

Fishery Management Report No. 14-05

**Fishery Management Report for the Recreational
Fisheries of the Upper Copper/Upper Susitna River
Management Area, 2012**

by

Mark A. Somerville

February 2014

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	<i>e</i>
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	
		corporate suffixes:		(simple)	r
Weights and measures (English)		Company	Co.	covariance	cov
cubic feet per second	ft ³ /s	Corporation	Corp.	degree (angular)	°
foot	ft	Incorporated	Inc.	degrees of freedom	df
gallon	gal	Limited	Ltd.	expected value	<i>E</i>
inch	in	District of Columbia	D.C.	greater than	>
mile	mi	et alii (and others)	et al.	greater than or equal to	≥
nautical mile	nmi	et cetera (and so forth)	etc.	harvest per unit effort	HPUE
ounce	oz	exempli gratia		less than	<
pound	lb	(for example)	e.g.	less than or equal to	≤
quart	qt	Federal Information Code	FIC	logarithm (natural)	ln
yard	yd	id est (that is)	i.e.	logarithm (base 10)	log
		latitude or longitude	lat or long	logarithm (specify base)	log ₂ , etc.
Time and temperature		monetary symbols		minute (angular)	'
day	d	(U.S.)	\$, ¢	not significant	NS
degrees Celsius	°C	months (tables and figures): first three letters	Jan,...,Dec	null hypothesis	H ₀
degrees Fahrenheit	°F	registered trademark	®	percent	%
degrees kelvin	K	trademark	™	probability	P
hour	h	United States	U.S.	probability of a type I error	
minute	min	(adjective)	U.S.	(rejection of the null hypothesis when true)	α
second	s	United States of America (noun)	USA	probability of a type II error	
		U.S.C.	United States Code	(acceptance of the null hypothesis when false)	β
Physics and chemistry		U.S. state	use two-letter abbreviations (e.g., AK, WA)	second (angular)	"
all atomic symbols				standard deviation	SD
alternating current	AC			standard error	SE
ampere	A			variance	
calorie	cal			population	Var
direct current	DC			sample	var
hertz	Hz				
horsepower	hp				
hydrogen ion activity	pH				
(negative log of)					
parts per million	ppm				
parts per thousand	ppt, ‰				
volts	V				
watts	W				

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MANAGEMENT AREA, 2012**

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

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TABLE OF CONTENTS

	Page
LIST OF TABLES.....	iv
LIST OF FIGURES.....	iv
LIST OF APPENDICES.....	iv
ABSTRACT.....	1
INTRODUCTION.....	1
Alaska Board of Fisheries.....	3
Advisory Committees.....	3
Recent Board of Fisheries Actions.....	3
ADF&G Emergency Order Authority.....	5
Federal Subsistence.....	5
Region III Division of Sport Fish Research and Management Staffing.....	6
Statewide Harvest Survey.....	6
Sport Fish Guide Licensing and Logbook program.....	7
SECTION I: MANAGEMENT AREA OVERVIEW.....	7
Management Area Description.....	7
Fishery Resources.....	8
Established Management Plans and Policies.....	9
Major Issues.....	11
Access Programs.....	13
Information and Education.....	13
Sport Fishing Effort, Harvest, and Catch.....	14
SECTION II: FISHERIES.....	14
King Salmon Sport Fisheries.....	15
Background and Historic Perspective.....	15
Gulkana River King Salmon Sport Fishery.....	17
Background and Historic Perspective.....	17
Recent Fishery Performance.....	18
Fishery Objectives and Management.....	19
Current Issues and Fishery Outlook.....	19
Recent Board of Fisheries Actions.....	20
Current or Recommended Research and Management Activities.....	20
Klutina River King Salmon Sport Fishery.....	20
Background and Historical Perspective.....	20
Recent Fishery Performance.....	21
Fishery Objectives and Management.....	22
Current Issues and Fishery Outlook.....	22
Recent Board of Fisheries Actions.....	23
Current or Recommended Research and Management Activities.....	23
Other Copper River Basin King Salmon Sport Fisheries.....	23
Background and Historical Perspective.....	23
Fishery Objectives and Management.....	25
Current Issues and Fishery Outlook.....	25
Recent Board of Fisheries Actions.....	25
Current or Recommended Research and Management Activities.....	25

TABLE OF CONTENTS (Continued)

	Page
Sockeye Salmon Sport Fisheries	25
Background and Historic Perspective	25
Recent Fishery Performance	27
Fishery Objectives and Management	27
Current Issues and Fishery Outlook	28
Recent Board of Fisheries Actions	28
Current or Recommended Research and Management Activities	28
Copper River Personal Use and Subsistence Salmon Fisheries	28
Background and Historical Perspective	28
Recent Fishery Performance	32
Fishery Objectives and Management	32
Current Issues and Fishery Outlook	33
Recent Board of Fisheries Actions	34
Current or Recommended Research and Management Activities	34
Resident Species Subsistence Fisheries	35
Background and Historical Perspective	35
Recent Fishery Performance	35
Fishery Objectives and Management	36
Current Issues and Fishery Outlook	36
Recent Board of Fisheries Actions	36
Current or Recommended Research and Management Activities	36
Wild Arctic Grayling Sport Fisheries	36
Background and Historical Perspective	36
Recent Fishery Performance	37
Fishery Objectives and Management	37
Current Issues and Fishery Outlook	38
Recent Board of Fisheries Actions	38
Current or Recommended Research and Management Activities	38
Lake Trout Sport Fisheries	38
Background and Historical Perspective	38
Recent Fishery Performance	39
Fishery Objectives and Management	39
Current Issues and Fishery Outlook	40
Recent Board of Fisheries Action	40
Current or Recommended Research and Management Activities	40
Burbot Sport Fisheries	41
Background and Historical Perspective	41
Recent Fishery Performance	41
Fishery Objectives and Management	41
Current Issues and Fishery Outlook	42
Recent Board of Fisheries Actions	42
Current or Recommended Research and Management Activities	42
Wild Rainbow and Steelhead Trout Sport Fisheries	42
Background and Historical Perspective	42
Recent Fishery Performance	43
Fishery Objectives and Management	44
Current Issues and Fishery Outlook	44
Recent Board of Fisheries Actions	44
Ongoing or Recommended Research and Management Activities	44

TABLE OF CONTENTS (Continued)

	Page
Dolly Varden Sport Fisheries	45
Background and Historical Perspective.....	45
Recent Fishery Performance	45
Fishery Objectives and Management	45
Current Issues and Fishery Outlook	45
Recent Board of Fisheries Action.....	45
Ongoing and Recommended Research and Management	46
Upper Copper / Upper Susitna Management Area stocked waters.....	46
Background and Historical Perspective.....	46
Recent Fishery Performance	47
Fishery Objectives and Management	47
Current Issues and Fishery Outlook	47
Recent Board of Fisheries Action.....	47
Current or Recommended Research and Management Activities	47
ACKNOWLEDGMENTS	48
REFERENCES CITED	49
TABLES	57
FIGURES	81
APPENDIX A	87
APPENDIX B.....	89
APPENDIX C.....	95
APPENDIX D	97

LIST OF TABLES

Table	Page
1. Reported subsistence and personal use harvest of king, sockeye, and coho salmon in the Copper River, 1993–2012.....	58
2. Commercial harvests of king and sockeye salmon in the Copper River District, 1994–2013.....	59
3. Sport fishing effort in the UCUSMA by drainage, 1993–2012.....	60
4. Number of fish harvested, by species, by sport anglers fishing UCUSMA waters, 1993–2012.....	61
5. Number of fish caught, by species, by sport anglers fishing UCUSMA waters, 1993–2012.....	62
6. Summary of king salmon harvests and upriver escapement in the Copper River 1993–2012.....	63
7. Harvest of king salmon by sport anglers fishing in the UCUSMA by drainage, 1993–2012.....	64
8. Harvest Summary data for guided anglers in the Upper Copper River drainage, 2006–2012. ^a	65
9. Catch of king salmon by sport anglers fishing in the UCUSMA by drainage, 1993–2012.....	66
10. Harvest of sockeye salmon by sport anglers fishing UCUSMA drainages, 1993–2012.....	67
11. Summary of sockeye harvests and upriver escapement in the Copper River 1993–2012.....	68
12. Distribution of sockeye salmon in major drainages in the Copper River, 2005–2009.....	69
13. Number of permits issued and expanded salmon harvests during the Glennallen Subdistrict subsistence salmon fishery in the Copper River, 1993–2012.....	69
14. Number of permits issued and expanded salmon harvested during the Chitina Subdistrict personal use salmon fishery in the Copper River, 1993–2012.....	70
15. Number of freshwater finfish subsistence permits issued and harvest from UCUSMA waters, 1993–2012.....	71
16. Harvest of wild Arctic grayling by sport anglers in the UCUSMA by drainage, 1993–2012.....	72
17. Harvest of lake trout by sport anglers fishing UCUSMA waters by drainage, 1993–2012.....	73
18. Percent of lake trout released in 5 UCUS lakes during years with 24” minimum length limits and with no length limits, 1990–2012.....	74
19. Sustainable yield (Lake Area model) and harvest of lake trout from UCUSMA lakes greater than 500 ha in size.....	74
20. Harvest of burbot by sport anglers fishing in the UCUSMA by drainage, 1993–2012.....	75
21. Sport catch of wild rainbow trout by sport anglers fishing UCUSMA waters by drainage, 1993–2012.....	76
22. Harvest of wild Dolly Varden by sport anglers fishing UCUSMA waters by drainage, 1993–2012.....	77
23. Stocking schedule for lakes in the UCUSMA, 2011–2013.....	78
24. Effort, harvest, and catch statistics by species for stocked lakes in the UCUSMA 1993–2012.....	79

LIST OF FIGURES

Figure	Page
1. Map of the sport fish regions in Alaska and the 5 Region III management areas.....	82
2. The Upper Copper/Upper Susitna Management Area.....	83
3. Gulkana River drainage.....	84
4. Upper Copper River fishery subdistricts and areas.....	85
5. Lake trout and burbot fisheries in the UCUSMA.....	86

LIST OF APPENDICES

Appendix	Page
A1. Listing of the addresses and contact numbers for information sources regarding UCUSMA information.....	88
B1. Emergency orders issued for UCUSMA sport, personal use, and subsistence fisheries during 2012 and 2013.....	90
C1. Federal subsistence permits and harvest ^a from the Copper River, Chitina Subdistrict, 2002–2012.....	96
D1. Federal subsistence permits and harvest from the Copper River, Glennallen Subdistrict, 2002–2012.....	98

ABSTRACT

Season summaries for subsistence, sport, and personal use fisheries for 2012 and preliminary information for 2013 in the Upper Copper/Upper Susitna Management Area (UCUSMA) are presented. The UCUSMA consists of all waters and drainages of the Copper River, upstream of Haley Creek and all waters and drainages of the Susitna River, upstream of the Oshetna River. The area's king, sockeye, and coho salmon are targeted in sport, personal use, and subsistence fisheries. Other resident and anadromous fishes such as burbot, lake trout, rainbow/steelhead trout, Arctic grayling, and Dolly Varden are targeted in year-round sport fisheries. Whitefish are mainly targeted in subsistence fisheries. Sport fishing effort and harvest in 2012 was the third lowest in the UCUSMA since 1977. Sport angler effort was estimated at 40,368 angler-days and sport catch was 80,042 fish in 2012. Estimated sport harvest totaled 31,933 fish with sockeye salmon the primary species targeted, accounting for 73% of the harvest. In the Glennallen Subdistrict state subsistence fishery a total of 78,851 salmon were harvested in 2012, which is the fourth highest harvest since 1984 and above the latest 5- and 10-year average harvests. Sockeye salmon comprised over 97% of the subsistence harvest. The Chitina Subdistrict personal use fishery state harvest totaled 129,362 salmon in 2012, also exceeding the previous 5- and 10-year average harvests.

Key Words: Copper River, Susitna River, Gulkana River, Chitina Subdistrict, Glennallen Subdistrict, personal use, subsistence, king salmon, sockeye salmon, burbot, lake trout, Arctic grayling, sport fish, fisheries management.

INTRODUCTION

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

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

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

Division of Sport Fish management and research activities are funded by ADF&G and Federal Aid in Fisheries Restoration funds. ADF&G funds are derived from the sale of state fishing licenses. Federal aid funds are derived from federal taxes on fishing tackle and equipment established by the Federal Aid in Sport Fish Restoration Act (also referred to as the Dingell-Johnson Act or D-J Act). The D-J funds are provided to states at a match of up to 3-to-1 with the

ADF&G funds. Additional funding specified for providing, protecting, and managing access to fish and game is provided through a tax on boat gas and equipment established by the Wallop-Breaux (W-B) Act. Other peripheral funding sources may include contracts with various government agencies and the private sector.

This area management report provides information regarding the UCUSMA and its fisheries for 2012, with preliminary information from the 2013 season. This report is organized into 2 primary sections: a management area overview, including a description of the UCUSMA and a summary of effort, harvest and catch for the area; and a section on the significant area fisheries, including specific harvest and catch by species and drainage.

The BOF divides the state into 18 regulatory areas to organize the sport fishing regulatory system by drainage and fishery. These areas (different from regional management areas) are described in Title 5 of the Alaska Administrative Code Chapters 47-74. The Division of Sport Fish of ADF&G divides the state into 3 administrative regions with boundaries roughly corresponding to groups of the BOF regulatory areas. Region I covers Southeast Alaska (the Southeast Alaska regulatory area). Region II covers portions of Southcentral and Southwest Alaska (including the Prince William Sound, Kenai Peninsula, Kenai River Drainage, Cook Inlet–Resurrection Bay Saltwater, Anchorage Bowl Drainages, Knik Arm Drainages, Susitna River Drainage, West Cook Inlet, Kodiak, Bristol Bay, and the Alaska Peninsula and Aleutian Islands regulatory areas). Region III includes Upper Copper River and Upper Susitna River area and the Arctic-Yukon-Kuskokwim Region (including the North Slope, Northwestern, Yukon River, Tanana River, and Kuskokwim-Goodnews regulatory areas).

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

For administrative purposes the Division of Sport Fish has divided Region III into 5 fisheries management areas (Figure 1). They are:

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

Area management biologists for the 5 areas are located in Nome/Fairbanks, Fairbanks, Glennallen, Fairbanks/Delta Junction, and Bethel/Fairbanks, respectively.

ALASKA BOARD OF FISHERIES

The BOF is a 7-member board that sets fishery regulations and harvest levels, allocates fishery resources, and approves or mandates fishery conservation plans for the State of Alaska. BOF members are appointed by the governor for 3-year terms and must be confirmed by the legislature.

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

ADVISORY COMMITTEES

Local ACs have been established throughout the state to assist the boards of Fisheries and Game in assessing fisheries and wildlife issues, and proposed regulation changes. AC meetings allow opportunity for direct public interaction with ADF&G staff attending the meetings, where they are available to answer questions and provide clarification of proposed regulatory changes regarding resource issues of local and statewide concern. The Boards Support Section within ADF&G's Division of Administrative Services provides administrative and logistical support for the BOF and ACs. During 2012, ADF&G had direct support responsibilities for 82 ACs in the state.

Within the UCUSMA there are 3 ACs: Tok Cutoff/Nabesna Road, Copper Basin, and Paxson committees. In addition, the Copper River/Prince William Sound (Cordova), Fairbanks, Delta Junction, Mat-Su (Palmer/Wasilla), Upper Tanana-Forty Mile (Tok) and Anchorage ACs often comment on proposals concerning UCUSMA fisheries.

RECENT BOARD OF FISHERIES ACTIONS

The BOF meets annually, but deliberates on each individual regulatory area on a 3-year cycle, most recently for the UCUSMA in December 2011 in Valdez. At that meeting, the BOF adopted 6 of 35 proposals specific to Upper Copper River subsistence, personal use and UCUSMA sport fisheries.

The BOF amended and adopted 1 proposal affecting the freshwater finfish (other than salmon) subsistence fishery in Lake Louise, Susitna, and Tyone lakes. The channels between Lake Louise and Susitna Lake and between Susitna Lake and Tyone Lake were closed to the taking of whitefish *Coregonus* and *Prosopium sp* with gillnets.

A proposal was adopted that changed the opening date of the Chitina Subdistrict personal use dip net fishery. The fishery can open on June 7 and must open on or before June 15, previously the fishery could open on June 1 and was required to open on or before June 11. This action, in conjunction with the BOF allowing only one 12-hr fishing period within the inside closure area

in the Copper River District commercial fishery during the first 2 weeks of the season, was taken to provide additional salmon to the Upper Copper River subsistence fishery. In another specific proposal affecting this subdistrict, the BOF ruled there was no new information and no errors in previous rulings in the Customary and Traditional (C&T) determination for the Chitina Subdistrict. As a result, the Chitina Subdistrict remains a personal use fishery.

The BOF adopted a proposal that amended the *Copper River King Salmon Management Plan* to include management guidance to ADF&G specific to the Chitina Subdistrict personal use and Glennallen Subdistrict subsistence fisheries. The revised plan gives ADF&G authority to restrict king salmon *Oncorhynchus tshawytscha* harvest for conservation purposes.

A proposal was adopted by the BOF that prohibits the use of bait in Lake Louise, Susitna, Tyone, and Crosswind lakes from April 16–October 31. The bag and possession limit for lake trout *Salvelinus namaycush* in these lakes was changed from 1 fish, 24 inches or greater to 1 fish, no size limit. These actions were taken to reduce hooking mortality and maintain harvests within sustainable levels. Another proposal was amended and adopted for the rainbow trout *O. mykiss* fishery in Summit Lake (Tebay River drainage). The spawning closure (June 1–30) was removed and the size limit was changed from 10 fish, 12 inches or less to 10 fish, of which only 1 may be greater than 18 inches in length.

The BOF adopted a proposal to add 1 day to the Arctic grayling *Thymallus arcticus* spawning closure from April 1–May 30 to April 1–May 31 in the *Wild Arctic Grayling Management Plan*. This aligned the dates in the plan with the dates in regulation and was the intent when the plan was adopted in 2004. The BOF also adopted a proposal opening Tolsona Lake to sport fishing for burbot *Lota lota* with a bag and possession limit of 2 fish. Tolsona Lake had been closed to burbot fishing since 1998 and the burbot population had recovered sufficiently to allow harvest.

In March 2010, the BOF held a 2-day meeting in conjunction with the statewide finfish meeting to consider 2 proposals addressing a court ruling that remanded, back to the BOF, the case against the BOF 2003 negative C&T finding for the Chitina Subdistrict. A proposal defining subsistence way of life as “a way of life that is based on consistent, long-term reliance upon the fish and game resources for the basic necessities of life,” was adopted. The second proposal sought a positive C&T finding for the Chitina Subdistrict considering the new definition of “subsistence way of life” that failed.

At the December 2008 meeting in Cordova, the BOF adopted proposals that moved regulatory language found in 5 AAC 01.630(e)(6) (Subsistence fishing permits) to 5 AAC 01.620 (Lawful gear and gear specifications), moved regulatory language found in 5 AAC 01.630(e)(9) to 5 AAC 01.645(a), and removed 5 AAC 24.360(c), which was created in 2000 when the Chitina Subdistrict fishery was classified a subsistence fishery, and should have been removed when the Chitina fishery was reclassified as a personal use fishery in 2003. At this meeting the BOF opened Crosswind Lake to subsistence fishing and made a positive C&T determination for freshwater finfish, other than salmon, in the Prince William Sound Area. As a result of the positive C&T determination, the BOF adopted an Amount Necessary for Subsistence (ANS) of 25,000–42,000 usable pounds of non-salmon fish for the Prince William Sound Area and expanded the boundaries of the Prince William Sound Area to include the Upper Susitna River drainage upstream of the Oshetna River.

Three proposals concerning sport fishing of salmon in the UCUSMA were adopted by the BOF. As a result, the following changes occurred: 1) sport fishing for king salmon was closed on the

Lakina River, Slana River drainage, and Sinona Creek; 2) current king salmon closures on Indian Creek, the clearwater tributaries of the Gakona River, Manker Creek (Klutina River drainage), and Gilahina River in the Chitina River drainage were expanded to include the waters within a ¼ mile radius of their confluences with the Copper, Klutina, or Chitina rivers; and, 3) removal of any salmon from the water that is not retained was prohibited in the Copper River drainage. Any salmon removed from the water must be retained and becomes a part of the angler's bag and possession limit.

