Districts 3–5 in the same manner it was instituted, chronologically upriver based on run timing, to afford similar protection to the early run fish as in the lower river.

According to the LYTF catch per unit effort (CPUE) data, approximately 50% (the midpoint) of the Chinook salmon run had entered the lower river by June 22, 1 day later than the average date for the midpoint (Figure 12). The first quarter point, midpoint, and third quarter point were on June 16, June 22, and June 28 respectively. The cumulative LYTF CPUE in 2007 was 19.21 (Appendix A13). Compared to previous years, this CPUE was below the 1989–2006 average of 22.99. The Pilot Station sonar passage estimate was 125,553 Chinook salmon (Appendix A14).

The first quarter point, midpoint, and third quarter point were on June 19, June 24, and July 1, respectively.

Similar to the management strategy utilized in 2006, ADF&G scheduled a short, early commercial fishing period based on the preseason projection. The opening was intended to foster early commercial interest. The first commercial fishing period in the lower river occurred in District 2 on Friday, June 15 for 3 hours with unrestricted mesh size gillnets (Appendix A16); this was the second shortest commercial opening targeting Chinook salmon on record. The commercial harvest was 2,081 Chinook and 142 chum salmon.

The first and largest pulse of Chinook salmon was detected from June 14 through June 17 as indicated by the LYTF (Figure 12). Based on this pulse, the Chinook salmon run was estimated to be slightly later than average. ADF&G delayed opening the next commercial period targeting Chinook salmon until June 18, 2 days after the first quarter point of the Chinook salmon run at the LYTF in District 1. During the second pulse from June 20 to June 24, it appeared that Chinook salmon were entering the river at a slow, steady rate rather than the more typical pulse-like entry pattern, and the run was not as strong as anticipated. A strong first pulse followed by a weaker second pulse is unusual. During the poor runs of 1998 and 2000, the LYTF CPUE and Pilot Station sonar estimates were lower than average throughout the run. As the 2007 run progressed, it became clear that the Chinook salmon run was not developing as expected and was weaker than the run observed in 2006.

Summer Chum Salmon

The Yukon River summer chum salmon run was managed according to the guidelines described in the *Yukon River Summer Chum Salmon Management Plan* (Table 2).

Table 2.–Summary of the summer chum salmon management plan.

Summer Chum Salmon Management Plan Overview					
	Recommended Management Action				
Projected Run Size [a]	Commercial	Personal Use	Sport	Subsistence	Targeted Drainagewide Escapement
600,000 or less	Closure	Closure	Closure	Closure[b]	>600,000
600,001 to 700,000	Closure	Closure	Closure	Possible Restrictions[b]	
700,001 to 1,000,000	Restrictions[b]	Restrictions[b]	Restrictions[b]	Normal Fishing Schedules	
Greater than 1,000,000	Open[c]	Open	Open	Normal Fishing Schedules	>1,000,000 [d]

[a] Projected Run Size: mainstem river sonar passage estimate plus the estimated harvests below the sonar site and the Andreafsky River escapement.

[b] The fishery may be opened or less restrictive in areas that indicator(s) suggest the escapement goal(s) in that area will be achieved.

[c] Drainagewide commercial fisheries: harvestable surplus will be distributed by district or subdistrict in proportion to the guidelines harvest levels established in 5 AAC 05.362 (f) and (g) and 5 AAC 05.365 if buying capacity allows.

[d] Inriver run goal: This is a specific management objective for salmon stocks that are subject to harvest upstream of the point where escapement is estimated.

This management plan provides for escapement needs and subsistence use priority before other consumptive uses such as commercial, sport, and personal use fishing. The plan allows for varying levels of harvest opportunity depending on the run size projection. ADF&G uses the best available data to assess the run: 1) preseason run outlooks, 2) test fishing indices, 3) age and sex composition, 4) subsistence and commercial harvest reports, and 5) escapement monitoring projects.

The 2007 run outlook was for an average to above average run, which would provide for escapement, support a normal subsistence harvest, and a surplus for commercial harvest. The commercial harvest in Alaska was projected to be from 500,000 to 900,000 summer chum salmon depending on salmon market conditions.

The summer chum salmon river entry in 2007 was average in run timing. Summer chum salmon run passage of approximately 1.7 million fish at the Pilot Station sonar project was the 7th highest on record (Appendix A14). By June 22, the summer chum salmon run at Pilot Station was projected to be near 1.6 million fish, a level that would allow a directed summer chum salmon fishery. The first quarter point, midpoint, and third quarter point were on June 21, June 27, and July 2, respectively. In 2007, there was a renewed market interest for summer chum salmon. Based on the projected near average run estimate for summer chum salmon, ADF&G initiated short chum salmon directed commercial periods with fishing gear restricted to 6-inch maximum mesh size in Districts 1 and 2. Because of the uncertainty in Chinook salmon run strength, only restricted mesh openings were allowed after June 25. ADF&G attempted to schedule these directed chum salmon commercial periods when Chinook salmon abundance was low. Additionally, 3 summer chum salmon directed commercial periods were established in Subdistrict 4-A and 7 were established in District 6. The total commercial harvest was 198,201 summer chum salmon (Appendix A6). A summary of emergency orders issued during the Chinook and summer chum salmon fishing season is provided in Appendices A19 and A20.

Harvest and Value

In 2007, a total of 33,634 Chinook and 198,201 summer chum salmon were commercially harvested (Appendices A6 and A16) and sold in the round in the Alaska portion of the Yukon River drainage. The commercial Chinook salmon harvest included 5 Chinook salmon harvested in the fall season. For historical comparisons, the commercial harvest in JTC (2008) includes the number of salmon sold in the round and the estimated number of salmon harvested to produce roe sold. The Chinook salmon commercial harvest was 23% below the 1997–2006 average harvest of 43,428 fish (JTC 2008). The summer chum salmon harvest was 315% above the 1997–2006 average harvest of 47,713 fish.

A total of 591 permit holders participated in the Chinook and summer chum salmon fishery (Appendix A16), which was 4% below the 1997–2006 (not including 2001) average of 614 permit holders. The Lower Yukon Area (Districts 1–3) and Upper Yukon Area (Districts 4–6) in Alaska are separate Commercial Fisheries Entry Commission (CFEC) permit areas. A total of 564 permit holders fished in the Lower Yukon Area in 2007, which was 4% below the 1997–2006 average of 585 permit holders. In the Upper Yukon Area in Alaska, 27 permit holders fished, which was 16% below the 1997–2006 (not including 2001) average of 32 permit holders.

Yukon River fishermen in Alaska received an estimated $2.2 million for their Chinook and summer chum salmon harvest in 2007 (Appendix A11), approximately 13% below the 1997–2006 average of $2.6 million. Lower Yukon River fishermen received an estimated average price per pound of $3.73 for Chinook and $0.19 for summer chum salmon. The average price paid for

Chinook salmon in the Lower Yukon Area was 19% above the 1997-2006 average of $3.14 per pound. Prices paid for summer chum salmon in the round continued to be low as observed since 1995. The average income for Lower Yukon Area fishermen in 2007 was $3,829. Upper Yukon Area fishermen received an estimated average price per pound of $1.33 for Chinook and $0.25 for summer chum sold in the round and $2.36 for summer chum roe. The average price paid for Chinook salmon in the Upper Yukon Area was 42% above the 1997–2006 average of $0.93 per pound. The average price paid for summer chum salmon sold in the round in the Upper Yukon Area was 18% above the 1997–2006 average of $0.21 per pound. The average income for Upper Yukon Area fishermen that participated in the 2007 fishery was $2,282.

Results by District

Districts 1-3

Similar to the management strategy utilized in 2006, ADF&G scheduled a short, early commercial period based on the preseason projection. The commercial harvest was 2,081 Chinook and 142 chum salmon.

Due to the uncertainty about the Chinook salmon run strength after the second pulse, management of the Chinook salmon commercial fishery was conservative in order to meet escapement and subsistence needs and U.S./Canada Border passage obligation. After June 25, no additional unrestricted commercial periods targeting Chinook salmon were allowed in the lower river districts.

A total of 22,796 Chinook salmon were taken during 6 unrestricted mesh size openings and 9,121 Chinook salmon were incidentally harvested in 15 restricted mesh periods in Districts 1 and 2 (Appendices A16 and A17). A total of 190 Chinook and 1 summer chum salmon were taken in 2 unrestricted mesh size fishing periods in District 3. The combined total harvest of all openings in Districts 1, 2, and 3 was 32,112 Chinook salmon (includes 5 harvested in the fall season). The average weight of Chinook salmon in unrestricted mesh openings in Districts 1, 2, and 3 was 20.1 pounds. The average weight of Chinook salmon in restricted mesh openings in Districts 1 and 2 was 12.2 pounds.

Estimated age and sex composition of Chinook salmon in the lower river commercial harvest was combined for Districts 1, 2, and 3, and is provided for both restricted and unrestricted mesh periods. The Chinook salmon age composition from the lower river unrestricted commercial harvest was 3.0% age-4, 16.9% age-5, 78.1% age-6, and 1.8% age-7 fish. Females comprised 52.2% of the harvest. The Chinook salmon age composition from the lower river restricted commercial harvest was 26.2% age-4, 32.4% age-5, 40.8% age-6, and 0.6% age-7 fish. Females comprised 36.2% of the harvest.

In 2007, there was a renewed market interest for summer chum salmon. Based on the projected near average run estimate for summer chum, ADF&G initiated short commercial periods restricted to 6-inch maximum mesh size in the lower river districts directed at chum salmon beginning in District 2 with a 2-hour commercial period on June 19. Because of the uncertainty about the Chinook salmon run strength, only restricted mesh openings were allowed after June 25 and an attempt was made to schedule chum salmon directed periods when Chinook salmon abundance was low.

The combined commercial summer chum salmon harvest in District 1, 2, and 3 was 176,223 fish. Average weight of summer chum salmon in Districts 1, 2, and 3 commercial harvests was 6.5

pounds. The summer chum salmon age composition from the lower river restricted mesh commercial harvest was 32.1% age-3, 50.7% age-5, 17.1% age-6, and 0.1% age- 7 fish. Females comprised 51.3% of the sample.

Districts 4-6

Historically, the Subdistrict 4-A fishery targets summer chum salmon. The dominant gear type, (fish wheels) and the location of the fishery typically result in a very high chum to Chinook salmon ratio. Commercial fishing in Subdistrict 4-A consisted of 3 periods for a total of 408 hours in 2007. However, limited salmon markets resulted in low effort and subsequently low harvest. A total of 5 fishermen harvested 7,304 summer chum salmon (Appendix A16), which produced a total of 5,938 pounds of summer chum salmon roe in Subdistrict 4-A. Fishermen were paid based upon pounds of roe with the number of female summer chum salmon harvested reported on fish tickets. Most fishermen manned their fish wheels to release Chinook salmon and male summer chum salmon. The renewed summer chum salmon commercial fishery in 2007 was the first commercial harvest in Subdistrict 4-A since 1997. Commercial fishing occurred near the villages of Anvik and Kaltag. Anvik River had an escapement of approximately 459,000 summer chum salmon. The projection required to allow an inriver commercial fishery is 500,000 fish. Therefore, the Anvik River Management Area (Figure 9) remained closed to commercial fishing in 2007. No commercial deliveries were reported in Subdistricts 4-B and 4-C because of a lack of a market.

Subsistence fishermen in the middle river reported difficulties in catching Chinook salmon, and ADF&G responded by providing additional fishing opportunities. By emergency order, ADF&G allowed subsistence fishing 7 days per week in District 4 beginning on July 6 and allowed an additional 7 days of drift gillnet fishing for Chinook salmon from July 16 through July 23 in Subdistrict 4-A.

Three commercial fishing periods were allowed in Subdistricts 5-B and 5-C for a total of 36 hours of fishing time. A total of 12 fishermen harvested 1,241 Chinook salmon (Appendix A16). The combined commercial Chinook salmon harvest in Subdistricts 5-B and 5-C was 3% above the 1997–2006 average harvest of 1,206 fish (JTC 2008). Typically, the harvest of summer chum salmon is low in these subdistricts because they are located far upriver of the vast majority of summer chum salmon spawning areas, and no summer chum salmon were harvested commercially in 2007. No commercial fishing periods were announced for Subdistrict 5-D due to lack of a market.

The age composition of Chinook salmon from the District 5 commercial harvest was 15.6% age-4, 37.7% age-5, 45.9% age-6, and 0.8% age-7 fish. Females comprised 37.9% of the sample.

In 2007, commercial fishing in District 6 consisted of 7 periods for a total of 246 hours. Summer chum salmon were targeted during these commercial fishing periods, although some Chinook salmon were harvested incidentally. Test fish wheel catches (Appendix A18) and commercial harvest indicated that the summer chum salmon run in the Tanana River was below average. The total District 6 commercial harvest was 281 Chinook and 14,674 summer chum salmon harvested by 10 fishermen (Appendix A16). The Chinook salmon harvest was well below the guideline harvest range of 600–800 fish. The age of Chinook salmon from the District 6 commercial harvest was 37.4% age-4, 18.8% age-5, 42.1% age-6, and 1.6% age-7 fish. Females comprised 35.4% of the sample. Fish wheels, the dominant gear type in the Upper Yukon Area, tend to catch a higher number of smaller Chinook salmon (Meehan 1961), which are mostly males. The

age composition of summer chum salmon was 0.5% age-3, 65.8% age-4, 31.7% age-5, and 2.1% age-6 fish. Females comprised 48.8% of the sample.

FALL CHUM AND COHO SALMON

The *Yukon River Drainage Fall Chum Salmon Management Plan* (Table 3) incorporates the U.S./Canada treaty obligations for border passage of fall chum salmon and provides guidelines necessary for escapement and prioritized uses.

Table 3.–Summary of the fall chum salmon management plan.

Fall Chum Salmon Management Plan Overview					
	Recommended Management Action				
Projected Run Size [a]	Commercial	Personal Use	Sport	Subsistence	Targeted Drainagewide Escapement
300,000 or less	Closure	Closure	Closure	Closure[b]	300,000 to 600,000
300,000 to 500,000	Closure	Closure[b]	Closure[b]	Possible Restrictions[b,c]	
500,000 to 600,000	Restrictions[b]	Open	Open	Pre-2001 Fishing Schedules	
Greater than 600,000	Open[d]	Open	Open	Pre-2001 Fishing Schedules	

[a] For projected run size; use the best available data (including preseason projections, mainstem river sonar passage estimates, test fisheries indices, subsistence and commercial fishing reports, and passage estimates from escapement monitoring projects).

[b] The fishery may be opened or less restrictive in areas that indicator(s) suggest the escapement goal(s) in that area will be achieved.

[c] Subsistence fishing will be managed to achieve a minimum drainagewide escapement goal of 300,000.

[d] Drainagewide commercial fisheries may be open and the harvestable surplus above 600,000 will be distributed by district or subdistrict (in proportion to the guidelines harvest levels established in 5 AAC 05.365 and 5 AAC 05.367.

There are incremental provisions in the plan to allow varying levels of subsistence salmon fishing balanced with requirements to attain escapement objectives. The intent of the plan is to align management objectives with the established BEGs, provide flexibility in managing subsistence harvest when the stocks are low, and bolster salmon escapement as run abundance increases.

In 2007, the Yukon River fall chum salmon run was exceptionally late which contributed to a commercial harvest of both fall chum and coho salmon well below the preseason outlook for both species. The outlook was for a run size of 900,000 to 1.2 million fall chum salmon and an above average run of coho salmon. However, the inseason run size estimate fluctuated between 600,000 and 700,000 due to the late run timing of fall chum salmon. Because of the lower than anticipated run size projection, a more conservative management approach was adopted. Subsistence fishing opportunity remained on the normal pre-2001 fishing schedule throughout the season, while commercial fishing periods were constrained by the *Yukon River Drainage Fall Chum Salmon Management Plan*, limiting harvest to the available surplus as it is projected by inseason assessment.

Postseason assessment well after the fishery suggests overall fall chum salmon run abundance may have been near 1.0 million fish (Appendix A34) with surplus escapements. Accurate inseason assessment is complicated by the exaggerated pulsed river entrance pattern exhibited by fall chum salmon. Underestimation was in part due to the exceptionally late run timing of fall chum salmon with pulses entering the river after Pilot Station sonar had ceased operations on August 31. Conversely, the 2007 coho salmon run began entering the river early and appeared strong, but dropped off early, ending with an overall run size slightly above average. Additionally, the commercial harvest of coho salmon was constrained because of concern for the late fall chum salmon run and subsequent low inseason run projection.

The fall commercial season was extended and fishing time was increased as fish continued to enter the lower river late in the season. A large surplus of fall chum salmon was identified by the time they reached the upriver districts, but the primary market did not develop until late in the season because cooler temperatures were needed to maintain product quality. However, freezing temperatures forced the commercial fishery to end even though catch rates and abundance remained high in the Tanana River drainage.

Fall Chum Salmon Management Overview

The fall chum salmon run was exceptionally late and near initial run size expectations. The first significant pulse began entering the mouth of the Yukon River on August 6, 1 day after the average midpoint for the drift test fish project at Emmonak (Figure 13). The pulse lasted 3 days and the abundance was estimated to be approximately 265,000 fish based upon Pilot Station sonar. The second pulse followed closely beginning on August 12; it lasted 3 days and was estimated to include approximately 140,000 fall chum salmon. However, during the passage of the second pulse, high water was eroding the river bank immediately upstream of the sonar project, resulting in an unusually high silt load that interfered with the sonar counter's ability to detect fish. Consequently, the passage was estimated for that timeframe by extrapolation using the passage immediately before and after to fill in the missed time. The lower river test fishery projects indicated additional pulses entering the river on August 24 and August 28 whereas the Pilot Station sonar noted only slight increase in passage for the corresponding dates.

The Pilot Station sonar cumulative total estimate of fall chum salmon for the 2007 season was 684,011 fish through August 31 (Appendix A14). The run began late and the first pulse occurred near the average midpoint of the run. This pulse was strong and this migratory pattern resulted in a compressed run in which the midpoint was 3 days late and the three-quarter point was 2 days early. However, as stated earlier, pulses of fall chum salmon were observed entering the river after the sonar project had ceased operations. Thus, the run was more protracted than indicated by the sonar. The end of season run reconstruction of 1.0 million fall chum salmon suggests that the total run size may have been up to 250,000 fish larger than accounted for by the Pilot Station sonar estimate with consideration for removal of harvest below the project. Project reviews and investigations are looking for causes of the discrepancies in the assessment and how to improve future assessment. Beginning in 2008, the project will be extended and the sonar will operate through September 7.

The 2007 preseason run size projection ranged from 900,000 to 1.2 million fall chum salmon. A point estimate of 1.0 million was derived by utilizing the 1974 to 1983 odd/even year maturity schedules to represent the recent trend of higher production. The projection range was based on the upper and lower values of the 80% confidence bounds for the point projection. A run of this

size was anticipated to provide for escapement requirements and for subsistence and personal use fisheries with a surplus of 50,000 to 400,000 fall chum salmon available for commercial harvest. The wide harvest range was due to the difficulties in selecting representative production rates which have been highly variable in recent years.

With an expectation of continued strong production, the preseason management strategy was to begin the fall season on the pre-2001 subsistence fishing regulations in accordance with the management plan. Commercial fishing was anticipated to begin near the first quarter point in run timing for the lower river (July 30) dependent upon early run assessment. This would have allowed time for late summer chum salmon to move out of the area thereby improving market quality and providing a window for some of the early fall chum salmon stocks which spawn upriver to pass through the area. The relationship between the summer and fall chum salmon runs (1993–1995, 1997–2004, and 2006) suggested the fall run would perform similarly and thereby increased managers' confidence in the fall chum salmon preseason projection at the beginning of the 2007 fall season.

On July 16, the fall chum salmon management plan went into effect and subsistence fishing management actions initiated during the summer season were continued into the fall season. The Coastal District, Districts 1–4 and the Innoko River were open 7 days per week and pre-2001 subsistence salmon fishing regulations were applied to Upper Yukon Area districts.

The first pulse of fall chum salmon passed through the Lower Yukon Area with little exploitation and was expected to benefit escapement and upriver fishermen. Commercial salmon markets were limited. Districts 1 and 2 and Subdistrict 6-B had buyer commitments prior to the season with additional buyers expressing interest in purchasing salmon in District 4 and Subdistrict 5-C. The first commercial periods were opened in the lower river District 1 on August 14 and on August 15 in District 2 (Appendices A21 and A22). The Pilot Station sonar cumulative estimate through August 14 of 422,000 fall chum salmon was near the historical average of 438,000 for that date. The total season run size was projected to be 668,000 fish based on average run timing and 764,000 if run timing was late. A developing assessment project utilizing genetic analysis to identify and quantify various stock components of the run suggested that approximately 100,000 of the chum salmon that had entered the river during the early portion of the fall season were summer chum salmon. Using this genetic assessment information, it could be reasoned that fewer fall chum salmon were in the river than indicated by the Pilot Station sonar estimate. The effect would have dropped the abundance below the threshold necessary to allow a directed fall chum salmon commercial fishery. However, run size, as applied to the *Yukon River Drainage Fall Chum Salmon Management Plan*, is based on the date of the fall season beginning on July 19 at Pilot Station.

Fisheries managers worked closely with commercial fish buyers to maximize processing capacity and available transportation opportunities. Frequent short periods were provided based on daily processing capacity. Buyers and fishermen also worked together to improve the quality of their harvest by more careful fish handling, improved icing techniques, and quicker deliveries. Furthermore, in an effort to maximize efficiency, fishing times in District 1 were scheduled to coincide with daily high tides which typically carry new fish into the river where they become available for harvest. Later in the season, darkness becomes a factor so daylight fishing times were scheduled to maintain fishermen safety. No commercial fishing periods were scheduled in District 3 due to lack of market, but some District 3 residents fished in Districts 1 and 2.

With the increased frequency of commercial fishing periods, the amount of subsistence fishing closure time around commercial periods was reduced from 12 hours to 6 hours before, during, and after each commercial fishing period. In Districts 1, 2, and 3, subsistence fishing was open 7 days a week, 24 hours a day except for closures around each commercial salmon fishing period. The length of closed subsistence fishing time was reduced beginning on August 13 prior to the first commercial period.

The commercial salmon fishing season in the lower Yukon River closes on or before September 1 by regulation. In 2007, the first half of the season was weak with no commercial fishing because the run size appeared to be only adequate to support escapement and subsistence needs. However, due to late run timing, the lower river commercial fishing season was extended because a harvestable surplus was identified and there was market interest.

The increased strength of recent fall chum salmon runs has renewed interests for commercial fishing in upriver districts. The commercial salmon fishing season was opened in District 4 with fishing periods scheduled during the summer season, but the interest dropped off as summer progressed and no periods were opened during the fall season. Subsistence fishing was on a schedule of 5 days a week in District 4 during most of the fall season and was extended to 7 days a week beginning October 5 to provide increased opportunity for subsistence fishermen to harvest late running fish.

One commercial fishing period was opened in Subdistricts 5-B and 5-C beginning August 26 which harvested 427 fall chum salmon out of the first pulse of fish moving upriver (Appendix A21). The small market was satisfied until interest rose again late in the season in Subdistrict 5-B. One period was announced to begin September 26. Fishing time was extended twice in an effort to develop the new operation. However, plans did not work out and no additional salmon were harvested commercially in District 5. Subsistence fishing in Subdistricts 5-B and 5-C was on a schedule of fishing 5 days a week and concurrent with commercial periods through most of the season until September 30 when fishing time was extended to 7 days a week, similar to Subdistrict 5-D. Subsistence fishing in Subdistrict 5-A was on a schedule of two 48-hour periods a week consistent with the *Tanana River Salmon Management Plan* for most of the fall season and was also relaxed to 7-days a week on September 30.

Commercial salmon fishing in District 6 began September 10 on a schedule of two 42-hour periods a week (Appendix A21). The Tanana River is managed under the *Tanana River Salmon Management Plan* which provides guidelines to manage District 6 as a terminal fishery based on the assessed strength of the stocks in the Tanana River drainage. The commercial harvest in District 6 was comprised of predominantly female salmon with the primary product bound for roe markets. One commercial period was canceled on September 17 because of inadequate catch reporting. The commercial fishing season in the Tanana River ended on October 10 due to freezing temperatures decreasing product value. Subsistence and personal use fishing was open concurrently with the commercial fishing periods. Personal use periods remained on the schedule of two 42-hour fishing periods per week while subsistence fishing in Subdistricts 6-A and 6-B was relaxed to 7-days a week in accordance with the *Tanana River Salmon Management Plan* at the close of the commercial fishing season. The Tanana River commercial harvest of 15,572 fall chum salmon was within the guideline harvest range (GHR) of 2,750 to 20,500 fish. The male portion of the harvest was reported as caught but not sold and used for subsistence. Even with the commercial fishery, the postseason assessment indicated that escapement goals were exceeded in the Tanana River.

The 2007 total run of fall chum salmon was approximately 1.0 million fish and was within the preseason projected range. The commercial harvest of 90,677 fall chum salmon was well above both the recent 5-year average harvest of 33,700 fish and the 10-year average of 20,500 fish (JTC 2008).

Coho Salmon Management Overview

The 2007 coho salmon run was managed to provide for escapement needs, subsistence, personal use, and commercial harvest. However, the commercial harvest was dependent to a large extent upon the abundance of fall chum salmon and the accompanying management strategies. The 2007 coho salmon outlook was for a continuation in the trend of above average runs, below average subsistence harvests because of low effort, with an expected commercial harvest of 50,000 to 70,000 fish.

The coho salmon run exhibited early run timing and the index of run size was above average based on Pilot Station sonar. Test fishery projects at Emmonak, Mountain Village, Kaltag, and in the Tanana River provided similar run assessment of magnitude and run timing. The run size estimate at Pilot Station sonar through August 31 was approximately 173,000 fish (Appendix A14), which was above the historical average (1995–2006) passage estimate of 140,000 coho salmon.

The preseason market outlook favored fall chum salmon, but buyers readily accepted coho salmon and paid a slightly higher price per pound as the season progressed. Even though the primary focus of commercial fishing was to target fall chum salmon, fishing periods were also controlled to spread harvest impacts throughout the run of the smaller coho salmon stock. As with fall chum salmon, transportation costs were a major limiting factor in the coho salmon fishery. Fish buyers only operated near the transportation hubs in the lower river Districts 1 and 2 and upriver in Subdistrict 6-B near Nenana. Fishermen had to weigh the price of gas in relation to the benefits of potential commercial harvests. The extended commercial season and liberalized subsistence fishing time increased fishing opportunity for coho salmon throughout the drainage.

Harvest and Value

The 2007 total commercial harvest for the Yukon River fall season included 90,677 fall chum and 44,575 coho salmon for the Alaska portion of the drainage (Appendix A5 and A21). Both the fall chum and coho salmon harvests were the third highest since 1997 (JTC 2008). A total of 74,678 fall chum and 43,207 coho salmon were harvested in the Lower Yukon Area and 15,999 fall chum and 1,368 coho salmon were harvested in the Upper Yukon Area. All salmon were sold in the round with no salmon roe sold separately. However, in District 6 whole female salmon were selectively purchased for roe extraction during the fall season. The 2007 Yukon Area fall chum salmon commercial harvest was approximately 21% of the previous 10-year average (1997-2006) of 74,873 fish and 54% above the 10-year average of 29,450 coho salmon (JTC 2008).

The overall average weight of fall chum salmon was 6.8 pounds and the average weight of coho salmon was 7.4 pounds. In Districts 1 and 2, the average weight was 7.1 and 7.5 pounds for fall chum and coho salmon respectively.

There were a total of 16 commercial fishing periods in the lower river Districts 1 and 2 combined (8 periods in District 1 and 8 periods in District 2). No periods were opened in District 3 due to the lack of a market. The commercial fishing season was open in District 4, but no periods were opened due to lack of market. Subdistricts 5-B and 5-C had one 48-hour commercial period early in the fall season with 2 fishermen landing 427 fall chum salmon. Subdistrict 5-B was opened later in the season for 264 hours to provide opportunity for commercial fishing, but no

commercial harvest was reported. In the Tanana River (District 6) there were eight 42-hour commercial salmon fishing periods beginning September 10 until October 10. After October 10 temperatures were below freezing and threatened product quality. This prompted the closure of the commercial season.

The preliminary 2007 commercial fall chum and coho salmon season exvessel value for the Yukon Area was $290,400 ($272,100 for the Lower Yukon Area, $18,300 for the Upper Yukon Area) (Appendix A11). The previous 10-year average value for the Yukon Area was $102,400 ($88,700 and $13,700 for the Lower and Upper Yukon Area, respectively).

Yukon River fishermen received an average price of $0.27 per pound for fall chum salmon in the Lower Yukon Area and $0.20 per pound in the Upper Yukon Area in 2007. This compares to the 1997–2006 average of $0.23 per pound and $0.13 per pound, respectively. For coho salmon, fishermen received an average price of $0.39 per pound and $0.20 per pound in the Lower and Upper Yukon areas compared to the recent 10-year average price of $0.28 and $0.12 per pound, respectively.

Fishing effort has increased in recent years. A total of 310 fishermen participated in the 2007 fall chum and coho salmon fishery. Of this total, 300 fished in the Lower Yukon Area and 10 fished in the Upper Yukon Area (Appendix A21) compared to the recent 10-year average of 118 permit holders (113 for the Lower Yukon Area, 5 for the Upper Yukon Area). Even though the effort appears high, participation is concentrated around a few buying stations rather than spread throughout the drainage as it was prior to the late 1990s.

ENFORCEMENT

The primary enforcement authority for violations of Fish and Game regulations is the Department of Public Safety, Alaska Wildlife Troopers (AWT). State AWT monitored subsistence, personal use, and commercial fisheries within the Yukon Area.

Patrols were conducted in Districts 1, 2 and 3 of the Yukon Area with the use of 4 float planes and several skiffs during salmon fisheries from June 15 through June 30, 2007. Boating safety patrols were conducted in conjunction with commercial fisheries enforcement and citations/warnings were issued for lack of personal floatation devices and vessel registrations. A total of 1,654 contacts were made and 118 citations were issued, of which approximately 30 were boating safety issues including 2 DUIs, 19 for fishing during closed periods or fishing in closed waters, 31 for either vessel or gear identification issues, 16 for license or permit issues, and 7 for either fish ticket or catcher-seller problems. ADF&G staff reported several incidences of lack of gear identification and fishing during a closure in Subdistricts 5-B and 5-C.

COMMERCIAL FISHERY–CANADA

Low run strength resulted in a closure of the commercial fishery during the Chinook salmon season. The commercial harvest of other species included 7,109 fall chum salmon and 2 coho salmon (Appendix A23). The combined species catch of 7,111 salmon was 12.5% below the 1997–2006 average commercial harvest of 8,127 salmon. Since 1997, there has been a marked decrease in commercial catches of Upper Yukon River Chinook and fall chum salmon that have resulted from a limited market as well as reduced fishing opportunities in some years due to below average run sizes.

Canadian Upper Yukon River commercial, non-commercial and Porcupine River Chinook salmon harvests for the 1961 to 2007 period are presented in JTC (2008). During 2007, 17 of 21 eligible commercial fishing licenses were issued. Twenty commercial fishing licenses were issued in 2005 and 2006 while 21 were issued in 2003 and 2004.

CHINOOK SALMON

The total run size of Canadian-origin Upper Yukon River (Canadian portion of the Yukon River drainage excluding the Porcupine River drainage) Chinook salmon in 2007 was expected to be average with a preseason outlook of 93,700 fish. This outlook was based on the average of a stock/recruitment (S/R) model and a sibling model. The outlook derived from the S/R model developed from the 1982 to 2000 brood years was 74,500 fish, while the outlook from the sibling relationship was 112,900 fish. Uncertainty regarding recent outlooks is apparent from the poor run sizes of Upper Yukon River Chinook salmon within the 1998 to 2001 period, which were significantly lower than expected, despite healthy brood year escapements.

In April 2007, the Yukon River Panel met to develop recommendations regarding spawning escapement goals for 2007. Prior to making their recommendation, the Panel considered the status of spawning escapements in the brood years that would contribute to the 2007 run. The Panel concluded that the 2007 Chinook salmon run should be considered to be a rebuilt run since the major contributing brood years achieved or exceeded the escapement goal range for rebuilt stocks as defined in the Yukon River Salmon Agreement (YRSA). As a result, the Panel recommended that the 2007 Upper Yukon River Chinook salmon spawning escapement goal should be 33,000–43,000 fish (Appendix A35).

Upon considering the Panel outcome, the Yukon Salmon Committee (YSC) recommended a spawning escapement goal of >33,000 Upper Yukon River Chinook salmon for 2007. This marks at least a 5,000 fish increase over the goal in recent years and resulted in modifications to the trigger points in the decision matrix used to determine the conduct of Canadian fisheries.

Compared to decision matrices developed in previous years when the spawning escapement goal was >28,000 Chinook salmon, the 2007 matrix included a wider Yellow Zone and higher trigger point for the Green Zone. The increase in the escapement goal to >33,000 in 2007 moved the trigger point for the Green Zone to 42,000 (from 37,000 in 2006), and the Yellow Zone was redefined as a run size projection (to the border) of between 19,000 and 42,000 Chinook salmon. Therefore, the consequences of planning to put more fish on the spawning grounds were as follows:

i. The commercial, domestic and recreational fisheries would not be opened unless it was expected the border escapement will be greater than 42,000 Chinook salmon (the 2006 threshold was 37,000 fish); and

ii. Consideration would be given to restricting First Nation fisheries if the run size to the border was within the 19,000 to 42,000 range; in 2006 restrictions could be implemented if the run was within the 19,000 to 37,000 range. Closures would be considered if the run projection was <19,000 fish, the same guideline used in previous years.

Determination of Run Status Inseason

An early indication of the run strength comes from data collected by U.S. management agencies (ADF&G and USFWS) and other U.S. projects. These data include: test fisheries at the mouth of the Yukon River and at Rampart Rapids, sonar estimates from Pilot Station (combined with

stock ID data if available) and Eagle sonar project, and Alaska commercial and subsistence fishery data. Although this information is not specific to Canadian stocks in the absence of stock identification (ID) information, it is useful in obtaining a preliminary "sense" of the run strength. Contact with U.S. managers usually commences in early June followed by weekly updates. By the time stocks reach the Canadian section of the drainage, the relative abundance of the various salmon runs and run timing characteristics have been generally ascertained in the lower river. This information serves as an early warning of runs that deviate from preseason outlooks and allows time to prepare Canadian managers and fish harvesters for potential changes to fishing plans. The initial openings or closures in the Canadian fisheries are often influenced by this information.

In the past, when the Chinook salmon run has reached the Canada/U.S. border, the focus usually shifted to stock assessment programs conducted in Canada, namely the Yukon River mark–recapture program. This program provides inseason projections of the border escapement, i.e., the run size as it enters the Canadian section of the Upper Yukon River, which guides weekly abundance-based management decisions. Inseason mark–recapture projections are generally available from the third week of July through mid-August. Traditionally, the recapture of tags in the commercial fishery has provided the data used to determine inseason run projections. In recent years when the commercial fishery has not opened due to conservation concerns, a test fishery funded by the Yukon River Panel has provided the information used for inseason run projections.

Chinook Salmon Season Start-up Regime in 2007

U.S. run assessments at the Rampart Rapids fish wheel and Eagle sonar programs were used to determine whether a Canadian commercial or test fishery would be chosen for assessment purposes. If the U.S. upriver assessment was >15%, above the 2006 data (adjusted for run timing), a commercial fishery would be initiated. Similarly, a test fishery would be initiated if the U.S. upriver assessment information was <15% than observed in 2006. It was postulated that in order to meet the new escapement goal range, the Alaska run indices in the upper Yukon River would need to be at least 15% higher than they were in 2006 for the commercial fishery to open. In the second week of the Chinook salmon season, inseason estimates from the DFO mark–recapture program as well as information from the Rampart Rapids fish wheel and Eagle sonar program were to be used to determine whether or not to open the commercial fishery. After the second week, the mark–recapture program was to be used to make decisions about the commercial fishery, although consideration would also be given to the Eagle sonar data.

Canadian Integrated Fisheries Management Plan

The key elements of the 2007 Integrated Fisheries Management Plan (IFMP) for Yukon River Chinook salmon developed by the Yukon Salmon Committee (YSC) were as follows:

i.) A minimum spawning escapement target of >33,000 Upper Yukon River Chinook salmon consistent with the Yukon River Panel recommendation from the April 2007 Yukon River Panel meeting in Fairbanks, Alaska. The YSC recommended allowing First Nation (FN) fisheries to occur as long as the spawning escapement was >18,000 Chinook salmon and the First Nation catch was consistent with the Yukon River Salmon Agreement harvest sharing provisions.

ii) Commercial, recreational and domestic fisheries would be given opportunities to fish if inseason run projections indicated that requirements for conservation, i.e. the target spawning escapement goal of >33,000, and First Nations harvests would likely be achieved.

In recent years, the opening of the commercial fishery has frequently been delayed in response to conservation concerns and/or uncertainties concerning the status of the run. When tag recoveries are unavailable due to the absence of a commercial fishery, there is a need to implement a test fishery to provide stock assessment data for inseason run assessment, because there is little other information to rely on for inseason run projections. The option of using just the DFO fish wheel catch has not been chosen because of a poor historical relationship between the fish wheel catch and run size estimates.

Early in the 2007 season, information from the U.S. test fishery at Emmonak, the Pilot Station sonar program, and the initiation of a U.S. commercial fishery on the lower Yukon River suggested that the Canadian Chinook salmon escapement target would likely be achieved and a TAC would be established. Based on this information it was deemed unlikely that FN fisheries would be restricted and fishing opportunities would likely be available for the Canadian commercial, domestic, and recreational fisheries. The domestic fishery is opened on the same schedule as the commercial fishery. However, it became apparent that the 2007 run was weaker than anticipated and there was a shift in the lower river commercial openings (Districts 1 and 2) from unrestricted commercial openings directed at Chinook salmon to restricted openings directed at summer chum salmon.

Based on information from the inseason run abundance indicators in Alaska, it was decided that a Canadian test fishery was required and commercial Chinook salmon fishing opportunities in Canada were unlikely.

Chinook salmon were first caught in the DFO fish wheels on July 3, which is 3 days later than the 1997–2006 average date of June 30. The first Chinook salmon was caught in early July in 8 of the 23 years within the 1985–2007 period. In 5 of the years since 1999, Chinook salmon were first caught in early July. A total of 1,462 Chinook salmon were caught in the fish wheels, which is 90.8% of the 1997–2006 average catch of 1,611 fish.

The primary purpose of DFO fish wheels is to live-capture salmon throughout the run for tagging purposes. Recoveries of tagged fish, primarily in the Dawson area commercial fishery, are used to estimate the abundance of fish throughout the season. Inseason projections of the total run into Canada, also referred to as "border escapement", are developed by expanding the point estimates of run size developed from the mark–recapture data by historical run timing information. These projections are a key component in Canadian management decisions.

Throughout the 2007 season, inseason border escapement run projections were usually produced twice weekly. Early in the season, run size projections are very sensitive to the run timing information used because the early timing information represents a very small proportion of the total run. The border escapement run projections are expanded based on what is considered to be the most likely timing scenario (i.e., early, average or late timing) given the information at hand (i.e., U.S. fishery and assessment data and early indications in Canada). The intent of applying different expansions is to ensure that the projections cover an appropriate range of the potential run timing scenarios.

Inseason run projections were consistently well below the decision threshold that would have triggered a commercial fishery. Consequently, the Chinook salmon commercial fishery was closed throughout the 2007 season and there were no reports of Chinook salmon harvested during the fall chum salmon commercial openings (Appendix A23). For comparison, the previous 10-year

average (1997–2006) commercial catch was 2,642 Chinook salmon (JTC 2008). The average does not include the year 2000, when the fishery was closed; however, it includes very low catches in 1998 and 2002 when the commercial fishery was severely restricted.

CHUM AND COHO SALMON

The preseason outlook for the 2007 Upper Yukon River fall chum salmon run was for a below average to average run of 94,600 to 147,600 fish. For odd-years returns, on average, 69% of Upper Yukon River adult chum salmon return as age-4, and 29% return as age-5. These percentages suggested the major portion of the 2007 chum salmon run would originate from the 2002 and 2003 brood years. The estimated escapements for these years were 98,695 and 142,683, respectively; both exceeded 80,000 fish and therefore achieved the escapement goal for rebuilt Upper Yukon River fall chum salmon. The weighted (by age) brood escapements contributing to the 2007 Upper Yukon River fall chum salmon run was 127,700 fish.

Since 2002, preseason outlooks have been based on stock/recruitment models incorporating escapement and subsequent associated adult return-by-age data. Annual runs were reconstructed using mark–recapture data and assumed contributions to U.S. catches. Although insufficient stock identification data were available for accurately estimating the annual U.S. catch of Upper Yukon River fall chum salmon, rough estimates were made using the following assumptions:

i. 30% of the U.S. catch of fall chum salmon was composed of Canadian-origin fish;

ii. U.S. catch of Canadian-origin Upper Yukon River and Canadian-origin Porcupine River chum salmon were proportional to the ratio of their respective border escapements; and

iii. Porcupine River border escapement consisted of the Old Crow aboriginal fishery catch plus the Fishing Branch River weir count.

All of these assumptions require additional evaluation as some recent Porcupine River mark–recapture data are available and advances in genetic stock ID will permit more accurate estimates of the proportion of Canadian fall chum salmon run harvested in U.S. fisheries.

The Canadian fall chum salmon management plan for 2007 acknowledged the recent improvements in run size from 2003 through 2006 and the likelihood of an average run in 2007. The plan contained the following key elements:

i. A minimum spawning escapement target of >80,000 Upper Yukon River fall chum salmon consistent with the April 2007 Yukon River Panel recommendation;

ii. A limited fall chum salmon commercial fishery would occur early in the 2007 season if DFO anticipated that the spawning escapement goal and First Nation's requirements would likely be achieved. Information from this early chum salmon fishery would be used for inseason run projections; and

iii. A minimum spawning escapement target of >34,000 fall chum salmon to the Fishing Branch River consistent with the April 2007 Yukon River Panel recommendation.

In 2007, funding was available from the Yukon River Restoration and Enhancement fund for a live-release fall chum salmon test fishery in the Dawson City area. This project is designed to provide catch and tag recovery data that are used to develop inseason population estimates. A similar project was conducted jointly by the Yukon River Commercial Fishing Association and

the Tr’ondek Hwech'in First Nation in 2002–2004. Prior to 2002, projections of fall chum salmon border escapement were developed from either the DFO fish wheel catch data or from fish wheel tagging data and tag recovery from 2 fisheries located in the Dawson City area: the commercial fishery and the Tr’ondek Hwech'in First Nation aboriginal fishery.

Similar to the decision matrix developed for Chinook salmon, a fall chum salmon decision matrix was presented in the 2007 Integrated Fisheries Management Plan (IFMP). Red, Yellow and Green management zones were described by specific reference points (run sizes into Canada) and expected management actions. The Red Zone included run projections of less than 40,000 fall chum salmon when closures in all fisheries except for the live release test fishery could be expected. The Yellow Zone included run projections within the 40,000 to 83,000 range; within this zone, commercial, domestic and recreational fisheries would be closed and the First Nation fishery would be reduced with more restrictions the closer the run projection was to the lower end of the Yellow Zone. The Green Zone included run size projections greater than 83,000 fall chum salmon and indicated that First Nation fisheries would be unrestricted and harvest opportunities within the commercial, domestic, and recreational fisheries would be considered depending on run abundance and international harvest sharing provisions. The difference between the escapement goal (>80,000) and the trigger point for the Green Zone was 3,000 fall chum salmon, a total of which would fully satisfy the needs of the Canadian aboriginal fishery. Management discretion is used when the inseason projections are close to the trigger points.

The total fall chum salmon catch in the DFO fish wheels in 2007 of 11,940 was the second highest on record and was 136% above the 1997 to 2007 average of 5,064 fish. The 2007 fall chum salmon run was unusually late. Information from stock assessment projects conducted in the U.S. including the Pilot Station sonar program, inseason GSI analyses of Pilot Station DNA samples, the Rampart Rapids fish wheel program, and the Eagle sonar program, all indicated that the Canadian Upper Yukon River fall chum salmon escapement target would likely be achieved and a TAC would be established. There were indications that a live–release test fishery was unnecessary in 2007; however, DFO managers were concerned that the commercial fishery information would provide insufficient data for the mark–recapture program. For this reason, a live-release test fishery was conducted concurrently with the commercial fishery. A 4-day commercial fishery initiated on September 18 was extended by 3 days and the commercial fishery was subsequently opened for 14 days from September 28 to October 12. The domestic fishery was opened on the same schedule as the commercial fishery. Despite liberal fishing opportunities, the number of fishermen participating in the 2007 commercial fishery was very low. Similar to most previous years, no domestic fishermen fished for fall chum salmon (Appendix A23).

The total 2007 commercial fall chum salmon catch of 7,109 fish (Appendix A23) was 11.3% higher than the 1997 to 2006 average of 6,386 (JTC 2008). Between 1997 and 2006, the commercial fall chum salmon catch ranged from zero in 1998, when the fishery was closed due to conservation concerns, to 11,931 fall chum salmon in 2005. The fall chum salmon commercial fishery is somewhat of a misnomer as virtually all of the catch is used for what could be termed personal needs. License holders use most of the catch to feed their personal sled dog teams. This situation could change with the development of local processing capability and a move towards the sale of value-added products such as smoked fall chum salmon and salmon caviar. Two coho salmon were recorded in the commercial catch in 2007.

SUBSISTENCE, PERSONAL USE, ABORIGINAL, DOMESTIC, AND SPORT FISHERIES

ALASKA

Subsistence Salmon Fishery

Subsistence salmon fishing activities in the Yukon Area typically begin in late May and continue through early October. Salmon fishing in May and October is highly dependent upon river ice conditions. Fishing activities are usually based from a fish camp or a home village. Extended family groups, representing 2 or more households, often work together to harvest, cut, and preserve salmon for subsistence use. Some households from communities not located along the mainstem Yukon River operate fish camps along the mainstem Yukon River.

Throughout the drainage most Chinook salmon harvested for subsistence use are dried, smoked or frozen for later human consumption. Summer chum, fall chum and coho salmon harvested in the Lower Yukon Area are primarily utilized for human consumption and are also dried, smoked, or frozen for later use. In the Upper Yukon Area, small Chinook (jacks), summer chum, fall chum, and coho salmon are all important sources of food for humans, but a larger portion of the harvested salmon are fed to dogs used for recreation, transportation and drafting activities (Andersen 1992). Summer chum salmon used for dog food are typically dried. Fall chum and coho salmon are often frozen in the open air, called cribbing.

In 2001, ADF&G recommended the BOF amend 5 AAC 01.236 to include a revised finding of the amount necessary for subsistence (ANS) for the Yukon Area using updated subsistence harvest data. After a thorough review of various options (Vania 2000), the BOF made a finding of ANS for the Yukon Area (including Coastal District communities of Hooper Bay and Scammon Bay) by species as follows:

ANS range for the Yukon Area by species:

ii. Chinook salmon 45,500–66,704
iii. Summer chum salmon 83,500–142,192
iv. Fall chum salmon 89,500–167,900
v. Coho salmon 20,500–51,980

In 2007, all salmon runs were judged sufficient to provide for escapement and subsistence needs within Alaska as well as border passage commitments for fall chum salmon to Canada. However, Chinook salmon border passage was below expectations, resulting in low Canadian escapements and low harvest. In Alaska, subsistence fishing for Chinook and summer chum salmon was open 7 days a week prior to commencement of the *Yukon River King Salmon Management Plan*. The plan requires a conservative regulatory window schedule which began May 28 in the lower Yukon Area District 1. The regulatory subsistence fishing schedule was in place for approximately 3 weeks and implemented sequentially in upriver districts according to dates consistent with the Chinook salmon migratory timing. After a short commercial fishing period on June 15 in District 2, the Chinook and summer chum salmon runs were assessed to have a surplus above escapement needs and subsistence use, and the subsistence salmon fishing schedule reverted back to the pre-2001 Alaska Board of Fisheries subsistence fishing schedule. The schedule was implemented in the same manner as it was instituted, which was chronologically upriver based on run timing, to afford similar protection as in the lower river to

the early run fish. Consequently, the subsistence salmon fishing schedule provided additional fishing opportunities to harvest Chinook and summer chum salmon.

The inseason management strategy for the fall season was to continue the pre-2001 subsistence summer fishing schedule into the fall season. This management decision was based on the satisfactory performance of the summer chum salmon run that provided confidence in the 2007 preseason projection that the fall chum salmon run would be more than sufficient to meet escapement goals and subsistence needs, and provide for commercial fishing opportunities. Coho salmon abundance was also assessed as large enough to meet escapement objectives and provide for additional subsistence and commercial salmon fishing opportunities. However, the 2007 fall chum salmon run was exceptionally late, which prompted a more conservative management approach. Subsistence fishing opportunity remained on the pre-2001 schedule during the first half of the fall season with no commercial fishing periods in accordance with the *Yukon River Drainage Fall Chum Salmon Management Plan*. As the fall season developed, the late abundance of fall chum salmon provided the confidence to extend the commercial fishing season and fishing time. In much of the drainage where commercial fishing did not occur, subsistence salmon fishing opportunities were open 7 days per week. In districts and subdistricts where commercial salmon fishing took place, the amount of subsistence salmon fishing time was increased by allowing additional fishing time around commercial fishing periods.

Throughout the summer and fall fishing seasons, fishing opportunities for non-salmon fish species were also available during subsistence salmon closed periods. Stipulations for harvesting non-salmon species during closed salmon periods required the use of gillnets with 4-inch or less stretch mesh, but prohibited the operation of fish wheels. A new regulation adopted by the BOF for the 2007 season was implemented in Yukon Area Districts 1–3, from June 1 to July 15. The regulation required fishermen to remove both tips (lobes) of the tail fin of Chinook salmon taken for subsistence use to provide assurance that subsistence caught Chinook salmon were not sold or purchased commercially (Figure 11).

In 2007, reports from fishermen suggested that most mainstem Yukon Area subsistence fishing households met their subsistence needs for salmon. Subsistence households in the lower Yukon River reported good catches of Chinook and summer chum salmon, and they commonly reported meeting their needs. Poor drying weather may have contributed to loss of fish due to spoilage, and in some cases the subsistence harvest for specific households was greater than usual to replace lost fish. In Koyukuk River communities, inseason reports and the annual postseason subsistence survey conducted by ADF&G indicated that households did not meet or had trouble meeting their needs for Chinook and chum salmon and for other non-salmon species. Difficulties in meeting needs as reported by Koyukuk River fishermen were initially due to high water and debris conditions followed by reports of poor quality (sickly) fish being caught. These reports indicated substantial numbers of dead and/or sick chum salmon, sheefish, and whitefish that could not be used for subsistence purposes.

Drainagewide, many surveyed fishermen who indicated they met their subsistence household needs for Chinook salmon reported they had to work harder than normal to harvest the fish. Chinook salmon flesh quality was reported as being generally better than in recent years, while fish size ranged from small to medium. Some upper mainstem Yukon River fishermen reported harvesting larger Chinook salmon than in recent years. Fishermen who targeted the late arriving fall chum salmon generally had to fish longer into the fall season to meet their needs. In addition to the poor fishing conditions from high water and weather conditions, many fishermen indicated fishing efforts

were further hampered because the fishing schedule and the Chinook salmon run timing in their area did not coincide, most notably in the lower Yukon River communities. A commonly cited reason for not meeting needs was that the fishing schedule conflicted with work opportunities, and when the regulatory fishing schedule was lifted most of the "good" Chinook salmon had already traveled past their area. Other factors contributing to the inability to meet subsistence salmon needs included the high price of gasoline, fuel shortage, health, elders unable to fish, lack of fishing gear, and mechanical problems. Fishermen in many communities avoided repetitive travel to fish camps because of high fuel costs. In many cases, they fished near their home community or waited until the peak of the run occurred in their area before attempting to fish. As in recent years, many individuals took advantage of work opportunities on fire-fighting crews outside of Alaska. They consequently did not fish and relied on others to provide them with fish.

