

Fishery Management Report No. 11-37

**Fishery Management Report for Sport Fisheries in the
Yukon Management Area, 2009**

by

John Burr

June 2011

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)		General		Mathematics, statistics	
centimeter	cm	Alaska Administrative Code	AAC	<i>all standard mathematical signs, symbols and abbreviations</i>	
deciliter	dL	all commonly accepted abbreviations	e.g., Mr., Mrs., AM, PM, etc.	alternate hypothesis	H_A
gram	g	all commonly accepted professional titles	e.g., Dr., Ph.D., R.N., etc.	base of natural logarithm	e
hectare	ha	at	@	catch per unit effort	CPUE
kilogram	kg	compass directions:		coefficient of variation	CV
kilometer	km	east	E	common test statistics	(F, t, χ^2 , etc.)
liter	L	north	N	confidence interval	CI
meter	m	south	S	correlation coefficient	
milliliter	mL	west	W	(multiple)	R
millimeter	mm	copyright	©	correlation coefficient (simple)	r
		corporate suffixes:		covariance	cov
Weights and measures (English)		Company	Co.	degree (angular)	$^\circ$
cubic feet per second	ft ³ /s	Corporation	Corp.	degrees of freedom	df
foot	ft	Incorporated	Inc.	expected value	E
gallon	gal	Limited	Ltd.	greater than	>
inch	in	District of Columbia	D.C.	greater than or equal to	≥
mile	mi	et alii (and others)	et al.	harvest per unit effort	HPUE
nautical mile	nmi	et cetera (and so forth)	etc.	less than	<
ounce	oz	exempli gratia	e.g.	less than or equal to	≤
pound	lb	(for example)		logarithm (natural)	ln
quart	qt	Federal Information Code	FIC	logarithm (base 10)	log
yard	yd	id est (that is)	i.e.	logarithm (specify base)	log ₂ , etc.
		latitude or longitude	lat. or long.	minute (angular)	'
Time and temperature		monetary symbols (U.S.)	\$, ¢	not significant	NS
day	d	months (tables and figures): first three letters	Jan, ..., Dec	null hypothesis	H_0
degrees Celsius	°C	registered trademark	®	percent	%
degrees Fahrenheit	°F	trademark	™	probability	P
degrees kelvin	K	United States (adjective)	U.S.	probability of a type I error (rejection of the null hypothesis when true)	α
hour	h	United States of America (noun)	USA	probability of a type II error (acceptance of the null hypothesis when false)	β
minute	min	U.S.C.	United States Code	second (angular)	"
second	s	U.S. state	use two-letter abbreviations (e.g., AK, WA)	standard deviation	SD
Physics and chemistry				standard error	SE
all atomic symbols				variance	
alternating current	AC			population sample	Var
ampere	A			sample	var
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				

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by

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

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TABLE OF CONTENTS

	Page
LIST OF TABLES.....	iii
LIST OF FIGURES.....	iii
LIST OF APPENDICES.....	iii
ABSTRACT.....	1
EXECUTIVE SUMMARY.....	1
INTRODUCTION.....	1
Alaska Board of Fisheries.....	3
Advisory Committees.....	3
Recent Board of Fisheries Actions.....	3
ADF&G Emergency Order Authority.....	4
Federal Subsistence.....	4
Region III Sport Fish Division Research and Management Staffing.....	5
Statewide Harvest Survey.....	5
Sport Fish Guide Licensing and Logbook Program.....	6
SECTION I: MANAGEMENT AREA OVERVIEW.....	7
Management Area Description.....	7
Fishery Resources.....	7
Established Management Plans and Policies.....	8
Major Issues.....	8
Access Program.....	9
Information and Education.....	10
Sport Angling Effort, Harvest and Catch.....	10
Other User Groups–Commercial and Subsistence Fish Harvests.....	11
SECTION II: FISHERIES.....	12
Yukon River Drainage Salmon.....	12
Background and Historical Perspective.....	12
Recent Fisheries Performance.....	13
Summary of Yukon Salmon Runs 2009–2010.....	13
Summary of Catch and Harvests in Yukon Salmon Sport Fisheries in 2009.....	16
Fishery Objectives and Management.....	17
Current Issues and Fishery Outlook.....	19
Recent Board of Fisheries Action.....	19
Current or Recommended Research and Management Activities.....	20
Yukon River Northern Pike.....	20
Background and Historical Perspective.....	20
Recent Fisheries Performance.....	22
Fishery Objectives and Management.....	24
Current Issues and Fisheries Outlook.....	25
Recent Board of Fisheries Action.....	26
Current or Recommended Research and Management Activities.....	27

TABLE OF CONTENTS (Continued)

	Page
Yukon River Arctic Grayling	28
Background and Historical Perspective	28
Recent Fishery Performance	30
Fishery Objectives and Management.....	30
Current Issues and Fishery Outlook.....	31
Recent Board of Fisheries Action	32
Current or Recommended Research and Management Activities	32
ACKNOWLEDGMENTS	33
REFERENCES CITED	33
TABLES	37
FIGURES	49
APPENDIX A	53
APPENDIX B.....	57
APPENDIX C.....	61
APPENDIX D	69
APPENDIX E.....	73

LIST OF TABLES

Table	Page
1. Fishing effort (angler-days) for the Yukon Management Area, Region III, and Alaska, 1977–2009.	38
2. Number of fish harvested and total catch by species by recreational anglers within the Yukon Management Area, 1994–2009.	39
3. Sport harvest of king salmon in the Yukon River drainage, 1999–2009.	41
4. Sport harvest of chum salmon in the Yukon River drainage, 1999–2009.	42
5. Sport harvest of coho salmon in the Yukon River drainage, 1999–2009.	43
6. Sport harvest of northern pike in the Yukon River drainage, 1999–2009.	44
7. Total fishing effort (angler-days), and northern pike catch and harvest from principal fisheries in the Yukon River area, 1990–2009.	45
8. Sport harvest and catch of Arctic grayling in the Yukon River drainage, 1998–2008.	46

LIST OF FIGURES

Figure	Page
1. Map of the sport fish regions in Alaska and the five management areas in Region III.	50
2. Yukon area, Tanana River drainage is excluded from the YMA.	51

LIST OF APPENDICES

Appendix	Page
A1. Contact information for agencies providing information concerning fishing sites within the Yukon Management Area.	54
B1. Sport harvest and catch from the Yukon Management Area (SWHS Area Y), 1977–2009.	58
B2. Guided angler effort (angler days) and fish species kept and released in the Yukon River Area, as reported in the freshwater guide logbooks, 2006–2009.	60
C1. Commercial, subsistence, and sport harvest of king salmon in the Yukon River drainage.	62
C2. Commercial, subsistence, and sport harvest of summer and fall chum salmon in the Yukon River.	63
C3. Commercial, subsistence and sport harvest of coho salmon in the Yukon River drainage.	64
C4. Yukon River Drainage Fall Chum Salmon Management Plan Overview.	65
C5. Yukon River Summer Chum Salmon Management Plan overview.	66
C6. Yukon River salmon fisheries preseason information sheet, 2009.	67
D1. Dall River Fisheries Management Plan.	70
E1. Number of visitors contacted at the Coldfoot Visitor’s Center ^a , estimated fishing effort (angler-days, all species), and total catch of Arctic grayling for the Dalton Highway corridor (Yukon River to Atigun Pass), 1996–2010.	74

ABSTRACT

Information specific to recreational fisheries in the Yukon Management Area in 2009 and preliminary information for 2010 is presented. Estimates of fishing effort, total catch and effort is summarized up through the 2009 season. This information is provided to the Alaska Board of Fisheries, as well as to the general public and interested parties. Summaries of major fisheries within the area are detailed, including descriptions of the performance of these fisheries, regulatory actions by Alaska Board of Fisheries, social and biological issues, and descriptions of ongoing research and management activities.

Key Words: Yukon, sport fisheries, sport fishery management, fisheries management plan, Anvik River, Nowitna River, Dall River, Innoko River, Dalton Highway, northern pike, Dolly Varden, king salmon, coho salmon, Arctic grayling

EXECUTIVE SUMMARY

This document provides a wide array of information specific to the recreational angling opportunities and subsistence and commercial fisheries that exist within the Yukon Management Area. Information specific to the recreational, subsistence and commercial fisheries within the Yukon River drainage during 2009 and preliminary data from 2010 are presented along with a brief history of these fisheries and past Alaska Board of Fisheries (BOF) decisions that have affected them.

INTRODUCTION

This report provides information for the Yukon Management Area (YMA) and is one in a series of reports annually updating fisheries management information within Region III. The report is provided for the BOF, Fish and Game Advisory Committees (ACs), the general public, and other interested parties. It presents fisheries assessment information and management strategies that are developed from that information. In addition, this report includes a description of the fisheries regulatory process, geographic, administrative, and regulatory boundaries, funding sources, and other information concerning Division of Sport Fish management programs within the area.

The goals of the Division of Sport Fish of the Alaska Department of Fish and Game (ADF&G) are to protect and improve the state's recreational fisheries resources by managing for sustainable yield of wild stocks of sport fish, providing diverse recreational fishing opportunities, and providing information to assist the BOF in optimizing social and economic benefits from recreational fisheries. In order to implement these goals, the division has in place a fisheries management process.

A regional review is conducted annually during which the status of important area fisheries is considered and research needs are identified. Fisheries stock assessment projects are developed, scheduled, and implemented to meet information needs identified by fisheries managers. Projects are planned within a formal operational planning process. Biological information gathered from these research projects is combined with effort information and input from user groups to assess the need for and development of fisheries management plans, and to propose regulatory strategies.

Division of Sport Fish management and research activities are funded by ADF&G and Federal Aid in Fisheries Restoration funds. ADF&G funds are derived from the sale of state fishing

licenses. Federal aid funds are derived from federal taxes on fishing tackle and equipment established by the Federal Aid in Sport Fish Restoration Act (also referred to as the Dingell-Johnson Act or D-J Act). D-J funds are provided to states at a match of up to three-to-one with the ADF&G funds. Additional funding specified for providing, protecting, and managing access to fish and game is provided through a tax on boat gas and equipment established by the Wallop-Breaux (W-B) Act. Other peripheral funding sources may include contracts with various government agencies and the private sector.

This area management report provides information regarding the YMA and its fisheries for 2009, with preliminary information from the 2010 season. This report is organized into two primary sections: a management area overview including a description of the management area and a summary of effort, harvest and catch for the area, and a section on significant area fisheries including specific harvest and catch by species and drainage.

The BOF divides the state into eighteen regulatory areas to organize the sport fishing regulatory system by drainage and fishery. These areas (different from regional management areas) are described in Title 5 of the Alaska Administrative Code Chapters 47–74. The Division of Sport Fish of ADF&G divides the state into three administrative Regions with boundaries roughly corresponding to groups of the BOF regulatory areas. Region I covers Southeast Alaska (the Southeast Alaska regulatory area). Region II covers portions of Southcentral and Southwest Alaska (including the Prince William Sound, Kenai Peninsula, Kenai River drainage, Cook Inlet-Resurrection Bay Saltwater, Anchorage Bowl, Knik Arm, Susitna River drainages, West Cook Inlet, Kodiak, Bristol Bay, and the Alaska Peninsula and Aleutian Islands regulatory areas). Region III includes Upper Copper River and Upper Susitna River area and the Arctic-Yukon-Kuskokwim Region (including the North Slope, Northwestern, Yukon River, Tanana River, and Kuskokwim-Goodnews regulatory areas).

Region III is the largest geographic region, encompassing the majority of the landmass of the state of Alaska (Figure 1). The region contains over 1,146,000 km² (442,500 mi²) of land, some of the state's largest river systems (Yukon, Kuskokwim, Colville, Noatak, Upper Copper and Upper Susitna River drainages), thousands of lakes, thousands of miles of coastline, and streams. Regional coastline boundaries extend from Cape Newenham in the southwest, around all of western, northwestern and northern Alaska to the Canadian border on the Arctic Ocean. Region III as a whole is very sparsely populated, with the most densely populated center located in the Tanana River Valley. Fairbanks (population about 35,000, Fairbanks North Star Borough population of about 99,000) is the largest community.

For administrative purposes, Sport Fish Division has divided Region III into five fisheries management areas (Figure 1). They are:

- Northwestern/North Slope Management Area (Norton Sound, Seward Peninsula, Kotzebue Sound, and North Slope drainages);
- Yukon Management Area (the Yukon River drainage except for the Tanana River drainage);
- Upper Copper/Upper Susitna Management Area (the Copper River drainage upstream of Canyon Creek and Haley Creek, and the Susitna River drainage above the Oshetna River);
- Tanana River Management Area (the Tanana River drainage);
- Kuskokwim Management Area (the entire Kuskokwim River drainage and Kuskokwim Bay drainages).

Area management biologists for the five areas are located in Nome/Fairbanks, Fairbanks, Glennallen, Fairbanks/Delta Junction, and Bethel/Fairbanks, respectively.

ALASKA BOARD OF FISHERIES

The BOF is a seven-member board that sets fishery regulations and harvest levels, allocates fishery resources, and approves or mandates fishery conservation plans for the State of Alaska. BOF members are appointed by the governor for three-year terms and must be confirmed by the legislature.

Under the current operating schedule, the BOF considers fishery issues for regulatory areas or groups of regulatory areas on a 3-year cycle. Proposals to create new or modify existing regulations and management plans are submitted by ADF&G and the public (any individual can submit a proposal to the BOF) for evaluation by the BOF. During its deliberations the BOF receives input and testimony through oral and written reports from ADF&G staff, members of the general public, representatives of local ACs, and special interest groups such as fishermen's associations and clubs. The public provides its input concerning regulation changes and allocation through submission of written proposals and testifying directly to the BOF, by participating in local AC meetings, or by becoming members of local ACs.

ADVISORY COMMITTEES

Local ACs have been established throughout the state to assist the Boards of Fisheries and Game in assessing fisheries and wildlife issues and proposed regulation changes. AC members are nominated from the local public and voted on by all present during an AC meeting. Most active committees in urban areas meet in the fall and winter on a monthly basis. Rural committees generally have only one fall and one spring meeting due to funding constraints. AC meetings allow opportunity for direct public interaction with ADF&G staff attending the meetings that answer questions and provide clarification concerning proposed regulatory changes regarding resource issues of local and statewide concerns. The Boards Support Section within ADF&G's Division of Administrative Services provides administrative and logistical support for the BOF and ACs. During 2009, ADF&G had direct support responsibilities for 81 ACs in the state.

Within the YMA there are ten ACs: Eagle, Upper Tanana/40-Mile, Yukon Flats, Central, Tanana-Rampart-Manley (TRM), Middle Yukon, Koyukuk, Grayling-Anvik-Shageluk-Holy Cross (GASH), Ruby, and Lower Yukon. In addition, the Delta and Fairbanks ACs often comment on proposals concerning fisheries in the YMA.

RECENT BOARD OF FISHERIES ACTIONS

The BOF meets annually, but deliberates on each individual regulatory area on a 3-year cycle. YMA fisheries will next be considered during January 2013. Proposals concerning sport fisheries in the YMA will be accepted through April 10, 2012.

The BOF most recently considered fisheries for the YMA in January 2010. Only one minor regulatory change was adopted during the meeting. The change concerned the spring spawning closure in the *Yukon River Area Wild Arctic Grayling Management Plan (5 AAC 73.055)*. The catch-and-release spawning season dates were changed by one day (May 30 to May 31) to align the management plan with the dates specified in regulation for the YMA.

During February 2007, the BOF considered and adopted two proposals affecting sport fisheries in the YMA. The BOF amended lake trout *Salvelinus namaycush* regulations by adopting a region-wide *AYK Lake Trout Management Plan (5 AAC 73.040)*. This plan provides a regulatory framework for consistent, conservative management of lake trout populations in the YMA as well as the other management areas within Region III. The bag and possession limit for northern pike *Esox lucius* in the Nowitna River drainage was reduced from 10 fish to five fish, of which only one fish can be 30 inches or longer.

ADF&G EMERGENCY ORDER AUTHORITY

ADF&G has emergency order (EO) authority (5 AAC 75.003) to modify time, area, and bag/possession limit regulations. EOs are implemented to address conservation issues not adequately controlled by existing regulations. Once implemented, an EO is in effect until the situation is resolved or the BOF can formally take up the issue. EOs are also used as a tool for inseason management of fisheries. Inseason management is usually in accordance with a fisheries management plan approved by the BOF. Two emergency orders were issued under this authority for the YMA during 2009 and one emergency order was issued in 2010.

In 2009, Emergency Order 3-KS-01-09 reduced the bag and possession limit for king salmon *Onchorynchus tshawytscha* in all tributaries of the Yukon River drainage to one king salmon and prohibited retention of king salmon in the mainstem Yukon River, effective June 1, 2009 due to the weak king salmon return. Emergency Order 3-CS-01-09 prohibited retention of chum salmon *Onchorynchus keta* in all waters of the Yukon River drainage (excluding the Tanana River drainage) effective September 4, 2009. This action was taken due to the poor fall chum salmon return.

During 2010, emergency order authority was used in response to a critically low fall chum salmon run to limit the sport harvest of chum salmon. Emergency Order 3-CS-02-10 prohibited retention of chum salmon in all waters of the Yukon River drainage (excluding the Tanana River drainage) effective August 20, 2010.

FEDERAL SUBSISTENCE

The Alaska National Interest Lands Conservation Act (ANILCA) established a priority subsistence use of fish and game for federally-qualified rural residents on lands and waters for which the federal government asserts jurisdiction. The state of Alaska has also established a priority for subsistence use of fish and game by Alaskan residents (AS 16.05.258) on all lands and waters, but cannot discriminate between rural and urban residents (Alaska State Constitution Article VIII, sections 3 and 15). Because of this difference, the federal government asserted authority to ensure a priority subsistence use of fish and game for rural residents on federal lands and certain adjacent waters. On October 1, 1999 the federal government asserted regulatory authority for assuring rural priority for subsistence fisheries on federal public lands, which includes non-navigable waters on public lands. Following the “Katie John” decision by the 9th Circuit Court in 1995, the federal government expanded the definition of public land to include waters for which the federal agencies assert federal reserved water rights. Under current practice, the federal land management agencies adopt regulations to provide for priority subsistence use by qualified rural residents in non-navigable waters within federal public lands (including Bureau of Land Management (BLM) lands) and in navigable waters adjacent to or

within federal conservation system units (generally does not include BLM lands). The State retains all other fish and wildlife management authorities, including management on federal land.

Development of regulations for subsistence fisheries under the federal subsistence program occurs within the established Federal Subsistence Board (FSB) process. The public provides its input concerning regulation changes by testifying in Federal Subsistence Regional Advisory Council (RAC) meetings or by becoming council members. Ten RACs have been established throughout Alaska to assist the FSB in determining local subsistence issues and providing recommendations on proposed fishing and hunting regulations on the fish and game populations under consideration. Each RAC meets twice a year, and subsistence users and other members of the public can comment on subsistence issues at these meetings.

Within the YMA the subsistence fisheries for which the federal government asserts management responsibility include those in Gates of the Arctic National Park, Yukon-Charley Rivers National Preserve, Steese National Conservation Area, White Mountain National Recreation Area, Innoko National Wildlife Refuge (NWR), Kanuti NWR, Koyukuk NWR, Nowitna NWR, Yukon Flats NWR, Yukon Delta NWR, Beaver Creek National Wild and Scenic River (NW&SR), Birch Creek NW&SR, and Fortymile NW&SR. Subsistence fisheries within the above listed areas fall under the purview of the Eastern, Western, and Yukon-Kuskokwim Delta RACs. The most recent meeting of the Yukon-Kuskokwim Delta RAC was in Bethel, (September 2009), the Western Interior RAC met in McGrath (October 2009), and the last meeting of the Eastern Interior RAC was in Fairbanks (October 2009). At these meetings, federal fishery proposals concerning gillnet mesh size and depth restrictions and implementation of special fishing periods for rural residents were addressed and council recommendations were forwarded to the FSB.