The BOF modified the open season for king salmon sport fishing on the Klutina, Tonsina, and Copper rivers. The open season for king salmon fishing in the Copper River drainage downstream of the upstream bank of the Klutina River and upstream of the south bank of Haley Creek was set for July 1 through August 10. Intermediate closure dates on the Klutina River are July 19 upstream of 19.2 mile of the Klutina Lake Road and July 31 upstream of 13.0 mile of the Klutina Lake Road, and on the Tonsina River is July 19 upstream of the downstream edge of the Alyeska Pipeline access bridge.

The BOF adopted 3 proposals concerning resident species in the UCUSMA. These updated the list of stocked waters in the UCUSMA, removed outdated regulations for rainbow/steelhead trout on Tolsona Lake, and repealed the *Lake Burbot Management plan*.

ADF&G EMERGENCY ORDER AUTHORITY

ADF&G has emergency order (EO) authority (5 AAC 75.003) to modify time, area, and bag/possession limit regulations. EOs are implemented to address conservation issues 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 BOF. EOs issued under this authority for the UCUSMA during 2012 and 2013 are summarized in Appendix B.

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 the priority subsistence use by qualified rural residents in non-navigable waters within federal public lands (including Bureau of Land Management (BLM) lands) and in navigable waters adjacent to or within federal conservation system units (generally does not include BLM lands). The state retains all other fish and wildlife management authorities, including management on federal land.

Development of regulations for subsistence fisheries under the federal subsistence program occurs within the established Federal Subsistence Board (FSB) process. The public provides 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 UCUSMA, the subsistence fisheries for which the federal government asserts management responsibility include those within and adjacent to the Wrangell-St. Elias National Park and Preserve (including the Copper River mainstem from Haley Creek upstream) and the Gulkana River National Wild River corridor. The UCUSMA fisheries fall under the purview of the Southcentral Regional Advisory Council (SCRAC). The SCRAC's most recent meeting was held in November 2013 in Anchorage. At this meeting, no federal fisheries proposals for the Prince William Sound Area were addressed.

REGION III DIVISION OF SPORT FISH RESEARCH AND MANAGEMENT STAFFING

The Region III Division of Sport Fish staff biologists are organized into a research group and a management group. The management group consists of a management supervisor, a regional management biologist, an area biologist for each of the 5 management areas, 1 or more assistant area management biologists, and 2 stocked-water biologists. Area biologists evaluate fisheries and propose and implement management strategies through plans and regulation in order to meet divisional goals. A critical part of these positions is interaction with the BOF, ACs, and the general public. Stocked-waters biologists plan and implement the regional stocking program for recreational fisheries. The regional management biologist assigned to the Region III office in Fairbanks also administers the regional fishing and boating access program.

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

STATEWIDE HARVEST SURVEY

Sport fishing effort and harvest of sport fish species in Alaska have been estimated and reported annually since 1977 using a mail survey (e. g., Jennings 2011). 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 non-resident). 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 2012 were available fall 2013. 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:

- Estimates based on fewer than 12 responses should not be used other than to document that sport fishing occurred;
- Estimates based on 12 to 29 responses can be useful in indicating relative orders of magnitude and for assessing long-term trends; and,
- 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, UCUSMA sites are designated within survey areas M (Susitna River Drainage) and I (Upper Copper River Drainage).

SPORT FISH GUIDE LICENSING AND LOGBOOK PROGRAM

Since 1998, the Division of Sport Fish has operated a program to register and/or license both sport fishing guides and sport fishing guide businesses, and to collect information on sport fishing participation, effort, and harvest by saltwater and freshwater-guided clients (Sigurdsson and Powers 2009). In 1998, the BOF adopted statewide sport fishing guide regulations (5 AAC 75.075) which required all sport fishing guides and businesses to register annually with ADF&G. At this time, the BOF also adopted statewide regulations that required logbooks for saltwater charter vessels. The logbooks collected information on charter activity (location, effort, and harvest) that was necessary for the BOF for allocation and management decisions specific to king salmon (*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 2009–2013).

SECTION I: MANAGEMENT AREA OVERVIEW

MANAGEMENT AREA DESCRIPTION

The UCUSMA consists of all waters and drainages of the Copper River upstream from a line crossing the Copper River between the south bank of the mouth of Haley Creek and the south bank of the mouth of Canyon Creek in Wood Canyon, and all waters and drainages of the Upper Susitna River upstream from the confluence of the Oshetna River (Figure 2). Located within the

UCUSMA are the communities of Glennallen, Gulkana, Gakona, Chitina, McCarthy, Kenny Lake, Copper Center, Chistochina, Paxson, Mentasta, and Slana. Three of the state's major highways (Edgerton, Glenn and Richardson), together with numerous secondary roads and trails, provide access to most of the area's sport fisheries. Float-equipped aircraft are commonly used during the summer to access the area's many remote lake and stream fisheries. Snowmachines are the popular mode of travel to remote fisheries during winter. Principal land managers in the UCUSMA are the National Park Service (Wrangell-St. Elias National Park), BLM (Gulkana Wild River), Ahtna Incorporated, Chitina Native Corporation, and the Alaska Department of Natural Resources.

FISHERY RESOURCES

The UCUSMA offers a unique blend of freshwater fishing opportunities to sport anglers, personal use and subsistence fishers. Three species of Pacific salmon (king, coho *O. kisutch*, and sockeye *O. nerka*) are available to anglers fishing the Upper Copper River drainage. No anadromous runs of salmon return to the Upper Susitna River drainage, upstream of the Oshetna River. Although at least 1 king salmon stock has been documented above Devils Canyon (located downstream of the Oshetna River and outside the UCUSMA), the canyon presents a velocity barrier that appears to limit upstream migration of salmon. Waters upstream of the Oshetna River confluence are closed to salmon fishing (Figure 2).

Popular fisheries occur on the area's resident stocks of Arctic grayling, burbot, Dolly Varden (*Salvelinus malma*), rainbow and steelhead trout, and lake trout. Smaller fisheries occur on resident stocks of whitefish.

There are a total of 29 stocked waters in the UCUSMA, but only 27 of those (Table 23) are currently stocked with rainbow trout, coho salmon, Arctic grayling, and Arctic char (*S. alpinus*). The stocked fish are reared at the state-owned Ruth Burnett Hatchery in Fairbanks. Stocked-lake fisheries provide additional, diversified angling opportunity and reduce harvest pressure on wild fish stocks.

A sockeye salmon hatchery operated by Prince William Sound Aquaculture Corporation (PWSAC) is located in the Upper Gulkana River near the community of Paxson. Egg takes are conducted near the hatchery and incubation and start-up rearing are accomplished at the hatchery. Fry are subsequently released at Crosswind, Paxson and Summit lakes. The returning adults are harvested in commercial, subsistence, personal use, and sport fisheries.

The BOF has established 1 personal use and 2 subsistence salmon fisheries in the Upper Copper River District. The Division of Sport Fish has the lead management responsibility for these fisheries (as opposed to Division of Commercial Fisheries which manages most of the state subsistence fisheries). From 2007–2011, an average of 173,221 salmon was reported harvested annually in these fisheries (Table 1). Sockeye salmon comprise about 96% of the total harvest.

Returns of salmon to the Copper River also support commercial fisheries in the Copper River District (CRD), located near the mouth of the Copper River. From 2008–2012, an average of 1,154,444 sockeye salmon and 12,161 king salmon were commercially harvested in the Copper River District (Table 2).

ESTABLISHED MANAGEMENT PLANS AND POLICIES

Regulations governing fisheries in the UCUSMA are found in 5 AAC 52.001 through 5 AAC 52.065 (sport fishing), in 5 AAC 77.001 through 5 AAC 77.016, 5 AAC 77.550, 5 AAC 77.570, and 5 AAC 77.591 (personal use fishing), in 5 AAC 01.001 through 5 AAC 01.040 and 5 AAC 01.600 through 5 AAC 01.647 (subsistence fishing), and in 5 AAC 24.360 (Copper River District Salmon Management Plan) and 5 AAC 24.361 (Copper River King Salmon Management Plan).

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

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

Some UCUSMA fisheries have been the focus of allocative conflicts. These conflicts have led the BOF to establish several management plans and policies to guide the fisheries in the area. The goal of these plans is to allocate fish resources among users and to provide managers with guidelines to maintain a sustained yield of the fish stocks in the area. The following management plans and policies have been adopted by the BOF for UCUSMA fish stocks:

Copper River District Salmon Management Plan (5 AAC 24.360). This management plan contains spawning escapement goals for sockeye and other salmon, inriver harvest goals for the subsistence, personal use, and sport fisheries in the drainage, and hatchery brood stock and hatchery surplus goals. The goals are met through regulation of the commercial fishery near the mouth of the river, and are measured at the sonar counter at Miles Lake.

Copper River King Salmon Management Plan (5 AAC 24.361). This management plan provides for a minimum sustainable escapement goal for king salmon in the Copper River drainage of 24,000 fish or greater. To ensure this goal, during statistical weeks 20 and 21 (generally, the first 2 weeks of the season) the commissioner may open no more than one 12-hour fishing period within the inside closure area of the Copper River District. The department will manage the sport fishery of the Upper Copper River drainage through an annual limit for king salmon 20 inches or greater in length of 4 fish. The department also has the authority to further restrict the sport fishery to achieve the escapement goals using the following management measures in the following priority order: a) reduction of the annual limit; b) modification of other methods and means not specified in the plan; c) catch-and-release only designation; and, d) closure of specific waters to sport fishing for king salmon.

The *Copper River Subsistence Salmon Fisheries Management Plans* (5 AAC 01.647) ensures that adequate escapement of salmon past the Miles Lake sonar in the lower Copper River and that subsistence needs are met. It also establishes the open area, gear, season, bag and possession limits, and permit requirements for a subsistence fishery near the traditional fishing village of Batzulnetas along a portion of Tanada Creek and its confluence with the Copper River.

The *Copper River Personal Use Dip Net Salmon Fishery Management Plan* (5 AAC 77.591) establishes fishing seasons, open area, gear, bag limits, and seasonal harvest level for a personal use fishery in the Copper River. The harvest will be distributed throughout the season based on projected daily sonar counts from the Miles Lake sonar counter. Harvest will be adjusted, based on actual sonar counts, through reduction or increase of fishing times by emergency order. The permit limit may be increased during weeks of harvestable surplus determined from actual sonar counts.

The *Wild Arctic Grayling Management Plan* (5 AAC 52.055) directs ADF&G to manage wild Arctic grayling populations in the UCUSMA for long-term sustained yield through a conservative harvest regime. The plan establishes and defines 3 management approaches under which ADF&G shall manage wild Arctic grayling populations in the UCUSMA: 1) the regional management approach; 2) the conservative management approach; and, 3) the special management approach. The plan also outlines guidelines and considerations for ADF&G, public and/or BOF to change or address the management approach for a water body or fish stock.

The *Wild Lake Trout Management Plan* (5 AAC 52.060) directs ADF&G to manage wild lake trout populations in the UCUSMA by employing a conservative harvest regime and by maintaining harvest below the maximum sustained yield level. ADF&G may take 1 or more management actions if there is a conservation or biological concern for the sustainability of the fishery or a stock harvested in that fishery. These actions include reduction of bag and possession limit, reduction of fishing time, allowing only catch-and-release, and modification of methods and means of harvest. The plan also specifies allowable measures to reduce harvest if the harvest level exceeds sustainable yield for a 2-year period. Finally, the plan establishes a process for designating special management waters and means for limiting harvest in these areas to meet the management objectives.

The *Upper Copper River and Upper Susitna River Area Stocked Waters Management Plan* (5 AAC 52.065) directs ADF&G to manage stocked waters in the UCUSMA to provide the public diverse fishing opportunities. The plan establishes and defines 3 management approaches under which ADF&G shall manage stocked waters in the UCUSMA: 1) the regional management approach; 2) the conservative management approach; and, 3) the special management approach. Stocked waters may be reclassified through a proposal from the public, ADF&G, or BOF during the BOF's meeting cycle.

The *Cook Inlet & Copper River Basin Rainbow/Steelhead Trout Management Policy* was adopted by the BOF to provide future BOFs, fisheries managers, and the sport fishing public with: (1) management policies and implementation directives for area rainbow and steelhead trout fisheries; (2) a systematic approach to developing sport fishing regulations that includes a process for rational selection of waters for special management; and, (3)

recommended research objectives. This management policy was never adopted as regulation.

MAJOR ISSUES

The major issues associated with UCUSMA sport, personal use, and subsistence fisheries are summarized below:

Copper River King Salmon: From 1995–1999 commercial, subsistence, personal use, and sport harvests of king salmon increased, which raised concerns regarding sustainability of the Copper River king salmon stocks. From 1999–2002, Upper Copper River king salmon escapement was estimated through a department radiotelemetry research study. This information, in addition to harvest and age data, resulted in a modification to the *Copper River King Salmon Management Plan (CRKSMP)* spawning escapement range of 28,000–55,000 king salmon to a minimum sustainable escapement goal (SEG) of 24,000 king salmon. Since 2003, king salmon escapement has been estimated through a fish wheel mark-recapture study conducted by the Native Village of Eyak (NVE) and LGL, Inc.

As a result of the actions taken through the CRKSMP, king salmon harvests have declined in the commercial, personal use, and sport fisheries. The department considers the king salmon resources of the Copper River fully utilized and while king salmon harvests have declined with the inception of the management plan, the allocation issues between the different user groups remain controversial.

More recently, king salmon total runs have declined averaging an estimated 45,654 fish since 2008. From 1999–2007, the estimated Copper River king salmon total run averaged 83,322 fish. The recent decline in king salmon is a statewide issue, but has required restrictive inseason actions in the Copper River fisheries (sport, personal use, and commercial) to ensure that the spawning escapement goal is achieved.

Copper River Personal Use and Subsistence Salmon Fisheries: The Chitina Subdistrict dip net salmon fishery has been controversial since its inception. Its designation as a personal use fishery with no allocative priority or as a subsistence fishery with an allocative priority was reversed at 2 consecutive BOF meetings. The last change in the status of this fishery occurred in 2003 when the BOF reversed its 1999 decision (classifying it a subsistence fishery) and made a negative C&T determination (reclassifying it a personal use fishery) for the Chitina Subdistrict. The BOF declined to review their 2003 decision at the 2005 and 2008 meetings citing no new information to justify reconsideration. Following the 2008 meeting, the Chitina Dipnetter’s Association and Alaska Fish and Wildlife Fund sued the BOF over their 2003 decision. In March 2010 the Alaska Superior Court remanded the case back to the BOF due to the 2003 BOF members’ inconsistent definition of the “subsistence way of life”. In March 2010 the BOF determined a definition for “subsistence way of life” and then reconsidered and upheld the negative C&T determination for the Chitina Subdistrict.

Land Access: Ahtna Incorporated (the regional Alaska Native Corporation) owns a majority of the land along the 3 rivers supporting major fisheries in the Upper Copper River drainage. Ahtna Inc. controls the uplands along the Klutina River between Klutina Lake and the Richardson Highway. The corporation owns the majority of land along the

Gulkana River downstream of Sourdough and the Gulkana River National Wild River corridor. Ahtna Inc. or its shareholders also own the majority of land along the Copper River within the Glennallen Subdistrict. Ahtna Inc. initiated an access fee program for corporation uplands adjacent to the Klutina River (1998) and the Gulkana River (1999). The fee program ended years of convenient, free access to these river systems. Access fees angered many of the sport fishing public that traditionally used corporation lands to access these rivers and resulted in some users avoiding these access points. Since that time, the access fee program has become established for all Ahtna Inc. lands and most anglers appear comfortable with paying for some access to fishing and camping areas.

Limited public access has been maintained through lands conveyed to Ahtna Inc. and other Alaska Native organizations by establishment of several public easements. The Klutina Lake Road runs parallel to the north shore of the Klutina River and is a combination of a 17b public easement (managed by the BLM), RS 2477 (managed by the State of Alaska Department of Natural Resources (DNR)), and a Department of Transportation (DOT) ROW and provides free access to Klutina Lake and Klutina River where the river passes within the width of the RS 2477 and DOT ROW. The 17b easement provides access to the Klutina River at approximately Mile 21 of the Klutina Lake Road, downstream of the lake. On the Gulkana River, public access to the river is limited to 4 public 17b easements along the Richardson Highway: Sailors Pit at mile 130.9, Poplar Grove (mile 137), Mile 141 trail, and the Middle Fork trail at mile 169.5. There is also public access via the DOT ROW around the Richardson Highway Bridge and via the BLM Sourdough and Paxson Lake campground boat launches.

Access to the Chitina Subdistrict fishery has long been an issue between dipnetters and the 2 local Native corporations (Ahtna Inc. and Chitina Native Corporation). From the early 1990s through 2003 an access fee was associated with the State issued dip net permit. In 2000, DOT conducted a survey of the O'Brien Creek Road from Chitina to Haley Creek and determined that the road ROW provided access to the Copper River from the road for a majority of its distance in the fishery. As a result of the survey, the Alaska Legislature removed the access fee from the permit. This action was opposed by Ahtna Inc. and Chitina Native Corporation who remained concerned over trespass and vandalism allegedly caused by dipnetters. In July 2004, Chitina Native Corporation blocked access to the Copper River at O'Brien Creek, a primary river access point and boat launching area for charter operators and private boats, forcing these boat operators to launch approximately 3 miles upstream at the Chitina-McCarthy Bridge. This also reduced the parking and camping area used by many of the fishery participants. The state did not dispute the blocked access, as the survey indicated that this land was outside of the ROW, but has tried to negotiate access at this point with the corporations. In 2005, Chitina Native Corporation instituted a fee based access permit where the general public can now purchase access across Corporation lands for the day or the season. However, even with the access permit, access to the river and trespass on Corporation lands is still a contentious issue.

Burbot and lake trout fisheries: The lakes of the UCUSMA have historically supported some of the largest sport fisheries for burbot and lake trout in Alaska. Stock assessment work indicated that many burbot and lake trout stocks were depressed due to overfishing in the early 1980s. Based on these and other findings, the BOF adopted management

plans for burbot (1989) and lake trout (2006) stocks in UCUSMA lakes. Under these management plans, the BOF adopted more conservative regulations for UCUSMA burbot and lake trout fisheries which have allowed some previously overfished stocks to recover enough to permit sustainable fisheries. Unattended set lines were prohibited in all UCUSMA lakes in 1991 to reduce the harvest of burbot, which also reduced the incidental harvest of lake trout. Bait restrictions have been implemented in some lakes to reduce the harvest of lake trout. These bait restrictions have adversely impacted some popular burbot fisheries. In some cases, like Lake Louise, Susitna, Tyone, Crosswind, Paxson and Summit lakes, regulations have been adjusted for lake trout retention and allow for a limited period when bait is permitted to facilitate a burbot ice fishery while providing protection to the lake trout populations.

Freshwater subsistence fisheries: At the 2008 BOF meeting a positive C&T determination was made for the freshwater fishes in the Prince William Sound Area which includes the entire UCUSMA. Freshwater subsistence permits were issued in the UCUSMA since 1960, but the positive C&T determination formalized this practice. The majority of permits issued for freshwater subsistence fishing are for gillnetting whitefish between October 1 and March 31. From 1964 through 2004, the maximum number of permits issued for subsistence fishing in any year was 13. In 2009, 28 permits were issued for fishing whitefish with a gillnet. With low participation, the subsistence whitefish fishery garnered little notice from other user groups. With the increase in subsistence permits and especially increases on popular sport fishing lakes (generally the road accessible fisheries of Lake Louise and Paxson Lake) concern by sport anglers over potential impacts on lake trout and burbot has been elevated and may be a continuing issue into the future.

ACCESS PROGRAMS

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

In spite of the large land base in the UCUSMA, access to sport fishing is restricted near most popular fisheries due to private land ownership. In addition, few suitable locations for boat launches exist on the major tributaries and Copper River mainstem. Various small access projects are completed each year in the UCUSMA, which entail validating easements, improving existing trails, and replacing or installing signs for local roadside lakes.

INFORMATION AND EDUCATION

Information regarding regulations, publications, stocking and fishing reports, news releases and EOs for the UCUSMA can be found from the *Fishing* and *Sport* links at the ADF&G website (<http://www.adfg.alaska.gov/index.cfm?adfg=fishingSport.main>). In addition, many of these publications as well as some additional publications regarding fishing opportunities in the UCUSMA can be found at the area ADF&G office in Glennallen and the regional ADF&G

office in Fairbanks. Information regarding the Gulkana Wild River (BLM) and Wrangell-St. Elias National Park (USNPS) can be obtained from the respective agency offices in Glennallen and Copper Center. The Ahtna Incorporated has its headquarters located in Glennallen and can be visited for information regarding access to corporation-owned lands. The Greater Copper Valley Chamber of Commerce can be a source for commercial operators located in the UCUSMA. A listing of the addresses and contact numbers for these information sources can be found in Appendix A.

