

Fishery Management Report No. 12-44

**Fishery Management Report for Sport Fisheries in the
Yukon Management Area, 2011**

by

John Burr

December 2012

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				

FISHERY MANAGEMENT REPORT NO. 12-44

**FISHERY MANAGEMENT REPORT FOR SPORT FISHERIES
IN THE YUKON MANAGEMENT AREA, 2011**

By

John Burr

Division of Sport Fish, Fairbanks

Alaska Department of Fish and Game
Division of Sport Fish, Research and Technical Services
333 Raspberry Road, Anchorage, Alaska, 99518-1599

December 2012

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

John Burr
Alaska Department of Fish and Game, Division of Sport Fish
1300 College Rd., Fairbanks, AK 99701-1599, USA

This document should be cited as:

Burr, J. 2012. Fishery management report for sport fisheries in the Yukon Management Area, 2011. Alaska Department of Fish and Game, Fishery Management Report No. 12-44, Anchorage.

The Alaska Department of Fish and Game (ADF&G) administers all programs and activities free from discrimination based on race, color, national origin, age, sex, religion, marital status, pregnancy, parenthood, or disability. The department administers all programs and activities in compliance with Title VI of the Civil Rights Act of 1964, Section 504 of the Rehabilitation Act of 1973, Title II of the Americans with Disabilities Act (ADA) of 1990, the Age Discrimination Act of 1975, and Title IX of the Education Amendments of 1972.

If you believe you have been discriminated against in any program, activity, or facility please write:

ADF&G ADA Coordinator, P.O. Box 115526, Juneau, AK 99811-5526
U.S. Fish and Wildlife Service, 4401 N. Fairfax Drive, MS 2042, Arlington, VA 22203
Office of Equal Opportunity, U.S. Department of the Interior, 1849 C Street NW MS 5230, Washington DC 20240

The department's ADA Coordinator can be reached via phone at the following numbers:
(VOICE) 907-465-6077, (Statewide Telecommunication Device for the Deaf) 1-800-478-3648,
(Juneau TDD) 907-465-3646, or (FAX) 907-465-6078

For information on alternative formats and questions on this publication, please contact:
ADF&G, Division of Sport Fish, Research and Technical Services, 333 Raspberry Rd, Anchorage AK 99518 (907) 267-2375

TABLE OF CONTENTS

	Page
LIST OF TABLES.....	ii
LIST OF FIGURES.....	ii
LIST OF APPENDICES.....	ii
ABSTRACT.....	1
EXECUTIVE SUMMARY.....	1
INTRODUCTION.....	1
Advisory Committees.....	1
ADF&G Emergency Order Authority.....	2
Federal Subsistence.....	2
Statewide Harvest Survey.....	3
Sport Fish Guide licensing and Logbook program.....	3
SECTION I: MANAGEMENT AREA OVERVIEW.....	4
Management Area Description.....	4
Fishery Resources.....	4
Established Management Plans and Policies.....	5
Major Issues.....	5
Access Program.....	7
Information and Education.....	7
Sport Fishing Effort, Harvest, and Catch.....	7
Other User Groups – Commercial and Subsistence Fish Harvests.....	8
SECTION II: FISHERIES.....	9
Yukon River Drainage Salmon.....	9
Background and Historical Perspective.....	9
Recent Fisheries Performance.....	10
Summary of Yukon King Salmon Runs 2011 and 2012.....	10
Summary of Catch and Harvests in Yukon King Salmon Sport Fisheries in 2011.....	12
Fishery Objectives and Management.....	12
Current Issues and Fishery Outlook.....	13
Recent Board of Fisheries Action.....	14
Current or Recommended Research and Management Activities.....	15
Yukon River Northern Pike.....	15
Background and Historical Perspective.....	15
Recent Fisheries Performance.....	16
Fishery Objectives and Management.....	19
Current Issues and Fisheries Outlook.....	20
Recent Board of Fisheries Action.....	21
Current or Recommended Research and Management Activities.....	21
Yukon River Sheefish.....	22
Background and Historical Perspective.....	22
Recent Fishery Performance.....	23
Fishery Objectives and Management.....	23
Current Issues and Fishery Outlook.....	24
Recent Board of Fisheries Action.....	24
Current or Recommended Research and Management Activities.....	24

TABLE OF CONTENTS (Continued)

	Page
ACKNOWLEDGMENTS	24
REFERENCES CITED	25
TABLES AND FIGURES	29
APPENDIX A	41
APPENDIX B.....	43
APPENDIX C.....	47

LIST OF TABLES

Table	Page
1. Fishing effort (angler-days) for the Yukon Management Area, Region III, and Alaska, 1990–2011.	30
2. Number of fish harvested and total catch by species by recreational anglers within the Yukon Management Area, 1996–2011.	31
3. Sport harvest and catch of king salmon in the Yukon River drainage, 2001–2011.....	33
4. Sport harvest of northern pike in the Yukon River drainage, 2001–2011.....	35
5. Total fishing effort (angler-days), and northern pike catch and harvest from principal fisheries in the Yukon River area, 1992–2011.....	36
6. Sport harvest and catch of sheefish in the Yukon River drainage, 2001–2011	367

LIST OF FIGURES

Figure	Page
1. Map of the sport fish regions in Alaska and the five management areas in Region III.	39
2. Yukon area, Tanana River drainage is excluded from the YMA.	40

LIST OF APPENDICES

Appendix	Page
A1. Guided angler effort and fish species kept and released in the Yukon River Area, as reported in the freshwater guide logbooks, 2006–2011.....	42
B1. Commercial, subsistence, and sport harvest of king salmon in the Yukon River drainage.....	44
B2. Yukon River salmon fisheries preseason information sheet, 2011.....	45
C1. Emergency orders issued for Yukon Management Area sport fisheries during 2011 and 2012.....	48
C2. Reference information specific to 2013 Alaska Board of Fisheries proposals	49

ABSTRACT

Information specific to recreational fisheries in the Yukon Management Area in 2011 and preliminary information for 2012 is presented. Estimates of fishing effort, total catch, and harvest is summarized through the 2011 season. This information is provided to the Alaska Board of Fisheries (board), 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 board, social and biological issues, and descriptions of ongoing research and management activities. The remote waters of the Yukon Management Area supported approximately 10,000 angler days of sport fishing in 2011. Freshwater species dominated the total catch of 23,000 fish and a harvest of approximately 2,400. Arctic grayling, northern pike, sheefish (inconnu), and Dolly Varden char comprised more 80% of the total catch.

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 recreational angling opportunities that exist within the Yukon Management Area (YMA). Information specific to the proposals that the Alaska Board of Fisheries (board) will address at its January 15–20, 2013 meeting is contained within this report. Appendix C2 (page 49) directs board members to information specific to the January meeting. This table guides the reader to specific information contained within the text, tables, and graphic format that may be useful in evaluating regulatory proposals. Information specific to recreational fisheries within the YMA during 2011, including preliminary data from 2012 are presented, along with a brief history of these fisheries and past board decisions that have affected them.

INTRODUCTION

This area management report provides information regarding the YMA and its fisheries for 2011, with preliminary information from the 2012 season. This report is organized into 2 primary sections: a management area overview, including a description of the YMA and summary of fishing effort, harvest, and catch for the area; and a section on the significant area fisheries including specific harvest and catch by species and drainage.

ADVISORY COMMITTEES

Local Fish and Game advisory committees (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 meetings allow opportunity for direct public interaction with Alaska Department of Fish and Game (department) 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 the department's Division of Administrative Services, provides administrative and logistical support for the board and ACs. During 2011, the department had direct support responsibilities for 82 ACs in the state.

Within the YMA there are 10 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.

ADF&G EMERGENCY ORDER AUTHORITY

The department 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 for resident species. EOs are also implemented as a tool for inseason management of salmon fisheries. Inseason management is usually in accordance with a fisheries management plan approved by the board. EOs issued under this authority for the YMA during 2011 and 2012 are summarized in Appendix A.

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 the rural priority for subsistence fisheries on federal public lands, which includes nonnavigable waters on public lands. Following the *State of Alaska v. Katie John* decision by the Ninth 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 nonnavigable 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 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 within and adjacent to the 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, (October 2012); the Western Interior RAC met in Holy Cross (October 2012); and the last meeting of the Eastern Interior RAC was in Fairbanks (October 2012). At these meetings, federal fishery proposals concerning adoption of daily limits for subsistence harvests of northern

pike in the Paimiut/ Holy Cross area, customary trade of subsistence fish, and limiting the sale of subsistence-caught king salmon were discussed. The RAC recommendations were forwarded to the FSB.

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. 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. Questionnaires are mailed to a stratified random sample of households containing at least 1 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 available the following year; hence, the results for 2011 were available fall 2012. Additionally, creel surveys have been used to verify the mail survey for fisheries of interest, or for fisheries that require more detailed information or inseason management.

The utility of SWHS estimates depends on the number of responses received for a given site (Mills and Howe 1992; Clark 2009). 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 board adopted statewide sport fishing guide regulations (5 AAC 75.075) which required all sport fishing guides and businesses to register annually with the department. At this time, the board 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 board for allocation and management decisions specific to king salmon *Oncorhynchus tshawytscha*, 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 2009 (data since 2006) in a Fishery Data Series report (Sigurdsson and Powers 2009, 2010, 2011, 2012).

SECTION I: MANAGEMENT AREA OVERVIEW

MANAGEMENT AREA DESCRIPTION

The YMA consists of approximately 157,475 miles² (407,858 km²) 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 2 National Parks and Preserves (Yukon-Charley and Gates of the Arctic), 5 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 *Oncorhynchus keta*, 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 *Esox lucius* and sheefish (inconnu) *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 *Salvelinus namaycush* are very widespread and sport fishing pressure on these wild stocks 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 and are currently not stocked in waters within the YMA. 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.** Divisional activities should strive to restore and maintain fish stocks and habitat damaged by human 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 board 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 Arctic-Yukon-Kuskokwim (AYK) region was adopted by the board 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 board in February 2007 (Burr 2006). Revision of existing plans, as well as 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 the department, 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 and has resulted in adoption of restrictive bag limits or catch-and-release regulations for fisheries within the corridor.