REGION III SPORT FISH DIVISION RESEARCH AND MANAGEMENT

STAFFING

Region III Division of Sport Fish staff biologists are organized into a research group and a management group. The management group consists of a management supervisor, an area biologist for each of the five management areas, one or more assistant area management biologists, and two stocked water biologists. Area biologists evaluate fisheries and propose and implement management strategies through plans and regulation in order to meet divisional goals. A critical part of these positions is interaction with the BOF, ACs, and the general public. Stocked waters biologists plan and implement the regional stocking program for recreational fisheries. The regional management biologist assigned to the Region III office in Fairbanks also administers the regional fishing and boating access program.

The research group consists of a research supervisor, a salmon research supervisor, a resident species supervisor, research biologists, and various field technicians. Research biologists plan and implement fisheries research projects in order to provide information needed by the management group to meet divisional goals. The duties of the management and research biologists augment one another.

STATEWIDE HARVEST SURVEY

Sport fishing effort and harvest of sport fish species in Alaska have been estimated and reported annually since 1977 using a mail survey (Mills 1979-1980, 1981a-b, 1982-1994; Howe et al. 1995-1996, 2001a-d, Walker et al. 2003, Jennings et al. 2004, 2006a-b, 2007, 2009a-b, 2010a-b, *In prep*). The Statewide Harvest Survey (SWHS) is designed to provide estimates of effort,

harvest, and catch on a site-by-site basis. It is not designed to provide estimates of effort directed towards a single species. Species-specific catch-per-unit-effort (CPUE) information can seldom be derived from the report. Two types of questionnaires are mailed to a stratified random sample of households containing at least one individual with a valid fishing license (resident or nonresident). Information gathered from the survey includes participation (number of anglers and days fished), number of fish caught and number harvested by species and site. These surveys estimate the number of angler-days of fishing effort expended by sport anglers fishing Alaskan waters as well as the sport harvest. Beginning in 1990, the survey was modified to include estimation of catch (release plus harvest) on a site-by-site basis. Survey results for each year are not available until the following year; hence, the results for 2009 were not available until late summer 2010. Additionally, creel surveys have been selectively used to verify the mail survey for fisheries of interest or for fisheries that require more detailed information for inseason management.

The utility of SWHS estimates depends on the number of responses received for a given site (Mills and Howe 1992). In general, estimates from smaller fisheries with low participation are less precise than those of larger fisheries with high participation. Therefore, the following guidelines were implemented for evaluating survey data:

1. Estimates based on fewer than 12 responses should not be used other than to document that sport fishing occurred;
2. Estimates based on 12 to 29 responses can be useful in indicating relative orders of magnitude and for assessing long-term trends; and,
3. Estimates based on 30 or more responses are generally representative of levels of fishing effort, catch, and harvest.

For purposes of reporting and organizing statistics in the SWHS, the YMA is designated as survey area (Y).

SPORT FISH GUIDE LICENSING AND LOGBOOK PROGRAM

Since 1998, the Division of Sport Fish has operated a program to register and/or license both sport fishing guides and sport fishing guide businesses and to collect information on sport fishing participation, effort, and harvest by saltwater and freshwater guided clients (Sigurdsson and Powers 2009). In 1998, the BOF adopted statewide sport fishing guide regulations (5 AAC 75.075) which required all sport fishing guides and businesses to register annually with the ADF&G. At this time the BOF also adopted statewide regulations that required logbooks for saltwater charter vessels. The logbooks collected information on charter activity (location, effort, and harvest) that was necessary for the BOF for allocation and management decisions specific to king salmon, rockfish (*Sebastes* spp.), and lingcod (*Ophiodon elongatus*) and for the North Pacific Fishery Management Council (NPFMC) for allocation of Pacific halibut (*Hippoglossus stenolepis*).

In 2004, the Alaska Legislature adopted House Bill 452 that established licensing requirements for sport fishing guide business owners and sport fishing guides on a statewide basis (effective 2005). This legislation also required logbook reporting for all freshwater guiding businesses in addition to the existing saltwater reporting requirements. The logbook data provides location of fishing effort, level of participation, and number of species kept and released by clients. This information is used for the regulation, development, and management of fisheries and has been published annually since 2008 in a Fishery Data Series report (Sigurdsson and Powers 2009, 2010).

SECTION I: MANAGEMENT AREA OVERVIEW

MANAGEMENT AREA DESCRIPTION

The YMA consists of approximately 407,858 km² (157,475 miles²) of extremely varied topography, climate, and zoogeography. The Yukon River is the largest river in Alaska and its drainage constitutes the fifth largest in North America. The YMA (Figure 2) includes all of the Yukon River drainage in the United States except for the Tanana River drainage. The area as a whole is sparsely populated. The communities within the management area are invariably located near water, because of the importance of fish and/or marine mammals as a food source to local people historically and today.

Access to most of the area is limited to water or air travel. Major river systems provide transportation corridors during winter, as well as during open water months. Road access to the Yukon River is provided by the Dalton Highway, by the Steese Highway at Circle and by the Taylor Highway at Eagle. With the exception of the Dalton Highway, these gravel roads are not maintained during winter.

Land ownership and jurisdictions fragment this large area into a complex mosaic. The federal government is the major land manager through its jurisdiction over lands in two National Parks and Preserves (Yukon–Charley and Gates of the Arctic), five National Wildlife Refuges (Yukon Flats, Kanuti, Koyukuk, Nowitna, and Innoko), the White Mountains National Recreation Area, the Steese National Conservation Area, and numerous Wild and/or Scenic Rivers, as well as other classifications of federal lands. Lands held by the State of Alaska, Native corporations, and other private landowners comprise the remaining landmass. Arvey et al. (1995) provides a detailed description of the geology of the YMA.

FISHERY RESOURCES

Virtually all freshwater and migratory fish species sought by anglers in Alaska are available in the YMA. All populations are wild; there is presently no enhancement of fish populations in the management area. Five species of Pacific salmon are available in tributaries of the Yukon River, including king salmon, coho salmon *Oncorhynchus kisutch*, chum salmon, sockeye salmon *Oncorhynchus nerka*, and pink salmon *Oncorhynchus gorbuscha*.

Unique opportunities to fish for freshwater resident species in remote wilderness settings exist throughout this management area. Exceptionally large northern pike and inconnu (sheefish) *Stenodus leucichthys* are available in the Innoko, Kaiyuh, and Nowitna river drainages. Opportunities to fish for Arctic grayling *Thymallus arcticus*, Dolly Varden *Salvelinus malma*, northern pike, burbot *Lota lota*, and lake trout are very widespread and fishing pressure on these wild stock is very light. The Dalton Highway is a popular destination and provides road access to adjacent lakes and streams which support stocks of Arctic grayling, northern pike and Dolly Varden. Wild stocks of rainbow trout *Oncorhynchus mykiss* do not occur naturally in drainages north of the Kuskokwim River. Additional species of whitefish that are of importance to fisheries in the YMA include broad whitefish *Coregonus nasus*, and Bering cisco *Coregonus laurettae*.

ESTABLISHED MANAGEMENT PLANS AND POLICIES

Regulations governing fisheries in the YMA are found in 5 AAC 73.005 through 5 AAC 73.065 (sport fishing), in 5 AAC 01.200 through 5 AAC 01.249 (subsistence fishing), and in 5 AAC 05.001 through 5 AAC 05.380 (commercial fishing).

Fisheries-specific management objectives for the management area have been identified in management plans for Arctic grayling and lake trout. In addition, a series of general divisional criteria have been prepared to guide establishment of fishery objectives, and include:

1. **Management and protection of existing fish resources.** Divisional activities should strive to manage and protect Alaska's wild fish stock resources for future generations;
2. **Public use and benefits of existing fish resources.** Alaska's fishery resources should be made available for public use and benefit on a sustained yield basis;
3. **Rehabilitation of depressed stocks and damaged habitat.** Division activities should strive to restore and maintain fish stocks and habitat damaged by man's activities; and,
4. **Enhancement of natural production or creation of new opportunities.** The Division should pursue creation of new sport fishing opportunities through rehabilitation of natural stocks or creation of new fisheries where these opportunities do not negatively impact other fisheries.

Two regionwide management plans that affect fisheries in the area have been completed. A regional management plan for Arctic grayling was adopted by the BOF in January 2004 (5 AAC 70.055, 2004). This plan supersedes a previous Yukon River drainage management plan for Arctic grayling. A management plan for lake trout in the AYK region was adopted by the BOF for the Upper Copper/Upper Susitna Management Area in December 2005. The *Wild Lake Trout Management Plan* (5 AAC 70.040, 2007) was adopted for the remainder of the AYK region by the BOF in February 2007 (Burr 2006). Revision of existing plans, as well as the development of additional fisheries management plans, will occur as needed in response to changes in use patterns as new quantitative information becomes available.

A cooperative planning effort for the Dall River northern pike fishery provided a management plan for this fishery (Burr 2001). Cooperators include ADF&G, the Stevens Village Natural Resources Office, the Yukon Flats NWR, and members of the Fairbanks AC.

MAJOR ISSUES

1. Dalton Highway recreational fisheries. The opening of the entire length of the Dalton Highway (North Slope Haul Road) to public travel in 1994 provided new access to lakes and streams along the route. Increases in recreational fishing effort and harvest have resulted in reductions in bag limits for northern pike and Arctic grayling. The State of Alaska is in the process of paving the Dalton Highway north of the Yukon River. Sport fishing by road construction crews and by increasing numbers of visitors will likely bring greater fishing effort to fish stocks in the highway corridor. Due to the unproductive fisheries habitat in the region, the likelihood of overexploitation of these stocks is considered high.
2. Development of new sport fisheries in rural Alaska. Relatively rapid development of sport fisheries in remote areas has resulted in friction between local residents and the non-local anglers. In many instances, local people have historically enjoyed nearly exclusive use of

fishery resources. Sport fishing guides and other anglers seeking less crowded fishing opportunities in wilderness settings continue to “discover” less well known, but potentially, high quality fisheries. As currently popular fishing destinations in other parts of Alaska become increasingly crowded, anglers and guides are likely to continue to travel farther to participate in Alaska’s fisheries. In addition to the social friction caused by this change in use patterns of remote areas and to some extent because of this friction, ADF&G will be increasingly expected to provide information on the status of stocks for which there is currently only the most rudimentary information. This is likely to be the biggest challenge in the management of sport fisheries in the YMA. Recent experiences at the Dall and Innoko rivers are examples of the type of challenges that should be anticipated (see page 24).

3. Rod and reel subsistence. In 2000, the BOF included rod and reel gear as a legal subsistence fishing method for harvest during the open water season in the Association of Village Council Presidents (AVCP) area of the Lower Yukon and Kuskokwim rivers. In 2001, rod and reel subsistence fishing was extended upstream to include the remainder of the Kuskokwim River drainage by emergency regulation in response to a petition to the BOF from Nikolai Native Village and the Western Interior RAC. Until these actions were taken, rod and reel fishing for subsistence was permitted only through the ice under state regulations. The primary concern with this potential change is how to manage for sustainable fish populations with legalization of rod and reel gear for subsistence fishing. It is likely that rural resident use patterns have incorporated rod and reel in past subsistence harvests, and legalization of this gear will not greatly affect local use patterns. Since all Alaskans qualify for subsistence, resident anglers could choose to fish with rod and reel under subsistence regulations instead of sport fish regulations. The greatest concerns relate to changes in urban resident behavior in regard to license sales, visitation to rural fisheries, harvests of fish populations, and ability to measure these harvests absent harvest surveys or permits.
4. Rural resentment of sport fishing and sport anglers. Some rural Alaskans have a cultural bias against the concept of "sport fishing" and feel that people do not have the right to "play" with food resources. The bias is particularly strong towards catch-and-release practices. This conflict of values has led to resentment towards sport anglers who wish to fish on private and public lands within the YMA.
5. Federal fishery management for subsistence in Alaska’s navigable waters. In October 1999, federal fishery managers assumed responsibility for ensuring a rural subsistence priority on navigable waters adjacent to or within the boundaries of federal conservation units. There is continued concern that a result of this action will be reduced opportunity for sport fishing throughout the state. Because of the large amount of federal public land within the YMA and because of the high proportion of subsistence users, this loss of opportunity is of acute concern for sport fishermen in the area. Recent proposals to the FSB and federal management actions (ie. Andreafsky River in 2009) to exclude recreational anglers from popular fisheries have required substantial efforts by ADF&G staff to maintain current opportunities.

ACCESS PROGRAM

The Wallop-Breaux amendment to the Federal Aid in Sport Fish Restoration Act (D-J) mandates that at least 15% of the federal funds collected from taxes on boat gas and sport fishing

equipment be used by the states for the development and maintenance of motorized boating access facilities. A broad range of access facilities can be approved for funding if they are constructed to achieve a state fishery management objective. These facilities can include boat ramps and lifts, docking and marina facilities, breakwaters, fish cleaning stations, rest rooms, and parking areas.

To date, relatively few access projects have been proposed for rural YMA. Access funds were used for construction of a concrete boat launch to the Yukon River in cooperation with the city of Galena. Another project currently planned is a concrete boat launch at Birch Creek on the Steese Highway.

INFORMATION AND EDUCATION

Information regarding regulations, publications, fishing reports, news releases and emergency orders for the YMA can be found at the ADF&G, Division of Sport Fish website (www.adfg.alaska.gov/index.cfm?adfg=fishingSport.main). Information on rivers and lakes is also available from the Alaska Department of Natural Resources website (www.dnr.alaska.gov/parks/aktrails/index.htm). Federal agencies provide information on waterbodies in National Parks and Preserves, National Wildlife Refuges, and Wild and Scenic Rivers. A listing of addresses and contact numbers for these information sources can be found in Appendix A1.

There are three regional information and education (I&E) staff located in the Fairbanks office. An Information Officer II and a seasonal Fisheries Technician III respond to questions from the public at the office and via phone and e-mail. In addition, I&E staff distribute and update fishery brochures, fishing regulations, the regional webpage, coordinate the Fairbanks Outdoor Show booth, Kid's Fish & Game Fun Day, and the Becoming an Outdoors-Woman (BOW) program. An Education Associate II coordinates the sport fishing component of the Alaska Conservation Camp and works with schools in various communities throughout the region to provide a curriculum in sport fishing and aquatic education.

SPORT ANGLING EFFORT, HARVEST AND CATCH

Estimates of angling effort in the YMA averaged approximately 11,600 angler-days during the last five (2004–2008) and ten (1999–2008) year periods. Angling effort in the region and statewide has also, on average, remained relatively stable during this period (Table 1).

The vast majority of the YMA and its fishable waters occur away from highways and motor vehicle roads of any kind. Small communities are scattered along major river systems of Interior Alaska and along the western coast. The communities are invariably located near water to facilitate transportation and because of the importance of fish as a food source to local people historically and today. Residents of these rural communities harvest a substantial amount of fish and game resources for subsistence use, but fishing is usually conducted with high catch-per-unit-of-effort gear types such as fish wheels and nylon gillnets. Recently, rod and reel fishing gear was added to the types of legal subsistence fishing gear in the lower portion of the Yukon River drainage. Recreational or sport fishing with rod and reel is practiced to some extent by rural residents, but often as an extension of subsistence activities and less for recreational purposes. Consequently, harvest estimates of sport-caught fish from rural Alaska are generally low because local residents usually fish under subsistence regulations and because the small amount of sport fishing done is usually conducted as a subsistence activity. Since statewide

harvest estimates are based upon surveys of licensed sport anglers, rural harvests are probably not fully documented.

Sport harvest of all species combined from the YMA averaged more than 12,000 fish until the early 1990s with the peak harvest of 14,720 in 1989 (Appendix B1). Since that time annual harvests have declined and have averaged about 7,180 fish (Table 2). The most recent estimate (2009) is 7,037 fish, similar to recent average harvests. The harvest in the YMA has been dominated by freshwater resident species, primarily Arctic grayling, northern pike, and sheefish. Pacific salmon (all species combined) comprise only about 12 percent of the total sport harvest in the management area (Appendix B1).

Sport catch of all species in the YMA has been estimated since 1990 (Table 2). Numbers reported as catch include fish that are caught and kept (harvested) and those that are caught and released. During the most recent 5-year period, approximately 88% of all fish caught in the YMA were released. The proportion of catch-and-release activity varies by species. For example, only 6% of burbot caught between 2004 and 2008 were released compared with 91% of northern pike, 89% of Arctic grayling, 72% of lake trout and 85% of king salmon.

The Freshwater Sport Fishing Guide Logbook has provided an additional measure of fishing effort, catch and harvest by guided anglers in recent years. The number of fish reported as harvested and released by guides provides a check on results from the SWHS in areas where sport fishery guides are operating businesses. For species for which most fishing effort is by guided fishermen, results are similar (Appendix C2). For example, king salmon harvest and catch from the guide logbook reports for the Yukon River area have averaged about 80 and 300 fish per year compared with 170 and 1,200 from the SWHS for 2006–2009. Please note that the SWHS reports catch (fish harvested and released) while the guide logbook reports list fish released. Also the SWHS reports estimates with incumbent error while the Guide Logbook attempts to report actual number of fish kept and released.

OTHER USER GROUPS—COMMERCIAL AND SUBSISTENCE FISH HARVESTS

Important subsistence and commercial fisheries exist in the Yukon River drainage and form an economic base for income and employment in many local communities. Commercial and subsistence harvests for all species of salmon are much larger than are sport harvests (Appendices C1–C3). In contrast to fisheries for salmon, the majority of the harvest of freshwater fish is by subsistence and sport users. Currently there are very limited commercial fisheries for sheefish, whitefish, and lamprey.

In the Yukon River drainage, salmon harvests have historically been dominated by chum salmon (Appendices C1–C3). King salmon, while less abundant, is a very important species for commercial sale and is preferred for subsistence use in many parts of the area. Between 1998 and 2004 the number of king salmon harvested in the commercial fishery exceeded the combined number of chum salmon (summer and fall) primarily due to reduced opportunities for chum salmon roe sales. In recent years, commercial fisheries directed at king salmon have been very limited and most of the commercial catch has been incidental to the fishery directed at summer chum salmon. The commercial harvest of coho salmon is primarily incidental to the fall chum salmon fishery. Pink salmon occur throughout the YMA in streams near the coast, but, while numerically dominant in some years, the species is not exploited to a great extent in commercial or subsistence fisheries.

Commercial harvests of all salmon species in the Yukon River averaged more than one million salmon annually from 1977 to 1996 (Appendices C1–C3). Weak returns of king and chum salmon since 1997, particularly through 2002, resulted in much lower than average commercial harvests. In 2001, there was no directed commercial fishery for king or chum salmon in the Yukon River drainage. Recently commercial harvests have increased but have not reached historical levels (Appendices C1–C3). Poor king salmon runs in 2008 and 2009 resulted in no commercial fishery directed at king salmon.

SECTION II: FISHERIES

Waters within the YMA offer some of the most remote and diverse sport fishing opportunities available in Alaska. Opportunities to catch trophy northern pike, sheefish, Dolly Varden, lake trout, and Arctic grayling within wilderness settings are well known. Sport fishing opportunities for salmon are currently not as well developed. However, angling for king and coho salmon has increased during recent years in the Yukon River drainage as pressure on other popular sites outside the YMA continues to increase. Marine sport fisheries within the boundaries of the YMA are extremely rare.

This section provides a summary of sport fisheries by species that were considered significant in the YMA in 2009 to 2010. Discussion of each fishery will address: 1) historical perspective; 2) recent fishery performance (stock status); 3) fishery objectives and management; 4) current issues; 5) recent actions by the BOF; and, 6) ongoing and recommended management and research activities. Recent fishery performance will focus on data from 2009. Information regarding the 2010 season will be included as available, but estimates of sport effort and harvest are not yet available for the 2010 season. Tables summarizing historic sport fish harvests by species are provided for reference (Table 2; Appendix C1-C3).