There are 3 regional information and education (I&E) staff located in the Fairbanks office. An Information Officer II and a seasonal Fisheries Technician III respond to questions from the public at the office and via phone and e-mail. In addition, I&E staff distribute and update fishery brochures, fishing regulations, the regional webpage, coordinate the Fairbanks Outdoor Show booth, Kid's Fish & Game Fun Day, and the Becoming an Outdoors-Woman (BOW) program. An Education Associate II coordinates the sport fishing component of the Alaska Conservation Camp and works with schools in various communities throughout the region to provide a curriculum in sport fishing and aquatic education.

SPORT FISHING EFFORT, HARVEST, AND CATCH

Effort, harvest, and catch statistics for UCUSMA sport fisheries have been estimated from response to the SWHS since 1977, and reported under the headings of the "Upper Copper River Drainage" (Area I) and the "Susitna River Drainage" (Area M); (Mills 1979-1980, 1981*a-b*, 1982-1994, Howe et al. 1995-1996, 2001*a-d*, Walker et al. 2003, Jennings et al. 2004, 2006*a-b*, 2007, 2009*a-b*, 2010*a-b*, 2011*a-b*, *In prep*; Romberg et al. *In prep*). Anglers expended a total of 40,368 angler-days of effort in UCUSMA drainages in 2012, which is 8,375 angler-days more than 2011 and the third lowest angler activity since 1977 when sport fishing effort was first estimated (Table 3). Angler effort in the UCUSMA has generally remained between 40,000 and 60,000 angler-days with the exception of the period from 1992 through 1995 when angler effort averaged nearly 85,000 angler-days and peaked at 102,951 angler-days in 1995. The majority of effort in the UCUSMA occurs in the Gulkana and Klutina river drainages, representing approximately 68% of the total area effort in the past decade (Table 3).

Sockeye salmon are the predominant species harvested in the UCUSMA representing 55% (14,069 fish average) of all species harvested from 2007-2011 and 73% (23,393 fish) in 2012 (Table 4). The next most harvested species, from 2007-2011, were Arctic grayling (3,610 fish) and king salmon (2,851 fish) followed by burbot, lake trout, rainbow trout, Dolly Varden, and whitefish.

Arctic grayling are the predominant species caught in the UCUSMA representing 47% (45,742 fish) of all species caught from 2007-2011 and 38% (30,320 fish) in 2012 (Table 5). The next most caught species, from 2007-2011, were sockeye salmon (19,787 fish), and lake trout (9,207 fish) followed by rainbow trout, king salmon, burbot, Dolly Varden, and whitefish.

SECTION II: FISHERIES

This section provides a summary of sport fisheries by species that were considered significant in the UCUSMA in 2012 and 2013. Discussion of each fishery will address: 1) historical perspective; 2) recent fishery performance (stock status); 3) fishery objectives and management; 4) current issues; 5) recent actions by the BOF; and, 6) ongoing and recommended management and research activities. Recent fishery performance will focus on data from 2012; however,

observations or research data regarding these fisheries in 2013 will be presented when available. A summary of the historical (prior to 1993) sport fishing effort and harvest in the UCUSMA can be found in Somerville (2008).

KING SALMON SPORT FISHERIES

Background and Historic Perspective

The Copper River drainage supports the only anadromous runs of king salmon in the UCUSMA. No anadromous runs of king salmon return to the Upper Susitna River drainage, upstream of the Oshetna River.

King salmon returning to the Copper River drainage pass through the Copper River Delta and enter the Copper River in early May. The peak timing in the Lower Copper River is from mid-May to mid-June, with the return essentially complete by July 1. However, small numbers of king salmon continue to enter the Copper River through August. King salmon make their way to spawning areas in the Upper Copper River tributaries through June and July and spawn mid-July through August. There are no known king salmon spawning streams downstream of Haley Creek.

King salmon are found in at least 40 tributaries distributed throughout the Copper River Basin. Aerial escapement surveys have been conducted in 35 of these systems, with 9 of these systems (Little Tonsina River, Greyling Creek, Mendeltna Creek, Kaina Creek, Indian River, Gulkana River, East Fork Chistochina, and Manker and St. Anne creeks) surveyed consistently from 1966 (Roberson and Whitmore 1991) through 2004. Unfortunately, aerial index counts have proven to be an unreliable index of overall king salmon escapement in the Copper River drainage. There is high variability in the proportion of total escapement between years and the majority of the index streams disproportionately represent early run stocks.

A radiotelemetry study conducted by the department from 2002–2004 showed that only 45% of the king salmon returns to the Klutina River and 16% to the Tonsina River spawned in the index streams. The remainder spawned in the glacial mainstem of those rivers (Savereide 2005a). The study also indicated that the 9 index streams represented only 26%–46% of total escapement in the Copper River drainage. Annual aerial index counts were reduced and have continued on only 4 index streams: Gulkana River, East Fork Chistochina, and Manker and St. Anne Creeks in the Klutina River drainage. These 4 streams provide comparable indices of escapement in these systems from year to year.

The *Copper River King Salmon Management Plan* was adopted by the BOF in 1996 and is the primary guide to management of king salmon stocks in the Copper River drainage. Copper River king salmon stocks are harvested in commercial and subsistence gillnet fisheries in the Copper River District near the mouth of the river, a personal use dip net fishery in the Chitina Subdistrict near Chitina, a subsistence dip net and fish wheel fishery in the Glennallen Subdistrict between the Chitina and Slana rivers, and sport fisheries in various tributaries. Because most of these fisheries are comprised of mixed stocks, the contribution to the harvest by each spawning stock could not be quantified and king salmon productivity assessed using stock specific spawner-recruit relationships (Brady et al. 1991; Roberson and Whitmore 1991). From 1969–1981 the commercial harvest of king salmon averaged 19,961 fish (Pirtle 1980; Randall et al. 1981). In 1982, commercial harvest spiked to over 47,000 king salmon and to over 52,000 king salmon in 1983 after which, the overall return and harvest of king salmon declined through 1990 with a commercial harvest of 21,702 king salmon that year (Hollowel et al. 2007). King salmon

harvests remained relatively stable in the subsistence and sport fisheries in the Upper Copper River while harvest in the Chitina Subdistrict personal use fishery increased with increased participation (Somerville 2008). Harvest in all king salmon fisheries entered an increasing trend beginning in 1991 (Table 6) that peaked in 1998 with an overall harvest of 87,343 king salmon in the Copper River fisheries.

From 1999 to 2006 total king salmon harvest ranged from 41,423–79,794 fish (Table 6). Over the last 5 years (2007–2011) the total king salmon harvest has averaged 26,425 fish. The total king salmon harvest in 2012 was 16,401 fish, which is the lowest since 1980 and second lowest ever. King salmon escapement has averaged 29,721 fish from 2000 through 2012 and met or exceeded the sustainable escapement goal (SEG) for the Copper River in 9 of those 13 years. King salmon escapement achieved the SEG in 2012 and was estimated at 27,911 fish. Since 2007, implementation of inseason management restrictions in all fisheries except subsistence, as provided in the *Copper River King Salmon Management Plan*, have resulted in reduced harvests and achievement of the SEG in all but 1 year (2010).

King salmon sport fisheries occur in various tributaries of the Copper River. Fisheries on the Gulkana and Klutina rivers account for 95% of the sport caught king salmon in the UCUSMA (Table 7). In 1994 an annual bag limit of 5 king salmon was established for the Upper Copper River drainage in an attempt to stem rising king salmon harvests. Sport harvest of king salmon continued to increase through 1996 when it peaked at 9,116 fish and has declined since (Table 7). In 1997, guides were prohibited to operate on Tuesdays during the king salmon season, but this appeared to have little or no effect on guided harvests. In 2000, the annual limit for king salmon in the Upper Copper River drainage was reduced from 5 to 4 and the guide restriction was repealed. From 2007–2011 sport harvest of king salmon in the UCUSMA averaged 2,851 fish and totaled only 459 fish in 2012 (Table 7), the lowest total harvest since 1977 (Somerville 2008). Inseason management actions have restricted the sport harvest of king salmon in the Upper Copper River drainage each year since 2009.

Creel survey data indicate that guided king salmon anglers are more successful than unguided anglers on the Gulkana and Klutina rivers (LaFlamme 1997; Potterville and Webster 1990; Schwanke 2009a). Harvest estimates from guide logbooks also indicate a majority of king salmon are harvested by guided anglers (Table 8). Since 2005, ADF&G has required guides to log the harvest and number of fish released per client by trip and fishing site (Sigurdsson and Powers 2009-2013). The number of guides operating on area rivers has increased since the early 1980s. For example, prior to the 1986 season, only 1 individual specialized in guiding anglers for king salmon on the Gulkana River. By 1989, 5 guides were operating on the Gulkana River (Potterville and Webster 1990) and from 2008 through 2012, 8–29 guides operated annually on the Gulkana River (H. Sigurdsson, Sport Fish Biologist, ADF&G, Anchorage, personal communication.) (Table 8). On the Klutina River 18–28 guides operated there annually since 2005 when logbooks became required.

To more accurately assess king salmon abundance in the Copper River, research was initiated in 1995 to estimate the timing and contribution of king salmon stocks from its major tributaries. In 1996, a weir was operated on the Gulkana River to enumerate king salmon in tandem with a creel survey to estimate king salmon harvest (LaFlamme 1997). From 1997 to 1999, a coded-wire tagging study was conducted in the Gulkana, Klutina, Tonsina, and East Fork Chistochina rivers. Unfortunately, marking wild king salmon fry with coded wire tags proved an ineffective method to assess returns due to a low tag recovery rate (Sarafin 2000; Brase and Sarafin 2004).

From 1999–2004, radiotelemetry studies were used to determine king salmon distribution and timing of entry into the spawning streams of the Copper River (Evenson and Wuttig 2000; Wuttig and Evenson 2001; Savereide and Evenson 2002; Savereide 2003, 2004, 2005a). Estimates of total escapement were obtained during these studies from a mark-recapture experiment in which king salmon were captured and tagged during the radio-transmitter deployment and then recaptured in the Chitina Subdistrict personal use fishery. In 2002 a separate mark-recapture study was initiated using only fish wheels as the means to capture (for marking) and recapture marked and unmarked king salmon. This continuing study, conducted by the Native Village of Eyak and LGL, Inc., has provided a post-season estimate of annual king salmon escapement to the Copper River since 2003 (Smith et al. 2003; Smith 2004; Smith and van den Broek 2005a-b; van den Broek et al. 2008, 2009a-c, 2011, *In prep*).

Gulkana River King Salmon Sport Fishery

Background and Historic Perspective

The Gulkana River drainage originates in the Alaska Range and flows south to join the Copper River near the community of Gulkana. The section of the Gulkana River upstream from Sourdough has been designated as “wild” under the Wild and Scenic Rivers Act of 1968. Access to the river, downstream of Paxson Lake, is limited to 7 state and federal trail and site easements, and 1 privately owned and controlled site accessible from the Richardson Highway, which parallels much of the river. Anglers use rafts, canoes, and powerboats to gain access to the more remote sections of the river. Raft and canoe anglers frequent the various sections of the river from Paxson Lake downstream to the Richardson Highway Bridge. Powerboat operators generally launch at the BLM Sourdough launch and use the river from approximately 2 miles below Sourdough upstream to several miles above the confluence of the West Fork. Powerboat operators also launch from the Richardson Highway Bridge and fish the 5-mile reach of the river above the bridge. Powerboat operators access the mouth of the Gulkana River, when the river level is sufficiently high, by launching near the Richardson Highway Bridge and boating down the Gulkana River and when water levels are lower by launching in the Gakona River, to the north, and then boating down the Copper River.

The Gulkana River drainage has historically supported the largest sport fishery for harvest (Table 7) and catch (Table 9) of king salmon in the UCUSMA. King salmon begin entering the Gulkana River in early to mid-June. The sport fishery peaks during late June/early July, but fishing for king salmon continues until the season closes July 20th. Spawning begins in mid-July and continues through late August. Most spawning occurs upstream of the confluence of the West Fork (Figure 3).

Spawning escapement of king salmon in the Gulkana River, upstream of the West Fork, has been documented since 1966 by aerial index counts (Brady et al. 1991; Roberson and Whitmore 1991; Taube 2006a-b). A weir was operated on the Gulkana River in 1996 to provide a count of king salmon escapement concurrent with a creel survey conducted that same year (LaFlamme 1997). The estimated total inriver run in 1996 was 13,840 and estimated spawning escapement was 11,399.

In 2002 ADF&G initiated a multi-year project with BLM to estimate the escapement of king salmon in the Gulkana River (Taras and Sarafin 2005; Perry-Plake et al. 2007; Perry-Plake and Antonovich 2009; Perry-Plake and Huang 2011; Savereide 2010, 2011; Maclean 2013, *In prep*). A counting tower site was established approximately 2 miles upstream of the West Fork

confluence to enumerate king salmon migrating upstream. The estimated escapement passing the counting tower has generally decreased each year since 2002 and has ranged from 6,390 in 2002 to 1,730 in 2012. The final estimated king salmon escapement in 2013 was 3,936 fish (Maclean *In prep*). From 2002–2004 a radiotelemetry tracking station was installed at the tower site to collect data in conjunction with the Copper River king salmon radiotelemetry project. These data enabled the estimation of the proportion of radiotagged king salmon that entered the Gulkana River and migrated past the tower. The telemetry data indicated that 50%–86% of the Gulkana River king salmon return passed the counting tower during these years (Taras and Sarafin 2005; Perry-Plake et al. 2007). A long-term goal of this project is to establish a king salmon SEG for the Gulkana River.

A roving creel survey conducted in 1989 (Potterville and Webster 1990) and an on-site survey conducted in 1996 (LaFlamme 1997) showed the majority of effort and harvest of king salmon from the Gulkana River occurs from the Richardson Highway Bridge upstream to the confluence of the West Fork. During both creel surveys few anglers appeared to fish the single-hook, artificial fly only area downstream of the Richardson Highway Bridge. Although many anglers floated the upper river, the harvest of king salmon appeared minimal in this reach because most king salmon did not arrive to the area until after the July 19 spawning season closure. Anglers that were guided or used bait had higher harvest and catch rates. Shore anglers caught as many king salmon as boat anglers, but harvested more and expended more time to catch a king salmon. According to both creel surveys, approximately 50% of the harvest occurred on weekends.

Regulations used to manage the Gulkana River king salmon fisheries accommodate concurrent fisheries on other species, provide protection to these other species populations, and provide protection for spawning king salmon while still providing maximum opportunity for the anglers who target king salmon. Twelvemile Creek, the Middle Fork drainage, and all waters of the Gulkana River drainage upstream of the Middle Fork confluence are closed to fishing for king salmon year-round to protect spawning fish (Figure 3). The remainder of the river is open to king salmon fishing from January 1 through July 19. From June 1 through July 19 anglers may use bait, artificial lures, and treble hooks upstream from the Richardson Highway Bridge to an ADF&G marker located 7.5 miles upstream of the West Fork confluence. From June 1 through July 31, anglers are limited to using only single-hook, artificial flies from the Richardson Highway Bridge downstream to an ADF&G marker approximately 500 yards downstream of the confluence with the Copper River. In all waters of the Gulkana River drainage, upstream of a marker 7.5 miles upstream of the West Fork confluence with the mainstem, and in the entire Gulkana River drainage from July 20 to May 31, only unbaited, single-hook artificial lures may be used. This restriction is intended to protect the resident rainbow trout population and the small population of steelhead that return to the Gulkana River.

Recent Fishery Performance

The sport harvest of king salmon in the Gulkana River averaged 1,624 fish over the last 5 years (2007–2011) and 2,142 fish from 2002–2011. Angler effort on the Gulkana River, which is presumed to be primarily focused toward king salmon, also peaked in the 1990s reaching 44,075 angler-days in 1995 (Table 3). The 5-year average (2007–2011) of angler effort was 17,296 angler-days. Angler effort in 2012 was the lowest ever recorded for the Gulkana River at 8,117 angler-days and most likely reflects inseason restrictions of the king salmon fishery (Appendix B).

On June 30, 2012, retention of king salmon was prohibited in the Gulkana River drainage. The use of bait and treble hooks in the Gulkana River was also prohibited. In addition, the annual limit for king salmon 20 inches or more in length was reduced from 4 to 1 fish, of which only 1 king salmon could be retained from any individual tributary in the remainder of the Upper Copper River drainage. No bait or hook restrictions were imposed. As a result of these management actions, the 2012 harvest of 120 king salmon from the Gulkana River was the lowest ever recorded (Table 7). The final escapement estimate for king salmon in the Gulkana River for 2012 was 1,730 fish (Maclean 2013), the lowest since the project began in 2002.

In 2013, management action was again taken to restrict the king salmon fishery in the Gulkana River. On June 15, the retention of king salmon was prohibited in the Gulkana River and portion of the Copper River from the confluence of the Gulkana and Copper rivers to an ADF&G marker located approximately 500 yards downstream. Furthermore, the use of bait and treble hooks in the Gulkana River was prohibited. The annual limit for king salmon 20 inches or more in length was reduced from 4 to 1 fish in the remainder of the Upper Copper River drainage. The final escapement estimate for king salmon in the Gulkana River for 2013 was 3,936 fish (Maclean *In prep*), which is the highest estimate since 2007.

Fishery Objectives and Management

The goal of past and current management of king salmon on the Gulkana River has been to ensure sustained yield, but there is currently no escapement goal specific to the Gulkana River. The *Copper River King Salmon Fishery Management Plan* was developed in 1996 to provide for king salmon escapement at or above average historic levels. To meet this goal, escapement objectives (post-season indices of escapement only) were developed for several river systems based on the 1977–1995 average aerial index count for those systems. Only years in which the systems were surveyed between July 17 and 31 were used in the average as this was considered the peak spawning period. An aerial escapement index objective of 1,200 king salmon has been used for the Gulkana River. An inseason escapement count target of 4,070 king salmon past the Gulkana River counting tower was developed using an expansion of the aerial survey indices from 2002–2011 to the tower counts for those years (Maclean 2013). This target is not a formal escapement goal, but rather a target to help guide inseason management decisions, which depend on voluntary reports from sport anglers and guides, Copper River subsistence and personal use fishers, aerial index counts, and counting tower reports.

Current Issues and Fishery Outlook

Increased use by floaters and powerboat operators on the Gulkana River intensified conflicts between these user groups and instigated health concerns by local residents who use the Gulkana River as a source of drinking water. There are currently no restrictions on the number of rafts or for operating motorized boats for the purposes of floating the river, fishing, or transporting anglers on the Gulkana River. At the 1999, 2003, and 2008 BOF meetings, proposals were submitted to limit motor boat use on the Gulkana River. None of these proposals were addressed, as they fell outside the purview of the BOF. However, BLM has authority within the designated wild section of the river to establish a permit system for camping on their lands and thus limit the number of trips per year or number of people per trip. No such permit system has been implemented, but BLM currently issues portable toilets for rafting groups floating the river from Paxson Lake to the Sourdough boat launch.

Public access to the Gulkana River is limited to a few easements and access points, and this lack of access drives the need for people to float long sections of the river or use a power boat to access quality fishing locations. A combination of private and federal campgrounds and a developed public use area on DOT land immediately below the Richardson Highway Bridge provide overnight sites for river users.

Recent trends in total returns of king salmon to the Copper River and other state waters indicate the Gulkana River will experience low returns into at least the near future. Harvest and catch data, as well as tower counts, indicate a declining trend in run strength for Gulkana River king salmon stocks beginning in the late 1990s. Despite these declines, the Gulkana River is expected to remain a highly popular king salmon fishery. If sport fishing effort returns to past levels as king salmon runs rebound there is potential for overharvest of the Gulkana River king salmon stocks. Environmental factors such as river level and turbidity can provide a significant buffer to overharvest, but it is anticipated that management actions in low run years will be needed to achieve adequate king salmon escapements to provide sustainable fisheries into the future.

Recent Board of Fisheries Actions

There were 3 proposals before the BOF at the 2011 meeting which addressed the Gulkana River king salmon fishery. One proposal sought to change the king salmon season on the Gulkana River from 7 days per week from January 1–July 19 to 5 days per week from June 10–August 10. This proposal failed. The BOF took no action on proposals that sought to restrict sport fish guides in some undetermined way if the Copper River District commercial drift gillnet fishery was closed for conservation measures, or sought to limit nonresident anglers to shipping only a single daily bag limit of fish from the state and establish a permitting system to ensure compliance.