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 nonlocal 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. The department 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 management of sport fisheries in the YMA. Experiences at the Dall and Innoko rivers are examples of the type of challenges that should be anticipated (see page 15).
3. Hook-and-line subsistence. In 2000, the board included hook-and-line attached to a rod or pole as a legal subsistence fishing method for harvest during the open-water season in the Association of Village Council Presidents’ area of the Lower Yukon and Kuskokwim rivers. Until this action was taken, hook-and-line fishing for subsistence was permitted only through the ice under state regulations in the YMA. The primary concern with this change is how to manage for sustainable fish populations with legalization of hook-and-line gear for subsistence fishing. It is likely that rural resident use patterns have incorporated hook-and-line 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 hook-and-line under subsistence regulations instead of sport fish regulations. The greatest concerns relate to changes in urban resident behavior in regard to license sales, those urban residents’ participation in rural fisheries and harvests of fish populations under subsistence regulations, and ability to measure these harvests’ absent harvest surveys or permits.
4. Rural resentment of sport fishing and sport anglers. At public meetings in this area, local residents sometimes express resentment toward “outsiders” who come into remote areas traditionally used by local people for subsistence hunting or fishing. They explain that there is a cultural proscription against the concept of "sport fishing" in that people do not have the right to "play" with food resources. This point of view can be particularly strong towards catch-and-release practices and has led to some resentment directed towards sport anglers who wish to fish in remote waters of YMA, and to proposals before the board that would have eliminated catch-and-release in some fisheries.
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 potential loss of opportunity is of

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 department staff to maintain current opportunities.

ACCESS PROGRAM

The Wallop-Breaux amendment to the Federal Aid in Sport Fish Restoration Act (Dingell-Johnson or D-J) mandates that at least 15% of the federal funds collected from taxes on boat gas and sport fishing equipment be used by states for 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, restrooms, 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 EOs for the YMA can be found from the *Fishing* and *Sport* links at the department's website (<http://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 (<http://dnr.alaska.gov/parks/aktrails/index.htm>). Federal agencies provide information on water bodies 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 3 regional information and education (I&E) staff located in the department's Fairbanks office. An Information Officer II and a seasonal Fisheries Biologist I 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 and Game Fun Day, and the Becoming an Outdoors-Woman 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 FISHING EFFORT, HARVEST, AND CATCH

Effort, harvest, and catch statistics for YMA sport fisheries have been estimated from response to the SWHS since 1977 and reported under the headings of the "Yukon River drainages" (Area Y) (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, 2011a-b, *In prep*). Estimates of angling effort in the YMA averaged more than 11,000 angler-days during the last 5- (2006–2010) and 10-year (2001–2010) 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 are located 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. 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, and fishing is usually conducted with high catch-per-unit-of-effort gear types such as fish wheels and nylon gillnets. Recently, hook-and-line fishing gear was added to the types of legal subsistence fishing gear in the lower portion of the Yukon River drainage. Sport fishing with hook-and-line 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 fishing done using hook-and-line 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 in the SWHS.

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 (Burr 2004). Since that time, annual harvests have declined; harvests averaged just more than 6,000 fish in the most recent 5-year period (Table 2). The most recent estimate (2011) is less than 2,400 fish, the smallest estimated annual harvest on record. 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 about 17 percent of the total sport harvest in the management area.

Sport catch of all species in the YMA has been estimated since 1990. 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 87% of all fish caught in the YMA were released. The proportion of catch-and-release activity varies by species. For example, only 10% of burbot caught between 2006–2010 were released compared with 91% of northern pike, 89% of Arctic grayling, 62% of lake trout, and 85% of king salmon.

The Freshwater Sport Fish Guide Logbook has provided an additional measure of fishing effort, catch, and harvest by guided anglers since 2006. 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 A1). For example, king salmon harvest and fish released from the guide logbook reports for the Yukon River area have averaged about 94 and 389 (harvested and fish released = catch of 483 fish) fish per year, respectively, compared with 160 and 1,070, respectively, from the SWHS for 2006–2011. Please note that the SWHS reports catch (fish harvested and released), while the guide logbook reports fish released. Additionally, the SWHS reports estimates, 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. Commercial fisheries provide an economic base for income and employment in many local communities. Commercial and subsistence harvests for all species of salmon are much larger than sport harvests (Appendices B1, Burr 2012). 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 *Lampetra camtschatica*.

In the Yukon River drainage, salmon harvests have historically been dominated by chum salmon (Estensen et al. 2012). King salmon, while less abundant, is an important species for commercial sale and is a preferred subsistence food 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 and poor chum salmon runs between 1998–2002. From 2008–2012, commercial fisheries directed at king salmon have been eliminated by measures to conserve king salmon 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 in streams near the coast of the YMA, though the species is not exploited to a great extent in commercial or subsistence fisheries.

Commercial harvests of all salmon species, combined, in the Yukon River averaged more than one million salmon annually from 1977–1996. Weak returns of king and chum salmon since 1997, particularly through 2002, resulted in much lower than average commercial harvests (Appendices B1, Estensen et al. 2012). Recently, commercial harvests of chum salmon have increased, but have not reached historical levels (Estensen et al. 2012).

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 rare.

This section provides a summary of significant sport fisheries by species in the YMA in 2011 and 2012, and has direct connection to proposals being addressed by the board in January 2013. Discussion of each fishery will include: 1) historical perspective; 2) recent fishery performance (stock status); 3) fishery objectives and management; 4) current issues; 5) recent actions by the board; and, 6) ongoing and recommended management and research activities. Recent fishery performance will focus on data from 2011. Information regarding the 2012 season will be included as available, but estimates of sport effort and harvest are not yet available for the 2012 season. A summary of recent sport fish harvests by species are provided for reference (Table 2) for a complete list of sport harvest and catch since 1977 for the Yukon drainage, see Burr 2012.

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 (Table 2, Appendix B1).

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 typically are less abundant upstream of the Anvik River (approximately 300 river miles from the Bering Sea). Sockeye salmon occur occasionally, but only a few fish are taken annually in commercial or subsistence harvests.

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 2012). Sport harvests are reported from other streams and drainages in the Yukon River watershed, primarily from the Andreafsky, Anvik, and Koyukuk rivers and their tributaries (Table 3). 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. Hook-and-line fishing for salmon is practiced in clear water tributaries of the Yukon River drainage by some rural residents and by nonlocal 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 1999, with runs in 2000 the worst on record for both species. In September 2000, the board 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 and continuing through 2011, the number of king salmon returning to the Yukon River drainage was less than expected.

Summary of Yukon King Salmon Runs 2011 and 2012

In 2011, the drainagewide king salmon run was projected preseason to be between 130,000 and 178,000 fish, well below average in size (JTC 2011). Because managers anticipated a weak run and because the Canadian border passage goal had not been attained in three of the past four 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 2011, the king salmon run was managed in a more conservative manner than in 2010. No commercial fishery directed at king salmon was allowed (JTC 2012). Gillnet mesh size was

restricted to 7.5 inch, or less, by regulations that took effect in 2011. One subsistence salmon fishing period was canceled in each district as the first pulse of king salmon migrated upstream to the Canadian border and subsistence fishing time on the second pulse was also cancelled. Furthermore, in late June, the mesh size was restricted to 6 inch, or less, during subsistence fishing periods in districts Y-1 and Y-2 to provide additional protection to the third pulse of king salmon as it moved upstream. The sport fishery for king salmon in the mainstem was closed preseason on June 2 and remained closed for the season. The sport fish bag limit was reduced in all tributaries from 3 to 1 king salmon. 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 4,083 king salmon were reported caught on commercial fish tickets, but were not sold. The prohibition on king salmon sales was lifted partway through the fall chum salmon season. During the fall season, the commercial harvest of king salmon totaled 82 fish (Appendix B1).

The king salmon run in 2011 was weak, as anticipated by the preseason projection and indicated by the early inseason assessment projects (JTC 2012). In general, escapement targets were met as a result of conservative management measures. The cumulative passage estimate from the Pilot Station sonar project was 107,300 king salmon, compared to an average of about 159,000. The sustainable escapement goals (SEGs) for the East and West Fork Andreafsky and the Nulato were met, but the Anvik River target was not attained. High water conditions on the Chena, Salcha, and Goodpaster rivers precluded counting for much of the season. Spawning escapement for the Canadian portion of the Yukon River drainage, estimated by Eagle sonar project near the Alaska-Canada border, was approximately 49,800 king salmon, in the middle of the range of the Interim Management Escapement Goal (IMEG) of 42,500–55,000 king salmon.

In 2012, the drainagewide king salmon run was projected preseason to be between 109,000–146,000 fish, far below average in size and similar to the 2008, 2010, and 2011 runs (JTC 2012). Again in 2012, a series of preseason 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 2012 was managed in a conservative manner. No commercial fishery directed at king salmon was allowed (JTC *In prep.*). In mid-June (prior to the arrival of the first pulse), gillnet mesh size was restricted to 6 inch, or less, during subsistence fishing periods in districts 1–3 in order to conserve king salmon and allow harvest of summer chum salmon. A subsistence salmon fishing period was canceled in each district as the first pulse of king salmon migrated upstream to the Canadian border. The sport fishery for king salmon in the mainstem was closed preseason on May 15 and remained closed for the remainder of the season. The sport fish harvest limit was reduced in all tributaries from 3 to 1 king salmon. As the season progressed, it became apparent that additional conservative measures would be needed to attain escapement goals. A second pulse closure was implemented immediately following the first pulse closure, creating a continuous closure of the first and second pulses. The second pulse closure was followed by reduced fishing periods in districts 1 through 4 in order to provide opportunity to harvest some of the abundant summer chum salmon while conserving king salmon. Subsistence fishing opportunity in Subdistrict 5-D, through which few summer chum salmon migrate, was restricted to one 36-hour fishing period during the king salmon run in an attempt to meet the border escapement goal for Canadian stocks.

Conservative management measures were also implemented in Yukon River tributaries in Alaska in an effort to protect these king salmon stocks. Gillnets were restricted to 6-inch mesh or less in the Innoko River from June 24–July 18 and from July 3–22 in the Koyukuk River. In subdistricts 6-A and B of the Tanana River between July 20–25, subsistence fishing gear was restricted to closely attended fish wheels equipped with chutes and all king salmon had to be returned to the water alive. Personal use salmon fishing in subdistrict 6-C (Tanana River near Fairbanks) was closed from July 20–29. The sport fishery in the Tanana River drainage was closed to the retention of king salmon on July 21 and on July 30 the Chena River was closed to king salmon fishing.

King salmon caught during commercial fishing for summer chum salmon in districts Y-1 and Y-2 could be released alive or retained for subsistence use, but could not be sold. A summer chum salmon directed fishery was allowed in Subdistrict 4-A through new regulations adopted by the board in 2012 that required the use of manned fish wheels with chutes and incidentally caught king salmon to be returned to the water unharmed. A total of 2,548 king salmon were reported caught on commercial fish tickets, but were not sold.