Documentation of the subsistence salmon harvest is necessary to determine if sufficient salmon are returning to the Yukon Area for escapement and subsistence requirements, and if enough fishing opportunities are provided to meet subsistence needs. Most subsistence users in the Alaska portion of the Yukon River drainage are not required to report their salmon harvest, so the primary method of estimating this harvest is the annual subsistence salmon harvest survey conducted by ADF&G. These surveys are conducted from September through early November. Typically 33 communities are visited and fishermen from randomly selected households are interviewed based on their recent historical harvest pattern. Survey data are expanded to estimate total subsistence harvest in surveyed communities. In 2007, approximately 1,300 households were selected to be surveyed. In addition to postseason surveys, subsistence "catch calendars" are mailed to approximately 1,600 households in the non-permit portions of the Yukon River drainage. The calendars supplement the survey information and provide harvest reports from households that are unavailable to be surveyed.

In portions of the upper Yukon and Tanana River drainages that are road accessible, fishermen are required to obtain subsistence fishing permits. Data collected from over 430 subsistence permits issued in 2007 are added to the total estimate of the subsistence salmon harvest provided by the survey portion. Subsistence harvest totals also include salmon that are harvested from test fisheries and distributed to residents of communities near the projects. Data collected from subsistence surveys and fishing permits also include other information such as non-salmon harvest and demographic information.

The survey program results for the 2007 season estimated 1,255 households fished for salmon from 33 communities in the entire Yukon Area, Alaska (D. Jallen, Commercial Fisheries Biologist, ADF&G, Fairbanks; personal communication). Additionally, 183 subsistence household permit holders fished for salmon. The estimated salmon harvest in the Alaska portion of the Yukon River drainage (excluding Coastal District) totaled 53,976 Chinook, 76,805 summer chum, 100,987 fall chum, and 19,514 coho salmon (Appendix A5 and A24). A future report covering 2007 subsistence harvests will provide a discussion about 2007 subsistence harvests in regard to ANS determinations. Included in the estimated total harvest are 1,965 Chinook, 2,359 summer chum, 3,028 fall chum, and 1,264 coho salmon distributed for subsistence use from the various test fishery projects. In addition, an estimated 148 fishing households harvested 1,198 Chinook, 16,121 summer chum, 234 fall chum, and 110 coho salmon in the Coastal District (Appendix A24). A chum salmon tagging study conducted in June and July 1986 indicated that residents of Hooper Bay harvest chum salmon bound primarily to the Yukon River, but some Norton Sound and Kotzebue chum salmon were also harvested (Kerkvliet *Unpublished*[1]).

[1] Kerkvliet, C. M. *Unpublished*. Hooper Bay salmon tagging study, 1986. Bering Sea Fishermen's Association. Located at: Alaska Department of Fish and Game, Division of Commercial Fisheries, 333 Raspberry Road, Anchorage, Alaska.

Personal Use Fishery

Fairbanks Nonsubsistence Area, located in the middle portion Tanana River, contains the only personal use fishery within the Yukon River drainage. Subsistence or personal use permits have been required in this portion of the drainage since 1973. Personal use fishing regulations were in effect from 1988 until July 1990 and from 1992 until April 1994. In 1995, the Joint Board of Fisheries and Game reestablished the Fairbanks Nonsubsistence Area, and it has been managed consistently under personal use regulations since then. Historical harvest data must account for these changes in status. Subsistence fishing is not allowed within nonsubsistence areas.

The area known as Subdistrict 6-C is completely within the Fairbanks Nonsubsistence Area and therefore falls under personal use fishing regulations. Personal use salmon and whitefish/sucker permits and a valid resident sportfish license are a requirement to fish within the Fairbanks Nonsubsistence Area. The individual personal use household permit harvest limit is 10 Chinook, 75 summer chum, and 75 fall chum and coho salmon combined. The personal use salmon fishery in Subdistrict 6-C has a harvest limit of 750 Chinook salmon, 5,000 summer chum salmon, and 5,200 fall chum and coho salmon combined.

In 2007, the personal use salmon fishery followed the regulatory fishing time of two 42-hour periods per week. A total of 65 personal use salmon and 3 personal use whitefish and sucker household permits were issued (D. Jallen, Commercial Fisheries Biologist, ADF&G, Fairbanks; personal communication). Of the 68 personal use permits issued, 66 were returned and 32 were fished. Personal use salmon permit holders from Subdistrict 6-C harvested 136 Chinook, 184 summer chum, 173 fall chum, and 135 coho salmon (Appendix A25). No salmon were harvested by personal use whitefish permit holders.

Sport Fishery

Sport fishing effort for anadromous salmon in the Yukon River drainage is directed primarily at Chinook and coho salmon, with little effort directed at chum salmon. In this report all of the chum salmon harvested in the sport fishery are categorized as summer chum salmon. A portion of the genetically distinct fall chum salmon stock may be taken by sport fishermen, however most of the sport chum salmon harvest is thought to be made up of summer chum salmon because: 1) that run is much more abundant in tributaries where most sport fishing occurs, and 2) the chum salmon harvest is typically incidental to effort directed at Chinook salmon which overlap in run timing with summer chum salmon.

Most of the drainage's sport fishing effort occurs along the road system in the Tanana River valley. From 2002–2006 the Tanana River on average made up 85% of the total Yukon River drainage Chinook salmon harvest, 29% of the summer chum salmon harvest, and 60% of the coho salmon harvest. Most Chinook and chum salmon are harvested from the Chena, Salcha, and Chatanika rivers, and most coho salmon are harvested from the Delta Clearwater and Nenana River systems.

In 2007, no emergency orders or special restrictions were issued for any of the salmon sport fisheries in the Yukon River drainage. Alaska sport fishing effort and harvests are monitored annually through a statewide sport fishery postal survey. Harvest estimates are typically not available until approximately one calendar year after the fishing season. The sport harvest of salmon in the Alaska portion of the Yukon River drainage in 2007 was estimated at 960 Chinook, 245 summer chum, and 597 coho salmon (Appendix A5). The recent 5-year (2002–2006) average Yukon River drainage sport salmon harvest was estimated at 1,188 Chinook, 649 summer chum and 1,164 coho salmon.

CANADA

Aboriginal Fishery

In 2007, as part of the implementation of the Yukon River Final Agreements (comprehensive land claim agreements), the collection of inseason harvest information for the Upper Yukon River was conducted by First Nations within their respective Traditional Territories. Before the start of the fishing season, locally hired surveyors distributed catch calendars to fishermen and asked them to voluntarily record catch and effort information on a daily basis. Interviews were then conducted in season to obtain more detailed catch, effort, gear, location and tag recovery information at fish camps or in the community, 1 to 3 times weekly. In most cases, weekly summaries were completed by the surveyors and sent to the Department of Fisheries and Oceans Canada (DFO) office in Whitehorse by fax or e-mail. Late or incomplete information was obtained post season and reviewed by First Nation staff in conjunction with DFO.

With a preseason outlook for an average run of Upper Yukon River Chinook salmon and a below average to average outlook for Upper Yukon River fall chum salmon, it was anticipated that aboriginal fisheries would not likely be restricted by conservation concerns. Recent run size trends and harvest levels suggested that 2007 Chinook and fall chum salmon escapement goals and aboriginal catch requirements would be achieved. However, a strategy was developed whereby aboriginal fisheries could be restricted, subject to international harvest sharing provisions, to address conservation concerns. For Chinook salmon, restrictions were not implemented although communities were advised that the border escapement was weaker than anticipated. For fall chum salmon, inseason run assessment information indicated that there were no apparent conservation concerns and First Nations were notified that a normal harvest level would be permitted.

Fish harvesters and First Nation staff commented that the Chinook salmon run was late, and it was an overall poor fishing season. While some fish camps reported good catches early in the run, others had limited success during the same period. Many fish camps reported their catch dropped off after the first week to 10 days of fishing and did not improve. It was reported that the majority of remote camps were closed down earlier than usual and the needs of most aboriginal communities were not met.

In 2007, the Upper Yukon River aboriginal Chinook salmon catch was 4,175 (Appendix A5), 36% below the recent 10-year average of 6,574 fish and 27% below the 2006 total of 5,757 fish (JTC 2008). In addition to the 4,175 Chinook salmon caught in the aboriginal fishery, 617 Chinook salmon were caught in the test fishery and distributed to Yukon River First Nations by the Tr'ondëk Hwëch'in First Nation.

The 2007 aboriginal catch recorded by the Tr'ondëk Hwëch'in First Nation in the Dawson area (1,067) and Ross River Dene Council near Ross River (330), were 9% and 21% above the 1997-2006 averages of 979 and 272 fish, respectively. The 2007 aboriginal catches recorded by Selkirk First Nation in the Pelly area and Little Salmon Carmacks First Nation in the Carmacks area, normally the 2 largest aboriginal fisheries in the mid-area of Upper Yukon River drainage, were 918 and 860 fish, respectively; these catches were 44% and 50% below the 1997–2006 averages of 1,639 and 1,712 fish, respectively. A below average catch was also reported by the First Nation of Na-Cho Nyäk Dun on the Stewart River; the 2007 harvest was 681 fish, 27% below the 1997–2006 average of 928 salmon. The Teslin Tlingit Council reported their lowest harvest since voluntary restrictions were implemented in 2000; a total of 298 Chinook salmon were reported,

42% of the 1997–2006 average of 707 fish. The total fishing effort for the 2007 Chinook salmon season is not available because several communities did not report fishing effort (JTC 2008).

The 2007 Upper Yukon River fall chum salmon harvest in the aboriginal fishery was 2,221 (Appendix A5); this is 6% lower than the previous 10-year average of 2,373 fall chum salmon; however, this does not include harvest data from Carmacks area and reported catch data from the Pelly area is incomplete. Participants in the 2007 fall chum salmon fishery described fishing as being excellent.

In 2007, with assistance from the Yukon River R&E Fund, the Vuntut Gwitchin Government (VGG) conducted a mark–recapture program on the Porcupine River near the community of Old Crow, Yukon Territory. The main purpose of this project is to develop a tool that quantifies the Porcupine River fall chum salmon run size at Old Crow inseason, thus enabling effective management of the local aboriginal fishery. Options to guide harvesting activity at various run sizes, and minimum spawning escapement thresholds for the Fishing Branch River are annually discussed with the VGG, Yukon Salmon Committee and DFO. For example, if the mark–recapture program estimate indicated a low abundance of fall chum salmon, the allowable aboriginal harvest at Old Crow could be lowered accordingly. This approach mirrors the abundance-based management system used on the Upper Yukon River in Canada for Chinook and fall chum salmon. In 2007, inseason information from the Porcupine mark–recapture program, the Fishing Branch River weir, and projects elsewhere in the Yukon River drainage indicated that restrictions in the Old Crow aboriginal fishery were not required.

Catch estimates of fall chum salmon on the Porcupine River near Old Crow are determined from locally conducted interviews using the catch calendar and a voluntary recording system described above. Data collection effort was more intensive during the fall chum salmon fishing season, as timely catch and tag recovery information was collected for use in the mark–recapture program. In 2007, the Chinook and coho salmon harvest estimates were derived from harvest averages and anecdotal information received from VGG staff.

A total of 4,500 fall chum salmon was harvested in the 2007 Old Crow aboriginal fishery (Appendix A5), 12% above the 1997–2006 average harvest of 4,027 chum salmon. This average harvest includes below average catches within the 2002 to 2004 period when voluntary restrictions were used to conserve the Fishing Branch River fall chum salmon run. Fall chum salmon fishing was described as excellent. An estimated 300 Chinook salmon were harvested. This compares to the 1997–2006 average harvest of 281 fish. The 2007 coho salmon harvest was estimated at 500 fish, which compares to the 1997–2006 average coho salmon harvest of 229 fish.

Domestic Fishery

There was no catch recorded in the domestic fishery in 2007. This fishery was closed during the Chinook salmon season and open for 21 days during the fall season concurrently with the fall chum salmon commercial fishery. In recent years domestic fish harvesters have targeted primarily Chinook salmon. Domestic fishery catches of Chinook and fall chum salmon for the 1961–2007 period average 579 and 405 fish, respectively (JTC 2008).

Recreational Fishery

In 1999, the YSC introduced a mandatory Yukon Salmon Conservation Catch Card (YSCCC) in an attempt to improve harvest estimates and to serve as a statistical base to ascertain the importance of salmon to the Yukon River recreational fishery. Anglers were required to report

their catch by mail by late fall. The information requested includes the number, species, sex, size, date, and location of all salmon caught and released.

In 2007, due to conservation concerns, the daily catch and possession limits in the recreational fishery were varied to zero effective August 2; most Chinook salmon had not yet reached the principal areas where recreational fishing normally occurs by this date. The preliminary estimate of the 2007 recreational catch was 2 Chinook salmon which were retained (Appendix A5) and 41 that were caught and released. The YSCCC program often involves some data interpretation and censoring, involving approximately 2% of the catch data submitted in 2007. For example, 1 sockeye salmon was reported as being caught and released; however, the catch of this species is highly unlikely as sockeye are not known to enter the Upper Yukon River drainage and coho salmon, which strongly resemble sockeye salmon in appearance, usually migrate much later than the date reported on the catch card. The sockeye record was therefore interpreted as a Chinook salmon misidentified as a sockeye salmon.

The YSCCC includes a location code that outlines 16 Yukon River locations, 4 Alsek River locations, a code for all other locations, and a request that fishermen "please specify" the other locations. In 2007, the 2 Chinook salmon retained were both caught on the Yukon River within 1 kilometer of either side of the Tatchun Creek confluence. Approximately 95% of the Chinook salmon reported to have been released were also caught on the Yukon River within 1 kilometer of either side of the Tatchun Creek confluence. The locations where the remaining 2 Chinook salmon were reported to have been caught and released were the Mayo River and Teslin Lake.

STATUS OF ESCAPEMENT GOALS

ADF&G undertakes a triennial review of salmon escapement goals in preparation for its triennial BOF meeting. This review is governed by the state's *Policy for the Management of Sustainable Salmon Fisheries* (5 AAC 39.222) and *Policy for Statewide Salmon Escapement Goals* (5 AAC 39.223) adopted in 2001. Under these policies ADF&G sets either a biological escapement goal (BEG) or a sustainable escapement goal (SEG) (ADF&G 2004; Brannian et al. 2006). Biological escapement goal (BEG) refers to a level of escapement that provides the highest potential to produce maximum sustainable yield. Sustainable escapement goal (SEG) identifies a level of escapement known to provide for sustainable yield over a 5 to 10 year period.

Most AYK Region escapement goals were set in the late 1970s or early 1980s. These goals were first documented by Buklis (1993) as required under ADF&G's original escapement goal policy signed in 1992. Changes to these goals were adopted in 2001 when BEGs were set for Yukon River fall chum salmon (Eggers 2001), Anvik River summer chum salmon (Clark and Sandone 2001), and Andreafsky River summer chum salmon (Clark 2001). These 2001 goals were adopted prior to passage of the policies, but were consistent with the policies.

Beginning in December of 2002, ADF&G undertook the first full review of its escapement goals following the adoption of the policies. An escapement goal review team, consisting of staff from the Divisions of Sport Fish and Commercial Fisheries, met 5 times over a 14-month period. Federal agency biologists and representatives of Tribal and fishing groups were invited to attend and participate in the meetings. The team's recommendations were presented to the Alaska Board of Fisheries in January 2004 and formally adopted by ADF&G in 2005. During this review, analyses for escapement goals established in 2001 were updated with the latest information and most goals were brought into compliance with the policies by making them ranges, rather than point goals.

In preparation for the February 2007 Alaska Board of Fisheries meeting, ADF&G again reviewed escapement goals. Formal meetings, open to agencies and the public, were held in April and November of 2005. Draft analyses were widely distributed for review and comment starting in January 2006 and a public review draft of recommendations for changes was distributed in March 2006. A final document summarizing the AYK Region escapement goal review was submitted to the BOF on April 10, 2006. No changes were recommended for Yukon River escapement goals in 2007.

CHINOOK SALMON

Five Chinook salmon aerial survey goals were converted to ranges and formally adopted in 2005 using the method devised by Bue and Hasbrouck[2]. In the case of Nulato River, the goals for the two forks were combined into a single goal. The escapement goal team recommended no changes to these escapement goals in Alaska for 2007 (Table 4).

Table 4.–Yukon River escapement goals set for Chinook salmon in 2005 were continued through 2007 and will be in effect for 2008.

Chinook Salmon Stock	Previous Goal (Type) Year Established	Goal Adopted in 2005 (Type)
E. Fork Andreafsky River	>1,500 (EO[a]) 1992	960-1,700 (SEG)
W. Fork Andreafsky River	>1,400 (EO[a]) 1992	640-1,600 (SEG)
Anvik River	>1,300 (EO[a]) 1992	1,100 – 1,700 (SEG)
Gisasa River	>600 (EO[a]) 1992	420 – 1,100 (SEG)
Nulato N. and S. combined	None	940 – 1,900 (SEG)
Chena River	2,800 – 5,700 (BEG) 2001	No Change
Salcha River	3,300 – 6,500 (BEG) 2001	No Change

[a] Goals were called escapement objectives (EO) because they were inconsistent with definitions BEG and SEG within the policy.

[2] Bue, B. G., and J. J. Hasbrouck. *Unpublished.* Escapement goal review of salmon stocks of Upper Cook Inlet. Alaska Department of Fish and Game, Report to the Alaska Board of Fisheries, November 2001 (and February 2002), Anchorage.

JTC Discussion of BEG for Upper Yukon River Chinook Salmon

A comprehensive BEG for Canadian origin Upper Yukon River Chinook salmon cannot be developed using available data and the Chinook Technical Committee criteria. At this time, the data are insufficient to warrant a Pacific Scientific Advice Review Committee (PSARC) review. The JTC will continue to reconcile minor differences in harvest and escapement estimates and investigate other methods to develop a less comprehensive BEG or a Spawning Escapement Goal (not to be mistaken for Sustainable Escapement Goal (SEG)). Available information on the return per spawner information for Yukon River Chinook salmon is presented in Appendix A27 and more information is available in JTC (2008).

Objective

Cooperative U.S./Canada management of Canadian origin Yukon River Chinook salmon has utilized an agreed escapement goal range for rebuilt stocks (33,000 to 43,000) which has been monitored through the use of a mark–recapture program. Since 2005, the Parties have developed the Eagle sonar program to assess the abundance of Chinook salmon migrating into Canada. Comparisons between estimates derived from the mark–recapture and sonar programs suggest that the mark–recapture program has underestimated Chinook salmon abundance. In progression towards the transition from mark–recapture to sonar based assessment, it is necessary to develop a new spawning escapement goal that: 1) is applicable to sonar; and 2) is biologically defensible taking into account the data collected to date regarding escapement, returns, and factors known to limit production such as habitat capacity. At the present time, there are known technical concerns with the standard methodology used to assess escapement goals for Canadian-origin Yukon River Chinook salmon that may be addressed with additional habitat capacity evaluations.

Approach

Independent methods for assessing habitat capacity for Chinook salmon have been developed by Parken et al. (2006) based on relationships between various stock recruitment parameters (e.g., capacity) and watershed area for stream and ocean type Chinook salmon stocks along the Pacific Coast. There is good potential to apply this methodology to Canadian-origin Yukon River Chinook salmon. The JTC recommends that this work be a high priority in refining a biologically-based escapement goal.

The independent capacity estimate needs to be applied to a jointly accepted historical database relating escapement to recruitment. There are several ways to derive this database, such as utilizing the relationship between the 3-area escapement index and Eagle sonar/radiotelemetry (local) estimates to calculate historical border passage. The JTC believes this methodology should be pursued as it may be superior to using a scaling factor applied to the DFO mark–recapture (M/R) estimates of border passage because these estimates do not appear to have been consistent through time.

SUMMER CHUM SALMON

In 2005, aerial survey goals for summer chum salmon were discontinued for the East and West Forks of the Andreafsky River in favor of using the East Fork Andreafsky River weir escapement goal as an index of escapement into the system. No change was recommended for the East Fork Andreafsky River weir goal. The biological escapement goal for Anvik River summer chum salmon was revised from the 400,000 to 800,000 fish to a range of 350,000 to

700,000 as measured by the Anvik River sonar (Table 5). The escapement goal team recommended no changes to these escapement goals for 2007.

Table 5.–Yukon River escapement goals set for summer chum salmon in 2005 were continued through 2007 and will be in effect in 2008.

Summer Chum Salmon Stock	Previous Goal and Year Established	Goal Adopted in 2005 (Type)
E. Fork Andreafsky River	65,000– 130,000 (BEG) 2001	No Change (weir)
E. Fork Andreafsky River	35,000– 70,000 (BEG) 2001	Discontinued (aerial)[a]
W. Fork Andreafsky River	65,000– 130,000 (BEG) 2001	Discontinued (pop. Est.)[a]
W. Fork Andreafsky River	35,000– 70,000 (BEG) 2001	Discontinued (aerial)[a]
Anvik River	400,000– 800,000 (BEG) 2001	350,000 – 700,000 (sonar)

[a] Discontinued because of difficulty conducting aerial surveys of summer chum salmon.

FALL CHUM SALMON

Analyses for all biological escapement goals for Alaska fall chum salmon stocks were updated in 2005 using the most recent data. There have been no changes to the BEGs established in 2001 for Alaska fall chum salmon stocks (Table 6). There are no fall chum salmon BEGs for Canadian-origin stocks within the Upper Yukon River mainstem and Porcupine River drainages. The BEGs recommended by ADF&G in 2001 for the Upper Yukon River mainstem (60,000–129,000) and Fishing Branch rivers (27,000–56,000) were not accepted by the PSARC review undertaken in 2002, due to concerns with the quality of the data.

Table 6.–River escapement goals set for fall chum salmon in 2001 were continued through 2007 and will be in effect in 2008.

Fall Chum Salmon Stock	Previous Goal (Type) Year Established	Goal Adopted in 2007
Yukon Drainage	300,000 – 600,000 (BEG) 2001	No Change
Tanana River	61,000 – 136,000 (BEG) 2001	No Change
Delta River	6,000 – 13,000 (BEG) 2001	No Change
Toklat River	15,000 – 33,000 (BEG) 2001	No Change
Upper Yukon tributaries	152,000 – 312,000 (BEG) 2001	No Change
Chandalar River	74,000 – 152,000 (BEG) 2001	No Change
Sheenjek River	50,000 – 104,000 (BEG) 2001	No Change

However, the JTC has recommended an IMEG range of 22,000 to 49,000 to be used for the Fishing Branch River from 2008 to 2010. It is anticipated that a BEG for Fishing Branch River fall chum salmon will be developed by 2011. The JTC recommends that the current goal for rebuilt Upper Yukon River mainstem fall chum salmon of >80,000, as per the Yukon River Salmon Agreement, be maintained in 2008.

COHO SALMON

In 2005, the Delta Clearwater River boat survey goal for coho salmon was revised from >9,000 to a sustainable escapement goal range of 5,200–17,000 using the Bue and Hasbrouck (*Unpublished*) method. The escapement goal team recommended no changes to these escapement goals for 2007.

STATUS OF SPAWNING STOCKS IN 2007

Alaskan and Canadian researchers have developed projects to monitor escapement and to determine genetic composition, relative abundances, run characteristics, and other information pertinent to the annual salmon migration. Main river sonar, tributary sonar, weir, counting tower projects and aerial surveys are used to monitor escapement. Other information collected at ground based projects may include, but is not limited to: salmon sex and length composition, scales for age determination, samples for genetic stock identification, data on resident species, and information from the recovery of tagged fish from various projects. Various government agencies, non-government organizations, and private contractors operate projects throughout the drainage (Appendix A3 and A4).

CHINOOK SALMON

Alaska

The 2007 escapement goals for all monitored tributaries were achieved for Yukon River Chinook salmon. This assessment is based on escapement counts and estimates from selected tributaries. SEGs for aerial survey assessments have been established for the East and West Fork Andreafsky, Anvik, Nulato and Gisasa rivers. All aerial survey escapement indices either met or exceeded their SEGs (Appendix A26). BEGs have been established for the Chena and Salcha rivers located in the Tanana River drainage. In 2007, the Chena River Chinook salmon escapement estimate was 3,806 fish counted at the tower project and was within the established BEG (2,800–5,700) for this system. In the Salcha River, Chinook salmon escapement was estimated to be 6,425 fish (BEG 3,300-6,500) by the counting tower project. A summary of escapements in 2007 can be found in Appendix A26 and historical information in JTC (2008). Age and sex information collected from escapement projects in 2007 are presented in Appendix A29.

Canada

The border passage estimate from the Eagle sonar project was approximately 41,700 Chinook salmon. Subtracting harvests upriver of the sonar in Eagle and in Canada resulted in a spawning escapement of 34,904 (Appendix A26). However, the escapement target into Canada was not met in 2007. The border passage target was 33,000 to 43,000 Chinook salmon, and this estimate is based upon the Canadian fish wheel mark–recapture project. The border passage estimate provided by the project was 17,326 fish and 42.9% below the 1997–2006 average spawning escapement of 30,363 Chinook salmon (JTC 2008). The escapement target had been achieved consistently from 2001 to 2005, and nearly met in 2006. The 2007 total Chinook salmon run was weaker than the run of 2006 and below the recent 10-year average of 210,000 Chinook salmon based upon preliminary run reconstruction estimates.

Similar to 2005 and 2006, the 2007 estimate of border escapement derived from mark–recapture data appears biased low when compared to estimate derived from the Eagle sonar program located near the community of Eagle, Alaska downstream of the U.S./Canada border.

Aerial surveys of the Little Salmon, Big Salmon, Wolf, and Nisutlin river index areas were conducted by the Department of Fisheries and Oceans Canada (Appendix A26). Survey results relative to the previous cycle averages are presented below. Single (or multiple) aerial surveys do not count the entire escapement within an aerial index area as runs are usually protracted with the early spawning fish disappearing before the late ones arrive. Weather and water conditions, the density of spawning fish, as well as observer experience and bias also affect survey accuracy. Index surveys are rated according to survey conditions. Potential ratings include excellent, good, fair and poor. Survey ratings that rank higher than poor are considered useful for inter-annual comparisons. Historical counts are documented in JTC (2008).

The Little Salmon aerial survey was flown on August 16. Survey conditions were rated as being excellent and surveyors counted 451 Chinook salmon, 49.1% of the 1997–2006 average count of 919 fish. The Big Salmon, Nisutlin, and Wolf river index areas were surveyed on August 15 under fair to good survey conditions. The Big Salmon count of 601 was 57.6% of the 10-year average of 1,043 fish. The Nisutlin River index count of 137 was 34.6% of the 10-year average count of 396 fish. The Wolf River count of 54 was 32.1% of the 10-year average count of 168 fish.

In 2007, the Blind Creek weir was operational from July 17 to August 16 with 304 Chinook salmon being counted; the 1997–2006 average count is 762. A total of 101 fish was sampled for age-sex-length data and 41 (40.6%) of these were female. Based on a sample of 61 aged fish, the age-5 and age-6 year components represented 34.4% and 45.9% of the sample, respectively (JTC 2008).

A total of 4,450 Chinook salmon was counted at the Big Salmon sonar station between July 15 and August 26 in 2007. A peak daily migration of 435 fish occurred on August 1 and 90% of the run had passed the station by August 14. The counts for the 2 previous years this program operated were 5,584 in 2005 and 7,308 in 2006.

The Whitehorse Rapids Fishway Chinook salmon count of 427 was 30.4% of the 1997–2006 average count of 1,403 fish. The overall sex composition observed at the fishway was 39.2% female (n=167). Hatchery-produced fish accounted for 55.7% of the run through the fishway and included 164 males and 74 females. The non-hatchery count accounted for 44.3% of the run and consisted of 96 wild males and 93 wild females. The run midpoint and the peak daily count both occurred on August 16 when 38 fish were counted. Historical fishway counts are presented in JTC (2008).

SUMMER CHUM SALMON ALASKA

Summer chum salmon runs have exhibited steady improvements since 2001 with harvestable surpluses in each of the past 6 years (2002–2007). Weak chum salmon runs from 1998 through 2001 are attributed to reduced run size, and not the result of low levels of parent year escapements as spawning escapements were well above average from 1994 to 1996.

The 2007 summer chum salmon run was average with a total run of approximately 2.1 million fish. The drainagewide optimum escapement goal of greater than 600,000 fish was exceeded based on an estimated 1,726,885 summer chum salmon passing the Pilot Station sonar project (Appendix A14), which is above the 1997–2006 average of 1,423,801 fish.

The 2007 summer chum salmon escapement levels were near average in most tributaries. The Anvik River sonar-based escapement of 459,038 summer chum salmon (Appendix A26) was within the BEG range of 350,000 to 700,000 and the East Fork Andreafsky River weir-based escapement of 69,642 summer chum salmon was within the BEG of 65,000 to 130,000 fish. The relative contribution of these 2 tributaries to the total run has decreased from over 50% to

approximately 25% in the past 5 years indicating a production shift to spawning tributaries higher in the drainage. Despite having an average total run in 2007, escapements were slightly below average in monitored tributaries of the Koyukuk and Tanana River drainages. However, high numbers of summer chum salmon were observed in the Nulato River aerial survey and in gillnet catches approximately 200 miles up the Innoko River from Shageluk while conducting a sheefish tagging project (J. Burr, Sport Fish Biologist, ADF&G, Fairbanks; personal communication). Because summer chum salmon tributary escapements have been in flux in recent years, ADF&G and USFWS are collecting genetic samples at the Pilot Station Sonar to provide inseason mixed stock analysis. Age and sex composition data collected from escapement projects in 2007 are presented in Appendix A30.

FALL CHUM SALMON

Major fall chum salmon spawning areas are located in the Chandalar, Tanana, and Porcupine river drainages and within the Canadian mainstem Yukon River drainage (Figure 14). Fall chum salmon runs were very poor from 1998 through 2002 and fall chum salmon were designated as a stock of concern. In response to the guidelines established in the *Policy for the Management of Sustainable Salmon Fisheries*, the Alaska Board of Fisheries discontinued the stock of concern classification for the Yukon River fall chum salmon stock as a yield concern in February 2007 after reviewing stock status information and public input during the regulatory meeting. The determination was based on the availability of a near historical average harvestable surplus of fall chum salmon above escapement needs since 2003, a record run in 2005, an above average run in 2006, and an anticipated near-average run in 2007. These runs reflect a return to near average production rates.

Alaska

The Yukon River drainagewide escapement of 900,000 fall chum salmon is well above the drainagewide escapement goal range of 300,000 to 600,000 fish. Assessments of overall run size can be made using several methods. Fishery management initially places considerable weight on the Pilot Station sonar abundance estimate until upriver monitoring projects can provide data. The fall chum salmon passage estimate, based on Pilot Station sonar for the period July 19 through August 31, was 684,011 fish with a 90% confidence interval of 636,566 to 731,456 fish (Appendix A14). One method to determine total run size is based on the Pilot Station sonar abundance estimate with the addition of estimated commercial and subsistence harvests downstream of the sonar site, including test fisheries (approximately 81,000 fish), and an estimated 5% for fall chum salmon that pass into the river after termination of the project. Therefore, the total run size for the Yukon River drainage, primarily calculated from the main river sonar at Pilot Station, was estimated to be approximately 800,000 fall chum salmon. Based on the location of the project, in this case, Pilot Station (river mile 123), the abundance estimate includes Koyukuk River drainage stocks.

A second method to calculate run size is accomplished by using the individually monitored systems in the upper Yukon River and Tanana River including the estimated U.S. and Canadian harvests. For 2007, this method results in an estimate of 1,100,000 fall chum salmon (Appendix A33). However, this method does not include an escapement estimate of approximately 25,000 for stocks located in tributaries downstream of the confluence of the Tanana River such as in the Koyukuk River (Eggers 2001). The estimates for the U.S./Canada border passage are provided by 2 methods: 1) the border mark–recapture project, and 2) the Eagle sonar project. Both

estimates are very similar for the second year of evaluation. The estimate of run size based on individual projects is typically higher than that based on Pilot Station sonar. Harvests were again conservative allowing for large escapements in most areas and the estimated total run was within the preseason projection range of 900,000 to 1,200,000 based on applicable production rates.

In 2007, the return of age-4 (76%) and age-5 (21%) fish was near average while the component of age-6 (3%) fish was the highest on record, since collections began in 1977. The high abundance of age-6 fish was expected due to the continued exceptional return from the 2001 brood year. The 2001 brood year returns are now complete resulting in a record return of approximately 3.0 million fall chum salmon and an estimated 9.0 return per spawner (Appendix A34). The second highest return per spawner in the data set is 3.2 and the odd-numbered year average is only 2.3 returns per spawner. Total return of fall chum salmon in 2007 was also average, at 1.1 million fish. The summer and fall chum salmon runs are split by a calendar date (July 15 at the mouth of the Yukon River), where overlap is known to occur. In 2007, the run was characterized as a week late in timing because the first quartile was not until August 7, a day later than the average midpoint. The first pulse did not materialize until August 6 followed by a second pulse on August 12, and a third pulse on August 24. Pilot Station sonar project operations terminated before a possible fourth pulse on August 28 could be fully assessed. The third and fourth pulse did not materialize as expected at Pilot Station (Figure 13). However, commercial fishing may have affected enumeration and estimates of abundance late in the run. Pilot Station sonar operations detected 2 large pulses with the third pulse substantially lower than what projects downstream (Mt. Village drift test fishery) and upstream (Kaltag drift test fishery) indicated in 2007. The low magnitude of the last 2 pulses and the late run timing as detected by Pilot Station sonar in combination with genetic stock identification results caused the Tanana River stocks as well as late stocks to the upper Yukon River to appear weaker than was anticipated and as a result, management of fisheries was more conservative than necessary.

The average size run for an odd-numbered year combined with a conservative harvest provided sufficient strength to meet or exceed the majority of the BEG. However, weakness is still evident in the Porcupine River system. Although the runs and established interim goals for the Fishing Branch River have increased steadily since 2004, weakness in 2007 was again anticipated and the interim goal was established preseason at 33,667 fish. The weir passage was 32,150 fish (Appendix A26).

The Sheenjek River (also a system in the Porcupine River) escapement was monitored by a sonar project operated from August 11 through September 24, 2007. The sonar operated for 44 days and the cumulative count at termination was 65,435 chum salmon. The Sheenjek River project utilized Dual-Frequency Identification Sonar (DIDSON) gear on both right and left banks. The right bank estimate of approximately 38,000 fish was 24% below the lower end of the BEG range of 50,000 to 104,000 fall chum salmon. Historical Sheenjek River escapement estimates, most of which were only estimated from the right bank, ranged from 14,229 in 1999 to 246,889 fall chum salmon in 1996, with the high of 600,346 fish observed on both banks in 2005 (JTC 2008). The left bank count represented approximately 42% of the escapement estimate in 2007. It will take several more years of data collection to determine how to interpret the historical estimates, but research to date has shown that in order to provide the highest quality escapement data the left bank must continue to be monitored. The transition from split-beam to DIDSON has gone smoothly and this equipment will continue to provide accurate escapement estimates in future years.

The Chandalar River sonar project ran from August 8 through September 26, 2007 and operated DIDSON equipment on both banks. The escapement estimate was 228,056 fall chum salmon (Appendix A26), about 25% higher than the 1997–2006 average of 172,000 fish. Chandalar River sonar estimates of fall chum salmon range from a low of 65,894 fish in 2000, to a high of 496,494 fish in 2005 (JTC 2008). The 2007 estimated escapement in the Chandalar River was 50% above the upper end of the BEG range of 74,000 to 152,000 fall chum salmon.

In 2007, Eagle sonar was operated into the fall season for the second year to enumerate chum salmon. The project ended October 6 due to the onset of winter. The passage estimate was 235,956 fall chum salmon, but at the time project operations concluded, daily counts were greater than 8,000 fish. The estimate to the cessation of fish passage was therefore expanded to include 46,500 fish. The estimate of 282,670 fall chum salmon can be used as a surrogate for the U.S./Canada Border passage estimate after exclusion of the harvests from the community of Eagle. The subsistence harvest by Eagle residents above the sonar project was estimated to be 18,691 fish, resulting in a border passage estimate of 263,979 fall chum salmon (Appendix A26). The estimated border passage based on the DFO mark–recapture project was 236,000 fall chum salmon and is approximately 1.9 times higher than the mainstem goal of greater than 80,000 fall chum salmon. Overall the relative contribution of Canadian origin stock represents approximately 27% of the total escapements in 2007.

The 2007 inseason monitoring of the Tanana River drainage consisted of fall chum salmon run abundance estimates from mark–recapture techniques. Two population estimates were generated, one for the Kantishna River drainage (approximately 81,843 fish) and one for the upper Tanana River drainage (approximately 320,811 fish) (Appendix A26). The Tanana River established BEG range of 61,000 to 136,000 includes the Toklat River index area BEG range of 15,000 to 33,000 fall chum salmon. To represent the upper Tanana River, the Toklat River range is subtracted, leaving a BEG range of 46,000 to 103,000 fall chum salmon used to compare with the mark–recapture estimate.

The Toklat River is the primary producer of fall chum salmon in the Kantishna River drainage and the Kantishna River estimate of abundance is combined with the upper Tanana River to estimate the contribution to the Tanana River as a whole. The 2007 combined population estimates for the Tanana River, minus appropriate harvests, is approximately 375,000 fish for escapement which is 2.8 times higher than the upper end of the BEG range of 61,000 to 136,000 fall chum salmon. Overall the relative contribution of the Tanana River stock represents 41% of the total escapements in 2007.

The Delta River, a tributary in the upper Tanana River drainage, has a BEG range of 6,000 to 13,000 fall chum salmon. Evaluation of the run to Delta River in 2007 was based on 9 replicate foot surveys conducted between October 5 and December 6. The Delta River escapement was estimated to be 18,610 fall chum salmon (Appendix A26) based on the area under the curve method. This level of escapement was 43% higher than the upper end of the BEG range.

Fall chum salmon run timing in 2007 can be characterized as a function of the evaluation projects rather than timing of actual fish passage due to late run timing (on average 7 days late for projects above the confluence of the Tanana River) and the relatively large size of the last component both in the Tanana and the upper Yukon areas where projects were still passing large amounts of fish when they had to be terminated due to the onset of winter. For example, the Eagle sonar project warranted expansion based on the high numbers of fish passage at termination and the ability to

derive an estimate whereas estimates dependent on mark–recapture were not expanded. These efforts attempt to determine the overall run size of fall chum salmon. Age and sex composition data collected from escapement projects in 2007 are presented in JTC (2008).

Canada

The preliminary fall chum salmon spawning escapement estimate in the Canadian portion of the drainage based on mark–recapture data is 226,626 fish (JTC 2008). This is the second highest fall chum spawning escapement estimate on record and is 71.4% above the 1997–2006 average of 132,240 fish. The highest estimated fall chum salmon spawning escapement of 437,733 occurred in 2005.

Aerial surveys of the mainstem Yukon, Kluane and Teslin river index areas were not conducted in 2007. Estimates of the relative abundance of fall chum salmon in these areas were developed from GSI analysis of samples collected in conjunction with the tagging program. Historical aerial survey data are presented in JTC (2008).

In the Porcupine River drainage, the Fishing Branch River weir count of fall chum salmon through October 10 (29,704) was adjusted to a total count of 32,150 fall chum salmon. It was necessary to adjust the 2007 weir count using average weir timing data because the run was unusually late and a significant, although undetermined, portion of the run occurred after the program ended. Unfortunately, other assessment programs were not conducted late enough in the 2007 fall season to more precisely determine the proportion of the Fishing Branch River run which may have entered the Fishing Branch River after the program ended. The adjusted weir count of 32,150 is 8% higher than the 1997–2006 average of 29,577 fall chum salmon, and close to the escapement target of >34,000 fall chum salmon established by the Yukon River Panel for 2007. Based on anecdotal catch reports from the Old Crow test and aboriginal fisheries, it is likely the late run strength was sufficient to exceed the 2007 Fishing Branch River escapement target of >34,000. The 2007 Fishing Branch River escapement fell below the lower end of the Yukon River Salmon Agreement escapement goal range of 50,000 to 120,000 fall chum salmon. The escapement goal range is currently under review by the JTC. Three coho salmon were counted through the weir in 2007.

COHO SALMON ALASKA

The coho salmon run exhibited early run timing and the run size was above average based on Pilot Station sonar. Test fishery projects at Emmonak, Mountain Village, Kaltag, and in the Tanana River provided similar run assessment of magnitude and run timing. The run size estimate at Pilot Station sonar through August 31 was 173,289 fish (Appendix A14), which was above the historical average (1995–2006) passage estimate of 140,000 coho salmon. There is only one established escapement goal for coho salmon in the Yukon River drainage, which is a SEG for the Delta Clearwater River of 5,200–17,000. The 2007 boat count survey of the Delta Clearwater River estimated 14,650 coho salmon (Appendix A26) which is within the SEG range.

PROJECT SUMMARIES

Various government and non-government agencies operate many projects in the Yukon Area to obtain the biological information necessary for management of the salmon runs. The following are select project highlights. See JTC (2008) for other project summaries and Appendix A3 and

A4 provide a complete list of salmon fishery projects conducted in Alaska and Canadian portions of the Yukon River drainage in 2007.

PILOT STATION SONAR

The goal of the Yukon River sonar project at Pilot Station is to estimate the daily upstream passage of Chinook, chum and coho salmon. The project has been in operation since 1986. Sonar equipment is used to estimate total fish passage, and CPUE from the drift gillnet test fishing portion of the project is used to estimate species composition.

Prior to 1993, ADF&G used dual-beam sonar equipment that operated at 420 kHz. In 1993, ADF&G changed the existing sonar equipment to operate at a frequency of 120 kHz to allow greater ensonification range and to minimize signal loss. The newly configured equipment's performance was verified using standard acoustic targets in the field in 1993. Use of lower frequency equipment increased fish detection at long range.

Up until 1995, ADF&G attempted to identify direction of travel of detected targets by aiming the acoustic beam at an upstream or downstream angle relative to fish travel. This technique was discontinued in 1995. Significant enhancements that year included refinements to the species apportionment process and implementation of an aiming strategy designed to consistently maximize fish detection. Because of these changes in methodology, data collected from 1995 to 2007 are not directly comparable to previous years. In 2001, the equipment was changed from the dual beam to the current split-beam sonar system. This technology allows better testing of assumptions about direction of travel and vertical distribution.

Early in the 2005 season, the Yukon River experienced high water levels and erosion in the river bottom profile, which, along with a combination of changes in fish movement and distribution, affected detection of fish with the split beam sonar within 20 m of shore on the left (south) bank. On June 19, a DIDSON was deployed in this area to supplement estimates generated with the split-beam sonar. With its wider beam angle, the DIDSON system was able to detect fish passage within 20 m despite high water levels and problematic erosion near shore, and was operated for the remainder of the season.

In 2006, the DIDSON was integrated into the sampling routine on left bank for the whole season, operating side-by-side with the split-beam sonar. The DIDSON sampled the first 20 m offshore; the remainder of the 250 m range was sampled by the split-beam. The DIDSON estimates accounted for 28% of Chinook salmon, 27% of summer chum, and 16% of fall chum, and 8.6% of coho salmon total passage estimates, which was similar to the contribution seen in 2005.

Though proportions of passage detected nearshore with the DIDSON were significant in 2005 and 2006, the left bank had been monitored in previous years and the profile and fish distributions did not appear to be as problematic prior to 2005. Therefore, estimates for fish passage prior to 2005 have not been adjusted or changed. The DIDSON was deployed on the right bank in 2005 as an assessment of nearshore detection, and the counts were comparable to those obtained with the split-beam. This was an expected result because the rocky, stable substrate on the right bank has maintained a consistently good profile throughout the project's history. The use of the DIDSON has not been necessary on the right bank.

In 2007, split-beam sonar was operated on both banks from June 2 through August 31. Test fishing began on May 30, 6 days before the first Chinook salmon was caught at the Pilot Station camp. The DIDSON was again deployed on the south bank and integrated into the sampling routine for

the entire season. However, the DIDSON-generated passage estimates contributed much less to the total passage than the previous 2 seasons, accounting for only 4.3% of the Chinook salmon, 2.7% of the summer chum, and 1.8% of the fall chum, and 1.8% of coho salmon total passage estimates.

Fish passage estimates at Pilot Station are based on a sampling design in which sonar equipment is operated daily in three 3-hour intervals and drift gillnets are fished twice each day between sonar periods to apportion the sonar counts to species. During most seasons, on designated days, sonar sampling is expanded to a single 24-hour period as a simple qualitative assessment. Estimates obtained in the regular 3-hour intervals are then compared with those found when the sonar runs continuously. Results of these comparisons have historically shown relatively close agreement between the established three 3-hour sampling schedule and the 24-hour sonar periods. In 2007, continuous 24-hour sonar periods were conducted on June 19 and August 5. The three 3-hour estimates were 3.2% lower than the 24-hour estimates on June 19, and 8.4% higher than the 24-hour estimates on August 5.

The test fishing program, used to apportion the sonar counts to species, utilizes an assortment of gillnets drifted through the sonar sampling areas twice daily between sonar data collection periods. All nets are 25 fathoms long with mesh sizes ranging from 7.0 cm to 21.6 cm (2.75 inches to 8.5 inches), In the 2007 season, as part of a separate Capital Improvement Program (CIP) funded genetic study, an extra period of gillnetting was conducted in order to collect additional Chinook salmon samples. The drifts were located upriver of the area sampled by the sonar, and 3 gillnet mesh sizes (6.5, 7.5, and 8.5 inches) were used to target all size classes of Chinook salmon. All other species captured during this extra period were immediately released and not sampled.

Drift gillnetting resulted in a catch of 7,120 fish including: 551 Chinook salmon (179 of which were caught in the extra test fishing period); 2,725 summer chum salmon; 1,595 fall chum salmon; 351 coho salmon; and 1,246 other species. Chinook salmon were sampled for age, sex and length, and genetic samples were taken from both Chinook and chum salmon. Any captured fish that were not successfully released alive were distributed daily to nearby residents in Pilot Station (JTC 2008).

The left bank substrate continued to be unstable throughout most of the summer, and problems with a reverberation band were encountered. For brief periods during the fall season, bank erosion upstream caused large plumes of silt to pass through the sonar sampling area, undermining optimal detection of targets. This problem was significant for the period of August 15 and 16; therefore estimates were partially interpolated for these days. As in previous years, the right bank substrate was consistently stable, so problems of this nature were not encountered on that bank (JTC 2008).

The 2007 passage estimates for Pilot Station are 125,553 Chinook; 1,726,885 summer chum; 684,011 fall chum; 173,289 coho salmon; and 1,157,015 other species. Detailed historical passage estimates for 1995 and 1997–2007, are listed in Appendix A14. Historical passage estimates were revised in 2006 using the most current apportionment model to allow direct comparison between the years 1995 and 1997–2007 (JTC 2008).

YUKON RIVER CHINOOK SALMON STOCK IDENTIFICATION

Scale pattern analysis, age composition estimates, and geographic distribution of harvests has been used by ADF&G on an annual basis from 1981 through 2003 to estimate stock composition of Chinook salmon in Yukon River harvests. Three region-of-origin groupings of Chinook

salmon, or stock groups, have been identified within the Yukon River drainage. The lower and middle stock groups spawn in Alaska and the upper stock group spawns in Canada.

Beginning in 2004, genetic analysis replaced scale pattern analysis as the primary method for stock identification. Tissue samples were collected from fish in mixed stock harvests from Districts 1 through 5 and paired with age data. Genetic analysis was performed on these samples by age group (age-1.3 and -1.4) and results from these analyses were combined with specific harvest age composition to provide the stock composition by harvest. Age groups not used for genetic analysis, age-1.1, -1.2, -2.2, -2.3, -2.4, -1.5, -1.6, and -2.5, were apportioned to stock groups using stock composition of analogous age groups, harvest age composition, and escapement age composition. Harvests from the Tanana River, the upper Koyukuk River, and Alaska tributaries upstream from the confluence of the Yukon and Tanana rivers were assigned to the middle stock group based on geographic location. Harvests occurring in Fort Yukon and above were assigned to the upper stock group under the assumption that these fish were bound for Canada.

The historical percentage by stock group in the total drainagewide Chinook salmon harvest (U.S. and Canada) is presented in Appendix A31. All fish from the lower and middle stock groups were harvested only in Alaska fisheries. Analysis from 2007 shows drainagewide harvest percentages were: 12.4 from the lower stock group, 31.3 from the middle stock group, and 56.3 from the upper stock group. Comparing the 2007 harvest stock percentage estimates to the averages (1981–2006), the lower stock group was below average, the middle stock group was above average, and the upper stock group was near average.

The Alaska harvest percentage of fish attributed to lower, middle, and upper river stock groups is shown in Appendix A32. In 2007, the Alaska harvest percentages from the lower, middle and upper stock groups were 13.1, 33.1, and 53.8, respectively. Comparing the 2007 Alaska harvest stock percentage estimates to the averages (1981–2006), the lower stock group was below average, the middle stock group was above average, and the upper stock group was near average.

The upper stock group proportion harvested in Alaska and Canadian fisheries is shown in Appendix A33. The 2007 percentage of the upper stock group harvested in Alaska and Canada were 90.4 and 9.6, respectively. Comparing these 2007 percentages to the 1981–2006 average, the Alaska percentage was above average and the Canadian percentage was below average.

YUKON RIVER CHUM SALMON MIXED-STOCK ANALYSIS

Since 2004, the stock compositions of chum salmon have been estimated from samples collected from Pilot Station sonar test fisheries for the period spanning July 1 through August 31. A baseline of standardized data collected at 21 microsatellite loci was constructed from the following stocks: Andreafsky River (*N*=261), Chulinak River (*N*=100), Anvik River (*N*=100), Nulato River (*N*=100), Gisasa River (*N*=200), Henshaw River (*N*=200), South Fork Koyukuk River (*N*=200), Jim Creek (*N*=160), Melozitna River (*N*=146), Tozitna River (*N*=200), Chena River (*N*=172), Salcha River (*N*=185), Big Salt River (*N*=71), Kantishna River (*N*=161), Toklat River (*N*=192), Delta River (*N*=80), Chandalar River (*N*=338), Sheenjek River (*N*=263), Black River (*N*=112), Fishing Branch River (*N*=481), Big Creek (*N*=200), Minto River (*N*=166), Pelly River (*N*=84), Tatchun River (*N*=175), Kluane River (*N*=462), Donjek River (*N*=72), and Teslin River (*N*=143). Results from this analysis were reported for each pulse or time strata and distributed by email to fishery managers within 24–48 hours of receiving the samples. Stock abundance estimates were derived by combining the sonar passage estimates with the stock composition estimates. To evaluate the concordance of various data sources, an analysis was conducted to compare these

stock specific abundance estimates against escapement and harvest estimates. This analysis revealed that the data were concordant for 2004–2007. To date, this information has primarily been utilized to evaluate the crossover time period between summer and fall chum salmon runs.

ICHTHYOPHONUS

Ichthyophonus hoferi (*Ichthyophonus* here after) is a marine-derived protozoan parasite infecting a variety of marine and anadromous fish species, including salmonids (McVicar 1999; Kocan et al. 2004; Tierney and Farrell 2004; Gavryuseava 2007).

Ichthyophoniasis has led to mass mortalities in herring and recent low abundance of Chinook salmon raises questions about the possible involvement of *Ichthyophonus* in these declines, either due to pathogen-induced mortality, reduced fecundity or the inability of Chinook salmon to successfully migrate and spawn in tributaries. Prior research suggested that *Ichthyophonus* is an emerging parasite in the AYK region and that the disease can have significant effects on pre-spawning mortality of Chinook salmon. Moreover, Yukon River Chinook salmon appear to be particularly susceptible to *Ichthyophonus* compared to Chinook salmon from some British Columbia stocks (Jones and Dawe 2002). In fact, exposure of naïve immune systems to *Ichthyophonus* results in high mortality (Kocan et al. 1999).

In 2007, Chinook salmon *Ichthyophonus* sampling (funded by the U.S./Canada R&E Fund) continued near the community of Emmonak at the mouth of the Yukon River as part of the Big Eddy test fishery operated by ADF&G. The Big Eddy test fish project utilizes set gillnets with 8.5 inch mesh. Samples of cardiac muscle (n=150) were collected over the course of the Chinook salmon run (from June 5 to July 15). Collection of samples over the entire run is of importance as Kocan et al. (2004) noted that salmon returning early in the season seem to be relatively free of typical *Ichthyophonus* lesions, while fish tend to be more severely infected later in the season.