Current or Recommended Research and Management Activities

A goal of the Gulkana River counting tower project is to provide data to develop a spawning escapement goal (SEG). The counting tower has already proven to be effective for inseason management and should be maintained as a future management tool. A 3-year radiotelemetry study on king salmon movements and spawning locations within the Gulkana River drainage was begun in 2013. This study will help to verify current assumptions with regard to spawning locations of king salmon in the Gulkana River in relation to the counting tower.

Klutina River King Salmon Sport Fishery

Background and Historical Perspective

The semi-glacial Klutina River drops rapidly out of Klutina Lake and enters the Copper River at the community of Copper Center. Access to the river is available from the old and new Richardson Highways and along the Klutina Lake Road (also called the Brenwick-Craig Road), which parallels the river. Shore anglers participate in the fishery adjacent to the Richardson Highway and the Klutina Lake Road. Jet-powered riverboats are used by experienced operators to access the upstream portions of the river. The river has considerable stretches of whitewater and is considered to be very challenging to navigate. Jet boats are launched from private land adjacent to the highway or from a boat launch within the highway ROW along the new Richardson Highway Bridge. Rafters also use the Klutina River and launch from sites located at mile 4, mile 14 and mile 22 of the Klutina Lake Road and exit the river at the new Richardson Highway Bridge. The fast water of the Klutina River limits the number of resting pools for king

salmon to less than 2 dozen good fishing sites accessible to most anglers in the lower portion of the river.

The Klutina River supports the second largest sport fishery for king salmon in the UCUSMA. King salmon begin entering the Klutina River in late June, with the run continuing into August. The king salmon sport fishery opens on July 1, peaks during the third week of July, and continues until the season closes on August 11. King salmon spawn from late-July through August in tributary streams of the river and lake and in the mainstem of the river. Most spawning is believed to occur upstream of a point adjacent to mile 19.2 on the Klutina Lake Road. Current open seasons for king salmon and areas closed to sport fishing for king salmon on the Klutina River provide protection to king salmon spawners. On the Klutina River from an ADF&G marker located adjacent to mile 19.2 of the Klutina Lake Road upstream to Klutina Lake, king salmon may be taken only from July 1 through July 19. From mile 19.2 downstream to an ADF&G marker at mile 13.0 of the Klutina Lake Road, king salmon may be taken from July 1 through July 31. From mile 13.0 downstream to the confluence of the Copper River, king salmon may be taken from July 1 through August 10. The current bag and possession limit for sport caught king salmon ≥ 20 inches is 1 fish. The Upper Copper River drainage wide annual bag limit of 4 king salmon ≥ 20 inches per year includes the Klutina River.

Creel surveys were conducted on the Klutina River in 1988 (Roth and Delaney 1989), in 1989 (Potterville and Webster 1990), and 2006 (Schwanke 2009a). All 3 surveys indicated that most kings are harvested by anglers accessing the river by boat (80% in 1988, 88% in 1989, and 87% in 2006). The 2006 survey segregated the boat accessed king salmon harvest by anglers accessing with power boats (70%) and rafts (17%) (Schwanke 2009a). Furthermore, anglers accessing the fishery via boats operated by commercial guide services were more successful. Nearly 80% of the harvest of king salmon and 90% of the king salmon catch was attributed to guided boat anglers in 1988 (Roth and Delaney 1989). The 1989 creel survey reported that the vast majority of boat anglers that participated in the fishery were guided (Potterville and Webster 1990). In 2006, guided anglers accounted for 90% of the king salmon harvest in June and 79% of the harvest in July (Schwanke 2009a).

Aerial index counts have been conducted on 2 clearwater tributaries (Manker and St. Anne creeks) of the Klutina River since 1966 (Brady et al. 1991, Roberson and Whitmore 1991, Taube 2006a-b). Radiotelemetry studies conducted on king salmon from 1999–2004 indicated that these 2 streams accounted for about 45% of the spawning population of the Klutina River system (Evenson and Wuttig 2000; Wuttig and Evenson 2001; Savereide and Evenson 2002; Savereide 2003, 2004, 2005a). Additionally, the king salmon returning to Manker and St. Anne creeks primarily represented the early component of the Klutina River king salmon run. The majority of Klutina River king salmon spawn in the mainstem and generally later than those in the clearwater tributaries of the river.

Recent Fishery Performance

In 2000, the Upper Copper River annual king salmon bag limit was reduced from 5 to 4 fish ≥ 20 inches and coincided with a dramatic decrease in angler effort and king salmon harvest and catch in the Klutina River, which is the only major king salmon fishery in the UCUSMA open after July 20th. The harvest of king salmon from the Klutina River ranged from 1,136 to 1,873 fish from 2000–2008. From 2009–2012, management actions were taken to ensure adequate spawning escapement in light of weak king salmon returns (Appendix B; Somerville 2011, 2013). These

management actions led to king salmon harvests in 2009 (733 fish), 2010 (863 fish), 2011 (1,043 fish), and 2012 (314 fish) that were the lowest since 1990 (Table 7).

On June 30, 2012, the annual limit for king salmon ≥ 20 inches length was reduced from 4 to 1 fish. On July 28, retention of king salmon and the use of bait and treble hooks were prohibited in the Klutina River and all waters of the Upper Copper River Drainage downstream of the upstream bank of the Klutina River. The 2012 harvest of 314 king salmon was below the 2007–2011 average harvest of 1,097 king salmon and the lowest harvest ever reported for the Klutina River fishery.

In 2013, management action was again taken to restrict the king salmon fishery in the UCUSMA and the Klutina River. On June 15, the annual limit for king salmon 20 inches or more in length was reduced from 4 to 1 fish. No further action was taken in the Klutina River fishery in 2013.

Fishery Objectives and Management

Although no specific fishery objectives have been established for this stock, the underlying goal of fisheries management is to ensure sustained yield. Aerial index counts of the clearwater tributaries will continue to be used to monitor Klutina River king salmon returns inseason along with anecdotal reports from the subsistence, personal use and sport fisheries; and catch data from the Copper River commercial gillnet fishery and NVE/LGL project fish wheels.

The Klutina River king salmon return is managed as a single stock. Anglers and guides consider the return to be 2 separate stocks of kings, comprising an early and late run. Radiotelemetry data indicate that early returning fish primarily spawn in Manker and St. Anne creeks and the later returning king salmon primarily spawn in the mainstem Klutina River (Evenson and Wuttig 2000; Wuttig and Evenson 2001; Savereide and Evenson 2002; Savereide 2003, 2004, 2005a). However, early and late returning king salmon do spawn in both locations and there is sufficient overlap in entry timing of both tributary and mainstem spawners that no distinct temporal differences between early and late returning king salmon have been identified. Genetic sampling conducted from 2003–2005 had insufficient resolution to determine a significant genetic difference between the tributary and mainstem spawners (Seeb et al. 2009).

Current Issues and Fishery Outlook

Radiotelemetry indicated that 10%–12% of the total Copper River drainage king salmon escapement from 2002–2004 spawned in the Klutina River, compared to the 17%–27% that spawned in the Gulkana River during the same period (Savereide 2005a). Since 1995 the king salmon sport harvest from the Klutina River has comprised 30%–40% of the overall Upper Copper River drainage sport harvest. While harvest levels rose from 2000–2003, they have since declined in conjunction with the drainage wide decline in king salmon runs in recent years (Table 7). Continued low king salmon runs may make future restrictions to the fishery necessary.

The majority of the land adjacent to the Klutina River upstream of the Richardson Highway is owned by Ahtna Native Corporation. Ahtna allows access across its lands along the Klutina Lake Road with the purchase of access passes. If fees increase without increased access this may result in conflicts between fishery users and the corporation or increased congestion in areas of the Klutina River that are not corporation lands.

Recent Board of Fisheries Actions

There were 2 proposals before the BOF at the 2011 meeting which indirectly concerned the Klutina River king salmon fishery. One proposal sought to restrict sport fish guides in some undetermined way if the Copper River District commercial drift gillnet fishery was closed for conservation measures. Another proposal sought to limit nonresident anglers to shipping only a single daily bag limit of fish from the state and establish a permitting system to ensure compliance. The BOF took no action on these proposals.

At the December 2008 meeting in Cordova, the BOF amended and adopted a proposal that modified the open season for king salmon sport fishing on the Klutina, Tonsina, and Copper rivers. The open season for king salmon fishing in the Copper River drainage downstream of the upstream bank of the Klutina River and upstream of the south bank of Haley Creek was set for July 1 through August 10 for consistency with the Klutina and Tonsina river seasons. Intermediate closure dates on the Klutina River were set at July 19 upstream of 19.2 mile of the Klutina Lake Road and July 31 upstream of 13.0 mile of the Klutina Lake Road, and on the Tonsina River at July 19 upstream of the downstream edge of the Alyeska Pipeline access bridge.

Current or Recommended Research and Management Activities

Aerial index counts should continue to provide an inseason assessment of the king salmon return in the Klutina River. Management of king salmon in the Klutina River would benefit from another radiotelemetry project, which could provide data on king salmon movements and milling behavior within the Klutina River to ensure current closing dates on the upper river sections are providing the assumed protection to spawning adults. Continued genetic sampling may provide data to determine if the tributary and mainstem spawning groups are distinct stocks or a single related stock. Finally, continuation of the NVE/LGL king salmon stock assessment provides the best inriver abundance estimate of king salmon for the Copper River and is essential to the management of king salmon sport fisheries.

Management of the Klutina River king salmon stock would benefit from a system to count or estimate the king salmon run to the Klutina River drainage. However, current technology does not appear able to provide reliable and accurate species apportionment between sockeye salmon and king salmon, as these 2 species run timings overlap.

Other Copper River Basin King Salmon Sport Fisheries

Background and Historical Perspective

Less than 10% of the harvest of king salmon in the UCUSMA occurs in systems other than the Gulkana and Klutina rivers. The majority of this remaining harvest occurs in the Tonsina River. The semi-glacial Tonsina River flows from Tonsina Lake into the Copper River downstream of the Klutina River confluence (Figure 2). The Tonsina River is crossed by the Richardson Highway, Edgerton Highway, and Alyeska Pipeline bridges. Shore anglers participate in the fishery adjacent to the Edgerton and Richardson highways; some angling is conducted by raft between the Richardson and Edgerton highways; and some angling is conducted by fly-in anglers fishing the Tonsina Lake outlet. Some boat anglers access the Tonsina River to fish the mouth by boating upstream from the Chitina-McCarthy Bridge.

King salmon return to the Tonsina River drainage from late-June through early-August, similar to the king salmon in the Klutina River. Spawning occurs in tributaries and mainstem of the Tonsina River from mid-July through August.

In 2012, drainage wide Copper River management actions were taken to ensure adequate spawning escapement in light of a poor king salmon run (Appendix B). On June 30, the annual limit for king salmon ≥ 20 in length was reduced from 4 to 1 fish (Appendix B). On July 28, retention of king salmon and the use of bait and treble hooks were prohibited in the Klutina River and all waters of the Upper Copper River Drainage downstream of the upstream bank of the Klutina River which included the Tonsina River.

In 2013, management action was again taken to restrict the king salmon fishery in the UCUSMA. On June 15, the annual limit for king salmon 20 inches or more in length was reduced from 4 to 1 fish.

No king salmon harvests from the Tonsina River have been reported through the SWHS since 2009 (Table 7). However, angler effort, directed at king salmon, has been observed every year in several locations along the river. The sport harvest of king salmon in the Tonsina River has averaged 12 fish over the last 5 years (2007–2011) and 74 fish over the last 10 years (2002–2011) (Table 7).

From 1999 to 2004, a radiotelemetry study of king salmon in the Copper River drainage provided annual estimates of total upriver escapement, as well as migratory timing through the Chitina Subdistrict personal use fishery, timing into the spawning tributaries, and distribution and proportion of king salmon in spawning tributaries (Evenson and Wuttig 2000; Wuttig and Evenson 2001; Savereide and Evenson 2002; Savereide 2003, 2004, 2005a). From 2002–2004 the Tonsina River king salmon run represented approximately 12% of the total Copper River return, a similar percentage as the run in the Klutina River.

King salmon spawning escapement to the Tonsina River was documented by aerial index counts of the Little Tonsina River and Greyling Creek from 1966–2004 (Brady et al. 1991; Roberson and Whitmore 1991; Taube 2006b). The spawning escapement to these index sites averaged 465 fish from 1977–1986, but the average index count declined to 310 for 1996–2004. Aerial index counts on the Tonsina River tributaries were discontinued after 2004 due to minimal sport fishing effort and harvest and based upon the radiotelemetry study which indicated that the majority of spawning occurred in the glacially-occluded mainstem and in the upper river.

Current regulations allow sport fishing for king salmon in the Tonsina River from July 1 through July 19 above the downstream edge of the Alyeska Pipeline access bridge and from July 1 through August 10 downstream of the access bridge. The July 20 closure date for the upper river provides protection for spawning king salmon. Tonsina Lake and all tributaries to the Tonsina River are closed to king salmon fishing. The current bag and possession limit for king salmon ≥ 20 inches in this drainage is 1 fish, with an annual bag limit of 4 king salmon ≥ 20 inches for the Copper River drainage.

A limited fishery for king salmon also occurs in the Tazlina River drainage. Traditionally, most effort was focused at the mouth of Kaina Creek, which flows into Tazlina Lake. Effort dramatically dropped after 1999 and has averaged 791 angler-days for 2002–2011 (Table 4) with no catch reported until 2007 and 2008 (Table 9) and no harvest reported after 1998 (Table 7). The average escapement index for the Tazlina drainage was 576 king salmon from 1977–2004

(65% from Kaina Creek, 35% from Mendeltna Creek). Aerial index counts on Kaina and Mendeltna creeks were discontinued after 2004, due to minimal sport fishing effort and harvest and based upon radiotelemetry studies (Evenson and Wuttig 2000; Wuttig and Evenson 2001; Saveriede and Evenson 2002; Saveriede 2003-2005a) that indicated the Tazlina River represented less than 5% of the total Copper River return of king salmon.

Fishery Objectives and Management

No specific fishery objectives have been established for the Tonsina or Tazlina river king salmon stocks. The underlying goal of past and current management is to ensure sustained yield. The aerial index count had been used as a post-season escapement index, but had limited utility to describe overall escapement in these systems.

Current Issues and Fishery Outlook

The overall strong runs of king salmon in the 1990s and good runs through 2007 along with implementation of the *Copper River King Salmon Management Plan* have thus far help prevent the overexploitation of Copper River king salmon stocks. However, if the Copper River experiences below average king salmon runs as seen in recent years, managers may need to continue to take inseason restrictions to ensure continued sustainability of the Copper River king salmon stocks.

Recent Board of Fisheries Actions

There were no proposals before the BOF at their 2011 meeting which directly affected the other Copper River Basin king salmon fisheries.

Current or Recommended Research and Management Activities

Assessment of the genetic structure of Copper River king salmon stocks included sampling from the Tonsina, Tazlina and Klutina drainages (Seeb et al. 2006, 2009). These drainages appear to have a similar genetic structure that is distinct from the Gulkana, and Upper Copper River king salmon stocks. Further genetic sampling and analysis may be helpful in further delineation of king salmon in these 3 drainages.

Management of the Tonsina River would benefit from continuation of the NVE/LGL king salmon population estimates.

SOCKEYE SALMON SPORT FISHERIES

Background and Historic Perspective

In the UCUSMA, only the Copper River drainage supports wild and enhanced stocks of sockeye salmon. Wild stocks are widely distributed and are present in approximately 125 of the Upper Copper River tributaries, while enhanced stocks are limited to the Gulkana River from production at the Gulkana Hatchery near Paxson. The abundance of salmon migrating into the Copper River has been estimated annually since 1978 by sonar at Miles Lake. Although there is no species apportionment program in place, it is assumed that most of the fish passing the sonar are sockeye salmon. Sonar counts are discontinued prior to the end of the sockeye run by July 31 each year before significant numbers of coho salmon enter the river. With the exception of 1993–1995 the escapement of sockeye salmon to Upper Copper River tributaries has been documented from 1966–2012 by the Division of Commercial Fisheries through aerial index counts to monitor

spawner distribution in the drainage (Pirtle 1980; Randall et al. 1981; Brady et al. 1991; Hollowell et al. 2007; Botz et al. 2013).

From 2007–2011 sport harvest of sockeye salmon from UCUSMA waters averaged 14,069 fish (Table 10). The sockeye salmon sport harvest in 2012 (23,393 fish) was the highest recorded and was dominated by the Klutina River where 21,564 sockeye were harvested. The primary sport fisheries for sockeye salmon occur in the Klutina and Gulkana rivers, accounting for an average of 96% of the UCUSMA sockeye salmon harvest from 2002–2011.

In addition to harvest in the tributary based recreational fisheries, sockeye salmon stocks of the Upper Copper River drainage are harvested in the Copper River District commercial drift gillnet fishery, the Chitina Subdistrict personal use fishery, and the Glennallen Subdistrict subsistence fishery (Table 11). The management of these fisheries is based on the abundance of all Copper River drainage stocks as counted past the Miles Lake sonar station. Under the *Copper River District Salmon Management Plan* (5 AAC 24.360), the department is directed to manage the commercial fishery to achieve an inriver allocation of 15,000 salmon (all species) for sport fishery harvest, 61,000–82,500 sockeye salmon (wild stocks only) for subsistence harvest, 100,000–150,000 (including hatchery stocks) for personal use harvest, 360,000–750,000 sockeye salmon for spawning escapement, 17,500 for spawning escapement of other salmon, and an amount determined annually for hatchery brood and surplus stocks.

Since 1999, the Klutina River (Figure 2) has consistently supported the largest sockeye salmon sport fishery in the UCUSMA (Table 10). Sockeye salmon begin entering the Klutina River in mid-June and continue through August. The Klutina River accounted for 33%–54% of the sockeye salmon radiotagged in the Copper River from 2005 to 2009 (Wade et al. 2010; Table 12). Spawning activity is known to occur in various locations of the river, lake, and tributaries.

Prior to 1999, the Gulkana River generally supported the largest sockeye salmon sport fishery in the UCUSMA. The sockeye salmon run to the Gulkana River is composed of both wild and hatchery stocks and has accounted for 7%–19% of the sockeye salmon radiotagged in the Copper River from 2005–2009 (Wade et al. 2010; Table 12). The Gulkana Hatchery has been producing sockeye salmon since the early 1970s and in the late 1990s produced enhanced returns of up to 800,000 adult salmon (Sharp et al. 2000). A strontium chloride otolith marking program was begun for hatchery fish in 2000. Issues with the strontium marking process caused mortality in marked sockeye salmon fry during brood years 2000 and 2001 significantly reducing adult returns from those brood years. Since 2000, hatchery returns have ranged from about 86,000 to 581,000 sockeye salmon (S. Moffit, Commercial Fisheries Biologist, ADF&G, Cordova, personal communication).

Gulkana River sockeye salmon life history and stock status data is limited beyond basic run timing. Spawning takes place in several upper reach tributaries and lakes. The Gulkana River sockeye salmon return begins in early June and continues into September. The hatchery enhanced return has a run timing that overlaps the late wild stock component. A weir was operated downstream of the West Fork in 1996 (LaFlamme 1997). An estimated 183,461 sockeye salmon passed the weir from June 11 to July 31. The proportion of the total run that this count represented is unknown, as the weir was operated only through a portion of the sockeye salmon run. Except for the period from 1993–1999, escapement of sockeye salmon to the Gulkana River has been documented by aerial index counts since 1966 (Brady et al. 1991, Hollowell et al. 2007)

Sockeye salmon passage has been recorded at a king salmon counting tower project initiated in 2002 on the mainstem Gulkana River upstream of the West Fork (Taras and Sarafin 2005; Perry-Plake et al. 2007; Perry-Plake and Antonovich 2009; Perry-Plake and Huang 2011; Savereide 2010, 2011; Maclean 2013, *In prep*). These counts are considered minimums as sockeye salmon are still passing the tower site after the tower project ends. From 2002–2012 an estimated 11,400 to 48,024 sockeye salmon (including hatchery fish) passed the tower from May 27 to August 14 each year.