YUKON RIVER DRAINAGE SALMON

King, chum, and coho salmon are important subsistence and commercial species in the Yukon River drainage. However, harvest by sport anglers has, to date, been minimal.

Background and Historical Perspective

King salmon are found throughout the Yukon River drainage. Chum salmon, composed of a summer run and a fall run, are numerically the most abundant species and are distributed throughout the drainage. Coho salmon are less abundant and spawn in large numbers in only a few identified streams. Pink salmon are locally abundant in some years but are not thought to migrate upstream of the Anvik River (approximately 250 river mi from the Bering Sea). Sockeye salmon occur occasionally, but only a few fish are taken annually in commercial or subsistence harvests. The locations of spawning sites for sockeye salmon have not been identified.

Annual sport harvests of salmon in the Yukon River drainage have historically been, and continue to be, primarily from streams of the Tanana River drainage. Sport fisheries in the Tanana River drainage are discussed within the Fishery Management Report for the Tanana River Management Area (Brase and Baker 2011). Sport harvests are reported from other streams and drainages in the Yukon River watershed, primarily from the Andreadsky, Anvik, and Koyukuk rivers and their tributaries (Tables 3–5). Approximately 12,000 people live along the Yukon River and its tributaries (excluding the Tanana River). Most of these people depend to some extent on salmon for livelihood, subsistence, or both. Rural residents customarily use high yield fishing methods such as gillnet and fish wheel, where a larger volume harvest can be taken in the turbid mainstem of Yukon River. Rod and reel fishing for salmon is practiced in clear water tributaries of the Yukon River drainage by some rural residents and by non-local residents who visit for the purpose of sport fishing. Consequently, the reported sport harvest does not reflect the abundance of salmon in the drainage.

Recent Fisheries Performance

A period of increased variability in run strength of Yukon River king and chum salmon began in 1997 with the 2000 runs the worst on record for both species. In September 2000 the BOF classified the Yukon River king salmon stock as a yield concern, the Yukon River summer chum salmon stock as a management concern and most of the Yukon River drainage fall chum salmon stock as a yield concern. Fall chum salmon stocks in the Toklat and Fishing Branch rivers were classified as management concerns. The *Policy for the Management of Sustainable Salmon Fisheries* (SSFP; 5 AAC 39.222) defines a yield concern as an inability to maintain expected yields or harvestable surpluses above the stock's escapement needs despite the use of specific management measures. A management concern is defined as the chronic inability to meet existing escapement goals for the stock. Between 2001 and 2003, increases in escapements were due primarily to more conservative management. Through 2007, king and chum salmon runs continued to improve over the very poor runs of 1999–2000. However, in 2008, 2009, and 2010, the number of king salmon returning to the Yukon River drainage was again less than expected. In 2009 and 2010, the number of fall chum salmon returning was also well below the level anticipated.

Summary of Yukon Salmon Runs 2009–2010

The 2009 drainage-wide king salmon run was projected preseason to be between 149,000 and 166,000 fish, a run size below average compared with recent observed runs (JTC 2009). Assessment of the 2009 king salmon run indicated that the run was indeed well below average. However very conservative management of the run resulted in good escapements to spawning areas in the United States and Canada. Because managers anticipated a weak run and because the Canadian border passage goal had not been attained in the past two seasons, a series of meetings and teleconferences were held prior to the start of the season. The purpose of these meetings was to provide managers, fishermen, tribal council representatives, and other stakeholders the opportunity to work cooperatively to identify options and practical management strategies that would assist in getting adequate numbers of fish to the spawning grounds, particularly to Canada.

In 2009 no commercial fishery directed at king salmon was allowed (JTC 2010). All salmon fishing was closed as the first pulse of king salmon migrated upstream to the Canadian border with the goal of conserving the greatest number of Canada-bound fish. Subsistence fishing time

on the remaining pulses was reduced by one half. The sport fishery for king salmon in the mainstem was closed preseason on June 1 and remained closed for the remainder of the season. The sport fish harvest limit was reduced in all tributaries from three to one king salmon. Between July 1 and 16, king salmon caught during commercial fishing for summer chum salmon in districts Y-1 through Y-5 could be released alive or retained for subsistence use, but could not be sold. A total of 3,752 king salmon were reported caught on commercial fish tickets, but were not sold. The total commercial harvest of king salmon in 2009 was 316 fish. These fish were taken during the last commercial fishing period targeting summer chum salmon in district Y-2 (131 fish), and during the fall chum salmon season (185 fish).

The cumulative passage estimate for June 1 through August 9, 2009 from the Pilot Station sonar project was 122,474 king salmon. The estimates from Pilot Station through June 23 are considered to be conservative because high water conditions made assessment of the early portion of the run challenging. Postseason evaluation of king salmon escapements in Alaskan tributaries indicates that most escapement goals within Alaska were met. Estimated border passage by the Eagle sonar was approximately 68,000 king salmon (harvest by the village of Eagle was deducted from this estimate). This passage estimate fulfills harvest sharing agreements with Canadian fisheries and meets the Interim Management Escapement Goal (IMEG) to Canadian spawning grounds.

In 2010 the drainage-wide king salmon run was projected preseason to be between 155,600 and 226,200 fish, below average in size but stronger than the 2009 run (JTC 2010). As in 2009, a series of pre-season meetings and teleconferences with managers and fishermen were held to identify options and practical management strategies that would assist in getting adequate numbers of fish to the spawning grounds, particularly to Canada.

The king salmon run in 2010 was managed in a less conservative manner than in 2009. In 2010, salmon fishing was not closed during the upstream migration of the first pulse of king salmon. Subsistence fishing timing followed the windowed schedule outlined pre-season beginning June 7 (Appendix C6). The sport fish harvest limit was not reduced in the mainstem Yukon River or the tributaries except for the Chena River (Tanana River) where sport fishing for king salmon was closed due to low escapement past the Chena River counting tower. While there was no commercial fishery directed at king salmon, a total of 9,897 king salmon were caught and sold in the commercial fishery for summer chum salmon in districts Y-1 and Y-2 (Appendix C1).

The king salmon run in 2010 was much weaker than the preseason projection and weaker than the early inseason assessment projects indicated (JTC 2011). In general, escapement results were disappointing. The cumulative passage estimate through August 1, 2010 from the Pilot Station sonar project was 113,400 king salmon. The Biological Escapement Goal (BEG) for the Salcha River was attained while the BEG for the nearby Chena River was not. The Sustainable Escapement Goals (SEG) for the East and West Fork Andreafsky were met but the Nulato and Anvik River targets were not attained. Spawning escapement for the Canadian portion of the Yukon River drainage estimated by Eagle sonar project near the Alaska-Canada border was approximately 33,500 king salmon, 21% below the lower range of the IMEG of 42,500–55,000 king salmon.

Pilot Station passage estimates for summer chum salmon in 2009 through July 18 was 1,283,206 fish. Despite adequate total run size, summer chum salmon escapement was variable among projects with generally poor performance in the lower portion of the drainage and higher

escapements in the upper tributaries. The East Fork Andreafsky and Anvik rivers failed to meet BEGs with historically low numbers. Escapements to the Gisasa and Tozitna rivers were also below expected levels. In contrast, the number of summer chum salmon at Henshaw Creek was twice the number expected and the second highest recorded for this project. Escapements to the Salcha and Chena rivers in the Tanana drainage also exceeded expected levels. Commercial fishing periods directed at summer chum salmon were delayed until an estimated 85% of the king salmon run had passed the lower river districts. Nets were restricted to 6-inch maximum mesh size. The total commercial harvest was 170,272 summer chum salmon, 140% above the 1999–2008 average of 63,341 fish (Appendix C2).

In 2010, the summer chum salmon run was only slightly below average, but performance of the run was extremely poor considering the primary parent year escapement abundance was near a record high (4.0 million in 2005). Pilot Station sonar estimated a passage of 1.3 million summer chum salmon, less than the average 1.6 million for the project. Estimated escapement to the East Fork Andreafsky (72,893) was above the SEG of >40,000. The estimated escapement of summer chum salmon into the Anvik River was 396,173 (BEG 350,000 – 750,000). The Anvik River again accounted for more than a quarter (30%) of the Pilot Station cumulative passage estimate. The renewed market interest in summer chum salmon continued in 2010. Due to concern for king salmon run strength, the commercial fishery for summer chum salmon was restricted to ≤6" mesh in districts Y1–Y2 and the openings were delayed until June 28. Total commercial harvest of 232,888 summer chum salmon for the Yukon River drainage was 193% above the 2000–2009 average harvest of 79,438 fish.

The 2009 fall chum salmon run was expected to be average in size but was much weaker than projected. The run was a few days late compared to average run timing and was composed of two small and one moderately sized pulses. During the season, fall chum salmon escapements were projected to fall below the 300,000 escapement goal. Subsistence fishing time was reduced by about one third and personal use fisheries were closed for a portion of the run to assure that escapement goals in most areas would be met. The sport fishery was closed September 4, in accordance with the fall chum salmon management plan. Post season assessments have revised the drainage-wide escapement estimate and suggest that it was within the 300,000 to 600,000 escapement goal range. The preliminary postseason total run estimate was approximately 450,000–500,000 fall chum salmon. This is below the 1974–2008 averages of all years (876,000) and of odd numbered years (687,000). Extremely low water conditions and difficulties with test fishing for species apportionment probably resulted in conservative estimate of fall chum salmon and a possible overestimate of coho salmon at Pilot Station. The total commercial harvest was approximately 25,000 fall chum salmon, well below the recent five-year average of 114,000 fish.

The 2010 fall chum salmon run was well below average with late run timing. The run consisted of three pulses, with the last pulse the largest. Near the midpoint of the run, managers became concerned that the run was much weaker than expected and would likely not exceed 400,000 fish. There was also concern that the Canadian border escapement obligation would not be met. As a result, one subsistence fishing period was cancelled starting in district Y1 and continuing chronologically upriver through Y5C. Sport fishing and personal use fishing was closed in accordance with the Fall Chum Management Plan (5 AAC 01.249, Appendix C5). No commercial fishing periods directed at fall chum salmon were opened. Commercial fishing did open late in the season to target coho salmon in district Y1, Y2 and Y6. The preliminary total

Yukon area commercial harvest was 2,550 fall chum salmon. A preliminary estimate of the 2010 subsistence harvest of fall chum salmon is approximately 70,000 fish, below the most recent five year average (Appendix C2) due to low abundance and difficulties fishing during high water conditions. The preliminary mainstem Canadian escapement is estimated to be 120,000 fall chum salmon. This exceeds the one year interim escapement goal of 70,000 to 104,000 fish. The preliminary drainage-wide escapement of fall chum salmon was estimated to be about 410,000, within the escapement goal range of 300,000 to 600,000 fish.

Coho salmon have an overlapping, but somewhat later, run timing with fall chum salmon. The escapement assessment for coho salmon is quite limited and relies heavily on information from commercial and personal use harvests. The Pilot Station sonar is terminated during the coho run as are many of the other assessment projects due to expense and/or icing conditions. The only escapement goal that is presently in place for the Yukon River drainage is the Delta Clearwater River in the Tanana River drainage. The current escapement goal (5,200–17,000), was established in 2004, and replaced the previous minimum goal of 9,000 fish. The goal continues to be based on a boat survey during peak spawning.

The coho salmon run in 2009 was determined to be adequate to meet escapement needs. Coho salmon run timing was approximately normal and the Pilot Station sonar passage estimate of 207,000 was well above the average of 143,000 for the project. However, extremely low water conditions and difficulties with test fishing for species apportionment likely resulted in a conservative estimate of fall chum salmon and a possible overestimate of coho salmon at Pilot Station. The estimated escapement of coho salmon to the Delta Clearwater was 16,850 fish, well within the bounds of the escapement goal. The total commercial harvest was approximately 6,600 coho salmon and below the recent five-year average of 42,179 fish (Appendix C3).

Coho salmon have remained relatively stable in recent years with the 2010 run assessed at average to below average with later than average run timing. The Pilot Station Sonar has operated for an additional week in 2008, 2009 and 2010 (September 7). The escapement index in 2010 was 142,000 fish which is below the historical average of 151,000. The estimated escapement of coho salmon to the Delta Clearwater River was 5,926 fish, just above the lower bound of the escapement goal range. The estimate of the commercial harvest of coho salmon in the Alaska portion of the Yukon drainage for 2010 is approximately 3,750 fish, well below recent average harvests and among the lowest on record (Appendix C3).

Summary of Catch and Harvests in Yukon Salmon Sport Fisheries in 2009

Estimated sport harvest of king salmon from the entire Yukon Management Area (Tanana River excluded) was 27 (SE = 20) fish during 2009 (Tables 2 and 3). The 2009 estimated harvest is lower than recent estimates but within the range of other estimates from the past decade. The result continues to indicate the low level of harvest by sport anglers. Total sport catch (including harvested and released fish) of king salmon in the YMA was estimated to be 970 (SE = 661) fish in 2009 (Table 2). As in previous years, most of the estimated catch and harvest of king salmon during the 2009 season came from Lower Yukon River drainages. The Anvik and Andreafsky rivers have been the predominant sites in recent years.

Sport fisheries harvested an estimated 103 (SE = 72) chum salmon in 2009 (Tables 2 and 4). All reported harvests of chum salmon were from Lower Yukon River drainages, most of which came from the Anvik and Andreafsky rivers. Total catch of chum salmon (harvested and released)

from the recreational fisheries in 2009 was estimated to be 1,257 (SE = 654) fish, with most of this catch coming from the Andreafsky and Anvik rivers (Table 2).

Sport harvest of coho salmon during 2009 was estimated to be 849 (SE = 534) fish (Table 2). The recent 5-year average harvest was 413 coho salmon. Total catch from the sport fishery during the reporting period was estimated to be 4,076 (SE = 2,348); the 5-year average is 1,927. As with other salmon sport fisheries in the Yukon River drainage outside of the Tanana River drainage, most of the coho fishery occurs downstream of the Koyukuk River and primarily in the Anvik and Andreafsky rivers (Table 5).

The sport fisheries for these three principal species of salmon have all generally demonstrated stable or very modest increases in catch and harvest in recent years (Appendix B1). This modest growth is likely a result of improved run sizes beginning in 2002 and a relaxation of restrictive management. The weak king salmon runs experienced in 2008 and 2009 resulted in the first restriction in the sport fishery in several years. However, relative to the size and the productivity of the Yukon River system, the estimated sport harvest continues to be extremely light and is unlikely to impact the runs to a measurable degree.

Fishery Objectives and Management

Yukon River drainage commercial, subsistence, and personal use fisheries are managed by the Division of Commercial Fisheries. As with other fish and wildlife populations, subsistence use has been designated as the highest priority among beneficial uses. Management of these fisheries is complex due a wide range of stock-specific abundances, overlap of inter- and intra-specific run timing, the immense size of Yukon River drainage, allocation between numerous user groups and international management treaties. ADF&G is generally unable to manage individual stocks in this mixed stock fishery because of inadequate stock-specific information.

Guideline harvest ranges have been established for commercial fisheries targeting king salmon, summer chum salmon, and fall chum salmon throughout the Alaskan portion of the Yukon River drainage (5 AAC 05.360, 5 AAC 05.362, and 5 AAC 05.365). The ADF&G attempts to manage the commercial fisheries such that the harvest in each district is proportionally similar to respective guideline harvest ranges. Management plans have been developed and adopted by the BOF for summer and fall chum salmon (Appendices C4 and C5).

Under the current management strategy, the commercial fishery for coho salmon is incidental to the commercial fishery directed at fall chum salmon. In November 1998, the BOF adopted the *Yukon River Coho Salmon Management Plan* (5 AAC 05.369) and modified the plan in January 2007. This plan provides for a directed commercial fishery for coho salmon under specific circumstances. In most years, fall chum salmon will continue to be the primary species of management concern during the fall season with only incidental catches of coho salmon. In 2007 and 2008, sufficient numbers of fall chum salmon and coho salmon were present to meet conditions outlined in the *Yukon River Coho Salmon Management Plan* for a commercial fishery targeting coho salmon.

In response to the guidelines established in the *Policy for the Management of Sustainable Salmon Fisheries* (5 AAC 39.222; SSFP), the BOF classified the Yukon River king salmon stock as a yield concern in September 2000. This determination was based on an 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 return and harvest in 2001. The

BOF classified the Yukon River summer chum salmon stock as a management concern. This classification was based on a chronic inability to meet existing escapement goals for the summer chum salmon stock since 1998.

During the winter of 2000/2001, the BOF developed a rebuilding plan for Alaskan Yukon River king and chum salmon stocks in accordance with the SSFP. This plan emphasizes improving salmon spawning escapements while providing opportunities to maintain subsistence uses when surpluses are available. The BOF developed a subsistence salmon fishing schedule. The purpose of the schedule was to provide more equitable allocation of fish among subsistence fishers throughout the drainage and to improve the quality of the escapement.

ADF&G has developed a preseason management strategy in cooperation with the U.S. Fish and Wildlife Service (USFWS) staff annually since 2001. This strategy is described and distributed annually in an information sheet (Appendix C6). Since 2004, the preseason strategy has been to begin the season following the subsistence fishing schedule developed by the BOF. In the event of a poor run, the subsistence schedule will be further reduced to meet escapement goals. If the run is strong and surplus fish are available, the subsistence fishery will follow the pre-2001 schedule (open except before and after commercial openings) and commercial fisheries will be permitted.

Stocks of concern were reviewed by the BOF in October 2009. At that time ADF&G recommended that the BOF continue the classification of yield concern for king salmon. The BOF adopted ADF&G's recommendation.

Sport fisheries for salmon in the YMA have very limited impact on stocks of salmon, in comparison to commercial, subsistence, and personal use fisheries. There is very little effect that management of the sport fishery can have on the annual status of the various salmon stocks. Therefore, the goal of sport fishery management is to maintain a reliable level of opportunity for anglers to participate in the fisheries throughout the season. To this end, emergency actions to restrict harvest and/or inseason regulations for the sport fishery are generally not contemplated unless it becomes apparent that the size of the run is so small that restrictions in the subsistence fishery will be necessary. In the case of summer chum salmon and fall chum salmon management, the BOF has identified the threshold run size at which emergency restrictions in the sport and personal use fisheries will occur (Appendices C4, C5).

In 2009, two emergency orders were issued concerning the sport fisheries for Yukon River salmon stocks. As described under the section "Summary of Yukon Salmon Runs 2009–2010", the sport fishery for king salmon in the mainstem was closed preseason on June 1, 2009 and remained closed for the remainder of the season. In addition, sport fishery bag limits in Yukon River tributaries other than the Tanana River drainage were reduced from 3 to 1. This action was taken as part of a coordinated management effort to reduce the harvest of king salmon, particularly those migrating to Canada. On September 1, 2009 another emergency order was issued to close the sport fishery for fall chum salmon in the Yukon River drainage (excluding the Tanana River drainage). This action was taken as prescribed by the *Yukon River Drainage Fall Chum Salmon Management Plan* (5 AAC 01.249 (2)(c)) because inseason assessment of the run indicated that minimum escapement goals would not be attained. On August 20, 2010 an emergency order was issued to close the sport fishery for fall chum salmon in the Yukon River drainage (an additional order closed the Tanana River drainage as well). This action was taken as prescribed by the *Yukon River Drainage Fall Chum Salmon Management Plan* (5 AAC

01.249 (2)(c)) because inseason assessment of the run indicated that minimum escapement goals would not be attained.