As anticipated, the king salmon run in 2012 was poor. The cumulative passage estimate from the Pilot Station sonar project was 106,731 king salmon, 30% less than the recent 10-year average (2002–2011) of about 152,000. Escapement goals were attained in several of the Alaska systems due to conservative management measures. The biological escapement goal (BEG) was met for the Salcha River, but not for the adjacent Chena River. High water conditions on the Chena River precluded counting for much of the season, but subsequent ground surveys indicated poor escapement to the Chena drainage. The SEG, based on aerial surveys, was attained for the Nulato River, but not for the Anvik River. The lower end of the SEG range was met for the Andreafsky River weir. Preliminary passage estimate at Eagle sonar was 35,227 fish, yielding a border passage of about 34,000 king salmon. The IMEG for the Canadian portion of the Yukon River drainage is 42,500–55,000. This was the fourth year since 2007 the IMEG was not met.

Summary of Catch and Harvests in Yukon King Salmon Sport Fisheries in 2011

Estimated sport harvest of king salmon from the entire YMA (Tanana River excluded) was 102 (SE = 63) fish during 2011 (Tables 2 and 3). The 2011 estimated harvest is consistent with 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 899 (SE = 697) fish in 2011 (Tables 2 and 3). As in previous years, most of the estimated catch and harvest of king salmon during the 2011 season came from Lower Yukon River drainages. The Anvik and Andreafsky rivers have been the predominant sites in recent years. Weak king salmon runs experienced since 2007 resulted in restrictions to the sport fishery in 4 of the past 5 years (2008, 2009, 2011, and 2012). 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 consumptive priority. 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 treaty with Canada. The department 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 throughout the Alaskan portion of the Yukon River drainage (5 AAC 05.360). The department attempts to manage king salmon commercial fisheries such that the harvest in each district is proportionally similar to respective guideline harvest ranges.

During the winter of 2000/2001, the board developed a rebuilding plan for Alaskan Yukon River king 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 board 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.

The department 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 B2). Since 2009, the preseason strategy has been to reduce subsistence fishing time during the first pulse of king salmon and subsequently follow the subsistence fishing schedule developed by the board. In the event of a poor run, the subsistence schedule will be further reduced to meet escapement goals. If after the historical midpoint of the run, the abundance is strong and surplus fish are available, the subsistence fishery will follow the pre-2001 schedule (open except before and after commercial openings in districts 1–3) and commercial fisheries will be permitted.

Stocks of concern will again be reviewed by the board in January 2013. At that time, the department will recommend that the board continue the classification of yield concern for king salmon.

Sport fisheries for salmon in the YMA have very limited impact on stocks of salmon due to low effort and harvest, in comparison to commercial and subsistence 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.

On June 2, 2011 and May 15, 2012, the sport fishery for king salmon in the mainstem Yukon River was closed preseason and remained closed for the remainder of each 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 harvest of king salmon, particularly those migrating to Canada.

Current Issues and Fishery Outlook

The primary issue concerning salmon fisheries is the uncertain run strength of salmon returning to the Yukon River drainage. Another issue affecting all users (including recreational anglers) of salmon in the YMA is dual management (state and federal); this continues to be an issue affecting all users in that each government defines subsistence users differently, having real

effects for various groups' access to fish. The State of Alaska provides for priority subsistence uses of these resources, but does not distinguish between rural and urban users due to constitutional provisions. There continues to be concern that federal regulations will result in loss of opportunity for nonsubsistence 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 uses 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 2013 king salmon run is uncertain, but the run will likely be below average. Weak king salmon runs realized in 2000 and 2001 produced near average returns through 2006. With improved run size since 2002 (due largely to conservative management), a stronger run in 2008 was anticipated, but did not materialize. 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 unprecedented conservative management of the run. The king salmon run in 2010 was managed in a less conservative manner than in 2009; escapements were disappointing and the Canadian IMEG was not attained. In 2011, the run was again managed very conservatively and escapements were attained, but the run size was smaller than in 2009. In 2012, the king salmon run was very weak and was once again managed very conservatively. Escapements were generally attained in Alaskan drainages, but the IMEG was not met for the fourth time in six years. Considering the poor runs experienced since 2008, it is anticipated that there will be no commercial fishery directed at king salmon in the mainstem Yukon River in 2013. Very conservative management measures will likely need to be repeated in 2013. If a poor run develops, the sport fishery will be managed in a manner consistent with run strength, which in past years has been a sport fishing closure in the mainstem Yukon River and reducing the bag limit from 3 to 1 in the tributaries in mid-May, prior to the arrival of king salmon. The intent of sport fishery management continues to focus on providing 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

The board adopted the *Yukon River King Salmon Management Plan* in January 2001 and modified the plan in 2002, 2003, 2004, and 2010 (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. Proposals to modify the *Yukon River King Salmon Management Plan* have been submitted and will be considered during the 2013 board meeting.

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 (Table 3). Up to 3 sport fish guiding businesses presently operate within 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, and more recently, by reports from the guide logbook program. Overflights 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 2013.

YUKON RIVER NORTHERN PIKE

Background and Historical Perspective

Sloughs, interconnected lakes, and 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. Within the past 10–20 years, new or 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 4). 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 5 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 a size limit, to 5 per day, with only 1 fish 30 inches or larger (Arvey and DeCicco 1989). During 1999 and 2000, a management plan was developed by the department, Stevens Village Office of Natural Resources, and USFWS which describes an area for special management of northern pike (Burr 2004). In 2001, the board adopted a special regulation for the Dall River management area consistent with 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 downstream from the mouth of the Tanana River. The Nowitna River was designated a Wild 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 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 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 concurrently with hunting activities. Both guided and unguided anglers participate in the fishery. In recent years, up to 6 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. There is one locally-owned and operated land-based lodge that offers guided sport fishing services in the area. 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 and also offers day trips to the Innoko River.

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 concentrated.

Estimates of harvest and catch of northern pike in the YMA were lower for 2011 than in recent seasons. Harvest in 2011 was estimated to be 430 (SE=159) fish compared with 5- and 10-year (2006–2010, 2001–2010) averages of 1,272 and 1,849, respectively (Table 5). Estimated catch of northern pike in 2011 was 5,300 (SE=2,054) fish and was about 62% less than the recent 5-

year average. While the total amount of use of northern pike has declined, the proportion of fish released by anglers has remained constant at more than 90%.

Dall River. Recent estimates of fishing effort and harvest in the Dall River sport fishery are based on small numbers of respondents to the harvest survey. The limited results suggest that participation in this fishery continues to be at a low level and may have declined in recent years. During the last 5- and 10-year periods, fishing effort (for all species) by guided and unguided anglers at the Dall River averaged more than 300 angler-days (Table 5). During 2010 and 2011, fishing effort was estimated at less than 180 angler-days. Estimated harvests of northern pike from the Dall River have been higher than from other YMA locations in most 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 board prior to the 2001 season, harvests were markedly reduced (Table 5). Total catch of northern pike from the Dall River has also declined recently. The last 5-year average of 916 fish is almost 65% less than the recent 10-year average.

Nowitna River. The Nowitna River currently accounts for about 17% of the sport fish harvest and more than 25% of the total catch of northern pike in the YMA. In the recent 5-year period, the proportion of the YMA harvest and catch of northern pike from the Nowitna River has averaged about 12% of the harvest and 22% of the total catch of all Yukon River sites. Any increased use of this area is likely, in part, the result of increased use of Nowitna River northern pike by guided anglers since the mid-2000s. In 2011, estimated harvest and catch of northern pike from the Nowitna River were again greater than recent average figures. Estimated level of sport fishing effort (for all species) by guided and unguided anglers in the Nowitna River was approximately 500 angler-days in 2011 (Table 5).

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 3 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 application of the study findings to future sampling efforts. The movements of individually marked fish indicate that northern pike using the lower 20 miles of the river are part of a single large stock. The study concluded that the population is currently lightly exploited and 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 of the drainage and assist in 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 of the river) traveled upstream of the Titna River (more than 100 river miles) during late summer and remained there throughout the winter. Other fish remained within the study area, while still others traveled 50 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.

Innoko River. Estimates of sport fishing effort (for all species) in the Innoko River generally increased through 2004 concurrently with establishment of fishing guides in the area. Current fishing effort is less (recent 5-year average, 2006–2010) and was estimated to be about 508 angler-days annually (Table 5). During this timeframe, estimates of harvest of northern pike have changed little, averaging less than 80 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 2011 was about 220 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 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 reduced abundance. Department 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 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, residents of Kuskokwim River communities were observed participating in this fishery 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 2 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 recoveries from the subsistence fishery of northern pike marked in the sport fishery, demonstrate that the fish targeted by these 2 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 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 prespawning 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 hook-and-line 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 inches total length (TL)) groups. As fishing effort increases, management for continued harvests will be structured around a bag limit of more than 1 northern pike, with a size limit structured to limit harvest of northern pike in large size groups.

The department 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 these 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. The department 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. The department, 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 nonlocal users. A summary of the current plan, including the shared policies, objectives, and issues/action items is found in Burr 2004.

- 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. Current regulations for the Dall River fishery were adopted by the board during January 2001 and required release of all northern pike between 30 and 48 inches. As a result, 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). Fishing effort and total harvest and catch have changed little. Growth of the fishery will be closely monitored. Management efforts will continue to be consistent with 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 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, the department recognized a need for new sport regulations consistent with other popular northern pike sport fisheries in the Yukon and Tanana River areas that would help control the loss of large adult northern pike. In January 2007, the board adopted a proposal to reduce 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 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 a 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 have also voiced a concern over increased wintertime use of northern pike stocks by nonlocal 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

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)

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 6 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 nonlocal 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.

Dall River. Current sport fishing regulations for the Dall River fishery were adopted by the board 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 4 northern pike less than 30 inches and 1 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 5 fish with only one 30 inches or larger. The intent of this regulation is to reduce harvest of large fish (>30 inches) as discussed above.

Innoko River. In 2001, the board adopted regulations governing the sport fishery for northern pike in the Innoko River. The bag limit is 3 northern pike per day, of which only 1 may be 30 inches or larger. The 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. The department 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 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; results of this study are not yet available.

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; results of this study are not yet available. 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 of growth in the sport and subsistence fisheries on the proportion of large northern pike present in the Lower Innoko River, the department will closely monitor these fisheries for increases in fishing effort or changes in patterns of use. In addition to closely inspecting estimates of catch, effort, and harvest in the sport fishery, the department 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 SHEEFISH

Background and Historical Perspective

Sheefish are large piscivorous members of the coregonid (whitefish) subfamily. In the Yukon River drainage, the species is highly migratory, primarily found in streams and the brackish water at the river mouth, but they also use lake habitats to forage.

Sheefish are subject to an intensive subsistence fishery during the winter on the Lower Yukon River (Crawford 1979), throughout the drainage during the open water season by subsistence fishermen, and incidentally in salmon fisheries all along the river (Estensen *et al.* 2012, Jallen *et al.* 2012). Sheefish are also harvested incidentally in a fall season commercial fishery targeting Bering cisco in the lower river (Estensen *et al.* 2012).