Recent Fishery Performance

Sockeye salmon harvest from the Klutina River increased dramatically over all previous years in 2006 and has continued to remain high (Table 10). Sockeye salmon harvests from the Klutina River averaged 12,277 fish from 2007–2011 compared to the average harvest from 1996–2005 of 5,629 sockeye salmon and the previous high harvest of 7,219 sockeye salmon in 2000. In 2011, the sockeye salmon sport harvest dropped closer to the historic average with 6,025 sockeye salmon harvested, but rebounded in 2012 to the highest reported harvest of 21,564 fish. Annual aerial surveys of the Klutina River drainage indicate that the high sport harvests of sockeye salmon since 2006 are coincident with historically high aerial survey indices in Mahlo and St. Anne creeks during 2006–2009 (Botz et al. 2010). Aerial surveys on these streams were about average in 2010 and 2011, but were again well above average in 2012 (Botz et al. 2012, 2013; Sheridan et al. 2013). Additionally, the highest proportional return of radio tagged sockeye salmon to the Klutina River occurred in 2006 (44.5) and 2007 (54.2) during a five year study conducted from 2005 through 2009 (Smith et al. 2005 a-b; Wade et al. 2007; Wade et al. 2009; Wade et al. 2010).

Sport harvest of sockeye salmon from the Gulkana River peaked in 1996 with a harvest of 7,418 sockeye salmon (Table 10). Returns of hatchery produced sockeye salmon peaked from 1996–2000 with total hatchery runs ranging from 474,000 to 1,119,000 sockeye salmon. Sockeye salmon sport harvest declined after 2000 reaching a low of only 575 sockeye harvested from the Gulkana River in 2008. In 2012, sport anglers harvested 1,528 sockeye salmon in the Gulkana River. Sockeye salmon returns in the Gulkana River are currently underutilized by sport anglers primarily due to the late timing of enhanced sockeye salmon and low king salmon returns which have led to overall reduced fishing effort on the river.

Fishery Objectives and Management

Sockeye salmon fisheries in the Copper River are managed to provide for sustained yield; that a diversity of public fishing opportunities and access are maintained; and to achieve public benefits from the fishery that outweigh the costs of associated management and research. Escapement objectives for individual rivers within the Copper River drainage have not been established.

Current levels of sport, personal use, commercial, and subsistence harvests are believed sustainable. The present management guidelines of the commercial, personal use, and subsistence fisheries are also thought to provide sustainability of the Copper River sockeye salmon stocks. If future Miles Lake sonar counts indicate significant decreases in abundance or if harvests increase to the point that the ADF&G believes that sustained yields are threatened, then regulatory actions will be considered.

Sport harvest of sockeye salmon is monitored through the SWHS. Harvest of sockeye salmon in the personal use and subsistence fisheries is monitored through a permit and mandatory reporting of harvest in those fisheries.

Current Issues and Fishery Outlook

Issues and conflicts involving the Gulkana and Klutina rivers sockeye salmon fisheries are similar to those previously noted for the king salmon fishery. Prior to 2006, angler effort on the Klutina River was primarily directed toward king salmon, but since 2006 it appears angler effort has been equally or more directed toward sockeye salmon. It appears unlikely that sport angler harvest of sockeye salmon will have any significant impact on the Klutina River stocks. Even at its second highest level in 2007, the sport harvest of sockeye salmon comprised less than 10% of the probable total return to the Klutina River based on the radiotelemetry distribution data.

Recent Board of Fisheries Actions

At the 2008 BOF meeting a proposal was adopted which prohibited removal from the water any salmon which was intended to be released. Previously, only king salmon that were intended to be released were prohibited from being removed from the water. There were no proposals submitted during the 2011 BOF cycle that affected sockeye salmon sport fisheries in the UCUSMA.

Current or Recommended Research and Management Activities

Sockeye salmon sport fish harvests will continue to be monitored with the SWHS. An aerial index count program was reinstated in 2000 for index escapement estimates on priority spawning areas of the drainage. The present management guidelines for the commercial, personal use, and subsistence fisheries are thought to assure sustainability of the Gulkana and Klutina River sockeye salmon stocks.

Future fisheries research on Klutina River sockeye salmon should be directed towards a better understanding of sport harvest, effort, and fishing patterns through a creel survey and studies of specific life history components of Klutina River sockeye salmon.

COPPER RIVER PERSONAL USE AND SUBSISTENCE SALMON FISHERIES

Background and Historical Perspective

There is a long history of salmon harvest in the Copper River drainage. Ahtna natives took salmon, mostly king and sockeye, with funnel traps and spears in clear water tributaries. Haley Creek was the site of one of many traditional fishing camps along the Copper River. By 1920, fish wheels had replaced dip nets as the primary means of capturing salmon in the mainstem Copper River, but weirs and funnel traps were used in clear water tributaries until the 1940s. The use of dip nets to capture salmon in the Copper River began to increase in the 1940s and 1950s as more residents from outside the Copper River Basin communities participated in the Copper River fisheries.

Historically, the taking of salmon for consumption as food or use as trapping and fishing bait, or dog food in the Copper River drainage has been governed under subsistence regulations. Since 1960, participants in the Copper River subsistence fisheries have been required to have a subsistence fishing permit and record all salmon harvested in the Copper River by species, location, and date. In 1977, due to growth in the subsistence fishery, the BOF created the Chitina and Glennallen subdistricts. At this time, due to the potential “fishing power” from the large number of participants in the Chitina Subdistrict, fishing time for fish wheels was allowed only 4

days a week, and dip nets were allowed 7 days a week. In 1978, Alaska passed its first subsistence law. This legislation recognized the "customary and traditional use" of fish and game harvest in Alaska and gave this harvest a priority over other harvests. The BOF adopted the *Copper River Subsistence Salmon Fisheries Management Plan* (5 AAC 01.647) in 1980. Under this plan, subsistence fishers were given 1 of 4 classes of permits depending upon their locality to the fishery, income, age, and past use. During times of low escapement, Copper River Basin residents received priority over non-basin residents. The current version of this management plan establishes seasons, open areas, legal gears, permit requirements, and bag limits for a subsistence salmon fishery in the Copper River. The plan also directs ADF&G to manage the Copper River District commercial salmon fishery to ensure adequate spawning escapement and that upriver subsistence needs are met.

In 1980, the Alaska National Interest Lands Conservation Act (ANILCA) established a priority subsistence use of fish and game for federally-qualified 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. To comply with ANILCA the Joint Boards of Fisheries and Game adopted a regulation in 1982 stating that only "rural" residents had "customary and traditional use" of fish and game and established 8 criteria for identifying "customary and traditional uses." This regulation excluded many individuals from participating in Copper River subsistence fisheries, thereby precluding them from harvesting fish for their personal use. This led the BOF to establish personal use fisheries in 1982 (5 AAC 77.001). These fisheries were created to provide Alaskans who became ineligible to harvest fish under new subsistence regulations the opportunity to harvest fish for consumption as food or use as bait. Personal use fisheries, like commercial and sport fisheries, were not given a "priority" in terms of allocation as with subsistence fisheries. In 1989, the McDowell decision reversed the "rural preference" and once again allowed all Alaskan residents to participate in subsistence fisheries under state regulations.

Personal use fisheries differ from sport fisheries in both their objectives and management. Both fisheries provide Alaskans the opportunity to harvest fish for personal consumption (in either fishery fish cannot be sold or bartered), but personal use fisheries are managed to maximize harvest potential whereby sport fisheries are managed to provide diversity of opportunity. Anyone can participate in Alaska's sport fisheries (provided they have a sport fishing license), but only Alaska *residents* may participate in personal use fisheries. The Division of Sport Fish manages most of the state's freshwater personal use fisheries, while the Division of Commercial Fisheries manages most of the subsistence fisheries and saltwater personal use fisheries. However, the Glennallen Subdistrict subsistence fishery in the Upper Copper River District is managed by the Division of Sport Fish.

In 1984, based on analysis of the 8-point criteria found in 5 AAC 99.010, the BOF created a personal use salmon fishery in the Copper River drainage under the *Copper River Personal Use Dip Net Salmon Fishery Management Plan* (5 AAC 77.590). At its December 1999 meeting, the BOF ruled in favor of a positive customary and traditional (C&T) determination for the Chitina Subdistrict and this fishery became a subsistence fishery (5 AAC 01.647(k)). Along with classifying the Chitina Subdistrict as a subsistence use area, the annual limit of king salmon was

reduced from 4 to 1 fish. In February 2003, the BOF reversed its positive C&T determination for the Chitina Subdistrict and reinstated the *Copper River Personal Use Dip Net Salmon Fishery Management Plan* (5 AAC 77.591). The BOF viewed this as a name and allocation priority change only. Management of the fishery continued as it had prior to the 1999 ruling, based upon the number of fish passing the Miles Lake sonar. The king salmon annual limit for the fishery was left at 1 fish.

Harvests in the Copper River subsistence and personal use fisheries are dominated by sockeye salmon, followed by king and coho salmon (Table 1). Both subsistence and personal use salmon fisheries in the Copper River drainage have undergone changes since their inception. Currently, all Alaskans are eligible to participate in the subsistence fishery based on the McDowell decision in 1989. The Glennallen Subdistrict Subsistence Salmon fishery occurs upstream of the Chitina-McCarthy Bridge to Slana and can be prosecuted with fish wheels or dip nets (Figure 4). The season is open from June 1 through September 30, unless closed by emergency order. Only Alaska residents may participate in this subsistence fishery. A free subsistence permit is required to participate in the fishery. Users must record their harvest on their permit prior to leaving the fishing site and return the permit upon completing fishing for the season. The limits are 30 salmon for a household of 1, 60 salmon for a household of 2, and 10 salmon for each additional person in a household of more than 2 people. Individuals may request additional salmon up to a maximum of 200 salmon and households may request up to 500 salmon. For people using dip nets, only 5 of the salmon may be king salmon. A subsistence fishery is also allowed in a portion of Tanada Creek with spears and dip nets and near the traditional Ahtna Native fishing site of Batzulnetas with a fish wheel or dip net.

The Chitina Subdistrict Personal Use Dip Net Salmon Fishery is opened each year by emergency order between June 7 and June 15. The mainstem Copper River between the downstream edge of the Chitina-McCarthy Bridge and a department marker located about 200 yards upstream of Haley Creek (in Wood Canyon) is open to personal use fishing (Figure 4). Both a valid Alaska sport fishing license and a free personal use permit are required to participate in the fishery. From 1991–1999, a fee of \$10 was attached to the permit and from 2000–2003, the permit fee was \$25. A portion of this fee was paid to Ahtna and Chitina Native Corporations for access across their lands. The permit fee was discontinued after 2003 and Chitina Native Corporation established their own access fee program for access across their lands.

Users must record their harvest on their permit prior to leaving the fishing site and return the permit when they are done fishing for the season or by October 15. The limits are 15 salmon for a single person and 30 salmon for a household of 2 or more, only 1 of which may be a king salmon. Only dip nets may be used to harvest salmon in this fishery. The BOF has mandated that a household may not be issued both a Glennallen Subdistrict subsistence salmon fishing permit and a Chitina Subdistrict personal use salmon fishing permit in the same year.

Prior to 1997, maximum harvest for the Chitina Subdistrict was 60,000 salmon, with 25% of fish in excess of the inriver goal allocated to the personal use fishery. From 1997–1999, maximum harvest for the Chitina Subdistrict was 100,000 salmon, excluding fish in excess of the inriver goal and not including any salmon harvested after August 31. In 1998, the BOF adopted a proposal that allows permit holders, who have filled their original limit, to take 10 additional sockeye salmon in weeks when a harvestable surplus of 50,000 salmon or greater will be available in the Chitina Subdistrict. This supplemental harvest is exclusive of the maximum harvest level. A supplemental harvest period has occurred at least once during the season in 12 of

the 14 years since this provision was adopted (no supplemental periods occurred in 2003 or 2009). From 2000–2002, as a subsistence fishery, the Chitina Subdistrict had a harvest range of 100,000–150,000 salmon, of which 85,000–130,000 were wild salmon. This target harvest range remained in place following the change of the Chitina Subdistrict back to a personal use fishery in 2003.

In 1999 federal management of the Copper River subsistence fisheries was initiated, primarily due to the state not complying with rural preference for subsistence uses as mandated by ANILCA. At that time, the federal system adopted the state regulations and as federal and state regulations were identical, both federal and state subsistence users participated in the fisheries under the state subsistence permit. In 2001, federally qualified subsistence users were able to begin fishing on May 15 in the Glennallen Subdistrict. Federal subsistence limits remained identical to state limits so federal subsistence users still fished under state subsistence permits. In 2002, the FSB established a federal subsistence fishery in the Chitina Subdistrict with an annual cumulative limit of 200 salmon for a household of 1 and 500 salmon for a household of 2 or more for both the Chitina and Glennallen subdistricts. Federal subsistence users are able to participate in both fisheries, while state subsistence users must select either the Chitina Subdistrict or Glennallen Subdistrict in which to participate. As a result, the National Park Service issued separate federal subsistence fishing permits to federally qualified subsistence users beginning in 2002 (Appendices C1 and D1). Although this change did not affect overall subsistence harvest from the Copper River, the number of state permits issued decreased after 2001 (Table 13), with at least a portion of the federally qualified residents opting for a federal rather than state permit.

Annual harvests from the Glennallen Subdistrict subsistence fishery have been estimated since 1965. The fishery experienced rapid growth from 1980 through 1983, when a peak harvest of about 119,000 salmon was taken (Somerville 2008). Under the subsistence fishery management plan, harvests decreased substantially in 1984 to about 29,000 salmon. Subsistence harvests gradually increased from 1984 through 2001 and held between 60,000 and 90,000 fish annually through 2012 including that portion of the harvest taken through federal subsistence permits (Table 13, Appendix D1).

Harvests in the Chitina Subdistrict fishery have been estimated since its establishment in 1984. From 1984 through 1988, harvests remained relatively stable, averaging about 47,000 salmon annually (Somerville 2008). After 1988, harvests in the personal use fishery generally increased through 1999. The harvest from the Chitina Subdistrict fishery declined from 1999–2003 to levels similar to the early 1990s (Table 14). From 2003–2007 the harvest steadily increased again before dropping off to 2003 levels in 2008 and 2009. Overall harvest from the Chitina Subdistrict fishery generally tracks with the number of permits fished in respective years (Table 14). The 2012 harvest was 130,298 salmon from the Chitina Subdistrict including federal harvest (Table 14, Appendix C1).

Sockeye are the primary species harvested in the Glennallen Subdistrict, while king salmon comprise less than 5% and coho salmon less than 1% of the annual harvest (Table 13). King salmon were traditionally present in the Glennallen and Chitina Subdistrict fisheries by June 1 and, on average, 80% of the king salmon harvest was taken by July 12 and 95% by July 25 (Roberson and Whitmore 1991). King salmon run timing and harvest rates have remained similar to these trends through 2008.

Recent Fishery Performance

A total of 1,527 state and 271 federal permits (1,798 total permits) were issued for the Glennallen Subdistrict in 2012 (Table 13; Appendix D1) which is the highest number of permits issued for the Glennallen Subdistrict since 1983. In 2013, 1,339 state and 272 federal permits were issued. The total permits issued (state and federal) have increased steadily since 1991 in the Glennallen Subdistrict. The drop in permits in 2013 mainly reflects the loss of fish wheels to floods in the spring as the number of fish wheel permits decreased by 132 permits from 2012 to 2013 while subsistence dip net permits only dropped by 56 permits.

Total harvest from the Glennallen Subdistrict subsistence fishery for 2012 was 96,074 salmon including the federal harvest (Table 13; Appendix D1), which is the highest harvest in this fishery since 1983. Since the issuance of permits by the federal government, total harvest under state permits has averaged 59,277 salmon from 2002–2011 (Table 13) and total harvest under federal permits has averaged 16,311 salmon (Appendix D1). The 2012 harvest under state permits was 78,851 salmon. The 2012 harvest under federal permits was 17,223 salmon.

A total of 10,016 state and 92 federal permits (10,108 total permits) were issued for the Chitina Subdistrict personal use fishery in 2012 (Table 14, Appendix C1).which is the highest number of permits ever issued for the Chitina Subdistrict. However, only 58% of permits were actually fished in 2012. Total harvest from the Chitina Subdistrict for 2012 was 130,298 salmon including the federal harvest (Table 14; Appendix C1). Since the issuance of permits by the federal government, total harvest under state permits has averaged 112,418 salmon from 2002–2011 (Table 14) and total harvest under federal permits has averaged 1,415 salmon (Appendix C1). The 2012 harvest under state permits was 129,362 salmon and under federal permits was 936 salmon.

Fishery Objectives and Management

The Glennallen Subdistrict subsistence fishery is managed under the *Copper River Subsistence Salmon Management Plan* (5 AAC 01.647). This plan stipulates management objectives and guidelines, with allocations for each fishery outlined in the *Copper River District Salmon Management Plan* (5 AAC 24.360). In 2005, the BOF amended the amounts necessary for subsistence (ANS) for the Glennallen Subdistrict (5 AAC 01.616). These amounts are 25,500–39,000 salmon for the portion of the Subdistrict from the Chitina-McCarthy Bridge upstream to the mouth of the Tonsina River; 23,500–31,000 salmon from the Tonsina River to the mouth of the Gakona River; and 12,000–12,500 salmon from the Gakona River to the mouth of the Slana River (and including the Batzulnetas fishery). The ANS amounts are based on the combined reported state and federal harvest, not the final estimated harvest which expands the reported harvest to account for unreturned permits.

Inseason management of the Chitina Subdistrict personal use dip net salmon fishery is guided by the objectives and guidelines in the *Copper River Personal Use Dip Net Salmon Fishery Management Plan* (5 AAC 77.591). The weekly fishing periods and limits established by EO are based on the projected inriver returns. Actual inriver returns are estimated in season by sonar located at Miles Lake. The harvest is distributed throughout the season, based upon the projected sonar counts. Adjustments are made to the preseason schedule based on the actual sonar counts, by increasing or decreasing fishing time. When the department determines that a weekly harvestable surplus of 50,000 salmon or more will be present in the Chitina Subdistrict, a supplemental permit for 10 additional fish is available to a permit applicant that has already met

their annual limit. The maximum harvest level (based on historical harvest levels) for the Chitina Subdistrict is 100,000–150,000 salmon, not including salmon above the inriver goal or salmon harvested after August 31. The fishery is open by regulation through the month of September.

The 2012 Chitina Subdistrict personal use fishery opened, by emergency order on June 7 for a 96-hr period (Appendix B). Salmon passage by the Miles Lake sonar was 55,199 salmon above projected. Due to a greater than 50,000 salmon surplus above the weekly salmon escapement objective, the first period was also a supplemental period. The second period was a 168-hr opening beginning on June 11 and was also a supplemental period. On June 18, the Chitina Subdistrict was closed to the retention of king salmon for the remainder of the 2012 season in conjunction with the beginning of the third period. As of June 7 a total of 9,363 king salmon had been harvested in the CRD commercial drift gillnet fishery which was less than half the recent 10-year average 21,081 king salmon. Copper River king salmon migratory timing and 5-year average harvest rates indicated insufficient numbers of king salmon to sustain a king salmon fishery and still attain a spawning escapement of 24,000 or more king salmon to the Copper River. The fishery remained open for the third through fifth periods for sockeye salmon for 3 consecutive 168-hr openings.

The sixth period was a 168-hr opening and a supplemental period. Salmon numbers past the Miles Lake sonar from June 18–July 1 were above the projected salmon counts for this period by 77,704 fish. Salmon numbers past the sonar continued to exceed the projected counts by more than 50,000 fish each week for weeks 7–10 allowing the fishery to remain open continuously through August 12 with supplemental periods during each week. The fishery remained open from August 13–31 (with no supplemental periods) and then was open by regulation September 1–30.

The 2013 Chitina Subdistrict personal use fishery opened, by emergency order on June 10. Salmon passage by the Miles Lake sonar was 53,761 salmon below projected, but was still sufficient enough to allow a full week (168 hr) of fishing time (Appendix B). The fishery remained open for the 2nd and 3rd period for 168-hr openings beginning June 17 and June 24. Due to a greater than 50,000 salmon surplus above the weekly salmon escapement objective, the 2nd and 3rd periods were also supplemental periods. The 4th period was also a 168-hr opening on July 1, but did not include a supplemental period. The fishery remained open for periods 5–8 (July 8–August 4) which were all supplemental periods. The fishery was opened to continuous fishing from August 5 to August 31 by emergency order and remained open by regulation September 1–30. Due to the higher than projected sockeye salmon passage at the Miles Lake sonar, a total of 6 supplemental periods were allowed during the 2013 season.

As of June 18, low harvest rates in the CRD commercial drift gillnet fishery and low capture rates in the NVE research fish wheels appeared consistent with the low preseason forecast for Copper River king salmon. The preseason forecast, inseason run strength indicators, and generally poor stock performance trend over the previous 4 years indicated a need for precautionary action in the personal use dip net fishery to attain a spawning escapement of 24,000 or more king salmon to the Copper River. Beginning with the third period, on June 24, the Chitina Subdistrict was closed to the retention of king salmon.