Current Issues and Fishery Outlook

The primary issue concerning salmon fisheries is the uncertain performance of salmon returning to the Yukon River drainage. Another issue affecting all users (including recreational anglers) of stocks of salmon in the YMA is the claim by federal land management agencies to the right to manage fish and wildlife resources to provide a rural subsistence priority. The state of Alaska also provides for a priority subsistence use of these resources, but is unable to discriminate between rural and urban users due to constitutional restraints. There continues to be concern that federal regulations will result in loss of opportunity for non-subsistence uses of fish resources, particularly recreational uses. This concern was realized in 2001 when federal personnel issued a special action prior to the beginning of the season. The action closed salmon fishing in all waters where federal regulations apply in the Yukon and Kuskokwim rivers to all but qualified rural residents. This action precluded all use for commercial, recreational, and state subsistence purposes of salmon in waters in which the federal agencies have asserted jurisdiction.

The unanticipated closure of sport fisheries for king salmon in the Yukon River in 2000 and 2001 placed a severe economic burden on fledgling local businesses that directly or indirectly support sport anglers, without any real biological benefit. Maintaining a constant level of fishing opportunity throughout the season is critical for local economic benefits that can accrue from these cottage industries. Complete closure of the recreational fishery should be contemplated only when substantial subsistence restrictions are needed, and should be implemented by specific tributary.

The outlook for the 2011 king salmon run is uncertain but the run will likely be below average to poor. Weak king salmon runs realized in 2000 and 2001 produced below average returns through 2007. With improved run size since 2002 (due largely to conservative management), a stronger run in 2008 was anticipated, but did not materialize. In both 2007 and 2008 the proportion of fish of Canadian origin was down to 37% and 36%, which is lower than the average figure of about 50%. The 2008 and 2009 runs were the first in several seasons that were too weak to support a commercial fishery. King salmon escapements were met throughout the drainage in 2009 due to the unprecedented conservative management of the run. The king salmon run in 2010 was managed in a less conservative manner than in 2009 and escapements were disappointing and the Canadian Interim Management Escapement Goal was not attained. Considering the poor runs experienced in 2008, 2009 and 2010, we expect that there will be no commercial fishery directed at king salmon in the mainstem Yukon River in 2011. Depending on final run projections, very conservation management measures may need to be repeated in 2011. If a poor run develops, the sport fishery will be managed in a manner consistent with run strength. The intent of sport fishery management continues to be to provide a predictable level of opportunity for anglers throughout the season, while providing for conservative management of Yukon River drainage king salmon, particularly for fish bound for Canada.

Recent Board of Fisheries Action

In 1987, bag and possession limits were established throughout the drainage for sport fisheries for all salmon species. In 1994, the BOF opened the Ray River and the Yukon River within the Dalton Highway Corridor to king salmon fishing (Burr et al. 1998). The BOF adopted the *Yukon River King Salmon Management Plan* in January 2001 and modified the plan in 2002 (5 AAC

05.360). In this plan, the subsistence fishing schedule is described and guideline commercial fishing harvest ranges for Yukon River District are established. The *Yukon River Fall Chum Salmon Management Plan* (Appendix C4) was adopted in 1994 and has been subject to numerous modifications; the most recent in 2010. The *Yukon River Summer Chum Salmon Management Plan* (Appendix C5) was adopted in January 2001. A *Yukon River Coho Salmon Management Plan* was adopted in November 1998 and modified in 2010. The plan seeks to provide a directed commercial fishery on coho salmon stocks in the drainage.

Current or Recommended Research and Management Activities

Currently, there is no active research program concerning the salmon sport fishery in the Yukon River drainage because of the minor nature of the fishery.

The Anvik River is one of very few locations in the Yukon River drainage outside of the Tanana River drainage where catch and harvest of salmon has regularly been reported (Tables 3–5). Up to three sport fish guiding businesses presently use this drainage. These sport fisheries target king and coho salmon, primarily for catch-and-release. Resident species including northern pike, Arctic grayling, and Dolly Varden are sought as secondary targets. Most anglers participating in the fishery are guided and are nonresidents, although local residents do participate in the fishery. Current levels of harvest are low and are reflected in results from the SWHS. Over-flights of the Anvik River have been conducted periodically during early July to describe the distribution of angling effort during the peak of the king salmon season. Aerial surveys of the Anvik River sport fishery during the king season should be conducted in 2011.

YUKON RIVER NORTHERN PIKE

Background and Historical Perspective

Sloughs, interconnected lakes, and the lower sections of large rivers throughout most of the management area are inhabited by northern pike. Many of the lowland area waters are particularly noted for large northern pike.

In the Yukon River drainage, most fishing for northern pike occurs during the open water season. Northern pike are targeted in early summer immediately following spawning and throughout the summer months. Northern pike are often fished in the fall in combination with hunting activities. Some sport and subsistence harvest is taken during winter months through the ice with hook and line gear. Spearing and bow and arrow techniques are also legal means and account for a small proportion of the total harvest, but most sport harvest of northern pike is taken with rod and reel.

Historically, fishing for northern pike in the YMA has been conducted by Alaska residents near towns or villages or where access is provided by road or boat. New or recently reestablished sport fish guiding businesses are promoting opportunities to catch trophy northern pike in the Dall, Nowitna, Koyukuk, Kaiyuh/Khotol, Anvik and Innoko rivers (Table 6). In these remote locations where sport fish guiding services have become available, most of the angling effort is by guided anglers and most of the guided fishermen are nonresidents.

Within the YMA, most catch of northern pike has come from five primary locations: the Porcupine, Dall, Nowitna, Koyukuk, Innoko and Andreafsky rivers. The Porcupine and Koyukuk rivers are two of the largest tributaries of the Yukon River. Sport fishing within these

drainages is dispersed and site-specific fishing effort is light. The level of effort directed at northern pike in the Dall, Nowitna, and Innoko rivers is relatively larger.

Dall River. Northern pike populations situated near the Dalton Highway on the Yukon River have experienced more angling pressure than have populations in other parts of the drainage. Following construction of the highway in the mid-1970s, a summer season sport fishery targeting northern pike developed at the Dall River. Residents of Stevens Village located near the mouth of the Dall River expressed concern over encroachment by outside visitors and by what they perceived as a depletion of resources, particularly northern pike.

Because of these concerns and the increased use of this fish stock, a series of stock assessment projects and use survey studies were conducted on the population and the fishery between 1987 and 2001 (Arvey and DeCicco 1989; Arvey and Burkholder 1990; Burr and James 1996; Chythlook and Burr 2002). During this period, sport fishing regulations were changed from 10 per day without size limit to 5 per day with only 1 fish 30 inches or larger (1988). During 1999 and 2000, a management plan was developed by ADF&G, Stevens Village Office of Natural Resources, and USFWS which describes a management area for special management of northern pike (Appendix D1). In 2001, the BOF adopted a special regulation for the Dall River management area consistent with the recommendations of the management plan. For a more complete description of the issues, study results, planning efforts and management actions taken refer to Burr (2004).

Nowitna River. The Nowitna River enters the Yukon River approximately 81 miles (130 km) downstream from the mouth of the Tanana River. The Nowitna River was designated a Wild and Scenic River in 1980 and most of the mainstem of the river and its major tributaries are included within the boundaries of the Nowitna National Wildlife Refuge. The lower 50 miles (80 km) of the river pass through a large wetland as a single-channel meander with numerous connected oxbow lakes and sloughs.

The Nowitna River offers one of the best opportunities in Alaska for sport anglers to catch large northern pike and sheefish in a wilderness setting. Most (>75%) of the sport fishing effort occurs within the lower 30 miles (48 km) of the river and connected waters. The fishery occurs almost entirely during the open water season, with a substantial portion of the fishing effort and harvest of northern pike occurring during September concurrent with hunting activities. Both guided and unguided anglers participate in the fishery. In recent years, up to six sport fishing guides have registered with Nowitna NWR.

Innoko River. The Innoko River and its tributaries drain a large flat wetland area and the foothills of the Kuskokwim Mountains. The Innoko River enters the Yukon River near the village of Holy Cross. This river system, with its extensive wetlands, provides excellent habitat for whitefish and northern pike. The lower Innoko River and this part of the Yukon River continue to produce some of the largest northern pike in the state. In 1995 a sport fish guiding business catering to anglers seeking catch-and-release opportunities for trophy-sized northern pike began operating in the lower Innoko River, using a large houseboat as a movable base of operations. Nearby, on the Anvik River, a long-standing sport fishing lodge was renovated and reopened. More recently, additional smaller businesses have begun to provide sport fish guiding services in the Innoko River system; two of these businesses are operated by residents of the Holy Cross area.

Recent Fisheries Performance

Little quantitative information is available concerning the status of northern pike stocks in much of the YMA, but because of limited access, fishing effort is light except on those stocks near towns and villages where angling and subsistence gillnetting effort may be more intense.

In the most recent five and ten-year periods (2004–2008, 1999–2008) little change was observed in total harvest or catch from the Yukon River reporting area (Table 7). Harvest estimates for 1999–2008 averaged 1,981 compared with 1,909 for 2004–2008. Estimated harvest in 2009 was less, but well within the range of observed values in the period. Catch estimates during the most recent 5-year period averaged 21,221 showing a large degree of catch-and-release fishing for this species (Table 7). The estimate of total catch for 2009 was approximately 10,900 northern pike, about one-half of recent average catch estimates.

Dall River. Recent estimates of fishing effort and harvest in the Dall River sport fishery indicate that this fishery has, on average, remained stable. During the last five and ten-year periods, fishing effort at the Dall River averaged about 400 angler-days (Table 7).

Estimated harvests of northern pike from the Dall River have been higher than from other YMA locations in most recent years. In recent years this fishery has provided on average more than 15% of all northern pike harvested from the YMA. In 2001 and 2002, following the new regulation adopted by the BOF prior to the 2001 season, harvests were markedly reduced (Table 7). However, in 2003 harvests again increased with the estimated harvest in 2004 higher than other recent estimates.

Catch of northern pike since 1990 show a modest increasing trend, with the estimate for 2004 (11,900) far exceeding all other estimates. These results, combined with little change in fishing effort, suggest that catch rates may be increasing in this fishery. During this period the proportion of the northern pike catch that is released by anglers has increased. Between 1990 and 2000, 77% were released, compared with 90% released since 2000. Although the estimated total catch of northern pike from the Dall River in 2008 and 2009 were lower than other recent estimates, about 95% were released. The high proportion of released fish was expected with the adoption of the regulation in 2001 that requires the release of all northern pike between 30 and 48 inches. Results are also consistent with anecdotal accounts of anglers reporting good catches of fish larger than 30 inches with a few northern pike of much larger size.

Nowitna River. Until 2001, the Nowitna River accounted for about 15% of the sport fish harvest and 33% of the total catch of northern pike in the YMA (excludes the Tanana River drainage). In the recent 5-year period, the proportion of the YMA catch and harvest of northern pike from the Nowitna River has averaged about 9% of the harvest and 14% of the total catch of all Yukon River sites. This apparent change was, in part, the result of increased use of northern pike in other Yukon River drainage fisheries, notably the Dall River and Innoko River fisheries. In 2009, estimated harvest of northern pike from the Nowitna River was lower than recent average figures while estimated catch was higher. Estimated level of sport fishing effort (for all species) by guided and unguided anglers in the Nowitna River was approximately 300 angler-days in 2009 (Table 7).

A study was conducted in 1997 to assess stock status of northern pike in the Lower Nowitna River. The objectives of the study were to estimate abundance and size composition of northern pike in three sloughs connected to the river during early, mid, and late summer (Burr 1998; Burr

and Roach 2003). In addition to obtaining current information on this northern pike stock, the goal of the study was to formulate a sampling protocol that would facilitate future sampling of this and other similarly situated northern pike stocks. The study found large numbers of northern pike in mature age and size categories. However, although estimates of abundance were obtained, the magnitude of movement of fish in and out of these sloughs and between sloughs was far greater than anticipated and confounded the application of the study findings to future sampling efforts. The movements of individually marked fish indicate that northern pike using the lower 20 miles (32 km) of the river are part of a single large stock. The study concluded that the population is currently lightly exploited and the levels of fishing pressure were within sustainable limits. A recommendation of the study was to conduct a radiotelemetry experiment in the Lower Nowitna River in order to describe the timing and magnitude of seasonal movements of this stock (Burr and Roach 2003).

In 2005 a radiotelemetry study was initiated in the lower Nowitna River. The research goal of the study was to obtain an understanding of the seasonal movements of northern pike over a 2-year period. Knowledge of seasonal movements would facilitate representative sampling of northern pike in the lower 25 miles (40 km) of the drainage and assist in the design of future mark-recapture experiments within an appropriately sized index area and within an appropriate time period.

Movements of radiotagged northern pike in this study showed that some fish captured in the study area (lower 25 miles (40 km) of the river) traveled upstream of the Titna River (more than 100 river miles (161 km)) during late summer and remained there throughout the winter. Other fish remained within the study area, while still others traveled fifty or more miles up or downstream in the Yukon River. These preliminary results show that northern pike inhabiting the Nowitna River use a very large portion of the Nowitna River drainage during the annual cycle and should be considered as a single stock for management purposes. The field studies were completed in 2007 and the completion report is under review and should be available in 2011.

Innoko River. Estimates of sport fishing effort (for all species) in the Innoko River generally increased through 2004. Current fishing effort is estimated to be about 700 angler-days annually (Table 7). During this timeframe, estimates of harvest of northern pike have changed little, averaging less than 100 northern pike per year. In contrast, estimates of total catch increased to an average figure of about 10,000 fish between 2001 and 2006, but have been substantially lower in recent years. Estimated total catch in 2009 was about 3,375 northern pike. Most of the increase observed earlier in the decade was likely from guided anglers taking advantage of recently developed facilities and services.

In 2000–2001 a need was identified for better information on the status of northern pike stocks in the Innoko River drainage and on the patterns and levels of use by sport and subsistence fishers. Absence of current stock status studies was contributing to differing perceptions on the status and trends of the northern pike population in the area. Local perception was that reduced catch rates, fewer large fish, and a growing number of sport anglers indicated a stock at risk. ADF&G biologists believed that the northern pike stock was healthy based on the presence of exceptionally large fish, fish in old age classes and low harvest levels.

A stock assessment project of northern pike inhabiting the Innoko River was conducted in 2002–2004 (Scanlon 2009). The project used radiotelemetry to describe seasonal movements and

geographic area used by this stock. The project also provided information on the age and size composition of northern pike in the area.

A separate, but related, project was also conducted in 2002–2004 (Brown et al. 2005). The purpose of this project was to describe current subsistence use patterns of freshwater fish, including geographic distribution of subsistence fishing for northern pike during winter and summer. The project also gathered information on size and sex composition of the winter subsistence catch and tag returns from fish tagged during the summertime sport fishery.

These studies found that northern pike spawning in the Innoko River drainage travel extensively (> 200 miles (322 km) seasonally), but generally remain within the Innoko River drainage during the open water season (do not travel into the Yukon River or neighboring drainages). In contrast, during winter these fish were regularly found in the Yukon River near Holy Cross and Paimiut Slough.

Sport fishing effort in the Innoko River drainage is confined to the open water season and occurs within the Innoko River and connected lakes and sloughs. The open water season subsistence fishery primarily occurs in the Yukon River or at the mouth of tributaries. The winter subsistence fishery for northern pike occurs in both the Innoko River and in the nearby Yukon River. Along with residents of the Yukon River communities, an additional group of winter season subsistence users was identified during the study. Residents of communities situated on the Kuskokwim River travel across country during spring to harvest northern pike in the Lower Innoko/Paimiut slough area. The two fisheries (sport and subsistence) are therefore generally segregated in time and in geographic location. Annual movements of northern pike tracked with radiotelemetry, together with tag returns by the subsistence fishery of northern pike, marked from the sport fishery, demonstrate that the fish targeted by these two user groups are from a single stock migrating seasonally throughout a very large open system.

Several residents of the area expressed concern that activities of the emerging guided sport fishery is resulting in declining numbers of large northern pike. Both sport and subsistence fisheries selectively catch large northern pike. The sport fishery targets large fish because they are highly valued by sport anglers. Fishing mortality is believed to be low since nearly all sport fish guides in the area insist that their clients practice catch-and-release only fishing. The level of incidental mortality from catch-and-release fishing is not known, but is believed to be less than 10% based on other studies (e.g., Burkholder 1992). The subsistence fishery also targets large northern pike that are preferred for traditional foods. It is assumed that nearly all northern pike caught in the subsistence fishery are killed. Northern pike sampled from the winter subsistence fishery were large (24 to 41 inches) mostly females (62%) and nearly all fish (99%) were in pre-spawning condition. The proportion of northern pike in larger and older age classes may decrease if a substantial increase in fishing effort by one or both fisheries occurs.

Fishery Objectives and Management

The goal of management of northern pike in the YMA is to maintain naturally reproducing populations of northern pike with characteristics that will provide sport fisheries with qualities that are desired by anglers. Management of northern pike in most of the YMA is structured to encourage participation in the fishery through liberal harvest limits. These regulations reflect the light level of use of northern pike within most of the YMA. Liberal regulations also provide harvest opportunity with rod and reel gear for rural residents within the sport fish regulation framework. In areas where northern pike fisheries are more intensive, management seeks to

provide consumptive use (harvest), while maintaining northern pike in large size (>30 in TL) groups. As fishing effort increases, management for continued harvests will be structured around a bag limit of more than one northern pike, with a size limit structured to limit harvest of northern pike in large size groups.

ADF&G monitors sport fisheries with the SWHS to track levels of harvest and effort at various sites and to detect changes in the distribution of fishing among sites. Using this harvest data, selected fisheries are closely monitored with creel surveys and other research projects. Length composition is used as an indicator of stock status for northern pike populations; the presence of large size fish within samples collected is used as an indicator of lightly exploited riverine populations. ADF&G uses this information to remain responsive to changes in these fisheries.

A special regulation was established for the Dall River fishery following a public management planning effort. ADF&G, together with the Stevens Village Natural Resource Office, and interested fish and game advisory committees, jointly developed a *Fisheries Management Plan for the Dall River Northern Pike Fishery*. The goal of this planning process is to maintain a high quality northern pike stock for the benefit of local and non-local users. A summary of the current plan, including the shared policies, objectives, and issues/action items is found in Appendix D.

- The current objective for the Dall River northern pike fishery is to maintain the proportion of northern pike 30 inches and larger at 0.3 (30%) in the assessed population¹.

Current Issues and Fisheries Outlook

At the present time, all available information suggests that northern pike stocks in the Yukon River drainage are healthy. Levels of catch and harvest, although low, have remained stable or have increased modestly throughout the area. Where assessments of local stocks have been conducted, the presence of substantial portions of fish sampled in large size and old age categories further suggests light levels of exploitation.

Dall River. New regulations for the Dall River fishery were adopted by the BOF during January 2001 that require the release of all northern pike between 30 and 48 inches. As a result, the opportunity to harvest large northern pike in this fishery was greatly restricted. Current regulations provide for harvest of smaller northern pike and for catch-and-release fishing of large northern pike (bag limit is 4 fish less than 30 inches and 1 fish 48 inches or longer). While fishing effort and total harvest have changed little, current estimates suggest that catch rates may be increasing in this fishery. If catch rates of large fish increase, additional angler participation is expected for the fishery. Growth of the fishery will be closely monitored. Management efforts should be consistent with the shared goals outlined in the *Fisheries Management Plan for the Dall River Northern Pike Fishery*. The intended effect of the current regulation is to increase the survival of large northern pike, thereby increasing the size of fish available for catch-and-release. The outlook for fishing at the Dall River is good in terms of the number and size of fish expected to be available.