Cardiac muscle samples of Chinook salmon were collected with extreme care using sterile, disposable sampling supplies to avoid cross-contamination with *Ichthyophonus* DNA between samples. Concurrently, fish morphometric data was recorded (i.e., length, sex, weight). The sex composition of acquired samples was 42% male (58% female) as determined by internal examination of gonads. The mean length of all sampled fish was 845 mm (from mideye to tail fork) with a mean weight of 21.3 pounds. The majority of Chinook salmon collected was age-6 (79.3%), followed by 16.0% age-5. Age composition of remaining samples was 1.3% age-4, 0.7% age-7 and 2.7% of unknown age. Age of Chinook salmon was estimated by scale pattern analysis with scales collected from the preferred area on the left side of the fish above the lateral line (Bales 2007). Average water temperature at Emmonak in 2007 was 13.3ºC and 18.1ºC for June and July, respectively.

Heart samples were fixed in 95% ethanol at time of collection and were analyzed for the presence of *Ichthyophonus* 18s rDNA using polymerase chain reaction (PCR) following the procedure described by Whipps et al. (2006). Briefly, approximately 50 mg of ethanol fixed tissue was placed in a 1.5 ml microfuge tube. Nucleic acid extractions were conducted following the manufacturers protocol for the DNeasy Tissue kit (QIAGEN Inc. Valencia, California). Clinical signs typical for *Ichthyophonus* infection were noted at the time of collection in 10% (15 of 150) of all fish sampled. However, white, granulomatous lesions are a general inflammatory response of fish to foreign bodies and do not necessarily establish actual infection with the parasite (Corbel 1975). In 2007, prevalence of *Ichthyophonus* in Chinook salmon sampled at Emmonak was 16.7% (25 of 150) using PCR. Of infected fish 68% were female. Mean length

and weight of infected fish was 855.6 ± 57.3 mm and 21.3 ± 4.6 pounds, respectively. Most infected salmon were age-6 (80%), followed by 12% age-5, and 8% of undeterminable age. The increased likelihood of infection with *Ichthyophonus* in older age classes has also been noted in other species (Hershberger et al. 2002; Rahimian and Thulin 1996).

Chinook salmon *Ichthyophonus* monitoring near the community of Emmonak at the mouth of the Yukon River has been ongoing since 1999. Cyclic *Ichthyophonus* epizootics have been described in herring (Sindermann 1965) and a similar cyclic pattern is noticeable in the Chinook salmon time series data from Emmonak (JTC 2008). Reasons for this temporal variability are poorly understood, although high mortality associated with these periodic outbreaks in herring warrant increasing awareness and study of this disease in Chinook salmon. Further, environmental change can affect temporal and geographical distribution of pathogens and alter dynamics of infectious disease and parasite-host interactions (Kutz et al. 2004; Ward and Lafferty 2004). Over the past 30 years, June water temperatures in the Yukon River have increased by approximately 4ºC. Okamoto et al. (1987) showed a positive relationship between *Ichthyophonus*-related mortality and water temperature and described a dramatic increase in fish mortality between 10°C and 15°C, with 100% mortality occurring at 15°C to 20°C after approximately 1 month. Equally detrimental effects of temperature on *Ichthyophonus*-infected sculpin (*Enophrys bison*) have been illustrated by Halpenny et al. (2002). However, cause and effect can sometimes be difficult to discern as inflammatory response in general is temperature dependent in poikilotherms (Finn and Nielsen 1971).

EAGLE SONAR

In 2003, ADF&G began investigating the feasibility of using sonar to estimate Chinook and fall chum salmon passage in the Yukon River near the U.S./Canada border. This effort was initiated in response to concerns about the current assessment methodologies and the importance of accurate border passage information when reviewing whether the annual objectives of the U.S./Canada salmon treaties have been met. A suitable section of river was identified near Eagle, Alaska for a potential sonar project. In 2004, ADF&G carried out a 2-week study to evaluate the performance of sonar at 2 preferred sites, Calico Bluff and Six-Mile Bend (Carroll et al. 2007). It was found that Six-Mile Bend was the superior site, that DIDSON should be deployed on the shorter, steeper right bank, and split-beam sonar should be deployed on the longer, more linear left bank.

A full-scale project was initiated at Six-Mile Bend in 2005 to estimate Chinook salmon passage using sonar (Carroll et al. 2007). Since 2006 both Chinook and fall chum salmon passage has been estimated at the same location (Dunbar and Crane 2007). The DIDSON was the ideal system for the right bank, where the profile is steep and less linear than the left bank. The split-beam system worked well on the left bank and appeared to have a satisfactory detection rate near shore, while still adequately detecting targets out to 150 m. In 2007, the total Chinook salmon passage estimate at the Eagle sonar site was 41,697 for the dates July 7 through August 22 and the total fall chum salmon passage estimate was 235,871 for the dates August 23 through October 6. The fall chum salmon passage estimate was expanded to include fish passing after the project was terminated. The results from 2005 to 2007 sonar operations and associated border passage estimates are summarized in Table 7.

Table 7.–Eagle sonar project passage estimates, and border passage estimates, 2005–2007.

	Sonar Estimate		Eagle Subsistence Harvest		Border Passage Estimate	
Date	Chinook	Chum	Chinook	Chum	Chinook	Chum
2005	81,528		2,566		78,962	
2006[a]	73,691	236,386	2,303	17,775	71,388	218,611
2007[a]	41,697	282,871 [b]	1,999	18,691	39,698	263,979

Note: All estimates for subsistence caught salmon (between sonar and border) include an unknown portion caught below the sonar. Most likely in the hundreds for Chinook salmon, and a few thousand chum salmon. Starting in 2008 the number of salmon caught between the sonar and the border will be documented on subsistence permits.

[a] Subsistence estimates are preliminary.

[b] Expanded sonar estimate including expansion for fish passing after operations ceased.

In addition to operating the sonar in 2005 and 2006, a drift gillnet program was conducted at Six-Mile Bend to gain a better understanding of species composition, behavior and spatial distribution of the fish passing the sonar site. Standard age, sex and length (ASL) data, and genetic samples were collected from captured Chinook and chum salmon. Six gillnets, 25 fathoms in length and with mesh sizes ranging from 2.75 to 8.5 inches, were fished in an effort to effectively capture all size classes of fish present and detectable by the hydroacoustic equipment. Set gillnets were also deployed with varied results to investigate nearshore passage. Catches from these earlier studies indicated that most of the non-salmon species were close to shore and smaller than salmon. Given the size disparity between the majority of the salmon and non-salmon species a 2-pronged approach was used in 2007 to determine the other species component. Salmon-sized fish were sampled using gillnets with mesh sizes ranging from 5.25 to 8.5 inches. Smaller non-salmon fish were examined with a DIDSON to determine the number of small fish passing and, because split-beam thresholds are optimized for salmon, the number of small non-salmon species actually counted on the split-beam sonar.

Data collected in 2006 and 2007 from a DIDSON operated side-by-side with the left bank split-beam sonar suggests that non-salmon species appear to be present in small numbers (about 3%) in the 0 m to 20 m range on the left bank. The split-beam sonar only detected 20% of the smaller non-salmon species, for a total 0.6% small non-salmon misidentified as salmon in the 0-20 m range on the left bank. There were no small non-salmon species detected by the DIDSON beyond 20 m. Since 2005, the drift gillnets have only captured 17 non-salmon fish in the drifts beyond the fish lead and represent less than 1.0% of the overall catch. Given the very low abundance of non-salmon species observed in the gillnets and the results of the DIDSON side-by-side comparison, it is concluded that non-salmon species are not biasing the Chinook and chum salmon estimates to a significant degree. On the right bank, where the DIDSON was operated, very few non-salmon were counted. Non-salmon targets were distinguished from salmon based on the shape of the trace on the echogram and the size, swim motion, and behavior as seen on DIDSON video image.

Although there were some chum salmon present in the river during the Chinook run and vice versa, Chinook and chum salmon runs appear to be largely discrete in time based on test fish results, local knowledge of catches, data collected in Canada, and past projects in the area.

YUKON RIVER CHINOOK SALMON COMPARATIVE MESH SIZE STUDY

Concerns over changing trends in the age, sex ratio, and size Yukon River Chinook salmon populations have recently emerged. In response to these concerns, the U.S./Canada JTC Salmon Size Subcommittee compiled relevant literature and existing analyses pertaining to these trends and potential causes of these trends in their *Potential Causes of Size Trends in Yukon River Chinook Salmon Populations* report (JTC 2006). This informational summary was divided into 6 sections: history of the Alaska Yukon River Chinook salmon harvest and fishery sampling, history of the Canadian Yukon River Chinook salmon harvest, summary of prior age, sex and size investigations, summary of Yukon River gillnet selectivity, heritability of traits and potential effects of selective fisheries, and oceanic influences on salmon size. The evidence that Yukon River Chinook salmon have undergone phenotypic alteration over time is limited, but suggestive. Analyses document a decrease in the weight of commercial harvests (Bigler et al. 1996) and a reduction in the prevalence of the largest fish (Hyer and Schleusner 2005). Whether the changes observed within Yukon River Chinook salmon have resulted from environmental or fishery-induced selective pressures, or a combination of both, is difficult to determine with certainty. The report recognizes several factors that may contribute to these trends, including environmental changes in the Bering Sea and Gulf of Alaska, fishery induced selective pressures and increased competition in the ocean from large numbers of hatchery fish.

In 2007, ADF&G initiated a Yukon River Chinook salmon comparative mesh size study. The goal of this 3-year study is to gain information about catch composition from 7-, 7.5- and 8-inch stretch-mesh drift gillnets from a test fishery in District 1 near Emmonak. The objectives of this study are to determine whether the proportion of Chinook salmon and chum salmon caught varies by mesh size, determine whether the age, sex, length, weight, and girth of individual Chinook salmon caught varies by mesh size, and to evaluate the marketability of the catch from the various mesh sizes. This information may provide insight into ways to implement management strategies and regulations to sustain Yukon River Chinook salmon while continuing to maintain subsistence and commercial fisheries.

The project operated from June 15 to July 1, 2007. Fishing occurred on 12 days for a total of 20 fishing periods composed of 10 morning shifts and 10 evening shifts. A total of 456 Chinook salmon and 572 summer chum salmon were caught using 7.0, 7.5, and 8.0 inch mesh (Table 8).

Table 8.–Number of Chinook and summer chum salmon harvested in the Lower Yukon River test fishery by mesh size, 2007.

Mesh Size	Chinook Salmon	Chum Salmon
7.0 inch	147	268
7.5 inch	180	146
8.0 inch	129	158
Total	456	572

This was considerably less than the targeted sample size of 400 Chinook salmon per mesh size. All Chinook salmon harvested were measured for age, sex, length, weight and girth. Results of this study will be provided at the next BOF AYK Region meeting.

TANANA FALL CHUM RADIOTELEMETRY

Fall chum salmon originating in the Tanana River represent on average 30% of the total run abundance within the Yukon River drainage. They are harvested in important subsistence,

personal use and commercial fisheries when migrating to spawning locations. The relationship between known tributary escapements and drainage abundance estimates suggest that a significant contribution to the fall chum salmon population maybe from Tanana River mainstem spawners. Previous telemetry results indicate large concentrations of adult chum salmon in the mainstem Tanana, but the extent of spawning remains poorly understood. The main objectives of this research include: 1) confirm that fall chum salmon are using the mainstem Tanana River for spawning; 2) identify and characterize mainstem spawning habitats used by fall chum salmon; 3) determine relative contributions of mainstem spawners to overall upper Tanana River fall chum salmon populations; and 4) construct mainstem spawning habitat location prediction models. The impacts of urbanization and resource development, including agriculture, timber, minerals, and petroleum are greatest within the Tanana River drainage. This study will assist with resource development in the area while simultaneously protecting habitat supporting the fishery resource.

In 2007, ADF&G and the Tanana Chiefs Conference (TCC), in conjunction with the University of Alaska Fairbanks (UAF), the U.S. Geological Survey (USGS) and USFWS, conducted field work from August through December. In early September, 4 new remote tracking stations (RTS) were installed to complement the existing 5 RTS for a total of 9 RTS (JTC 2008) currently covering the Tanana River mainstem and major tributaries from Manley to the Gerstle River east of Delta Junction.

Testing of tags occurred September 8–11 and was composed of 3 tag sizes applied 40 times each on 120 female chum salmon. The test fish were held in totes with circulating water for 2 hours and then removed for necropsy. The largest and smallest tag types seemed to be regurgitated most often while the medium sized tags appeared to have the best stomach seat. The stomachs were still elastic, but fairly thin upon inspection.

A total of 30 female fall chum salmon were tagged and released, half on September 17 and the remainder on September 19. Overall, 27 (90%) fish showed significant upriver movement. Three fish regurgitated their tags near the tagging wheel, 2 fish were caught in the Nenana fishery, and 1 fish migrated to the Tolovana River. A total of 24 (80%) tagged fish migrated past Fairbanks and the majority were distributed upstream to the Little Delta River (JTC 2008) in the mainstem Tanana River with 1 fish migrating into the middle channel of the Delta River.

Twenty-eight aerial surveys were conducted twice weekly from September 17 through December 18 in order to document; 1) radio tagged fish locations, 2) areas where fish were observed, 3) open water upwelling locations, and 4) monitor radio tag battery life. Data analysis is ongoing to determine the significance of the 3 tag types during migration and the impact on final locations. Radio tags will be purchased for the second year of this project based on performance and fish behavior.

On December 5–6, habitat monitoring equipment was installed in 4 locations in the study area where spawning fish were present. Open water mapping was also conducted during this time and periodic flights are scheduled to monitor upwelling areas this winter. Recovery of monitoring equipment is scheduled to be conducted during late April or early May of 2008. Preparations for deployment of 370 radio tags throughout the course of the run in 2008 are being made.

WHITEHORSE HATCHERY OPERATIONS

All 166,154 fry of the 2006 brood year Chinook salmon reared at the Whitehorse Rapids Fish Hatchery were released between May 24 and June 8, 2007. All fish released were marked with

an adipose fin clip. The fry[3] were released into various locations upstream of the Whitehorse Rapids hydroelectric dam. The numbers of fry released by location were as follows:

Wolf Creek:	41,184
Michie Creek:	50,590
M'Clintock River	38,771
Mainstem Yukon River	35,609
Total	166,154

Included in the above numbers were 2,632 fry that were considered to be too small or unfit for tagging. These fish had their adipose fins removed, but were not tagged with CWTs, and were released in Wolf Creek on June 3, 2007.

The 2007 release was the 12 year in which all fit fish released from the Whitehorse Rapids Fish Hatchery into the Yukon River were marked, i.e., 1995–2006 brood years. With the exception of all fish released from the 1998 BY, which were adipose-clipped but not tagged, all of the 1995–2006 brood year releases involved adipose fin removal and application of coded wire tags to all fit fish; approximately 94% of the 1994 BY release was tagged with coded wire tags. The initiative to mark all of the fish released from the hatchery provides an opportunity to accurately determine the hatchery contribution as adult fish migrate upstream through the Whitehorse Rapids Fishway and it is also helpful during brood stock collection.

Tag retention for the fish tagged from the 2006 brood year release was calculated to be 98.8%. This means that an estimated 2,028 of the tagged fish did not retain their tag. The total 2007 release therefore includes 161,494 fish which were adipose-clipped with tags, 2,028 fish which were estimated to have lost their tags and 2,632 small (or unfit) fish which were clipped but not tagged for a total release of 166,154 fish (JTC 2008).

In August 2007, brood stock collection began after 122 Chinook salmon had migrated through the Whitehorse Rapids Fishway. Brood stock was collected from August 14 to August 30. An attempt was made to collect 2 males for each female during brood stock collection to allow matrix spawning. Matrix spawning has been used for 19 years in an effort to maintain genetic diversity (JTC 2008).

A total of 37 males were retained and used for the brood stock program; 23 of these fish were adipose-clipped (hatchery) and 14 had intact adipose fins (wild). Milt was collected from an additional 13 males (6 hatchery and 7 wild) which were then released back into the fishway to continue their migration. Therefore, the total number of males used as Whitehorse Rapids Hatchery brood stock in 2007 was 50 fish. In total, 19.2% of the total male return of 260 was used for brood stock (JTC 2008).

A total of 26 females were collected for the brood stock program. Three of these perished during holding and an additional 2 females which were not maturing were released back into the Yukon River above the Whitehorse Rapids Fishway. A total of 21 females were successfully spawned; female brood collected consisted of 8 adipose-clipped fish (hatchery) and 13 fish with intact adipose fins (wild fish). In addition to the females collected for brood stock, an additional 9

[3] The fish released are referred to as fry, however virtually all of them emigrate to the ocean shortly after release, and they may more accurately be referred to as pre-smolt.

females were opportunistically captured and used for the broodstock program when they failed to migrate through the fishway; these females consisted of 6 adipose-clipped fish (hatchery) and 3 fish with intact adipose fins (wild fish). The final total number of females used for the Whitehorse Rapids Hatchery brood stock in 2007 was 30 fish. In total, 18.0% of the total female return of 167 was used for brood stock (JTC 2008).

An additional female collected at the Whitehorse Rapids Fishway was fertilized and the eggs were used at the McIntyre Creek facility located downstream of the Whitehorse Rapids Hatchery. Egg takes began on 16 August and were completed on September 2. An estimated total of 135,235 green eggs were collected from the 31 spawned females (30 Whitehorse Rapids Fishway and one McIntyre Creek facility). Average fecundity was estimated at 5,000 eggs per female and the fertilization rate was estimated to be 83%. Shocking and second inventory of the eggs began on October 2 and was completed by October 14 (JTC 2008).

BERING STRAIT RECOVERIES OF CHINOOK SALMON FRY RELEASED FROM THE WHITEHORSE RAPIDS HATCHERY

Three recoveries of coded wire tagged Chinook salmon released from the Whitehorse Rapids Hatchery in the spring of 2007 were made during the BASIS cruise at 65.19° N and 168.07° W on September 13, 2007. Recovery locations are presented in JTC (2008). Recovered fish had an agency-only coded wire tag (CWT) code first used for brood year 2006 fish released in 2007. The average weight at the time of release was ~2.9 grams. Length and weight data collected at the time of capture is provided in Table 9.

Table 9.–Data from three coded wire tagged Chinook salmon fry released from the Whitehorse Rapids Fish Hatchery and caught in the BASIS cruise on September 13, 2007 at 65.19° N and 168.07° W.

Fish	Length (mm)	Weight (g)
1	176	58
2	125	18
3	179	58

YUKON RIVER SALMON RUN OUTLOOKS 2008

CHINOOK SALMON

The 2007 Chinook run was well below average despite adequate escapements in parent years of 2001 and 2002, and yielded approximately 31,000 less Canadian-origin fish than expected. The poor 2007 run is cause for concern. Whether this is attributable to dramatically increasing bycatch harvest in the Bering Sea pollock trawl fishery or to ocean conditions or some other suite of environmental factors remains unknown. Bering Sea pollock trawl bycatch of adult Chinook salmon has increased substantially over the last few years, with a record catch in 2007 of over 140,000 Chinook salmon. The increased magnitude of the bycatch may result in a lower than expected return to the Yukon River.

Yukon River Chinook salmon return primarily as age-5 and age-6 fish, although age-4 and age-7 fish also contribute to the run. Yukon River Chinook salmon demonstrate a strong sibling relationship between age-4, -5, and -6 fish. Though the overall number of Chinook salmon was

low in 2007, the age-4 and age-6 proportions of the run were above average, whereas the age-5 proportion was below average. Spawning ground escapements in 2002 and 2003, the brood years producing age-6 and age-5 fish returning in 2008, respectively, were well above average throughout the drainage. High escapements were observed in the Chena and Salcha rivers, the largest Chinook salmon producing rivers in the U.S. portion of the drainage, and record escapements were estimated into Canada.

The 2008 run is expected to be below average and similar to the 2007 run. It is anticipated that the 2008 run will provide for escapements, support a normal subsistence harvest, and a below average commercial harvest. Fishery management will be based on inseason assessments of the run. However, there is a possibility that the run may not be large enough to support even a small directed commercial fishery. If inseason indicators of run strength suggest sufficient abundance exists to have a commercial Chinook salmon fishery, the commercial harvest could range from 5,000 to 30,000 Chinook salmon including the incidental harvest taken during anticipated summer chum directed periods. This range of commercial catch is below the 10-year (1998–2007) average of approximately 35,399 Chinook salmon.

SUMMER CHUM SALMON

The strength of the summer chum salmon runs in 2008 will be dependent on production from the 2004 (age-4 fish) and 2003 (age-5 fish) escapements as these age classes generally dominate the run. The total run during 2002 and 2003 was approximately 1.2 million summer chum salmon in each year, though tributary escapements were highly variable. It appears that production has shifted from major spawning tributaries in the lower portion of the drainage, such as the Andreafsky and Anvik rivers over the last 5 years, to higher production in spawning tributaries upstream.

In 2007, the return from the 2003 brood year produced a higher than average percentage of age-4 fish. Since summer chum salmon exhibit a strong sibling relationship from age-4 fish to age-5 fish, an above average percentage of age-5 fish is expected in 2008. Using the Anvik River brood table, sibling relationships between age-4 and age-5 fish, and the 5-year average ratio between the Anvik River and Pilot Station sonar, the 2008 run can be estimated. It is expected that approximately 600,000 summer chum salmon will return to the Anvik River in 2008 and the total run in the Yukon River could be approximately 2.0-2.5 million summer chum salmon which constitutes an average run.

The 2008 run is anticipated to be near average, which would provide for escapements and support a normal subsistence and commercial harvest. Summer chum salmon runs have exhibited steady improvements since 2001 with a harvestable surplus in each of the last 5 years (2003–2007). If inseason indicators of run strength suggest sufficient abundance exists to allow for a commercial fishery, the commercial harvest surplus in Alaska could range from 500,000 to 900,000 summer chum salmon. The actual commercial harvest of summer chum salmon in 2008 will likely be dependent on market conditions and may be affected by a potentially poor Chinook salmon run because Chinook salmon are incidentally harvested in fisheries directed at chum salmon.

FALL CHUM SALMON

Yukon River drainagewide estimated escapements of fall chum salmon for the brood years 1974 through 2002 have ranged from approximately 180,000 to 1,500,000, based on expansion of escapement assessments for selected stocks to approximate overall abundance. Escapements in these years resulted in subsequent returns that ranged in size from approximately 311,000 to

3,000,000 fish, using the same approach to approximating overall escapement. Corresponding return per spawner rates ranged from 0.3 to 9.0, averaging 2.1 for all years combined (1974–2001).

A considerable amount of uncertainty has been associated with fall chum salmon run projections, particularly recently because of unexpected run failures from 1997 to 2002 followed by a strong improvement in productivity from 2003 through 2006. Weakness in salmon runs prior to 2003 has generally been attributed to reduced productivity in the marine environment and not as a result of low levels of parental escapement. Similarly, the recent improvements in productivity may be attributed to the marine environment. Projections have been presented as ranges since 1999 to allow for adjustments based on more recent trends in production.

Yukon River fall chum salmon return primarily as age-4 and age-5 fish, although age-3 and age-6 fish also contribute to the run. Escapements for the 2002 and 2004 parent years, that will contribute age-6 and age-4 fish in the 2008 run, were below the upper end of the drainagewide escapement goal of 300,000 to 600,000 fall chum salmon. The 2003 and 2005 escapements that will contribute age-5 and age-3 fish in the 2008 return were above the upper end of the drainagewide escapement goal range. The major contributor to the 2008 fall chum salmon run is anticipated to be age-4 fish returning from the 2004 parent year. Run sizes in even-numbered years are on average half of those in odd-numbered years.

The 2008 Yukon River fall chum salmon projected run size is estimated using the total drainagewide brood table based on predicted return per spawner (R/S) rates and associated even-odd year maturity schedules (Table 10).

Table 10.–Projected return of fall chum salmon based on parent year escapement for each brood year and predicted return per spawner (R/S) rates, Yukon River, 2002–2005.

Brood Year	Escapement	Estimated production (R/S)	Estimated Production	Contribution based on age	Current Return
2002	397,977	1.71	533,289	1.0%	10,083
2003	695,363	1.83	1,140,395	32.9%	346,163
2004	537,873	2.01	925,142	64.3%	675,059
2005	2,035,183	0.52	1,058,295	1.8%	19,345
Total expected run (unadjusted)					1,050,649
Total expressed as a range based on the forecasted vs. observed returns from 1987 to 2007 (80% CI):					890,000 to 1.2 million

The resulting point projection provided an estimate of 1.0 million fall chum salmon returning in 2008. The range around the estimate is based on 80% confidence bounds and is expressed as 890,000 to 1.2 million fall chum salmon. However, this projection appears to be high based on other information, such as the lack of immature chum salmon encountered in the high seas BASIS research as well as notable declines in chum salmon bycatch levels, and the low probability of another record even-numbered year run.

If the 2008 run size is near the projected range of 890,000 to 1.2 million, it will be well above the upper end of the BEG range of 600,000 fall chum salmon. A run of this size should support normal subsistence fishing activities and provide opportunity for commercial ventures where markets exist. The strength of the run will be monitored inseason to determine appropriate

management actions and levels of harvest based on stipulations in the Alaska *Yukon River Drainage Fall Chum Salmon Management Plan*.

COHO SALMON

Although there is little comprehensive escapement information on Yukon River drainage coho salmon, it is known that coho salmon primarily return as age-4 fish and overlap in run timing with fall chum salmon. The major contributor to the 2008 coho salmon run will be the age-4 fish returning from the 2004 parent year. Based on Pilot Station sonar operations from 1995 and 1997 through 2007, the 2004 passage estimate of 188,000 coho salmon was above average. The Delta Clearwater River (DCR) is the major producer of coho salmon in the upper Tanana River drainage, and the parent year escapement of 38,000 fish was fifth highest on record and 2.2 times the upper end of the SEG range of 5,200 to 17,000 coho salmon. DCR abundance has been on the increase since 1972, in particular within the last decade. Evaluations of coho salmon escapements in the Andreafsky, Nenana, and Richardson Clearwater rivers also indicated the run was average to above average. Assuming average survival, the 2008 coho salmon run is anticipated to be average to above average based on good escapements in 2004.

The Alaska *Yukon River Coho Salmon Management Plan* allows a directed commercial coho salmon fishery, but only under unique conditions. Directed coho salmon fishing is dependent on the assessed levels in the return of both coho and fall chum salmon because they migrate together.

Spawning Escapement Targets in 2008: Canadian Origin Chinook and Fall Chum Salmon

For the 2008 season, the U.S./Canada panel agreed to a one year Canadian Interim Management Escapement Goal (IMEG) of >45,000 Chinook salmon based on the Eagle sonar program and set a 3 year IMEG for the Fishing Branch River of 22,000 to 49,000 fall chum salmon based on the Fishing Branch River weir count. The U.S./Canada Yukon River Panel also agreed to a Canadian Yukon River fall chum salmon mainstem escapement objective of >80,000 fish based on the Eagle sonar program rather than the one previously based on the mark–recapture project near the mainstem border.

MARINE FISHERIES INFORMATION

INTRODUCTION

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

Some of these salmon are caught in commercial fisheries that take place in marine waters. Marine commercial fisheries with a bycatch that likely included some Yukon River salmon included: (1) the U.S. groundfish trawl fisheries in the Bering Sea-Aleutian Islands management

area (BSAI) and in the Gulf of Alaska, (2) the purse seine and gillnet salmon fishery in the South Alaska Peninsula ("False Pass") area, and (3) Norton Sound salmon gillnet fisheries.

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

The South Unimak and Shumagin Islands June fisheries occur along the south side of the Alaska Peninsula and from 1975 through 2000 were managed on the basis of forecasted Bristol Bay sockeye salmon inshore harvests. These fisheries also harvest chum salmon which are destined for a wide range of locations. Consequently, the Alaska Board of Fisheries placed a chum salmon harvest cap on both South Alaska Peninsula June fisheries to protect Arctic-Yukon-Kuskokwim (AYK) Area chum salmon stocks in 1986 through 2000. In 2001 the BOF designated several AYK chum salmon stocks plus the Kvichak River sockeye salmon as stocks of concern. From 2001 to 2003, the South Peninsula June fisheries were limited to no more than 9 fishing days for seine and drift gillnet gear with no harvest limits. Prior to the 2004 fishing season, many of the restrictions in place from 2001 to 2003 were replaced by a set fishing schedule, which is currently still in effect. The sockeye salmon harvest in 2007 was 737,642 in the South Unimak and 852,198 in the Shumagin Islands June fisheries for a total harvest of 1,589,840 fish. The chum salmon harvest in 2007 for the South Unimak and Shumagin Islands June fisheries was 153,334 and 144,205, respectively (Appendix A36).

A small commercial salmon gill net fishery operates in subdistricts at various river mouths in Norton Sound, and is managed by ADF&G and the Alaska Board of Fisheries. A small portion of Chinook and chum salmon caught in the southern subdistricts may be bound for the Yukon River (Gaudet and Schaefer 1982). In 2007, the commercial catch of Chinook and chum salmon for all of the Norton Sound subdistricts combined totaled 19 Chinook and 22,431 chum salmon.

Salmon runs were substantially better in the last 5 years than in previous years across a broad region of western Alaska, including the Yukon River in Alaska and Canada. However, they were still below average. The world catch of Chinook salmon has dropped significantly since the late 1970s, but has rebounded some since the low in 2001 (JTC 2008). The world chum salmon catch remains high with most of the harvest by Japan. The causes for the production failures are not known, but attention has focused on the marine environment because of the broad scope of the production failures. Likely factors that have received the most attention to date have included the effects of El Nino, ocean and climate regime shifts, and competition relative to ocean carrying capacity (i.e., hatchery/wild interactions). Nearly half of the chum salmon in the North Pacific Ocean are of hatchery origin.

BERING SEA AND GULF OF ALASKA GROUNDFISH FISHERY

History and Management of the Groundfish Fishery

The U.S. groundfish fisheries in the Bering Sea-Aleutian Islands (BSAI) and in the Gulf of Alaska (GOA) are managed under the Magnuson-Stevens Fisheries Conservation and

Management Act by the North Pacific Fishery Management Council (NPFMC), and are regulated by the National Marine Fisheries Service (NMFS).

In general, the groundfish fisheries of the GOA are managed and regulated separately from those in the BSAI. Both major areas contain multiple smaller regulatory areas, which are numbered. The groundfish fisheries east of 170º west longitude and north of the Alaska Peninsula are considered to be in the BSAI. The groundfish fisheries operating in waters south of the Alaska Peninsula and east of 170º west longitude are considered to be in the GOA.

The U.S. groundfish fishery off the coast of Alaska expanded rapidly during the last 15 years. In 1977, the year after the Magnuson Act went into effect, the U.S. groundfish harvest off Alaska amounted to only 2,300 metric tons (mt, 1 mt = 2,204.6 pounds), or only 0.2% of the total groundfish harvest off Alaska by all nations. Most of that U.S. catch was Pacific halibut caught with hook-and-line gear.

The Magnuson Act, which claimed exclusive fishery jurisdiction by the United States of waters to a distance 200 nautical miles seaward from the coast, allowed the U.S. to gradually replace the foreign groundfish fisheries by "joint-venture" fisheries, in which U.S. fishermen caught the fish and delivered them at sea to foreign fish processing vessels. The joint-venture fishery, in turn, was replaced by an entirely U.S. fishery.

The U.S. groundfish fisheries use basically 3 types of fishing gear: trawls, hook-and-line (including longline and jig), and pots. Of these types of fisheries, trawlers have by far the greatest impact on salmon bycatch numbers.

A major issue affecting the BSAI and GOA groundfish fisheries was a NMFS biological opinion concluding that continued fishing for groundfish, including pollock, Atka mackerel and Pacific cod, under the agency's existing rules is likely to jeopardize the western population of Steller sea lions and adversely affect its critical habitat. Many of the North Pacific Councils actions in 2001 were related to Steller sea lion protection measures establishing temporal and spatial dispersion of harvest and protection of Steller sea lion critical habitat. There will now be 2 seasons for the pollock, Atka mackerel and Pacific cod fisheries and the amount taken within sea lion critical habitat will be limited. Among several documents prepared in accordance with the National Environmental Policy Act of 1969, NMFS published a Final Programmatic SEIS (Supplemental Environmental Impact Statement) for the Alaska Groundfish Fisheries, a Final SEIS for Steller Sea Lion Protection Measures in the Alaska Groundfish Fisheries, and a Draft Environmental Impact Statement (EIS) for the essential fish habitat components of the several fishery management plans.

The Western Alaska Community Development Quota (CDQ) Program has 6 groups representing the 65 eligible western Alaska communities expanded from pollock only to all federally managed BSAI groundfish species. Currently, the CDQ program is allocated portions of the groundfish fishery that range from 10% for pollock to 7.5% for most other species. On January 1, 2000, the License Limitation Program (LLP) required that any person who wished to deploy a harvesting vessel in the king and Tanner crab fisheries in the BSAI and in the directed groundfish fisheries (except for the Individual Fishing Quota (IFQ) sablefish, and for demersal shelf rockfish east of 140° West longitude) in the GOA or the BSAI must hold a valid groundfish or crab license (as appropriate) issued under the LLP.

Observer Program

Under U.S. law and regulations, salmon may not be retained by the U.S. groundfish fishery and must be returned to the sea. One exception is the voluntary Salmon Donation Program which allows for distribution of Pacific salmon taken as bycatch in the groundfish trawl fisheries off Alaska to economically disadvantaged individuals by tax exempt organizations through a NMFS authorized distributor. This action supports industry initiatives to reduce waste from discards in the groundfish fisheries by processing salmon bycatch for human consumption. The groundfish observer program began in 1977 on foreign groundfish vessels operating within the U.S. Exclusive Economic Zone (200 nautical miles from the U.S. shore). It continued with the joint-venture fishery until its end. Until 1990, however, there was little information on the accidental or incidental catch of salmon by the U.S. groundfish fishery.

In 1990, the United States began a scientific observer program for the U.S. groundfish fishery off the coast of Alaska. In general, a groundfish harvesting or processing vessel must carry a NMFS certified observer onboard whenever fishing or fish processing operations are conducted if the operator is required by the NMFS Administrator, Alaska Region, NMFS, (Regional Administrator) to do so, and a shoreside groundfish processing plant must have a NMFS certified observer present whenever groundfish is received or processed if the plant is required to do so by the Regional Administrator.

The amount of observer coverage is usually related to the length of the vessel or the amount of fish processed by a shoreside plant or mothership processing vessel. Groundfish harvesting vessels having a length of 125 feet or more are required to carry observers at all times when they are participating in the fishery. Vessels with lengths between 60 and 124 feet are required to carry observers during 30% of their fishing days during trips when they fish more than 3 days. Vessels shorter than 60 feet do not have to carry observers unless required to do so by the Regional Administrator. Mothership or Shoreside processing plants processing 1,000 metric tons (mt) or more per month are required to have 100% observer coverage, those processing between 500 and 1,000 mt per month are required to have 30% coverage, and those processing less than 500 mt per month need no observer coverage unless it was required specifically by the Regional Administrator.

Observers must be trained and certified. To be certified as an observer by the NMFS, an applicant must have a bachelor's degree in fisheries, wildlife biology, or a related field of biology or natural resource management. Observers must be capable of performing strenuous physical labor, and working independently without direct supervision under stressful conditions. Because observers are not employees of the Federal Government but instead hired by certified contractors, applicants must apply directly to a certified contractor. If hired, the contractor will arrange for them to attend a 3-week observer training course in Seattle or Anchorage. Upon successful completion of the course, they will be certified as a groundfish observer.

In addition to the observer coverage, all groundfish harvesters over 60 feet and processors must maintain and submit logbooks on their groundfish harvests and their catch of the prohibited species, including crabs, halibut, herring, and salmon.

Estimated Catch of Salmon in the Groundfish Fisheries

NMFS estimates the number of salmon caught in the groundfish fisheries from the observer reports and the weight of groundfish caught. Observers are instructed to collect random samples of each net haul before it has been sorted, and to gather information from each salmon in a haul.

Observers record the species caught and the number of each species, determine the sex of dead or dying salmon, record the weight and length of each salmon, collect scales, and check for missing adipose fins. If a salmon is missing its adipose fin, the observer removes and preserves the snout, which may contain a coded wire tag.

NMFS scientists then use the number of salmon of each species caught in each haul sampled, the weight of groundfish caught in each haul sampled, and the total weight of groundfish harvested during the sampling period to estimate the total number of salmon of each species caught by the entire groundfish fleet. A summary of the estimated numbers of Chinook and other salmon caught by the U.S. groundfish fisheries from 1990 through 2007 is presented in Appendix A37. The number of salmon caught by the groundfish fisheries varies considerably by species of salmon, by year, and between the BSAI and the GOA. Chinook and chum salmon make up most of the catch, with coho a distant third. Sockeye and pink salmon are minor components.

The catch of salmon in the BSAI in 2007 was 129,567 Chinook and 97,352 other salmon and in the GOA the salmon catch was 40,359 Chinook and 3,421 other salmon (Appendix A37). Certain areas in the BSAI have been declared salmon savings areas for both chum and Chinook salmon based on high rates of catch in the past[4]. After the 1998 season, because of the concerns regarding Chinook salmon conservation in western Alaska and in response to a proposal submitted by BSFA, the NPFMC lowered the allowable bycatch of Chinook salmon in the BSAI trawl fishery.

Of primary concern are the origin of salmon being caught by the U.S. groundfish fisheries and the proportion of each stock in the bycatch. Some information comes from coded wire tagged salmon recovered by observers. But that information only shows that certain coded wire tagged stocks are caught; it says nothing specific about the many stocks without coded wire tags. Canada has coded wire tagged upper Yukon River Chinook salmon for a number of years. To date, 16 have been recovered in the Bering Sea groundfish fisheries and 6 were picked up by the U.S. BASIS cruise in 2003 and 2007 (JTC 2008). In addition, 10 Chinook salmon captured and tagged on the high seas have returned to the Yukon River drainage.

BERING SEA RESEARCH

Background

Extensive research has begun in the Bering Sea in the last few years focusing on physical and biological oceanography and climate change. Many different organizations from several countries have been involved, and several international organizations have been formed to try and coordinate this research. The discussion that follows will concentrate on those studies directed towards Pacific salmon.

Bering-Aleutian Salmon International Survey

The Bering-Aleutian Salmon International Survey (BASIS) is an NPAFC-coordinated program of ecosystem research on salmon in the Bering Sea. The major goal of this program, which was developed in 2001, is to clarify how changes in the ocean conditions affect the survival, growth, distribution, and migration of salmon in the Bering Sea. Research vessels from U.S. (F/V *Sea Storm,* F/V *Northwest Explorer*), Japan (R/V *Kaiyo maru,* R/V *Wakatake maru*), and Russia (R/V *TINRO*), have participated in synoptic BASIS research surveys in Bering Sea since in 2002.

[4] Information on past and present bycatch of salmon in the BSAI and GOA groundfish fisheries can be obtained from the NMFS Alaska Region web page at www.fakr.noaa.gov.

The primary findings from the past 5 years (2002–2006) indict that there were special variations in distribution among species: juvenile coho and Chinook salmon tend to be distributed nearshore and juvenile sockeye, chum, and pink salmon tended to be distributed further offshore. In general, juvenile salmon were largest during 2002 and 2003 and smallest during 2006, particularly in the northeast Bering Sea region. Fish, including age-0 pollock and Pacific sand lance were important components of the diets for all species of juvenile salmon in some years; however, annual comparisons of juvenile salmon diets indicated a shift in primary prey for many of the salmon species during 2006 in both the northeast and southeast Bering Sea regions. In addition, the average CPUE of juvenile salmon fell sharply during 2006 in the southeast Bering Sea region. It is speculated that spring sea surface temperatures (SSTs) on the eastern Bering Sea shelf likely impact growth rate of juvenile western Alaska salmon through bottom-up control in the ecosystem. Cold spring SSTs lead to lower growth and marine survival rates for juvenile western Alaska salmon, while warm spring SSTs have the opposite effect.

Stock mixtures of salmon from BASIS surveys in the Bering Sea have provided new information on oceanic migration and distribution of regional stock groups in the Bering Sea. Recent results from Japanese surveys indicate that 81% of the immature chum salmon in the Bering Sea basin were from Asian (Russia and Japan) populations during August-September in 2002. Results from U.S. surveys on the Bering Sea shelf and Aleutian chain indicate considerable spatial variation in stock mixtures; however, when pooled over location mixtures were very similar to mixtures present in the basin with 80% of the immature chum salmon from Asian populations. Immature chum salmon from western Alaska comprised 2% and 8% of immature chum salmon on the southern Bering Sea shelf and northern Bering Sea shelf, respectively. Stock mixtures of juvenile chum salmon have identified where migratory routes of western Alaska and Russian chum salmon stocks overlap and has helped identify the contribution of Russian stocks to the total biomass of juvenile chum salmon on the eastern Bering Sea shelf.

In 2007, the U.S. BASIS program sampled in the Bering Straits and the Chukchi Sea and found that water temperatures there were warmer than in the Bering Sea. Substantial numbers of juvenile pink and chum salmon were caught that were larger than those caught south of the Bering Straits. Three juvenile Chinook salmon caught off the Seward Peninsula were coded wire tagged in the Canadian Yukon indicating a northward migrating component in juvenile Yukon River Chinook salmon (JTC 2008). Juvenile chum salmon in this area and from the Chukchi Sea may also originate from the Yukon River. Auke Bay Laboratories are currently conducting genetic stock identification on these samples to determine river of origin.

JTC (2008) provides the relative abundance of juvenile salmon in the Northern Shelf Region of the Bering Sea as determined by the U.S. BASIS cruises from 2002 to 2007. The very low numbers of chum salmon juveniles in 2004 may explain the relatively low chum salmon bycatch in the BSAI groundfish fishery in 2007. The numbers of juvenile chum salmon appear to be rebounding in 2006 and 2007. Very high numbers of juvenile pink salmon were found in 2007 and may foretell a large return of adult pink salmon to Western Alaska in 2008. Relative abundance of juvenile Chinook salmon appears to be increasing after 3 consecutive years of decline.

CAPE ROMANZOF DISTRICT HERRING FISHERY

INTRODUCTION

The Cape Romanzof Herring District consists of all state waters from Dall Point north to 62 degrees north latitude (Appendix B1). Pacific herring (*Clupea harengus pallasii*) are present in coastal waters of the Yukon Area during May and June. Spawning populations occur primarily in the Cape Romanzof area in Kokechik Bay and Scammon Bay where spawning habitat consists of rocky beaches and rockweed (*Fucus* sp). The arrival of herring on the spawning grounds is influenced by ocean water temperature and ice conditions. Typically, herring appear immediately after ice breakup. Spawning usually occurs between mid-May and mid-June.

Local residents use herring harvested in Hooper Bay, Kokechik Bay and Scammon Bay for subsistence purposes. Additionally, a few fishermen in the Yukon Delta report harvesting herring along the coast near Black River and Kwiguk Pass for subsistence use. It is speculated that these herring are migrating toward southern Norton Sound. Additionally, some Yukon Delta residents harvest herring spawn-on-kelp (*Fucus* sp) north of Stebbins in southern Norton Sound.

A commercial herring sac-roe fishery has occurred in the Cape Romanzof District since 1980. Commercial harvests increased steadily after the inception of the fishery, reaching a peak harvest of 1,865 tons in 1986 (Appendix B2). In 1982, the BOF reduced the area open to commercial fishing by closing the waters outside of Kokechik Bay because of increasing fishing effort and difficulty monitoring the fishery. Since 2000, the harvest has greatly decreased because of declining markets resulting in lower prices paid and lower fishing effort. In 2004, the BOF opened the Cape Romanzof District for commercial herring fishing to the pre-1982 boundaries in an effort to allow more fishing opportunity. Gillnets are the only legal commercial gear type and mesh size may not be less than 2.5 inches and may not exceed 3.5 inches. The use of mechanical shakers has been prohibited since 1988. Limited entry to the fishery began with a moratorium on new entrants in 1988. The fishery is now limited to 101 permits.

COMMERCIAL FISHERY

Since the fishery was initiated in 1980, commercial harvests have ranged from 25 tons in 2005 to 1,865 tons in 1986 (Appendix B2). The exvessel value of the fishery has ranged from $1,000 in 2001–2004 to $1.1 million in 1986. The number of permit holders participating has ranged from 8 in 2006 to 157 in 1987. The commercial fishery saw an increasing trend in effort, harvests, and value from the inception of the fishery in 1980 until its peak in 1986. Declining market value after 2000 resulted in reduced effort, harvest, and exvessel values, eventually leading to no commercial fishery in 2007.

Despite a commercial fishery in 2006, in which 92 tons were harvested, there was a lack of commercial interest in buying herring north of the Togiak District in 2007. Therefore, no commercial fishing occurred in the Cape Romanzof District in 2007. Market demand for herring has decreased dramatically since the inception of the fishery in 1980. Buyers indicated preseason

that they would be able to meet their market needs from fisheries operating in areas outside the AYK Region.

Harvest of a high percentage of males and partially spawned out females have historically contributed to low roe recovery rates in the Cape Romanzof fishery. In recent years, fishermen in the district have been using larger mesh gillnets to selectively harvest larger (older) herring and a higher percentage of females. This change in the mesh size has increased the harvest quality, but also resulted in lower harvest rates.

Historically, short commercial herring fishing openings have been scheduled around high tide events in the Cape Romanzof District. Beginning with the 2004 season, opening and closing the commercial herring fishery based on tide events was modified by opening fishing in the district on a continuous basis. Opening the commercial fishery on a continual basis was justified based on the reduced commercial fishing effort, limited tendering capacity, and decreased processor interest in the area. Conducting commercial fisheries this way allows fishermen the maximum opportunity to explore the district to find marketable quality of sac roe herring and allows the buyer to direct when fishing will occur based on current harvest information.

For each year in which commercial fishing has occurred the overall herring exploitation rate has been estimated postseason as the proportion of the available biomass harvested (Appendix B2). Historical age composition of the harvest estimated using scale analysis from a subsample of commercially caught herring is presented in Bue et al. (2011). Due to the lack of commercial fishing, no samples were collected in 2007.

SUBSISTENCE FISHERY

A total of 191 mail-out questionnaires were sent to households in the communities of Hooper Bay, Chevak, and Scammon Bay in 2007. A total of 18 (9%) households responded. The subsistence harvest and effort figures represent only the harvest which was reported. The reported harvest is a minimum estimate since not all fishing families were contacted and not all households who received questionnaires returned them. During 2007, an estimated subsistence harvest of 3.1 tons of herring was taken by 18 fishing families from Hooper Bay, Chevak, and Scammon Bay (Appendix B3). In addition, 3 households harvested 60 pounds of herring spawn-on-kelp for subsistence purposes (Appendix B4).

STOCK STATUS

Due to excessive water turbidity in the Cape Romanzof area, it is usually not possible to estimate herring biomass using aerial survey techniques. Herring biomass in previous years has been estimated using a combination of information from aerial surveys, test and commercial catches, spawn deposition, and age composition. No aerial surveys were conducted in the Cape Romanzof District in 2007. The 2007 biomass was estimated to be 4,500, which was the projected biomass preseason.

ADF&G did not conduct test fishing operations in Cape Romanzof during the 2007 season. However, test fishing with variable mesh gillnets has been conducted in every other year since 1978 to determine distribution, timing and relative abundance of spawning herring, and to collect samples for age, sex, size, and relative maturity information. Prior year information is shown in Bue et al. (2011).

HERRING OUTLOOK FOR 2008

The projected biomass of herring to return to Cape Romanzof District in 2008 is expected to be 3,871 tons. At a 20% exploitation rate, the allowable harvest is expected to be 774 tons and will be based on inseason indicators of abundance. Since water turbidity in the Cape Romanzof area generally prevents aerial observations of herring, spawn deposition and test and commercial catch rates will be used to determine the timing and duration of commercial fishing periods. Ages 6, 10, and 11 are expected to comprise 64% of the returning biomass (27%, 14%, and 23%, respectively). Age 9 and older herring are expected to comprise 52% of the biomass.

Normally it is not possible to determine herring abundance using aerial survey methods in the Cape Romanzof District due to turbid water conditions. Variability in the quality of aerial survey assessments of biomass and deviations from the assumed survival or recruitment rates may result in the observed biomass being either above or below these projections. Therefore, guideline harvest levels may be adjusted during the season according to observed herring spawning biomass. If determining herring abundance using aerial survey methods is not possible, stock abundance will be assessed using information from the projected biomass, test, and commercial catches, and spawn deposition observations. In accordance with the AYK Region harvest strategy, the commercial fishery will not target newly recruited age classes (age 2 through age 5 herring). If market conditions improve to allow for commercial herring fishing activity, ADF&G will work cooperatively with fishermen and buyers to optimize roe recovery. In each district, the occurrence and length of fishing periods and harvests depend on inseason biomass estimates, roe quality, spawning activity, weather conditions, fishing effort, and processor input.

OTHER MARINE AND FRESHWATER FINFISH FISHERIES

SUBSISTENCE FISHERY 2007

Non-salmon species (e.g. pike, sheefish, whitefish, blackfish, etc) are an important subsistence resource for people in most areas throughout the Yukon drainage (Brown et al. 2005; Andersen et al. 2004). Many subsistence users harvest marine and freshwater finfish other than salmon and herring either as an incidental bycatch while fishing for salmon or by directly targeting those species. Subsistence users particularly rely on non-salmon species when other sources of fish or wildlife are unavailable.

Non-salmon harvest information is documented yearly during the ADF&G postseason subsistence salmon harvest surveys, but is secondary to information regarding household use of salmon. Therefore, less emphasis is placed on determining harvest estimates of non-salmon species. Comprehensive harvest assessment projects are still needed for many areas to identify the overall non-salmon harvest and utilization on a drainagewide basis. In an effort to gain more information about these subsistence fisheries, the Koyukuk River drainage and lower-middle communities of Grayling, Anvik, Shageluk, and Holy Cross (GASH) of the Yukon River drainage were extensively surveyed in 2 studies by ADF&G (Division of Subsistence and Sport Fish) and Tanana Chiefs Conference (TCC). The studies documented traditional ecological knowledge (TEK) of the behavior, harvest, and use of non-salmon fish in these areas of Alaska and found that non-salmon species are harvested by a high percentage of households in these areas (Brown et al. 2005; Andersen et al. 2004).

Subsistence harvest of freshwater finfish and other non-salmon fish species are estimated annually from subsistence surveys conducted throughout the drainage (Appendices C1 and C2). Blackfish, small whitefish, and pike accounted for the highest proportion of the total estimated and reported subsistence harvest. Since 1988, subsistence salmon surveys have included the collection of freshwater finfish harvest data. Prior to 1988, non-salmon subsistence harvest was collected with less consistency during the postseason subsistence salmon surveys. Subsistence catches of freshwater finfish taken under authority of a permit in the Upper Yukon Area are presented in Appendix C3. In 2007, a total of 440 subsistence household permits were issued. Of those issued, 410 permits were returned and 242 of the returned permits fished. The preliminary reported harvest was 3,326 whitefish, 82 sheefish, 99 burbot, 2,093 pike, 243 suckers, and 525 grayling (D. Jallen, Commercial Fisheries Biologist, ADF&G; personal communication).

A variety of fishing methods are used in the main rivers and coastal marine waters to harvest non-salmon finfish. Beach seines are occasionally used near spawning grounds, primarily capturing salmon or other schooling species of fish. Traps and fish weirs of various designs are used, mainly in the fall and winter months, to capture whitefish, blackfish, and burbot. Sheefish, northern pike, char, and "tomcod" (saffron cod) are frequently taken through the ice using hand lines. Dip nets are used in late May to early June to harvest smelt in the delta area. Dip nets and “eel sticks” are used in late October to early December to harvest Arctic lamprey (*Lampetra camtschatica)* in the mainstem Yukon River from the mouth upstream to the village of Grayling.