Distribution of sport fishing effort, as indicated by catch and harvest, is likewise widespread. Historic documentation of harvests indicates that most sport utilization has occurred during summer and during the fall spawning migration near the mouth of tributary streams, including the Andreafsky, Innoko, Nulato, Nowitna, and Melozitna rivers (Table 6).

Currently sheefish in the Yukon River are under a single regulation adopted by the board in 1969:

- Bag and possession limit is 10 fish, no size limit. Season is open entire year.

The Trans-Alaska pipeline corridor was closed to all sport fishing in 1977. The highway corridor was reopened in 1980 to sport fishing for all species, except for sheefish and salmon for which the area has remained closed.

Although sheefish can be captured throughout much of the Yukon River drainage, many aspects of their life history remain unclear. Major migration routes, timing of migrations, and important habitat areas for the species are only partly understood.

Recent multi-year studies using radio telemetry have verified known or identified new locations of spawning areas in the Yukon River drainage. To date, 6 specific spawning locations have been described in the following locations: Upper Innoko River, Alatna River (Koyukuk drainage), Sulukna River (Nowitna drainage), Chatanika River (Tanana drainage), mainstem Tanana River near Fairbanks, and mainstem Yukon River upstream of the Porcupine River mouth (Alt 1969, Brown 2000, Gerken 2009, Brown and Burr 2012). Additional spawning areas are thought to exist in the Porcupine and Black river drainages, as well as the upper reaches of the Yukon River itself (Alt 1987), but specific locations have not been identified. Movements of juveniles, rearing habitats, and the behavior of nonspawning adults are largely matters of speculation.

Sheefish are represented by both anadromous and resident forms. Some sheefish are thought to be members of resident populations that restrict their lifetime geographic range to the drainage in which they spawn (Alt 1985). Others are anadromous and are known to make rapid long distance migrations to the mouth of the Yukon River and salt water immediately following spawning (Brown and Burr 2012). Analysis of strontium concentrations in otoliths from sheefish harvested from spawning migrations into the Upper Koyukuk, Yukon Flats, Tanana River, and Nowitna River were conducted to identify anadromy in sheefish, (Brown et al. 2007 and Esse 2011). At least some anadromous individuals were present in the spawning populations within all of these drainages.

Recent Fishery Performance

Estimated average sport harvest of sheefish from the YMA in the recent 5-year period (2006–2010) was 338 fish. In the last 10-year period, harvests have ranged from 118 in 2011 to 1,352 in 2004 (Table 6). Similarly, catch estimates for the YMA have ranged widely, from 378 in 2011 to more than 8,000 in 2006 (Table 6). These data reflect a continued low, but variable, level of use of the species by sport anglers in the YMA as a whole.

Fishery Objectives and Management

Because the sport fishery for sheefish is currently widely distributed through the drainage, specific management objectives have not been identified. The goal of management is to maintain naturally-reproducing populations of sheefish with characteristics that are sustainable and desirable to the public.

Current Issues and Fishery Outlook

At present, there is little concern for overharvest of sheefish in the Yukon drainage. However, sheefish are currently being subjected to increased harvest in subsistence and commercial fisheries. Local subsistence fishers report increased harvest of sheefish to help offset limited access to king salmon brought on by poor runs in recent years. A commercial fishery for Bering cisco during fall in the lower Yukon River has documented an increased harvest of sheefish. Increased harvest of large adult sheefish in either or both of these fisheries is likely to impact this anadromous stock.

Construction of new industrial roads for development of mineral deposits near known and recently identified spawning areas is of potential concern. The alignment of the proposed mining road from the Dalton Highway to the Ambler area traverses the Alatna River a short distance upstream of the sheefish spawning area. Potential impacts include increased human access to vulnerable spawning sheefish and habitat degradation from road construction and release of heavy metals and fuel spills.

Recent Board of Fisheries Action

No regulatory actions have been taken by the board for Yukon River sheefish since 1980.

Current or Recommended Research and Management Activities

A radiotelemetry study of sheefish in the Tanana drainage is currently being conducted. The study seeks to identify spawning locations, spawning frequency, and degree of anadromy migration timing of sheefish using the Tanana drainage (Gryska *In prep.*). The project is scheduled to be completed by 2014.

Additional sheefish spawning areas are thought to exist in the Porcupine and Black river drainages, as well as in the upper reaches of the Yukon River itself (Alt 1987), but specific locations have not been identified. A study to identify any additional spawning areas in the upper Yukon and the degree to which sheefish in the area are anadromous is recommended. Because of the large distance from the upriver areas to the rich marine feeding habitats, sheefish inhabiting the upper Yukon are likely to be resident, rather than anadromous populations. The resident populations are less resilient to increased harvest pressure than are the anadromous forms. It is important to identify these stocks so the effects of changes in harvest and use patterns can be managed effectively.

ACKNOWLEDGMENTS

The author thanks Tom Taube for a complete and careful editing this report. Thanks also to Rachael Kvapil, Region III publications technician, for assistance with formatting and final report preparation.

REFERENCES CITED

- Alt, K. T. 1969. Taxonomy and ecology of the inconnu, (*Stenodus leucichthys nelma*), in Alaska. Biological Papers of the University of Alaska 12:61pp.
- Alt, K. T. 1985. Inventory and cataloging of sport fish and sport fish waters of western Alaska. Alaska Department of Fish and Game, Project F-9-17, Volume 26, Juneau.
- Alt, K. T. 1987. Review of inconnu *Stenodus leucichthys* studies in Alaska. Alaska Department of Fish and Game, Federal Aid in Fish Restoration, Fishery Manuscript No. 3, Juneau.
- Arvey, W. D. and A. L. DeCicco. 1989. Northern pike in the vicinity of the Yukon River haul road crossing, 1988. Alaska Department of Fish and Game, Fishery Data Series No. 105, Juneau.
- Arvey, W. D. and A. Burkholder. 1990. Stock assessment of northern pike in the vicinity of the Yukon River haul road crossing, 1988 and 1989. Alaska Department of Fish and Game, Fishery Manuscript No. 90-1, Anchorage.
- Arvey, W. D., J. Burr, A. L. DeCicco, J. Hallberg and J. Parker. 1995. Fishery Management Report for sport fisheries in the Arctic-Yukon-Kuskokwim, Tanana River, and Northwest Alaska regulatory areas, 1992. Alaska Department of Fish and Game, Fishery Management Report No. 95-9, Anchorage.
- Brase, A. L. J. and B. Baker. 2012. Fishery Management Report for Recreational Fisheries in Tanana Management Area in 2010. Alaska Department of Fish and Game, Fishery Management Report No. 12-32, Anchorage.
- Brown, R. J. 2000. Migratory patterns of Yukon River inconnu as determined with otolith microchemistry and radio telemetry. Master's Thesis, University of Alaska Fairbanks.
- Brown, C., J. Burr, K. Elkin and R. J. Walker. 2005. Contemporary subsistence uses and population distribution of non-salmon fish in Grayling, Anvik, Shageluk and Holy Cross. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 289, Juneau.
- Brown, R. J., Bickford, N., and Severin, K. 2007. Otolith trace element chemistry as an indicator of anadromy in Yukon River drainage Coregonine fishes. Transactions of the American Fisheries Society 136:678-690.
- Brown, R. J. and J. M. Burr. 2012. A radiotelemetry investigation of the spawning origins of Innoko River inconnu (sheefish). Alaska Department of Fish and Game, Fishery Data Series No. 12-54, Anchorage.
- Burkholder, A. 1992. Mortality of northern pike captured and released with sport fishing gear. Alaska Department of Fish and Game, Fishery Data Series No. 92-3, Anchorage.
- Burr J. M. 1998. Effect of post-capture handling on mortality in northern pike. Alaska Department of Fish and Game, Fishery Data Series No. 98-34, Anchorage.
- Burr, J. 2001. Fishery Management Report for Sport Fisheries in the Arctic-Yukon-Kuskokwim Management Area, 1999–2000. Alaska Department of Fish and Game, Fishery Management Report No. 01-03, Anchorage.
- Burr, J. 2004. Fishery Management Report for Sport Fisheries in the Arctic-Yukon-Kuskokwim Management Area, 2002–2003. Alaska Department of Fish and Game, Fishery Management Report No. 04-02, Anchorage.
- Burr, J. M. 2006. AYK Lake Trout Management Plan. Alaska Department of Fish and Game, Fishery Management Report No. 06-52, Anchorage.
- Burr, J. 2012. Fishery Management Report for Sport Fisheries in the Yukon Management Area, 2010. Alaska Department of Fish and Game, Fishery Management Report No. 12-35, Anchorage.
- Burr, J. M. and D. James. 1996. Dall River cooperative research project, 1995. Alaska Department of Fish and Game, Fishery Data Series No. 96-34, Anchorage.
- Burr, J. M. and S. Roach. 2003. Abundances, length and age compositions, and CPUE of northern pike within selected sloughs of the Nowitna River, 1997. Alaska Department of Fish and Game, Fishery Data Series No. 03-16, Anchorage.