Nowitna River. The population of northern pike inhabiting the Nowitna River is not believed to be in danger of overexploitation. However, ADF&G recognized a need for new sport regulations

¹ The assessed population includes the portion of the population that is accessible to the sampling gear used in stock assessment. For the Dall River this includes fish larger than 19 inches TL (450 mm FL)

consistent with other popular northern pike sport fisheries in the Yukon and Tanana areas that would help to control the loss of large adult northern pike. In January 2007, the BOF adopted a proposal to reduce the harvest of large (≥ 30 inches) northern pike (bag limit of 5 fish, only 1 may be 30 inches or longer). As with other fisheries where a similar regulation has been established, the intent is to increase the survival of large northern pike and thereby increase the size of fish available for catch-and-release and allow for a limited harvest. With this regulation, the outlook for northern pike fishing in the Nowitna River is good with an increased proportion of larger fish available in the population over time.

Innoko River. Growth of the guided sport fishery for northern pike in the Innoko River is the source of concern for many residents of local GASH communities. Many residents of this area hold traditional beliefs and live traditional subsistence lifestyles. There is limited acceptance of catch-and-release fishing as practiced by many visiting anglers. Local residents have reported reduced catch rates during winter and summer fishing with rod and reel. Residents also are concerned over increased wintertime use of northern pike stocks by non-local rural residents. They report that groups travel from communities downstream in the Yukon River drainage and from the nearby Kuskokwim River area to subsistence fish for northern pike through the ice.

The stock of northern pike inhabiting the Lower Innoko River is not believed to be in danger of overharvest. Movements of radiotagged northern pike show that these fish travel extensively throughout a large area of connected rivers, lakes, and sloughs. The population size of northern pike in this area, though unknown, is likely to be very large. Approximately 3,000 northern pike were tagged with numbered Floy anchor tags between 2001 and 2004. Recapture rate in the sport fishery of these tagged fish has been less than 2% annually (Scanlon 2009). To date, only six of these tagged fish have been reported captured in the subsistence fishery. A substantial portion of fish in this stock are in old and large size categories as shown in samples collected during tagging (Scanlon 2009) and from the subsistence fishery (Brown et al. 2005). The large amount of undisturbed habitat, large population size, and presence of many size and age groups, combine to make this stock very resilient to moderate increase in fishing effort and harvest. Abundance of northern pike in the area is not likely to change due to overfishing. However, if either the subsistence use by local or non-local residents or the sport use grows substantially, a decrease in the proportion of very large and old fish is possible.

Recent Board of Fisheries Action

Current sport fishing regulations for northern pike in the YMA were established in 1987. Prior to 1987, there were no bag, possession, or size limits for northern pike within most of the area. Proposals submitted by ADF&G and adopted by the BOF in 1987 established the current background regulation of 10 per day, with no size limit for most of the YMA. Because of concern for the maintenance of Yukon River northern pike stocks near the Dalton Highway Bridge, the BOF adopted a more restrictive regulation of five per day, with only one fish ≥ 30 inches for Yukon River tributaries between the Hodzana and Tanana rivers.

Opening of the entire Dalton Highway to public travel in 1994 caused concern that increases in recreational use would result in localized depletions of freshwater fish populations in waters adjacent to the roadway. The BOF addressed this concern in 1994 by adopting new regulations for many of the resident fish species in the highway corridor (Burr et al. 1998). The northern pike bag and possession limit was reduced to five fish with only one 30 inches or larger.

Dall River. Current sport fishing regulations for the Dall River fishery were adopted by the BOF during January 2001. Regulations established special bag, possession and size limits for northern pike in the Dall and Little Dall River drainages. The regulations are consistent with the recommendations of the *Fisheries Management Plan for the Dall River Northern Pike Fishery*. Current regulations are:

- Open season – May 20–September 30;
- Bag and possession limit is four northern pike less than 30 inches and one fish 48 inches or larger;
- No harvest of northern pike 30–48 inches; and,
- No bait allowed.

Nowitna River. In 2007, the sport regulation for northern pike in the Nowitna River drainage was reduced from 10 per day without size limit to five fish with only one 30 inches or larger. The intent of this regulation is to reduce the harvest of large fish (>30 inches) as discussed above.

Innoko River. In 2001, the BOF adopted regulations governing the sport fishery for northern pike in the Innoko River. The bag limit is three northern pike per day of which only one may be 30 inches or larger. The sport fishery regulation adopted for the Innoko River fishery is consistent with the regulatory strategy outlined in the *Yukon River Northern Pike Fishery Management Plan* and recommendations of the GASH AC.

Current or Recommended Research and Management Activities

The northern pike sport fishery in the YMA has gained a higher profile as a result of better access provided by guiding services and facilities established in recent years. ADF&G will continue to monitor levels of fishing effort, catch and harvest throughout the YMA with the intent of identifying additional sites for stock assessment. To ensure the quality of these stocks continues, careful monitoring of sport fishing effort, catch, and harvest is needed with anticipated growth in both sport and subsistence fisheries.

Dall River. To assess the effectiveness of the new protected slot length limit established in 2001, it will be necessary to assess the Dall River northern pike stock periodically with the goal of estimating the proportion of northern pike larger than 30 inches (the lower end of the current slot limit). A need for better methodology for assessing length compositions of northern pike stocks in large open riverine systems has been identified. A field project initiated on Birch Creek in 2007 seeks to assess proposed methodology.

Nowitna River. The popular Nowitna River fishery continues to provide a substantial portion of the total catch and harvest of northern pike in the YMA. Field work for the radiotelemetry study of northern pike inhabiting the Lower Nowitna River was completed in 2007. Complete analysis of these data and completion of the report should provide a clearer understanding of the geographic range, spawning areas, and annual movements of this stock. Further assessment of the characteristics of the sport fishery and of the northern pike stock inhabiting the lower portion of the Nowitna River may be recommended depending on the results of the radiotelemetry study.

Innoko River. Given the potential impact by growth in the sport and subsistence fisheries on the proportion of large northern pike present in the Lower Innoko River, ADF&G will closely monitor these fisheries for growth in fishing effort or changes in patterns of use. In addition to closely inspecting estimates of catch, effort, and harvest in the sport fishery, ADF&G should establish a sampling protocol to monitor changes in proportion of large fish in the sport fish catch.

Seasonal movements and age and size composition of northern pike in the Innoko River upstream of Shageluk should be investigated. According to information recorded by Brown et al. (2005), this area (Holikachuk to several miles upstream of Iditarod) is especially important to residents of Shageluk and Grayling for harvesting freshwater fish. The guided sport fishery also targets northern pike in the area. The northern pike stock in this area is believed to be generally distinct from the lower Innoko River stock studied by Scanlon (2009) and Brown et al. (2005). To date, no movement of northern pike between these areas has been detected by recapture of Floy tagged fish or by movements of radiotagged fish.

YUKON RIVER ARCTIC GRAYLING

Background and Historical Perspective

Arctic grayling are distributed throughout the entire drainage, from extreme headwaters in Canada to streams that originate in the Yukon Delta. Sport fishing effort is likewise widespread. Historic documentation of harvests (Mills 1979-1994; Howe et al. 1995, 1996, 2001a-d; Walker et al. 2003; Jennings et al. 2004, 2006a-b, 2007, 2009a-b, *In prep*) indicates that the heaviest sport utilization has occurred in the middle part of the Yukon River drainage, between the Porcupine River downstream to the Koyukuk River. Within this section, most of the catch and harvest comes from the Koyukuk River tributaries, including those that are crossed by the Dalton Highway. Improved road access has also been provided to Nome and Beaver creeks, and other popular Middle Yukon River sites. In addition, an important component of the catch (but not harvest) of Arctic grayling comes from the Anvik River in the Lower Yukon River section. Most of this fishing effort is believed to come from clients staying at a fishing lodge located on the Upper Anvik River. Virtually all other Arctic grayling harvests in the drainage are from streams that have no, or very limited, road access. Historic sport effort and harvests in these systems are estimated to be small relative to road accessible streams (Table 8).

Dalton Highway. The sport fishery for Arctic grayling from Koyukuk River tributaries accessed from the Dalton Highway (Haul Road) account for about 50% of the harvest and 60% of the catch of Arctic grayling from the entire Koyukuk River drainage (Table 8). Given the relatively small portion of the Koyukuk River drainage that is accessible from the Dalton Highway, Arctic grayling stocks along this road are subjected to the highest level of use by anglers in the drainage.

The Jim River (Dalton Highway) supports the largest regional stock, and in many years, the largest harvest by sport anglers (Fish 1997; Table 8). The Jim River is one of the most accessible of the streams crossed by the Dalton Highway because the road parallels the stream for many miles. In contrast, most other streams generally flow perpendicular to the roadbed. Between 1995 and 1997, studies were conducted to obtain baseline abundance and composition data for stocks of Arctic grayling in rivers and streams crossed by the Dalton Highway. Studies concluded that catchability of fish in the Jim River is not affected by accessibility from the

highway, and that fishing pressure at easily accessible locations along the river is probably not great enough to cause changes in catchability throughout the summer (Fish 1997).

A study of the movement of Arctic grayling captured in the Jim River summer fishery was conducted in 1997 and 1998 using radiotelemetry. The goals of the study were to locate spawning and overwintering habitats of Arctic grayling and to determine the fidelity of Arctic grayling to summer feeding grounds in the Jim River. This study found that most fish tagged in the Jim River remain in the Jim River through the winter (Fish 1998). A smaller proportion (about 35%) wintered in other locations, including the South Fork Koyukuk River, the Middle Fork Koyukuk River and Prospect Creek. During the spawning season, most Arctic grayling were located in the Jim River in either the fishery area or in the lower Jim River. Some fish (< 20%) were located during the spawning season in Fish Creek, Prospect Creek, and the South Fork Koyukuk River. The migration characteristics and patterns of habitat use are very similar to those of other stocks of Arctic grayling inhabiting other clearwater rapid-runoff rivers in Interior Alaska (Tanana Valley). This study suggests that Arctic grayling in the Jim River are probably a distinct stock of fish that may share overwintering and feeding habitat with other related Koyukuk River stocks.

In 2000 and 2001, a study was conducted to estimate maturity schedules for Arctic grayling in the Jim River (Gryska 2003). This study found that Arctic grayling in this system mature at larger size and at an older age than do Arctic grayling in the Chena River; 50% maturity was estimated at 7 years and at about 300 mm FL (13 inches TL) compared with 5 years and 270 mm (12 inches TL) for the Chena River stock. In January 2004, the Alaska BOF adopted new regulations for the Dalton Highway Arctic grayling fishery. The 12 inch minimum length limit was rescinded; the bag limit remained at five fish.

Nome/Beaver Creek. Excellent access has been provided to Beaver Creek by way of the improved road to Nome Creek. Beginning in the early 1990s, BLM upgraded the roadbed and initiated construction of multiple campgrounds. In 1999, construction of the campgrounds and the expanded road system leading to Nome Creek and its confluence with Beaver Creek was completed. This road system is located near the Fairbanks population center and has resulted in increased visitor use and an increased catch of Arctic grayling in this area.

Baseline studies conducted by BLM during the late 1980s indicated a very small resident Arctic grayling population in Nome Creek. Concern over increased fishing effort and potentially high levels of exploitation of the Arctic grayling stock in this 3rd order tributary prompted ADF&G to propose increasingly restrictive regulations for Nome Creek, culminating in the current catch-and-release only regulation that was adopted by the BOF in the winter 1994–1995.

During 2000, a mark-recapture experiment was conducted in a 30-mile section of Beaver Creek (excluding Nome Creek) to assess the Arctic grayling population (Fleming and McSweeney 2001). The study found a very high population density (1,325 fish per river mile) of small Arctic grayling (>150 mm FL, most 220–250 mm FL) with age classes age-3 and age-4 dominating. The density of Arctic grayling larger than 250 mm FL in the study area was substantially less (200–350 fish per river mile), with larger fish distributed farther upstream in general. As a result of this information, a new sport fishing regulation (bag limit of five fish, no size limit) was adopted for Beaver Creek during the 2001 BOF meeting.

Recent Fishery Performance

Estimated average harvest of Arctic grayling from the YMA in the recent 5-year period (2004–2008) was 2,710 fish, which reflects little change over historic levels (2,915 fish, 1999–2008). In 2009, an estimated 2,773 grayling were harvested. Catch estimates for the YMA have averaged about 22,400 annually since 1999; estimated catch in 2009 was approximately 23,000 Arctic grayling (Table 8). These data reflect a continued low, but stable, level of use of the species in the YMA as a whole.

Dalton Highway. Sport fisheries for Arctic grayling in the YMA along the Dalton Highway (Haul Road) have harvested an average of approximately 300 fish annually since 1999. In most years, more Arctic grayling are harvested from the Jim River than from the other streams along the roadway (Table 8). In 2005 and 2006, no Arctic grayling harvest was reported from the Jim River, but harvest from the Jim River typically accounts for 30% or more of the Dalton Highway total. In 2009, only 57 (17%) of the estimated 339 Arctic grayling harvested from the Dalton Highway were from the Jim River. Total estimated catch from waters along the Dalton Highway since 1999 has averaged about 3,800 fish of which about 2,300 came from the Jim River (Table 8). In 2009 the estimated catch for the Dalton Highway Arctic grayling fishery was 3,300 fish, lower than the past three recent estimates. Annual fluctuations in angler effort, catch and harvest are typically related to weather conditions or other factors unrelated to fish population abundance. For example, high water in July and large forest fires along the Dalton Highway corridor in 2005 combined to yield very low levels of use of the resource by anglers.

Nome/Beaver Creek. The SWHS combines Beaver Creek and Nome Creek data into a single estimate. The estimated annual catch of Arctic grayling from Nome and Beaver creeks averaged approximately 6,000 fish for the most recent 5-year period (Table 8). Estimated catch from 2009 was approximately 3,900 fish. The harvest of Arctic grayling from Beaver Creek (Nome Creek is closed to harvest) has averaged about 400 fish during the last 5- and 10-year periods.

Fishery Objectives and Management

Management strategies for Arctic grayling stocks in the YMA are found in the *Yukon River Area Wild Arctic Grayling Management Plan* (5 AAC 73.055). The goal of management is to maintain naturally reproducing populations of Arctic grayling with characteristics that are sustainable and are desirable to the public.

The “regional management approach” for sport fishery regulation is currently applied to all Arctic grayling fisheries in the YMA except for Nome Creek in the Beaver Creek drainage. Under the regional regulation, the bag limit is five fish, bait is permitted, and the season is open year round. The Nome Creek fishery is regulated under the “special management approach”. In Nome Creek, the fishery is open year round, but is restricted to catch-and-release. In addition, from April 1 through May 31, only unbaited, single-hook, artificial lures may be used. To date, fishery objectives are in place for two fisheries in the YMA: the Dalton Highway and Nome/Beaver Creek.

Dalton Highway. The fishery objective for the Dalton Highway Arctic grayling fishery is to maintain total harvest of Arctic grayling from the Jim River below 10% of the estimated abundance of fish larger than 250 mm FL in the assessed area. The most recent applicable estimate of abundance is 12,000 fish (Fish 1998). Catch and harvest estimates from the SWHS provide the measure of fishing mortality. For the purpose of this management scheme, 10% of

all fish released are added to the estimate of harvest to incorporate mortality of released fish. The performance of the Jim River Arctic grayling fishery will serve as a proxy for the Arctic grayling fishery in the Yukon drainage portion of the Dalton Highway.

New regulations for the Dalton Highway Arctic grayling fishery were adopted in January 2004:

- Bag and possession limit is 5 fish, no size limit.

The length limit (12 inch minimum size, adopted in 1994) was rescinded for this fishery because all estimates of effort and harvest, and stock status studies indicated that these stocks could sustain greater levels of harvest. Also, the 12 inch minimum length limit that had been in place was not large enough to attain the goal of delaying recruitment to the fishery until maturity was attained (Gryska 2003). In order to be effective at protecting pre-spawning fish, the length limit would need to be increased to at least 13 inches. If it becomes necessary to reduce fishing mortality on these stocks, a reduction in bag limit with no length limit is recommended.

Nome/Beaver Creek. The goal of management for Nome Creek is to minimize fishing mortality of Arctic grayling within this small tributary of Beaver Creek with a catch-and-release fishery.

The fishery objective for Beaver Creek is to maintain total harvest of Arctic grayling below 10% of the estimated abundance of fish larger than 250 mm FL in the assessed area. The most recent estimate of abundance of grayling larger than 250 mm FL in the assessed area is 9,900 fish (Fleming and McSweeney 2001). Catch and harvest estimates from the SWHS provide the measure of fishing mortality. For the purpose of this management scheme, 10% of all fish released are added to the estimate of harvest to incorporate mortality of released fish.

Current sport fishing regulations were adopted by the BOF for Beaver Creek Arctic grayling fishery in January 2004. The current regulations for Nome Creek and Beaver Creek are:

- Only unbaited, single hook, artificial lures may be used April 1 – May 31;
- Nome Creek – catch-and-release only for the entire year; and,
- Beaver Creek (from its headwaters downstream to its confluence with the Yukon River, except for Nome Creek) – bag and possession limit is 5 fish, no size limit.

Current Issues and Fishery Outlook

Dalton Highway. Local roadside depletion of fish stocks near crossings of the Koyukuk River tributaries by the Dalton Highway has been a concern because such depletions would reduce angling opportunity for sport fishers traveling this route. A study (Fish 1997) concluded that catchability of fish in the Jim River was not affected by accessibility from the highway, and that fishing pressure at easily accessible locations along the river is not great enough to cause changes in catchability throughout the summer.

Substantial increases in the levels of angler effort, catch, and harvest have been expected as a result of the large improvements in the road surface (most of the highway north of the Yukon River and south of Wiseman was paved beginning in 2001). However, while modest increases in visitor use have been recorded at the visitor center in Coldfoot (Appendix E1), only the most recent estimates (2006–2009) of angler effort and Arctic grayling catch has reflected any evidence of significant increases in the sport fishery. With better road access and with a somewhat less restrictive sport fishing regulation, ADF&G anticipates that the participation in the road-side fishery for Arctic grayling will increase.

Prior to the 2004 season, the minimum length limit was rescinded from the regulation for the Dalton Highway Arctic grayling sport fishery. A modest increase in the harvest of Arctic grayling from area waters was expected and was realized. However, estimated harvests since 2004 have remained substantially below the established harvest threshold of 1,200 fish, (or 10% of 12,000, the last abundance estimate for Arctic grayling in the Jim River). Continued modest increases in angler effort, catch, and harvest are expected in this fishery. Results from the SWHS and the survey from the visitor center in Coldfoot will be reviewed annually to detect changes in this fishery.

In addition to changes in the sport fishery, a new gillnet subsistence fishery in these streams was authorized by the BOF during winter 2004. To date, only two individuals have participated in this new permit fishery and harvests have been insignificant. If this permit fishery grows, the additional subsistence harvest will need to be factored into the estimated annual harvest. In this case, due to the state's subsistence priority, adjustments would be needed in the regulation of the sport fishery to ensure that harvest levels remain sustainable.

Nome Creek/Beaver Creek.

Improved access to Beaver and Nome creeks has resulted in a growing sport fishery for Arctic grayling, particularly in Nome Creek (catch-and-release fishery). Only modest increases in visitor use and in angling effort are anticipated as the recreational destination becomes more popular. With adoption of new regulations in 2001, no changes in the fishery regulations for Nome and Beaver creeks are anticipated. Current annual harvest levels from Beaver Creek have not yet approached the 1,000 fish threshold level established in the objective for this fishery.

Recent Board of Fisheries Action

Dalton Highway. In 1994, the BOF reduced the bag and possession limit for Arctic grayling within the Dalton Highway Corridor from 10 to 5 fish and added a minimum length limit of 12 inches. This action was taken in response to increases in recreational use and harvest (Burr et al. 1998). As described above (Fisheries Objectives and Management), the 12 inch minimum size limit was rescinded in 2004.

Nome Creek/Beaver Creek. In 1994, the BOF adopted a catch-and-release only regulation for Arctic grayling in Nome Creek in anticipation of continued increasing recreational use of this small tributary of Beaver Creek. In January 2004, the sport fishery bag limit regulation for Beaver Creek from its headwaters downstream to its confluence with O'Brien Creek, except for Nome Creek, was reduced from 10 to 5 per day.