The spring sheefish migration occurs just prior to, and during, the beginning of the upstream migration of Chinook salmon. During late May and early June, sheefish are harvested in the lower Yukon River as they migrate upriver. Harvest of whitefish and sheefish in the upper Yukon and Tanana rivers from fish wheels at times may be large in certain areas, but it is usually a relatively small incidental harvest from the subsistence and commercial salmon fishery.

Several studies have been conducted to investigate sheefish migrations and to locate spawning areas in the Koyukuk River drainage (Alt 1968, 1969, 1970, 1974) and in the mainstem Yukon River between Stevens Village and Fort Yukon (Alt 1986). From 1997 through 1999, a sheefish tagging and radiotelemetry study was conducted by the USFWS near Rampart in cooperation with NMFS and ADF&G. The study found that sheefish captured at the study site were mature fish engaged in a spawning migration that originated in the lower Yukon River, or associated estuary regions, and continued towards a common spawning destination in the Yukon River approximately 1,700 km from the sea (Brown 2000). USFWS, in conjunction with ADF&G, has an ongoing radiotelemetry project investigating sheefish spawning and migration for the Nowitna River drainage, upper Koyukuk, upper Yukon Flats, Tanana River drainage, and Chatanika River.

Behavior and migration patterns of whitefish species are not well documented for the Yukon River drainage, but the USFWS is currently conducting a 3-year radiotelemetry and TEK study of the seasonal migrations and important habitats for humpback and broad whitefish in the upper Koyukuk and the upper Tanana River drainage.

Since 1995, ADF&G Division of Sport Fish has conducted several stock assessment projects on northern pike using radiotelemetry in large tributaries of the Yukon River including: the Dall, Innoko, and Nowitna rivers, as well as in the Kaiyuh Flats and the Old Lost Creek drainage (Taube and Lubinski 1996; Chythlook and Burr 2002; Joy and Burr 2004). Based upon the results of these experiments, coupled with low reports of sport and subsistence annual harvests,

there appears to be no conservation concern for these populations and harvests appear sustainable at this time.

PERSONAL USE FISHERY 2005

In 2007, the personal use salmon fishery followed the regulatory fishing time of two 42-hour periods per week. A total of 65 personal use salmon and 3 personal use whitefish and sucker household permits were issued. Of the 68 personal use permits issued, 66 were returned and 32 were fished (Appendix C3). Along with the reported salmon harvests an incidental catch of 4 whitefish, 1 sheefish, and 1 pike were reported in the Fairbanks Nonsubsistence Area in 2007 (D. Jallen, Commercial Fisheries Biologist, ADF&G; personal communication).

COMMERCIAL FISHERY

Regulations adopted by the BOF allow ADF&G to issue permits for the commercial harvest of non-salmon freshwater fish including whitefish, sheefish, burbot, northern pike, blackfish, and Arctic lamprey throughout the Yukon and Tanana River drainages. Most of these fisheries are issued limited or experimental permits, and operate in discrete time periods throughout the year. Following the decline in salmon runs, a marked increase in non-salmon fisheries emerged on the Yukon River. Despite the strengthening chum salmon returns in recent years the interest in freshwater fisheries has remained, particularly for cisco and Arctic lamprey. The reported historical harvests for all lower Yukon Area commercial freshwater fisheries for whitefish are presented in Appendix C4.

YUKON RIVER WHITEFISH FISHERY SUMMARY 2007

In 2005, 2006 and 2007, ADF&G issued Commissioner's permits for the commercial harvest of whitefish in the Lower Yukon River. Commissioner's permits are issued for the experimental commercial harvest of species not managed under existing State of Alaska commercial fishing regulations. The purpose of the experimental commercial fishery was to collect information regarding species composition and abundance, to evaluate operational and catch characteristics of gear, and to test market conditions. Species harvested include broad whitefish *Coregonus nasus*, iconnu *Stenodus leucichthys* (commonly referred to as "sheefish" by Yukon River residents and in this report), Bering cisco *C. laurettae*, humpback whitefish *C. pidschian* and least cisco *C. sardinella*.

Gear restrictions implemented during the 2007 whitefish commercial fishery reduced the maximum stretch-mesh size from 6 inches (allowed in 2005 and 2006) to 4 inches. The gear restriction was implemented to target least cisco and to reduce fishing pressure on older-aged fish in the population, such as sheefish, broad whitefish and humpback whitefish.

In 2006, a test fishing project was operated in conjunction with the whitefish commercial fishery. Test fishing was conducted by commercial fishermen who were trained by ADF&G staff to collect baseline information using standardized methods and fishing gear. The test fishing project did not operate in 2007 due to time and funding constraints.

In 2007, three freshwater commercial fishery permits were issued for whitefish. The permits specified limits for broad whitefish, sheefish and miscellaneous whitefish *Coregonus* spp. Two permits were issued to direct market catcher–sellers and each permit allowed a harvest of up to 500 pounds of whitefish comprised of no more than 125 broad whitefish and 50 sheefish. One permit was issued to a commercial processor which allowed a harvest of up to 9,000 pounds of

whitefish comprised of no more than 1,250 broad whitefish and 400 sheefish. Fishing gear was restricted to one set or drift gillnet up to 150 feet in length with a maximum stretch-mesh size of 4 inches, or hand hook and line.

The whitefish commercial fishery permits were valid September 17 through December 31, 2007. One permit holder was a commercial processor based in District 1 near Emmonak, and the other two were catcher–sellers based in District 2 near Saint Mary's.

The commercial harvest began in District 1 on September 26 and ended on October 1. A total of 23 fishermen made 42 deliveries to the commercial processor in Emmonak, and a total of 9,002 pounds of whitefish were harvested (Appendix C4). The price per pound was $1.00 and the estimated harvest value to fishermen was $9,002. The average harvest value for each fisherman was $391. The commercial fishing effort consisted of local residents from the lower Yukon River communities of Nunam Iqua, Emmonak, Alakanuk, Kotlik and Mountain Village.

In District 2, the direct market permit holders began setting gillnets under frozen river ice in late November. Whitefish were harvested intermittently near the community of Saint Mary's through the end of December; however, permit holders elected to retain their catch for subsistence use. Therefore, whitefish were not sold commercially in District 2 during the 2007 commercial fishery.

The total commercial harvest was 9,002 pounds, which was 998 pounds below the 10,000 pound harvest cap, resulting in a conservative harvest.

In the Upper Yukon Area, commercial freshwater fisheries targeting primarily whitefish have been permitted in prior years (Appendix C5), although in recent years few permit applications have been received or utilized. Permit authorization is not required for the sale of these species when taken incidentally during the commercial salmon fishing season. In 2007, such sales of incidental whitefish during the commercial salmon fishery only occurred in District 6 (Appendix C6).

Harvest Sampling

In 2007, a total of 420 commercially harvested whitefish were sampled for biological information. Age sex length (ASL) data were collected by ADF&G staff at the processor's facility in Anchorage before the fish were processed. All specimens were cut to identify reproductive organs. Fork length (tip of snout to fork of tail) was measured to the nearest millimeter. Broad whitefish sampled (n=89) had a mean length of 477 mm, and 49% of fish sampled were female. Humpback whitefish sampled (n=100) had a mean length of 362 mm, and 47% of fish sampled were female. Bering cisco sampled (n=100) had a mean length of 359 mm, and 55% of fish sampled were female. Sheefish sampled (n=131) had a mean length of 648 mm, and 59% of fish sampled were female.

Otoliths were collected from Bering cisco (n=100), broad whitefish (n=89), humpback whitefish (n=100), and sheefish (n=96), and age was determined by counting annual rings under a compound microscope (A. Padilla, Commercial Fisheries Biologist, ADF&G, Fairbanks, personal communication, 2007). Bering cisco ages ranged from 3 to 8 years and both sexes had a median age of 4. Sheefish ages ranged from 3 to 17 years. Male sheefish had a median age of 5 and females had a median age of 6 (male n=12, female n=16). The difference in median age by sex for sheefish may be due to small aged-sex sample sizes as the median age was 5 for all aged sheefish (n=95). Humpback whitefish ages ranged from 3 to 14 years and both sexes had a median age of 5. Broad whitefish ages ranged from 4 to 13 years. Both male and female broad whitefish had a median age of 6.

ASSESSMENT

There is a paucity of information relating to whitefish biology and demography within the Yukon River Delta. As such, the Yukon River whitefish commercial fishery has been authorized since 2005 as experimental. No intensive assessment project has been initiated in the Yukon River drainage to gauge the overall abundance of whitefish in the entire watershed. This fishery may be used in the future to determine species distribution, relative abundance, and run timing for these species. Whitefish harvest and use for subsistence purposes is documented for the lower, middle and upper Yukon River areas with TEK being useful in providing run timing information.

While the fishery provides some commercial opportunity for fishermen in the lower Yukon River, information is still insufficient to fulfill a larger harvest allocation. The harvest cap for whitefish was based on the historical commercial harvest of sheefish and whitefish in the lower Yukon Area from limited commercial fisheries conducted from 1980 through the early 1990s. ADF&G does not foresee this commercial fishery to be developed to harvest more than the current 10,000 pound limit in the near future.

ARCTIC LAMPREY FISHERY SUMMARY

Beginning in 2003 an experimental commercial Arctic lamprey fishery emerged on the Yukon River. A Commissioner's permit has been issued annually allowing for a harvest total of 5,000 to 44,080 lbs of Arctic lamprey in Districts 2 and Subdistrict 4-A. Commissioner's permits are issued for the experimental commercial harvest of species not managed under existing State of Alaska commercial fishing regulations. The purpose of this fishery was to determine species distribution and abundance, to evaluate operational and catch characteristics of gear, and to test market conditions. The reported historical lamprey commercial harvests for the Yukon Area are presented in Appendix C7. The catch is being sold in markets in Asia and to pharmaceutical companies. The exact dates of the fishery have varied each year in response to the seasonal movements of lamprey; however, the commercial harvest has generally occurred in the mid- to late November. Gear is restricted to one hand dip net per commercial permit holder.

Commercial Fishery

In 2007, there were 4 freshwater commercial fishery permits issued for lamprey. Three of the permits were issued to direct market catcher–sellers and each permit allowed a harvest of up to 1,000 pounds of lamprey. One permit was issued to a commercial processor which allowed a harvest of up to 44,080 pounds of lamprey.

The lamprey commercial fishery permits were valid October 1 through December 31, 2007. Three permit holders were based in District 2 near Saint Mary's and one permit holder was based in Subdistrict 4-A near Grayling.

The commercial harvest was conducted by dipping fishing gear into medium sized holes cut through near-shore ice, and the gear was restricted to one hand held dip net or one "eel stick" (large wood pole with long protruding spikes) for each permit holder.

The 2007 commercial harvest occurred in Subdistrict 4-A on November 29. Fishing began at approximately 5:00 p.m. and low harvests were reported for a 15-20 minute period, then passage at the fishing sites dropped off. Fishing success was adversely affected by poor river ice conditions. One fisherman sold 42 pounds of lamprey at the processor's onshore buying station in Grayling, and retained an additional 30 pounds of lamprey for subsistence use. A small

quantity of lamprey harvested by other Grayling commercial fishermen was also retained for subsistence use. Fishermen in Grayling continued to monitor the fishing sites through December 10, but there was no additional commercial or subsistence harvest.

The combined commercial harvest by all 4 permit holders was 42 pounds, which was negligible compared to the 44,080 pound harvest cap (Appendix C7). The price paid per pound was $1.00, resulting in an estimated harvest value of $42.00.

Subsistence Fishery

ADF&G started monitoring subsistence catches on November 5, 2007. Phone contacts were established in the villages of Emmonak, Mountain Village, Saint Mary's, Russian Mission, Anvik and Grayling. Information was collected regarding subsistence harvest and effort, river and weather conditions, and run timing.

Subsistence fishermen in Mountain Village reported harvesting a small quantity of lamprey on November 13, but no lamprey were harvested by direct market catcher–sellers in this area for commercial purposes. River ice conditions were reported as poor, with jagged near shore ice and open flowing water off shore.

Subsistence fishermen reported catching 110 lampreys on November 24 downriver near Holy Cross. On November 26, a small amount of lamprey was harvested in the village of Anvik.

Fishermen in Grayling began setting up lamprey fishing sites on November 26. They used chainsaws and/or manual ice breakers to cut large rectangular holes through near shore ice at traditional fishing sites. The fishing holes were monitored visually and by occasionally flicking a stick through the water in the fishing holes. The lamprey began to pass Grayling on November 29. Local individuals reported that although traditional fishing sites were used, ice conditions were thin and unstable, and open water precluded fishermen from crossing the river and exploring other fishing locations.

Assessment

Traditional Ecological Knowledge (TEK) provides valuable information regarding run timing and favorable harvest sites for lamprey fishing in the lower Yukon River. The lamprey run is closely monitored by both subsistence and commercial fishermen, and information is readily shared between user groups and among local communities. Based on the November 13 report from subsistence fishermen in Mountain Village, and the commercial fishery which occurred in Grayling on November 29, the estimated lamprey travel speed between the 2 communities was 15 miles per day. The quantity of lamprey harvested in Grayling for commercial and subsistence purposes was consistent with the subsistence harvests reported by downriver community members. The low overall catch rates may be a result of poor ice conditions and fluctuating water levels, which limited fisherman accessibility to traditional fishing sites. Other variables to consider are low overall abundance, varying effort levels and fishing time, and/or efficiency of fishing site locations.

In 2007, there was an increased effort to collect harvest and effort data from commercial fishermen. An ADF&G representative worked with the 4 permit holders as well as Grayling community members and fishermen to document fishery information. In addition, a YDFDA technician worked with Grayling commercial fishermen in completing their catch logs. At the time of this report, 6 commercial fishermen have returned catch logs to ADF&G. In the future,

all fishermen electing to participate in the commercial fishery must ensure permit requirements are followed, which includes thorough documentation of effort and harvest on the catch logs provided by the department.

The Yukon River Arctic lamprey commercial fishery is experimental and exploratory in nature, and specific questions regarding the life history and abundance of Arctic lamprey persist. Should a dedicated Arctic lamprey assessment project be developed in the future, data collected during the Yukon River Arctic lamprey commercial fisheries may contribute valuable baseline information.

NORTHERN AREA

DESCRIPTION OF AREA

The Northern Area includes all waters of Alaska north of the latitude of the western most tip of Point Hope and west of 141° West longitude, including those waters draining into the Arctic Ocean and the Chukchi Sea (Appendix D1).

SUBSISTENCE FISHERIES

Many subsistence fishermen operate gillnets in the rivers and coastal marine waters of the Northern Area to harvest marine and freshwater finfish. Small numbers of chum, pink, and Chinook salmon have been reported by subsistence fishermen along the Arctic coast. Traps and fish weirs of various designs are also used, mainly in the fall and winter months, to capture whitefish, blackfish, and burbot. Northern pike, char, and "tomcod" are frequently taken through the ice by hand lines. The extent of the harvest of non-salmon finfish in the Northern Area is inadequately documented. However, recent fishery harvest studies were undertaken for 2 small Inupiat communities in the Northern Area by the ADF&G Division of Subsistence. It was found that annual community fish harvest for Kaktovik consisted of Dolly Varden *Salvelinus malma*, Arctic cisco *Coregonus autumnalis*, Arctic grayling, Lake trout *Salvelinus sp.*, salmon, and Arctic cod (Pedersen and Hugo 2005). Similarly, community fishermen in Anaktuvuk Pass produced annual catches of “char” (a mix of Arctic char and Dolly Varden), lake trout, Arctic grayling, Arctic cisco, and few burbot (Pedersen and Linn 2005).

COMMERCIAL FISHERIES

Regulations adopted by BOF allow ADF&G to issue permits for the commercial harvest of freshwater species of fish such as whitefish, sheefish, char, northern pike, blackfish and Arctic lamprey in the Northern Area. However, there are no commercial fisheries for salmon species in the Northern Area. A commercial fishery for freshwater finfish has existed in the Colville River delta (located approximately 60 miles west of Prudhoe Bay) since 1964 (Appendix D2). Historically, commercial fishing generally took place during late June and July for broad and humpback whitefish, and October through early December for Arctic and least cisco. However, since 1990, commercial fishing effort has predominately occurred in October and November for Arctic and least cisco. Set gillnets are used as capture gear and fishing during fall months occurs under the ice. All fish are harvested to sell commercially and are reported daily on a catch form. However, not all fish reported on permits for this area are sold. Those fish not commercially sold

are retained and used for subsistence purposes. In the 2007 season, the harvest included 462 humpback whitefish, 2,265 least cisco, and 390 Arctic cisco (Appendix D2). No commercial sales were reported in 2007.

ACKNOWLEDGEMENTS

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FIGURES

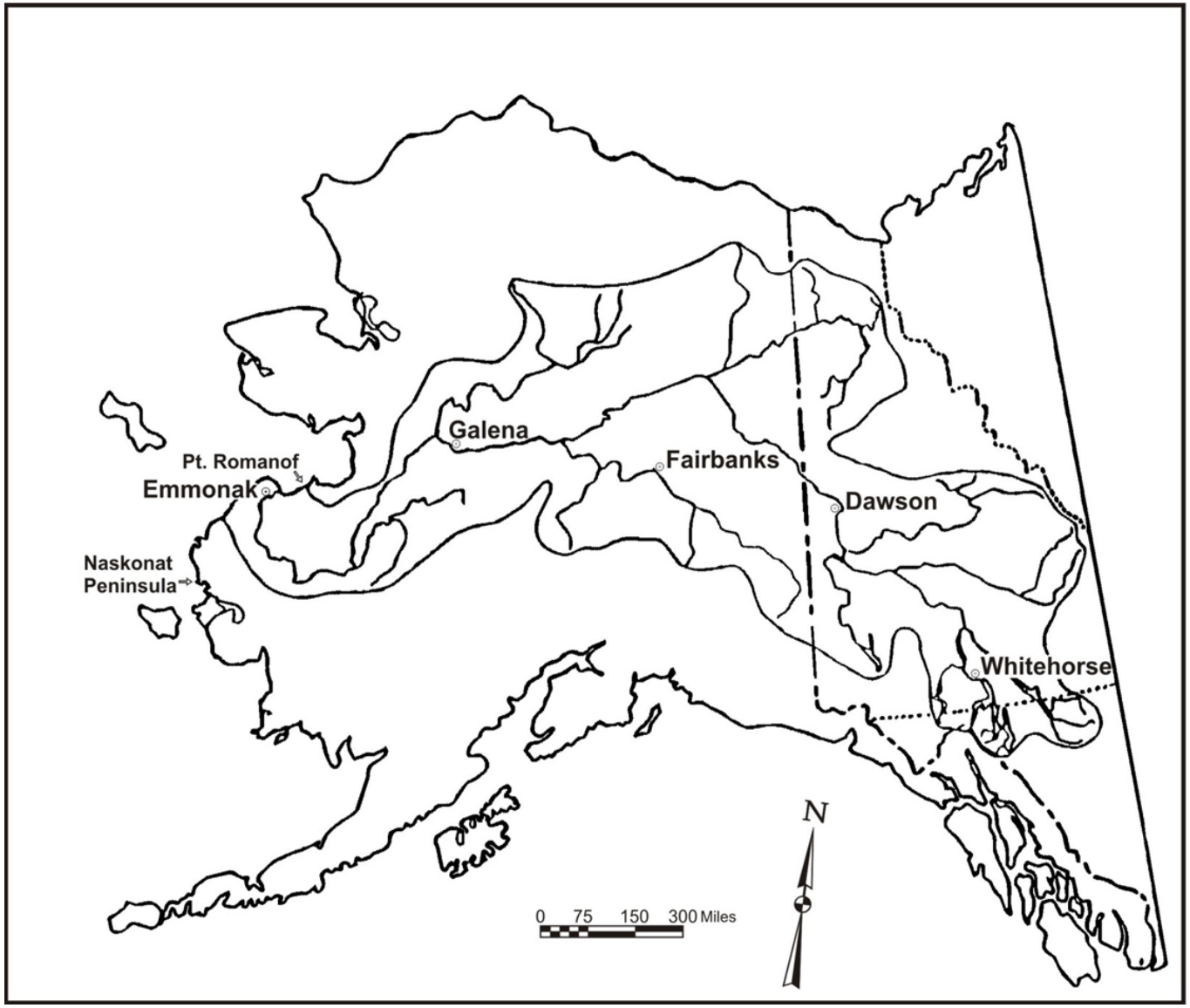


Figure 1.–Map of the Yukon River drainage.

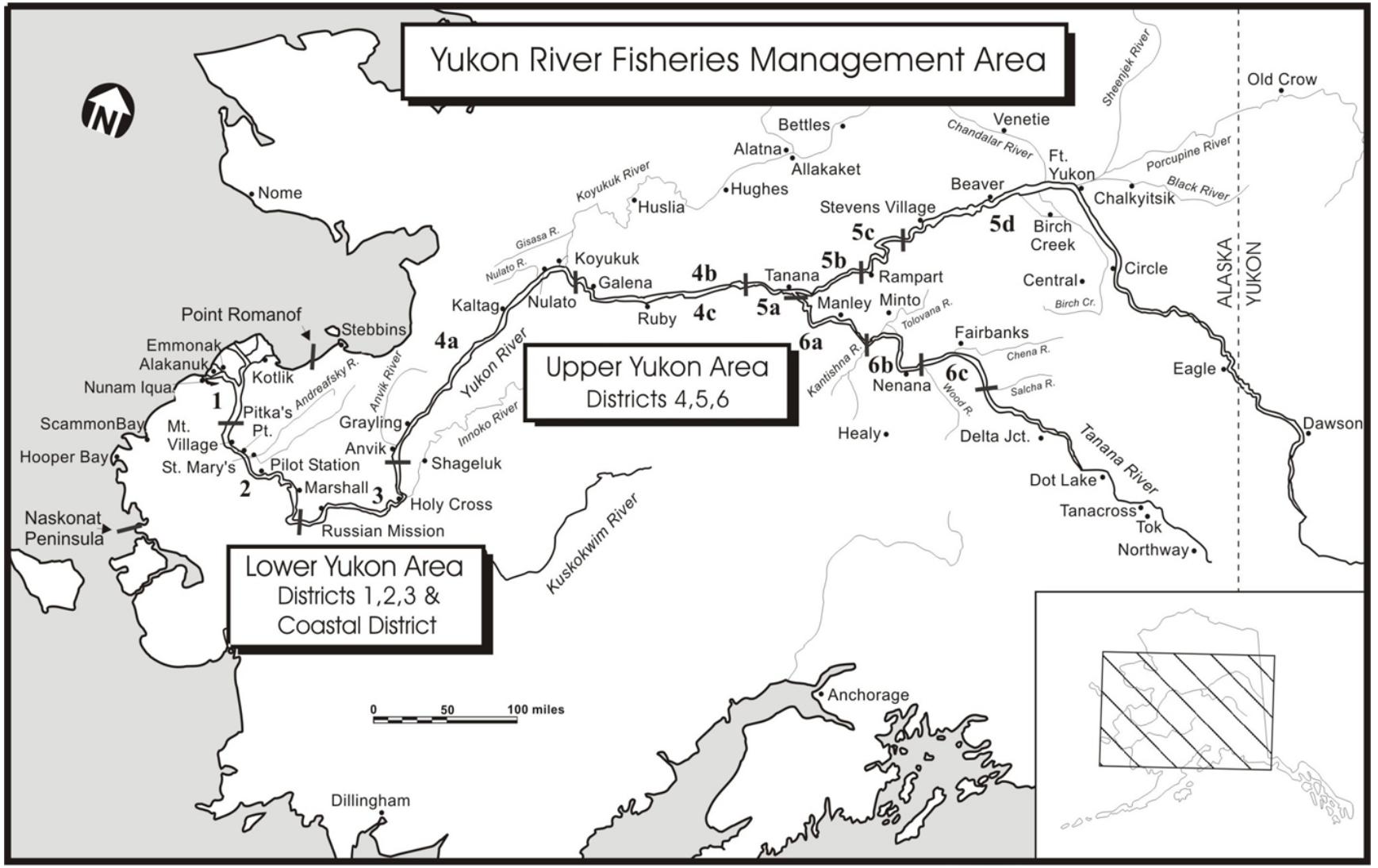


Figure 2.–Alaska portion of the Yukon River drainage showing communities and fishing districts.

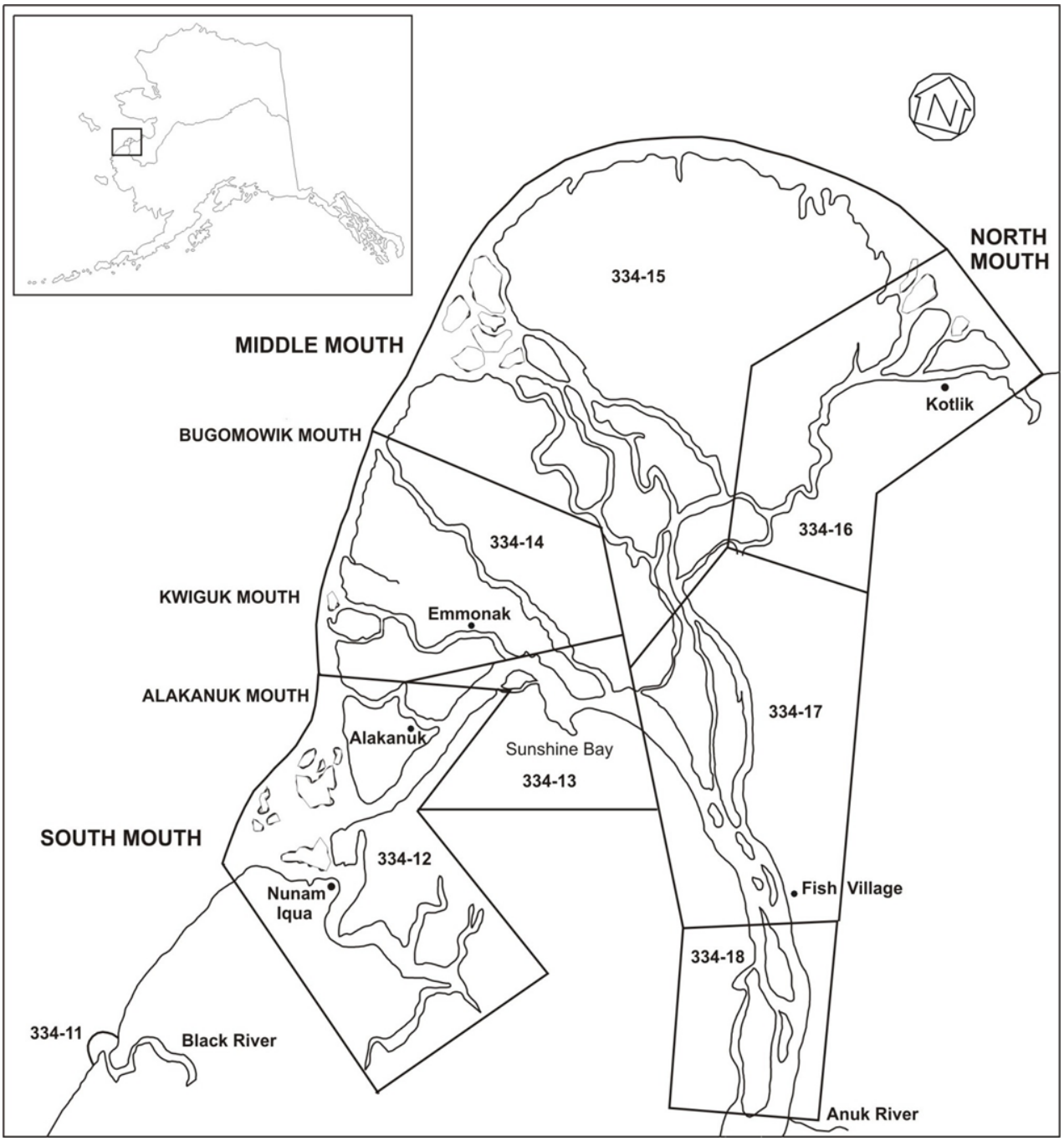


Figure 3.–District 1 showing statistical areas, Yukon Area.

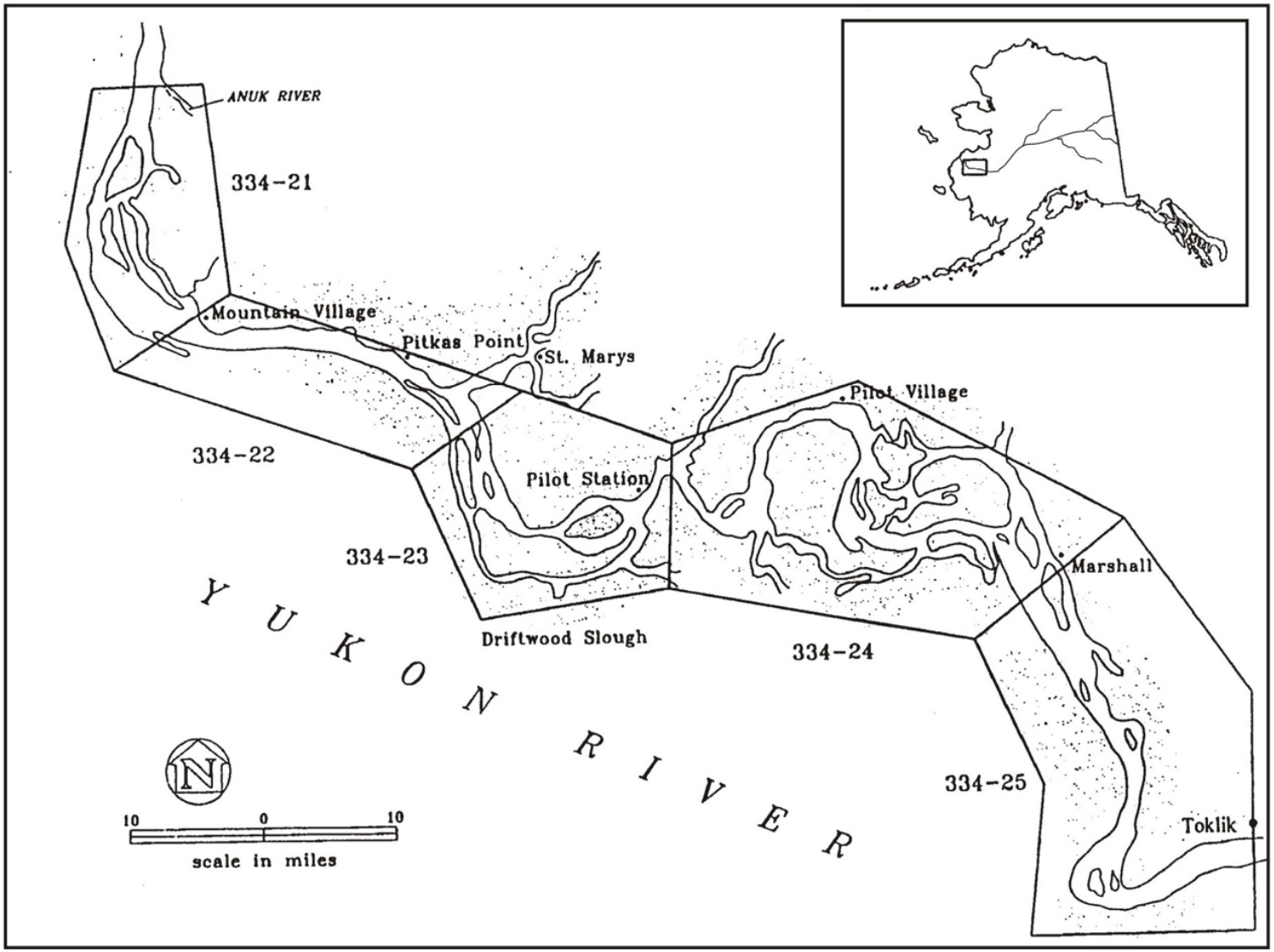


Figure 4.–District 2 showing statistical areas, Yukon Area.

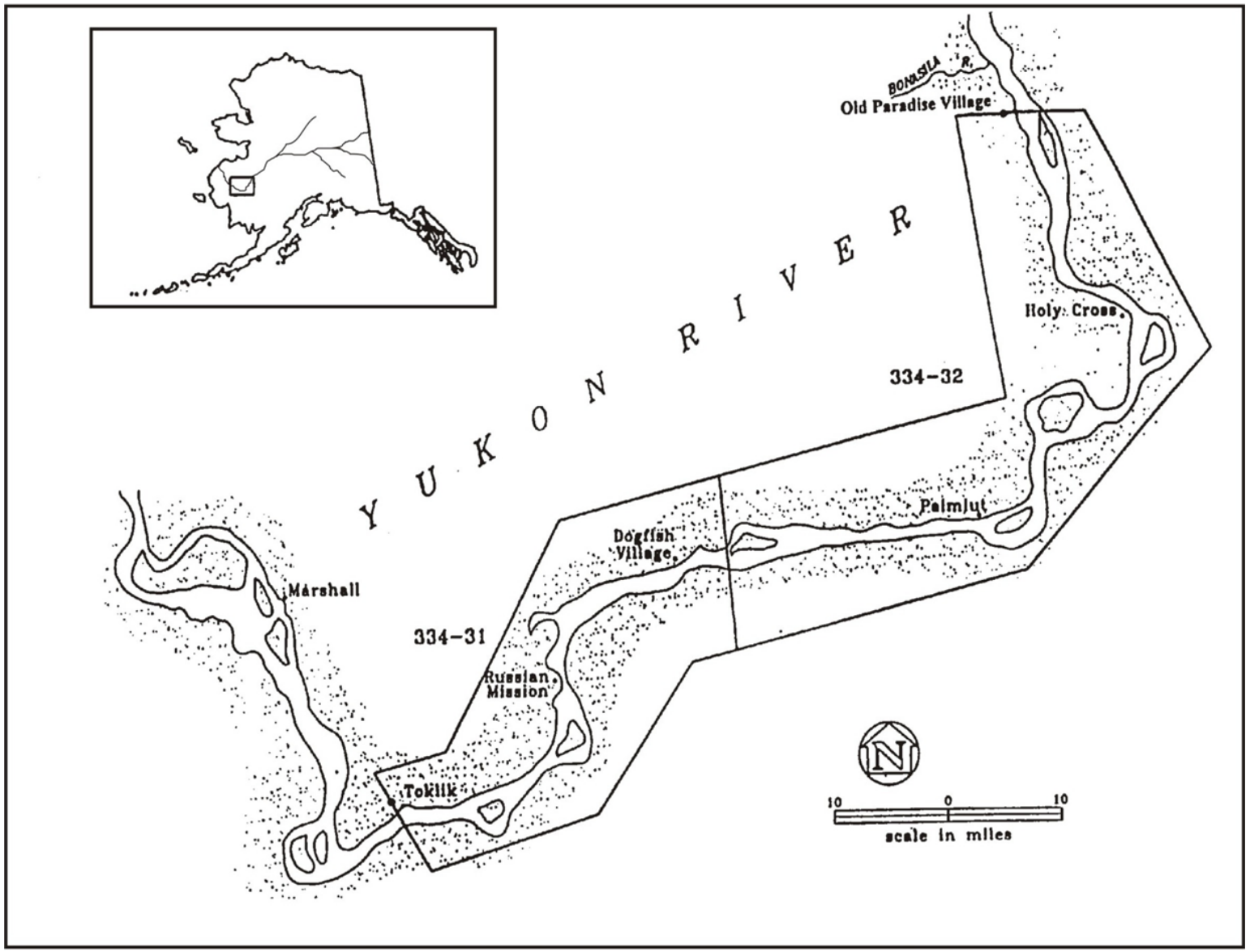


Figure 5.–District 3 showing statistical areas, Yukon Area.

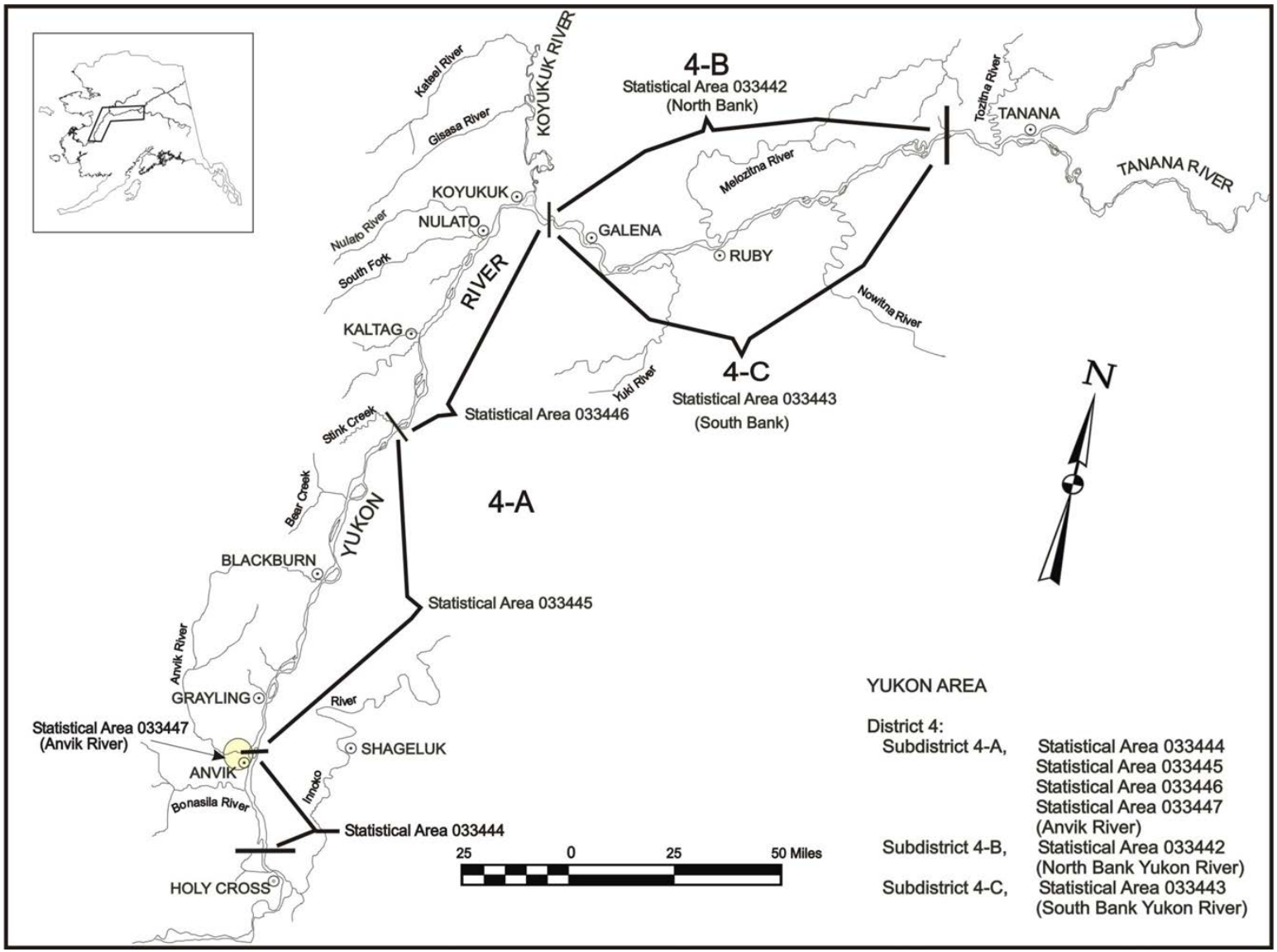


Figure 6.–District 4 showing statistical areas, Yukon Area.

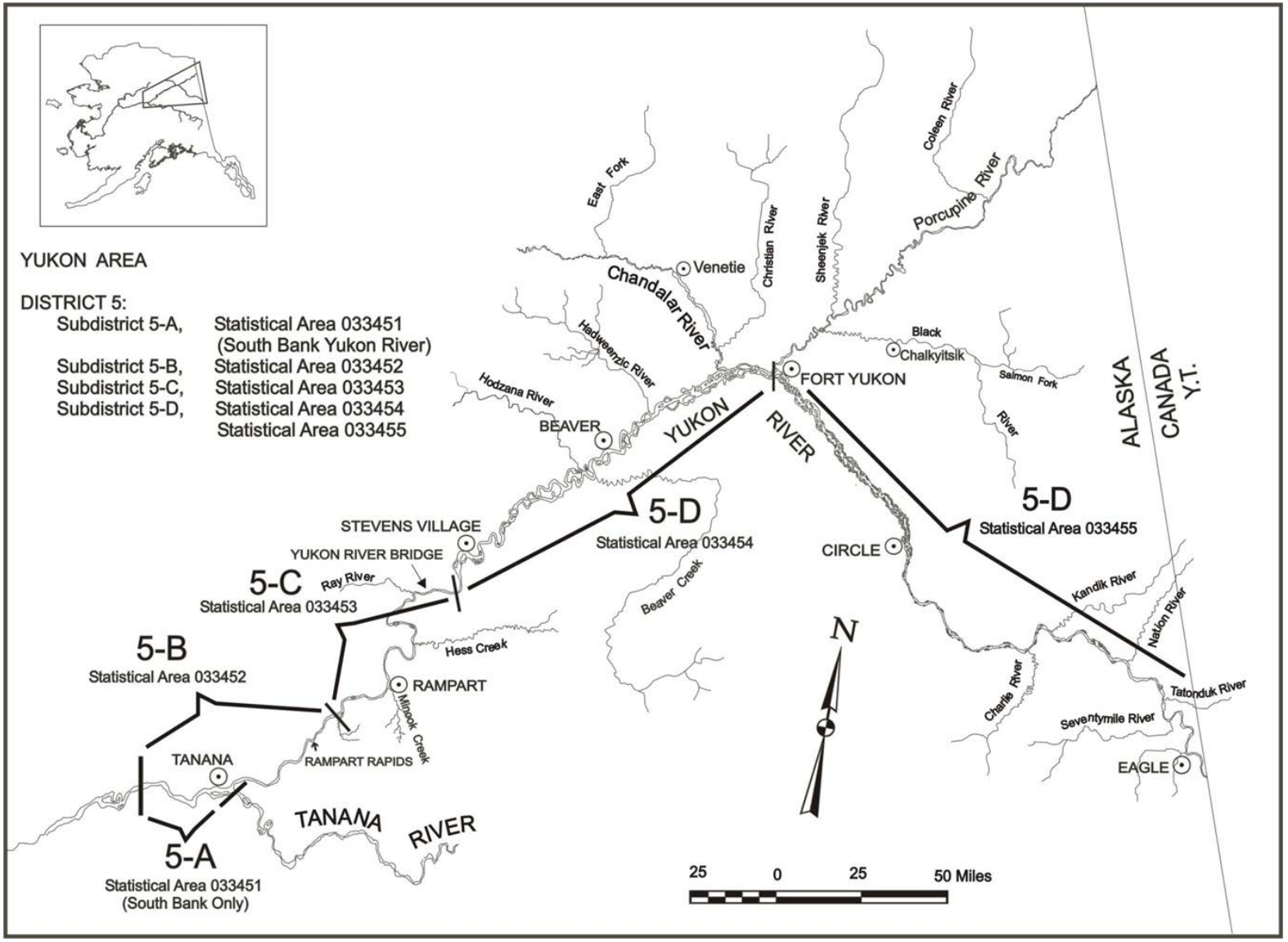


Figure 7.–District 5 showing statistical areas, Yukon Area.

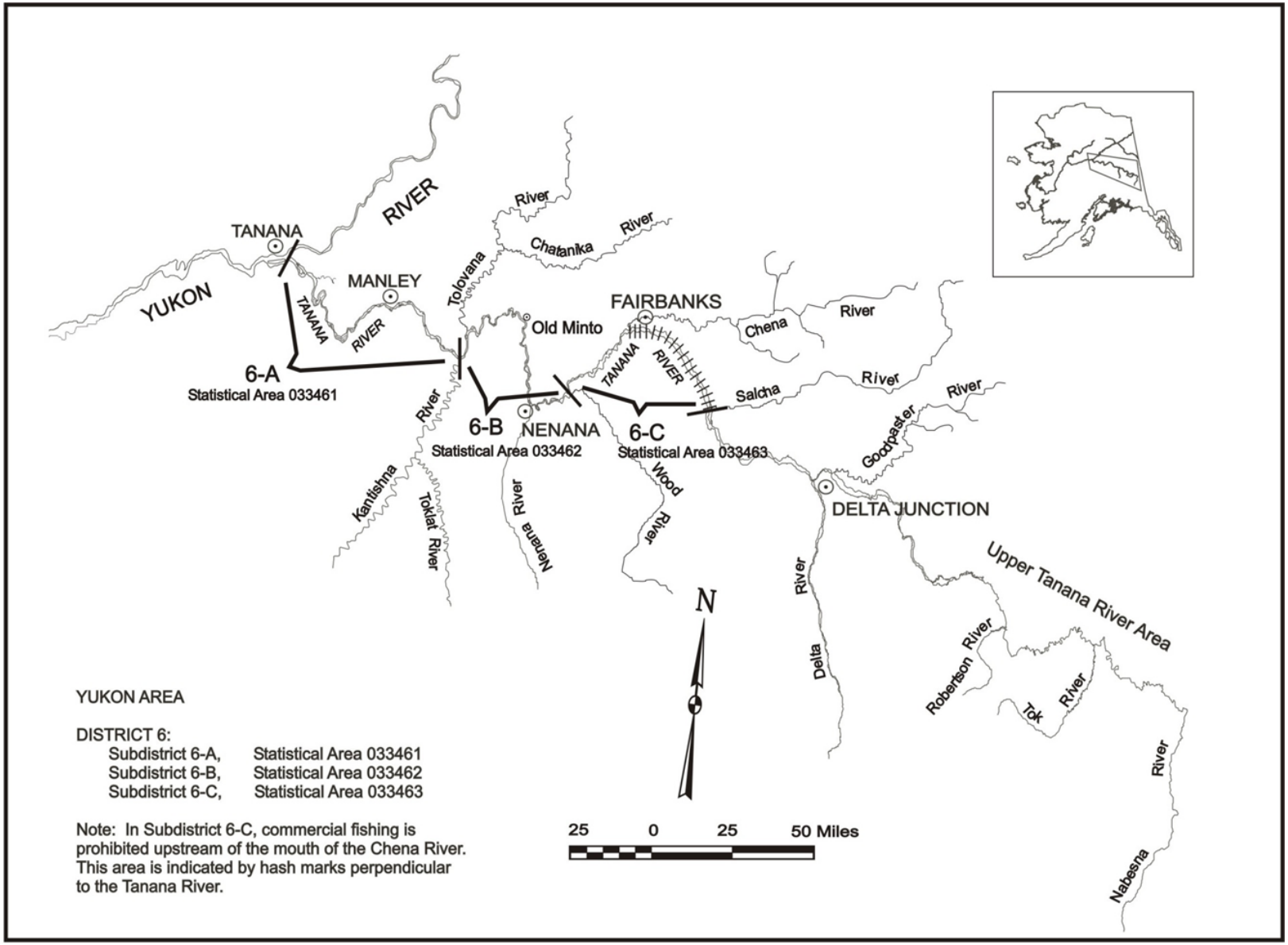


Figure 8.–District 6 showing statistical areas, Yukon Area.

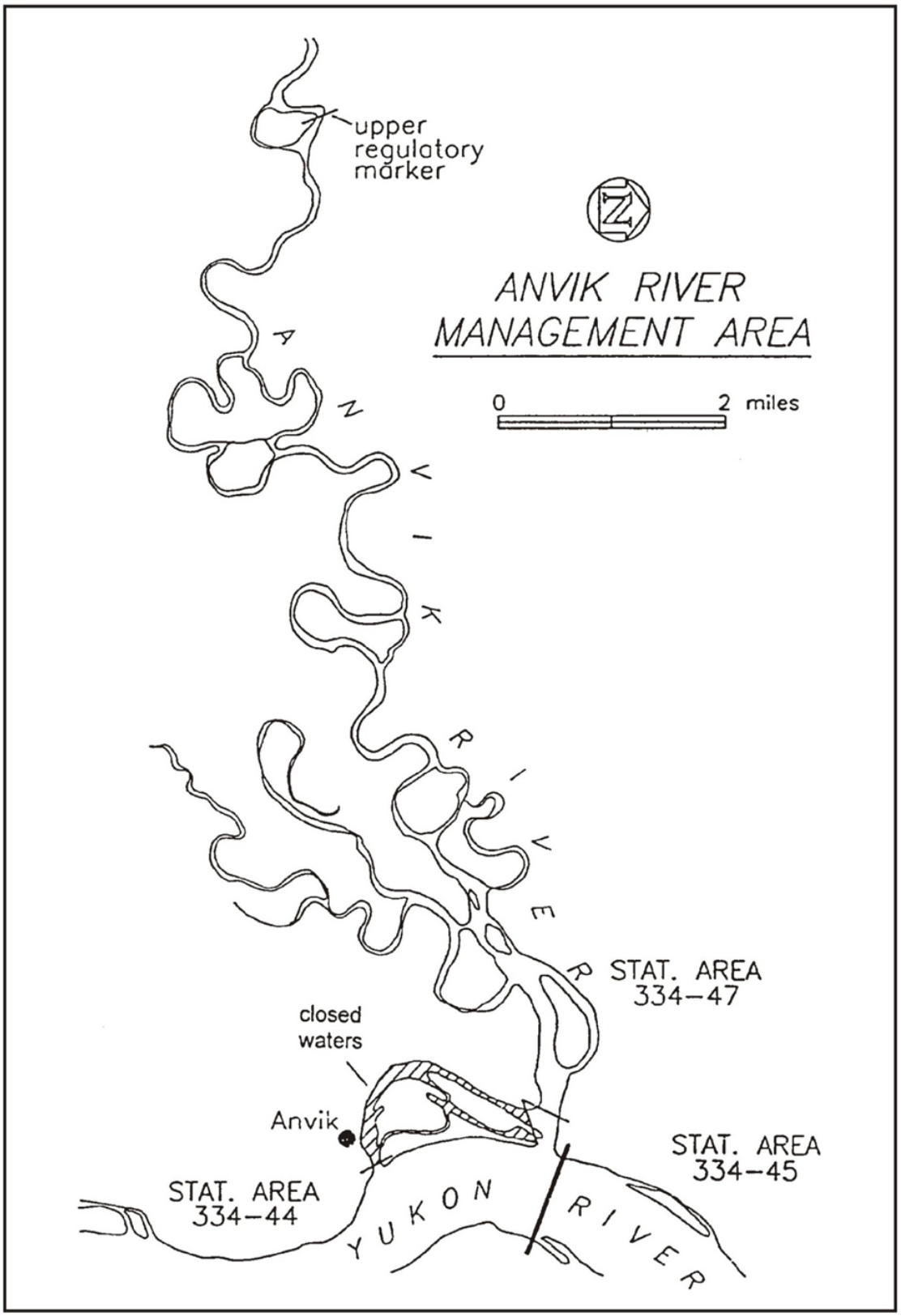


Figure 9.–Anvik River Management Area, Yukon Area.