REFERENCES CITED (Continued)

- Burr, J. M., A. L. DeCicco, J. Hallberg and J. Parker. 1998. Fishery Management Report for sport fisheries in the Arctic-Yukon-Kuskokwim, Tanana River, and Northwest Alaska regulatory areas, 1993–1994. Alaska Department of Fish and Game, Fishery Management Report No. 98-5, Anchorage.
- Clark, R. A. 2009. An evaluation of estimates of sport fish harvest from the Alaska statewide harvest survey, 1996–2006. Alaska Department of Fish and Game, Special Publication No. 09-12, Anchorage.
- Crawford, D. 1979. Lower Yukon River sheefish study October 1977–June 1978. Alaska Department of Fish and Game, Division of Commercial Fisheries, AYK-Region Sheefish Report No. 9, Anchorage.
- Chythlook, J, and J. M. Burr. 2002. Seasonal movements and length composition of northern pike in the Dall River, 1999–2000. Alaska Department of Fish and Game, Fishery Data Series No. 02-07, Anchorage.
- Esse, D. A. 2011. Characteristics of the Sulukna River spawning population of inconnu, Yukon River drainage, Alaska. Bureau of Land Management, Central Yukon Field Office, Program Report BLM/AK/F03000-6500/FY09/1120/07, Fairbanks, Alaska.
- Estensen, J. L., S. Hayes, S. Buckelew, D. Green, D. J. Bergstrom. 2012. Annual management report for the Yukon and Northern Area, 2010, Alaska Department of Fish and Game, Fishery Management Report No. 12-23. Anchorage.
- Estensen, J., S. J. Hayes, B. M. Borba, S. N. Schmidt, D. L. Green, D. M. Jallen, E. J. Newland, and A. C. Wiese. *In prep.* Annual Management Report Yukon Area, 2011, Alaska Department of Fish and Game, Division of Commercial Fisheries, Fishery Management Report, Anchorage.
- Gerken, J. 2009. Identification and characterization of inconnu spawning habitat in the Sulukna River, Alaska. Master's Thesis, University of Alaska Fairbanks
- Gryska, A. D. *In prep.* Preliminary report on the spawning locations of Tanana River summer resident sheefish. Alaska Department of Fish and Game. Fishery Data Series, Anchorage.
- Howe A. H., G. Fidler and M. Mills. 1995. Harvest, catch and participation in Alaska sport fisheries during 1994. Alaska Department of Fish and Game. Fishery Data Series No. 95-24, Anchorage.
- Howe, A. L., G. Fidler, A. E. Bingham, and M. J. Mills. 1996. Harvest, catch, and participation in Alaska sport fisheries during 1995. Alaska Department of Fish and Game, Fishery Data Series No. 96-32, Anchorage.
- Howe, A. L., R. J. Walker, C. Olnes, K. Sundet, and A. E. Bingham. 2001a. Revised Edition: Harvest, catch, and participation in Alaska sport fisheries during 1996. Alaska Department of Fish and Game, Fishery Data Series 97-29 (revised), Anchorage.
- Howe, A. L., R. J. Walker, C. Olnes, K. Sundet, and A. E. Bingham. 2001b. Revised Edition: Harvest, catch, and participation in Alaska sport fisheries during 1997. Alaska Department of Fish and Game, Fishery Data Series 98-25 (revised), Anchorage.
- Howe, A. L., R. J. Walker, C. Olnes, K. Sundet, and A. E. Bingham. 2001c. Revised Edition: Participation, catch, and harvest in Alaska sport fisheries during 1998. Alaska Department of Fish and Game, Fishery Data Series 99-41 (revised), Anchorage.
- Howe, A. L., R. J. Walker, C. Olnes, K. Sundet and A. E. Bingham. 2001d. Participation, catch, and harvest in Alaska sport fisheries during 1999. Alaska Department of Fish and Game, Fishery Data Series No. 01-08, Anchorage.
- Jallen, D. M., S. K. S. Decker, and T. Hamazaki. 2012. Subsistence and personal use salmon harvests in the Alaska portion of the Yukon River drainage, 2011. Alaska Department of Fish and Game, Fishery Data Series No. 12-72, Anchorage.
- Jennings, G. B., K. Sundet, A. E. Bingham, and D. Sigurdsson. 2004. Participation, catch, and harvest in Alaska sport fisheries during 2001. Alaska Department of Fish and Game, Fishery Data Series 04-11, Anchorage.
- Jennings, G. B., K. Sundet, A. E. Bingham, and D. Sigurdsson. 2006a. Participation, catch, and harvest in Alaska sport fisheries during 2002. Alaska Department of Fish and Game, Fishery Data Series 06-34. Anchorage.

REFERENCES CITED (Continued)

- Jennings, G. B., K. Sundet, A. E. Bingham, and D. Sigurdsson. 2006b. Participation, catch, and harvest in Alaska sport fisheries during 2003. Alaska Department of Fish and Game, Fishery Data Series 06-44, Anchorage.
- Jennings, G. B., K. Sundet, and A. E. Bingham. 2007. Participation, catch, and harvest in Alaska sport fisheries during 2004. Alaska Department of Fish and Game, Fishery Data Series 07-40, Anchorage.
- Jennings, G. B., K. Sundet, and A. E. Bingham. 2009a. Estimates of participation, catch, and harvest in Alaska sport fisheries during 2005. Alaska Department of Fish and Game, Fishery Data Series 09-47, Anchorage.
- Jennings, G. B., K. Sundet, and A. E. Bingham. 2009b. Estimates of participation, catch, and harvest in Alaska sport fisheries during 2006. Alaska Department of Fish and Game, Fishery Data Series 09-54, Anchorage.
- Jennings, G. B., K. Sundet, and A. E. Bingham. 2010a. Estimates of participation, catch, and harvest in Alaska sport fisheries during 2007. Alaska Department of Fish and Game, Fishery Data Series 10-02, Anchorage.
- Jennings, G. B., K. Sundet, and A. E. Bingham. 2010b. Estimates of participation, catch, and harvest in Alaska sport fisheries during 2008. Alaska Department of Fish and Game, Fishery Data Series 10-22, Anchorage.
- Jennings, G. B., K. Sundet, and A. E. Bingham. 2011a. Estimates of participation, catch, and harvest in Alaska sport fisheries during 2009. Alaska Department of Fish and Game, Fishery Data Series 11-45, Anchorage.
- Jennings, G. B., K. Sundet, and A. E. Bingham. 2011b. Estimates of participation, catch, and harvest in Alaska sport fisheries during 2010. Alaska Department of Fish and Game, Fishery Data Series 11-60, Anchorage.
- Jennings, G. B., K. Sundet, and A. E. Bingham. *In prep.* Estimates of participation, catch, and harvest in Alaska sport fisheries during 2011. Alaska Department of Fish and Game, Fishery Data Series, Anchorage.
- JTC (Joint Technical Committee of the Yukon River US/Canada Panel). 2011. Yukon river salmon 2010 season summary and 2011 season outlook. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report No. 3A11-01, Anchorage.
- JTC (Joint Technical Committee of the Yukon River US/Canada Panel). 2012. Yukon river salmon 2011 season summary and 2012 season outlook. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report No. 3A12-01, Anchorage.
- JTC (Joint Technical Committee of the Yukon River US/Canada Panel). *In prep.* Yukon river salmon 2012 season summary and 2013 season outlook. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report No. 3A13-01, Anchorage.
- Mills, M. J. 1979. Alaska statewide sport fish harvest studies. 1977 data. Alaska Department of Fish and Game. Federal Aid in Fish Restoration, Annual Report of Progress, 1978-1979. Project F-9-11, Volume 20 (SW-1-A), Juneau.
- Mills, M. J. 1980. Alaska statewide sport fish harvest studies. 1978 data. Alaska Department of Fish and Game. Federal Aid in Fish Restoration, Annual Report of Progress, 1979-1980. Project F-9-12, 21 (SW-1-A) Juneau.
- Mills, M. J. 1981a. Alaska statewide sport fish harvest studies. 1979 data. Alaska Department of Fish and Game, Federal Aid in Fish Restoration and Anadromous Fish Studies, Annual Performance Report 1980-1981, Project F-9-13, Volume 22a (SW-I-A), Juneau.
- Mills, M. J. 1981b. Alaska statewide sport fish harvest studies. 1980 data. Alaska Department of Fish and Game, Federal Aid in Fish Restoration and Anadromous Fish Studies, Annual Performance Report 1980-1981, Project F-9-13, Volume 22b (SW-I-A), Juneau.
- Mills, M. J. 1982. Alaska statewide sport fish harvest studies. 1981 data. Alaska Department of Fish and Game, Federal Aid in Fish Restoration and Anadromous Fish Studies, Annual Performance Report 1981-1982, Project F-9-14, Volume 23 (SW-I-A), Juneau.
- Mills, M. J. 1983. Alaska statewide sport fish harvest studies. 1982 data. Alaska Department of Fish and Game. Federal Aid in Fish Restoration and Anadromous Fish Studies, Annual Performance Report 1982-1983. Project F-9-15, Volume 24 (SW-I-A), Juneau.

REFERENCES CITED (Continued)

- Mills, M. J. 1984. Alaska statewide sport fish harvest studies. 1983 data. Alaska Department of Fish and Game. Federal Aid in Fish Restoration and Anadromous Fish Studies, Annual Performance Report, 1983-1984. Project F-9-16, Volume 25 (SW-I-A), Juneau.
- Mills, M. J. 1985. Alaska statewide sport fish harvest studies. 1984 data. Alaska Department of Fish and Game. Federal Aid in Fish Restoration and Anadromous Fish Studies, Annual Performance Report, 1984-1985. Project F-9-17, Volume 26 (SW-I-A), Juneau.
- Mills, M. J. 1986. Alaska statewide sport fish harvest studies. 1985 data. Alaska Department of Fish and Game. Federal Aid in Fish Restoration and Anadromous Fish Studies, Annual Performance Report, 1985-1986. Project F-9-18, Volume 27 (FR-2), Juneau.
- Mills, M. J. 1987. Alaska statewide sport fisheries harvest report. 1986 data. Alaska Department of Fish and Game. Fishery Data Series No. 2, Juneau.
- Mills, M. J. 1988. Alaska statewide sport fisheries harvest report. 1987 data. Alaska Department of Fish and Game, Fishery Data Series No. 52, Juneau.
- Mills, M. J. 1989. Alaska statewide sport fisheries harvest report, 1988. Alaska Department of Fish and Game, Fishery Data Series No. 122, Juneau.
- Mills, M. J. 1990. Harvest and participation in Alaska sport fisheries during 1989. Alaska Department of Fish and Game, Fishery Data Series No. 90-44, Anchorage.
- Mills, M. J. 1991. Harvest, catch and participation in Alaska sport fisheries during 1990. Alaska Department of Fish and Game, Fishery Data Series No. 91-58, Anchorage.
- Mills, M. J. 1992. Harvest, catch, and participation in Alaska sport fisheries during 1991. Alaska Department of Fish and Game, Fishery Data Series Number 92-40, Anchorage.
- Mills, M. J. 1993. Harvest, catch, and participation in Alaska sport fisheries during 1992. Alaska Department of Fish and Game, Fishery Data Series Number 93-42, Anchorage.
- Mills, M. J. 1994. Harvest, catch, and participation in Alaska sport fisheries during 1993. Alaska Department of Fish and Game, Fishery Data Series Number 94-28, Anchorage.
- Mills, M. J. and A. L. Howe. 1992. An evaluation of estimates of sport fish harvest from the Alaska statewide mail survey. Alaska Department of Fish and Game, Special Publication No. 92-2, Anchorage.
- Scanlon, B. 2009. Movements and fidelity of northern pike in the lower Innoko River drainage, 2002–2004. Alaska Department of Fish and Game, Fishery Data Series No. 09-45, Anchorage.
- Sigurdsson, D. and B. Powers. 2009. Participation, effort, and harvest in the sport fish business/guide licensing and logbook reporting programs, 2006–2008. Alaska Department of Fish and Game, Special Publication No. 09-11, Anchorage.
- Sigurdsson, D. and B. Powers. 2010. Participation, effort, and harvest in the sport fish business/guide licensing and logbook programs, 2009. Alaska Department of Fish and Game, Fishery Data Series No. 10-65, Anchorage.
- Sigurdsson, D. and B. Powers. 2011. Participation, effort, and harvest in the sport fish business/guide licensing and logbook programs, 2010. Alaska Department of Fish and Game, Fishery Data Series No. 11-31, Anchorage.
- Sigurdsson, D. and B. Powers. 2012. Participation, effort, and harvest in the sport fish business/guide licensing and logbook programs, 2011. Alaska Department of Fish and Game, Fishery Data Series No. 12-27, Anchorage.
- Walker, R. J., C. Olnes, K. Sundet, A. L. Howe, and A. E. Bingham. 2003. Participation, catch, and harvest in Alaska sport fisheries during 2000. Alaska Department of Fish and Game, Fishery Data Series 03-05, Anchorage.