Current or Recommended Research and Management Activities

At present, there is little concern for overharvest of Arctic grayling in streams crossed by the Dalton Highway or in the Nome/Beaver Creek fishery. Conservative annual sustainable harvest target levels have been established.

Dalton Highway. A reassessment of the stocks will be needed as fishing effort and harvests increase and begin to approach threshold use levels. In addition, a concurrent on-site creel census is recommended to better describe the sport fishery.

Nome Creek/Beaver Creek. A reassessment of the Arctic grayling stock inhabiting Nome Creek (Beaver Creek drainage) is recommended to determine if a sustainable harvest opportunity currently exists.

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TABLES

Table 1.–Fishing effort (angler-days) for the Yukon Management Area, Region III, and Alaska, 1977–2009.

Year	Yukon Angler-days	Percent of Region	Region III Angler-days	Percent of State	Statewide Angler-days
1977	4,729	4%	123,161	10%	1,197,590
1978	6,314	4%	145,492	11%	1,285,063
1979	7,714	6%	126,096	9%	1,364,739
1980	6,849	4%	160,266	11%	1,488,962
1981	6,679	4%	148,886	10%	1,420,172
1982	11,034	6%	198,791	12%	1,623,090
1983	11,070	6%	199,361	12%	1,732,528
1984	6,358	3%	199,041	11%	1,866,837
1985	8,670	5%	186,883	10%	1,943,069
1986	9,381	5%	194,713	9%	2,071,412
1987	7,017	3%	217,109	10%	2,152,886
1988	8,261	4%	233,559	10%	2,311,291
1989	10,712	4%	239,629	11%	2,264,079
1990	15,539	6%	245,629	10%	2,453,284
1991	10,749	5%	219,922	9%	2,456,328
1992	12,831	7%	181,852	7%	2,540,374
1993	14,011	6%	220,972	9%	2,559,408
1994	12,872	6%	209,987	8%	2,719,911
1995	18,677	7%	270,141	10%	2,787,670
1996	10,678	5%	201,166	10%	2,006,528
1997	12,725	5%	238,856	11%	2,079,514
1998	10,127	4%	227,841	12%	1,856,976
1999	12,906	4%	304,522	12%	2,499,152
2000	11,327	5%	241,574	9%	2,627,805
2001	10,531	5%	194,138	9%	2,261,941
2002	15,044	7%	220,276	10%	2,259,091
2003	9,117	4%	206,705	9%	2,219,398
2004	13,109	6%	217,041	9%	2,473,961
2005	8,965	5%	183,535	7%	2,463,929
2006	11,423	7%	175,274	8%	2,298,092
2007	11,394	6%	204,032	8%	2,543,674
2008	12,973	7%	183,084	8%	2,315,601
2009	10,608	5%	194,593	9%	2,216,445
Averages					
1999–2008	11,679	6%	218,545	9%	2,396,264
2004–2008	11,573	6%	192,593	8%	2,419,051

Table 2.—Number of fish harvested and total catch by species by recreational anglers within the Yukon Management Area, 1994–2009.

Year	All Fish Total	Pacific Salmon					
		Total	King	Coho	Sockeye	Pink	Chum
Harvest							
1994	9,445	1,228	410	728	0	0	90
1995	7,311	388	37	162	0	0	189
1996	9,036	656	128	432	0	30	66
1997	7,328	606	221	179	0	0	206
1998	6,969	861	207	154	64	85	351
1999	7,434	272	22	158	11	0	81
2000	6,103	407	99	244	0	0	64
2001	7,308	191	12	126	0	0	53
2002	9,655	639	8	551	3	0	77
2003	6,205	311	99	160	0	24	28
2004	10,432	1,318	194	907	79	33	105
2005	7,954	729	0	360	78	0	291
2006	6,088	794	101	371	0	54	268
2007	5,627	873	411	258	0	0	204
2008	5,793	636	155	171	0	0	310
2009	7,037	979	27	849	0	0	103
Averages							
1994–2008	7,513	661	140	331	16	15	159
1999–2008	7,260	617	110	331	17	11	148
2004–2008	7,179	870	172	413	31	17	236
Catch							
1994	36,015	1,979	510	1,109	9	0	351
1995	32,282	1,453	177	542	0	0	734
1996	57,857	5,354	2,785	813	0	964	792
1997	41,491	1,633	673	386	30	28	516
1998	40,070	6,206	456	385	1,019	802	3,544
1999	45,136	1,503	56	804	343	0	300
2000	41,907	1,651	562	684	0	39	366
2001	41,269	1,834	315	822	0	0	697
2002	63,955	1,486	18	1,064	3	38	363
2003	56,760	9,240	850	3,386	21	53	4,930
2004	91,804	10,492	1,088	4,329	678	1,041	3,356
2005	47,429	4,188	455	504	151	848	2,230
2006	64,380	5,486	438	1,640	183	514	2,711
2007	49,572	6,725	2,681	1,887	0	0	2,157
2008	39,378	6,836	685	1,277	113	2,072	2,689
2009	46,976	6,337	970	4,076	34	0	1,257
Averages							
1994–2008	49,954	4,404	783	1,309	170	427	1,716
1999–2008	54,159	4,944	715	1,640	149	461	1,980
2004–2008	58,513	6,745	1,069	1,927	225	895	2,629

-continued-

Table 2.–Page 2 of 2.

Year	Non-Salmon						
	Total	Lake Trout	Dolly Varden Arctic Char	Arctic Grayling	Sheefish	Northern Pike	Burbot
Harvest							
1994	8,217	59	488	4,574	391	1,968	145
1995	6,923	66	122	3,421	476	1,937	216
1996	8,380	9	881	4,000	606	2,502	203
1997	6,722	0	344	3,456	231	1,870	415
1998	6,108	27	205	3,912	258	1,452	133
1999	7,162	545	203	3,164	133	2,418	168
2000	5,696	55	373	3,279	372	1,277	118
2001	7,117	56	368	3,193	492	1,772	50
2002	9,016	147	551	2,832	538	3,291	1,160
2003	5,894	57	358	3,131	238	1,507	594
2004	9,114	98	167	3,271	1,352	3,656	111
2005	7,225	171	130	2,883	1,348	1,899	534
2006	5,294	6	174	2,041	540	1,134	741
2007	4,754	40	181	2,824	177	1,281	60
2008	5,157	33	36	2,531	462	1,577	279
2009	6,058	76	381	2,773	210	1,265	789
Averages							
1994–2008	6,852	91	305	3,234	508	1,969	328
1999–2008	6,643	121	254	2,915	565	1,981	382
2004–2008	6,310	76	138	2,710	776	1,909	345
Catch							
1994	34,036	177	1,779	15,951	1,121	11,694	152
1995	30,829	155	751	11,454	1,335	15,828	288
1996	52,503	60	1,938	21,417	2,915	25,502	212
1997	39,858	70	1,448	23,318	453	13,367	687
1998	33,864	74	1,991	18,318	568	12,349	149
1999	43,633	1,330	2,104	18,432	812	20,213	168
2000	40,256	166	1,678	23,024	1,144	13,589	130
2001	39,435	56	1,619	16,000	1,531	18,788	57
2002	62,469	1,596	2,142	19,194	1,483	35,975	1,217
2003	47,520	296	2,837	24,465	769	18,392	648
2004	81,312	553	2,420	32,455	5,329	39,762	178
2005	43,241	540	407	20,940	1,999	18,332	534
2006	58,894	26	984	23,718	8,298	24,335	766
2007	41,257	79	1,590	25,458	318	15,021	75
2008	32,542	58	1,332	20,687	834	8,655	286
2009	40,639	281	1,681	22,767	1,717	10,931	898
Averages							
1994–2008	45,550	349	1,668	20,989	1,927	19,453	370
1999–2008	49,216	470	1,711	22,437	2,252	21,306	406
2004–2008	51,760	251	1,347	24,652	3,356	21,221	368

Table 3.—Sport harvest of king salmon in the Yukon River drainage, 1999–2009.

Harvest	Year											Averages	
	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	1999–2008	2004–2008
Yukon R. drainages (Ft. Yukon to Canadian Border)													
Subtotal^a	0	0	0	0	0	0	0	0	0	0	0	0	0
Fortymile River	0	0	0	0	0	0	0	0	0	0	0	0	0
Charley River	0	0	0	0	0	0	0	0	0	0	0	0	0
Yukon R. drainages (Koyukuk R. to Ft. Yukon)													
Subtotal^a	22	81	12	0	0	35	0	0	0	15	0	17	10
Porcupine River	0	0	0	0	0	0	0	0	0	0	0	0	0
Chandalar River	0	0	0	0	0	0	0	0	0	0	0	0	0
Beaver and Nome Creeks	0	0	0	0	0	0	0	0	0	0	0	0	0
Dall River	0	0	0	0	0	0	0	0	0	0	0	0	0
Haul Road Streams	0	0	0	0	0	0	0	0	0	0	0	0	0
Nowitna River	0	12	0	0	0	35	0	0	0	0	0	7	18
Melozitna River	0	0	0	0	0	0	0	0	0	0	0	0	0
Koyukuk River	22	9	0	0	0	0	0	0	0	0	0	4	0
Yukon R. drainages (downstream from Koyukuk R.)													
Subtotal^a	0	18	0	0	99	159	0	101	411	140	27	93	162
Nulato River	0	0	0	0	0	0	0	0	0	0	0	0	0
Anvik River	0	0	0	0	60	147	0	48	250	140	10	65	117
Innoko River	0	0	0	0	0	0	0	0	0	0	0	0	0
Andreafsky River	0	18	0	0	39	11	0	53	161	0	17	28	45
Total^b	22	99	12	8	99	194	0	101	411	155	27	110	172

^a Water bodies listed below are the key systems included in the subtotal.

^b Total may exceed the sum of subtotals because fishing site(s) not specified.

Table 4.—Sport harvest of chum salmon in the Yukon River drainage, 1999–2009.

Harvest	Year											Averages	
	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	1999–2008	2004–2008
Yukon R. drainages (Ft. Yukon to Canadian Border)													
Subtotal^a	0	0	0	0	0	0	0	0	0	0	0	0	0
Fortymile River	0	0	0	0	0	0	0	0	0	0	0	0	0
Charley River	0	0	0	0	0	0	0	0	0	0	0	0	0
Yukon R. drainages (Koyukuk R. to Ft. Yukon)													
Subtotal^a	81	0	21	0	0	0	0	26	0	0	26	13	5
Porcupine River	0	0	0	0	0	0	0	0	0	0	0	0	0
Chandalar River	0	0	0	0	0	0	0	0	0	0	0	0	0
Beaver and Nome Creeks	0	0	0	0	0	0	0	0	0	0	0	0	0
Dall River	0	0	0	0	0	0	0	0	0	0	0	0	0
Haul Road Streams	0	0	0	0	0	0	0	0	0	0	0	0	0
Nowitna River	0	0	0	0	0	0	0	0	0	0	0	0	0
Melozitna River	0	0	0	0	0	0	0	0	0	0	0	0	0
Koyukuk River	81	0	21	0	0	0	0	0	0	0	26	10	0
Yukon R. drainages (downstream from Koyukuk R.)													
Subtotal^a	0	64	32	77	28	105	291	242	204	310	77	135	230
Nulato River	0	0	0	53	0	0	26	33	0	0	0	11	12
Anvik River	0	64	32	9	28	49	90	0	197	310	77	86	162
Innoko River	0	0	0	0	0	0	0	0	0	0	0	0	0
Andreafsky River	0	0	0	15	0	56	175	209	0	0	0	46	88
Total	81	64	53	77	28	105	291	268	204	310	103	148	236

^a Water bodies listed below are the key systems included in the subtotal.

Table 5.—Sport harvest of coho salmon in the Yukon River drainage, 1999–2009.

Harvest	Year											Averages	
	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	1999–2008	2004–2008
Yukon R. drainages (Ft. Yukon to Canadian Border)													
Subtotal^a	0												
Fortymile River	0	0	0	0	0	0	0	0	0	0	0	0	0
Charley River	0	0	0	0	0	0	0	0	0	0	0	0	0
Yukon R. drainages (Koyukuk R. to Ft. Yukon)													
Subtotal^a	0	129	0	0	57	52	0	0	0	0	0	24	10
Porcupine River	0	0	0	0	0	0	0	0	0	0	0	0	0
Chandalar River	0	0	0	0	0	0	0	0	0	0	0	0	0
Beaver and Nome Creeks	0	0	0	0	12	0	0	0	0	0	0	1	2
Dall River	0	0	0	0	0	0	0	0	0	0	0	0	0
Haul Road Streams	0	0	0	0	0	0	0	0	0	0	0	0	0
Nowitna River	0	25	0	0	0	0	0	0	0	0	0	3	0
Melozitna River	0	0	0	0	0	0	0	0	0	0	0	0	0
Koyukuk River	0	0	0	0	0	52	0	0	0	0	0	5	10
Yukon R. drainages (downstream from Koyukuk R.)													
Subtotal^a	85	115	80	551	103	855	360	371	258	171	849	295	403
Nulato River	0	0	0	0	0	0	0	0	0	0	0	0	0
Anvik River	85	53	23	56	69	457	0	136	29	123	213	100	149
Innoko River	0	61	0	0	0	0	0	0	0	0	0	6	0
Andreafsky River	0	37	0	412	0	45	360	208	210	0	188	127	165
Total	158	244	126	551	160	907	360	371	258	171	849	331	413

^a Water bodies listed below are the key systems included in the subtotal.

Table 6.—Sport harvest of northern pike in the Yukon River drainage, 1999–2009.

	Year											Averages	
	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	1999–2009	2004–2008
Yukon R. drainages (Ft. Yukon to Canadian Border)													
Subtotal^a	19	102	0	259	12	60	0	160	68	74	24	75	72
Fortymile River	0	0	0	0	0	0	0	86	0	0	0	0	0
Charley River	0	0	0	0	0	0	0	0	0	0	0	0	0
Yukon R. drainages (Koyukuk R. to Ft. Yukon)													
Subtotal^a	2,032	1,108	333	1,899	992	2,428	724	834	831	1,351	652	1,253	1,234
Porcupine River	9	10	47	774	206	45	0	77	23	39	18	123	37
Chandalar River	0	10	0	0	0	0	0	0	0	7	0	0	0
Birch Creek	19	29	28	0	0	15	19	0	0	264	0	37	60
Beaver & Nome Crks	16	38	0	157	28	0	47	0	25	60	10	37	26
Dall River	862	257	13	115	246	1,252	268	146	306	13	203	348	379
Haul Road Streams	0	0	0	0	0	0	0	55	0	0	0	6	11
Nowitna River	286	201	0	114	12	181	0	197	172	130	70	129	136
Melozitna River	8	0	0	13	0	0	0	0	0	0	0	2	0
Koyukuk River	634	204	97	299	111	629	265	241	92	622	0	319	370
Yukon R. drainages (downstream from Koyukuk R.)													
Subtotal^a	358	102	1,439	1,122	549	1,002	1,127	140	133	152	589	612	511
Nulato River	0	0	10	41	36	0	9	0	0	0	0	11	2
Kaiyuh/Khotol R.	28	34	0	103	0	60	0	0	15	0	0	24	15
Anvik River	0	41	0	40	22	13	48	0	38	43	0	25	28
Innoko River	145	10	28	40	120	249	59	0	0	60	173	71	74
Andreasfsky River	0	0	1,318	629	11	302	884	44	80	0	130	327	262
Total^b	2,418	1,277	1,772	3,291	1,507	3,656	1,899	1,134	1,281	1,577	1,265	1,981	1,909

^a Water bodies listed below are the key systems included in the subtotal

^b Total may exceed the sum of subtotals because fishing site(s) not specified

Table 7.—Total fishing effort (angler-days), and northern pike catch and harvest from principal fisheries in the Yukon River area, 1990–2009.

Year	Yukon	Dall River			Nowitna River			Innoko River		
	Total ^a	Effort	Number	Percent ^b	Effort	Number	Percent	Effort	Number	Percent
Harvest										
1990	2,474	273	372	15%	652	118	5%	415	118	5%
1991	4,454	359	559	13%	1,238	1,617	36%	520	118	3%
1992	3,590	224	342	10%	491	196	6%	53	43	1%
1993	2,347	845	352	15%	446	63	3%	637	151	6%
1994	1,968	455	215	11%	733	161	8%	93	9	1%
1995	1,937	1,018	350	18%	1,977	302	16%	430	90	5%
1996	2,502	341	334	13%	834	651	26%	654	110	4%
1997	1,870	694	414	22%	605	148	8%	445	56	3%
1998	1,452	360	182	13%	645	218	15%	847	93	6%
1999	2,418	687	862	36%	862	286	12%	551	145	6%
2000	1,277	316	257	20%	843	201	16%	327	10	1%
2001	1,772	300	13	1%	434	0	0%	1,458	28	2%
2002	3,291	165	115	3%	525	114	3%	2,533	40	1%
2003	1,507	360	246	16%	180	12	0%	310	120	8%
2004	3,656	686	1,252	34%	664	181	5%	1,522	249	7%
2005	1,899	423	268	14%	414	0	0%	355	59	3%
2006	1,134	347	146	13%	1,078	197	17%	581	0	0%
2007	1,281	600	306	24%	1,006	172	13%	600	0	0%
2008	1,577	102	13	1%	723	130	8%	515	60	4%
2009	1,265	349	203	16%	294	70	6%	606	173	14%
Averages										
1999–2008	1,981	399	348	16%	673	129	8%	875	71	3%
2004–2008	1,909	432	397	17%	777	139	9%	715	74	3%
Catch										
1990 ^c	17,717	273	1,810	10%	652	694	4%	415	964	5%
1991	13,895	359	1,029	7%	1,238	2,749	20%	520	1,544	11%
1992	14,801	224	1,042	7%	491	1,426	10%	53	171	1%
1993	13,502	845	2,645	20%	446	1,362	10%	637	1,661	12%
1994	11,694	455	1,308	11%	733	2,868	25%	93	18	0%
1995	15,828	1,018	2,463	15%	1,977	3,049	19%	430	1,039	7%
1996	25,502	341	1,358	5%	834	9,493	37%	654	4,090	16%
1997	13,349	694	1,961	15%	605	1,154	9%	445	3,024	23%
1998	12,349	360	1,304	11%	645	1,290	10%	847	4,433	36%
1999	20,213	687	3,320	16%	862	1,357	7%	551	3,770	19%
2000	13,589	316	1,740	13%	843	4,509	33%	327	1,912	14%
2001	18,788	300	1,550	8%	434	478	3%	1,458	12,866	68%
2002	35,975	165	1,356	4%	525	5,488	15%	2,533	17,551	49%
2003	18,392	360	3,599	20%	180	1,309	7%	310	1,763	10%
2004	39,762	686	11,900	30%	664	2,429	6%	1,522	10,572	27%
2005	18,332	423	2,944	16%	414	348	2%	355	9,271	51%
2006	24,335	347	908	4%	1,078	4,040	18%	581	5,833	24%
2007	15,021	600	2,440	16%	1,006	5,216	35%	600	2,464	16%
2008	8,655	102	243	3%	723	917	11%	515	1,104	13%
2009	10,931	349	765	7%	294	2,721	25%	606	3,375	31%
Averages										
1999–2008	21,306	399	3,000	13%	673	2,614	13%	875	6,711	29%
2004–2008	21,221	432	3,687	14%	777	2,600	14%	715	5,849	26%

^a Harvest or total catch of northern pike in the Yukon area.

^b Percent of harvest or total catch of northern pike in the Yukon area.

^c Estimates of total catch are not available prior to 1990.

Table 8.—Sport harvest and catch of Arctic grayling in the Yukon River drainage, 1998–2008.