Current Issues and Fishery Outlook

Access to the Glennallen and Chitina Subdistrict fisheries is an ongoing issue. Currently, access is allowed across Chitina Native Corporations (CNC) lands with payment of a daily or annual fee

paid directly to CNC. Ahtna and CNC land enforcement officers monitor compliance with the fee based access system.

The Glennallen Subdistrict subsistence fishery continues to be popular and the number of permits issued has gradually increased over the last 20 years (Table 13). The ANS designations established in 2006 increased the overall allocation for subsistence harvest from 75,000 salmon to 82,500 salmon. The popularity of the Copper River subsistence fisheries is unlikely to diminish under current management guidelines. If decreasing returns or additional regulations restrict the Chitina Subdistrict personal use fishery, a portion of those using this fishery may shift to the subsistence fishery. Increased pressure in the subsistence fishery will exacerbate access conflicts and conflicts between rural and non-rural users of the fishery.

Recent Board of Fisheries Actions

The status of the Chitina Subdistrict as a subsistence or personal use fishery continues to be an issue in that fishery. In March 2010, the BOF held a special 2-day meeting to consider 2 proposals addressing a court ruling that remanded, back to the BOF, the case against the BOF's 2003 negative Customary and Traditional (C&T) finding for the Chitina Subdistrict. A proposal defining subsistence way of life as "a way of life that is based on consistent, long-term reliance upon the fish and game resources for the basic necessities of life," was adopted. The second proposal sought a positive C&T finding for the Chitina Subdistrict, considering the new definition of "subsistence way of life." This proposal failed. At the 2011 BOF meeting in Valdez, 2 proposals requested the BOF to reconsider the Customary and Traditional Use determination for the Chitina Subdistrict. No action was taken on these proposals with the BOF citing no new information or error in their earlier decisions to warrant reconsideration.

A total of 8 proposals potentially affecting the Chitina Subdistrict personal use salmon fishery were submitted to the 2011 BOF meeting. In addition to the C&T status proposals, 4 proposals sought changes in king salmon or sockeye salmon limits in the personal use fishery and all failed. A commercial fishery proposal to further restrict the Copper River District commercial drift gillnet fishery from fishing within the inside closure area during its first 2 statistical weeks was amended and carried. As a result the Copper River District commercial fishery was limited to a single 12-hr opener in the inside closure area during the first 2 weeks of the fishery and the Chitina Subdistrict personal use dip net fishery opening dates were delayed from opening as early as June 1 and no later than June 11 to opening no earlier than June 7, but prior to June 15. These changes were made to increase the number of early run sockeye and king salmon into the Glennallen Subdistrict subsistence fishery and increase spawning escapement for these early run timing stocks.

ADF&G submitted a proposal to the BOF for the 2011 meeting that concerned the Glennallen Subdistrict subsistence salmon fishery. This proposal was carried and added language to the *Copper River King Salmon Management Plan* providing guidance and authority to the department to restrict king salmon harvest for conservation in the Chitina Subdistrict personal use and Glennallen Subdistrict subsistence fisheries.

Current or Recommended Research and Management Activities

Daily sampling in the Chitina Subdistrict personal use fishery (sockeye and king salmon) and Glennallen Subdistrict subsistence fishery (king salmon only) is conducted from the opening of the fishery in June through the majority of the sockeye salmon run at the end of August. Otoliths

and length of sockeye harvested in the fishery are collected. Otoliths are examined to determine age and for the presence of a strontium chloride mark that was imprinted on hatchery sockeye fry prior to release from the Gulkana River hatchery. The collected data are used to estimate hatchery contribution to the Copper River sockeye salmon run and to determine age and length composition of the Chitina Subdistrict sockeye salmon harvest. Scales and length data are collected from king salmon harvested in both fisheries for use in stock composition models. Sampling technicians provide a department presence in the Chitina area 6 days per week. They also monitor compliance with fishery regulations, educate subsistence and personal use fishers on the regulations and emergency orders, and note any violations observed.

From 2005–2009, ADF&G assisted the Native Village of Eyak and LGL, Inc., in a radiotelemetry study to estimate sockeye salmon distribution and run timing of major Copper River stocks throughout the Upper Copper River drainage. During the 5-year study the Upper Copper River and Tazlina stocks had the earliest mean run timing, followed by the Klutina River, Chitina River, Lower Copper River (stocks downstream of Haley Creek), Gulkana River and finally the Tonsina River stocks (Wade et al. 2007-2010). The Klutina River accounted for over a third of the sockeye spawners annually, followed by 12%-14% of the spawners going into each of the Tazlina River, Gulkana River, and the Upper Copper River (Table 12).

The Native Village of Eyak continues to conduct a mark-recapture study on king salmon to estimate total inriver abundance past the Miles Lake sonar and conducted a similar study on sockeye salmon from 2007–2009. The sockeye salmon mark-recapture study was specifically designed to act as an independent validation of the Miles Lake sonar passage estimates and was discontinued following 2009 after determining the sonar counts appeared accurate (van den Broek 2008; 2009a-b).

RESIDENT SPECIES SUBSISTENCE FISHERIES

Background and Historical Perspective

Freshwater subsistence fishing permits have been issued in the UCUSMA since 1960. The majority of permits issued have been for freshwater subsistence fishing with gillnets for whitefish between October 1 and March 31 in several area lakes. At the 2008 meeting, the BOF made a positive C&T determination for the freshwater fishes in the Prince William Sound Area which includes the entire UCUSMA with an ANS of 25,000–42,000 useable pounds of fish. Prior to 2002, the maximum number of permits issued for subsistence fishing in any year was 10 in 1992 and 1997, and a maximum harvest of 2,976 fish in 1995 (Table 15). From 2002–2011 the maximum number of permits issued was 28 in 2009 and a maximum harvest of 3,109 fish in 2007. From 2002–2011 an average of 18 permits were issued annually with a harvest of 1,704 fish.

Recent Fishery Performance

The average harvest of whitefish from 2007–2011 was 1,891 fish with an average incidental catch of nontarget species of 33 fish (Table 15). In 2012, 15 permits were issued for fishing whitefish with a gillnet. A total of 10 of these permits were fished, with a total reported harvest of 648 whitefish, from a total of 2 lakes. Beginning in 2011, retention of any species other than whitefish or longnose suckers *Catostomus catostomus* from a gillnet was prohibited by permit stipulation. This change was made to remove any incentive for a permit holder to target lake

trout or burbot with gillnets when fishing for whitefish. In 2012, 8 lake trout were reported caught in whitefish gillnets with all released.

Fishery Objectives and Management

There are no specific fishery objectives or management plans for resident freshwater subsistence fisheries in the UCUSMA. Resident species are managed to provide for sustained yield. The current low number of participants in the winter gillnet fishery allows for liberal management of the whitefish harvest. However, slower-growing resident species such as lake trout and burbot are managed with bag limits similar to those in the sport fisheries for these species. More efficient gear is permitted for the abundant, high productivity species (whitefish and longnose suckers), while selective, non-lethal gear is permitted for the less abundant, low productivity species (lake trout and burbot).

Current Issues and Fishery Outlook

With low participation, the subsistence whitefish fishery garnered little notice from other user groups for several decades. The increase in subsistence permits in 2009 (generally for the road accessible fisheries of Lake Louise and Paxson Lake) and the incidental catch of popular sport species such as lake trout created concern among area sport anglers. This resulted in several letters from sport anglers to ADF&G and proposals requesting restrictions for the subsistence fishery submitted to the BOF. To address these concerns ADF&G developed additional permit stipulations to ensure compliance with the fishery and to ensure sustainability of the various fish populations within targeted waters.

Recent Board of Fisheries Actions

A total of 15 proposals were submitted to the 2011 BOF meeting in Valdez specific to the UCUSMA freshwater subsistence fishery. These proposals mainly addressed the whitefish fishery in Lake Louise, Susitna, and Tyone lakes and the harvest of lake trout. The BOF took no action on 6 of these proposals and 8 proposals failed. One proposal was amended and carried resulting in the closure of the channels between Lake Louise and Susitna Lake and between Susitna and Tyone lakes to the use of gillnets.

Current or Recommended Research and Management Activities

Harvest in the freshwater finfish subsistence fishery is monitored through a permit system which requires permit holders to log their harvests on a daily basis and return their harvest reports at the end of the permit period. There are no research projects recommended specific to this fishery; however, research on resident species populations within the UCUSMA would provide data useful in the management of the freshwater finfish subsistence fishery.

WILD ARCTIC GRAYLING SPORT FISHERIES

Background and Historical Perspective

Wild Arctic grayling (does not include Arctic grayling in stocked lakes) were the most harvested fish in the UCUSMA from 1977–1995 (Somerville 2008). Harvests declined after 1988 and have been surpassed nearly every year since 1996 by sockeye salmon and by king salmon in 2005 and 2007 (Table 4). The decline in harvest from 1988–1999 most likely resulted from more restrictive regulations that reduced overall bag limits and limited anglers to only 1 fish 14 inches or larger in the Gulkana River drainage to ensure the sustained yield of the area's wild Arctic

grayling stocks (Taube 2002). In 2003, the bag and possession limit in lakes was reduced to 5 wild Arctic grayling. Continued declines in harvest may reflect a general decline in fishing effort areawide since 2000.

Wild Arctic grayling are harvested throughout the UCUSMA. The Gulkana River drainage averaged 37% of the total UCUSMA harvest from 2007–2011 (Table 16). The Susitna River drainage accounted for 35% of the harvest during this period followed by smaller tributary streams in the Upper Copper River drainage (12%) and the Tazlina River drainage (4%).

Wild Arctic grayling are the most caught species in the UCUSMA (Table 5). As with harvest, catch has declined over the past decade, but wild Arctic grayling catch, on average, contributes nearly 50% to the annual total catch of all species.

Recent Fishery Performance

Harvest of wild Arctic grayling has averaged 4,241 fish over the last 10 years (2002–2011) and 3,518 fish over the last 5 years (2007–2011) (Table 16). Total harvest of wild Arctic grayling in 2012 was 3,934 fish.

Fishery Objectives and Management

Wild Arctic grayling fisheries in the UCUSMA are managed to maintain sustained yield and historic age and size composition and stock abundance while producing satisfactory catch rates for anglers (Roth and Alexandersdottir 1990). Harvest and catch of wild Arctic grayling are monitored by the SWHS.

The *Wild Arctic Grayling Management Plan* (5 AAC 52.055) was adopted in 2004 and designates 3 management approaches: regional, conservative, and special management. Most wild Arctic grayling fisheries in the UCUSMA fall under the regional management approach and are open to fishing all year, with or without bait, and a bag and possession limit of 5 fish with no size limit. Under the conservative management approach the fishery is open from June 1–March 31, may be limited to unbaited lures, and a bag and possession limit of 2 fish. Size limits may or may not be imposed. Four fisheries within the UCUSMA are classified under the conservative management approach; Mendeltna Creek (2 fish \geq 12 inches), Moose Lake and Our Creek in the Tazlina drainage (2 fish, no size limit), and the Gulkana River upstream of Paxson Lake (2 fish, only 1 fish \geq 14 inches, open all year). Under these regulations, the wild Arctic grayling stocks in the UCUSMA are able to support current harvest levels.

The bag limit for wild Arctic grayling in the remainder of the Gulkana River (5 fish, only 1 fish \geq 14 inches), which was established in 1986 (Taube 2002), deviates slightly from the 3 management approaches outlined in the *Wild Arctic Grayling Management Plan*. However, previous estimates of abundance indicate that current exploitation rates on the major stock units of wild Arctic grayling in the Gulkana River drainage appear sustainable given current harvest levels. Data from stock assessments also indicate that the restriction limiting anglers to only 1 fish \geq 14 inches allowed the population to reach and maintain historic levels (Fish and Roach 1999). A similar assessment was conducted in 2002 on the upper reaches to determine the impacts of the 1996 regulatory change to catch-and-release and provide background information for any future BOF proposals (Wuttig 2007). No stock assessments have been conducted on the Gulkana River since 2002.

Current Issues and Fishery Outlook

Overall, UCUSMA wild Arctic grayling fisheries appear sustainable. The current management strategies and regulatory regimes are within the guidelines of the management plan to manage for long-term sustained yield. As a result, it is anticipated that harvest levels of wild Arctic grayling will remain at sustainable levels.

Recent Board of Fisheries Actions

The BOF carried a proposal that aligned the *Wild Arctic Grayling Management Plan* (5 AAC 52.055) spawning closure dates (April 1–May 30) with those in area regulations (April 1–May 31) during the 2011 meeting in Valdez.

Current or Recommended Research and Management Activities

An objective of the wild Arctic grayling research program was to develop a plan for monitoring the status of wild Arctic grayling stocks in the Gulkana River drainage. This consisted of monitoring of the 3 identified stocks (mainstem, Middle Fork and waters upstream of Paxson Lake) for abundance, age and length composition every 3 to 5 years. Stock assessments were conducted in 1998 (Fish and Roach 1999) and in 2002 (Wuttig 2007). It is recommended that a monitoring program continue, with stock assessment linked to an increase in harvest, to assure the sustained yield of the fishery.

LAKE TROUT SPORT FISHERIES

Background and Historical Perspective

The UCUSMA is the only area in Alaska where numerous lake trout fisheries exist along the road system (Figure 5). Lake trout are harvested mainly from lakes within the Tyone River drainage (Lake Louise, Susitna and Tyone lakes) and the Gulkana River drainage (Paxson, Summit, and Crosswind lakes) (Table 17).

Prior to 1987, the bag limit in UCUSMA waters was 2 lake trout \geq 20 inches and 10 lake trout $<$ 20 inches. Under these regulations, lake trout harvests from UCUSMA waters averaged about 7,400 fish annually (Somerville 2008). However, it was found that 8 of 9 lake trout populations in the Upper Copper River drainage were being harvested above sustainable levels, based on surplus production models developed from lake trout populations in Canada and the Great Lakes (Burr 1987). As a result of these findings, the bag limit for UCUSMA waters was reduced to 2 fish and a minimum size limit of 18 inches was adopted for Summit and Paxson lakes and Lake Louise, Susitna, and Tyone lakes in the Tyone River drainage in 1987. The minimum size limit was imposed to allow female lake trout to spawn once before reaching harvestable size.

In 1994, the minimum size limit for lake trout was increased from 18 to 24 inches in Lake Louise, Susitna, Tyone, Crosswind, Paxson and Summit lakes, and the bag and possession limit was reduced from 2 to 1 lake trout in Lake Louise, Susitna, Tyone, and Crosswind lakes. The minimum size limit was increased to allow lake trout to reach a size where they could spawn at least once before being recruited to the fishery and to reduce the harvest to a sustainable level in Paxson and Summit lakes. The bag limit reduction was imposed on lakes with lake trout of greater than average length to prevent effort from being concentrated on these size classes.

Following the 24 in. minimum size restriction, the number of lake trout released by anglers in Crosswind, Paxson, and Summit lakes and Lake Louise, Susitna and Tyone lakes increased from

an average of 60% released prior to the restriction (1990–1993) to an average 80% for all the years following (1994–2005; Table 18). Although harvest decreased, the overall catch rate did not decrease and in many cases increased so that effective harvest (harvest plus 10% of the catch minus the harvest, to account for hooking mortality of released fish) was still exceeding the sustainable yield levels in the larger UCUSMA lake trout fisheries.

The department initiated a regional review of lake trout regulations and management in 2002 and developed a lake trout management plan which was adopted by the BOF in 2005 (Burr 2006). Based on this review and adoption of the management plan, the minimum size limit for lake trout was removed in Paxson and Summit lakes and the bag limit was set to 1 per day beginning in 2006. Additionally, the use of bait was prohibited from April 16–October 31. Bait was allowed from November 1–April 15 to provide for the burbot fishery. In 2012, these same regulations were implemented for Lake Louise, Susitna, Tyone, and Crosswind lakes effectively aligning lake trout management in all large lakes with high angler effort and effective harvest rates that consistently met or exceeded sustainable levels. These regulation changes are intended to reduce fishing mortality below the sustainable yield estimates for these lakes.

Recent Fishery Performance

Total harvest of lake trout averaged 1,333 fish from 2007–2011 (Table 18). Harvests from the Susitna River drainage accounted for 53% and the Gulkana River drainage accounted for 30% of the annual UCUSMA harvest from 2007–2011. Lake Louise (37%), Crosswind (10%), and Paxson (11%) lakes accounted for over half the annual average lake trout harvest in the UCUSMA from 2007–2011. The harvest of 676 lake trout from the UCUSMA in 2012 was the lowest recorded harvest for the UCUSMA with the 2011 harvest of 726 lake trout being the second lowest. Harvest declined in nearly all fisheries in the area and most likely reflects recent regulatory changes and the drop in overall fishing effort from 2009 to 2012 (Table 3).

Fishery Objectives and Management

Lake trout fisheries in the UCUSMA are managed conservatively following the guidelines in the *Wild Lake Trout Management Plan* (5 AAC 52.060). ADF&G uses restrictive bag and size limits to maintain harvests below sustained yield. Assessment of lake trout stock status is currently based on evaluation of the SWHS harvest and catch (and associated hooking mortality) in relation to the sustained yield estimate. If total mortality exceeds the sustained yield estimate for 2 consecutive years, stock assessment is initiated for that population.

ADF&G uses the Lake Area model (Evans et al. 1991) to develop sustained yield thresholds for lake trout. The Lake Area model involves estimating the level of sustainable harvests for lakes based on an observed lake trout production and lake surface area relationship for northern latitude lakes. The Lake Area model provides an excellent general guideline for sustainable harvests, but is based on a large range of lakes and their observed sustainable yields. Therefore the predicted annual yields are inherently imprecise (Burr 2006). The potential yield given by the Lake Area model is treated as a threshold that should not be exceeded rather than a target level of exploitation.

Because estimates of the average weight of lake trout from most lakes in the UCUSMA are unavailable, the sustainable harvest of lake trout has been estimated based on the probable range of lake trout weights (1.0 to 4.0 kg) depending on the area of the lake. Based on Evans et al. (1991) and these assumed weights, lakes in the UCUSMA which are less than 500 ha appear

capable of sustaining harvest and catch mortalities of 147 to 231 lake trout annually. Lakes larger than 500 ha appear capable of sustaining annual harvest and catch mortalities of 320 to 585 lake trout. Estimates of sustained yield for the larger lake trout fisheries in the UCUSMA are found in Table 19.

Current Issues and Fishery Outlook

A reduced bag limit, prohibition of bait during the open water period and removal of the size limit have reduced effective harvest in Paxson and Summit lakes to sustainable levels. These changes were implemented in 2006 and it was expected that the average release rate of lake trout would decline to the pre-24 in. size limit percentages of 48%–54% (Table 18). Such a decline did not occur until 2011 when zero lake trout were released in Paxson Lake and 40% were released in Summit Lake. However, release rates were again high (86%) in Paxson Lake in 2012.

Effective harvest of lake trout in Lake Louise exceeded the sustainable yield predicted by the Lake Area model in 8 of the last 10 years (2002–2011). Additionally, some lake trout have been harvested as incidental take in gillnets targeting whitefish in the subsistence whitefish fishery on that lake. Actions taken by the BOF at the 2011 meeting will likely reduce overall harvest of lake trout in Lake Louise.

Recent Board of Fisheries Action

The BOF considered 7 proposals at its 2011 meeting in Valdez that addressed lake trout sport fisheries in the UCUSMA. Two proposals to implement spawning closures failed as did 2 proposals banning commercial guiding on Lake Louise. Proposals to lengthen the time bait is allowed on Paxson and Summit lakes and impose a maximum size limit for lake trout on Lake Louise and Crosswind Lake also failed. The BOF adopted a proposal by ADF&G to remove the size limit for lake trout and prohibit the use of bait from April 16–October 31 in Lake Louise, Susitna, Tyone, and Crosswind lakes.

Current or Recommended Research and Management Activities

A research program was initiated in 1990 to evaluate the status of lake trout fisheries in the UCUSMA. The goal of the research program was to determine appropriate management strategies that assured the sustained yield of lake trout in UCUSMA lakes. The study was conducted primarily in Paxson Lake and Lake Louise. Annual results of the research projects are summarized in Szarzi (1992, 1993), Szarzi and Bernard (1994, 1995, 1997). Stock assessment was discontinued in 1995 for Paxson Lake and Lake Louise, but assessment in Paxson Lake was again conducted from 2002–2004 (Scanlon 2004; Wuttig 2010).