TABLES AND FIGURES

Table 1.—Fishing effort (angler-days) for the Yukon Management Area, Region III, and Alaska, 1990–2011.

Year	Yukon angler-days	Percent of region	Region III angler-days	Percent of statewide	Statewide angler-days
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
2010	9,134	5%	184,824	9%	2,000,167
2011	10,291	7%	144,755	8%	1,919,313
Average					
2001–2010	11,230	6%	196,293	9%	2,305,230
2006–2010	11,106	6%	187,989	8%	2,274,796

Table 2.—Number of fish harvested and total catch by species by recreational anglers within the Yukon Management Area, 1996–2011.

Year	All fish total	Pacific salmon					
		Total	King	Coho	Sockeye	Pink	Chum
Harvest							
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
2010	5,890	1,877	161	575	20	0	1,121
2011	2,368	498	102	179	0	0	217
Average							
1996–2010	7,257	743	123	366	17	15	222
2001–2010	7,199	835	117	433	18	11	256
2006–2010	6,087	1,032	171	445	4	11	401
Catch							
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
2010	39,473	9,258	745	1,983	85	1,768	4,677
2011	22,924	3,530	899	558	43	92	1,938
Average							
1996–2010	51,164	5,215	852	1,603	177	544	2,039
2001–2010	54,100	6,188	825	2,097	127	633	2,507
2006–2010	47,956	6,928	1,104	2,173	83	871	2,698

-continued-

Table 2.–Page 2 of 2.

Year	Nonsalmon						
	Total	Lake Trout	Dolly Varden /Arctic Char	Arctic Grayling	Sheefish	Northern Pike	Burbot
Harvest							
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
2010	4,013	23	346	1,778	299	1,104	173
2011	1,870	124	11	907	118	430	168
Average							
1996–2010	6,514	90	313	3,005	484	1,867	369
2001–2010	6,365	71	269	2,726	566	1,849	449
2006–2010	5,055	36	224	2,389	338	1,272	408
Catch							
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
2010	30,215	23	2,700	15,521	1,100	10,143	252
2011	19,394	201	272	12,842	378	5,300	245
Average							
1996–2010	45,949	347	1,791	21,714	1,951	19,024	417
2001–2010	47,913	351	1,771	22,121	2,338	20,033	491
2006–2010	41,027	93	1,657	21,630	2,453	13,817	455

Table 3.—Sport harvest and catch of king salmon in the Yukon Management Area, 2001–2011.

Harvest	Year											Averages	
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2001–2010	2006–2010
Yukon R. drainages (Ft. Yukon to Canadian Border)													
Subtotal^a	0	0	0	0	0	0	0	0	0	0	0	0	0
Yukon R. drainages (Koyukuk R. to Ft. Yukon)													
Subtotal^a	12	0	0	35	0	0	0	15	0	0	0	6	3
Porcupine River drainage	0	0	0	0	0	0	0	0	0	0	0	0	0
Koyukuk River	0	0	0	0	0	0	0	0	0	0	0	0	0
Other streams	12	0	0	35	0	0	0	15	0	0	0	6	3
Yukon R. drainages (downstream from Koyukuk R.)													
Subtotal^a	0	0	99	159	0	101	411	140	27	161	102	110	168
Anvik River	0	0	60	147	0	48	250	140	10	161	66	82	122
Andreafsky River	0	0	39	12	0	53	161	0	17	0	0	28	46
Other streams	0	0	0	0	0	0	0	0	0	0	0	0	0
Total^b	12	8	99	194	0	101	411	155	27	161	102	117	171

^a Water bodies listed below are the key systems included in the subtotal; these may represent only a portion of the subtotal harvest.

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

-continued-

Table 3.–Page 2 of 2.

Catch	Year											Averages	
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2001–2010	2006–2010
Yukon R. drainages (Ft. Yukon to Canadian Border)													
Subtotal^a	0	0	0	0	0	0	0	0	0	0	0	0	0
Yukon R. drainages (Koyukuk R. to Ft. Yukon)													
Subtotal^a	12	0	0	35	89	0	0	54	609	0	0	80	133
Porcupine River drainage	0	0	0	0	0	0	0	0	0	0	0	0	0
Koyukuk River	0	0	0	0	77	0	0	39	0	0	0	12	8
Other streams	12	0	0	35	12	0	0	15	609	0	0	68	125
Yukon R. drainages (downstream from Koyukuk R.)													
Subtotal^a	303	56	595	1,053	366	438	2,082	631	361	745	899	663	851
Anvik River	258	0	595	1,028	354	385	1,905	631	344	726	899	623	798
Andreafsky River	0	0	255	12	12	53	161	0	17	0	0	51	46
Other streams	45	56	0	13	0	0	16	0	0	19	0	15	7
Total^b	315	181	850	1,088	455	438	2,681	685	970	745	899	841	1,104

^a Water bodies listed below are the key systems included in the subtotal; these may represent only a portion of the subtotal harvest.

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

Table 4.—Sport harvest of northern pike in the Yukon Management Area, 2001–2011.

Harvest	Year											Averages	
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2001–2010	2006–2010
Yukon R. drainages (Ft. Yukon to Canadian Border)													
Subtotal^a	0	259	12	60	0	160	68	74	24	10	0	67	67
Fortymile River	0	0	0	0	0	86	0	0	0	0	0	9	17
Other Streams	0	259	12	60	0	74	68	74	24	10	0	65	50
Yukon R. drainages (Kovukuk R. to Ft. Yukon)													
Subtotal^a	333	1,899	992	2,428	724	834	831	1,351	652	856	423	1,090	905
Porcupine River	47	774	206	45	0	77	23	39	18	0	41	123	31
Chandalar River	0	0	0	0	0	0	0	7	0	0	0	1	2
Birch Creek	28	0	0	15	19	0	0	264	0	87	14	41	70
Beaver & Nome Creeks	0	157	28	0	47	0	25	60	10	186	0	51	56
Dall River	13	115	246	1,252	268	146	306	13	203	73	110	264	148
Haul Road Streams	0	0	0	0	0	55	0	0	0	59	0	11	232
Nowitna River	0	114	12	181	0	197	172	130	70	185	74	106	151
Melozitna River	0	13	0	52	0	0	0	0	0	54	19	7	14
Koyukuk River	97	299	111	629	265	241	92	622	0	123	17	248	216
Other Streams	148	427	389	306	125	118	213	216	351	89	135	238	197
Yukon R. drainages (downstream from Kovukuk R.)													
Subtotal^a	1,439	1,122	549	1,002	1,127	140	133	152	589	238	7	649	250
Nulato River	10	41	36	0	9	0	0	0	0	0	0	11	0
Kaiyuh/Khotol River	0	103	0	60	0	0	15	0	0	0	0	18	3
Anvik River	0	40	22	13	48	0	38	43	0	0	7	20	16
Innoko River	28	40	120	249	59	0	0	60	173	29	0	76	52
Andreafsky River	1,318	629	11	302	884	44	80	0	130	18	0	342	54
Other Streams	0	1,318	629	11	302	884	44	80	0	130	0	184	124
Total	1,772	3,291	1,507	3,656	1,899	1,134	1,281	1,577	1,265	1,104	430	1,849	1,272

^a Water bodies listed below are the key systems included in the subtotal; these may represent only a portion of the subtotal harvest.

Table 5.—Total fishing effort (angler-days), and northern pike catch and harvest from principal sport fisheries in the Yukon Management Area, 1992–2011.

Year	Yukon	Dall River			Nowitna River			Innoko River		
	total ^a	Effort	Number	Percent ^b	Effort	Number	Percent	Effort	Number	Percent
Harvest										
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%
2010	1,104	179	73	7%	830	185	17%	237	29	3%
2011	430	165	110	26%	536	74	17%	263	0	0%
Average										
2001–2010	1,849	351	264	13%	615	108	7%	872	76	4%
2006–2010	1,272	315	148	12%	786	151	12%	508	52	4%
Catch										
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%
2010	10,143	179	225	2%	830	2,491	25%	237	659	6%
2011	5,300	165	300	6%	536	2,853	54%	263	216	4%
Average										
2001–2010	20,033	351	2,593	11%	615	2,549	14%	872	6,546	29%
2006–2010	13,817	315	916	6%	786	3,087	22%	508	2,687	18%

^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.

Table 6.—Sport harvest and catch of sheefish (inconnu) in the Yukon Management Area, 2001–2011.

Harvest	Year											Averages	
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2001–2010	2006–2010
Yukon R. drainages (Ft. Yukon to Canadian Border)													
Subtotal^a	0	0	0	0	0	0	0	26	0	14	0	4	8
Charlie River	0	0	0	0	0	0	0	26	0	0	0	3	5
Other streams	0	0	0	0	0	0	0	0	0	14	0	1	3
Yukon R. drainages (Koyukuk R. to Ft. Yukon)													
Subtotal^a	63	175	208	809	991	316	129	254	80	197	118	322	195
Porcupine River	18	0	0	0	0	0	0	20	0	184	32	22	41
Birch Creek	0	0	0	0	27	0	0	0	0	0	0	3	0
Dall River	0	0	0	0	0	0	0	30	0	0	0	3	6
Ray River	0	0	30	0	54	0	48	0	80	0	0	21	26
Nowitna River	18	0	0	117	0	113	81	143	0	0	26	47	67
Melozitna River	0	13	0	146	0	0	0	0	0	0	0	16	0
Koyukuk River	27	10	30	468	0	0	0	61	0	13	12	61	15
Other streams	0	152	148	78	910	203	0	0	0	0	48	149	41
Yukon R. drainages (downstream from Koyukuk R.)													
Subtotal^a	429	363	30	543	357	224	48	182	130	88	0	239	134
Nulato River	7	199	0	58	340	0	0	0	23	76	0	88	33
Innoko River	18	116	30	47	17	20	0	182	0	12	0	49	54
Andreafsky River	367	0	0	0	0	41	24	0	0	0	0	62	33
Other streams	35	48	0	438	0	163	24	0	107	0	0	82	59
Total^b	492	538	238	1,352	1,348	540	177	462	210	299	118	566	338

^a Water bodies listed below are the key systems included in the subtotal; these may represent only a portion of the subtotal harvest.