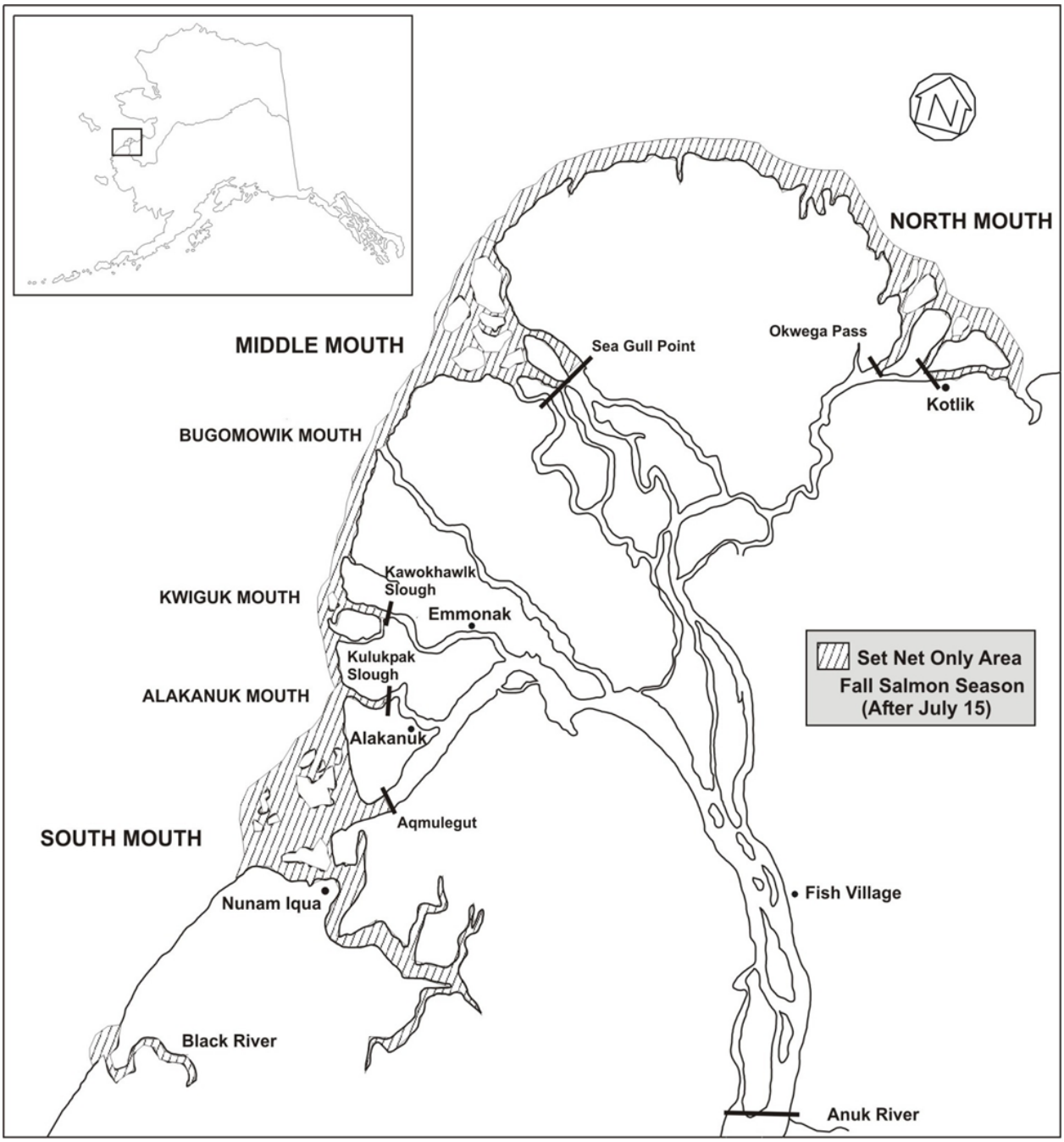
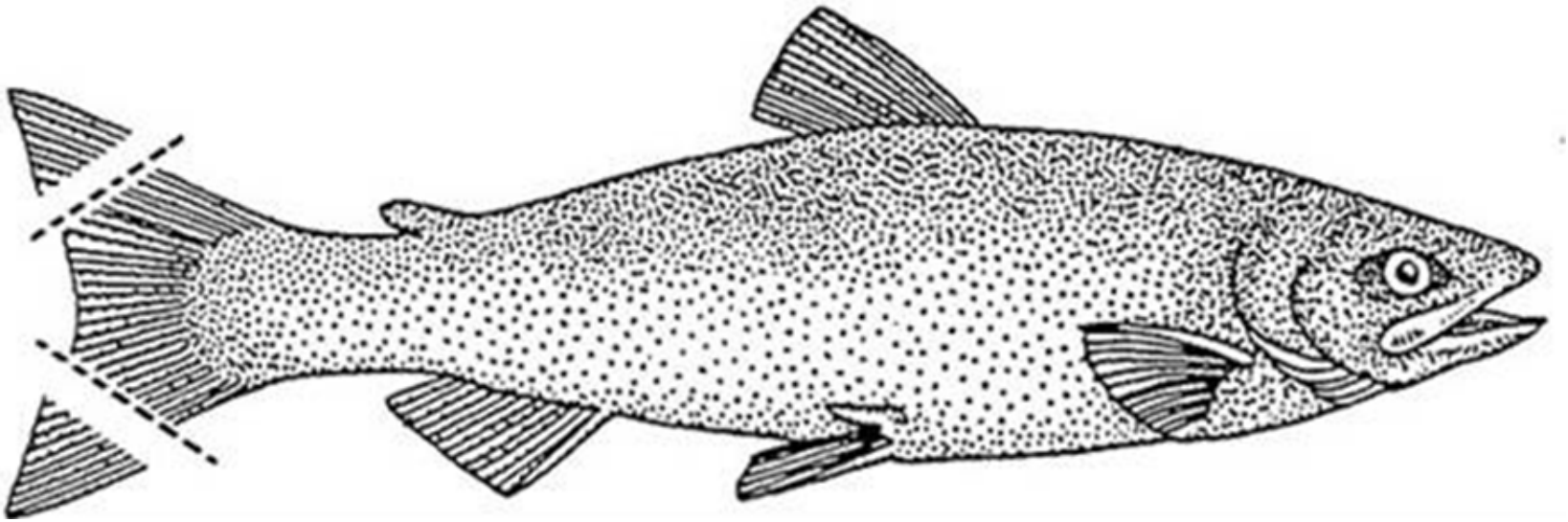


Figure 10.–Set Gillnet Only Area of District 1, Lower Yukon Area.



Note: Both lobes of the tail fin need to be removed before Chinook salmon are transferred from fishing sites. Fish with removed tail fins may not be sold or purchased.

Figure 11.–New subsistence fishing marking requirements for Chinook salmon in Districts 1–3 from June 1 to July 15.

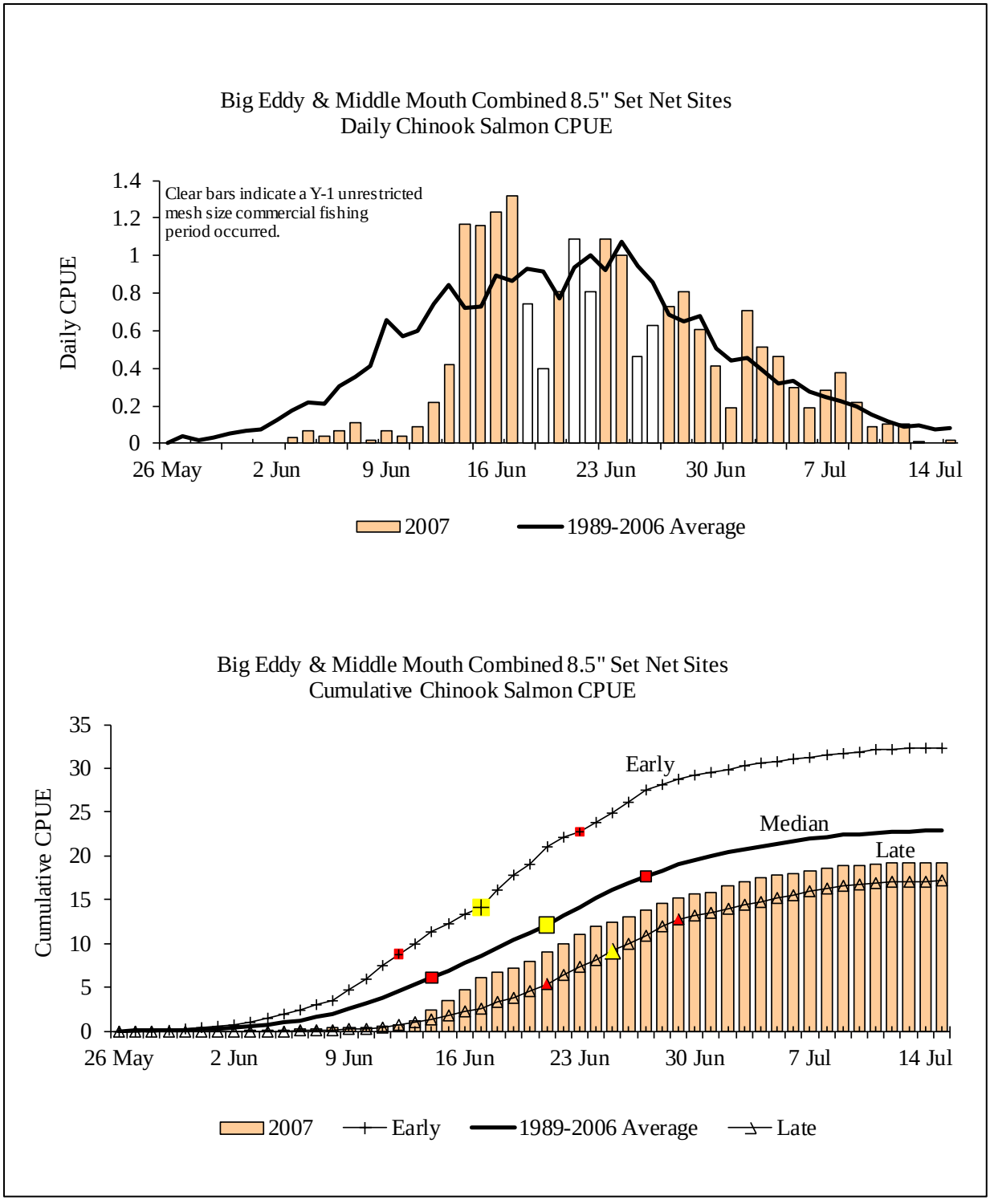


Figure 12.–Daily test fish CPUE for Chinook salmon test fish sites 2007 compared to the 1989–2006 average (above).

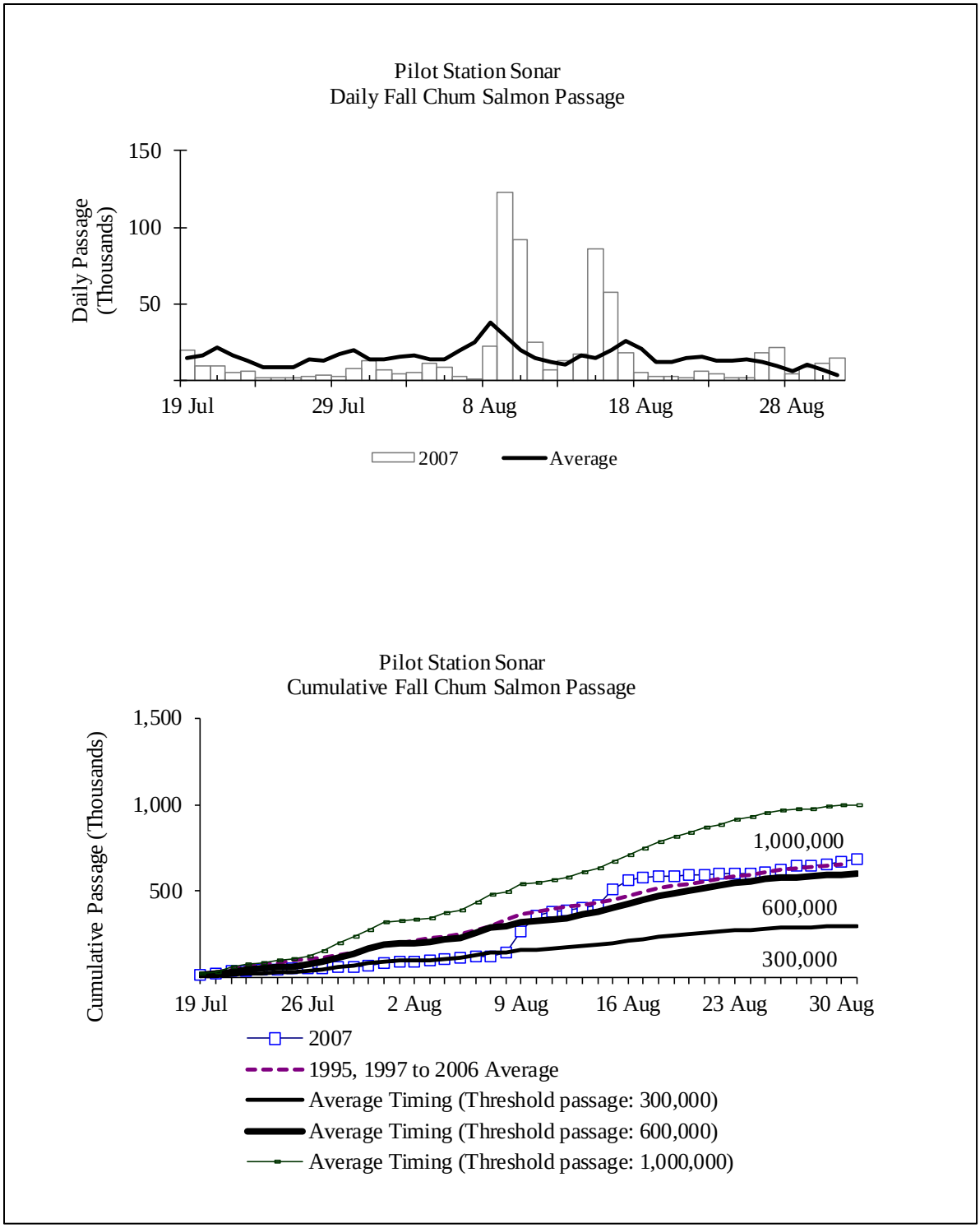


Figure 13.–Daily sonar passage counts attributed to fall chum salmon, located near the community of Pilot Station, Yukon River, 1995, and 1997 through 2006 average compared to 2007 (above), and cumulative sonar passage counts, 1993, 1995, and 1997 through 2006 average timing to obtain threshold passage, compared to 2007 (below).

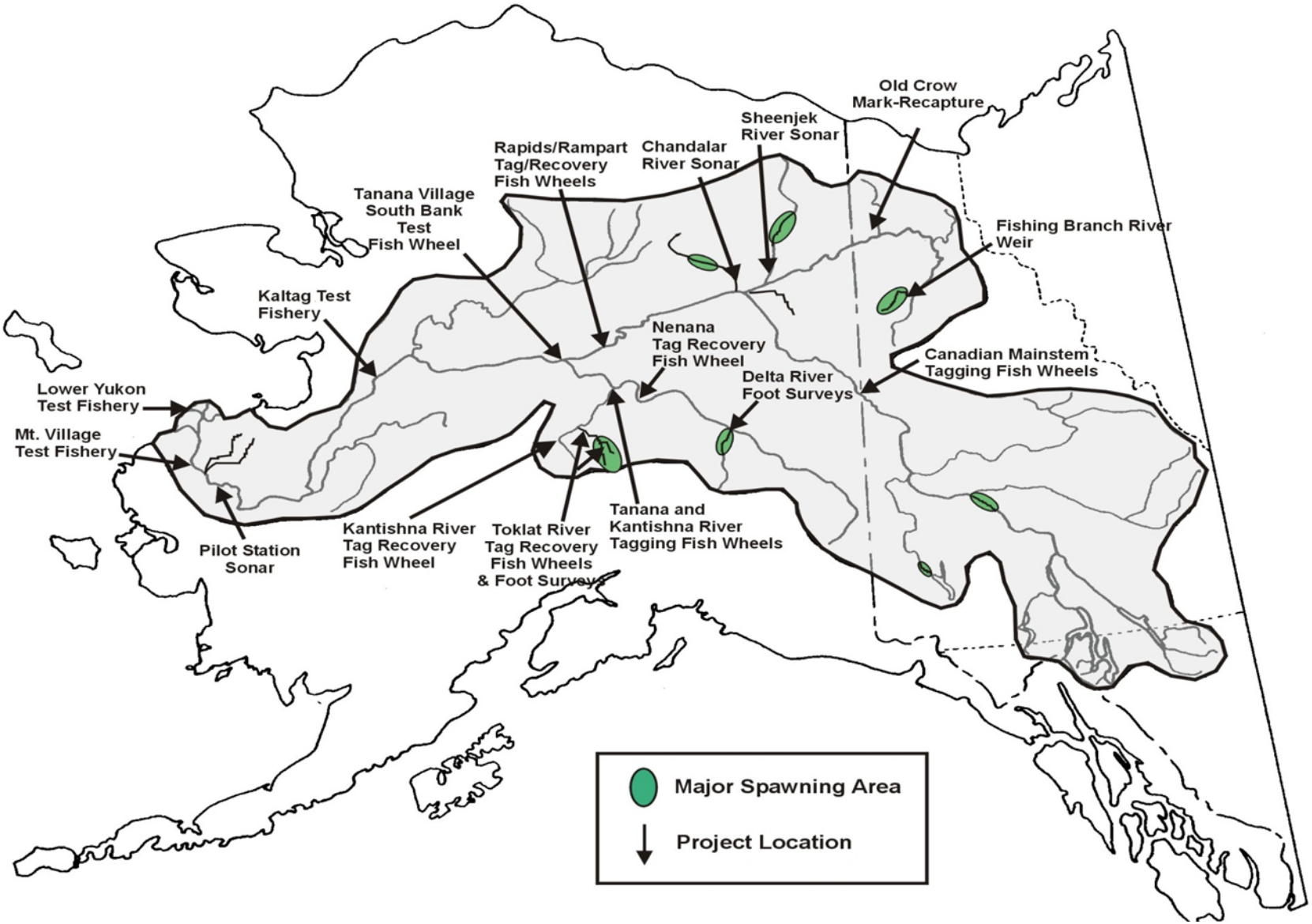


Figure 14.–Select fall chum salmon monitoring projects, Yukon River drainage.

APPENDIX A: DRAINAGE OVERVIEW AND SALMON HARVEST AND ESCAPEMENT

Appendix A1.–List of indigenous fishes found in the Yukon Area.

Species Code [a]	Scientific Name	Common Name
601	*Lampetra japonica*	Arctic Lamprey
570	*Stenodus leucichthys*	Inconnu (Sheefish)
588	*Coregonus nasus*	Broad Whitefish
589	*Coregonus pidschian*	Humpback Whitefish
583	*Coregonus sardinella*	Least Cisco
585	*Coregonus laurettae*	Bering Cisco
586	*Prosopium cylindraceum*	Round Whitefish
587	*Prosopium coulteri*	Pygmy Whitefish
610	*Thymallus arcticus*	Arctic Grayling
550	*Salvelinus namaycush*	Lake Trout
520	*Salvelinus alpinus*	Arctic Char
530	*Salvelinus malma*	Dolly Varden
410	*Oncorhynchus tshawytscha*	Chinook Salmon
420	*Oncorhynchus nerka*	Sockeye Salmon
430	*Oncorhynchus kisutch*	Coho Salmon
440	*Oncorhynchus gorbuscha*	Pink Salmon
450	*Oncorhynchus keta*	Chum Salmon
513	*Osmerus mordax*	Rainbow Smelt
514	*Hypomesus olidus*	Pond Smelt
500	*Esox lucius*	Northern Pike
630	*Dallia pectoralis*	Alaska Blackfish
650	*Couesius plumbeus*	Lake Chub
640	*Catostomus catostomus*	Longnose Sucker
670	*Percopsis omiscomaycus*	Trout Perch
590	*Lota lota*	Burbot (lush)
661	*Pungitius pungitius*	Ninespine Stickleback
162	*Cottus cognatus*	Slimy Sculpin
ESTUARINE		
113	*Eleginus gracilis*	Saffron Cod
122	*Liopsetta glacialis*	Arctic Flounder
127	*Limanda aspera*	Yellowfin Sole
129	*Platichthys stellatus*	Starry Flounder
192	*Hexagrammos stelleri*	Whitespotted Greenling
230	*Clupea harengus pallas*	Pacific Herring
516	*Mallotus villosus*	Capelin
NA	*Megalocottus platycephalus*	Sculpin

Note: Includes fishes found in the Yukon River drainage in Canada.

[a] The species code is a three-digit number that identifies the type of fish caught on harvest fish tickets.

Appendix A2.–Yukon River drainage.

Location	Mileage from Mouth
NORTH MOUTH (APOON PASS)	
Kotlik	6
Hamilton	26
MIDDLE MOUTH (KWIKPAK,KAWANAK PASS)	
Choolunawick	16
Akers Camp	26
New Hamilton	34
SOUTH MOUTH (KWIKLUAK PASS)	
Mouth, Black River	-18
Flat Island	0
Sheldon Point	5
Tin Can Point	8
Alakanuk	17
Emmonak-Kwiguk (Kwiguk Pass)	24
Sunshine Bay	24
Aproka Pass (upstream mouth)	35
Kwikpak Pass (upstream mouth)	44
Head of Passes	48
Fish Village	52
Mouth, Anuk River	63
(District 1/2 Boundary)	
Patsys Cabin	71
Mountain Village	87
Old Andreafsky	97
Pitkas Point	103
Mouth, Andreafsky River	104
St. Marys	107
Pilot Station	122
Mouth, Atcheulinguk (Chulinak) River	126
Pilot Village	138
Marshall (Fortuna Ledge)	161
Upstream Mouth Owl Slough	163
Ingrihak	170
Ohogamuit	185
Toklik	191
(District 2/3 Boundary)	
Kakamut	193
Russian Mission	213
Dogfish Villaage	227
Paimuit	251
Mouth, Innoko River (South Slough)	274
Shageluk	328
Holikachuk	383
Holy Cross	279
Mouth, Koserefski River	286
Old Paradise Village	301
(District 3/4 Boundary)	
Mouth, Bonasila River	306
Anvik	317
Mouth, Anvik River	318
Grayling	336
Mouth, Thompson Creek	349
Blackburn	370
Eagle Slide	402
Mouth, Rodo River	447
Kaltag	450
Mouth, Nulato River	483
Nulato	484
Koyukuk	502
Mouth, Koyukuk River	508
Mouth, Gisasa River	564
Huslia	711
Mouth, Dakli River	755
Mouth, Hogatza River	780
Hughes	881
Mouth, Kanuti River	935
Alatna (Mouth, Alatna R.)	956
Allakaket	956
Mouth, South Fork	986
Mouth, John River	1,117
Bettles	1,121
Middle Fork	1,141
Cold Foot	1,174
Wiseman	1,186
Bishop Rock	514
Prospect Point	519
Galena	530
Whiskey Creek	555
Mouth, Yuki River	562
Ruby	581
Mouth, Melozitna River	583
Horner Hot Springs	605
Kokrines	608
Mouth, Nowitna River	612
Birches	647
Kallands-Mouth of Illinois Creek	664
(District 4/5 Boundary)	
Mouth, Tozitna River	681
Tanana Village	695
Mouth, Tanana River	695
(District 5/6 Boundary)	
Manley Hot Springs	765
Mouth, Kantishna River	793
Mouth, Toklat River	838
Mouth, Sushana R.	850
Mouth, Bearpaw River	887
Outlet, L. Minchumina	959
Minto	835

Location	Mileage from Mouth
Nenana	860
Mouth, Nenana River	860
Mouth, Wood River	894
Rosie Creek Bluffs	912
Mouth, Chena R.(Fairbanks)	920
Mouth, Salcha River	965
Benchmark #735 Slough	991
Mouth, Little Delta R.	1,000
Mouth, Delta Creek	1,014
Mouth, Clear Creek (Richardson-Clearwater)	1,015
Mouth, Shaw Creek	1,021
Mouth, Delta River (Big Delta)	1,031
Delta Junction	1,041
Mouth, Goodpaster River	1,049
Bluff Cabin Slough	1,050
Outlet, Clearwater Lake	1,052
Outlet, Clearwater Crk (Delta Clearwater)	1,053
Mouth, Gerstle River	1,059
Outlet, Healy Lake	1,071
Outlet, Lake George	1,086
Tanacross	1,128
Outlet, Tetlin Lake	1,188
Mouth, Nabesna River	1,210
Northway Junction	1,214
Mouth, Chisana River	1,215
Mouth, Sheep Creek	1,297
Rampart Rapids	731
Rampart	763
Mouth, Hess Creek	789
Mouth, Ray River	817
Highway Bridge - Pipeline Crossing	820
Mouth, Dall River	841
Stevens Village	847
Mouth, Hodzana River	897
Beaver	932
Mouth Hadweenzic River	952
Mouth, Chandalar River (Venetie Landing)	982
Venetie	1,025
Fort Yukon	1,002
Mouth, Porcupine River	1,002
Mouth, Black River	1,026
Chalkyitsik	1,084
Mouth, Salmon Fork R.	1,142
Mouth, Sheenjek River	1,054
Mouth, Coleen River	1,157
Mouth, Salmon Trout R.	1,193
U.S. - Canadian Border	1,219
Old Crow	1,259
Fishing Branch R. spawning area	1,600
Circle	1,061
Woodchopper	1,110
Mouth, Charley River	1,124
Mouth, Kandik River	1,135
Mouth, Nation River	1,166
Mouth, Tatonduk River	1,186
Mouth, Seventymile River	1,194
Eagle	1,213
U.S.-Canadian border	1,224
Mouth, Fortymile River	1,269
Dawson	1,319
Mouth, Klondike River	1,320
Mouth, Sixty Mile River	1,369
Mouth, Stewart River	1,375
McQuesten	1,455

Appendix A3.–Salmon fishery projects conducted in the Alaska portion of the Yukon River drainage in 2010.

Project Name	Location	Primary Objective(s)	Duration	Agency	Responsibility
Commercial Catch and Effort Assessment	Alaskan portion of the Yukon River drainage	document and estimate the catch and associated effort of the Alaskan Yukon River and commercial salmon fishery via receipts (fish tickets) of commercial sales of salmon	June - Oct.	ADF&G	all aspects
Commercial Catch Sampling and Monitoring	Alaskan portion of the Yukon River drainage	determine age, sex, and size of Chinook, chum and coho salmon harvested in Alaskan Yukon River commercial fisheries; monitor Alaskan commercial fishery openings and closures.	June - Oct.	ADF&G ADPS	all aspects enforcement
Subsistence and Personal Use Catch and Effort Assessment	Alaskan portion of the Yukon River drainage	document and estimate the catch and associated effort of the Alaskan Yukon River subsistence salmon fishery via interviews, catch calendars, mail-out questionnaires, telephone interviews, and subsistence fishing permits, and of the personal use fishery based on fishery permits.	ongoing	ADF&G	all aspects
Sport Catch, Harvest and Effort Assessment	Alaskan portion of the Yukon River drainage	document and estimate the catch, harvest, and associated effort of the Alaskan Yukon River sport fishery via post-season mail-out questionnaires.	post season	ADF&G	all aspects
Yukon River Chinook Microsatellite Baseline	Yukon River drainage	Survey standardized microsatellites and Yukon River Chinook salmon populations.	ongoing	ADF&G DFO	US populations Canada populations
Yukon River Salmon Stock Identification	Yukon River drainage	estimate Chinook salmon stock composition of the various Yukon River drainage harvests through genetic stock identification, age compositions, and geographical distribution of catches and escapements.	ongoing	ADF&G	all aspects
Yukon River Chum and Chinook Mixed-Stock Analysis	Pilot Station, RM 123	estimate the stock compositions of Chinook and chum salmon using samples collected from Pilot Station sonar test fisheries	May-Aug	USFWS	all aspects
YRDFA Weekly Teleconference	Yukon River drainage	acts as a forum for fishers along the Yukon River to interact with state and federal managers for the collection and dissemination of fisheries information.	May - Sept.	YRDFA	all aspects
Lower Yukon River Set Gillnet Test Fishing	South, Middle, and North mouths of the Yukon River delta, RM 20	index Chinook salmon run timing and abundance using set gillnets. sample captured salmon for age, sex, size composition information.	June - Aug.	ADF&G	all aspects
Lower Yukon River Drift Test Fishing	South, Middle, and North mouths of the Yukon River delta, RM 20	index Chinook, summer and fall chum, and coho salmon run timing and abundance using drift gillnets. sample captured salmon for age, sex, size composition information.	June - Aug.	ADF&G	all aspects
Mountain Village Drift Gillnet Test Fishing	Mainstem Yukon River, RM 87	index fall chum and coho salmon run timing and relative abundance using drift gillnets. sample captured salmon for age, sex, size composition information.	July - Sept.	Asa'carsarmiut Trad. Council	all aspects R&M funding
East Fork Weir, Andreafsky River	mile 20 East Fork RM 124	estimate daily escapement, with age, sex and size composition, of Chinook and summer chum salmon into the East Fork of the Andreafsky River.	June - Aug.	USFWS -	all aspects OSM funding
Yukon River Sonar	Pilot Station, RM 123	estimate Chinook and summer and fall chum salmon passage in the mainstem Yukon River. Apportionment of species including coho salmon and other finfish.	June - Aug.	ADF&G AVCP	all aspects
Anvik River Sonar	Mile 40 Anvik River, RM 358	estimate daily escapement of summer chum salmon to the Anvik River; estimate age, sex, and size composition of the summer chum salmon escapement.	June - July	ADF&G	all aspects
Kaltag Creek Tower	Mile 1 Kaltag Creek, RM 451	estimate daily escapement of Chinook and summer chum salmon into Kaltag Creek; estimate age, sex, and size composition of the summer chum salmon escapement.	June - July	City of Kaltag ACES BSFA	all aspects provided funding provided funding R&E funding

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Project Name	Location	Primary Objective(s)	Duration	Agency	Responsibility
Gisasa River Weir	Mile 3 Gisasa River, Koyukuk River drainage, RM 567	estimate daily escapement of Chinook and summer chum salmon into the Gisasa River; estimate age, sex, and size composition of the Chinook and summer chum salmon escapements.	June - Aug.	USFWS	all aspects OSM funding
Henshaw Creek Weir	mile 1 Henshaw Creek, RM 976	estimate daily escapement of Chinook and summer chum salmon into Henshaw Creek; estimate age, sex, and size composition of the Chinook and summer chum salmon escapements (OSM 2005-2007)	June - Aug.	TCC USFWS-OSM	all aspects oversight & funding report write-up
Chandalar River Sonar	mile 14 Chandalar River, RM 996	estimate fall chum salmon passage using DIDSON sonar in the Chandalar River. estimate sex and size composition of fall chum salmon escapement. collected ASL data including vertebrae.	Aug. - Sept.	USFWS	all aspects R&M funding
Sheenjek River Sonar	mile 6 Sheenjek River, Porcupine River drainage, RM 1,060	estimate daily escapement of fall chum salmon into the Sheenjek River using DIDSON sonar and counted both left and right banks. estimate age, sex, and size composition of the fall chum salmon escapement.	Aug. - Sept.	ADF&G	all aspects
Eagle Sonar	Mainstem Yukon River Eagle, RM 1,213	estimate daily passage of Chinook and chum salmon in the mainstem Yukon River using both split-beam and DIDSON. estimate age, sex, and size composition of salmon captured in the test nets.	Jul.-Oct.	ADF&G DFO	all aspects technical support
Kaltag Village Drift Gillnet Test Fishing	Mainstem Yukon River Kaltag, RM 451	index fall chum and coho salmon run timing and relative abundance using drift gillnets. sample captured salmon for age, sex, size composition information.	July - Sept.	City of Kaltag	all aspects R&E funding
Middle Yukon River Chinook Sampling Project	Mainstem Yukon River Kaltag, RM 451	estimate age, sex, and size composition of Chinook salmon harvested in middle Yukon River subsistence fisheries	June - July	City of Kaltag USFWS-OSM	all aspects R&E funding
Nenana River Escapement Surveys	Nenana River drainage, above RM 860	aerial and ground surveys for numbers and distribution of coho and chum salmon in ten tributaries of the Nenana below Healy Creek.	Sept. - Oct.	ADF&G	all aspects
Rapids Fish Wheel Test Fishing	Mainstem Yukon River RM 730	index run timing of Chinook and fall chum salmon runs as well as non-salmon species using video monitoring techniques.	June-Sept.	Zuray USFWS	all aspects R&E funding
Nenana Test Fish Wheel Test Fishing Tag Recovery	mainstem Tanana River Nenana, RM 860	index the timing of Chinook, summer chum, fall chum, and coho salmon runs using test fish wheels. Tag recovery fish wheel for fall chum salmon for Tanana Tagging mark-recapture project.	June - Sept.	ADF&G OSM USFWS	all aspects fall season contract tech support R&M funding
Tanana Tagging Mark-recapture	mainstem Tanana River between RM 793 and 860.	estimate the population size of the Tanana River fall chum salmon run above the confluence of the Kantishna River using mark-recapture methodology;	Aug. - Sept.	ADF&G OSM	all aspects funding
Tozitna River Weir	Mile 50 Tozitna River Yukon River, RM 681	estimate daily escapement of Chinook and summer chum salmon into the Tozitna River, estimate age, sex and size comp of the Chinook and summer chum escapement	June-Aug.	BLM TTC	all aspects

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Project Name	Location	Primary Objective(s)	Duration	Agency	Responsibility
Kantishna River Mark–recapture	Kantishna River RM 800	provides a mark-recapture abundance estimate for fall chum salmon within the Kantishna River drainage.	Aug - Oct.	ADF&G BSFA TCC OSM	all aspects R&M funding for tagging fish wheel fund recovery fish wheels funding
Kantishna River Tag Recovery	Kantishna River RM 880	index run timing of fall chum and coho salmon using test fish wheels. recover tags from fall chum salmon for the Kantishna mark-recapture project.	Aug - Oct.	ADF&G TCC	all aspects funding for fish wheel contract
Delta River Ground Surveys	Tanana River drainage, RM 1,031	estimate fall chum spawning escapement in Delta River. recover tags from Upper Tanana mark-recapture program. Sample fall chum salmon carcasses for age, sex, and size composition information.	Oct.-Dec.	ADF&G	all aspects
Chena River Tower	Chena River, Tanana River drainage, RM 921	estimate daily escapement of Chinook and summer chum salmon into the Chena River.	July - Aug.	ADF&G	all aspects
Salcha River Tower	Salcha River, Tanana River drainage, RM 967	estimate daily escapement of Chinook and summer chum salmon into the Salcha River.	July - Aug.	BSFA	all aspects R&M funding
Goodpaster River Tower	Goodpaster River, Tanana River drainage, RM 1,049	estimate daily escapement of Chinook and summer chum salmon into the Goodpaster River.	July	TCC	all aspects Pogo Mine funding
Upper Yukon River Chum Salmon Genetic Stock Identification	Yukon River drainage	establish the feasibility of using DNA marks for genetic stock identification of chum salmon in the Yukon River. OSM 2006-2008	June - Oct	USFWS	all aspects
Ichthyophonus Sampling	Emmonak, RM 20	determine prevalence of Ichthyophonus at lower Yukon Emmonak site.	May-July	ADF&G	all aspects R&E funding
Marshall Test Fish	Mainstem Yukon River RM 161	index Chinook, summer and fall chum, and coho salmon run timing and abundance using drift gillnets. sample captured salmon for age, sex, size composition information.	June - July	AVCP	all aspects
Clear Creek Videography	Mile 1 Clear Creek Hogatza River drainage	estimate daily escapement of summer chum salmon into Clear Creek using video monitoring equipment. Estimate sex composition of summer chum escapement.	June - Aug.	BLM	all aspects
Yukon River Inseason Salmon Harvest Interviews	Emmonak, Holy Cross, Nulato, Huslia, Galena, and Beaver Primary	Collect qualitative inseason subsistence salmon harvest information through weekly interviews.	June-Sept	USFWS YRDFA	all aspects OSM funding

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Project Name	Location	Primary Objective(s)	Duration	Agency	Responsibility
Migratory Timing and Harvest Information of Chinook Salmon Stocks	Yukon River drainage	Enlarge existing allozyme and develop a DNA database to characterize the genetic diversity of Chinook salmon in the Yukon River within the U.S. and Canada. U.S. collections, microsatellites, allozyme. Can. Collections, microsatellites.	June-Aug.	USFWS ADF&G DFO OSM	all aspects
Juvenile Chinook Rearing in non-natal streams	Yukon River downstream of the Canadian border	Capture juvenile Chinook salmon in non-natal Yukon River tributary streams. determine whether Canadian-origin juvenile Chinook salmon rear in Yukon River tributary streams of the United States using genetic techniques describe non-natal stream rearing habitat characteristics for habitat characteristics for Yukon River Chinook salmon.	July-Aug.	USFWS	all aspects
Comparative Mesh Size Study	Y-1 near Emmonak	determine if the proportion of Chinook and chum salmon caught varies by mesh size. determine if age, sex, length, weight, and girth of individual Chinook salmon caught varies by mesh size. evaluate the marketability of the catch from the various mesh sizes,	June-July 3 years	ADF&G YDFDA	all aspects
Gillnet catch composition in lower and middle Yukon River fisheries	Yukon District Y-1	determine the weight and girth of individual Chinook salmon caught in the Lower Yukon River Test Fishery at Big Eddy and Middle Mouth and Rampart Rapids fish wheels. characterize the weight and girth composition of Chinook salmon caught in the Lower Yukon Test Fishery and Rampart Rapids fish wheels by run timing.		YRDFA ADF&G	all aspects R&E funding

Agency Acronyms:

ADF&G = Alaska Department of Fish and Game
ADPS = Alaska Department of Public Safety
AVCP = Association of Village Council Presidents, Inc.
BSFA = Bering Sea Fishermen's Association
DFO = Department of Fisheries and Oceans (Canada)
NPS = National Park Service
TCC = Tanana Chiefs Conference, Inc.
UAF = University of Alaska Fairbanks
USFWS = United States Fish and Wildlife Service
USFWS-OSM = United States Fish and Wildlife Service, Office of Subsistence Management
YRDFA = Yukon River Drainage Fisheries Association

Appendix A4.–List of harvest/escapement monitoring and incubation/rearing projects involving salmon in the Canadian portion of the Yukon River drainage, 2007.

Project Name	Location	Primary Objective(s)	Duration	Agency	Responsibility
Upper Yukon Tagging Program (mark-recapture)	Downstream of Dawson City	- to obtain population, and escapement estimates of Chinook and chum salmon in the Canadian section of the mainstem Yukon River - to collect stock ID, age, size, sex composition data - to participate in Eagle Sonar Program	June - Oct	DFO	all aspects
Chinook and Chum Test Fishery Fisheries	Near Dawson City	- to provide catch and tag recovery information for the mark recapture program as required (both required in 2007) - to provide ASL samples - the Chinook test fishey uses nets, while the chum test fishery uses live release fish wheels	July-Oct	YRCFA, THFN	all aspects
Commercial Catch Monitoring	Near Dawson City	- to determine weekly catches and effort in the Canadian commercial fishery (CM and CK); recovery of tags - to provide ASL information and DNA samples	July - Oct	DFO	all aspects
Aboriginal Catch Monitoring	Yukon communities	- to determine weekly catches and effort in the aboriginal fishery and recover tags - to implement components of the UFA and AFS	July - Oct	YFN's DFO	joint project
Recreational Catch Monitoring	Yukon River mainstem and tributaries	- to determine the recretation harvest, landed and retained, of salmon caught in the Yukon through a catch card program	June-Oct	DFO	all aspects
DFO Escapement Index Surveys	Chinook and chum aerial index streams	- to obtain counts in index areas including: Big Salmon, L. Salmon Wolf, Nisutlin, Mainstem Yukon, Kluane & Teslin rivers	Aug - Nov	DFO	all aspects
Escapement Surveys and DNA Collection	Throughout upper Yukon River drainage	- to conduct surveys of spawning fish by foot, boat and air etc. - to enumerate and recover tags in terminal areas - to collect DNA samples from spawning population and aggregate samples from fisheries and large migration corridors	July - Oct	Various R&E Projects DFO YFN's AFS	all aspects
Fishing Branch Chum Salmon Weir	Fishing Branch River	- to enumerate chum salmon returning to the Fishing Branch River and obtain age, size, tag and sex composition data	Aug - Oct	DFO VGG	joint project
Whitehorse Rapids Fishway	Whitehorse	- to enumerate wild and hatchery reared Chinook returns to the Whitehorse fishway area and obtain age, size, sex and tag composition data	July - Aug	YFGA	all aspects

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Project Name	Location	Primary Objective(s)	Duration	Agency	Responsibility
Blind Creek Weir	Pelly River	- to enumerate Chinook escapement and recover tags - to collect ASL data and DNA samples	July-Aug	JW&A	all aspects
Big Salmon Sonar	Big Salmon River	- installation and operation of a DIDSON sonar program for Chinook - carcass survey for tags, ASL, and DNA	July-Aug	JW&A	all aspects
Escapement Sampling	Various tributaries	- to collect ASL data and DNA samples	Aug -Oct	DFO	all aspects
Porcupine Mark-Recapture Program	Porcupine River	- to conduct chum marking and test fishery porgram - to establish method of conducting in-season local management	Aug -Oct	VGG & EDI	all aspects
Whitehorse Rapids Fish Hatchery and Coded-Wire Tagging Project	Whitehorse	- to rear and release ~150K Chinook fry from broodstock collected at the Whitehorse Rapids Fishway - to mark fry with CWT, adipose clip, and release upstream of Whitehorse hydroelectric facility	ongoing	RR, YEC YFGA, DFO	all aspects coded-wire tagging
MacIntyre Incubation Box and Coded-Wire Tagging Project	Whitehorse	- to rear up to 120K Chinook fry from broodstock collected from the Takhini River and/or Tatchun Creek - to mark fry with CWT, adipose clip, and release at natal sites	ongoing	DFO YC NRI	technical support field work, project monitoring

Acronyms:

AFS	= Aboriginal Fisheries Strategy
DFO	= Department of Fisheries and Oceans Canada
EDI	= Environmental Dynamics Incorporated
JW&A	= Jane Wilson & Associates
NRI	= Northern Research Institute
RR	= Government of Yukon- Renewable Resources
THFN	= Tr'ondek Hwech'in First Nation
VGG	= Vuntut Gwitchin Government
YC	= Yukon College
YEC	= Yukon Energy Corporation
YFN's	= Yukon First Nation's
YFGA	= Yukon Fish and Game Association
YRCFA	= Yukon River Commercial Fishers Association

Appendix A5.–Total utilization in numbers of salmon by district and country, Yukon River drainage, 2007.

District	Fishery [a]	Chinook	Summer Chum	Fall Chum	Coho
1	Subsistence	6,059	24,209	4,390	2,265
	Commercial	18,616	106,790	38,852	21,720
	Test Fish Sales	792	10	0	0
	Total	25,467	131,009	43,242	23,985
2	Subsistence	10,553	23,507	3,472	2,347
	Commercial	13,306	69,432	35,826	21,487
	Test Fish Sales	57	0	0	0
	Total	23,916	92,939	39,298	23,834
3	Subsistence	4,651	2,056	925	739
	Commercial	190	1	0	0
	Total	4,841	2,057	925	739
Total Lower Yukon Area	Subsistence	21,263	49,772	8,787	5,351
	Commercial	32,112	176,223	74,678	43,207
	Test Fish Sales	849	10	0	0
	Total	54,224	226,005	83,465	48,558
4	Subsistence	11,831	16,256	8,576	2,952
	Commercial [b]	0	7,304	0	0
	Total	11,831	23,560	8,576	2,952
5	Subsistence	19,165	8,881	53,731	3,366
	Commercial	1,241	0	427	0
	Total	20,406	8,881	54,158	3,366
6	Subsistence	1,717	1,896	29,893	7,845
	Commercial	281	14,674	15,572	1,368
	Personal use	136	184	173	135
	Total	2,134	16,754	45,638	9,348

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District	Fishery [a]	Chinook	Summer Chum	Fall Chum	Coho
Total	Subsistence	32,713	27,033	92,200	14,163
Upper	Commercial	1,522	21,978	15,999	1,368
Yukon	Personal use	136	184	173	135
Area	Total	34,371	49,195	108,372	15,666
Total	Subsistence	53,976	76,805	100,987	19,514
Yukon	Commercial	33,634	198,201	90,677	44,575
Area	Personal use	136	184	173	135
(Alaska)	Test Fish sales	849	10	0	0
	Sport Fish [c]	960	245	0	597
	Total	89,555	275,445	191,837	64,821
	Domestic	0	0	0	
Total	Aboriginal (mainstem)	4,175	0	2,221	0
Canada	Sport Fish	2	0	0	0
	Test Fish harvest [d]	617	0	0	0
	Commercial	0	0	7,109	2
	Subtotal	4,794	0	9,330	2
	Porcupine Aboriginal	300	0	4,500	500
	Total	5,094	0	13,830	502
Grand Total		94,649	275,445	205,667	65,323

Note: Subsistence harvest data are preliminary.

[a] Commercial harvest includes only fish sold in the round. Does not include subsistence harvest from coastal communities of Hooper Bay and Scammon Bay.

[b] Summer chum salmon commercial harvest in District 4 is the number of females recorded on fish tickets that were taken to produce 5,938 pounds of roe.

[c] Sport fish harvest for the Alaskan portion of the Yukon River drainage. Assume majority of chum salmon caught during summer season.

[d] The Canadian test fishery is for management purposes. Chinook salmon that are retained are given to Aboriginal and Domestic users, but are not reported under those categories. Chum salmon caught in the test fishery are all intended to be released, but any that are retained are reported under the Porcupine Aboriginal harvest.

Appendix A6.–Alaska commercial salmon harvest by district. 2007.

District/ Subdistrict	Number of Fishermen [a]	Chinook	Summer Chum	Fall Chum	Coho
1	366	18,616	106,790	38,852	21,720
2	236	13,306	69,432	35,826	21,487
Subtotal	563	31,922	176,222	74,678	43,207
3	3	190	1	0	0
Total Lower Yukon	566	32,112	176,223	74,678	43,207
Anvik River	0	0	0	0	0
4-A	5	0	7304 [b]	0	0
4-BC	0	0	0	0	0
4-D	0				
Subtotal District 4	5	0	0	0	0
5-ABC	13	1,241	0	427	0
5-D	0	0	0	0	0
Subtotal District 5	13	1,241	0	427	0
6	12	281	14,674	15,572	1,368
Total Upper Yukon	30	1,522	14,674	15,999	1,368
Total Alaska	596	33,634	190,897	90,677	44,575

Note: Does not include ADF&G test fishery sales.

[a] Number of unique permits fished by district, subdistrict or area. Totals by area may not add up due to transfers between districts or subdistricts.

[b] Summer chum salmon harvest in Subdistrict 4-A is the number of females recorded on fish tickets that were taken to produce 5,938 pounds of roe.

Appendix A7.–Commercial salmon and salmon roe sales by statistical area, Yukon Area, 2007.

Statistical Area	Chinook		Summer Chum			Fall Chum		Coho		Total Salmon	
	Numbers	Roe	Numbers	Roe	Estimated Harvest	Numbers	Roe	Numbers	Roe	Numbers	Roe
334-11	1,116	0	3,724	0	3,724	0	0	0	0	4,840	0
12	1,419	0	15,690	0	15,690	6,395	0	1,320	0	24,824	0
13	1,555	0	14,297	0	14,297	8,550	0	2,361	0	26,763	0
14	855	0	10,746	0	10,746	4,951	0	1,983	0	18,535	0
15	4,890	0	15,816	0	15,816	1,423	0	993	0	23,122	0
16	1,168	0	8,801	0	8,801	2,130	0	6,331	0	18,430	0
17	5,828	0	25,753	0	25,753	12,562	0	7,091	0	51,234	0
18	1,785	0	11,963	0	11,963	2,841	0	1,641	0	18,230	0
Subtotal District 1	18,616	0	106,790	0	106,790	38,852	0	21,720	0	185,978	0
334-21	2,818	0	21,356	0	21,356	8,619	0	4,195	0	36,988	0
22	5,509	0	32,583	0	32,583	17,068	0	12,354	0	67,514	0
23	2,458	0	9,310	0	9,310	8,245	0	3,253	0	23,266	0
24	1,375	0	1,740	0	1,740	1,894	0	1,685	0	6,694	0
25	1,146	0	4,443	0	4,443	0	0	0	0	5,589	0
Subtotal District 2	13,306	0	69,432	0	69,432	35,826	0	21,487	0	140,051	0
334-31	190	0	1	0	1					191	0
32	0	0	0	0	0	NO COMMERCIAL FISHING				0	0
Subtotal District 3	190	0	1	0	1	0	0	0	0	191	0
Total Lower Yukon	32,112	0	176,223	0	176,223	74,678	0	43,207	0	326,220	0

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Statistical Area	Chinook		Summer Chum			Fall Chum		Coho		Total Salmon	
	Numbers	Roe	Numbers	Roe	Estimated Harvest	Numbers	Roe	Numbers	Roe	Numbers	Roe
334-42					NO COMMERCIAL FISHING					0	0
43										0	0
44	0	0	5,359	4,232	5,359 [a]	NO COMMERCIAL FISHING				5,359	4,232
45	0	0	0	0	0	NO COMMERCIAL FISHING				0	0
46	0	0	1,945	1,706	1,945 [a]	NO COMMERCIAL FISHING				1,945	1,706
47					NO COMMERCIAL FISHING					0	0
Subtotal District 4	0	0	7,304	5,938	7,304	0	0	0	0	7,304	5,938
334-51					NO COMMERCIAL FISHING					0	0
52	1,064	0	0	0	0	385	0	0	0	1,449	0
53	177	0	0	0	0	42	0	0	0	219	0
54					NO COMMERCIAL FISHING					0	0
55										0	0
Subtotal District 5	1,241	0	0	0	0	427	0	0	0	1,668	0
334-61	0	0	0	0	0	0	0	0	0	0	0
62	106	0	10,627	0	10,627	15,572	0	1,368	0	27,673	0
63	175	0	4,047	0	4,047	0	0	0	0	4,222	0
Subtotal District 6	281	0	14,674	0	14,674	15,572	0	1,368	0	31,895	0
Total Upper Yukon	1,522	0	21,978	5,938	21,978	15,999	0	1,368	0	40,867	5,938
Grand Total Yukon Area	33,634	0	198,201	5,938	198,201	90,677	0	44,575	0	367,087	5,938

Note: Sales reported in numbers of fish and pounds of unprocessed roe. Does not include ADF&G test fishery sales.

[a] Summer chum salmon harvest in Subdistrict 4-A is the number of females recorded on fish tickets that were taken to produce 5,938 pounds of roe.

Appendix A8.–Commercial salmon sales and estimated harvest by statistical area, all gears combined, Upper Yukon Area, 2007.

Beach Seine, Purse Seine, Set Gillnet and Fish Wheel Combined										
Statistical Area	Number of Fishermen [a]	Chinook		Summer Chum			Fall Chum		Coho	
		Number	Roe	Number	Roe	Estimated Harvest	Number	Roe	Number	Roe
334-42	NO COMMERCIAL FISHING									
334-43										
334-44	4	0	0	5,359	4,232	5,359 [b]	NO COMMERCIAL FISHING			
334-45	0	0	0	0	0	0	NO COMMERCIAL FISHING			
334-46	1	0	0	1,945	1,706	1,945 [b]	NO COMMERCIAL FISHING			
334-47	NO COMMERCIAL FISHING									
Subtotal District 4	5	0	0	7,304	5,938	7,304 [b]	0	0	0	0
334-51	NO COMMERCIAL FISHING									
334-52	9	1,064	0	0	0	0	385	0	0	0
334-53	4	177	0	0	0	0	42	0	0	0
334-54	NO COMMERCIAL FISHING									
334-55										
Subtotal District 5	13	1,241	0	0	0	0	427	0	0	0
334-61	0	0	0	0	0	0	0	0	0	0
334-62	12	106	0	10,627	0	10,627	15,572	0	1,368	0
334-63	2	175	0	4,047	0	4,047	0	0	0	0
Subtotal District 6	12	281	0	14,674	0	14,674	15,572	0	1,368	0
Total Upper Yukon Area	30	1,522	0	21,978	5,938	21,978	15,999	0	1,368	0

Note: The estimated harvest is the number of fish sold in the round plus number of females reported on fish tickets to produce roe sold.

[a] The number of fishermen is the unique number of permits fished i.e., some fishermen may fish multiple areas, therefore the subtotals will not necessarily add up by district.

[b] Summer chum harvest in Subdistrict 4-A is the number of females recorded on fish tickets that were taken to produce 5,938 pounds of roe.

Appendix A9.–Commercial set gillnet salmon sales and estimated harvest by statistical area, Upper Yukon Area, 2007.