Harvest	Year											Averages	
	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	1999–2008	2004–2008
Yukon R. drainages (Canadian Border to Ft. Yukon)													
Subtotal^a	833	569	318	308	916	371	129	235	474	86	169	424	259
Fortymile River	178	0	0	39	690	0	0	86	386	0	106	138	94
Charley River	289	20	65	61	70	272	0	121	11	70	0	98	95
Kandik River	34	239	172	0	128	0	0	0	0	0	0	57	0
Yukon R. drainages (Ft. Yukon to Koyukuk R.)													
Subtotal^a	2,085	2,078	2,006	1,483	1,420	2,571	1,777	1,296	2,184	1,669	1,414	1,857	1,899
Porcupine River	83	0	601	251	141	227	226	91	128	865	188	261	307
Birch Creek	61	178	500	75	47	178	109	110	223	231	80	171	170
Beaver and Nome Cr	311	672	0	156	324	568	432	699	330	0	180	349	406
Haul Road Streams ^b	497	88	249	75	70	188	328	91	1,213	285	339	308	421
Jim River	321	10	163	75	70	104	0	0	501	173	57	142	156
Koyukuk River ^c	863	735	571	577	490	1,035	415	54	12	129	475	488	329
Yukon R. drainages (downstream from Koyukuk R.)													
Subtotal^a	77	307	677	1,041	739	253	881	510	166	776	1,190	543	517
Nulato River	0	0	0	492	0	0	78	0	0	100	668	149	45
Anvik River	27	174	67	154	310	146	0	10	151	174	98	121	96
Innoko River	0	42	112	0	141	16	0	72	15	0	0	44	21
Andreafsky River	0	11	463	365	141	0	803	414	0	0	264	244	243
Total Yukon Harvest	3,164	3,279	3,193	2,832	3,131	3,271	2,883	2,041	2,824	2,531	2,773	2,915	2,710

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Table 8.–Page 2 of 2.

Catch	Year											Averages	
	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	1999–2008	2004–2008
Yukon R. drainages (Canadian Border to Ft. Yukon)													
Subtotal^a	2,883	2,428	1,869	2,026	3,815	981	452	745	1,030	1,773	691	1,800	996
Fortymile River	490	0	0	103	2,461	65	0	313	533	27	225	399	188
Charley River	1,151	249	377	61	256	692	0	259	238	0	211	328	238
Kandik River	373	1,167	601	0	618	0	0	35	0	0	0	254	7
Yukon R. drainages (Ft. Yukon to Koyukuk R.)													
Subtotal^a	13,786	14,453	10,500	9,454	11,163	20,256	18,730	16,804	22,400	11,677	12,010	14,822	17,773
Porcupine River	1,327	1,626	3,521	607	197	707	705	472	198	1,742	1,622	1,110	765
Birch Creek	331	1,089	1,455	1,163	967	246	508	1,126	499	558	858	794	587
Beaver and Nome Cr	1,427	2,405	1,517	1,971	3,379	7,424	6,661	2,417	13,529	134	3,883	4,086	6,033
Haul Road Streams ^b	5,293	756	919	705	1,786	3,258	2,184	9,703	5,520	7,503	3,253	3,763	5,634
Jim River	5,075	517	566	666	1,139	2,687	437	4,265	3,229	4,765	1,440	2,253	3,077
Koyukuk River ^c	4,630	7,964	1,761	3,920	3,438	6,242	4,505	671	70	268	825	3,347	2,351
Yukon R. drainages (downstream from Koyukuk R.)													
Subtotal^a	1,215	4,191	3,381	7,490	8,783	10,723	1,340	6,169	3,028	7,237	10,066	6,469	5,699
Nulato River	0	38	35	796	493	0	78	20	0	1,505	668	297	321
Anvik River	945	3,670	2,575	4,857	6,925	7,197	368	3,513	3,013	5,197	8,164	3,826	3,858
Innoko River	0	67	129	0	423	3,352	11	1,104	15	0	0	516	896
Andreafsky River	0	49	584	1,712	457	0	803	1,518	0	0	968	512	464
Total Catch	18,432	23,024	16,000	19,194	24,465	32,455	20,940	23,718	25,458	20,687	22,767	22,437	24,652

^a Water bodies listed below are the key systems included in the subtotal.

^b Jim River is also included in the Haul Road Streams row.

^c Koyukuk drainage waters not accessed by the Haul Road (Dalton Highway).

FIGURES

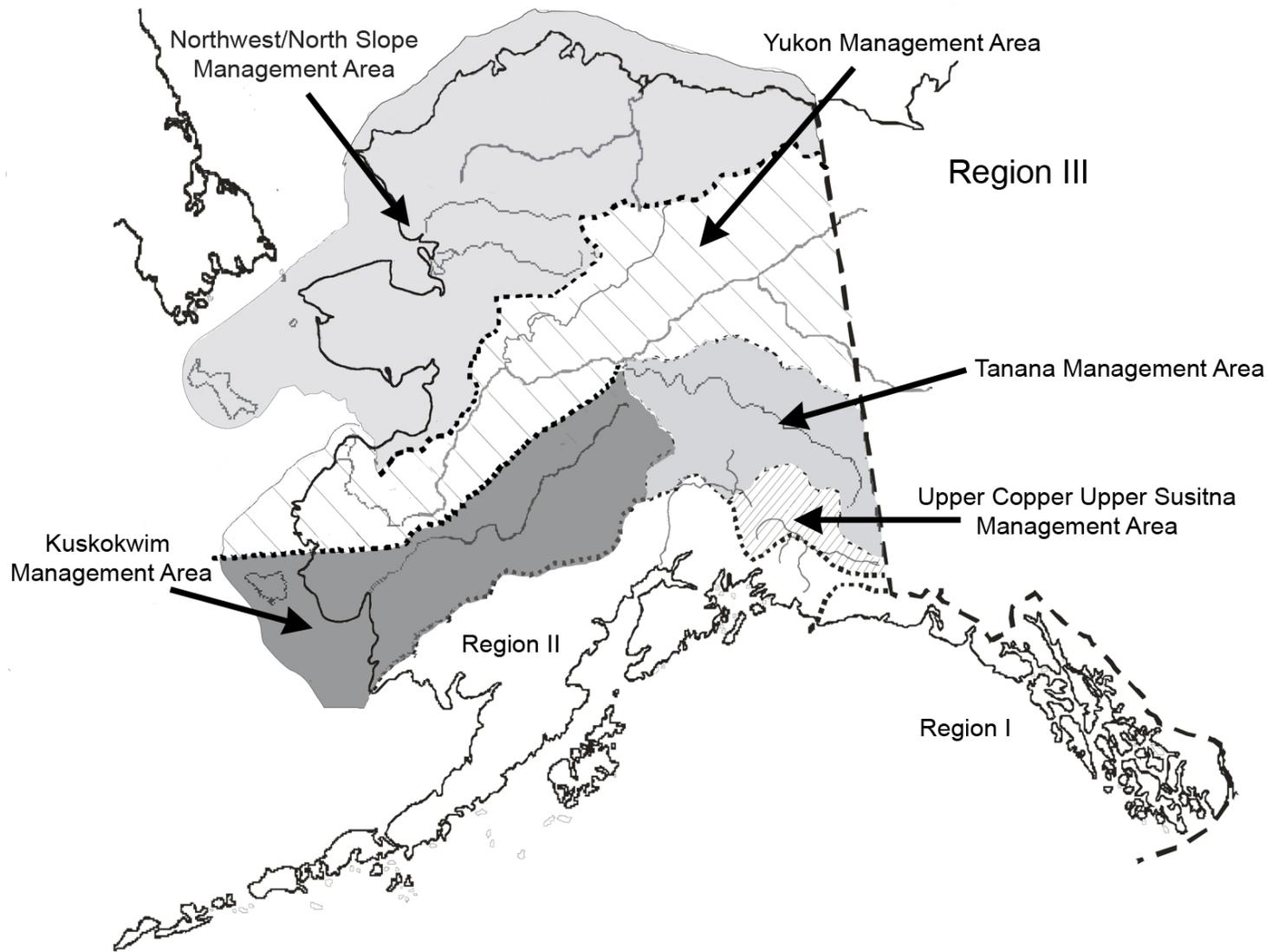


Figure 1.—Map of the sport fish regions in Alaska and the five management areas in Region III.

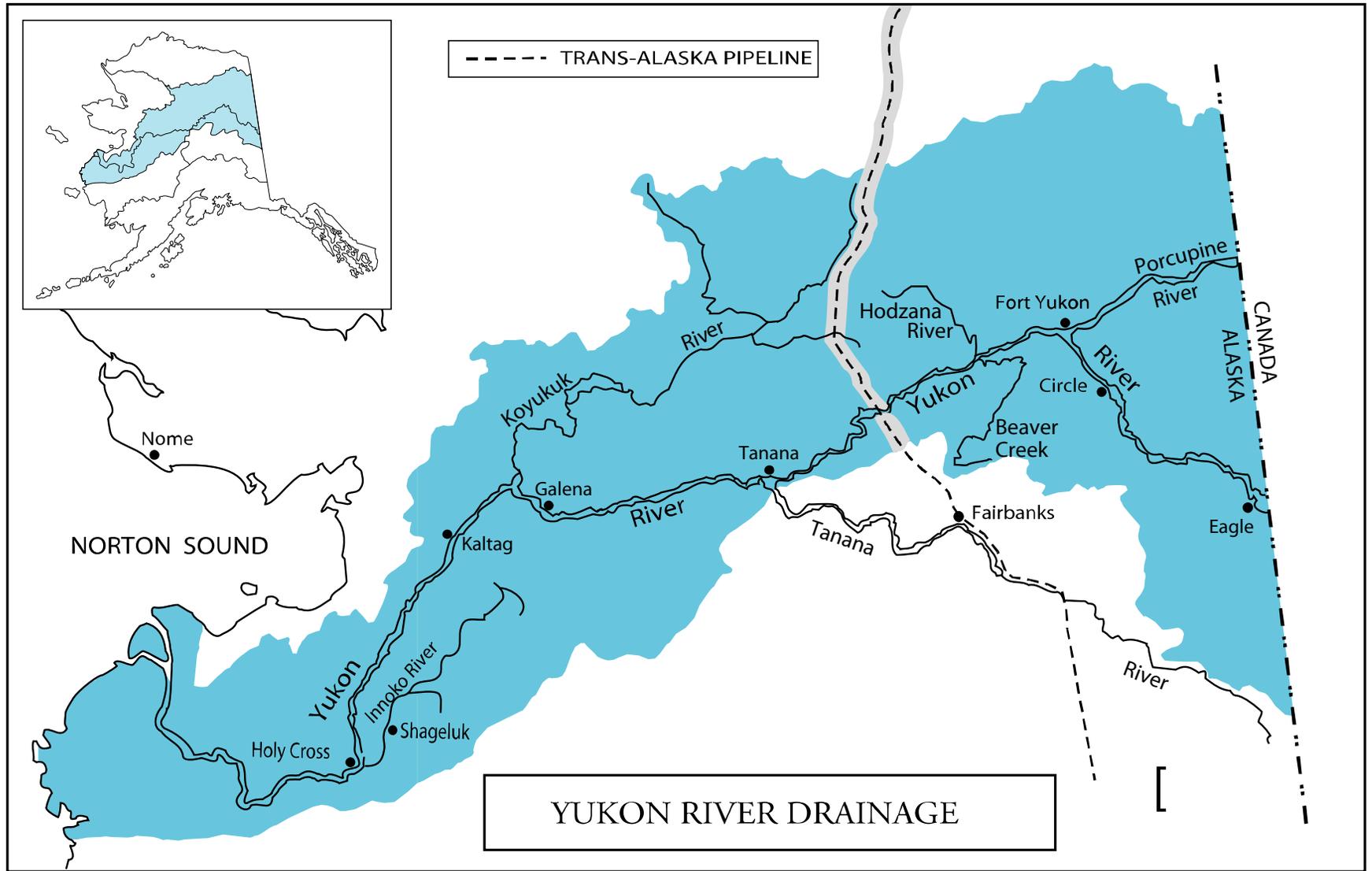


Figure 2.—Yukon area, Tanana River drainage is excluded from the YMA.

APPENDIX A

Appendix A1.–Contact information for agencies providing information concerning fishing sites within the Yukon Management Area.

Gates of the Arctic National Park and Preserve

<http://www.nps.gov/gaar/>

P.O. Box 30
Bettles, AK 99726
(907) 692-5494

Wild and Scenic Rivers Associated with Gates of the Arctic NP&P

<http://www.nps.gov/gaar/wildandscenicrivers.htm>

Alatna River, <http://www.nps.gov/gaar/alatna.htm>

John River, <http://www.nps.gov/gaar/johnriver.htm>

North Fork Koyukuk River, <http://www.nps.gov/gaar/koyukukriver.htm>

Tinayguk River, <http://www.nps.gov/gaar/tinaygukriver.htm>

Yukon-Charlie Rivers National Preserve

<http://www.nps.gov/yuch/>

Eagle Visitor Center
P.O. Box 167
Eagle, AK 99738
(907) 547-2233

Steese National Conservation Area

http://www.blm.gov/ak/st/en/prog/sa/steese_conserv.html

Bureau of Land Management
Fairbanks District Office
1150 University Avenue
Fairbanks, Alaska 99709-3844
(907) 474-2200 or 1-800-437-7021

Birch Creek National Wild River

http://www.blm.gov/ak/st/en/prog/sa/beavercrk_nwsr.html

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White Mountain National Recreation Area

http://www.blm.gov/ak/st/en/prog/sa/white_mtns.html

Bureau of Land Management
Fairbanks District Office
1150 University Avenue
Fairbanks, Alaska 99709
(907) 474-2200 or 1-800-437-7021

Beaver Creek National Wild River

http://www.blm.gov/ak/st/en/prog/sa/beavercrk_nwsr.html

Arctic National Wildlife Refuge

<http://arctic.fws.gov/>

101 12th Avenue, Room 236
Fairbanks, Alaska 99701
(907) 456-0250 or 1-800-362-4546

Wild and Scenic Rivers Associated with Arctic National Wildlife Refuge

Sheenjek National Wild and Scenic River, <http://arctic.fws.gov/>
<http://www.dnr.state.ak.us/parks/aktrails/ats/ne/sheenjek.htm>

Wind National Wild and Scenic River, <http://arctic.fws.gov/>

Innoko National Wildlife Refuge

<http://innoko.fws.gov>

Tonzona Avenue
P.O. Box 69
McGrath, AK 99627
E-mail: Innoko@fws.gov
(907) 524-3251

Kanuti National Wildlife Refuge

<http://kanuti.fws.gov/>

101 12th Ave.
Fairbanks, AK 99701
E-mail: kanuti_refuge@fws.gov
(907) 456-0329

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Koyukuk National Wildlife Refuge

<http://koyukuk.fws.gov/>

101 Front Street

P.O. Box 287 MS 525

Galena, Alaska 99741-0287

(907) 656-1231 or 1-800-656-1231

E-Mail: r7kynwr@fws.gov

Nowitna National Wildlife Refuge

<http://nowitna.fws.gov/>

101 Front Street

P.O. Box 287 MS 525

Galena, Alaska 99741-0287

(907) 656-1231 or 1-800-656-1231

E-Mail: r7kynwr@fws.gov

Yukon Flats National Wildlife Refuge

<http://yukonflats.fws.gov/>

101 12th Avenue, Room 264 MS 575

Fairbanks, Alaska 99701

(907) 456-0440 or 1-800-531-0676

E-Mail: yukonflats_refuge@fws.gov

Yukon Delta National Wildlife Refuge

<http://yukondelta.fws.gov/>

807 Chief Eddie Hoffman Road

P. O. Box 346 MS 535

Bethel, Alaska 99559

(907) 543-3151

E-Mail: yukondelta@fws.gov

APPENDIX B

Appendix B1.—Sport harvest and catch from the Yukon Management Area (SWHS Area Y), 1977–2009.

Year	All Fish Total	Salmon					Non-Salmon							
		King	Coho	Sockeye	Pink	Chum	Lake Trout	AC/DV	Arctic Grayling	Whitefish	Sheefish	Northern Pike	Burbot	Other Fish
Harvest														
1977	4,168	56	31	0	6	16	308	88	2,486	55	180	899	43	0
1978	9,814	360	163	0	93	293	262	823	3,976	511	388	2,583	362	0
1979	10,993	39	25	0	16	109	173	531	8,273	92	271	1,446	18	0
1980	13,291	15	0	0	19	0	293	506	9,640	9	251	2,498	60	0
1981	10,173	6	0	0	11	17	302	197	6,176	18	509	2,718	219	0
1982	13,580	22	139	0	41	82	720	470	7,171	568	372	3,551	444	0
1983	13,225	0	52	0	0	349	305	856	8,014	52	259	3,318	10	10
1984	10,531	13	0	0	78	0	143	143	6,856	182	104	2,960	52	0
1985	7,985	12	12	0	0	12	485	382	4,180	315	245	2,132	210	0
1986	10,775	15	161	0	98	202	508	91	5,566	328	214	3,470	122	0
1987	12,740	0	61	0	0	226	0	541	9,054	206	128	2,492	32	0
1988	12,363	91	183	0	0	546	0	618	6,115	610	656	3,526	18	0
1989	14,720	100	215	0	0	997	272	726	7,491	245	757	3,516	367	34
1990	9,948	105	228	0	0	417	220	391	4,961	322	323	2,474	507	0
1991	14,258	143	430	180	0	449	434	675	5,570	422	1,341	4,454	160	0
1992	11,416	313	551	58	27	618	193	672	4,171	248	553	3,590	422	0
1993	8,128	122	619	0	0	193	101	528	3,330	173	436	2,347	279	0
1994	9,445	410	728	0	0	90	59	488	4,574	89	391	1,968	145	503
1995	7,311	37	162	0	0	189	66	122	3,421	82	476	1,937	216	603
1996	9,036	128	432	0	30	66	9	881	4,000	160	606	2,502	203	19
1997	7,328	221	179	0	0	206	0	344	3,456	398	231	1,870	415	8
1998	6,969	207	154	64	85	351	27	205	3,912	121	258	1,452	133	0
1999	7,434	22	158	11	0	81	545	203	3,164	511	133	2,418	168	0
2000	6,103	99	244	0	0	64	55	373	3,279	222	372	1,277	118	0
2001	7,308	12	126	0	0	53	56	368	3,193	928	492	1,772	50	258
2002	9,655	8	551	3	0	77	147	551	2,832	497	538	3,291	1,160	0
2003	6,205	99	160	0	24	28	57	358	3,131	0	238	1,507	594	9
2004	10,432	194	907	79	33	105	98	167	3,271	284	1,352	3,656	111	147
2005	7,954	0	360	78	0	291	171	130	2,883	79	1,348	1,899	534	181
2006	6,088	101	371	0	54	268	6	174	2,041	631	540	1,134	741	27
2007	5,627	411	258	0	0	204	40	181	2,824	74	177	1,281	60	117
2008	5,793	155	171	0	0	310	33	36	2,532	230	462	1,577	279	9
2009	7,037	27	849	0	0	103	76	381	2,773	499	210	1,265	789	65

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Appendix B1.–Page 2 of 2.