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

-continued-

Table 6.–Page 2 of 2.

Catch	Year											Averages	
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2001–2010	2006–2010
Yukon R. drainages (Ft. Yukon to Canadian Border)													
Subtotal^a	0	0	0	0	0	0	0	26	0	290	0	32	63
Charlie River	0	0	0	0	0	0	0	26	0	0	0	3	5
Other Streams	0	0	0	0	0	0	0	0	0	290	0	29	58
Yukon R. drainages (Koyukuk R. to Ft. Yukon)													
Subtotal^a	230	190	532	3,403	1,145	651	210	612	80	722	371	778	455
Porcupine River	18	0	0	0	0	0	12	20	0	522	32	60	117
Birch Creek	19	0	0	0	27	0	0	0	0	0	0	5	0
Dall River	9	0	0	0	0	0	0	30	0	0	0	4	6
Ray River	0	0	325	0	54	0	48	0	80	0	0	51	26
Nowitna River	110	0	0	2,046	0	448	81	259	0	12	198	296	160
Melozitna River	0	13	0	175	0	0	0	0	0	0	0	19	0
Koyukuk River	37	13	30	1,052	137	0	0	303	0	13	93	159	63
Other Streams	37	164	177	130	927	23	69	0	0	145	48	185	83
Yukon R. drainages (downstream from Koyukuk R.)													
Subtotal^a	1,301	1,293	237	1,926	854	7,647	108	196	1,637	88	7	1,529	1,935
Nulato River	7	199	59	58	580	36	0	0	23	76	0	104	27
Innoko River	881	1,046	118	1,137	257	903	35	196	199	12	0	478	267
Andreafsky	367	0	0	0	0	610	24	0	0	0	0	100	127
Other Streams	46	48	60	731	17	6,098	49	0	1,415	0	7	846	1,512
Total^b	1,531	1,483	769	5,329	1,999	8,298	318	834	1,717	1,100	378	2,338	2,453

^a Water bodies listed below are the key systems included in the subtotal; these may represent only a portion of the subtotal harvest.

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

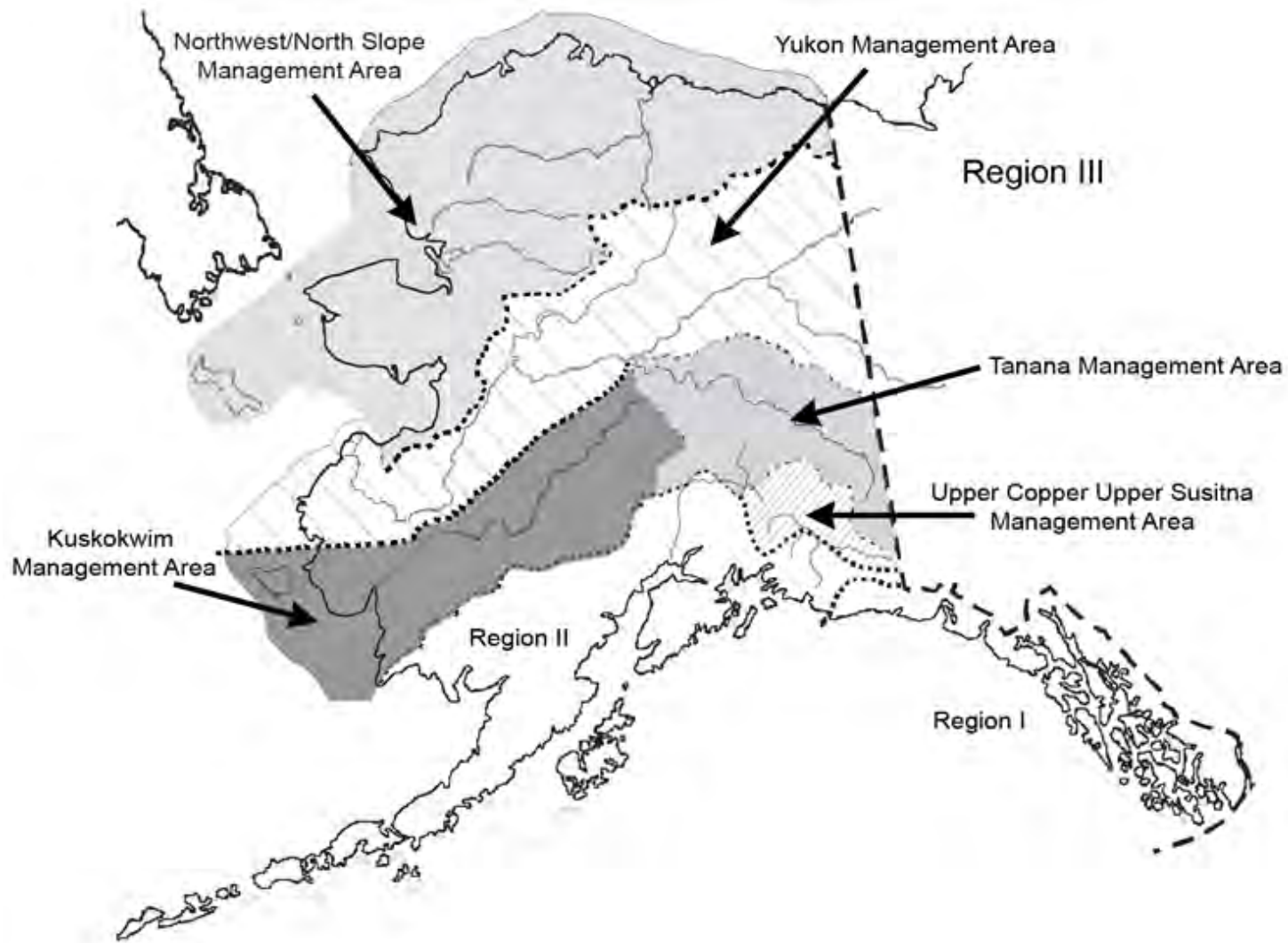


Figure 1.—Map of the sport fish regions in Alaska and the five management areas in Region III.

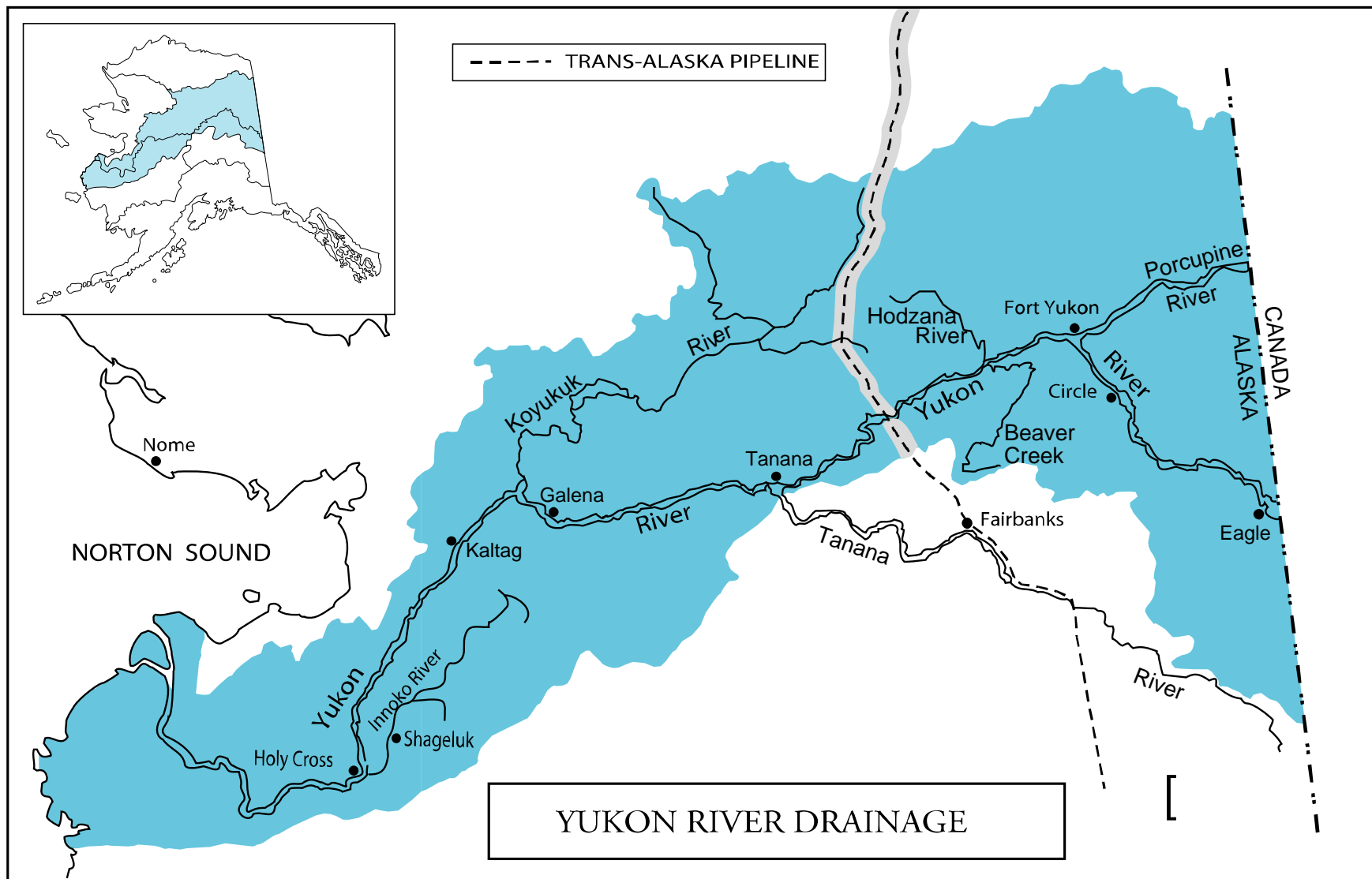


Figure 2.—Yukon Management Area, Tanana River drainage is excluded from the YMA.

APPENDIX A

Appendix A1.—Guided angler effort (angler-days) and fish species kept and released in the Yukon River Area, as reported in the freshwater guide logbooks, 2006–2011.