Set Gillnet										
Statistical Area	Number of Fishermen [a]	Chinook		Summer Chum			Fall Chum		Coho	
		Number	Roe	Number	Roe	Estimated Harvest	Number	Roe	Number	Roe
334-42				NO COMMERCIAL FISHING						
334-43										
334-44	0	0	0	0	0	0	NO COMMERCIAL FISHING			
334-45	0	0	0	0	0	0	NO COMMERCIAL FISHING			
334-46	0	0	0	0	0	0	NO COMMERCIAL FISHING			
334-47				NO COMMERCIAL FISHING						
Subtotal District 4	0	0	0	0	0	0	0	0	0	0
334-51				NO COMMERCIAL FISHING						
334-52	3	202	0	0	0	0	0	0	0	0
334-53	3	177	0	0	0	0	0	0	0	0
334-54				NO COMMERCIAL FISHING						
334-55										
Subtotal District 5	6	379	0	0	0	0	0	0	0	0
334-61	0	0	0	0	0	0	0	0	0	0
334-62	0	0	0	0	0	0	0	0	0	0
334-63	0	0	0	0	0	0	0	0	0	0
Subtotal District 6	0	0	0	0	0	0	0	0	0	0
Total Upper Yukon Area	6	379	0	0	0	0	0	0	0	0

Note: The estimated harvest is the number of fish sold in the round plus number of females reported on fish tickets to produce roe sold.

[a] The number of fishermen is the unique number of permits fished i.e., some fishermen may fish multiple areas, therefore the subtotals will not necessarily add up by district.

Appendix A10.–Commercial fish wheel salmon sales and estimated harvest by statistical area, Upper Yukon Area, 2007.

Fish Wheel										
Statistical Area	Number of Fishermen [a]	Chinook		Summer Chum			Fall Chum		Coho	
		Number	Roe	Number	Roe	Estimated Harvest	Number	Roe	Number	Roe
334-42				NO COMMERCIAL FISHING						
334-43										
334-44	4	0	0	5,359	4,232	5,359 [b]	NO COMMERCIAL FISHING			
334-45	0	0	0	0	0	0				
334-46	1	0	0	1,945	1,706	1,945 [b]	NO COMMERCIAL FISHING			
334-47				NO COMMERCIAL FISHING						
Subtotal District 4	5	0	0	7,304	5,938	7,304 [b]	0	0		0
334-51				NO COMMERCIAL FISHING						
334-52	6	862	0	0	0	0	385	0	0	0
334-53	1	0	0	0	0	0	42	0	0	0
334-54				NO COMMERCIAL FISHING						
334-55										
Subtotal District 5	7	862	0	0	0	0	427	0	0	0
334-61	0	0	0	0	0	0	0	0	0	0
334-62	12	106	0	10,627	0	10,627	15,572	0	1,368	0
334-63	2	175	0	4,047	0	4,047	0	0	0	0
Subtotal District 6	12	281	0	14,674	0	14,674	15,572	0	1,368	0
Total Upper Yukon Area	24	1,143	0	21,978	5,938	21,978	15,999	0	1,368	0

Note: The estimated harvest is the number of fish sold in the round plus number of females reported on fish tickets to produce roe sold.

[a] The number of fishermen is the unique number of permits fished i.e., some fishermen may fish multiple areas, therefore the subtotals will not necessarily add up by district.

[b] Summer chum harvest in Subdistrict 4-A is the number of females recorded on fish tickets that were taken to produce 5,938 pounds of roe.

Appendix A11.–Value of commercial salmon fishery to Yukon Area fishermen, 1977–2007.

	Summer Season						
	Chinook			Summer Chum			
Year	Lower Yukon Value	Value	Upper Yukon Subtotal	Lower Yukon Value	Upper Yukon Value	Subtotal	Total Season
1977	1,841,033	148,766	1,989,799	1,007,280	306,481	1,313,761	3,303,560
1978	2,048,674	66,472	2,115,146	2,071,434	655,738	2,727,172	4,842,318
1979	2,763,433	124,230	2,887,663	2,242,564	444,924	2,687,488	5,575,151
1980	3,409,105	113,662	3,522,767	1,027,738	627,249	1,654,987	5,177,754
1981	4,420,669	206,380	4,627,049	2,741,178	699,876	3,441,054	8,068,103
1982	3,768,107	162,699	3,930,806	1,237,735	452,837	1,690,572	5,621,378
1983	4,093,562	105,584	4,199,146	1,734,270	281,883	2,016,153	6,215,299
1984	3,510,923	102,354	3,613,277	926,922	382,776	1,309,698	4,922,975
1985	4,294,432	82,644	4,377,076	1,032,700	593,801	1,626,501	6,003,577
1986	3,165,078	73,363	3,238,441	1,746,455	634,091	2,380,546	5,618,987
1987	5,428,933	136,196	5,565,129	1,313,618	323,611	1,637,229	7,202,358
1988	5,463,800	142,284	5,606,084	5,001,100	1,213,991	6,215,091	11,821,175
1989	5,181,700	108,178	5,289,878	2,217,700	1,377,117	3,594,817	8,884,695
1990	4,820,859	105,295	4,926,154	497,571	506,611	1,004,182	5,930,336
1991	7,128,300	97,140	7,225,440	782,300	627,177	1,409,477	8,634,917
1992	9,957,002	168,999	10,126,001	606,976	525,204	1,132,180	11,258,181
1993	4,884,044	113,217	4,997,261	226,772	203,762	430,534	5,427,795
1994	4,169,270	124,270	4,293,540	79,206	396,685	475,891	4,769,431
1995	5,317,508	87,059	5,404,567	241,598	1,060,322	1,301,920	6,706,487
1996	3,491,582	47,282	3,538,864	89,020	966,277	1,055,297	4,594,161
1997	5,450,433	110,713	5,561,146	56,535	96,806	153,341	5,714,487
1998	1,911,370	17,285	1,928,655	26,415	821	27,236	1,955,891
1999	4,950,522	74,475	5,024,997	19,687	1,720	21,407	5,046,404
2000	725,606	-	725,606	8,633	-	8,633	734,239
2001	-	-	-	-	-	-	-
2002	1,691,105	20,744	1,711,849	4,342	6,176	10,518	1,722,367
2003	1,871,202	40,957	1,912,159	1,585	6,879	8,464	1,920,623
2004	3,063,667	38,290	3,101,957	8,884	9,645	18,529	3,120,486
2005	1,952,109	24,415	1,976,524	11,004	13,479	24,483	2,001,007
2006	3,290,367	32,631	3,322,998	23,862	42,988	66,850	3,389,848
2007	1,939,114	27,190	1,966,304	220,715	34,421	255,136	2,221,440
2002-2006Average	2,373,690	31,407	2,405,097	9,935	15,833	25,769	2,430,866

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	Fall Season							
	Fall Chum			Coho				
	Lower Yukon	Upper Yukon		Lower Yukon	Upper Yukon		Total	Total
Year	Value	Value	Subtotal	Value	Value	Subtotal	Season	Value
1977	718,571	102,170	820,741	140,914	2,251	143,165	963,906	4,267,466
1978	691,854	103,091	794,945	96,823	6,105	102,928	897,873	5,740,191
1979	1,158,485	347,814	1,506,299	83,466	6,599	90,065	1,596,364	7,171,515
1980	394,162	198,088	592,250	17,374	2,374	19,748	611,998	5,789,752
1981	1,503,744	356,805	1,860,549	87,385	4,568	91,953	1,952,502	10,020,605
1982	846,492	53,258	899,750	135,828	18,786	154,614	1,054,364	6,675,742
1983	591,011	128,950	719,961	17,497	11,472	28,969	748,930	6,964,229
1984	374,359	103,417	477,776	256,050	12,823	268,873	746,649	5,669,624
1985	634,616	178,125	812,741	176,254	26,797	203,051	1,015,792	7,019,369
1986	399,321	30,309	429,630	211,942	556	212,498	642,128	6,261,115
1987	-	-	0	-	-	0	0	7,202,358
1988	638,700	151,300	790,000	734,400	34,116	768,516	1,558,516	13,379,691
1989	713,400	223,996	937,396	323,300	33,959	357,259	1,294,655	10,179,350
1990	238,165	174,965	413,130	137,302	37,026	174,328	587,458	6,517,794
1991	438,310	157,831	596,141	300,182	21,556	321,738	917,879	9,552,796
1992	0	54,161	54,161	0	19,529	19,529	73,690	11,331,871
1993	0	0	0	0	0	0	0	5,427,795
1994	0	8,517	8,517	0	8,739	8,739	17,256	4,786,687
1995	185,036	167,571	352,607	80,019	11,292	91,311	443,918	7,150,405
1996	48,579	45,438	94,017	96,795	13,020	109,815	203,832	4,797,993
1997	86,526	7,252	93,778	79,973	1,062	81,035	174,813	5,889,300
1998	-	-	0	0	0	0	0	1,955,891
1999	35,639	876	36,515	3,620	0	3,620	40,135	5,086,539
2000	-	-	0	0	0	0	0	734,239
2001	-	-	0	-	-	-	-	-
2002	-	-	0	0	0	0	0	1,722,367
2003	5,993	3,398	9,391	18,168	5,095	23,263	32,654	1,953,277
2004	1,126	848	1,974	2,774	6,372	9,146	11,120	3,131,606
2005	316,698	48,159	364,857	83,793	19,182	102,975	467,832	2,468,839
2006	202,637	33,806	236,443	50,299	11,137	61,436	297,879	3,687,727
2007	144,256	16,907	161,163	127,869	1,368	129,237	290,400	2,511,840
2002-2006Average	131,614	21,553	122,533	31,007	8,357	39,364	161,897	2,592,763

Note: Unless otherwise indicate blank cells indicate years in which no information was collected or harvest numbers were insufficient to generate summary information. Dashes indicate no commercial fishing activity occurred.

Appendix A12.–Salmon processors, buyers, catcher-sellers and associated data, Yukon area, 2007.

Commercial operation(Processing location/ buying station)	Product	District
Kwik'pak Fisheries, LLC 1016 6th Avenue Suite 301 Anchorage, AK 99501 (Emmonak, Mt. Village)	Frozen Salmon Fresh Salmon Chinook Chum, Coho Salmon Roe	1 and 2
Boreal Fisheries P.O. Box 561 Graham, WA 98338 (St. Mary's)	Frozen Salmon Fresh Salmon Chinook Chum, Coho Salmon Roe	1 and 2
BB's Kings HC 60 Box 227 I Copper Center, AK 99573	Fresh Salmon Chinook	2
Erik Weingarth PO Box 74 St. Mary's, AK 99658	Fresh Salmon Chinook	2
Francis Beans PO Box 325 St. Mary's, AK 99658	Fresh Salmon Chinook	2
David Herbert PO Box 9 St. Mary's, AK 99658	Fresh Salmon Chinook	2
JustWildFish LLC Mike Irving PO Box 335 St. Mary's, AK 99658	Fresh Salmon Chinook	2
Maserculiq Fish Processors Paul Coffee PO Box 90 Marshall, AK 99585	Fresh Salmon Chinook	2
Bering Sea Fisheries 4413 83rd Ave. S.E. Snohomish, WA 98290	Fresh Salmon Chinook	1 and 2

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Commercial operation (Process station)	Product	District
Great Ruby Fish & Stevens Fisheries P.O. BOX 38 Nenana, AK 99760		4 and 6
Inlet Salmon PO BOX 114 Kenai, AK 99611 (Nenana)		6
Lone Treepoint Seafood Company PO BOX 267 La Conner, WA 98257		4 and 6
Interior Alaska Fish Processors 2400 Davis Road Fairbanks, AK 99701		5 and 6
Yutana Fisheries 400 Landing Rd. Manley Hot Springs 99756		6
Jack Berry 35480 Upland St. Homer, AK 99603 (Yukon Bridge)		5
Mari Hoe-Raitto 5801 Old Valdez Trail Salcha, AK 99714 (Yukon Bridge)		5
Linda Johnson P.O. BOX 57 Manley, AK 99756 (Rapids)		5
D.Y. Sandy Jamieson P.O. BOX 130 Ester, AK 99725 (Rapids)		5

Appendix A13.–Historical daily and cumulative CPUE for Chinook salmon, Lower Yukon River set net test fishery, 1989–2006 average and 2006 compared to 2007.

	2007				2006		Average (1989-2006) [a]	
Date	Daily Catch	Daily CPUE	Cumulative CPUE	District 1 Commercial Hrs Fished	Daily CPUE	Cumulative CPUE	Cumulative CPUE	
26 May							0.00	0.00
27 May							0.04	0.03
28 May	0 [b]	0.00	0.00				0.02	0.05
29 May	0	0.00	0.00				0.03	0.08
30 May	0	0.00	0.00				0.05	0.12
31 May	0	0.00	0.00				0.07	0.19
1 Jun	0	0.00	0.00				0.08	0.26
2 Jun	0 [c]	0.00	0.00				0.13	0.38
3 Jun	3	0.03	0.03				0.18	0.55
4 Jun	7	0.07	0.10		0.00	0.00	0.22	0.76
5 Jun	4	0.04	0.14		0.00	0.00	0.21	0.96
6 Jun	7	0.07	0.21		0.02	0.02	0.31	1.25
7 Jun	11	0.11	0.32		0.04	0.06	0.35	1.58
8 Jun	2	0.02	0.34		0.03	0.09	0.41	1.99
9 Jun	7	0.07	0.41		0.05	0.14	0.66	2.65
10 Jun	4	0.04	0.45		0.08	0.22	0.57	3.22
11 Jun	9	0.09	0.54		0.08	0.30	0.60	3.81
12 Jun	21	0.22	0.76		0.08	0.38	0.74	4.56
13 Jun	40	0.42	1.18		0.24	0.62	0.84	5.40
14 Jun	112	1.17	2.35		0.40	1.02	0.72	6.12
15 Jun	111	1.16	3.51		0.90	1.92	0.73	6.85
16 Jun	118	1.23	4.74		1.23	3.15	0.89	7.75
17 Jun	127	1.32	6.06		1.06	4.21	0.87	8.61
18 Jun	71	0.74	6.80	7	0.58	4.79	0.93	9.54
19 Jun	38	0.40	7.20	2	0.31	5.10	0.92	10.46
20 Jun	78	0.81	8.01		0.45	5.55	0.77	11.23
21 Jun	105	1.09	9.10	6	0.73	6.28	0.94	12.17
22 Jun	78	0.81	9.91	3	0.78	7.06	1.00	13.18
23 Jun	105	1.09	11.00		2.02	9.08	0.93	14.10
24 Jun	96	1.00	12.00		2.14	11.22	1.07	15.18
25 Jun	44	0.46	12.46	3	2.19	13.41	0.95	16.12
26 Jun	60	0.63	13.09	3	1.34	14.75	0.86	16.98
27 Jun	70	0.73	13.82		0.72	15.47	0.69	17.67
28 Jun	78	0.81	14.63		1.21	16.68	0.65	18.31
29 Jun	59	0.61	15.24		0.89	17.57	0.68	18.99
30 Jun	39	0.41	15.65		0.84	18.41	0.51	19.50

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Date	2007 Daily Catch	2007 Daily CPUE	2007 Cumulative CPUE	2007 District 1 Commercial Hrs Fished	2006 Daily CPUE	2006 Cumulative CPUE	Average (1989-2006) [a] Cumulative CPUE	
1 Jul	18	0.19	15.84		0.68	19.09	0.44	19.94
2 Jul	68	0.71	16.55		0.63	19.72	0.45	20.40
3 Jul	49	0.51	17.06		0.48	20.20	0.39	20.79
4 Jul	44	0.46	17.52		0.29	20.49	0.32	21.11
5 Jul	29	0.30	17.82		0.21	20.70	0.33	21.44
6 Jul	18	0.19	18.01		0.15	20.85	0.27	21.72
7 Jul	27	0.28	18.29		0.20	21.05	0.24	21.96
8 Jul	36	0.38	18.67		0.16	21.21	0.22	22.19
9 Jul	21	0.22	18.89		0.14	21.35	0.19	22.38
10 Jul	9	0.09	18.98		0.06	21.41	0.15	22.53
11 Jul	10	0.10	19.08		0.16	21.57	0.11	22.64
12 Jul	10	0.10	19.18		0.05	21.62	0.09	22.74
13 Jul	1	0.01	19.19		0.03	21.65	0.09	22.83
14 Jul	0 [d]	0.00	19.19		0.08	21.73	0.07	22.90
15 Jul	2 [e]	0.02	19.21		0.08	21.81	0.08	22.99
	1,846		19.21			21.81		22.99

Note: The box within the column indicates the first to the third quartile of the cumulative index. The median date of the cumulative index is also highlighted.

[a] Average CPUE is without 1998 and 2000. Data are smoothed and adjusted for late run timing.

[b] Big Eddy test nets only.

[c] Middle Mouth set nets operational and included.

[d] Last day of Big Eddy 8.5" set net operation.

[e] Middle Mouth total daily count of 2 Chinook salmon. Data interpolated for Big Eddy 8.5" set net catch of zero Chinook salmon.

Appendix A14.–Pilot station sonar project estimates, Yukon River drainage, 1995 and 1997 to 2007.

Species	Estimated Passage											
	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997 [a]	1995
Large Chinook Salmon [b]	90,184	145,553	142,007	110,236	245,037	92,584	85,511	39,233	127,809	71,177	118,121	130,271
Small Chinook Salmon	35,369	23,850	17,434	46,370	23,500	30,629	13,892	5,195	16,914	16,675	77,526	32,674
Total Chinook Salmon	125,553	169,403	159,441	156,606	268,537	123,213	99,403	44,428	144,723	87,852	195,647	162,945
Summer Chum Salmon	1,726,885	3,767,044	2,439,616	1,357,826	1,168,518	1,088,463	441,450	456,271	973,708	826,385	1,415,641	3,556,445
Fall Chum Salmon	684,011	790,563	1,813,589	594,060	889,778	326,858	376,182	247,935	379,493	372,927	506,621	1,053,245
Total Chum Salmon	2,410,896	4,557,607	4,253,205	1,951,886	2,058,296	1,415,321	817,632	704,206	1,353,201	1,199,312	1,922,262	4,609,690
Coho Salmon [c]	173,289	131,919	184,718	188,350	269,081	122,566	137,769	175,421	62,521	136,906	104,343	101,806
Other Species [d]	1,157,015	991,523	631,180	880,632	507,534	622,670	354,096	396,723	467,316	344,317	624,236	1,036,459
TOTAL	3,866,753	5,850,452	5,228,544	3,177,474	3,103,448	2,283,770	1,408,900	1,320,778	2,027,761	1,768,387	2,846,488	5,910,900

[a] The Yukon River sonar project operated in training mode in 1996 and there are no passage estimates for that year.

[b] Chinook salmon >655 mm for 1999–2005, >700 mm for 1995–1998.

[c] This estimate may not include the entire run.

[d] Includes pink salmon, cisco, whitefish, sheefish, burbot, suckers, Dolly Varden, sockeye salmon, and northern pike.

Appendix A15.–Commercial Fisheries Entry Commission salmon gear permits issued by residence, Yukon Area, 2007.

District	Residence	Gillnet Permits (S04Y)
1, 2, and 3	Alakanuk	76
	Anchorage	35
	Bethel	14
	Chevak	3
	Copper Center	4
	Dillingham	2
	Eagle River	2
	Elim	1
	Emmonak	96
	Fairbanks	7
	Fort Richardson	1
	Fortuna Ledge	3
	Girdwood	1
	Glennallen	1
	Holy Cross	7
	Homer	1
	Hooper Bay	2
	Kalskag	1
	Kenai	2
	Kotlik	73
	Kotzebue	1
	Kwethluk	1
	Lower Kalskag	1
	Manley Hot Springs	2
	Marshall	36
	Mountain Village	76
	Newtok	1
	Nightmute	1
	Nome	3
	Nunam Iqua	12
	Palmer	1
	Pilot Station	47
	Pitkas Point	1
	Russian Mission	11
	Scammon Bay	35
	Shageluk	1
	Shaktoolik	1
	Sitka	1
	St. Marys	69
	St. Michael	3
	Stebbins	8
	Tuluksak	1
	Wasilla	6
	Willow	1
	Everett, WA	1
	Rock Hill, SC	1
	Snohomish, WA	1
	Twisp, WA	1
Total Lower Yukon Area		656

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District	Residence	Gillnet Permits (S04P)	Fish Wheel Permits (S08P)	Total	
4, 5, and 6	Anchorage	3	4	7	
	Anchor Pt.	0	2	2	
	Aniak	1	0	1	
	Anvik	4	7	11	
	Circle City	0	1	1	
	Dot Lake	0	1	1	
	Eagle River	0	1	1	
	Fairbanks	27	23	50	
	Ft. Wainwright	0	1	1	
	Ft. Yukon	0	1	1	
	Galena	3	8	11	
	Grayling	4	5	9	
	Holy Cross	1	0	1	
	Huslia	0	1	1	
	Kaltag	2	8	10	
	Manley Hot Springs	2	5	7	
	Nenana	7	18	25	
	North Pole	2	3	5	
	Nulato	0	9	9	
	Rampart	1	1	2	
	Ruby	1	5	6	
	Salcha	1	0	1	
	Soldotna	1	0	1	
	Stevens Village	0	3	3	
	Tanana	2	13	15	
	Wasilla	1	2	3	
	Lusk, WY	1	1	2	
	Valley Village, CA	1	0	1	
Total Upper Yukon Area		65	123	188	
Grand Total Yukon Area		721	123	844	[a]

Note: Counts are for initial issues only and do not include transfers. Counts include interim entry permits but not interim use or test fish permits.

[a] Total applies to number of permits.

Appendix A16.–Summer season commercial harvest summary, Yukon Area, 2007.

District 1

Period Number	Starting Time	Start Date	Ending Time	End Date	Hours Fished	Mesh Size	Number of Fishermen	Chinook Salmon Number	Chinook Salmon Pounds	Chinook Salmon Average Weight	Summer Chum Salmon Number	Summer Chum Salmon Pounds	Summer Chum Salmon Average Weight
1	5:00 PM	18 Jun	2:00 AM	19 Jun	9	U	306	4,291	87,364	20.4	1,011	6,663	6.6
2	11:00 AM	20 Jun	1:00 PM	20 Jun	2	R	87	261	3,399	13.0	1,855	12,505	6.7
3	6:00 PM	21 Jun	3:00 AM	22 Jun	9	U	326	5,885	121,611	20.7	4,009	26,607	6.6
4	6:00 PM	22 Jun	10:00 PM	22 Jun	4	R	140	632	7,929	12.5	8,104	53,921	6.7
5	9:00 PM	25 Jun	3:00 AM	26 Jun	6	U	309	3,382	69,417	20.5	3,771	24,501	6.5
6	12:00 PM	27 Jun	6:00 PM	27 Jun	6	R	174	1,064	13,807	13.0	16,995	114,321	6.7
7	12:00 PM	30 Jun	6:00 PM	30 Jun	6	R	197	1,247	15,318	12.3	17,332	112,334	6.5
8	6:00 PM	2 Jul	Midnight	2 Jul	6	R	207	821	11,160	13.6	28,304	184,759	6.5
9	12:00 PM	6 Jul	6:00 PM	6 Jul	6	R	160	395	5,534	14.0	5,888	38,036	6.5
10	6:00 PM	9 Jul	3:00 AM	10 Jul	6	R	172	397	5,460	13.8	9,195	59,575	6.5
11	Midnight	12 Jul	6:00 AM	13 Jul	6	R	131	151	2,078	13.8	5,912	37,818	6.4
12	Midnight	14 Jul	6:00 AM	15 Jul	6	R	80	89	1,326	14.9	4,414	28,726	6.5
							Chinook salmon sold in the fall season [a]	1	14	14.0			
Unrestricted Mesh Subtotal					24		-	13,558	278,392	20.5	8,791	57,771	6.6
Restricted Mesh Subtotal					48		-	5,058	66,025	13.1	97,999	641,995	6.6
District 1 Subtotal					72		359	18,616	344,417	18.5	106,790	699,766	6.6

District 2

Period Number	Starting Time	Start Date	Ending Time	End Date	Hours Fished	Mesh Size	Number of Fishermen	Chinook Salmon Number	Chinook Salmon Pounds	Chinook Salmon Average Weight	Summer Chum Salmon Number	Summer Chum Salmon Pounds	Summer Chum Salmon Average Weight
1	6:00 PM	15 Jun	9:00 PM	15 Jun	3	U	166	2,081	41,589	20.0	142	985	6.9
2	8:00 PM	19 Jun	10:00 PM	19 Jun	2	R	91	702	7,454	10.6	7,470	50,071	6.7
3	6:00 PM	20 Jun	Midnight	20 Jun	6	U	196	3,932	74,811	19.0	922	6,271	6.8
4	12:00 PM	21 Jun	4:00 PM	21 Jun	4	R	44	415	4,036	9.7	3,341	22,364	6.7
5	6:00 PM	24 Jun	Midnight	24 Jun	6	U	199	3,225	63,367	19.6	1,456	9,704	6.7
6	12:00 PM	26 Jun	6:00 PM	26 Jun	6	R	89	848	9,641	11.4	14,210	91,578	6.4
7	12:00 PM	28 Jun	6:00 PM	28 Jun	6	R	101	805	8,954	11.1	21,439	136,509	6.4
8	12:00 PM	3 Jul	6:00 PM	3 Jul	6	R	119	902	10,651	11.8	12,232	78,149	6.4
9	6:00 PM	8 Jul	Midnight	8 Jul	6	R	93	392	4,923	12.6	8,220	51,459	6.3
							Chinook salmon sold in the fall season [a]	4	65	16.3			
Unrestricted Mesh Subtotal					15		-	9,238	179,767	19.5	2,520	16,960	6.7
Restricted Mesh Subtotal					30		-	4,068	45,724	11.2	66,912	430,130	6.4
District 2 Subtotal					45		220	13,306	225,491	16.9	69,432	447,090	6.4

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District 3

Period Number	Starting Time	Start Date	Ending Time	End Date	Hours Fished	Mesh Size	Number of Fishermen	Chinook Salmon Number	Chinook Salmon Pounds	Chinook Salmon Average Weight	Summer Chum Salmon Number	Summer Chum Salmon Pounds	Summer Chum Salmon Average Weight	
1	2:00 PM	22 Jun	8:00 PM	22 Jun	6	U	1	74	1,484	20.1	0	0	-	
2	12:00 PM	25 Jun	9:00 PM	25 Jun	9	U	3	116	2,112	18.2	1	6	6.0	
District 3 Subtotal					15		3	190	3,596	18.9	1	6	6.0	
Lower Yukon Area Districts 1, 2, and 3 Subtotal					132		564 [b]	32,112	573,504	17.9	176,223	1,146,862	6.5	
1	6:00 PM	3 Jul	6:00 PM	10 Jul	168		4	0	0	0	5,359	4,232	5,359	[c]
2	6:00 PM	10 Jul	6:00 PM	15 Jul	120		0	-	-	-	-	-	-	
3	6:00 PM	21 Jul	6:00 PM	26 Jul	120		1	0	0	0	1,945	1,706	1,945	[c]
Subdistrict 4-A Subtotal					408		5	0	0	0	7,304	5,938	7,304	[c]

Subdistricts 5-B and 5-C

Period Number	Starting Time	Start Date	Ending Time	End Date	Hours Fished	Number of Fishermen	Chinook Salmon Number	Chinook Salmon Pounds	Chinook Salmon Average Weight	Summer Chum Salmon Number	Summer Chum Salmon Pounds	Summer Chum Salmon Average Weight
1	6:00 PM	3 Jul	6:00 AM	4 Jul	12	9	330	4,810	14.6	0	0	0
2	6:00 PM	4 Jul	6:00 AM	5 Jul	12	10	533	7,523	14.1	0	0	0
3	6:00 PM	10 Jul	6:00 AM	11 Jul	12	10	378	5,417	14.3	0	0	0
Subdistrict 5-B and 5-C Subtotal					36	12	1,241	17,750	14.3	0	0	0

Subdistricts 6-A, 6-B, and 6-C

Period Number	Starting Time	Start Date	Ending Time	End Date	Hours Fished	Number of Fishermen	Chinook Salmon Number	Chinook Salmon Pounds	Chinook Salmon Average Weight	Summer Chum Salmon Number	Summer Chum Salmon Pounds	Summer Chum Salmon Average Weight	
1	6:00 PM	21 Jul	12:00 PM	22 Jul	18	6	27	212	7.9	454	2,724	6.0	
2	6:00 PM	23 Jul	12:00 PM	25 Jul	42	6	133	1,082	8.1	1,491	8,946	6.0	
3	6:00 PM	27 Jul	12:00 PM	29 Jul	42	3	91	1,091	12.0	2,437	14,782	6.1	
4	6:00 PM	30 Jul	12:00 PM	1 Aug	42	7	30	364	12.1	4,059	22,449	5.5	
5	6:00 PM	4 Aug	12:00 PM	5 Aug	18	8	0	0	-	1,291	6,537	5.1	
6	6:00 PM	6 Aug	12:00 PM	8 Aug	42	8	0	0	-	2,063	10,875	5.3	
7	6:00 PM	10 Aug	12:00 PM	12 Aug	42	6	0	0	-	2,879	14,639	5.1	
Subdistricts 6-A, 6-B, and 6-C Subtotal					246	10	281	2,749	9.8	14,674	80,952	5.5	
Upper Yukon Area Districts 4, 5, and 6 Subtotals					690	27	1,522	20,499	13.5	21,978	80,952	5.5	[d]
Yukon Area Districts 1 Through 6 Total					822	591 [b]	33,634	594,003	17.7	198,201	1,227,814	6.4	[d]

Note: No commercial fishing occurred in Subdistricts 4-B, 4-C, 5-A, and 5-D. Mesh size U=Unrestricted and R=6" maximum mesh size.

[a] Fall Chinook salmon sales were added to the restricted mesh size subtotals in Districts 1 and 2.

[b] The number of fishermen is the unique number of permits fished. Some fishermen may fish multiple areas, therefore the subtotals will not necessarily add up by district.

[c] Summer chum salmon harvest in Subdistrict 4-A is the number of females recorded on fish tickets that were taken to produce 5,938 pounds of roe.

[d] Summer chum salmon harvest from Subdistrict 4-A was not included when calculating total and average weights.

Appendix A17.–Commercial catches of Chinook and summer chum salmon by mesh size, Districts 1 and 2, Lower Yukon Area, 1961–2007.

		Unrestricted Mesh Size [a]				6 inch Maximum Mesh Size [b]	
		Chinook			Summer Chum	Chinook	Summer Chum
Year		District 1	District 2	Total	Districts 1 and 2	Districts 1 and 2	Districts 1 and 2
1961		84,466	29,026	113,492	-	-	-
1962		67,099	22,224	89,323	-	-	-
1963		85,004	24,221	109,225	-	-	-
1964		67,555	20,246	87,801	-	-	-
1965		89,268	23,763	113,031	-	-	-
1966		70,788	16,927	87,715	-	-	-
1967		104,350	20,239	124,589	10,919	-	-
1968		79,465	21,392	100,857	14,402	-	-
1969		70,588	14,756	85,344	41,418	97	15,437
1970		56,469	17,141	73,610	104,705	57	16,623
1971		84,397	19,226	103,623	42,189	1,176	57,851
1972		68,059	17,317	85,376	78,698	1,991	37,881
1973	[c]	52,790	12,479	65,269	89,841	5,168	196,540
1974		69,457	17,464	86,921	349,758	1,631	227,507
1975		41,550	9,064	50,614	148,919	4,162	345,472
1976		56,392	15,296	71,688	267,075	7,631	128,431
1977		65,745	15,328	81,073	157,909	4,720	205,634
1978		53,198	28,872	82,070	275,512	7,737	354,603
1979		61,790	33,347	95,137	136,973	22,136	434,188
1980		78,157	42,755	120,912	95,876	19,474	605,679
1981		88,038	37,660	125,698	163,979	18,648	758,767
1982		70,743	35,656	106,399	225,106	6,887	217,563
1983		76,280	30,798	107,078	121,927	31,002	590,329
1984		65,101	29,355	94,456	242,076	16,394	287,531
1985	[d]	76,106	38,194	114,300	170,345	22,445	265,240
1986		42,922	36,603	79,525	231,372	15,307	438,182
1987		62,147	40,127	102,274	128,017	21,827	269,757
1988		32,792	20,009	52,801	225,049	39,469	848,321
1989	[e]	32,180	21,494	53,674	126,360	38,548	765,233
1990	[e]	42,092	24,000	66,092	99,588	18,147	281,418

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Year		Unrestricted Mesh Size [a]				6 inch Maximum Mesh Size [b]	
		Chinook			Summer Chum	Chinook	Summer Chum
		District 1	District 2	Total	Districts 1 and 2	Districts 1 and 2	Districts 1 and 2
1991	[e]	52,074	36,290	88,364	108,986	4,145	205,610
1992	[e]	54,569	28,679	83,248	81,458	27,678	242,878
1993		47,084	37,293	84,377	47,488	2,202	45,503
1994	[f]	61,633	41,692	103,325	39,832	608	15,369
1995		74,827	39,607	114,434	113,860	3,098	112,223
1996		56,642	30,209	86,851	123,233	0	0
1997		63,062	39,052	102,114	49,953	3,611	28,204
1998		24,202	16,806	41,008	20,314	1,211	7,804
1999		37,145	27,119	64,264	27,883	0	0
2000		4,735	3,783	8,518	6,624	0	0
2001	[g]	0	0	0	0	0	0
2002		11,087	11,434	22,521	10,354	0	0
2003		22,709	14,220	36,929	6,162	0	0
2004		28,403	24,145	52,548	20,652	0	0
2005		16,619	13,413	30,032	32,278	0	0
2006		23,728	19,356	43,084	35,574	478	11,785
2007		13,558	9,238	22,796	11,311	9,121	164,911
10 Year Average 1987-1996		51,604	31,940	83,544	109,387	15,572	278,631
10 Year Average 1997-2006		23,169	16,933	40,102	20,979	530	4,779

Note: ADF&G test fishery sales included, 1961–1990. ADF&G test fishery sales not included, 1991–2007.

[a] Primarily 8 to 8.5 inch mesh size used during early June to early July.

[b] Catch through July 15–20, relatively few Chinook and summer chum salmon taken after these dates.

[c] 6 inch maximum mesh size regulation beginning late June to early July became effective in 1973.

[d] 6 inch maximum mesh size regulation by emergency order during commercial fishing season became effective in 1985.

[e] Only includes information from fish ticket database; does not include salmon purchased illegally.

[f] 8 inch or greater mesh size restriction was in effect until June 27 and fishermen were requested to take chum salmon home for subsistence use until June 22 in order to reduce the harvest of chum salmon.

[g] No commercial fishery in 2001.

Appendix A18.–Summary of test fish wheel projects conducted in the Upper Yukon Area, 2007.

Test Fish Wheel PROJECTS	Contractor/ Operator	River Mile [b]	Operational Dates	Total Days of Operation	Estimated Total Salmon Captured [a] Chinook	Summer Chum	Fall Chum	Coho	Historical Data / Comments
Yukon River									
Rapids Video Test Fish Wheel	Yukon River Panel								
Left Bank [c]	S. Zuray	731	18 Jun to 23 Sep	97	1,008	1,892	22,403	-	Wheel uses 24 hour video counts.
Tanana River									
Lower Tanana Tag Deployment Fish Wheel	ADF&G								
Right Bank	C. Boulding	793	16 Aug to 26 Sep	41	-	-	11,861	1,047	Project operated as the fall chum salmon tag deployment fish wheel 1995-2007.
Nenana Test and Recovery Fish Wheel	ADF&G								
Right Bank [d]	P. Kleinschmidt	859	29 Jun to 5 Aug	37	665	1,191	-	-	Project started in 1988 as CPUE fish wheel.
			16 Aug to 1 Oct	46	-	-	17,711	7,808	Also operates as a fall chum salmon tag recovery fish wheel 1995-2007.
Kantishna / Toklat Rivers									
Lower Kantishna River Tag Deployment Fish Wheel	BSFA/ADF&G								
Left Bank	C. Boulding	802	16 Aug to 1 Oct	46	-	-	9,078	261	Project operation 1999-2007.
Upper Kantishna River Tag Recovery Fish Wheels									
Right Bank	M. Turner	880	16 Aug to 3 Oct	48	-	-	2,187	181	Project operation 2000-2007.
Left Bank	M. Turner	880	11 Sep to 3 Oct	22			1,109	164	Left bank operation 2003-2006. Operated in 2007 for subsistence purposes.
Toklat River Tag Recovery Fish Wheels	ADF&G								
Right Bank	ADF&G Crew	846	21 Aug to 29 Sep	39	-	-	2,470	577	Operated as a mark-recapture recovery wheel 1999-2007.
Left Bank	ADF&G Crew	846	19 Aug to 29 Sep	41	-	-	1,736	182	Project operation 1996-2007. Also operated as Toklat CWT recovery wheel 1996-2000.

[a] Unless otherwise noted, fish wheel catch are adjusted to estimate total catch per day (i.e., less than or greater than 24 hour catches adjusted to reflect a 24 hour catch).

[b] Estimated river miles from the mouth of the Yukon River.

[c] Estimated summer chum salmon totals include all chum salmon caught through August 4 based on fall chum salmon travel time related to the July 16 season transition date at Lower Yukon Test Fish project.

[d] Estimated summer chum salmon totals include all chum salmon caught through August 5. Estimated fall chum salmon totals include all chum salmon caught beginning August 16.

Appendix A19.–List of emergency orders pertaining to Districts 1-3 Chinook and summer chum salmon fishery, Yukon Area, 2007.

EO Number: 3-S-LY-01-07	Effective Date: May 28, 2007

Implements the subsistence salmon fishing schedule in District 1.

EO Number: 3-S-LY-02-07	Effective Date: May 30, 2007

Implements the subsistence salmon fishing schedule in District 2.

EO Number: 3-S-LY-03-07	Effective Date: June 1, 2007

Implements the subsistence salmon fishing schedule in District 3.

EO Number: 3-S-LY-04-07	Effective Date: June 1, 2007

Allows 7 days per week subsistence salmon fishing in the Innoko River.

EO Number: 3-S-LY-05-07	Effective Date: June 15, 2007

Opens commercial salmon fishing season in District 2.

EO Number: 3-S-LY-06-07	Effective Date: June 15, 2007

Establishes a 3-hour commercial period with unrestricted mesh size gillnets in District 2.

EO Number: 3-S-LY-07-07	Effective Date: June 14, 2007

Adjusts subsistence fishing schedule in District Y-2 to make up time lost to a commercial fishing period established by 3-S-LY-06-07.

EO Number: 3-S-LY-08-07	Effective Date: June 18, 2007

Opens commercial salmon fishing season in District 1.

EO Number: 3-S-LY-09-07	Effective Date: June 18, 2007

Establishes a 9-hour commercial period with unrestricted mesh size gillnets in District 1.

EO Number: 3-S-LY-10-07	Effective Date: June 18, 2007

Reduces subsistence closure in Districts 1 and 2 from 18 hours immediately before, during, and 12 hours after a commercial fishing period to18 hours immediately before, during, and 6 hours after period.

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EO Number: 3-S-LY-11-07 Effective Date: June19, 2007

Reduces subsistence closure in Districts 1 and 2 from 18 hours immediately before, during, and 6 hours after a commercial fishing period to12 hours immediately before, during, and 6 hours after a period.

EO Number: 3-S-LY-12-07 Effective Date: June 19, 2007

Establishes a 2-hour commercial fishing period with gillnets restricted to 6 inch maximum mesh size in District 2.

EO Number: 3-S-LY-13-07 Effective Date: June 20, 2007

Establishes a 2-hour commercial fishing period with gillnets restricted to 6 inch maximum mesh size in District 1.

EO Number: 3-S-LY-14-07 Effective Date: June 20, 2007

Establishes a 6-hour commercial fishing period in District 2 with unrestricted mesh size gillnets.

EO Number: 3-S-LY-15-07 Effective Date: June 21, 2007

Establishes a 4-hour commercial fishing period with gillnets restricted to 6 inch maximum mesh size in District 2.

EO Number: 3-S-LY-16-07 Effective Date: June 21, 2007

Establishes a 9-hour commercial fishing period in District 1 with unrestricted mesh size gillnets.

EO Number: 3-S-LY-17-07 Effective Date: June 20, 2007

Reduces subsistence closure in District 3 from 18 hours immediately before, during, and 12 hours after a commercial fishing period to12 hours immediately before, during, and 6 hours after a period.

EO Number: 3-S-LY-18-07 Effective Date: June 22, 2007

Opens commercial salmon fishing season in District 3.

EO Number: 3-S-LY-19-07 Effective Date: June 22, 2007

Establishes a 4-hour commercial fishing period with gillnets restricted to 6 inch maximum mesh size in District 1.

EO Number: 3-S-LY-20-07 Effective Date: June 24, 2007

Establishes a 6-hour commercial fishing period in District 2 with unrestricted mesh size gillnets.

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EO Number: 3-S-LY-21-07 Effective Date: June 25, 2007

Establishes a 6-hour commercial fishing period in District 1 with unrestricted mesh size gillnets.

EO Number: 3-S-LY-22-07 Effective Date: June 25, 2007

Establishes a 9-hour commercial fishing period in District 3 with unrestricted mesh size gillnets.

EO Number: 3-S-LY-23-07 Effective Date: June 26, 2007

Establishes a 6-hour commercial fishing period with gillnets restricted to 6 inch maximum mesh size in District 2.

EO Number: 3-S-LY-24-07 Effective Date: June 27, 2007

Establishes a 6-hour commercial fishing period with gillnets restricted to 6 inch maximum mesh size in District 1.

EO Number: 3-S-LY-25-07 Effective Date: June 28, 2007

Establishes a 6-hour commercial fishing period with gillnets restricted to 6 inch maximum mesh size in District 2.

EO Number: 3-S-LY-26-07 Effective Date: June 30, 2007

Establishes a 6-hour commercial fishing period with gillnets restricted to 6 inch maximum mesh size in District 1.

EO Number: 3-S-LY-27-07 Effective Date: July 2, 2007

Establishes a 6-hour commercial fishing period with gillnets restricted to 6 inch maximum mesh size in District 1.

EO Number: 3-S-LY-28-07 Effective Date: July 3, 2007

Establishes a 6-hour commercial fishing period with gillnets restricted to 6 inch maximum mesh size in District 2.

EO Number: 3-S-LY-29-07 Effective Date: July 6, 2007

Establishes a 6-hour commercial fishing period with gillnets restricted to 6 inch maximum mesh size in District 1.

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EO Number: 3-S-LY-30-07 Effective Date: July 8, 2007

Establishes a 6-hour commercial fishing period with gillnets restricted to 6 inch maximum mesh size in District 2.

EO Number: 3-S-LY-31-07 Effective Date: July 9, 2007

Establishes a 6-hour commercial fishing period with gillnets restricted to 6 inch maximum mesh size in District 1.

EO Number: 3-S-LY-32-07 Effective Date: July 12, 2007

Establishes a 6-hour commercial fishing period with gillnets restricted to 6 inch maximum mesh size in District 1.

EO Number: 3-S-LY-33-07 Effective Date: July 14, 2007

Establishes a 6-hour commercial fishing period with gillnets restricted to 6 inch maximum mesh size in District 1.

EO Number: 3-S-UY-01-07 Effective Date: June 16, 2007

Implements subsistence fishing schedule in Subdistrict Y4-A of two 48-hour periods per week.

EO Number: 3-S-UY-02-07 Effective Date: June 23, 2007

Implements subsistence fishing schedule in Subdistrict Y4-B and Y4-C of two 48-hour periods per week.

EO Number: 3-S-UY-03-07 Effective Date: June 29, 2007

Implements subsistence fishing schedule in Subdistricts Y5-A, Y5-B and Y5-C of two 48-hour periods per week.

EO Number: 3-S-UY-04-07 Effective Date: July 7, 2007

Opens commercial fishing in Subdistricts Y4-A, Y4-B, and Y4-C. Schedules 5 12-hour periods in Subdistrict Y4-A from July 7-12.

EO Number: 3-S-UY-05-07 Effective Date:July 11, 2007

Extends commercial period in Y4-A from 12 hours July 11-12 to 48 hours July 11-13.

EO Number: 3-S-UY-06-07 Effective Date: July 13, 2007

Extends commercial period in Y4-A from 48 hours July 11-13 to 120 hours July 11-16.

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EO Number: 3-S-UY-07-07 Effective Date: July 16, 2007

Establishes one 120-hour commercial salmon fishing period in Subdistrict 4-A.

EO Number: 3-S-UY-08-07 Effective Date: July 19, 2007

Establishes a 42-hour commercial fishing period in District 6 from 6:00 p.m. July 19 to 12:00 noon July 21.

EO Number: 3-S-UY-09-07 Effective Date: July 21, 2007

Establishes a 120 hour commercial fishing period in Subdistrict 4-A from 6:00 p.m. July 21 to 6:00 p.m. July 26.

EO Number: 3-S-UY-07-07 Effective Date: July 23, 2007

Establishes a 42 hour commercial fishing period in District 6 from 6:00 p.m. July 23 to 12:00 noon July 25.

EO Number: 3-S-UY-11-07 Effective Date: July 30, 2007

Closes personal use salmon fishing in the Tanana River within ½ mile of the mouth of the Chena River.

EO Number: 3-S-UY-12-07 Effective Date: July 25, 2007

Establishes 5 days per week subsistence fishing schedule for Subdistricts 4-A, 4-B, and 4-C.

EO Number: 3-S-UY-13-07 Effective Date: July 26, 2007

Establishes one 120-hour commercial fishing period in Subdistrict 4-A from 6:00 p.m. July 26 to 6:00 p.m. July 31.

EO Number: 3-S-UY-14-07 Effective Date: July 26, 2007

Establishes one 42-hour commercial fishing period in District 6 from 6:00 p.m. July 26 to 12:00 noon July 28.

EO Number: 3-S-UY-15-07 Effective Date: July 30, 2007

Establishes one 42-hour commercial fishing period in District 6 from 6:00 p.m. July 30 to 12:00 noon August 1.

EO Number: 3-S-UY-16-07 Effective Date: Aug. 2, 2007

Establishes one 42-hour commercial fishing period in District 6 from 6:00 p.m. August 2 to 12:00 noon August 4.

EO Number: 3-S-UY-17-07 Effective Date: Aug. 6, 2007

Establishes one 42-hour commercial fishing period in District 6 from 6:00 p.m. August 6 to 12:00 noon August 8.

EO Number: 3-S-UY-18-07 Effective Date: Aug. 9, 2007

Establishes one 42-hour commercial fishing period in District 6 from 6:00 p.m. August 9 to 12:00 noon August 11.

Appendix A20.–List of emergency orders pertaining to Districts 4-6 Chinook and summer chum salmon fishery, Yukon Area, 2007.

EO Number: 3-S-UY-01-07	Effective Date: June 10, 2007

Implements the subsistence fishing schedule in District 4.

EO Number: 3-S-UY-02-07	Effective Date: June 19, 2007

Implements the subsistence fishing schedule in District 5.

EO Number: 3-S-UY-03-07	Effective Date: June 24, 2007

Opens the commercial fishing season in Subdistrict 4-A.

EO Number: 3-S-UY-04-07	Effective Date: June 24, 2007

Continues the subsistence fishing schedule in Subdistricts 4-B and 4-C.

EO Number: 3-S-UY-05-07	Effective Date: July 1, 2007

Opens subsistence fishing to 5 days per week from 6:00 pm Tuesdays to 6:00 pm Sundays in Subdistrict 4-A and removes the 12-hour closing requirement.

EO Number: 3-S-UY-06-07	Effective Date: July 1, 2007

Opens the commercial fishing season 4-B and 4-C.

EO Number: 3-S-UY-07-07	Effective Date: July 1, 2007

Opens a 5-day per week subsistence fishing schedule in Subdistricts 4-B and 4-C.

EO Number: 3-S-UY-08-07	Effective Date: July 3, 2007

Opens the commercial fishing season in District 5.

EO Number: 3-S-UY-09-07	Effective Date: July 3, 2007

Establishes two 12-hour commercial fishing periods in District 5.

EO Number: 3-S-UY-10-07	Effective Date: July 3, 2007

Opens one 5-day commercial fishing period in Subdistrict 4-A.

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EO Number: 3-S-UY-11-07 Effective Date: July 6, 2007

Opens subsistence fishing in District 4 for 7 days per week 24 hours per day.

EO Number: 3-S-UY-12-07 Effective Date: July 10, 2007

Establishes one 12-hour commercial fishing period in District 5.

EO Number: 3-S-UY-13-07 Effective Date: July 8, 2007

Extends Subdistrict 4-A commercial period by 48 hours.

EO Number: 3-S-UY-14-07 Effective Date: July 10, 2007

Establishes a 5 day commercial fishing period in Subdistrict 4-A.

EO Number: 3-S-UY-15-07 Effective Date: July 16, 2007

Extends subsistence drift fishery in Subdistrict 4-A.

EO Number: 3-S-UY-16-07 Effective Date: July 21, 2007

Establishes a 5 day commercial fishing period in Subdistrict 4-A.

EO Number: 3-S-UY-17-07 Effective Date: July 19, 2007

Opens commercial fishing season in District 6.

EO Number: 3-S-UY-18-07 Effective Date: July 21, 2007

Establishes an 18-hour commercial fishing period in District 6.

EO Number: 3-S-UY-19-07 Effective Date: July 23, 2007

Establishes one 42-hour commercial fishing period in District 6.

EO Number: 3-S-UY-20-07 Effective Date: July 27, 2007

Establishes schedule consisting of two 42-hour commercial fishing periods per week fishing in District 6.

EO Number: 3-S-UY-21-07 Effective Date: August 3, 2007

Rescinds schedule consisting of two 42-hour commercial fishing periods per week fishing in District 6.

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EO Number: 3-S-UY-22-07 Effective Date: August 4, 2007

Establishes an 18-hour commercial fishing period in District 6.

EO Number: 3-S-UY-23-07 Effective Date: August 6, 2007

Establishes a 42-hour commercial fishing period in District 6.

EO Number: 3-S-UY-24-07 Effective Date: August 10, 2007

Establishes a 42-hour commercial fishing period in District 6.

Appendix A21.–Fall season commercial harvest summary, Yukon Area, 2007.