Length and weight data were collected from Lake Louise in the fall of 2006 and assessment to estimate abundance was to continue in 2007 and 2008. However, review of the past data indicated that movement of lake trout between Lake Louise, Susitna, and Tyone lakes may affect any estimate of abundance. Therefore, a more extensive research project must be developed including radiotelemetry to assess movement of lake trout between the 3 lakes prior to starting a mark-recapture study.

Lake trout research in Alaska lakes has provided a length-weight relationship and future sampling can focus on collecting lengths alone. Length data for Susitna Lake and Crosswind Lake needs to be collected to update the Lake Area model yield estimates. If harvest rates approach the estimates of sustainable yield calculated by the Lake Area model for Paxson and

Summit lakes, stock abundance and size composition of lake trout should be reassessed to monitor any changes under the 2006 regulations.

BURBOT SPORT FISHERIES

Background and Historical Perspective

Burbot fisheries occur primarily during the winter months from November to April using closely attended lines. Many lakes and rivers of the UCUSMA historically contained large populations of burbot (Figure 5) and prior to 1990, these waters supported an average of 56% of the statewide sport harvest of this species (Somerville 2008). The largest fishery historically occurred in Lake Louise, Susitna, and Tyone lakes (Table 20). Other fisheries occur in various lakes of the Gulkana River drainage (e.g., Paxson, Summit, and Crosswind lakes), Tazlina River drainage, and smaller remote lakes scattered throughout the UCUSMA.

With rapid growth in the fishery from 1979–1985, burbot stocks in the UCUSMA were in danger of being overexploited (Somerville 2008). A research program was initiated in 1986 to evaluate the life history of Interior Alaska burbot and to determine stock status and sustained yields of burbot fisheries in the UCUSMA. Annual results of these studies are summarized in Lafferty et al. (1990-1992), Lafferty and Bernard (1993), Parker et al. (1987-1989), Schwanke and Bernard (2005*a-b*), Schwanke and Perry-Plake (2007), Schwanke (2009b), Taube et al. (1994, 2000), and Taube and Bernard (1995, 1999, 2001, 2004). Concern over the sustainability of burbot fisheries in the UCUSMA led to adoption of increasingly restrictive regulations and some complete fishery closures, most of which were reopened once stocks recovered (Somerville 2008).

More recent studies on burbot abundance have occurred in Crosswind and Tolsona lakes. An abundance survey of the burbot population in Crosswind Lake was conducted in 2006 and 2007 (Schwanke 2009*b*) to provide a basis to compare future estimates of abundance should harvest levels significantly change. The 2006 abundance of burbot (≥ 18 in (450 mm)) in Crosswind Lake was 3,860 fish (90% CI = 2,262–5,549) and in 2007 it was 3,130 fish (90% CI = 2,170–4,091). Tolsona Lake was closed to burbot fishing by either emergency order or by regulation from 1998 through 2011. Stock assessment on Tolsona Lake occurred on an annual basis from 1986 to 2010 with a goal to open the fishery when the burbot population rebuilt to 1,500 burbot ≥ 18 in (Taube and Bernard 2001). Based on results from 2009 and 2010 sampling, it appears the burbot population achieved this abundance goal (C. Schwanke, Sport Fish Biologist, ADF&G, Glennallen, personal communication).

Recent Fishery Performance

With the adoption of more conservative regulations in 1987, harvests of burbot from UCUSMA waters decreased (Somerville 2008). Total burbot harvest from the UCUSMA averaged 1,643 fish from 2007–2011 (Table 20). Total harvest of burbot from UCUSMA waters has ranged from 556–2,997 over that same period. The 2011 harvest of 556 burbot was the lowest ever recorded for the UCUSMA. Harvest increased to 995 burbot in 2012.

Fishery Objectives and Management

The burbot fisheries in lakes of the UCUSMA are managed for sustained yield and opportunity to participate. The majority of burbot fisheries in the UCUSMA are monitored for trends in harvests estimated through the SWHS.

Current Issues and Fishery Outlook

Unattended setlines are an efficient method of fishing, but data clearly show burbot populations in UCUSMA lakes cannot sustain use of this method and is therefore prohibited. Prohibition of unattended set lines in 1991 reduced burbot harvest in area lakes. Based on enforcement reports, some anglers still continue to use unattended set lines. ADF&G and AWT educate anglers to fish closely attended lines with clearly visible strike indicators. Prohibition of set lines also reduced mortality of lake trout caught on burbot gear.

Based upon current regulations the harvest of burbot in the UCUSMA should remain stable. Winter weather conditions can dictate ice fishing effort in a given year; mild winter or late winter conditions can result in increased ice fishing effort. Annual fluctuations in harvest appear to be related to angler effort and winter weather conditions rather than a reflection of the abundance of burbot in specific lakes.

Recent Board of Fisheries Actions

The BOF repealed the *Lake Burbot Management Plan* at the 2008 meeting. A specific regulatory management plan for burbot was no longer needed. The provisions of the plan to allow time and area reductions and to prohibit the use of set lines are now incorporated into the background area regulations (5 AAC 52.022) and emergency order authority (5 AAC 75.003).

The BOF opened Tolsona Lake to burbot fishing at the 2011 meeting in Valdez. The bag and possession limit was set at 2 burbot.

Current or Recommended Research and Management Activities

The burbot stock assessment program in the UCUSMA continues on a limited scale. A monitoring program has been proposed for Lake Louise on a 3 to 5-year schedule. Lake Louise burbot populations were sampled in 1999 and again in 2005 to assess the impact of the fishery reopening in 2003 (Taube et al. 2000; Schwanke and Perry-Plake 2007). Catch per unit effort was estimated with baited hoop traps to monitor population trends. Baseline data was collected on the Copper River burbot population in 2003 (Schwanke and Bernard 2005b). If future harvest levels increase significantly, the Lake Louise population should continue to be monitored.

WILD RAINBOW AND STEELHEAD TROUT SPORT FISHERIES

Background and Historical Perspective

The Upper Copper River drainage is the northernmost extent of the natural range of rainbow and steelhead trout in North America. The area's widely distributed stocks of wild rainbow and steelhead trout display generally low production with little ability to sustain harvests. To assure that these stocks are not overexploited, a conservative regulation plan was developed and implemented in several Upper Copper River drainages to manage the fisheries targeting these stocks. This plan was guided by the *Upper Cook Inlet and Copper River Basin Rainbow/Steelhead Trout Management Policy* (CISFPT Unpublished).

In 1988, the waters of Lower Hanagita Lake and the Hanagita River from Lower Hanagita Lake to the Tebay River were restricted to catch-and-release for rainbow/steelhead trout. In 1990, the Gulkana River drainage fishery was restricted to catch-and-release. In 2005, the remainder of the Hanagita River drainage (upstream of Lower Hanagita Lake) and the Tebay River downstream of the Hanagita River confluence were included in the area closed to the retention (catch-and-

release only) of rainbow/steelhead trout. Regulations restricting waters supporting rainbow/steelhead trout to only unbaited, single-hook, artificial lures were adopted for the flowing waters of Tebay River drainage in 1988, all flowing waters of the Gulkana River drainage above a point on the mainstem Gulkana River 7.5 miles upstream of the confluence of the West Fork, in 1990, and for all flowing waters of the UCUSMA in 1999. Spawning closures were established around the identified rainbow/steelhead trout spawning areas on the Middle Fork of the Gulkana River in 1997 and Twelvemile Creek (a tributary of the Gulkana River) in 2003. Additionally, the retention of rainbow or steelhead trout incidentally caught in the Copper River Personal Use Dip Net Salmon Fishery (Chitina Subdistrict) in 1997 was prohibited. Beginning in 2003, rainbow trout or steelhead trout caught by dip net in the subsistence salmon fishery (Glennallen Subdistrict) could not be retained.

Summit Lake and its outlet stream Bridge Creek in the Tebay drainage constitute a unique rainbow trout fishery within the UCUSMA. Test netting, hook-and-line sampling and visual surveys from 1982–1985 showed that these waters contained the largest nonanadromous rainbow trout in the Copper River drainage, with individual fish measuring over 32 inches in length and weighing up to 20 pounds (Williams and Potterville 1985). Sampling also indicated that the unique size structure of this population could not sustain high levels of harvest. Special regulations (bag limit of 1 fish \geq 32 inches) were established in 1988 for these waters to provide anglers the opportunity to harvest a "trophy trout" while maintaining the overall population structure. However, sampling in late 1990s (Fleming 2000) indicated that only 27% of all rainbow trout sampled ($>$ 3,000 fish) were greater than 12 inches, with a maximum size of 18 inches. As a result, the "trophy trout" regulations were repealed at the 1999 BOF meeting and changed to a bag and possession limit of 10 per day, maximum size limit of 12 inches, and an open season of July 1–May 31. In addition, the department initiated a research study in 2002 to remove a percentage of rainbow trout from Summit Lake on an annual basis to reduce the population density to determine if growth can be promoted (Wuttig *In prep*).

All other waters supporting wild rainbow/steelhead trout stocks are managed under a 2 fish bag limit of which only 1 fish may be \geq 20 inches. The season is year-round with the exception of the spawning closure (April 15–June 14) on the Middle Fork Gulkana River and Twelvemile Creek.

In 2003, the BOF adopted a statewide *Policy for the Management of Sustainable Wild Trout Fisheries* (5 AAC 75.222). This policy provides guidelines to the BOF and ADF&G for developing regulations and managing wild trout populations.

Recent Fishery Performance

A total of 512 wild rainbow trout were reported harvested from the UCUSMA in 2012, which is more than double the 2007–2011 average of 203 fish (Table 4). Harvest from the Klutina River accounted for 39% of the 2012 harvest. The overall catch of 4,141 wild rainbow trout in 2012 was the 3rd lowest catch since 1983 and was below the 2007–2011 average of 4,999 fish (Table 21). Over the last 5 years (2007–2011) the Gulkana River drainage has accounted for 82% of the wild rainbow catch in the UCUSMA.

No steelhead trout have been reported harvested since 1999. The catch of steelhead trout in the UCUSMA declined from a high of 334 fish in 2000 to 0 steelhead trout in 2011 and 2012. The Gulkana River drainage accounted for 97% (257 fish) of the steelhead catch in the UCUSMA from 2007–2011. Historic trends in the area's wild rainbow/steelhead fishery are difficult to ascertain, as annual harvest and catch estimates have been small and fluctuate markedly.

Fishery Objectives and Management

The wild rainbow trout and steelhead populations are managed under the guidelines in the *Upper Cook Inlet and Copper River Basin Rainbow/Steelhead Trout Management Policy* and the statewide *Policy for the Management of Sustainable Wild Trout Fisheries*.

Current Issues and Fishery Outlook

Rainbow trout and steelhead trout populations and distribution in the UCUSMA are still not fully understood. Some populations may yet be unidentified and may be reported through the SWHS periodically.

With adoption of more restrictive regulations, particularly in the Gulkana River drainage, harvests of rainbow trout have declined from the historic average (Table 4). No steelhead trout have been reported harvested in a UCUSMA sport fishery since 1999 when 8 fish were reported from other unspecified streams in the Upper Copper River drainage. Since 1999 the total UCUSMA catch of wild rainbow trout has ranged from a low of 3,790 to a high of 12,806 with no particular trend (Table 22).

Recent Board of Fisheries Actions

At the 2011 meeting the BOF changed the bag limit for rainbow trout in Summit Lake of the Tebay River drainage from 10 fish \leq 12 inches to 10 fish \leq 18 inches. The spawning closure in Bridge Creek, the outlet of Summit Lake, was also rescinded at this meeting. These actions were made to encourage sport harvest to try and maintain the large fish component in the Summit Lake rainbow trout population.

Ongoing or Recommended Research and Management Activities

The research project initiated in 2002 to alter the size distribution of rainbow trout in Summit Lake by large-scale removal and relocation of fish was discontinued in 2013, but fish up to 23 in (580 mm FL) were captured during the most recent sampling. Data from the project indicate that maximizing sport harvest of rainbow trout, up to an 18 in length, is the most feasible regulatory means to attempt to maintain the improved size structure of the rainbow trout population in Summit Lake (Wuttig *in prep*). Due to the remote access of this fishery (fly-in only) it is doubtful sport harvest alone will maintain the current size structure.

Stock assessment of the Gulkana River rainbow trout population was initiated in 2004. The project objective was to estimate abundance of rainbow trout from Paxson Lake to 2 miles downstream of Sourdough; an index area xx km long. Feasibility work was conducted in August and September of 2004 and a mark-recapture study was conducted in 2005 (Schwanke and Taras 2009). The abundance of rainbow trout \geq 11 in (275 mm FL) was 5,238 fish (SE=689; 95% CI = 3,888-6,588) and for rainbow trout 6–11 in (160–274 mm FL) was 6,850 fish (SE = 1,023; 95% CI = 4,845-8,855). A radiotelemetry study was conducted on rainbow trout in the Gulkana River beginning in 2009. Approximately 100 rainbow trout were tagged and tracked. Previously undocumented spawning areas were identified in the West Fork Gulkana and Gulkana River Mainstem above the confluence with the West Fork (Schwanke *in prep*).

A project to determine steelhead trout distribution using radiotelemetry was conducted in the Upper Copper River from 2004–2006. Feasibility work was conducted in September 2004 and the full project was conducted during fall 2005 and 2006 (Savereide 2005*b, c*, 2008).

Radiotagged fish migrated into the mainstem Chitina (26%), Tazlina (47%), and Gulkana (27%) rivers.

DOLLY VARDEN SPORT FISHERIES

Background and Historical Perspective

Dolly Varden are primarily targeted by sport anglers in the Klutina and Tonsina river drainages. Resident populations are found throughout the Upper Copper River drainage with the exception of the Gulkana River drainage. No juvenile or adult fish have been captured during any of the ADF&G stock assessment projects on the river. Dolly Varden have been reported in the SWHS as being caught in the Gulkana River, downstream of the Richardson Highway bridge, but these occurrences are rare. Based upon harvest and catch reports from the SWHS, some Dolly Varden occur in the Upper Susitna River drainage, though due to the barrier at Devils Canyon it is believed these are resident populations.

Sport fisheries in the Klutina and Tonsina river drainages have traditionally accounted for an average of 77%–85% of the Dolly Varden harvest in the UCUSMA (Somerville 2008). These fisheries occur primarily in the Little Tonsina River and the Upper Klutina River. Harvests of Dolly Varden in the UCUSMA, peaked at 6,001 fish in 1985 (Somerville 2008). The bag and possession limit for Dolly Varden has been 10 per day since at least the early 1970s.

Recent Fishery Performance

Total harvest of Dolly Varden in the UCUSMA declined significantly after 2004 (Table 22). From 2000–2004 the annual harvest of Dolly Varden averaged 1,441 fish. Over the last 5 years (2007–2011) this average has been 562 fish. Total harvest of Dolly Varden in the UCUSMA in 2011 was the lowest ever recorded at 231 fish. In 2012 a total of 753 Dolly Varden were harvested in UCUSMA waters, 80% of them from the Klutina River drainage.

Fishery Objectives and Management

There are currently no specific management objectives for Dolly Varden. The underlying goal of the department has been to assure sustained yield and provide fishing opportunity on fish resources. Harvest and catch of Dolly Varden in the UCUSMA is monitored through the SWHS.

Current Issues and Fishery Outlook

There is a lack of biological and stock data for UCUSMA Dolly Varden populations. It is suspected that both resident and anadromous populations exist within individual systems. However, one study in Klutina Lake to date failed to identify any anadromous individuals.

There have been no indications that the populations of Dolly Varden in the UCUSMA are declining. Declines in harvest appear to reflect a general decline in angler effort. However, the SWHS does not distinguish effort between individual species. Without a creel survey to assess the proportion of effort directed at individual species, the current effort data is only specific to drainage or system trends. If fishing effort in the UCUSMA as a whole increases, it is anticipated that Dolly Varden harvest will also increase.

Recent Board of Fisheries Action

There were no proposals before the BOF in 2008 or 2011 specific to the Dolly Varden fisheries in the UCUSMA.

Ongoing and Recommended Research and Management

There is limited knowledge regarding the Dolly Varden populations in the UCUSMA. Prior to 2012, only 2 projects studied this species. A University of Alaska Fairbanks graduate study was conducted on the Tielkel and Little Tonsina rivers in 1985 and 1986 (Gregory 1988). This study documented the biological characteristics of Tielkel River Dolly Varden and compared these to the characteristics of a sample of Little Tonsina River Dolly Varden. A second graduate study collected aquatic habitat data on the Tielkel River and identified habitat important to Dolly Varden (Martin 1988).

Since there is a lack of baseline data on Dolly Varden stocks, future research projects in the UCUSMA that may capture Dolly Varden should record biological data for incorporation into an area database. If creel surveys are conducted on the Klutina or Tonsina rivers for king or sockeye salmon, otoliths should be collected from any Dolly Varden observed and sampled for evidence of strontium deposition levels consistent with anadromous movement. During the 2006 creel survey on the Klutina River, no Dolly Varden were reported harvested and thus no heads or otoliths were collected despite this being an objective of the project (Schwanke and Taras 2009).

In 2012, ADF&G collected 20 Dolly Varden from the Upper Klutina River and mouth of Klutina Lake during late October. Otoliths from all 20 fish were analyzed for strontium signatures (Zimmerman *In prep*). None of the fish were anadromous, but chemical signatures in the otoliths suggested the fish may migrate within the greater Copper River drainage or there may be large variance in strontium isotope concentrations with the Klutina River drainage. Further otolith analyses of Klutina River and other stocks and analysis of water chemistry from those systems will augment these findings.

UPPER COPPER / UPPER SUSITNA MANAGEMENT AREA STOCKED WATERS

Background and Historical Perspective

ADF&G stocks approximately 27 lakes in the UCUSMA providing fishing opportunities for popular fish species in locations where fishing opportunities are limited or didn't exist previously (Table 23). The lake stocking program serves a segment of the public who want to fish, but must remain on or near the road system. All but 5 of the 27 stocked lakes are road-accessible or within 2 miles of a road and have trail access. This program provides increased fishing opportunities and offers a diversity of species in rural areas where minimal opportunity exists for sport fishing. It also diverts effort from wild populations in areas for which ADF&G has conservation concerns. Stocked lakes vary in size from 1.5 to 500 acres.

ADF&G stocks fingerling size fish (2–3 inches), subcatchable size fish (4-6 inches) and catchable size fish (7–9 inches) in area lakes, of which most are rainbow trout but other stocked species have included Arctic grayling, Arctic char, coho and king salmon. Most large lakes can produce sufficient numbers of catchable size fish from stockings of fingerling to meet angler demand. Smaller lakes or the more popular large lakes are stocked with subcatchable or catchable size fish because stockings of fingerling cannot provide sufficient numbers of catchables to meet angler demand. In the few UCUSMA stocked lakes that may be prone to winterkill (low dissolved oxygen in late winter months) catchables are stocked to provide an immediate open water and early winter fishery.

Recent Fishery Performance

Effort on stocked waters peaked in the UCUSMA at 7,623 angler-days in 1992 (Somerville 2008). In 2012, angler effort on stocked waters was 2,510 angler-days, slightly above the latest 5-year average (2007–2011) of 2,169 angler days (Table 24).

Anglers harvested 1,093 stocked fish in 2012 and caught 5,765 stocked fish for a catch rate of 2.3 fish per angler-day (Table 25). The average catch per effort for the last 5 years has been 1.8 fish per day fished. The average harvest from 2007–2011 was 947 stocked fish.

Rainbow trout comprised 86% of the harvest and 87% of the catch of stocked fish from 2007–2011. Arctic grayling, which were not stocked from 2004–2012 still comprised 10% of the stocked lake harvests and catches from 2007–2011, indicating long-term survival from some stocked Arctic grayling releases.

Silver Lake on the McCarthy Road and other stocked lakes in the Chitina area have been the most popular stocked lakes in the UCUSMA since the early 1990s, respectively averaging 37% and 55% of all UCUSMA stocked lake angler-days from 2007–2011. Silver Lake accounted for 34% of the rainbow trout harvest from all UCUSMA stocked lakes and lakes in the Chitina area and along the McCarthy Road (5 lakes total) accounted for 76% of the harvest in 2012.

Fishery Objectives and Management

The *Upper Copper River and Upper Susitna River Area Stocked Waters Management Plan* (5 AAC 52.065), requires the department to manage stocked waters in the AYK Region to meet public demand for diverse fishing opportunities. Sport fishing effort and harvest are estimated through the Statewide Harvest Survey. All 26 stocked lakes in the UCUSMA are managed under the regional approach, with a bag and possession limit of 10 fish (all stocked species combined), only 1 fish 18 inches or larger.