Year	Angler-days	Salmon			Lake trout	Dolly Varden	Arctic grayling	Northern pike	Sheefish
		King	Coho	Sockeye					
Fish kept (Harvested)									
2006	946	79	330	0	ND	5	55	ND	ND
2007	1,273	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
2010	1,119	74	238	0	0	20	133	24	7
2011	965	163	153	0	0	11	191	41	2
Fish released									
2006	946	318	2,305	47	0	238	3,782	ND	ND
2007	1,273	566	2,218	18	0	660	8,826	9,267	84
2008	992	366	1,559	25	0	548	5,292	6,257	64
2009	566	94	918	0	0	177	4,540	4,074	114
2010	1,119	287	1,888	121	0	961	7,579	4,513	145
2011	965	703	646	49	5	647	6,236	3,274	43

Source: Sigurdsson and Powers, 2009–2011.

APPENDIX B

Appendix B1.–Commercial^a, 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
1990	2,989	2,618	439	94,719	45,969	105	97,708	48,587	544
1991	1,163	2,515	630	105,942	44,258	143	107,105	46,773	773
1992	785	2,438	118	121,349	43,188	313	122,134	45,626	431
1993	1,445	1,672	1,573	94,237	60,814	122	95,682	62,486	1,695
1994	2,606	2,370	1,871	112,865	50,471	410	115,471	53,077	2,281
1995	2,747	1,779	2,488	123,457	46,756	37	126,204	48,535	2,525
1996	447	1,177	3,745	91,443	42,129	128	91,890	43,306	3,230
1997	2,728	2,712	1,953	113,693	53,266	221	116,421	55,978	2,174
1998	963	1,919	447	43,662	51,814	207	44,625	53,733	654
1999	690	1,624	1,001	70,078	50,570	22	70,767	52,194	1,023
2000	0	983	177	9,115	34,858	99	9,115	35,841	277
2001	0	2,327	667	0	50,610	12	0	52,937	679
2002	836	1,067	478	23,820	41,553	8	24,656	42,620	486
2003	1,813	2,145	2,153	39,305	52,964	99	41,118	55,109	2,719
2004	2,057	1,388	1,319	54,886	52,287	194	56,943	53,675	1,513
2005	453	1,828	485	31,886	50,733	0	32,339	52,561	485
2006	84	1,229	638	46,562	46,481	101	46,646	47,710	739
2007	281	1,717	549	34,202	52,241	411	34,384	53,958	960
2008	0	605	254	4,641	43,089	155	4,641	43,694	409
2009	0	1,285	836	319	31,615	27	316	32,900	863
2010	0	1,143	313	9,897	42,116	161	9,897	43,259	474
2011	0	1,367	370	82	38,844	102	82	40,211	472
2012	0	ND	ND	0	ND	ND	0	ND	ND
				Average					
1992–2001	1,241	1,900	1,404	77,990	48,448	157	79,231	50,371	1,497
2002–2011	552	1,377	740	24,560	45,192	126	25,112	46,570	912
2007–2011	56	1,223	464	9,828	41,581	171	9,884	42,804	636

Source: Estensen et al. 2012, *in prep.*

^a Includes test fish sales and estimated harvest of female king salmon to produce roe sold.



2012 Yukon River Salmon Fisheries Outlook

This information sheet describes the anticipated management strategies for the 2012 season.

Run and Harvest Outlook

	Chinook	Summer Chum	Fall Chum	Coho
Projection:	Below average to poor	Average to above average	Average to above average	Average to below average
Escapement:	Expect to meet goals	Expect to meet goals	Expect to meet goals	Expect to meet goals
Subsistence:	Conservation measures necessary to share available harvest	Expect to provide for normal harvest	Expect to provide for normal harvest	Expect to provide for normal harvest
Commercial:	No fishery anticipated	0.5 to 1 million potentially available for harvest	500,000 to 700,000 potentially available for harvest	10,000 to 70,000 potentially available for harvest

Management Strategies

- Initial management will be based on preseason projections and shift to inseason run assessment as runs develop.
- The regulatory windowed subsistence salmon fishing schedule will begin May 31 in District Y-1 and will be implemented chronologically with the upriver migration.
- To conserve Chinook salmon, subsistence fishing on the first pulse will be closed. Beginning in District Y-1 (and the northern portion of the Coastal District), one fishing period will be closed (approximately 5-day closure) and this action will be similarly implemented in upriver fishing districts and subdistricts based on migratory timing.
- Due to the considerable distance between the upper and lower boundaries in some districts and subdistricts it is anticipated that these areas will be further subdivided and managed separately.
- If inseason assessment indicates Chinook salmon run strength continues to be poor after the first pulse closure, an additional subsistence fishing period may be closed or fishing time may be reduced.
- In the sport fishery, retention of Chinook salmon will not be permitted in the mainstem Yukon River. In the Yukon River tributaries (excluding the Tanana River drainage) the Chinook salmon bag and possession limit will be reduced from three to one fish.
- All Tanana River fisheries will be managed to meet Chinook salmon escapement goals for the Chena and Salcha rivers.
- Chinook salmon directed commercial fishing is not anticipated.
- A surplus of summer chum salmon is anticipated above escapement and subsistence needs. However, the extent of the summer chum salmon directed commercial fishery will be dependent upon the strength of the overlapping Chinook salmon run.
- It is anticipated that the sale of incidentally harvested Chinook salmon during summer chum directed commercial fishing periods will be prohibited.

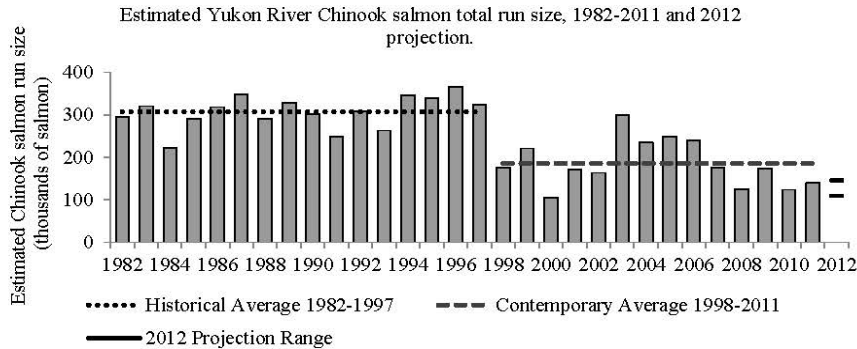
The US/Canada Yukon River Panel agreed to Interim Management Escapement Goals (IMEG) of 42,500-55,000 Chinook salmon and 70,000-104,000 fall chum salmon based upon the Eagle sonar program in 2012. In addition, approximately 5,000 Chinook and 10,000 fall chum salmon will be allowed to cross the border to fulfill harvest sharing commitments specified in the US/Canada Yukon River Agreement. For the Fishing Branch River, the IMEG of 22,000-49,000 fall chum salmon based upon the Fishing Branch River weir count will continue through 2012.

-continued-



2012 Yukon River Salmon Fisheries Outlook

The 2012 Chinook salmon projection is for a run size range of 109,000 to 146,000. The following chart shows the historical estimated Yukon River Chinook salmon total run size, illustrating the drastic decline in production beginning in 1998.



The cause of this drop in production remains largely unknown. Though parent year escapement objectives were generally achieved throughout the drainage, Chinook salmon returns since 2007 have been much lower than expected. As in recent years, fishery managers will begin the season using conservative management strategies. One subsistence fishing period will be closed on the first pulse of Chinook salmon and additional periods are likely to be closed or restricted to attain management objectives. The schedule below is subject to change depending upon run strength.

Area	Regulatory Subsistence	Date Schedule	
	Fishing Periods	To Begin	Open Fishing Times
Coastal District	7 days/wk	All Season	M/T/W/TH/F/SA/SU - 24 hours/day
District Y-1	Two 36-hour periods/wk	May 31	Mon. 8 pm to Wed. 8 am / Thu. 8 pm to Sat. 8 am
District Y-2	Two 36-hour periods/wk	June 3	Wed. 8 pm to Fri. 8 am / Sun. 8 pm to Tue. 8 am
District Y-3	Two 36-hour periods/wk	June 6	Wed. 8 pm to Fri. 8 am / Sun. 8 pm to Tue. 8 am
Subdistrict Y- 4A	Two 48-hour periods/wk	June 10	Sun. 6 pm to Tue. 6 pm / Wed. 6 pm to Fri. 6 pm
Subdistrict Y-4B, C	Two 48-hour periods/wk	June 17	Sun. 6 pm to Tue. 6 pm / Wed. 6 pm to Fri. 6 pm
Koyukuk and Innoko Rivers	7 days/wk	All Season	M/T/W/TH/F/SA/SU - 24 hours/day
Subdistrict Y-5A, B, C	Two 48-hour periods/wk	June 22	Tue. 6 pm to Thu. 6 pm / Fri. 6 pm to Sun. 6 pm
Subdistrict Y-5D	7 days/wk	All Season	M/T/W/TH/F/SA/SU - 24 hours/day
Subdistrict Y-6	Two 42-hour periods/wk	All Season	Mon. 6 pm to Wed. Noon / Fri. 6 pm to Sun. Noon
Old Minto Area	5 days/wk	All Season	Friday 6 pm to Wednesday 6 pm

For additional information:

ADF&G Steve Hayes, Anchorage 907-267-2383; Jeff Estensen, Fairbanks 907-459-7217; or contact the Emmonak office 907-949-1320.

Subsistence fishing schedule: 1-866-479-7387 (toll free outside of Fairbanks); in Fairbanks, call 907-459-7387.

USFWS: Fred Bue, Fairbanks 907-455-1849 or 1-800-267-3997; or contact the Emmonak office 907-949-1798.

APPENDIX C

Appendix C1.–Emergency orders issued for Yukon Management Area sport fisheries during 2011 and 2012.

Year	E. O. Number	Explanation
2011	3-KS-02-11	Reduced the sport fishing bag and possession limit for king salmon to 1 king salmon in all tributaries of the Yukon River (excluding the Tanana River drainage), effective 12:01 a.m. Thursday, June 2, 2011. This EO also closes all waters of the mainstem Yukon River to sport fishing for king salmon, effective 12:01 a.m. Thursday, June 2, 2011.
2012	3-KS-01-12	Reduced the sport fishing bag and possession limit for king salmon to 1 king salmon in all tributaries of the Yukon River (excluding the Tanana River drainage), effective 12:01 a.m. Tuesday, May 15, 2012. This EO also closes all waters of the mainstem Yukon River to sport fishing for king salmon, effective 12:01 a.m. Tuesday, May 15, 2012.

Appendix C2.–Reference information specific to 2012 Alaska Board of Fisheries Arctic-Yukon-Kuskokwim meeting proposals.

Proposal	Proposal Subject	Text (page #)	Table #	Figure #	Appendix
92	Allow large multiple hooks while sport fishing for fish other than salmon	15-24	2, 4, 5, 6		
97	Reduce sport fishing bag limit for northern pike in Yukon River Holy Cross-Paimiut	18-22	2, 4, 5		
154	Close Black River to sport fishing for king salmon	8-14	3		B1