Period Number	Starting Time	Start Date	Ending Time	End Date	Hours Fished Drift	Hours Fished Set	Number of Fishermen	Fall Chum Salmon Number	Fall Chum Salmon Pounds	Fall Chum Salmon Average Weight	Coho Salmon Number	Coho Salmon Pounds	Coho Salmon Average Weight	Percent Coho
1	3:00 AM	14 Aug	12:00 PM	14 Aug	6	9	90	7,981	56,706	7.1	6,616	49,880	7.5	45.3%
2	6:00 AM	19 Aug	3:00 PM	19 Aug	6	9	92	2,313	16,742	7.2	1,538	11,704	7.6	39.9%
3	9:00 AM	24 Aug	6:00 PM	24 Aug	6	9	112	17,000	122,909	7.2	3,706	28,302	7.6	17.9%
4	9:00 AM	26 Aug	6:00 PM	26 Aug	6	9	126	5,855	41,402	7.1	4,689	36,244	7.7	44.5%
5	9:00 AM	30 Aug	6:00 PM	30 Aug	6	9	124	4,012	27,680	6.9	3,952	30,560	7.7	49.6%
6	9:00 AM	3 Sep	6:00 PM	3 Sep	6	9	52	745	5,060	6.8	709	5,519	7.8	48.8%
7	9:00 AM	6 Sep	6:00 PM	6 Sep	6	9	23	338	2,289	6.8	256	1,941	7.6	43.1%
8	9:00 AM	9 Sep	6:00 PM	9 Sep	6	9	35	608	4,184	6.9	254	1,868	7.4	29.5%
District 1 Subtotal:					48	72	181	38,852	276,972	7.1	21,720	166,018	7.6	35.9%

District 2

Period Number	Starting Time	Start Date	Ending Time	End Date	Hours Fished	Number of Fishermen	Fall Chum Salmon Number	Fall Chum Salmon Pounds	Fall Chum Salmon Average Weight	Coho Salmon Number	Coho Salmon Pounds	Coho Salmon Average Weight	Percent Coho
1	10:00 AM	15 Aug	2:00 PM	15 Aug	4	70	9,255	66,731	7.2	3,715	26,021	7.0	28.6%
2	10:00 AM	20 Aug	2:00 PM	20 Aug	4	64	934	6,406	6.9	2,805	20,691	7.4	75.0%
3	10:00 AM	23 Aug	4:00 PM	23 Aug	6	55	1,368	9,473	6.9	2,307	17,049	7.4	62.8%
4	8:00 AM	27 Aug	2:00 PM	27 Aug	6	70	11,463	82,244	7.2	2,847	21,348	7.5	19.9%
5	8:00 AM	29 Aug	2:00 PM	29 Aug	6	80	7,252	50,749	7.0	4,457	33,344	7.5	38.1%
6	10:00 AM	2 Sep	4:00 PM	2 Sep	6	59	2,749	19,444	7.1	3,411	25,425	7.5	55.4%
7	10:00 AM	5 Sep	4:00 PM	5 Sep	6	53	2,103	14,593	6.9	1,765	13,366	7.6	45.6%
8	12:00 Noon	9 Sep	6:00 PM	9 Sep	6	11	702	4,626	6.6	180	1,310	7.3	20.4%
District 2 Subtotal:					44	122	35,826	254,266	7.1	21,487	158,554	7.4	37.5%

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	Hours Fished		Number of	Fall Chum Salmon			Coho Salmon			
	Drift	Set	Fishermen [a]	Number	Pounds	Average Weight	Number	Pounds	Average Weight	Percent Coho
Lower Yukon Area, Fall Season, Districts 1, 2, and 3 Subtotal:	92	72	300	74,678	531,238	7.1	43,207	324,572	7.5	36.7%

Subdistricts 5-B and 5-C

Period Number	Starting Time	Start Date	Ending Time	End Date	Hours Fished	Number of Fishermen	Fall Chum Salmon Number	Pounds	Average Weight	Coho Salmon Number	Pounds	Average Weight	Percent Coho
1	6:00 PM	24 Aug	6:00 PM	26 Aug	48	2	427	2,782	6.5	0	0	-	-
2	6:00 PM	26 Sep	6:00 PM	7 Oct	264	0	0	0	-	0	0	-	-
Subdistricts 5-B and 5-C Subtotal:					312	2	427	2,782	6.5	0	0	-	-

Subdistricts 6-A, 6-B, and 6-C

Period Number	Starting Time	Start Date	Ending Time	End Date	Hours Fished	Number of Fishermen	Fall Chum Salmon Number	Pounds	Average Weight	Coho Salmon Number	Pounds	Average Weight	Percent Coho
1	6:00 PM	10 Sep	12:00 Noon	12 Sep	42	5	883	4,405	5.0	370	1,850	5.0	29.5%
2	6:00 PM	14 Sep	12:00 Noon	16 Sep	42	6	1,298	6,487	5.0	314	1,570	5.0	19.5%
3	6:00 PM	21 Sep	12:00 Noon	23 Sep	42	4	2,151	10,755	5.0	158	790	5.0	6.8%
4	6:00 PM	24 Sep	12:00 Noon	26 Sep	42	1	864	4,320	5.0	28	140	5.0	3.1%
5	6:00 PM	28 Sep	12:00 Noon	30 Sep	42	7	4,931	27,366	5.5	220	1,100	5.0	4.3%
6	6:00 PM	1 Oct	12:00 Noon	3 Oct	42	4	3,464	19,225	5.6	243	1,215	5.0	6.6%
7	6:00 PM	5 Oct	12:00 Noon	7 Oct	42	5	1,981	10,995	5.6	35	175	5.0	1.7%
8	6:00 PM	8 Oct	12:00 Noon	10 Oct	42	0	0	0	-	0	0	-	-
District 6 Subtotal:					336	8	15,572	83,553	5.4	1,368	6,840	5.0	8.8%
Upper Yukon Area, Fall Season, Districts 4, 5, and 6 Subtotals:					648	10	15,999	86,335	5.9	1,368	6,840	5.0	8.6%
Yukon Area, Fall Season, Districts 1 Through 6 Total:					720 [b]	310 [a]	90,677	617,573	6.8	44,575	331,412	7.4	33.0%

Note: No commercial fishing occurred in District 3, District 4, Subdistrict 5-A, and Subdistrict 5-D.

[a] The Number of Fishermen is the unique number of permits fished . Some fishermen may fish multiple areas, therefore the subtotals will not necessarily add up by district.

[b] Total hours fished includes only the Districts 1 and 2 Drift subtotal as this represents the largest portion of participating fishermen.

Appendix A22.–List of emergency orders pertaining to Districts 1–6 fall chum and coho salmon fishery, Yukon Area, 2007.

EO Number: 3-S-FY-01-07 Effective Date: July 29, 2007

Changes subsistence fishing schedule in Subdistricts 4-B and C to 5 days a week from 6:00 pm Sundays until 6:00 pm Fridays.

EO Number: 3-S-FY-02-07 Effective Date: August 13, 2007

Reduces subsistence fishing closure time around commercial periods in lower river districts to 6 hours before, during and 6 hours after commercial periods.

EO Number: 3-S-FY-03-07 Effective Date: August 14, 2007

Establishes a commercial fishing period in District 1 on August 14 and in District 2 on August 15.

EO Number: 3-S-FY-04-07 Effective Date: August 19, 2007

Establishes a commercial fishing period in District 1 on August 19 and in District 2 on August 20.

EO Number: 3-S-FY-05-07 Effective Date: August 23, 2007

Establishes a commercial fishing period in District 1 on August 24 and in District 2 on August 23.

EO Number: 3-S-FY-06-07 Effective Date: August 24, 2007

Establishes one 48 hour commercial fishing period in Subdistricts 5-B and C and is concurrent with subsistence which remains open 5-days/week.

EO Number: 3-S-FY-07-07 Effective Date: August 26, 2007

Establishes a commercial fishing period in District 1 on August 26 and in District 2 on August 27.

EO Number: 3-S-FY-08-07 Effective Date: August 29, 2007

Establishes a commercial fishing period in District 1 on August 30 and in District 2 on August 29.

EO Number: 3-S-FY-09-07 Effective Date: September 2, 2007

Establishes commercial fishing periods in District 1 on September 3 and 6; in District 2 on September 2 and 5.

EO Number: 3-S-FY-10-07 Effective Date: September 10, 2007

Establishes commercial fishing schedule in Subdistricts 6-A, B, and C consisting of two 42-hour periods per week.

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EO Number: 3-S-FY-11-07 Effective Date: September 9, 2007

Establishes a commercial fishing period in District 1 and District 2 on September 9.

EO Number: 3-S-FY-12-07 Effective Date: September 17, 2007

Cancels one commercial fishing period scheduled for September 17-19 in District 6 due to inadequate reporting.

EO Number: 3-S-FY-13-07 Effective Date: September 26, 2007

Establishes a commercial fishing period in Subdistrict 5-B and is concurrent with subsistence which remains open 5-days/week.

EO Number: 3-S-FY-14-07 Effective Date: September 30, 2007

Changes subsistence fishing schedule in Subdistricts 5-A, B, and C to 7-days a week.

EO Number: 3-S-FY-15-07 Effective Date: September 30, 2007

Extends commercial fishing season and period in Subdistrict 5-B from 6pm September 30 until 6pm October 3.

EO Number: 3-S-FY-16-07 Effective Date: October 3, 2007

Extends commercial fishing season and period in Subdistrict 5-B from 6pm October 3 until 6pm October 7.

EO Number: 3-S-FY-17-07 Effective Date: October 5, 2007

Changes subsistence fishing schedule in Subdistricts 4-A, B, and C to 7-days a week.

EO Number: 3-S-FY-18-07 Effective Date: October 10, 2007

Ends commercial fishing season in District 6.

EO Number: 3-S-FY-19-07 Effective Date: October 10, 2007

Changes subsistence fishing schedule in Subdistricts 6-A and B to 7-days a week.

Appendix A23.–Canadian weekly commercial catches of Chinook, fall chum and coho salmon in the Yukon River in 2007.

Statistical Week	Week Ending	Start Date	Finish Date	Days Fished	Number Fishing	Boat Days	Chinook Salmon	Chum Salmon	Coho Salmon
27	7 Jul			closed	0	0	0	0	0
28	14 Jul			closed	0	0	0	0	0
29	21 Jul			closed	0	0	0	0	0
30	28 Jul			closed	0	0	0	0	0
31	4 Aug			closed	0	0	0	0	0
32	11 Aug			closed	0	0	0	0	0
33	18 Aug			closed	0	0	0	0	0
34	25 Aug			closed	0	0	0	0	0
35	1 Sep			closed	0	0	0	0	0
36	8 Sep			closed	0	0	0	0	0
37	15 Sep			closed	0	0	0	0	0
38	22 Sep	19 Sep	22 Sep	3	1.2	3.6	0	1,553	0
39	29 Sep	22 Sep	26 Sep	4	1.5	6	0	1,315	0
40	6 Oct	28 Sep	5 Oct	7	1.9	13	0	3,113	2
41	13 Oct	5 Oct	12 Oct	7	0.7	5	0	1,128	0
Dawson Area Subtotal				21	1.3	28	0	7,109	2
Upriver Commercial Subtotal				21	0	28	0	0	0
Total Commercial Harvest							0	7,109	2
Chinook & Chum Test Fisheries (Chum is live release)							617	3,765	2
Domestic Harvest							0	0	0
Estimated Recreational Harvest							2	0	0
Aboriginal Fishery Catch							4,175	2,221	0
Total Upper Yukon Harvest							4,794	9,330	2
Old Crow Aboriginal Fishery							300	4,500	500
Old Crow Test Fishery								2,622	

Appendix A24.–Subsistence and personal use salmon harvest estimates which include commercially related and test fish harvests provided for subsistence use and related information, Yukon Area, 2007.

Community	Survey Date, Permit Area [a]	Number of Fishing Households [b]	Number of Dogs [c]	Estimated Harvest				Primary Gear Used [d]		
				Chinook	Summer Chum	Fall Chum	Coho	Set Gillnet	Drift Gillnet	Fish Wheels
Hooper Bay	9/13-15	102	130	430	12,234	64	26	35	2	0
Scammon Bay	9/11-12	46	84	768	3,887	170	84	20	1	0
Coastal District Total		148	214	1,198	16,121	234	110	55	3	0
Nunam Iqua [e]	9/11-12	16	31	907	2,325	152	92	12	2	0
Alakanuk [f]	9/9-10	64	170	1,257	7,611	1,348	857	14	18	0
Emmonak [f]	9/6-8	88	156	2,326	9,256	2,360	1,032	6	51	0
Kotlik [f]	9/8-10	71	160	1,569	5,017	530	284	19	15	0
District 1 Subtotal		239	517	6,059	24,209	4,390	2,265	51	86	0
Mountain Village [f]	9/18-19	97	131	2,077	8,104	1,073	1,027	10	36	0
Pitkas Point	9/20	11	37	320	515	44	38	0	7	0
St. Mary's [f]	9/16-17, 21	105	140	3,573	8,107	825	97	2	48	1
Pilot Station [f]	9/22-24	58	65	2,028	3,711	741	263	2	24	0
Marshall [f]	9/25-27	50	148	2,555	3,070	789	922	1	23	0
District 2 Subtotal		321	521	10,553	23,507	3,472	2,347	15	138	1
Russian Mission	9/26-27	31	164	1,301	759	530	259	1	10	0
Holy Cross	9/22-23	37	55	2,902	320	248	213	10	15	0
Shageluk	9/24	31	66	448	977	147	267	5	8	0
District 3 Subtotal		99	285	4,651	2,056	925	739	16	33	0
Lower Yukon River Total		659	1,323	21,263	49,772	8,787	5,351	82	257	1
Anvik	9/25	19	96	1,321	5,250	429	807	8	8	2
Grayling	9/26-27	35	51	1,500	641	317	271	2	8	0
Kaltag [f]	10/8-9	43	29	1,456	109	910	204	1	11	0
Nulato	10/8-9	66	126	2,431	356	1,345	130	3	21	0
Koyukuk	10/10-11	17	69	811	995	927	189	3	9	0
Galena	10/4-7	71	89	2,511	571	1,471	425	7	18	1
Ruby	10/3-4	18	131	1,594	416	1,959	168	4	0	6
District 4 Yukon River Subtotal		269	591	11,624	8,338	7,358	2,194	28	75	9
Huslia	10/10-11	21	160	146	3,243	272	592	8	2	0
Hughes	10/11-12	9	46	8	1,213	0	100	6	0	0
Allakaket	10/12-14	9	110	53	3,451	939	66	9	0	0
Alatna	10/12-14	1	4	0	11	7	0	1	0	0
Bettles	10/15	0	71	0	0	0	0	0	0	0
Koyukuk River Subtotal		40	391	207	7,918	1,218	758	24	2	0
District 4 Subtotal		309	982	11,831	16,256	8,576	2,952	52	77	9

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Community	Survey Date, Permit Area [a]	Number of Fishing Households [b]	Number Of Dogs [c]	Estimated Harvest				Primary Gear Used [d]		
				Chinook	Summer Chum	Fall Chum	Coho	Set Gillnet	Drift Gillnet	Fish Wheels
Tanana	10/16-18	43	410	5,498	5,229	21,596	2,369	10	0	14
Rampart	permits	2	3	250	25	250	50	2	0	0
Fairbanks NSB [g]	permits	48	192	2,510	564	2,126	26	45	0	2
Stevens Village [h]	10/13-14, permits	15	79	610	254	199	0	14	0	0
Birch Creek	10/23-24	3	24	113	0	0	0	1	0	0
Beaver	10/17	18	31	1,244	41	354	354	10	0	3
Fort Yukon	10/18-21	44	296	4,076	2,365	8,264	567	10	0	11
Circle	permits	9	39	1,057	200	1,286	0	4	0	5
Central	permits	7	11	334	0	0	0	6	0	1
Eagle [f]	permits	29	235	1,999	15	18,676	0	20	0	9
Other District 5 [i]	permits	18	87	472	81	46	0	17	0	1
District 5 Yukon River Subtotal		*236*	*1,407*	*18,163*	*8,774*	*52,797*	*3,366*	*139*	*0*	*46*
Venetie	11/5-6	13	87	1,002	107	721	0	6	0	1
Chalkyitsik	10/22-23	3	22	0	0	213	0	2	0	0
Chandalar and Black Rivers Subtotal		*16*	*109*	*1,002*	*107*	*934*	*0*	*8*	*0*	*1*
District 5 Subtotal		*252*	*1,516*	*19,165*	*8,881*	*53,731*	*3,366*	*147*	*0*	*47*
Manley	permits	9	102	333	140	3,419	1,126	9	0	0
Minto	permits	8	97	82	82	155	155	7	0	1
Nenana [f]	permits	23	293	899	1,429	21,863	4,487	9	0	14
Healy	permits	3	40	0	0	1,090	1,463	3	0	0
Fairbanks NSB [j]	permits	40	202	539	429	3,480	744	37	0	3
Other District 6 [k]	permits	19	156	0	0	59	5	14	0	1
District 6 Tanana River Subtotal [l]		*102*	*890*	*1,853*	*2,080*	*30,066*	*7,980*	*79*	*0*	*19*
Upper Yukon River Total		663	3,388	32,849	27,217	92,373	14,298	278	77	75
Survey Village Subtotal		1,255	3,468	44,882	87,786	45,919	10,439	242	337	39
Subsistence Permit Subtotal [m]		183	1,457	8,082	2,781	38,679	6,723	142	0	36
Subsistence Test Fish Subtotal [n]		-	-	1,965	2,359	3,028	1,264	-	-	-
District 6 Commercial Related [o]				245	0	13,595	1,198	-	-	-
Subsistence Harvests Subtotal		*1,438*	*4,925*	*55,174*	*92,926*	*101,221*	*19,624*	*384*	*337*	*75*
Alaska, Yukon River Subs. Harvest Subtotal		*1,290*	*4,711*	*53,976*	*76,805*	*100,987*	*19,514*	*329*	*334*	*75*
Personal Use Permit Subtotals		*32*	-	*136*	*184*	*173*	*135*	*31*	*0*	*1*
Alaska, Yukon River Total [p]		1,322	4,711	54,112	76,989	101,160	19,649	360	334	76
Alaska, Yukon Area Total		1,470	4,925	55,310	93,110	101,394	19,759	415	337	76
AK, Yukon Area Percentages of the Total	-		-	21%	35%	38%	7%	50%	41%	9%

-continued-

Note: Data presented in this table is preliminary (D. Jallen. Draft. Subsistence and personal use salmon harvests in the Alaska portion of the Yukon River drainage, 2007. Commercial Fisheries Biologist, ADF&G, Fairbanks).

[a] Data collected by Alaska Department of Fish and Game (ADF&G), Division of Commercial Fisheries. Survey data is expanded for number of fishing households, number of dogs, and harvest. Permit data is unexpanded, and is from all permits received as of March 27, 2009.

[b] Estimated number of households that fished in surveyed communities or number of permit households who reported fishing in permit required areas.

[c] The number of dogs is based on survey information or from subsistence permits issued.

[d] Primary fishing gear used is based on survey information or from subsistence permits issued. Primary gear information for surveyed communities is not expanded for households that were not surveyed.

[e] Formerly known as Sheldon or Sheldons Point.

[f] Test fish have been added to the total fish harvested in a surveyed and permit required communities.

[g] Fairbanks North Star Borough (FNSB) households that obtained a permit and indicated they fished in the Yukon River permit required area.

[h] Permit harvest information from Stevens Village residents was used to complement the information obtained by the survey.

[i] "Other District 5" includes residents of Anchorage, Anderson, Big Lake, Healy, Manley, Minto, Nenana, Northway, Tok, and Wiseman that obtained a household permit and fished in a Yukon River permit required area.

[j] Fairbanks North Star Borough (FNSB) households that obtained a subsistence and/or personal use permit and indicated they fished in the Tanana River permit required area.

[k] "Other District 6" includes residents of the Upper Tanana River drainage communities of Delta Junction, Dot Lake, Northway, Tanacross, and Tok, and the communities of Circle and Chugiak who obtained a permit and fished in the Tanana River.

[l] Includes salmon retained (not sold) during commercial fishing. However not include harvest of female chum and coho salmon sold commercially for roe and carcass returned to fishermen for dog food in Subdistrict 6-B.

[m] Subsistence permit subtotal does not include Stevens Village permit information, or 54 permits issued and fished for pike in the ST permit area.

[n] Test fish given away for subsistence use.

[o] District 6 "Commercial Related" included fish caught during commercial fishing and "not sold" but retained for subsistence use.

[p] Does not include Coastal District.

Appendix A25.–Reported subsistence and personal use fish harvested under the authority of a permit, listed by permit area, Yukon Area, 2007.

Permit Fishing Area	Permit [a] Type	Issued [b]	Returned	Percent Returned	Number of Permits Returned that Fished [c]	Reported Harvest Chinook [d]	Summer Chum	Fall Chum [d]	Coho	Whitefish	Sheefish	Burbot	Pike	Suckers	Grayling
Subsistence Permit															
Koyukuk Middle and South Fork Rivers	SF	1	1	100%	1	0	0	0	0	5	0	0	0	1	10
Yukon River Rampart Area	SR	23	19	83%	15	1,744	495	2,050	50	75	0	11	20	3	0
Yukon River near Haul Road Bridge	SY	85	80	94%	51	1,707	177	626	26	61	26	25	43	0	0
Yukon River near Circle and Eagle [e]	SE	78	71	91%	51	3,548	218	20,005	0	582	32	11	21	189	478
Tanana River Subdistrict 6A	SA	17	17	100%	12	333	144	3,779	1,482	24	3	4	8	0	0
Tanana River Subdistrict 6B [f]	SB	79	75	95%	39	1,127	1,750	12,477	4,521	656	17	32	108	26	2
Tanana River Upstream of Subdistrict 6C	SU	34	33	97%	17	0	0	41	5	1,786	0	15	19	24	35
Kantishna River Subdistrict 6A	SK	5	5	100%	2	0	0	0	639	0	0	0	37	0	0
Tolovana River Pike Subdistrict 6B	ST	118	109	92%	54	12	2	1	0	137	4	1	1,837	0	0
Subsistence Permit Subtotals		440	410	93%	242	8,471	2,786	38,979	6,723	3,326	82	99	2,093	243	525
Personal Use Permit															
Tanana River Salmon Subdistrict 6C	PC	65	63	97%	32	136	184	173	135	4	1	0	1	0	0
Tanana River Whitefish Upstream of Subdistrict 6C	PW	3	3	100%	0	0	0	0	0	0	0	0	0	0	0
Personal Use Permit Subtotals		68	66	97%	32	136	184	173	135	4	1	0	1	0	0
Permit Totals		508	476	94%	274	8,607	2,970	39,152	6,858	3,330	83	99	2,094	243	525

Note: Data presented in this table are preliminary. (D. Jallen. Draft. Subsistence and personal use salmon harvests in the Alaska portion of the Yukon River drainage, 2007. Commercial Fisheries Biologist, ADF&G, Fairbanks).

[a] Permits returned as of March 31, 2009.

[b] Includes 33 households that were "issued" permits for more than one area, and includes one households that was issued two duplicate permits for same area.

[c] Includes 8 households that "fished" in two different permit areas.

[d] Does not include District 6 commercial related harvest of 245 Chinook, 13,595 fall chum, and 1,198 coho salmon caught but "not sold" during commercial fishing and retained for subsistence use.

[e] Does not include fish distributed to community households from ADF&G Eagle Sonar test fish project (12 Chinook and 3 fall chum salmon).

[f] Includes unknown number of fish distributed to community households from ADF&G Nenana test fish wheel project that were documented on contractor's subsistence permit.

Appendix A26.–Detailed salmon spawning escapement estimates for the Yukon River drainage, 2007.

Stream (drainage)		Date	Survey Rating	Chinook	Summer Chum	Fall Chum	Coho	Agency
Andreafsky River								
	East Fork (weir count)	6/19-7/30	--	4,504	69,642	--	9	USFWS
	East Fork	7/24	Fair	(1,758)	--	--	--	ADF&G
	West Fork	7/23	Fair	976	--	--	--	ADF&G
	Andreafsky Subtotal			5,480	69,642	--	9	
Pilot Station (Sonar estimate)		6/4-8/31	--	(125,553)	(1,726,885)	(684,011)	(173,289)[a]	ADF&G
Anvik River								
	Anvik River (Sonar estimate)	6/27-7/26	--	--	459,038	--	--	ADF&G
	Goblet Creek to Yellow R.	7/23	Fair	29	(5,150)	--	--	ADF&G
	Yellow R. to McDonald Cr. (aerial index area)[b]	7/23	Fair	1,497	0	--	--	ADF&G
	Swift River	7/23	Good	3	--	--	--	ADF&G
	Otter Creek	7/23	Good	118	--	--	--	ADF&G
	Anvik Subtotal			1,647	459,038	--	--	
Nulato River								
	North Fork[c]	7/24	Good	1,684	21,825	--	--	ADF&G
	South Fork	7/24	Good	899	15,277	--	--	ADF&G
Total Lower Yukon River (downstream of Koyukuk River)				9,710	565,782	--	9	
Koyukuk River Drainage								
	Gisasa River (weir project)	6/24-7/28	Fair/Good	1,427	46,257	--	--	USFWS
	Gisasa River	7/22	Fair	(593)	--	--	--	ADF&G
	Hogatza River drainage							
	Clear Creek	6/23-8/6	--	--	6,029	--	--	BLM
	Caribou Creek	6/30-7/29	--	--	17,728	--	--	BLM
	Henshaw Creek (weir project)	6/25-8/6	Fair/Good	569	44,425	--	--	TCC
Total Koyukuk River				1,996	114,439	--	--	
Tozitna River (weir)		6/23-8/6	--	494	14,147	--	--	BLM
Total Yukon River (downstream of Tanana River)				12,200	694,368	--	9	

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Stream (drainage)	Date	Survey Rating	Chinook	Summer Chum	Fall Chum	Coho	Agency
Tanana River Drainage							
Kantishna River Drainage							
Kantishna River Tagging Estimate	8/16-10/3	--	--	--	81,843	--	ADF&G
Toklat Springs (helicopter survey) [d]	10/17	Good	--	--	(1,280)	9	ADF&G
Main Channel and Sloughs			--	--	--	--	
Geiger Creek			--	--	--	--	
	Toklat Subtotal		--	--	1,280	9	
Bearpaw River	7/28	Good	39	--	--	--	ADF&G
Total Kantishna River			39	--	81,843	9	
Tanana River Tagging Estimate	8/16-10/6	--	--	--	320,811	--	
Chatanika River	7/19	Good	62	1	--	--	ADF&G
		-Continued-					
Nenana River Drainage							
Teklanika Springs			--	--	--	--	
Mainstem Nenana (helicopter survey)	10/21	Good	--	--	15	520	ADF&G
Seventeen Mile Slough	7/28, 10/21	Good	173	--	--	1,733	ADF&G
Julius Creek	7/28,10/21	Good	96	--	3	10	ADF&G
Wood Creek	10/21	Good	--	--	25	605	ADF&G
Clear Creek	10/21	Good	--	--	0	1,268	ADF&G
Glacier Creek	10/21	Good	--	--	2	2	ADF&G
Lost Slough (western floodplain)	10/21	Good	--	--	0	63	ADF&G
Lignite Springs (foot survey)	10/12	Good	--	--	0	334	ADF&G
June Creek (foot survey)	10/12	Good	--	--	--	45	ADF&G
	Nenana Subtotal		269	--	45	4,580	
Chena River							
Moose Creek Dam to West Fork	7/20	Good	(299)	--	--	--	ADF&G
Chena River (counting tower estimate) [a]	6/28-8/4	--	3,806	4,999	--	--	ADF&G
Salcha River							
Salcha River (aerial index area)	7/18	Fair	(1,150)	--	--	--	ADF&G
Salcha River (outside aerial index area)	7/18	Fair	(107)	--	--	--	ADF&G
Salcha River (counting tower estimate) [a]	6/30-8/15	--	6,425	13,069	--	--	BSFA
Richardson Clearwater River	11/2	Good	--	--	381	553	ADF&G

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Stream (drainage)	Date	Survey Rating	Chinook	Summer Chum	Fall Chum	Coho	Agency
Mainstem Tanana sloughs (helicopter survey)							
Benchmark 735 slough	11/2	Good	--	--	1,467	67	ADF&G
Little Delta River mouth vicinity	11/2	Good	--	--	658	35	ADF&G
Whitestone slough	11/2	Good	--	--	9	30	ADF&G
Rika's Roadhouse vicinity	11/2	Good	--	--	744	1	ADF&G
Bluff Cabin Island slough	11/2	Good	--	--	28	0	ADF&G
Clearwater Lake Outlet slough (aerial, boat)	11/2, 11/1	Good	--	--	570	2,075	ADF&G
Pearse slough and vicinity	11/2	Good	--	--	47	0	ADF&G
Goodpaster River							
Goodpaster River	7/26	Fair	(314)	--	--	--	ADF&G
Goodpaster River (counting tower estimate)	7/15-7/27	--	476	--	--	--	TCC/BSFA
Delta River							
Foot Survey (peak count)	11/3	Good	--	--	(15,781)	238	ADF&G
Population Estimate [e]			--	--	18,610	--	ADF&G
Blue Creek	10/16	Good	--	--	1,325	100	ADF&G
Bluff Cabin Slough	11/2	Good	--	--	666	1	ADF&G
Bluff Cabin Creek	11/2	Good	--	--	111	134	ADF&G
Delta Clearwater River Index Area (boat survey)	10/31	--	--	--	5	14,650	ADF&G
Delta Clearwater River Tributaries	10/31	--	--	--	--	3,961	ADF&G
Total Tanana River Survey Areas			11,077	18,069	25,946	26,434	
Total Tanana River Mark-Recapture	8/16-10/6		--	--	402,654	--	
Chandalar River (sonar estimate)	8/8-9/26	--	--	--	228,056	--	USFWS
Porcupine River Drainage							
Sheenjek River (sonar estimate)	8/11-9/24	--	--	--	65,435	--	ADF&G
Fishing Branch River (weir project)	9/1-10/25	--	--	--	32,150	--	DFO
Total Porcupine River			--	--	97,585	--	
Eagle (sonar estimate)	7/7-10/18	--	(41,697)	--	(282,670)	--	ADF&G/DFO

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Stream (drainage)	Date	Survey Rating	Chinook	Summer Chum	Fall Chum	Coho	Agency
Total Alaskan Portion of Drainage Observed Escapements [f]			23,277	712,437	696,145	26,443	
Yukon Territory Streams [g]							
Blind Creek (weir)	7/17-8/17	--	304	--	--	--	DFO [h]
Little Salmon River (Index area)	8/16	Good	451	--	--	--	DFO
Big Salmon River (index area)	8/15	Fair/Good	(601)	--	--	--	DFO
Big Salmon River (sonar estimate)	7/15-8/26	--	4,450	--	--	--	DFO [h]
Teslin River Drainage			--	--	--	--	--
Nisutlin River	8/15	Fair/Good	137	--	--	--	DFO
Wolf River	8/15	Good	54	--	--	--	DFO
	Teslin Subtotal		191	--	--	--	
Whitehorse Fishway	7/20-9/3	--	427	--	--	--	DFO [h]
Canadian Mainstem Yukon River							
Border Passage Estimate (Eagle sonar minus U.S. harvest)			(39,698)	--	(263,979)	--	ADF&G/DFO
Canadian Escapement Estimate (Border Passaage minus Canada Harvest)			34,904	--	254,649	--	ADF&G/DFO
Total Yukon Territory [i]			34,904	--	286,799	--	DFO
Yukon River Drainage Total Observed Escapements			58,181	712,437	982,944	26,443	

Note: Data in parentheses are not included in subtotals or totals. Aerial survey data unless otherwise noted.

[a] Considered to be a conservative estimate due to the project ending before the completion of the salmon run (coho salmon for Pilot and summer chum salmon for Chena and Salcha tower projects).

[b] Anvik River chum salmon index area includes mainstem counts between Goblet Creek and McDonald Creek.

[c] Nulato River mainstem aerial survey counts below the forks are included with the North Fork.

[d] Incomplete survey of Toklat Springs various areas and sloughs.

[e] Population estimate based upon replicate foot surveys and salmon streamlife data.

[f] Total for the Alaska portion of drainage does not include Fishing Branch River. Total for Yukon Territory includes Fishing Branch River.

[g] Canadian "border passage" estimate for Yukon Territory streams (excluding the Fishing Branch River). Canadian harvest has not been removed.

[h] Yukon Territory counts provided by DFO but are operated by various contractors mostly funded by Restoration and Enhancement Funds.

[i] Yukon Territory counts include Canadian mainstem Yukon River escapement estimate plus Fishing Branch River.

Appendix A27.–Yukon River Canadian Chinook salmon total run by brood year and escapement by year 1982–2004 based on 3-Area Index, Eagle sonar (2005–2007), and radiotelemetry (local) (2002–2004).

Brood Year	3	4	5	6	7	8	Return	Spawners	R/S
1974						634			
1975					33,080	175			
1976				88,405	22,026	40			
1977			19,491	111,771	19,734	801	151,797		
1978		4,443	22,845	63,235	29,424	1,493	121,439		
1979	1,534	3,388	21,422	100,503	48,253	1,175	176,274		
1980	15	6,604	13,510	70,415	33,978	4,240	128,763		
1981	0	1,122	33,220	114,180	54,845	1,841	205,208		
1982	0	5,141	17,169	37,883	27,763	376	88,330	43,538	2.03
1983	560	7,558	35,117	89,449	16,408	162	149,253	44,475	3.36
1984	69	13,368	34,379	75,041	13,782	138	136,778	50,005	2.74
1985	223	10,738	38,956	62,142	4,756	91	116,906	40,435	2.89
1986	347	20,408	45,928	109,067	15,843	138	191,731	41,425	4.63
1987	0	2,368	33,542	67,697	11,700	18	115,325	41,307	2.79
1988	0	6,641	34,323	75,396	8,937	68	125,366	39,699	3.16
1989	75	13,517	78,826	128,851	25,841	0	247,109	60,299	4.10
1990	56	6,343	24,873	71,641	10,816	9	113,737	59,212	1.92
1991	501	7,107	82,332	121,590	10,182	0	221,712	42,728	5.19
1992	6	2,608	23,981	41,677	1,831	0	70,103	39,155	1.79
1993	14	5,313	36,363	86,880	5,880	0	134,450	36,244	3.71
1994	0	755	19,932	30,683	6,175	0	57,545	56,449	1.02
1995	34	1,784	15,989	52,720	7,026	10	77,562	50,673	1.53
1996	20	276	23,201	44,462	14,610	2	82,571	74,060	1.11
1997	14	3,567	26,386	94,406	7,828	14	132,216	53,821	2.46
1998	0	3,478	39,260	76,502	4,357	0	123,598	35,497	3.48
1999	134	1,692	30,110	76,649	2,870	0	111,455	37,184	3.00
2000	0	2,798	40,704	63,414	1,509	0	108,424	25,870	4.19
2001	8	1,813	50,877	51,785	2,339		106,822	52,564	2.03
2002	75	2,262	28,704	22,035			53,076	42,359	1.25
2003	63	5,898	39,178				45,139	80,594	0.56
2004	3	2,475					2,478	48,469	0.05
2005	9							68,551	
2006								62,933	
2007								34,903	
Average							122,099	46,048	2.65

Appendix A28.–Percent age composition of combined commercial and subsistence salmon harvest by species, Yukon River drainage, 1982–2007.

Species / Run	Year	Sample Size	Age In Years (Percent) 3	4	5	6	7	8	Total [a]
Chinook	1982	3,795	0.2	6.8	18.5	58.3	15.9	0.3	100.0
Salmon	1983	3,801	0.0	6.6	21.0	62.9	9.4	0.0	100.0
	1984	3,700	0.0	3.7	27.0	56.0	13.1	0.1	100.0
	1985	4,567	0.1	5.7	13.2	69.4	11.3	0.3	100.0
	1986	5,785	0.3	3.9	27.2	42.8	25.1	0.6	100.0
	1987	5,300	0.0	4.2	8.4	72.5	14.5	0.3	100.0
	1988	5,108	0.1	14.8	22.8	31.5	29.4	1.4	100.0
	1989	3,901	0.5	7.2	30.3	51.1	10.2	0.6	99.9
	1990	3,416	0.0	17.2	26.9	49.4	6.3	0.2	100.0
	1991	3,879	0.0	5.8	45.1	42.6	6.4	0.1	100.0
	1992	3,772	0.1	8.1	20.1	68.6	3.1	0.0	100.0
	1993	4,034	0.2	15.8	25.4	50.5	8.0	0.0	99.9
	1994	3,692	0.3	4.1	47.2	44.5	3.8	0.0	99.9
	1995	5,559	0.0	7.8	13.7	74.7	3.6	0.2	100.0
	1996	5,861	0.0	2.4	44.0	35.6	17.9	0.2	100.1
	1997	5,134	0.0	7.5	17.8	70.5	4.2	0.1	100.1
	1998	3,122	0.7	5.2	55.1	31.4	7.6	0.0	100.0
	1999	4,285	0.1	3.8	17.7	76.7	1.7	0.0	100.0
	2000	1,201	0.0	1.0	29.9	60.5	8.6	0.0	100.0
	2001 [b]	1,182	0.1	9.0	27.2	57.6	6.1	0.0	100.0
	2002	3,580	0.0	8.2	27.0	53.9	10.9	0.0	100.0
	2003	3,850	0.1	3.4	32.3	56.5	7.7	0.0	100.0
	2004	6,556	0.0	9.9	23.3	63.1	3.6	0.0	100.0
	2005	4,515	0.0	5.8	43.0	48.5	2.6	0.0	100.0
	2006	4,470	0.0	4.2	53.6	40.7	1.5	0.0	100.0
	2007	7,095	0.0	11.0	26.8	60.0	2.1	0.0	100.0
	2002-2006 Average	4,594	0.0	6.3	35.8	52.5	5.3	0.0	100.0

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Species / Run	Year	Sample Size	Age In Years (Percent) 3	4	5	6	7	Total [a]
Chum	1982	3,419	5.3	0.0	88.6	6.1	0.0	100.0
Salmon/	1983	4,110	1.0	53.8	44.4	0.8	0.0	100.0
Summer	1984	2,722	2.0	73.7	23.9	0.5	0.0	100.0
	1985	2,472	1.4	68.6	29.2	0.8	0.0	100.0
	1986	3,473	0.1	29.1	69.8	1.0	0.0	100.0
	1987	2,184	0.4	60.8	31.8	6.9	0.0	100.0
	1988	5,112	0.0	70.1	29.1	0.8	0.0	100.0
	1989	3,778	0.4	38.7	60.5	0.4	0.0	100.0
	1990	3,155	0.4	38.3	58.9	2.4	0.0	100.0
	1991	5,015	1.3	48.0	49.8	0.9	0.0	100.0
	1992	4,303	0.2	31.0	65.0	3.8	0.0	100.0
	1993	2,011	0.4	47.5	47.7	4.5	0.0	100.1
	1994	3,820	0.1	51.3	46.6	2.0	0.0	100.0
	1995	4,740	0.6	51.9	45.3	2.1	0.0	99.9
	1996	3,863	0.4	46.2	48.8	4.5	0.1	100.0
	1997	3,195	0.2	29.0	67.2	3.6	0.0	100.0
	1998	1,147	0.3	62.8	34.2	2.7	0.0	100.0
	1999	1,627	0.2	40.7	58.2	0.9	0.0	100.0
	2000	442	0.0	44.2	53.4	2.4	0.0	100.0
	2001 [b]	586	0.0	15.4	81.9	2.7	0.0	100.0
	2002	1,103	0.1	52.9	44.4	2.6	0.0	100.0
	2003	1,144	0.3	55.4	39.2	5.1	0.0	100.0
	2004	2,742	1.3	37.2	60.4	1.0	0.1	100.0
	2005	2,381	0.2	83.2	15.2	1.5	0.0	100.0
	2006	2,799	0.1	18.6	81.1	0.2	0.0	100.0
	2007	4,356	0.0	34.5	50.5	14.9	0.1	100.0
	2002-2006 Average	2,034	0.4	49.5	48.1	2.1	0.0	100.0

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Species / Run	Year		Sample Size	Age in Years (Percent) 3	4	5	6	Total [a]
Chum	1982		2,918	6.5	58.6	34.5	0.3	100.0
Salmon/	1983		1,735	0.7	91.4	8.0	0.0	100.0
Fall	1984		1,902	6.6	55.6	37.5	0.4	100.0
	1985		2,801	5.2	83.4	11.0	0.4	100.0
	1986		1,715	7.4	89.6	2.5	0.5	100.0
	1987		1,513	5.0	77.1	17.5	0.4	100.0
	1988		4,030	4.1	45.7	46.6	3.5	99.9
	1989		4,939	1.0	87.0	11.8	0.2	100.0
	1990		2,351	2.8	74.9	21.7	0.6	100.0
	1991		5,314	2.7	75.4	21.7	0.2	100.0
	1992		3,069	1.2	45.9	51.8	1.1	100.0
	1993		1,616	0.1	62.8	35.2	1.8	99.9
	1994		1,295	2.4	66.4	31.1	0.1	100.0
	1995		1,731	0.8	59.2	37.4	2.6	100.0
	1996		1,391	0.3	52.3	43.9	3.5	100.0
	1997		1,245	0.3	57.2	41.6	0.9	100.0
	1998	[c]	0	-	-	-	-	-
	1999		371	0.0	79.2	20.5	0.3	100.0
	2000	[c]	0	-	-	-	-	-
	2001	[b]	295	0.0	54.2	45.4	0.3	99.9
	2002	[c]	0	-	-	-	-	-
	2003		1,596	0.1	79.6	19.4	0.9	100.0
	2004		1,449	19.6	54.7	25.7	0.0	100.0
	2005		4,754	0.0	97.6	2.1	0.3	100.0
	2006		2,340	1.4	43.1	55.4	0.1	100.0
	2007		3,064	0.7	75.4	22.2	1.8	100.0
	2002-2006 Average		2,028	5.3	68.8	25.6	0.3	100.0

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Species / Run	Year		Sample Size	Age in Years (Percent) 3	4	5	Total [a]
Coho	1982		320	4.1	87.3	8.6	100.0
Salmon	1983		121	4.1	91.7	4.1	100.0
	1984		619	12.9	73.7	13.4	100.0
	1985		462	14.1	76.3	9.6	100.0
	1986		491	2.2	88.6	9.2	100.0
	1987		0	-	-	-	-
	1988		1,091	12.2	85.5	2.3	100.0
	1989		749	20.0	74.5	5.5	100.0
	1990		428	28.9	67.1	3.9	99.9
	1991		615	8.3	91.6	0.1	100.0
	1992		920	24.1	74.4	1.6	100.1
	1993		522	15.5	83.5	1.0	100.0
	1994		752	22.9	76.2	0.9	100.0
	1995		664	41.7	58.0	0.3	100.0
	1996		944	10.4	87.2	2.4	100.0
	1997		516	6.1	92.0	2.0	100.1
	1998	[c]	0	-	-	-	-
	1999		40	7.5	85.0	7.5	100.0
	2000	[c]	0	-	-	-	-
	2001	[b]	18	22.2	77.8	0.0	100.0
	2002	[c]	0	-	-	-	-
	2003		753	25.1	69.8	5.1	100.0
	2004		590	22.3	75.0	2.7	100.0
	2005		1,921	8.3	84.8	6.8	100.0
	2006		1,231	14.7	80.7	4.6	100.0
	2007		1,234	11.6	85.6	2.8	100.0
	2002-2006 Average		899	17.6	77.6	4.8	100.0

Note: Ages were estimated from samples collected from each gear type, by district and fishery, or from adjacent fisheries with similar gear. Fisheries for which no appropriate samples were available were not included.

[a] Total may not equal 100% due to rounding.

[b] No commercial fishing, samples were from subsistence harvests.

[c] No commercial fishing occurred and subsistence harvests for fall chum and coho salmon were not sampled.

Appendix A29.–Chinook salmon age and sex percentages from selected Yukon River escapement projects, 2007.

Location	Sample Size		Age 3	4	5	6	7	8	Total
East Fork Andreafsky River [a]	631	Males	0.0	25.5	18.0	11.5	0.4	0.0	55.3
		Females	0.0	16.2	7.7	20.6	0.3	0.0	44.7
		Total	0.0	41.7	25.7	32.0	0.6	0.0	100.0
Gisasa River [a]	336	Males	0.0	26.1	17.9	17.0	0.0	0.0	61.0
		Females	0.0	4.2	2.8	31.7	0.2	0.0	39.0
		Total	0.0	30.4	20.7	48.7	0.2	0.0	100.0
Henshaw Creek [a]	258	Males	0.0	46.6	15.9	12.6	0.0	0.0	75.1
		Females	0.0	0.0	4.5	20.5	0.0	0.0	24.9
		Total	0.0	46.6	20.4	33.0	0.0	0.0	100.0
Salcha River [b]	308	Males	0.0	22.1	23.4	18.8	0.0	0.0	64.3
		Females	0.0	0.3	3.6	31.5	0.3	0.0	35.7
		Total	0.0	22.4	26.9	50.3	0.3	0.0	100.0
Tozitna River [a]	217	Males	0.0	29.2	31.7	13.1	0.0	0.0	73.9
		Females	0.0	0.0	3.3	22.4	0.4	0.0	26.1
		Total	0.0	29.2	35.0	35.4	0.4	0.0	100.0

[a] Samples were collected from a weir trap.

[b] Samples were collected from carcasses.

Appendix A30.–Summer chum salmon age and sex percentages from selected Yukon River escapement projects, 2007.

Location	Sample Size		Age 3	4	5	6	7	Total
Anvik River [a]	560	Males	0.1	24.5	13.2	4.0	0.0	41.8
		Females	1.0	36.0	16.4	4.8	0.0	58.2
		Total	1.1	60.5	29.6	8.8	0.0	100.0
East Fork Andreafsky River [b]	805	Males	1.1	37.0	12.9	2.1	0.0	53.2
		Females	0.3	34.4	10.0	2.1	0.0	46.8
		Total	1.4	71.5	22.9	4.2	0.0	100.0
Gisasa River [b]	579	Males	0.8	25.0	15.7	2.9	0.0	44.4
		Females	1.5	30.5	20.9	2.7	0.0	55.6
		Total	2.3	55.5	36.6	5.6	0.0	100.0
Henshaw Creek [b]	540	Males	0.8	33.1	20.4	1.7	0.0	56.0
		Females	1.4	25.8	16.2	0.5	0.0	44.0
		Total	2.2	59.0	36.6	2.2	0.0	100.0
Tozitna River [b]	708	Males	1.3	36.4	17.7	2.0	0.0	57.4
		Females	0.7	28.1	13.2	0.7	0.0	42.6
		Total	2.0	64.5	30.9	2.7	0.0	100.0

[a] Samples were collected by beach seine.

[b] Samples were collected from a weir trap.

Appendix A31.–Total (U.S. and Canada) Yukon River Chinook salmon harvest percent by stock group, 1981–2007.

Year [b]	Stock Group [a]		
	Lower	Middle	Upper
1981	5.4	54.5	40.1
1982	13.9	24.7	61.4
1983	12.9	33.7	53.3
1984	25.3	40.2	34.5
1985	27.6	22.3	50.1
1986	19.5	9.6	70.9
1987	15.9	19.6	64.5
1988	21.8	15.8	62.5
1989	24.4	15.9	59.7
1990	20.2	25.2	54.7
1991	28.0	25.3	46.7
1992	16.3	21.8	61.9
1993	21.5	25.4	53.1
1994	18.2	21.4	60.4
1995	17.9	22.4	59.7
1996	21.0	10.4	68.6
1997	26.4	16.8	56.9
1998	32.7	17.4	49.8
1999	40.1	6.3	53.6
2000	33.9	12.3	53.8
2001	31.6	16.0	52.4
2002	19.4	29.2	51.4
2003	6.8	28.9	64.3
2004	15.3	28.8	55.9
2005	20.7	21.4	57.9
2006	17.6	27.6	54.9
2007	12.4	31.3	56.3
Average (1981-2006)	21.3	22.8	55.9

[a] Upper denotes Canadian-origin fish and Lower and Middle denote U.S. origin fish.

[b] Stock identification methods from 1981 through 2003 were based on scale pattern analysis. Beginning in 2004, genetic analysis was used.

Appendix A32.–Yukon River Chinook salmon harvest percent by stock group in Alaska, 1981–2007.

Year [b]	Stock Group [a]		
	Lower	Middle	Upper
1981	5.9	59.8	34.3
1982	15.4	27.5	57.1
1983	14.2	37.0	48.9
1984	28.0	44.3	27.7
1985	30.4	24.6	45.1
1986	22.3	10.9	66.8
1987	17.4	21.4	61.2
1988	24.9	18.1	57.0
1989	27.2	17.7	55.1
1990	22.8	28.4	48.8
1991	31.8	28.7	39.6
1992	18.0	24.1	57.8
1993	23.7	28.0	48.3
1994	20.4	24.1	55.5
1995	20.0	25.0	55.0
1996	24.0	11.8	64.2
1997	28.9	18.3	52.8
1998	34.7	18.5	46.8
1999	44.1	6.9	49.0
2000	37.5	13.6	48.9
2001	37.5	19.0	43.4
2002	22.1	33.2	44.7
2003	7.5	31.7	60.8
2004	16.9	31.6	51.5
2005	23.4	24.2	52.4
2006	19.2	30.2	50.5
2007	13.7	32.3	54.0
Average (1981-2006)	23.8	25.3	50.9

[a] Upper denotes Canadian-origin fish and Lower and Middle denote U.S. origin fish.

[b] Stock identification methods from 1981 through 2003 were based on scale pattern analysis. Beginning in 2004, genetic analysis was used.

Appendix A33.–Upper stock group percent, by country, from the Yukon River Chinook salmon harvest, 1981–2007.

	Upper Stock Group	
Year [a]	Alaska	Canada
1981	78.1	21.9
1982	83.5	16.5
1983	83.7	16.3
1984	72.7	27.3
1985	81.6	18.4
1986	82.7	17.3
1987	86.7	13.3
1988	79.8	20.2
1989	82.9	17.1
1990	79.2	20.8
1991	74.8	25.2
1992	84.5	15.5
1993	82.6	17.4
1994	81.8	18.2
1995	82.4	17.6
1996	81.9	18.1
1997	84.8	15.2
1998	88.8	11.2
1999	83.0	17.0
2000	81.9	18.1
2001	69.8	30.3
2002	76.3	23.5
2003	86.2	13.8
2004	83.7	16.3
2005	80.1	19.9
2006	84.1	15.9
2007	90.4	9.6
Average (1981-2006)	81.5	18.5

[a] Stock identification methods from 1981 through 2003 were based on scale pattern analysis. Beginning in 2004, genetic analysis was used.

Appendix A34.–Yukon River fall chum salmon estimated brood year production and return per spawner estimates 1974–2007.

Year	(P) Estimated Annual Totals			Estimated Brood Year Return: Number of Salmon [a]				Estimated Brood Year Return: Percent				(R) Total Brood Year Return[a]	(R/P) Return/ Spawner
	Escapement	Catch	Return	Age 3	Age 4	Age 5	Age 6	Age 3	Age 4	Age 5	Age 6		
1974	436,485	478,875	915,360	91,751	497,755	68,693	0	0.139	0.756	0.104	0.000	658,199	1.51
1975	1,465,213	473,062	1,938,275	150,451	1,225,440	61,401	123	0.105	0.853	0.043	0.000	1,437,415	0.98
1976	268,841	339,043	607,884	102,062	587,479	137,039	4,316	0.123	0.707	0.165	0.005	830,895	3.09
1977	514,843	447,918	962,761	102,660	1,075,198	175,688	4,189	0.076	0.792	0.129	0.003	1,357,735	2.64
1978	320,487	434,030	754,517	22,222	332,230	90,580	0	0.050	0.747	0.204	0.000	445,032	1.39
1979	780,818	615,377	1,396,195	41,114	769,496	274,311	3,894	0.038	0.707	0.252	0.004	1,088,814	1.39
1980	263,167	488,373	751,540	8,377	362,199	208,962	3,125	0.014	0.622	0.359	0.005	582,663	2.21
1981	551,192	683,391	1,234,583	45,855	955,725	278,386	8,888	0.036	0.742	0.216	0.007	1,288,853	2.34
1982	179,828	373,519	553,347	11,327	400,323	166,754	679	0.020	0.691	0.288	0.001	579,083	3.22
1983	347,157	525,485	872,642	12,569	875,355	223,468	2,313	0.011	0.786	0.201	0.002	1,113,704	3.21
1984	270,042	412,323	682,365	7,089	408,040	174,207	8,516	0.012	0.683	0.291	0.014	597,852	2.21
1985	664,426	515,481	1,179,907	46,635	874,819	270,984	3,194	0.039	0.732	0.227	0.003	1,195,632	1.80
1986	376,374	318,028	694,402	0	429,749	368,513	4,353	0.000	0.535	0.459	0.005	802,614	2.13
1987	651,943	406,143	1,058,086	12,413	617,519	290,767	7,720	0.013	0.665	0.313	0.008	928,418	1.42
1988	325,137	353,685	678,822	41,003	175,236	152,368	10,894 [b]	0.108	0.462	0.401	0.029	379,501	1.17
1989	506,173	545,166	1,051,339	2,744	282,905	345,136 [b]	20,290	0.004	0.435	0.530	0.031	651,075	1.29
1990	369,654	352,007	721,661	710	579,452 [b]	418,448	30,449	0.001	0.563	0.407	0.030	1,029,059	2.78
1991	591,132	439,096	1,030,228	3,663 [b]	1,024,800	369,103	12,167	0.003	0.727	0.262	0.009	1,409,733	2.38
1992	324,253	148,846	473,099	6,763	653,648	197,073	3,907	0.008	0.759	0.229	0.005	861,392	2.66
1993	352,688	91,015	443,703	7,745	451,327	102,420	3,235	0.014	0.799	0.181	0.006	564,727	1.60
1994	769,920	169,225	939,145	4,322	225,243	149,527	1,603 [b]	0.011	0.592	0.393	0.004	380,695	0.49
1995	1,009,155	461,147	1,470,302	2,371	266,955	68,918 [b]	383	0.007	0.788	0.204	0.001	338,627	0.34
1996	800,022	260,923	1,060,945	420	165,691 [b]	136,906	8,295	0.001	0.532	0.440	0.027	311,312	0.39
1997	494,831	170,059	664,890	3,087 [b]	244,801	118,343	3,332	0.008	0.662	0.320	0.009	369,563	0.75
1998	263,121	70,820	333,941	651	269,653	57,962	6,694	0.002	0.805	0.173	0.020	334,960	1.27
1999	288,962	131,175	420,137	29,097	705,152	174,424	13,952	0.032	0.764	0.189	0.015	922,624	3.19
2000	210,756	28,543	239,299	8,446	297,012	117,431	0	0.020	0.702	0.278	0.000	422,889	2.01

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Year	(P) Estimated Annual Totals			Estimated Brood Year Return: Number of Salmon [a]				Estimated Brood Year Return: Percent				(R) Total Brood Year Return[a]	(R/P) Return/ Spawner
	Escapement	Catch	Return	Age 3	Age 4	Age 5	Age 6	Age 3	Age 4	Age 5	Age 6		
2001	337,765	44,976	382,741	136,038	2,193,983	675,688	32,952	0.045	0.722	0.222	0.011	3,038,661	9.00
2002	397,977	27,411	425,388	0	444,507	232,089	2,134	0.000	0.655	0.342		678,731 [c]	>1.71
2003	695,363	79,529	774,892	24,263	833,346	411,457						1,269,066 [d]	>1.83
2004	537,873	76,296	614,169	0									
2005	2,035,183	290,183	2,325,366										
2006	873,987	270,471	1,144,458										
2007	903,601	194,786	1,098,387										
Average-06	553,781	318,837	872,618										
	490,514	All Brood Years (1974-2001)		32,199	605,257	209,768	7,124	0.0335	0.6903	0.2671	0.0091	854,348	2.10
	369,863	Even Brood Years (1974-2001)		21,796	384,551	187,432	27,132	0.0364	0.6540	0.2993	0.0104	586,868	1.90
	611,164	Odd Brood Years (1974-2001)		42,603	825,963	244,931	8,331	0.0307	0.7267	0.2349	0.0077	1,121,827	2.31
	512,803	All Brood Years (1974-1983)		58,839	708,120	168,528	2,753	0.0611	0.7401	0.1960	0.0027	938,239	2.20
	293,762	Even Brood Years (1974-1983)		47,148	435,997	134,406	1,624	0.0692	0.7045	0.2239	0.0023	619,175	2.28
	731,845	Odd Brood Years (1974-1983)		70,530	980,243	202,651	3,881	0.0530	0.7757	0.1681	0.0031	1,257,304	2.11
	486,388	All Brood Years (1984-2001)		10,421	451,294	206,619	8,176	0.0166	0.6591	0.3116	0.0127	676,510	1.64
	412,142	Even Brood Years (1984-2001)		7,712	355,969	196,937	8,301	0.0181	0.6259	0.3412	0.0148	568,919	1.68
	544,119	Odd Brood Years (1984-2001)		27,088	740,251	268,420	10,803	0.0183	0.6994	0.2720	0.0103	1,046,562	2.42

[a] The estimated number of salmon which returned are based upon annual age composition observed in lower Yukon test nets each year, weighted by test fish CPUE.