Year	All Fish Total	Salmon					Non-Salmon							Other Fish
		King	Coho	Sockeye	Pink	Chum	Lake Trout	AC/DV	Arctic Grayling	Whitefish	Sheefish	Northern Pike	Burbot	
Catch														
1990	62,327	199	533	0	0	2,149	914	2,842	34,299	914	2,251	17,717	509	0
1991	48,722	316	859	205	77	1,839	757	5,202	23,458	459	1,495	13,895	160	0
1992	43,322	1,242	1,329	107	155	1,960	741	3,744	17,300	349	1,569	14,801	25	0
1993	45,034	640	1,023	9	0	1,224	196	4,249	21,420	302	2,127	13,502	342	0
1994	36,015	510	1,109	9	0	351	177	1,779	15,951	301	1,121	11,694	152	2,861
1995	32,282	177	542	0	0	734	155	751	11,454	109	1,335	15,828	288	909
1996	57,857	2,785	813	0	964	792	60	1,938	21,417	434	2,915	25,502	212	25
1997	41,491	673	386	30	28	516	70	1,448	23,318	430	453	13,367	687	85
1998	40,070	456	385	1,019	802	3,544	74	1,991	18,318	415	568	12,349	149	0
1999	45,136	56	804	343	0	300	1,330	2,104	18,432	554	812	20,213	168	0
2000	41,907	562	684	0	39	366	166	1,678	23,024	524	1,144	13,589	130	0
2001	41,269	315	822	0	0	697	56	1,619	16,000	1,037	1,531	18,788	57	347
2002	63,955	18	1,064	3	38	363	1,596	2,142	19,194	862	1,483	35,975	1,217	0
2003	56,760	850	3,386	21	53	4,930	296	2,837	24,465	45	769	18,392	648	68
2004	91,804	1,088	4,329	678	1,041	3,356	553	2,420	32,455	371	5,329	39,762	178	187
2005	47,429	455	504	151	848	2,230	540	407	20,940	260	1,999	18,332	534	229
2006	64,380	438	1,640	183	514	2,711	26	984	23,718	631	8,298	24,335	766	136
2007	49,572	2,681	1,887	0	0	2,157	79	1,590	25,458	139	318	15,021	75	167
2008	39,378	685	1,277	113	2,072	2,689	58	1,332	20,687	471	834	8,655	286	219
2009	46,975	970	4,076	34	0	1,257	281	1,681	22,767	2,144	1,717	10,931	898	220

Appendix B2.– Guided angler effort (angler days) and fish species kept and released in the Yukon River Area, as reported in the freshwater guide logbooks, 2006–2009.

Year	Angler Days	Salmon			Lake Trout	Dolly Varden	Arctic Grayling	Northern Pike	Sheefish
		King	Coho	Sockeye					
Fish Kept (Harvested)									
2006	946	79	330	0			5	ND	ND
2007	1273	143	164	2	0	28	215	223	6
2008	992	72	244	1	0	5	15	12	8
2009	566	31	120	0	0	5	35	21	0
Fish Released									
2006	946	318	2305	47	0	238	3782	ND	ND
2007	1273	566	2218	18	0	660	8826	9267	84
2008	992	366	1559	25	0	548	5292	6257	64
2009	566	94	918	0	0	177	4540	4074	114

APPENDIX C

Appendix C1.—Commercial, subsistence, and sport harvest of king salmon in the Yukon River drainage.

Year	Tanana River			Yukon River without Tanana			All Yukon River		
	Commercial	Subsistence	Sport	Commercial	Subsistence	Sport	Commercial	Subsistence	Sport
1989	1,741	2,999	963	102,457	45,900	100	105,491	48,899	1,063
1990	2,156	3,069	439	93,504	45,969	105	97,708	49,038	544
1991	1,072	2,515	630	105,344	44,258	143	107,105	46,773	773
1992	753	2,438	118	120,419	43,188	313	122,134	45,626	431
1993	1,445	2,098	1,573	92,665	60,814	122	95,682	65,701	1,695
1994	2,606	2,370	1,871	111,234	50,707	410	115,471	53,077	2,281
1995	2,747	2,118	2,488	121,305	46,756	37	126,204	48,874	2,525
1996	447	1,392	3,745	89,745	42,129	128	91,890	43,521	3,230
1997	2,728	3,025	1,953	110,882	53,266	221	116,421	56,291	2,174
1998	963	2,276	447	42,736	51,814	207	44,625	54,090	654
1999	690	1,955	1,001	68,873	50,570	22	70,767	52,525	1,023
2000	0	1,058	177	8,518	34,858	99	9,115	35,916	277
2001	0	2,449	667	0	50,610	12	0	53,059	679
2002	1,066	1,193	478	22,593	41,553	8	24,656	42,746	486
2003	1,813	2,349	2,153	36,928	52,964	99	41,118	55,313	2,719
2004	2,057	1,589	1,319	52,566	52,287	194	56,943	53,876	1,513
2005	453	1,966	485	30,107	50,733	0	32,325	52,699	485
2006	84	1,318	638	43,591	46,481	101	46,646	47,799	739
2007	281	1,853	549	31,917	52,241	411	33,348	54,094	960
2008	0	731	254	4,641	43,089	155	4,641	43,820	409
2009	0	1,412	836	319	31,619	27	319	33,027	863
2010	0	ND	ND	9,897	ND	ND	9,897	ND	ND
				Average					
1979–1988	1,266	3,467	808	129,976	36,977	21	131,350	40,444	829
1989–1998	1,666	2,430	1,423	99,029	48,480	179	102,273	51,189	1,537
1999–2008	644	1,646	772	29,973	47,539	110	35,954	50,344	954
2004–2008	575	1,491	649	32,564	48,966	172	34,781	50,458	821

Appendix C2.—Commercial, subsistence, and sport harvest of summer and fall chum salmon in the Yukon River.

Year	Tanana River			Yukon River without Tanana			All Yukon River		
	Commercial	Subsistence	Sport	Commercial	Subsistence	Sport	Commercial	Subsistence	Sport
1989	103,429	69,507	1,135	1,640,871	311,780	997	1,744,300	381,287	2,132
1990	65,808	51,176	55	603,034	234,656	417	688,842	285,832	472
1991	68,340	45,538	588	851,850	218,526	449	920,190	264,064	1,037
1992	26,250	35,217	690	539,723	197,882	618	565,973	233,099	1,308
1993	3,705	17,320	371	138,280	164,892	193	141,985	182,375	564
1994	35,803	40,623	260	234,149	192,499	90	269,952	233,122	350
1995	111,545	62,472	985	997,120	188,400	189	1,108,665	250,872	1,174
1996	64,464	45,223	1,880	732,425	187,407	66	767,889	232,630	1,946
1997	25,287	24,049	456	264,609	168,876	206	289,896	192,925	662
1998	570	20,460	70	31,247	128,497	351	31,817	148,957	421
1999	148	18,769	474	49,635	141,934	81	49,783	160,703	555
2000	0	1,452	97	6,624	82,780	64	6,624	84,232	161
2001	0	4,094	29	0	89,445	53	0	93,539	82
2002	3217	3,892	307	10,351	87,936	77	13,568	91,828	384
2003	8,556	16,442	63	13,125	109,188	1,575	21,681	125,630	1,603
2004	10,060	11,207	98	20,460	121,132	105	30,139	132,339	203
2005	58,623	25,245	144	162,890	145,406	291	221,513	170,651	435
2006	67,980	18,530	315	198,678	156,787	268	266,658	175,317	583
2007	30,246	32,146	41	258,632	143,694	204	288,878	175,840	245
2008	7,698	17,765	61	263,474	139,919	310	271,172	157,684	371
2009	7,810	17,711	71	187,340	116,371	103	195,150	134,082	174
2010	7,201	ND	ND	228,237	ND	ND	235,438	ND	ND
				Average					
1979–1988	59,711	50,377	629	1,197,868	379,536	154	1,257,579	429,912	783
1989–1998	50,520	41,175	649	603,331	199,342	358	653,851	240,516	1,007
1999–2008	18,653	14,954	163	98,387	121,822	303	117,040	136,776	466
2004–2008	34,921	20,979	132	180,827	141,388	236	215,748	162,366	367

Appendix C3.–Commercial, subsistence and sport harvest of coho salmon in the Yukon River drainage.

Year	Tanana River			Yukon River without Tanana			All Yukon River		
	Commercial	Subsistence	Sport	Commercial	Subsistence	Sport	Commercial	Subsistence	Sport
1989	16,084	19,572	1,596	69,409	21,870	215	85,493	41,442	1,811
1990	14,804	18,768	1,719	29,483	25,873	228	46,937	44,641	1,947
1991	9,775	21,561	2,345	96,839	15,827	430	109,657	37,388	2,775
1992	7,979	17,554	1,115	0	34,367	551	9,608	51,921	1,666
1993	0	4,304	278	0	11,468	619	0	15,772	897
1994	4,451	26,489	1,165	0	15,205	728	4,451	41,694	1,893
1995	6,900	19,219	1,116	40,113	9,423	162	47,013	28,642	1,278
1996	7,142	15,091	1,354	48,840	15,419	432	55,982	30,510	1,786
1997	0	11,945	1,229	35,320	12,350	179	35,320	24,295	1,408
1998	0	7,481	604	1	10,300	154	1	17,781	758
1999	0	9,547	451	1,601	11,423	158	1,601	20,970	609
2000	0	5,150	310	0	9,567	244	0	14,717	554
2001	0	9,000	1,122	0	12,654	126	0	21,654	1,248
2002	0	9,519	541	0	5,742	551	0	15,261	1,092
2003	15,119	10,912	1,317	10,124	13,217	160	25,243	24,129	1,477
2004	18,649	11,817	716	1,583	9,148	907	20,232	20,965	1,623
2005	21,831	19,645	267	36,533	7,433	360	58,311	27,078	627
2006	11,137	10,868	629	53,805	8,800	371	64,942	19,650	1,000
2007	1,368	7,980	339	43,207	13,923	258	44,575	21,903	597
2008	3,177	8,478	170	33,283	8,311	171	36,460	16,789	341
2009	0	7,116	115	6,605	8,709	849	6,605	15,825	964
2010	1,700	ND	ND	2,050	NDa	ND	3,750	ND	ND
				Average					
1979–1988	59,711	50,377	629	1,197,868	379,536	154	1,257,579	429,912	783
1989–1998	50,520	41,175	649	603,331	199,342	358	653,851	240,516	1,007
1999–2008	7,123	10,292	586	18,014	10,022	331	25,136	20,312	917
2004–2008	7,492	10,817	304	34,687	9,435	402	42,179	20,249	706

Appendix C4.– Yukon River Drainage Fall Chum Salmon Management Plan Overview.

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

^a PROJECTED RUN SIZES 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 500,000 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).

Appendix C5.–Yukon River Summer Chum Salmon Management Plan overview.

Summer Chum Salmon Management Plan Overview					
Projected Run Size ^a	Recommended Management Action				Targeted Drainage- wide Escapement
	Commercial	Personal Use	Sport	Subsistence	
600,000 or less	Closure	Closure	Closure	Closure ^b Possible	≤600,000
600,001 to 700,000	Closure	Closure	Closure	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	≥800,000

^a PROJECTED RUN SIZE: Mainstem river sonar passage estimate plus estimated harvests below the sonar site and 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 05.36 5 if buying capacity allows.



2010 Yukon River Salmon Fisheries Outlook



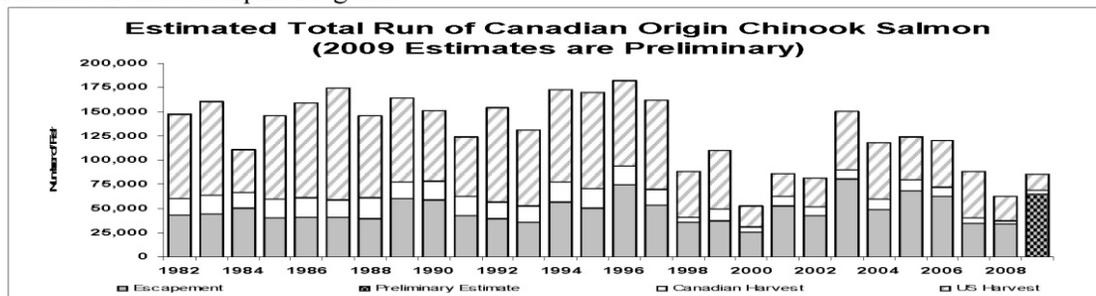
This information sheet describes the anticipated management strategies for the 2010 season after discussing options with fishermen during several preseason meetings. State and Federal fishery managers will coordinate management of the Yukon River subsistence salmon fishery.

RUN AND HARVEST OUTLOOK

Chinook Salmon	Chum Salmon	Coho Salmon
Below average to average run is projected.	Below average to average runs are projected to provide for escapement and subsistence uses.	Average run is projected to provide for escapement and subsistence uses.
Chinook run is projected to provide for escapement and subsistence uses.	Summer chum commercial surplus is anticipated to be 250,000 to 500,000 fish.	
Directed commercial fishery is unlikely.	Fall chum commercial harvest is anticipated to be 0 to 100,000 fish.	Commercial harvest is anticipated to be 30,000 to 70,000 fish.

MANAGEMENT STRATEGIES

- Initial management will be based on preseason projections and shift to inseason assessment information as runs develop.
- It is unlikely there will be any directed Chinook salmon commercial openings.
- A normal subsistence salmon fishing schedule will begin June 7 in Y-1 and implemented chronologically with the upriver migration.
- The Tanana River personal use and sport fisheries will be managed to meet escapement objectives for Chena and Salcha rivers.
- A surplus of summer chum salmon is anticipated above escapement and subsistence needs. However, the extent of a directed chum commercial fishery will be dependent upon the strength of the Chinook salmon run.
- If the Chinook salmon run develops below expectations, managers will consider implementing conservation measures, such as no fishing on a portion of the run or a reduction in fishing time, in an effort to meet escapement goals.



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2010 Subsistence Fishing Schedule



The US/Canada Yukon River Panel agreed to one year Canadian Interim Management Escapement Goal (IMEG) ranges of 42,500-55,000 Chinook salmon and 70,000-104,000 fall chum salmon based on the Eagle sonar program. In addition to escapement needs, Alaska is obligated to pass approximately 7,000 Chinook and 20,000 fall chum or more, depending on run strength across the Border, in order to fulfill harvest sharing commitments specified in the Agreement. The IMEG for the Fishing Branch River of 22,000 to 49,000 fall chum salmon based on the Fishing Branch River weir count will continue through 2010.

A subsistence salmon fishing schedule will be in place early in the season until the salmon run size is projected to be of sufficient strength to warrant relaxing or additional conservation measures appear necessary. The schedule is intended to reduce harvest impacts during years of low salmon runs on any particular run component and to spread subsistence harvest opportunity among users. **Note: this schedule is subject to change depending on run strength.**

Area	Reduced Regulatory Subsistence Fishing Periods	Approximate Schedule to Begin	Days of the Week
Coastal District	7 days/week	All Season	M/T/W/TH/F/SA/SU – 24 hours
District Y-1	Two 36-hour periods/week	June 7	Mon. 8 pm to Wed. 8 am /Thu. 8 pm to Sat. 8 am
District Y-2	Two 36-hour periods/week	June 9	Wed. 8 pm to Fri. 8 am / Sun. 8 pm to Tue. 8 am
District Y-3	Two 36-hour periods/week	June 13	Wed. 8 pm to Fri. 8 am / Sun. 8 pm to Tue. 8 am
Subdistrict Y-4-A	Two 48-hour periods/week	June 16	Sun. 6 pm to Tue. 6 pm / Wed. 6 pm to Fri. 6 pm
Subdistricts Y-4-B, C	Two 48-hour periods/week	June 23	Sun. 6 pm to Tue. 6 pm / Wed. 6 pm to Fri. 6 pm
Koyukuk and Innoko Rivers	7 days/week	All Season	M/T/W/TH/F/SA/SU – 24 hours
Subdistricts Y-5-A, B, C	Two 48-hour periods/week	June 29	Tue. 6 pm to Thu. 6 pm /Fri. 6 pm to Sun. 6 pm
Subdistrict Y-5-D	7 days/week	All Season	M/T/W/TH/F/SA/SU – 24 hours
District Y-6	Two 42-hour periods/week	All Season	Mon. 6 pm to Wed. Noon /Fri. 6 pm to Sun. Noon
Old Minto Area	5 days/week	All Season	Friday 6 pm to Wednesday 6 pm

All subsistence salmon fishing with gillnets and fish wheels must be stopped during subsistence salmon fishing closures. In **Districts Y-1, 2, and 3**, from **June 1 to July 15** a person may not possess Chinook salmon taken for subsistence uses unless **both tips (lobes) of the tail fin** have been removed.

For additional information:

ADF&G Steve Hayes in Anchorage 907-267-2383; Dayna Norris, Fairbanks 907-459-7240; or Emmonak 907-949-1320

Subsistence fishing schedule: 1-866-479-7387 (toll free outside of Fairbanks); in Fairbanks, call 459-7387

USFWS: Fred Bue in Fairbanks 907-455-1849 or 1-800-267-3997; or in Emmonak 907-949-1798

APPENDIX D

Dall River Fisheries Management Plan

Purpose of Plan

- To provide the public, state and federal agencies, the Stevens Village Natural Resource agency and the Alaska BOF with a clear understanding of the underlying principles by which northern pike inhabiting the Dall River Area will be managed and provide guidance in developing future regulations.

Philosophy of Plan

- Conservative Wild Stock Management.
- Protect biological integrity of the wild stock while maximizing the benefits to various users of the stock consistent with the subsistence priority.

Goal

- Ensure the long term quality of the northern pike fishery in Dall River Area.

Principles/Policies

- Native northern pike population(s) to be managed for maintenance of historic age and size composition (avoid enhancement or supplementing the wild stocks).
- Maintain opportunities for traditional (subsistence) and recreational use of the northern pike stock.

Objective

- Proportion of northern pike 30 inches and longer to be greater than 0.30 in the assessed population.

Issues / Action Items

- Establish a special management area for the protection of large size northern pike.
- Evaluate the effective size of the special management area.
- Control fishing mortality within special management area; minimize fishing mortality for northern pike > 30 inches.
- Evaluate and establish sport fishing regulations that will promote survival of large size northern pike.
- Encourage local efforts to minimize mortality of large size northern pike in the subsistence fishery.
- Educate prospective anglers concerning proper fish handling techniques.
- Educate prospective anglers concerning proper fishing gear.
- Reduce friction between local traditional users and non-local recreational users.
- Educate non-locals on the extent of private/public land.
- Incorporate local knowledge with scientific information to a greater degree in management decisions.
- Encourage greater local acceptance of non-local recreational angling as a legitimate use of the Dall River northern pike resource.
- Encourage local economic opportunities associated with recreational use.

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Definitions

Dall River Area The Dall River Area includes the Dall and Little Dall River drainages.

Benefits The concept of benefit varies with users. Traditional subsistence users seek fish resources for traditional purposes including human food. Village residents have recognized the potential for economic opportunities in providing services to recreational users of the fish and land resources. Urban anglers seek continued opportunity to participate in the fishery; both consumptive and non-consumptive uses are desired.

Quality All groups stress the importance of a quality fishery. In the present context quality is defined as a stock with historic size and age composition. The presence of fish in large size and old age categories is recognized by all groups as an appropriate indicator of stock health.

Assessed Population The assessed population includes the portion of the population that is accessible to the sampling gear used in stock assessment efforts. For northern pike in the Dall River area, this includes fish larger than 450 mm FL (19 inches Total Length).

APPENDIX E

Appendix E1.—Number of visitors contacted at the Coldfoot Visitor’s Center^a, estimated fishing effort (angler-days, all species), and total catch of Arctic grayling for the Dalton Highway corridor (Yukon River to Atigun Pass), 1996–2010.

Year	Visitors	Fishing Effort	Grayling Catch
1996	4,742	423	936
1997	5,399	843	3,025
1998	5,124	617	1,656
1999	5,248	577	5,293
2000	5,002	363	759
2001	4,629	445	919
2002	4,714	152	705
2003	7,067	396	1,786
2004	8,597	503	3,258
2005	8,051	270	2,184
2006	8,378	2,590	9,703
2007	9,439	1,975	5,779
2008	9,657	987	7,503
2009	8,574	1,177	3,253
2010	8,311	ND	ND

^a A multiagency visitor center operated by the US Department of Interior: Bureau of Land Management, US Fish and Wildlife Service and National Park Service