[b] Based upon expanded test fish age composition estimates for years in which the test fishery terminated early both in 1994 and 2000.

[c] Brood year return for 3, 4, and 5 year fish, indicate that production (R/P) from brood year 2002 was at least 1.71. Recruits estimated for incomplete brood year.

[d] Brood year return for 3 and 4 year fish, indicate that production (R/P) from brood year 2003 was at least 1.83. Recruits estimated for incomplete brood year.

Appendix A35.–Escapement, rebuilding and interim goals for Canadian origin Chinook and chum salmon stocks, 1985–2007.

Year	Canadian Origin Stock Targets Chinook Salmon		Fall Chum Salmon			
	Escapement Goal	Stabilization/ Rebuilding	Mainstem Escapement Goal	Stabilization/ Rebuilding	Porcupine Escapement Goal	Porcupine Interim Goal
1985	33,000-43,000					
1986	33,000-43,000					
1987	33,000-43,000		90,000-135,000		50,000-120,000	
1988	33,000-43,000		90,000-135,000		50,000-120,000	
1989	33,000-43,000		90,000-135,000		50,000-120,000	
1990	33,000-43,000	18,000	80,000		50,000-120,000	
1991	33,000-43,000	18,000	80,000		50,000-120,000	
1992	33,000-43,000	18,000	80,000	51,000	50,000-120,000	
1993	33,000-43,000	18,000	80,000	51,000	50,000-120,000	
1994	33,000-43,000	18,000	80,000	61,000	50,000-120,000	
1995	33,000-43,000	18,000	80,000	80,000	50,000-120,000	
1996	33,000-43,000	28,000	80,000	65,000	50,000-120,000	
1997	33,000-43,000	28,000	80,000	49,000	50,000-120,000	
1998	33,000-43,000	28,000	80,000	80,000	50,000-120,000	
1999	33,000-43,000	28,000	80,000	80,000	50,000-120,000	
2000	33,000-43,000	28,000	80,000	80,000	50,000-120,000	
2001	33,000-43,000	28,000	80,000	80,000	50,000-120,000	
2002	33,000-43,000	28,000	80,000	60,000	50,000-120,000	
2003	33,000-43,000	28,000	80,000	65,000	50,000-120,000	15,000
2004	33,000-43,000	28,000	80,000	65,000	50,000-120,000	13,000
2005	33,000-43,000	28,000	80,000	65,000	50,000-120,000	24,000
2006	33,000-43,000	28,000	80,000	80,000	50,000-120,000	28,000
2007	33,000-43,000	33,000-43,000	80,000	80,000	50,000-120,000	33,667

Appendix A36.–South Unimak and Shumagin Islands June commercial sockeye and chum salmon harvest, all gear combined, by year, 1980–2007.

	Sockeye			Chum		
Year	South Unimak	Shumagin Islands	Total	South Unimak	Shumagin Islands	Total
1980	2,731,148	475,127	3,206,275	458,499	50,366	508,865
1981	1,470,393	350,572	1,820,965	509,876	54,071	563,947
1982	1,668,153	450,548	2,118,701	933,728	161,316	1,095,044
1983	1,545,075	416,494	1,961,569	616,354	169,277	785,631
1984	1,131,365	256,838	1,388,203	227,913	109,207	337,120
1985	1,454,969	336,431	1,791,400	324,825	109,004	433,829
1986	315,370	156,027	471,397	252,721	99,048	351,769
1987	652,397	140,567	792,964	405,955	37,064	443,019
1988	474,457	282,230	756,687	464,765	61,946	526,711
1989	1,347,547	396,958	1,744,505	407,635	47,528	455,163
1990	1,088,944	255,585	1,344,529	455,044	63,501	518,545
1991	1,215,658	333,272	1,548,930	670,103	102,602	772,705
1992	2,046,022	411,834	2,457,856	323,891	102,312	426,203
1993	2,366,573	607,171	2,973,744	381,941	150,306	532,247
1994	1,001,250	460,013	1,461,263	374,409	207,756	582,165
1995	1,451,490	653,831	2,105,321	342,307	195,126	537,433
1996	572,495	456,475	1,028,970	129,889	229,931	359,820
1997	1,179,179	449,002	1,628,181	196,016	126,309	322,325
1998	974,628	314,097	1,288,725	195,454	50,165	245,619
1999	1,106,208	269,191	1,375,399	186,886	58,420	245,306
2000	892,016	359,212	1,251,228	168,888	70,469	239,357
2001	121,547	29,085	150,632	36,099	12,251	48,350
2002	356,157	234,949	591,106	201,211	177,606	378,817
2003	335,903	117,244	453,147	121,169	161,269	282,438
2004	531,955	816,118	1,348,073	130,626	351,683	482,309
2005	437,443	566,952	1,004,395	143,799	284,031	427,830
2006	491,053	441,238	932,291	96,016	203,811	299,827
2007	737,642	852,198	1,589,840	153,334	144,205	297,539
1987-2006 Average	932,146	379,751	1,311,897	271,605	134,704	406,309
1997-2006 Average	642,609	359,709	1,002,318	147,616	149,601	297,218

Source: Poetter et al. 2009.

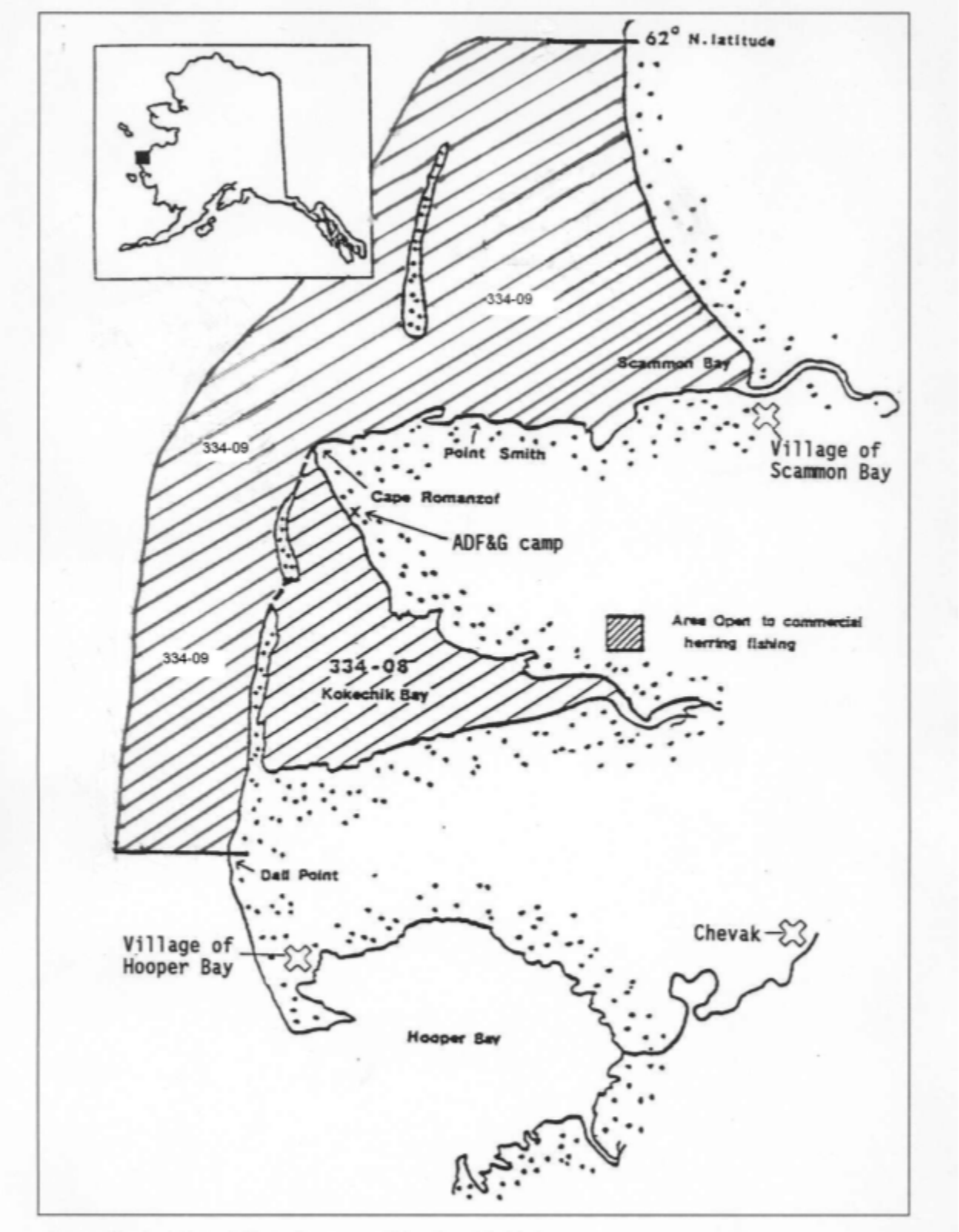
Note: Harvest does not include test fish harvest.

Appendix A37.–Total groundfish catch and estimated number of Chinook and other salmon caught by the groundfish fisheries off the coast of Alaska, 1990 through 2007.

	Year	Groundfish Groundfish (mt)	Chinook	Chum	Coho	Sockeye	Pink	Total
BSAI								
	1990	1,706,379	14,085	16,202	153	30	31	30,501
	1991	2,154,903	48,873	29,706	396	79	79	79,133
	1992	2,057,849	41,955	40,090	1,266	14	80	83,405
	1993	1,854,216	45,964	242,895	321	22	8	289,210
	1994	1,958,788	44,380	95,978	231	20	202	140,811
	1995	1,928,073	23,079	20,901	858	0	21	44,859
	1996	1,847,631	63,205	77,771	218	5	1	141,200
	1997	1,824,188	50,218	67,349	114	3	69	117,753
	1998	1,615,685	55,427		----------65,631----------			121,058
	1999	1,424,752	12,924		----------46,295----------			59,219
	2000	1,607,549	7,470		----------57,600----------			65,070
	2001	1,813,924	37,734		----------57,339----------			95,073
	2002	1,934,957	37,605		----------78,454----------			116,059
	2003	1,970,817	54,763		----------193,981----------			248,744
	2004	1,978,721	62,459		----------447,196----------			509,655
	2005	1,407,925	74,843		----------701,741----------			776,584
	2006	1,974,920	85,764		----------326,296----------			412,060
	2007	1,856,110	129,567		----------97,352----------			226,919
GOA								
	1990	244,397	16,913	2,541	1,482	85	64	21,085
	1991	269,616	38,894	13,713	1,129	51	57	53,844
	1992	269,797	20,462	17,727	86	33	0	38,308
	1993	255434	24,465	55,268	306	15	799	80,853
	1994	239,503	13,973	40,033	46	103	331	54,486
	1995	216,585	14,647	64,067	668	41	16	79,439
	1996	202,054	15,761	3,969	194	2	11	19,937
	1997	230,448	15,119	3,349	41	7	23	18,539
	1998	245,516	16,984		----------13,544----------			30,528
	1999	227,614	30,600		----------7,530----------			38,130
	2000	204,398	26,705		---------- 10,995----------			37,700
	2001	182,011	15,104		---------- 6,063----------			21,167
	2002	165,664	12,759		----------3,192----------			15,951
	2003	176,433	15,877		----------10,599----------			26,475
	2004	168,475	17,832		----------5,893----------			23,725
	2005	133,171	31,896		----------6,841----------			38,737
	2006	195,356	17,577		----------4,746----------			22,323
	2007	161,930	40,356		----------3,421----------			43,777

Sources: Berger 2003 and NMFS Alaska Region Catch Accounting.

APPENDIX B: HERRING



Appendix B1.–Map of Cape Romanzof herring district.

Appendix B2.–Commercial herring fishery data, Cape Romanzof District, 1980–2007.

Year	Catch (tons)	Hours Fished	Percent Roe Recovery	Avg. Wt. of Fish (grams) [a]	Estimated Value ($ millions)	Number of Buyers	Number of Fishermen	Number of Boats	Number Shaker Boats [b]	% Effort by Local Fishermen [c]	% Harvest by Local Fishermen [c]	Biomass Estimate [d]	Exploitation Rate
1980	611	326.0	9.8	188	0.13	2	69	54	12	70	40	3,000	20.4
1981	720	120.0	8.0	189	0.21	4	111	82	11	81	60	4,850	14.8
1982	657	180.0	9.3	206	0.22	2	75	50	10	85	84	4,850	13.5
1983 [e]	816	144.0	9.0	224	0.37	3	63	57	2	92	88	5,512	14.8
1984	1,185	90.0	8.6	239	0.31	3	66	59	1	99	100	6,063	19.5
1985	1,299	60.0	8.3	240	0.55	2	73	69	2	91	94	7,000	18.6
1986	1,865	42.0	9.2	252	1.14	5	97	90	12	84	70	7,500	24.9
1987 [f]	1,342	8.0	8.9	294	1.00	9	157	152	22	53	33	7,216	18.6
1988	1,119	11.0	9.1	306	1.02	6	113	108	-	63	60	6,600	17.0
1989	926	13.0	9.3	313	0.49	6	115	110	-	87	82	4,400	21.0
1990	329	3.0	8.4	304	0.15	4	95	90	-	76	77	4,500	7.3
1991	526	5.0	8.8	355	0.21	2	80	79	-	96	97	4,500	11.7
1992	530	6.0	8.0	358	0.16	2	73	73	-	97	96	4,500	11.8
1993	371	12.5	9.6	373	0.11	2	41	41	-	95	91	4,000	9.3
1994	456	7.0	9.2	372	0.12	2	55	54	-	95	92	5,000	9.1
1995	541	15.0	10.1	367	0.33	2	49	49	-	98	99	5,000	10.8

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Year	Catch (tons)	Hours Fished	Percent Roe Recovery	Avg. Wt. of Fish (grams) [a]	Estimated Value ($ millions)	Number of Buyers	Number of Fishermen	Number of Boats	Number Shaker Boats [b]	% Effort by Local Fishermen [c]	% Harvest by Local Fishermen [c]	Biomass Estimate [d]	Exploitation Rate
1996	752	34.0	10.6	356	0.64	3	63	63	-	95	96	6,000	12.5
1997	879	29.5	10.2	360	0.19	3	65	65	-	95	95	5,000	17.6
1998	727	35.0	9.6	369	0.13	1	41	41	-	98	98	4,500	16.2
1999	533	13.5	9.2	364	0.13	1	57	57	-	98	99	3,800	14.0
2000	500	13.0	8.1	376	0.08	2	46	46	-	98	98	3,500	14.3
2001	137	13.5	7.6	378	0.01	1	23	23	-	100	100	2,700	5.1
2002	102	41.5	9.8	412	0.01	1	21	21	-	100	100	3,600	2.8
2003	81	64.0	10.9	428	0.01	1	11	11	-	100	100	3,685	2.2
2004	25	148.0	12.4	359	0.01	1	10	10	-	100	100	3,500	0.7
2005	125	158.0	10.4	401	0.02	1	10	10		100	100	3,388	3.7
2006	92	89.0	10.3	407	0.02	1	8	8		100	100	4,813	1.9
2007 [g]	-	-	-	-	-	-	-	-	-	-	-	4,500	-
5 Yr. Avg (2002-2006)	85	100	11	401	0	1	12	12		100	100	3,797	2.9
10 Yr. Avg (1997-2006)	320	61	10	385	0	1	29	29		99	99	3,849	8.9
All Yr. Avg (1980-2006)	639	62	9	326	0	3	62	58		91	87	4,777	12.4

[a] Average weight from commercial harvest sampling program.

[b] Numbers of boats using shakers were estimated.

[c] Local fishermen described as residents of Chevak, Scammon Bay, and Hooper Bay.

[d] Biomass estimate is a qualitative estimate of herring abundance, except for aerial survey biomass estimate in 1987 and 2006.

[e] Exclusive Use regulation went into effect.

[f] Final year hydraulic shakers were allowed.

[g] No commercial fishing occurred.

Appendix B3.–Subsistence herring harvest (st) and effort data by village, Cape Romanzof, 1975–2007.

	Scammon Bay		Chevak		Hooper Bay		Totals	
Year	Harvest	Number of Fishermen	Harvest	Number of Fishermen	Harvest	Number of Fishermen	Harvest	Number of Fishermen
1975	-	-	-	-	2.8	34	2.8	34
1976	0.7	4	0.7	9	3.0	28	4.4	41
1977	-	-	0.2	2	2.4	28	2.5	30
1978	0.7	1	-	-	3.9	29	4.5	30
1979	6.0	21	2.3	21	3.1	42	11.4	84
1980	3.1	18	3.6	20	3.7	23	10.4	61
1981	7.7	16	1.8	9	4.0	20	13.5	45
1982	3.9	15	1.9	10	4.7	18	10.5	43
1983	2.5	14	1.5	5	5.2	18	9.2	37
1984	4.3	16	2.6	7	4.2	24	11.1	47
1985	2.4	11	2.2	13	3.4	20	8.0	44
1986	2.8	17	0.7	4	2.5	19	6.0	40
1987	1.4	8	0.5	5	1.1	10	3.0	23
1988	2.0	7	1.5	6	3.6	19	7.2	32
1989	1.1	7	0.1	1	1.8	16	3.0	24
1990	1.7	5	0.6	3	5.6	24	7.9	32
1991	1.7	7	0.4	3	1.1	8	3.2	18
1992	1.2	10	0.4	4	2.5	16	4.1	30
1993	2.7	17	0.1	1	2.4	24	5.1	42
1994	1.4	9	2.0	16	3.1	23	6.5	48
1995	1.1	11	1.2	9	3.8	22	6.1	42
1996	1.0	10	0.5	4	1.7	15	3.1	29
1997	0.9	10	0.2	3	2.2	21	3.2	34
1998	0.7	7	0.1	2	0.9	7	1.7	16
1999	6.0	24	2.3	12	4.2	31	12.5	67
2000	3.9	26	1.0	10	1.3	14	6.2	50
2001	1.5	8	1.0	10	0.1	5	3.1	24
2002	0.6	7	0.2	3	1.1	10	1.9	20
2003	3.0	13	1.0	8	2.0	13	6.0	34
2004	3.5	14	1.2	8	1.3	12	6.0	34
2005	6.2	9	0.1	2	0.6	2	6.9	13
2006	1.7	9	0.3	3	0.5	2	2.5	14
2007	1.5	8	1.2	6	0.4	4	3.1	18
5 Year Average (2002-2006)	3.0	10	0.6	5	1.1	8	4.7	23

Note: Subsistence survey results are believed to reflect harvest trends, however, reported catches reflect minimum figures because not all fishermen could be contacted.

Appendix B4.–Subsistence harvest of herring roe-on-kelp by village, Cape Romanzof District, 1993–2007.

	Scammon Bay		Chevak		Hooper Bay		Totals	
Year	Number of Fishermen	Pounds Roe-on-Kelp	Number of Fishermen	Pounds Roe-on-Kelp	Number of Fishermen	Pounds Roe-on-Kelp	Number of Fishermen	Pounds Roe-on-Kelp
1993	9	300			10	213	19	513
1994	7	104	4	135	12	417	23	656
1995	12	298	1	25	13	383	26	706
1996	7	113	2	31	9	480	18	624
1997	6	130	1	25	13	400	20	555
1998	2	420	2	105	3	60	7	585
1999	15	416	5	160	22	549	42	1,125
2000	19	644	3	155	8	220	30	1,019
2001	2	25	3	113	2	50	7	188
2002	2	56	0	0	4	105	6	161
2003	8	185	2	130	7	185	17	500
2004	7	354	1	50	1	5	9	409
2005	5	1,125	0	0	0	0	5	1,125
2006	3	170	1	20	1	30	5	220
2007	2	50	1	10	0	0	3	60
5 Year Average (2002-2006)	5	378	1	40	3	65	8	483

APPENDIX C: FRESHWATER FINFISH

Appendix C1.–Estimated subsistence harvest of pink salmon, whitefish, pike, and sheefish fish, by surveyed villages, Yukon Area, 2007.

			Estimated Subsistence Harvest										Total
			Pink Salmon		Large Whitefish [a]		Small Whitefish		Pike		Sheefish		Expanded
	Total	Households	Estimated	CI (95%)	Estimated	CI (95%)	Estimated	CI (95%)	Estimated	CI (95%)	Estimated	CI (95%)	Miscellaneous
Community	Households	Contacted [b]	Total	(+/-)	Total	(+/-)	Total	(+/-)	Total	(+/-)	Total	(+/-)	Fish Harvest
Hooper Bay	196	62	113	178	45	67	4,712	2,153	764	562	124	199	5,758
Scammon Bay	74	31	1,435	702	511	197	1,590	323	1,640	1,000	105	76	5,281
Coastal District	270	93	1,548	724	556	208	6,302	2,177	2,404	1,147	229	213	11,039
Nunam Iqua	35	24	170	60	179	55	1,385	317	639	229	1,147	152	3,520
Alakanuk	125	54	32	15	1,396	603	4,756	2,063	2,904	1,364	1,424	599	10,512
Emmonak	156	88	51	17	543	208	3,113	1,770	2,315	550	1,287	321	7,309
Kotlik	98	43	129	121	504	215	4,309	1,913	2,788	1,541	2,327	1,070	10,057
District 1	414	209	382	137	2,622	675	13,563	3,339	8,646	2,142	6,185	1,277	31,398
Mountain Village	146	59	87	15	1,895	835	2,370	920	2,321	761	1,094	385	7,767
Pitkas Point	27	18	66	53	132	96	655	300	111	67	104	51	1,068
St. Mary's	127	55	32	16	1,969	838	1,424	646	2,522	795	447	194	6,394
Pilot Station	102	44	0	0	1,379	1,005	1,184	986	638	383	721	373	3,922
Marshall	71	30	0	0	676	149	468	153	1,619	1,013	267	60	3,030
District 2	473	206	185	57	6,051	1,562	6,101	1,533	7,211	1,545	2,633	575	22,181
Russian Mission	57	19	3	5	463	349	389	310	715	597	143	107	1,713
Holy Cross	60	35	0	0	1,016	1,248	438	106	482	191	53	13	1,989
Shageluk	41	17	0	0	278	142	228	55	577	437	157	124	1,240
District 3	158	71	3	5	1,757	1,304	1,055	332	1,774	764	353	164	4,942
Anvik	34	28	0	0	210	59	124	6	140	16	110	43	584
Grayling	48	14	0	0	552	413	274	270	308	227	519	270	1,653
Kaltag	60	19	0	0	15	0	6	0	42	25	70	62	133
Nulato	86	30	0	0	274	87	826	1,170	385	323	448	315	1,933
Koyukuk	35	22	0	0	78	50	19	9	231	44	134	43	462
Galena	148	41	0	0	518	186	451	159	157	74	131	57	1,257
Ruby	57	21	0	0	287	380	192	168	64	76	74	72	617
Huslia	69	30	0	0	399	378	408	371	2,901	3,659	102	64	3,810
Hughes	29	17	0	0	941	47	10,586	47	309	4	245	235	12,081
Allakaket	38	36	0	0	1,372	29	1,115	17	234	16	582	28	3,303
Alatna	10	5	0	0	0	0	0	0	0	0	6	3	6
Bettles	24	11	0	0	0	0	0	0	26	32	16	6	42
District 4	638	274	0	0	4,646	714	14,001	1,279	4,797	3,683	2,437	498	25,881

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Appendix C1.–Page 2 of 2.

Community	Total Households	Households Contacted [b]	Estimated Subsistence Harvest: Pink Salmon Estimated Total	Pink Salmon CI (95%) (+/-)	Large Whitefish [a] Estimated Total	Large Whitefish CI (95%) (+/-)	Small Whitefish Estimated Total	Small Whitefish CI (95%) (+/-)	Pike Estimated Total	Pike CI (95%) (+/-)	Sheefish Estimated Total	Sheefish CI (95%) (+/-)	Total Expanded Miscellanous Fish Harvest
Tanana	99	45	0	0	2,442	1,147	3,084	1,459	43	32	963	409	6,532
Stevens Village	25	18	0	0	61	34	11	8	61	25	39	26	172
Birch Creek	18	6	0	0	257	330	0	0	141	73	131	163	529
Beaver	29	19	0	0	37	7	6	0	107	94	11	3	161
Fort Yukon	150	49	0	0	1,000	989	443	495	426	382	140	88	2,009
Venetie	49	19	0	0	267	413	0	0	215	196	0	0	482
Chalkyitsik	30	22	0	0	12	0	64	58	122	64	82	37	280
District 5	400	178	0	0	4,076	1,604	3,608	1,541	1,115	452	1,366	451	10,165
Survey Totals	2,353	1,031	2,118	739	19,708	2,779	44,630	4,729	25,947	4,758	13,203	1,576	105,606

Source: Data presented in this table are preliminary. (D. Jallen. Draft. Subsistence and personal use salmon harvests in the Alaska portion of the Yukon River drainage, 2007. Commercial Fisheries Biologist, ADF&G, Fairbanks).

Note: The estimated harvest in surveyed communities is based on a stratified random sample of households as designated for the estimation of subsistence salmon harvests. Estimations include 95% confidence interval, CI (95%).

[a] Large whitefish are considered those four pounds or larger and small whitefish are less than 4 pounds.

[b] The number of households contacted per species may vary. The number of households indicated is the greatest number of households contacted for a given species.

Appendix C2.–Reported subsistence harvest of other miscellaneous fish species by surveyed communities, Yukon Area, 2007.

Community	Total Households	Households Contacted [a]	Reported Harvest of Miscellaneous Fish Species (Not Expanded)								Total Not Expanded Miscellaneous Fish Harvest
			Burbot	Lamprey [b]	Tomcod	Grayling	Sucker	Arctic Char	Blackfish	Sockeye Salmon [c]	
Hooper Bay	196	62	36	0	2,034	0	0	1	4,620	38	6,729
Scammon Bay	74	31	20	0	2,375	0	0	2	13,880	40	16,317
Coastal District	270	93	56	0	4,409	0	0	3	18,500	78	23,046
Nunam Iqua	35	24	335	0	506	0	0	0	13,650	7	14,498
Alakanuk	125	54	176	150	590	0	1	0	20,690	52	21,659
Emmonak	156	88	408	0	1,225	20	0	0	24,613	58	26,324
Kotlik	98	43	220	0	385	18	0	6	9,669	28	10,326
District 1	414	209	1,139	150	2,706	38	1	6	68,622	145	72,807
Mountain Village	146	59	585	3,841	0	204	0	5	12,160	25	16,820
Pitkas Point	27	18	26	483	0	35	0	0	2,590	10	3,144
St. Mary's	127	55	262	1,915	6	14	0	0	20,050	18	22,265
Pilot Station	102	44	84	285	0	15	0	1	4,200	6	4,591
Marshall	71	30	750	4,140	0	0	0	0	0	4	4,894
District 2	473	206	1,707	10,664	6	268	0	6	39,000	63	51,714
Russian Mission	57	19	37	750	0	1	0	0	1,890	0	2,678
Holy Cross	60	35	57	220	0	8	0	0	1,400	5	1,690
Shageluk	41	17	21	0	0	3	0	0	0	0	24
District 3	158	71	115	970	0	12	0	0	3,290	5	4,392
Anvik	34	28	6	0	0	12	0	0	0	0	18
Grayling	48	14	76	800	0	10	0	0	0	16	902
Kaltag	60	19	0	0	0	60	0	45	0	0	105
Nulato	86	30	48	0	0	463	0	105	0	14	630
Koyukuk	35	22	10	0	0	6	0	1	0	0	17
Galena	148	41	76	0	0	17	30	0	2,100	32	2,255
Ruby	57	21	7	0	0	0	6	0	0	3	16
Huslia	69	30	61	0	0	13	4	0	200	5	283
Hughes	29	17	3	0	0	160	50	0	0	0	213
Allakaket	38	36	138	0	0	441	110	0	0	121	810
Alatna	10	5	0	0	0	1	0	0	0	0	1
Bettles	24	11	0	0	0	15	0	15	0	0	30
District 4	638	274	425	800	0	1,198	200	166	2,300	191	5,280

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Community	Total Households	Households Contacted [a]	Reported Harvest of Miscellaneous Fish Species (Not Expanded)								Total Not Expanded Miscellaneous Fish Harvest
			Burbot	Lamprey [b]	Tomcod	Grayling	Sucker	Arctic Char	Blackfish	Sockeye Salmon [c]	
Tanana	99	45	53	0	0	2	16	0	0	0	82
Stevens Village	25	18	0	0	0	0	0	0	0	0	0
Birch Creek	18	6	0	0	0	0	0	0	0	0	0
Beaver	29	19	1	0	0	6	0	0	0	0	7
Fort Yukon	150	49	0	0	0	310	8	0	0	11	329
Venetie	49	19	0	0	0	436	0	0	0	0	436
Chalkyitsik	30	22	4	0	0	15	0	0	0	0	19
District 5	400	178	58	0	0	769	24	0	0	11	862
Survey Totals	2,353	1,031	3,500	12,584	7,121	2,285	225	181	131,712	493	158,101

Source: Data presented in this table are preliminary. (D. Jallen. Draft. Subsistence and personal use salmon harvests in the Alaska portion of the Yukon River drainage, 2007. Commercial Fisheries Biologist, ADF&G, Fairbanks).

[a] The number of households contacted per species may vary. The number of households indicated is the greatest number of households contacted for a given species.

[b] Surveys are conducted prior to Lamprey fishery in November and December. Consequently lamprey totals are for previous year harvest, i.e., the 2007 reported harvest here is for the calendar year 2006.

[c] 2007 is fourth year that sockeye salmon harvest information was included in postseason survey. Due to low sockeye salmon numbers, infrequent harvest, and difficulties with species identification by fishermen the harvest is not estimated.

Appendix C3.–Reported subsistence and personal use non-salmonid freshwater finfish fish harvested under the authority of subsistence fishing and personal use permits, listed by permit area, Yukon Area, 2007.

Permit Fishing Area	Permit Type [a]	Permits Issued [b]	Permits Returned	Percent Returned	Number of Permits Returned that Fished [c]	Reported Harvest					
						Whitefish	Sheefish	Burbot	Pike	Suckers	Grayling
Subsistence Permit											
Koyukuk Middle and South Fork Rivers	SF	1	1	100%	1	5	0	0	0	1	10
Yukon River Rampart Area	SR	23	19	83%	15	75	0	11	20	3	0
Yukon River near Haul Road Bridge	SY	85	80	94%	51	61	26	25	43	0	0
Yukon River near Circle and Eagle	SE	78	71	91%	51	582	32	11	21	189	478
Tanana River Subdistrict 6A	SA	17	17	100%	12	24	3	4	8	0	0
Tanana River Subdistrict 6B	SB	79	75	95%	39	656	17	32	108	26	2
Tanana River Upstream of Subdistrict 6C	SU	34	33	97%	17	1,786	0	15	19	24	35
Kantishna River Subdistrict 6A	SK	5	5	100%	2	0	0	0	37	0	0
Tolovana River Pike Subdistrict 6B	ST	118	109	92%	54	137	4	1	1,837	0	0
Subsistence Permit Subtotals		440	410	93%	242	3,326	82	99	2,093	243	525
Personal Use Permit											
Tanana River Salmon Subdistrict 6C	PC	65	63	100%	32	4	1	0	1	0	0
Tanana River Whitefish Upstream of Subdistrict 6C	PW	3	3	100%	0	0	0	0	0	0	0
Personal Use Permit Subtotals		68	66	97%	32	4	1	0	1	0	0
Permit Totals		508	476	94%	274	3,330	83	99	2,094	243	525

Source: Data presented in this table are preliminary. (D. Jallen. Draft. Subsistence and personal use salmon harvests in the Alaska portion of the Yukon River drainage, 2007. Commercial Fisheries Biologist, ADF&G, Fairbanks).

[a] Permits returned as of March 31, 2009.

[b] Includes 33 households that were "issued" permits for more than one area. Additionally, includes 2 households that were issued duplicate permits for same area.

[c] Includes 8 households that "fished" in 2 different permit areas.

Appendix C4.–Commercial freshwater whitefish harvest, lower Yukon River, 1978–2007.

	Sheefish		Whitefish		Least Cisco		Bering Cisco		Broad Whitefish		Humpback Whitefish	
Year	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
1978	0	0	19	87	-	-	-	-	-	-	-	-
1979	5	39	23	55	-	-	-	-	-	-	-	-
1980	283	2,265	78	250	-	-	-	-	-	-	-	-
1981	299	2,812	779	2,875	-	-	-	-	-	-	-	-
1982	754	6,161	1,633	6,214	-	-	-	-	-	-	-	-
1983	395	2,692	163	648	-	-	-	-	-	-	-	-
1984	94	762	794	2,362	-	-	-	-	-	-	-	-
1985	358	3,081	1,514	4,586	-	-	-	-	-	-	-	-
1986	-	-	1,533	5,845	-	-	-	-	-	-	-	-
1987	-	-	2,144	7,564	-	-	-	-	-	-	-	-
1988	0	0	696	2,171	-	-	-	-	-	-	-	-
1989	0	0	-	-	-	-	-	-	-	-	-	-
1990	0	0	180	260	-	-	-	-	-	-	-	-
1991	0	0	-	-	-	-	-	-	-	-	-	-
1992	0	0	95	640	-	-	-	-	-	-	-	-
1993	-	-	-	-	-	-	-	-	-	-	-	-
1994	0	0	157	471	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-	-	-	-	-	-
1996	-	-	-	-	-	-	-	-	-	-	-	-
1997	-	-	-	-	-	-	-	-	-	-	-	-
1998	-	-	-	-	-	-	-	-	-	-	-	-
1999	-	-	-	-	-	-	-	-	-	-	-	-
2000	-	-	-	-	-	-	-	-	-	-	-	-
2001	-	-	-	-	-	-	-	-	-	-	-	-
2002	-	-	-	-	-	-	-	-	-	-	-	-
2003	0	0	-	-	-	-	-	-	-	-	-	-
2004	-	-	-	-	-	-	-	-	-	-	-	-
2005	266	1,688	781	1,419 [a]	1,694	2,294	241	362	163	411	31	141
2006	472	2,912	828	1,112 [a]	69	81	4,497	5,519	37	104	998	1,535
2007	445 [b]	3,363	1,748	3,145 [a]	-	-	2,451	2,951	-	-	-	-
2002-2006 Average	369	2,300	805	1,266	882	1,188	2,369	2,941	100	258	515	838

Note: Unless otherwise indicated, a blank cell indicates information is not available and en dash indicates years in which no commercial fishing occurred.

[a] Includes whitefish purchased commercially that were not identified to species.

[b] Includes 416 sheefish (2,906 pounds) sold in the whitefish directed commercial fishery and 29 sheefish (457 pounds) sold in the salmon directed commercial fishery.

Appendix C5.–Commercial freshwater finfish harvest, Upper Yukon area, 1971–2007.

	Healy Lake		Lake Minchumina		Tanana River				Yukon River			
	Whitefish		Whitefish		Burbot		Whitefish		Burbot		Whitefish [a]	
Year	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
1971	-	-	3,277	9,831	0	0	0	0	0	0	0	0
1972	2,605	3,950	718	2,154	0	0	0	0	0	0	0	0
1973	2,187	3,915	1,697	5,037	0	0	0	0	0	0	0	0
1974	1,885	3,390	854	2,562	0	0	0	0	0	0	0	0
1975	1,357	2,375	0	0	0	0	0	0	0	0	0	0
1976	1,440	2,625	0	0	0	0	0	0	0	0	0	0
1977	-	-	-	-	-	-	-	-	-	-	-	-
1978	-	-	-	-	-	-	-	-	-	-	-	-
1979	1,336	2,306	0	0	0	0	0	0	0	0	0	0
1980	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-
1984	0	0	0	0	0	76	0	0	0	0	0	0
1985	-	-	-	-	-	-	-	-	-	-	-	-
1986	0	0	0	0	0	0	72	0	0	0	0	0
1987	-	-	-	-	-	-	-	-	-	-	-	-
1988	0	0	0	0	0	0	837	0	0	0	0	0
1989	0	0	0	0	0	0	0	0	1	0	0	2,070
1990	0	0	0	0	1	0	809	0	0	0	985	2,078
1991	-	-	-	-	-	-	-	-	-	-	-	-
1992	-	-	-	-	-	-	-	-	-	-	-	-
1993	-	-	-	-	-	-	-	-	-	-	-	-
1994	0	0	0	0	0	0	921	1,400	0	0	0	0
1995	-	-	-	-	-	-	-	-	-	-	-	-
1996	-	-	-	-	-	-	-	-	-	-	-	-
1997	0	0	0	0	0	0	908	1,160	0	0	0	0
1998 [b]	-	-	-	-	-	-	-	-	-	-	-	-
1999	-	-	-	-	-	-	-	-	-	-	-	-
2000	-	-	-	-	-	-	-	-	-	-	-	-
2001	-	-	-	-	-	-	-	-	-	-	-	-

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	Healy Lake		Lake Minchumina		Tanana River				Yukon River			
	Whitefish		Whitefish		Burbot		Whitefish		Burbot		Whitefish [a]	
Year	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
2002	-	-	-	-	-	-	-	-	-	-	-	-
2003	-	-	-	-	-	-	-	-	-	-	-	-
2004	-	-	-	-	-	-	-	-	-	-	-	-
2005	-	-	-	-	-	-	-	-	-	-	-	-
2006	-	-	-	-	-	-	-	-	-	-	-	-
2007	-	-	-	-	-	-	-	-	-	-	-	-
2002-2006 Avg	0	0	0	0	0	0	0	0	0	0	0	0
1997-2006 Avg	0	0	0	0	0	0	908	1,160	0	0	0	0

Note: Unless otherwise indicated a blank cell indicates information is not available and dashes indicate years in which no commercial fishing occurred. Numbers reflect fish harvested with the intent of commercial sale.

[a] Based on Zephyr categorizations, whitefish species include: general whitefish, least cisco, broad whitefish, and humpback whitefish.

[b] Requests for commercial whitefish fishing permits were denied because of the additional pressure placed on non-salmon species during poor salmon runs.

Appendix C6.–Freshwater finfish sales during the commercial salmon fishing season by district, Upper Yukon Area, 1988–2007.

	District 4		District 5				District 6	
	Whitefish		Whitefish		Sheefish		Whitefish	
Year	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
1988	170	977	1,432	1,497	94	689	1,055 [a]	1,078
1989	403	1,331	687	803	47	381	178	444
1990	0	0	266	266	25	170	2	15
1991	2,600	4,055	0	0	0	0	-	-
1992	2,635	2,455	1,864	1,379 [b]	0	0	199	499
1993	0	0	59	48	0	0	140	300
1994	1	4	108	215	0	0	209	433
1995	0	0	95	95	0	0	183	387
1996	0	0	22	66	0	0	103	292
1997	0	0	270	301	0	0	4	8
1998	0	0	116	88	0	0	0	0
1999	0	0	0	0	0	0	0	0
2000	-	-	-	-	-	-	-	-
2001	-	-	-	-	-	-	-	-
2002	0	0	0	0	0	0	60	120
2003	40	113	0	0	0	0	129	297
2004	-	-	4	15	0	0	53	112
2005	0	0	0	0	0	0	66	175
2006	-	-	0	0	0	0	99	397
2007	0	0	0	0	0	0	55	152
2002-2006 Average	13	38	1	3	0	0	81	220
1997-2006 Average	7	19	49	51	0	0	51	139

Note: Unless otherwise indicated a blank cell indicates information is not available, and dashes indicate years in which no commercial fishing which no commercial fishing occurred.

[a] Includes test fish sales.

[b] The sale of 950 pounds of the total 1,379 pounds of whitefish sold did not include number of fish. Used the average weight (0.74 lbs) to estimate number of fish.

Appendix C7.–Arctic lamprey commercial harvest, Yukon River, 2003–2007.

Year		Arctic Lamprey (lbs)	Number of Fishermen	Est. Harvest Value
2003	[a]	49,657	38	$62,000
2004	[b]			
2005	[c]			
2006	[d]	8,196	12	$8,196
2007	[e,f]	42	1	$42

[a] Harvest took place in Grayling area. The average weight of sampled lamprey was (0.257 lbs).

[b] There was no commercial fishery in 2004.

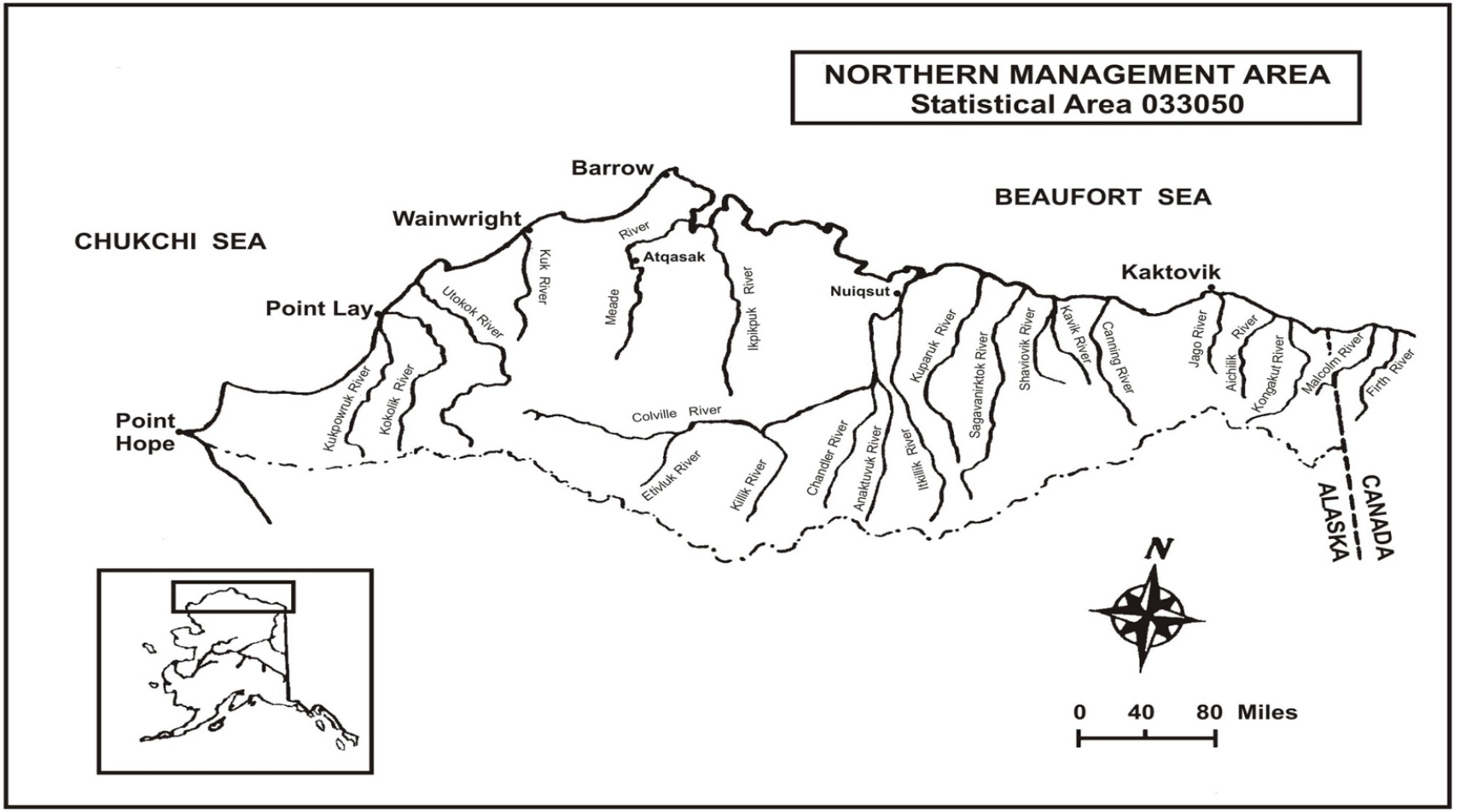
[c] A commercial permit was issued in 2005 for the harvest of up to 5,000 lbs of lamprey. However, poor ice conditions and limited run timing information resulted in no commercial harvest.

[d] The majority of the harvest took place in the Grayling area. The average weight of sampled lamprey was (0.227 lbs).

[e] Permits were issued in 2007 for harvest of up to 47,080 lbs. Poor river ice conditions adversely affected fishing success.

[f] All of the harvest took place near Grayling and no samples were collected.

APPENDIX D: NORTHERN AREA



Appendix D1.–Northern management area, AYK Region.

Appendix D2.–Commercial freshwater finfish harvest and sales, Colville River, Northern Area, 1964–2007.

Year	Number of Fish Harvested Intended for Commercial Sale[a]					Estimated Commercial Sales Based on Fish Tickets[b]	
	Broad Whitefish	Humpback Whitefish	Least Cisco ("herring")	Arctic Cisco ("kaktok")	Total Harvest	Arctic Cisco	Whitefish Species[c]
1964	2,951 [d]	-	9,000	16,000	27,951	-	-
1965	3,000 [d]	-	-	50,000	53,000	-	-
1966	2,500 [d]	-	-	40,000	42,500	-	-
1967	-	-	-	-	0	-	-
1968	3,130	-	18,180	42,055	63,365	-	-
1969	-	-	-	-	0	-	-
1970	2,080 [d]	-	25,930	19,602	47,612	-	-
1971	3,815	132	22,713	38,016	64,676	-	-
1972	3,850	1,497	13,283	37,333	55,963	-	-
1973	2,161	-	25,188	71,569	98,918	-	-
1974	3,117	2,316	13,813	35,601	54,847	-	-
1975	2,201	1,946	20,778	28,291	53,216	-	-
1976	2,172	1,815	34,620	31,659	70,266	-	-
1977	443	1,431	14,961	31,796	48,631	-	-
1978 [e]	20	1,102	21,589	17,292	40,003	-	-
1979	0	1,831	24,984	8,684	35,499	-	-
1980	0	4,231	31,459	14,657	50,347	-	-
1981	1,035	469	16,584	38,206	56,294	-	-
1982	1,662	201	25,746	15,067	42,676	-	-
1983	0	408	35,322	18,162	53,892	-	-
1984	789	179	13,076	27,686	41,730	-	-
1985	401	191	17,595	23,679	41,866	-	-
1986	0	18	9,444	29,895	39,357	-	-
1987	5	1,989	10,922	24,769	37,685	-	-
1988	429	6,733	23,910	10,287	41,359	-	-
1989	71	6,575	23,303	17,877	47,826	-	-
1990	0	5,694	21,003	19,374	46,071	12,571 [f]	14,249 [f]
1991	0	1,240	5,697	13,805	20,742	1,970 [g]	3,307 [g]
1992	126	5,209	6,962	20,939	33,236		10,200 [h]
1993	20	5,339	6,037	31,310	42,706	11,291 [g]	6,170 [g]
1994	0	6,056 [i]	10,176	8,958	25,190	7,434 [g]	4,121 [g]
1995	0	33,794 [j]	-	-	33,794	13,921	6,000
1996	0	6,425 [i]	7,796	21,817	36,038	9,076	4,127
1997	0	1,721 [i]	10,754	9,403	21,878	9,403	4,760
1998	0	4,881 [i]	9,936	7,019	21,836	5,648	7,105
1999	0	6,875 [i]	7,430	8,832	23,137	7,095	6,170

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Year	Number of Fish Harvested Intended for Commercial Sale[a]					Estimated Commercial Sales Based on Fish Tickets[b]	
	Broad Whitefish	Humpback Whitefish	Least Cisco ("herring")	Arctic Cisco ("kaktok")	Total Harvest	Arctic Cisco	Whitefish Species[c]
2000	0	3,706 [i]	5,758	2,619	12,083	2,809	6,569
2001	0	6,078 [i]	2,839	1,740	10,657	1,779	7,306
2002	0	4,183 [i]	5,503	3,935	13,621	899	4,093
2003	0	6,463 [i]	4,777	5,627	16,867	0	1,292
2004	0	1,145 [i]	3,061	3,061	7,267	2,412 [h]	476
2005	0	490 [i]	2,870	9,343	12,703	2,975 [h]	2,170
2006	0	1,188 [i]	4,995	3,293	9,476	1,482 [h]	3,655
2007	0	462	2,265	390	3,117	-	- [j]
2002-2006	0	2,694	4,241	5,052	11,987	1,554	2,337
1997-2006	0	3,673	5,792	5,487	14,953	3,450	4,360

[a] Reported on daily catch form returned to ADF&G. Catch reports were returned to ADF&G following the fishing season. All fish reported on the catch report were harvested with the intent to sell. Dashes indicate information is not available.

[b] Fish tickets were often not generated at the time of sale. Since 1990, the commercial harvest is based on fish ticket information. Dashes indicate information is not available.

[c] Whitefish species include mostly Humpback whitefish and Least cisco with some Broad whitefish.

[d] Includes small numbers of Humpback whitefish.

[e] Reported the harvest of 1 Chinook, 2 sockeye, 9 chum, and 118 pink salmon.

[f] Commercial harvest estimate based on one fish ticket average weights of 0.89 pounds (900 Arctic cisco at 800 pounds) and 0.61 pounds (1400 whitefish species at 850 pounds).

[g] Estimated commercial harvest sales based on 1995 to 2001 average weight of .92 pounds for Arctic cisco and .89 pounds for whitefish species (Humpback and Broad whitefish and Least cisco).

[h] Mixed commercial harvest of mostly Arctic cisco including undetermined amounts of Least cisco.

[i] No information is available from fish tickets indicating that harvested fish were sold commercially. Humpback whitefish harvest includes undetermined amounts of Broad whitefish.

[j] No information is available from fish tickets indicating that harvested fish were sold commercially.