Current Issues and Fishery Outlook

Due to aging hatcheries, disease issues, and delays in construction of new hatchery facilities stocking schedules, number of fish stocked, and the availability of catchable sized fish has fluctuated and generally declined over the past 6 years. Fortunately, new hatcheries in Fairbanks and Anchorage are producing all sizes of fish and stocking levels have improved as of 2011.

The outlook for UCUSMA stocked lakes is good, with consistent stocking of catchable rainbow trout, Arctic grayling, and Arctic char, and fingerling coho salmon and Arctic char. Once popular lakes like Tolsona, Pippin, and Squirrel Creek Pit lakes are again being stocked with catchable rainbow trout and both harvest and angler effort is expected to increase on these lakes. Angler success should increase greatly over the next few years which may lead to increased angler effort in all area lakes.

Recent Board of Fisheries Action

The BOF adopted a proposal at the 2008 BOF meeting in Cordova to add Kathleen and Tolsona lakes to the stocked waters list.

Current or Recommended Research and Management Activities

Population status of stocked species is assessed by periodic sampling or as a component of research projects. No other research is currently planned for UCUSMA stocked waters.

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TABLES

Table 1.—Reported subsistence and personal use (Glennallen and Chitina Subdistricts) harvest of king, sockeye, and coho salmon in the Copper River, 1993–2012.

Year	Harvest			
	King salmon	Sockeye salmon	Coho salmon	Total
1993	4,037	138,211	1,428	143,791
1994	5,423	153,049	1,958	160,561
1995	6,326	125,364	5,547	137,301
1996	4,881	141,337	3,817	150,354
1997	7,798	224,611	334	232,915
1998	8,334	195,567	2,607	206,660
1999	8,680	208,841	3,123	221,007
2000	7,789	161,510	4,051	173,739
2001	6,176	200,421	3,486	210,534
2002	5,766	132,164	2,317	140,602
2003	4,611	129,595	2,840	137,318
2004	5,917	164,231	3,015	173,589
2005	4,220	189,001	1,729	195,400
2006	4,958	173,292	2,144	180,994
2007	6,089	190,384	1,797	198,955
2008	4,655	122,937	3,058	131,107
2009	3,031	137,823	1,691	142,884
2010	2,862	197,443	1,980	202,829
2011	3,834	183,674	2,042	190,332
2012	2,794	193,196	1,561	197,984
Average 2007–2011	4,094	166,452	2,114	173,221
Average 2002–2011	4,594	162,054	2,261	169,401

Note: Starting with 2002 includes federal fishery harvests in the Glennallen and Chitina Subdistricts and Batzulnetas.

Table 2.—Commercial harvests of king and sockeye salmon in the Copper River District, 1994–2013.

Year	King salmon	Sockeye salmon
1994	47,061	1,152,220
1995	65,675	1,271,822
1996	55,646	2,356,365
1997	51,273	2,955,431
1998	68,827	1,341,692
1999	62,337	1,682,559
2000	31,259	880,334
2001	39,524	1,323,577
2002	38,734	1,248,503
2003	47,721	1,188,052
2004	38,191	1,048,004
2005	34,624	1,331,664
2006	30,278	1,496,754
2007	39,095	1,901,773
2008	11,437	320,815
2009	9,457	896,469
2010	9,645	635,961
2011	18,500	2,052,432
2012	11,764	1,866,541
2013 ^a	8,687	1,583,980
Average 2008–2012	12,161	1,154,444
Average 2003–2012	25,071	1,273,847

Source: Sheridan et al. 2013

^a Data for 2013 are preliminary.

Table 3.–Sport fishing effort (angler-days) in the UCUSMA by drainage, 1993–2012.

Year	Gulkana River drainage			Upper Susitna drainage			Copper River						Other Sites			Area total
	Lakes	Streams	Total	Lakes	Streams	Total	Klutina	Tazlina	Tonsina	Upstream of Gulkana	Downstream of Klutina ^a	Stocked lakes	Lakes	Streams	Total	
1993	8,302	27,543	35,845	14,384	2,451	16,835	8,177	3,112	2,901	1,322	728	4,760	2,205	1,985	4,190	77,870
1994	9,121	25,581	34,702	16,686	1,888	18,574	10,624	3,837	2,254	1,611	1,778	5,561	3,231	3,348	6,579	85,520
1995	10,660	33,415	44,075	17,080	3,658	20,738	14,496	4,034	3,912	2,276	1,373	5,441	3,482	3,124	6,606	102,951
1996	6,298	25,727	32,025	8,749	1,110	9,859	10,699	1,775	1,514	815	695	3,759	1,475	1,791	3,266	64,407
1997	5,343	23,713	29,056	5,046	949	5,995	11,644	1,489	1,099	457	952	2,160	1,517	1,888	3,405	56,257
1998	4,560	27,349	31,909	5,135	508	5,643	9,408	1,592	1,054	540	795	3,346	1,182	1,237	2,419	56,706
1999	7,933	29,934	37,867	11,120	883	12,003	15,687	1,617	1,230	1,184	388	3,841	1,340	2,462	3,802	77,619
2000	4,825	20,896	25,721	8,899	1,747	10,646	11,125	1,583	1,182	459	780	3,689	1,717	1,292	3,009	58,194
2001	6,188	18,664	24,852	4,829	332	5,161	8,960	902	1,100	781	484	4,396	1,549	694	2,243	48,879
2002	5,910	18,060	23,970	4,991	531	5,522	9,111	751	1,381	675	301	2,377	945	1,580	2,525	46,613
2003	6,682	19,164	25,846	7,934	844	8,778	8,897	773	879	1,947	330	2,858	1,382	449	1,831	52,139
2004	3,257	17,351	20,608	6,037	819	6,856	10,472	241	1,007	1,431	2,608	1,406	1,611	318	1,929	46,558
2005	5,209	15,277	20,486	3,723	755	4,478	10,516	613	593	1,133	539	2,313	721	293	1,014	41,685
2006	2,545	11,910	14,455	4,032	1,111	5,143	12,285	587	716	734	855	2,790	738	804	1,542	39,107
2007	3,297	19,323	22,620	7,681	521	8,202	16,512	593	562	1,180	578	1,974	150	459	609	52,830
2008	4,099	16,794	20,893	7,089	1,383	8,472	12,677	641	653	1,216	1,349	1,453	807	210	1,017	48,371
2009	4,373	13,340	17,713	7,595	1,250	8,845	15,665	802	645	1,653	508	2,254	1,407	3,917	5,324	53,409
2010	2,880	13,834	16,714	9,896	1,424	11,320	16,534	1,540	725	1,726	974	2,049	400	250	650	52,232
2011	2,407	6,134	8,541	4,609	1,423	6,032	9,915	1,366	535	408	1,366	3,117	233	480	713	31,993
2012	2,524	5,593	8,117	6,625	1,163	7,788	18,030	1,067	380	894	628	2,510	721	233	954	40,368
Average 2007–2011	3,411	13,885	17,296	7,376	1,200	8,576	14,261	988	624	1,237	955	2,169	599	1,063	1,663	47,768
Average 2002–2011	4,066	15,119	19,185	6,370	1,011	7,381	12,258	791	770	1,210	941	2,259	839	876	1,715	46,509

^a Copper River drainage streams and lakes below the confluence with the Klutina River and excluding the Tonsina River drainage.

Table 4.—Number of fish harvested, by species, by sport anglers fishing UCUSMA waters (including stocked waters), 1993–2012.

Year	King salmon	Sockeye salmon	Coho salmon	Rainbow trout wild	Rainbow trout stocked	Dolly Varden ^a	Lake trout	Arctic grayling ^a	Burbot	Whitefish	Landlocked salmon ^a	Other fish	Total fish
1993	8,217	5,288	305	918	6,327	3,173	4,714	13,356	1,694	815	56	9	44,872
1994	6,431	6,533	289	1,599	4,209	1,598	4,352	15,233	2,869	1,149	134	128	44,531
1995	6,709	6,068	202	419	4,252	1,695	3,098	15,093	995	898	42	30	39,511
1996	9,116	11,851	606	1,076	4,000	2,575	2,713	11,260	981	384	751	0	45,313
1997	8,346	12,293	370	1,135	1,677	1,092	1,983	9,153	1,358	134	331	56	37,928
1998	8,245	11,184	684	443	4,739	1,589	1,818	8,498	1,485	584	477	0	39,746
1999	6,742	11,101	256	798	3,044	2,390	2,224	9,510	1,861	317	232	0	38,483
2000	5,531	12,361	760	331	2,546	991	1,709	7,111	2,290	451	436	22	34,539
2001	4,904	8,169	374	452	1,964	1,612	1,245	4,923	1,506	1,135	282	207	26,773
2002	5,098	7,761	384	393	2,901	1,388	2,215	9,849	2,224	2,288	282	54	34,837
2003	5,717	7,108	277	1,335	2,426	1,578	1,854	6,596	1,457	422	51	104	28,925
2004	3,435	6,464	131	696	1,615	2,153	2,044	4,177	1,127	885	0	1,629	24,356
2005	4,093	8,135	72	378	1,440	891	2,354	3,969	1,374	1,089	122	16	23,933
2006	3,425	14,297	54	486	1,618	777	737	3,478	575	662	42	111	26,262
2007	5,123	23,028	0	32	573	712	964	3,048	577	124	0	17	34,198
2008	3,616	11,431	56	324	694	396	1,470	4,332	1,234	655	0	18	24,226
2009	1,355	13,415	36	241	1,013	943	1,875	4,515	2,850	569	44	81	26,937
2010	2,409	14,743	90	158	1,006	682	1,631	4,845	2,997	759	78	0	29,398
2011	1,753	7,727	21	262	803	231	726	1,892	556	298	10	12	14,291
2012	459	23,393	0	512	936	753	676	4,091	995	107	11	0	31,933
Average 2007–2011	2,851	14,069	41	203	818	593	1,333	3,610	1,643	481	26	26	25,693
Average 2002–2011	3,602	11,411	112	431	1,409	975	1,587	4,590	1,497	775	63	204	26,656

^a Includes fish harvested in stocked waters. Landlocked salmon includes stocked king and coho salmon.

Table 5.—Number of fish caught, by species, by sport anglers fishing UCUSMA waters, 1993–2012.

Year	King salmon	Sockeye salmon	Coho salmon	Steelhead trout	Rainbow trout	Dolly Varden ^a	Lake trout	Arctic grayling ^a	Burbot	Whitefish	Landlocked salmon ^a	Other fish	Total fish
1993	21,767	10,813	410	102	23,300	7,903	17,728	84,257	2,471	2,670	145	53	171,619
1994	11,272	11,700	913	332	25,187	5,992	13,368	84,357	4,064	3,368	550	660	161,763
1995	14,178	10,383	363	51	16,979	3,129	10,937	71,189	2,375	1,826	109	70	131,589
1996	27,195	25,265	1,195	170	19,935	4,595	11,209	83,611	1,639	3,017	1,244	6	179,081
1997	27,760	26,724	748	81	20,867	3,439	9,101	71,432	2,646	1,075	1,095	81	165,049
1998	22,324	21,359	2,574	192	22,283	4,156	8,184	73,014	2,849	1,612	1,708	80	160,335
1999	18,034	20,782	382	276	14,809	6,993	14,184	68,860	3,173	907	309	58	148,767
2000	18,503	19,348	1,396	334	18,330	3,332	9,388	53,421	4,316	2,019	800	58	131,245
2001	16,000	15,843	1,246	234	19,531	6,188	6,913	49,901	2,527	3,069	513	233	122,198
2002	19,497	12,181	471	129	16,605	4,714	12,197	106,424	3,878	3,756	927	100	180,879
2003	19,426	15,718	585	112	17,583	3,720	12,425	90,190	2,496	2,338	169	356	165,118
2004	12,664	10,912	478	64	12,836	5,622	8,212	51,219	1,626	1,420	0	1,637	106,690
2005	9,778	16,093	172	64	10,954	2,551	11,057	50,760	2,150	2,259	279	32	106,149
2006	11,057	21,778	72	50	7,915	2,189	4,043	25,524	1,054	1,023	42	111	74,858
2007	12,109	30,875	11	99	5,919	3,647	6,125	29,815	1,503	273	0	26	90,402
2008	7,827	16,912	57	61	10,233	1,814	9,140	47,718	1,482	1,605	0	36	96,885
2009	4,231	19,788	36	20	7,170	3,211	12,843	76,559	3,471	1,076	554	81	129,040
2010	8,213	19,489	114	84	9,970	1,089	14,082	54,882	5,897	1,994	282	10	116,106
2011	7,025	11,873	21	0	8,292	1,058	3,846	19,738	1,157	483	10	23	53,526
2012	1,869	30,336	21	0	9,296	1,712	4,217	30,320	1,853	373	66	0	80,042
Average 2007–2011	7,881	19,787	48	53	8,317	2,164	9,207	45,742	2,702	1,086	169	35	97,192
Average 2002–2011	11,183	17,562	202	68	10,748	2,962	9,397	55,283	2,471	1,623	226	241	111,965

^aIncludes fish caught in stocked waters. Landlocked salmon includes stocked king and coho salmon.

Table 6.–Summary of king salmon harvests and upriver escapement in the Copper River 1993–2012.

Year	Commercial harvest ^a	Copper River District subsistence harvest	Sport harvest ^b	Glennallen Subdistrict harvest ^c	Chitina Subdistrict harvest ^c	Total harvest	Upriver return estimate	Estimated total return	Upriver escapement	Estimate source
1993	29,727	120	8,217	1,434	2,846	42,344	ND	ND	ND	ND
1994	47,812	164	6,431	1,989	3,743	60,139	ND	ND	ND	ND
1995	67,363	154	6,709	1,892	4,707	80,825	ND	ND	ND	ND
1996	57,815	276	9,116	1,482	3,584	72,273	ND	ND	ND	ND
1997	52,516	200	8,346	2,583	5,447	69,092	ND	ND	ND	ND
1998	70,238	295	8,245	1,842	6,723	87,343	ND	ND	ND	ND
1999	63,508	353	6,742	3,278	5,913	79,794	32,090	95,951	16,157	ADF&G
2000	32,018	689	5,531	4,856	3,168	46,262	38,047	70,754	24,492	ADF&G
2001	40,551	826	4,904	3,553	3,113	52,947	39,778	81,155	28,208	ADF&G
2002	39,552	549	5,098	4,217	2,056	51,472	32,873	72,974	21,502	ADF&G
2003	49,031	710	5,717	3,092	1,921	60,471	44,764	94,505	34,034	NVE
2004	38,889	1,106	3,435	3,982	2,502	49,914	40,564	80,559	30,645	NVE
2005	35,764	260	4,093	2,618	2,094	44,829	30,333	66,357	21,528	NVE
2006	31,309	779	3,425	3,229	2,681	41,423	67,789	99,877	58,454	NVE
2007	40,276	1,145	5,123	3,939	2,722	53,205	46,349	87,770	34,565	NVE
2008	12,067	470	3,616	3,218	2,022	21,393	41,343	53,880	32,487	NVE
2009	10,394	212	1,355	3,036	223	15,220	32,401	43,007	27,787	NVE
2010	10,582	276	2,409	2,425	718	16,410	22,323	33,181	16,771	NVE
2011	19,788	212	1,753	3,062	1,080	25,895	33,889	53,889	27,994	NVE
2012	12,623	237	459	2,510	572	16,401	31,452	44,312	27,911	NVE
Average 2007–2011	18,621	463	2,851	3,136	1,353	26,425	35,261	54,345	27,291	
Average 2002–2011	28,765	572	3,602	3,282	1,802	38,023	39,263	68,600	30,577	

^a Includes commercial personal use, educational, and donated harvests from the Copper River District.

^b Includes sport harvest from Copper River District and delta and Upper Copper River.

^c These data are expanded to reflect unreported permits and include reported federal subsistence harvest figures from 2002 to 2004 and expanded federal subsistence harvest beginning with 2005. See Table 2 for reported harvests.

Table 7.—Harvest of king salmon by sport anglers fishing in the UCUSMA by drainage, 1993–2012.

Year	Gulkana River Drainage				Klutina River drainage	Tonsina River drainage	Tazlina River drainage	Copper River		Other waters	Area total
	Upper river	Lower river	Unspecified	Total				Upstream of Gulkana	Downstream of Klutina		
1993	694	1,894	3,304	5,892	1,988	172	0	47	64	53	8,217
1994	1,352	2,071	279	3,702	2,188	349	105	16	20	50	6,431
1995	984	2,250	322	3,556	2,488	539	0	0	0	129	6,709
1996	1,165	3,362	733	5,260	3,142	331	64	0	64	255	9,116
1997	1,872	2,514	355	4,741	3,342	131	28	0	22	80	8,346
1998	885	3,786	732	5,403	2,608	39	63	0	15	117	8,245
1999	845	1,764	484	3,093	3,488	0	0	25	11	124	6,742
2000	1,318	2,304	555	4,177	1,302	0	0	0	10	41	5,531
2001	967	1,793	514	3,274	1,462	11	0	0	32	122	4,904
2002	715	2,125	143	2,983	1,778	230	0	13	0	94	5,098
2003	1,427	2,164	116	3,707	1,872	25	0	0	12	100	5,717
2004	64	1,670	156	1,890	1,338	115	0	0	39	53	3,435
2005	392	2,081	100	2,573	1,276	214	0	0	15	15	4,093
2006	464	1,495	188	2,147	1,136	100	0	0	13	29	3,425
2007	467	2,643	165	3,275	1,687	0	0	0	113	48	5,123
2008	241	2,036	46	2,323	1,160	0	0	0	118	15	3,616
2009	62	454	0	516	732	58	0	0	48	0	1,355
2010	400	1,032	13	1,445	862	0	0	0	101	0	2,409
2011	0	536	27	563	1,042	0	0	0	107	40	1,753
2012	14	106	0	120	312	0	0	0	25	0	459
Average 2007–2011	234	1,340	50	1,624	1,097	12	0	0	97	21	2,851
Average 2002–2011	423	1,624	95	2,142	1,288	74	0	1	57	39	3,602

Table 8.—Harvest Summary data for guided anglers in the Upper Copper River drainage, 2006–2012.^a

Site	Year	Guides	Clients	Trips	King salmon	Sockeye salmon	Coho salmon	Dolly Varden	Arctic grayling	Rainbow trout	Lake trout
Gulkana River drainage ^b	2006	27	874	240	478	68	0	0	0	3	0
Gulkana River drainage ^b	2007	28	1,251	364	754	64	0	0	7	0	10
Gulkana River drainage ^b	2008	29	1,001	284	504	11	0	1	8	0	2
Gulkana River drainage ^b	2009	19	364	109	147	33	0	0	0	0	6
Gulkana River drainage ^b	2010	18	452	139	197	14	0	0	0	0	0
Gulkana River drainage ^b	2011	19	463	144	192	33	0	0	15	0	0
Gulkana River drainage ^b	2012	8	314	86	58	136	0	0	1	0	0
Klutina River drainage ^c	2006	22	1,614	476	842	913	0	154	45	0	0
Klutina River drainage ^c	2007	28	1,657	500	904	967	0	161	39	2	2
Klutina River drainage ^c	2008	22	1,571	470	688	266	4	84	21	4	0
Klutina River drainage ^c	2009	28	1,203	359	374	540	5	225	31	3	0
Klutina River drainage ^c	2010	25	1,286	407	563	356	0	184	6	1	0
Klutina River drainage ^c	2011	19	953	307	387	189	0	93	2	3	0
Klutina River drainage ^c	2012	18	979	281	237	757	0	28	22	3	0
Tonsina River drainage ^d	2006	7	51	13	18	0	0	0	0	0	0
Tonsina River drainage ^d	2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tonsina River drainage ^d	2008	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tonsina River drainage ^d	2009	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tonsina River drainage ^d	2010	4	18	6	6	0	0	0	0	0	0
Tonsina River drainage ^d	2011	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tonsina River drainage ^d	2012	0	0	0	0	0	0	0	0	0	0

^a Harvest data is total harvest and may exceed the harvest reported by area and site in Sigurdsson and Powers 2009–2013 since harvest cannot be reported for sites or drainages with 3 or fewer guides reporting in a given year.

^b Includes all sections of the Gulkana River, Crosswind Lake, Paxson Lake, and Mud Lake.

^c Includes Klutina River and Klutina Lake.

^d Includes Tonsina River and Tonsina Lake.

Table 9.—Catch of king salmon by sport anglers fishing in the UCUSMA by drainage, 1993–2012.

Year	Gulkana River				Klutina River drainage	Tonsina River drainage	Tazlina River drainage	Copper River		Other waters	Area total
	Upper river	Lower river	Unspecified	Total				Upstream of Gulkana	Downstream of Klutina		
1993	10,592	4,994	0	15,586	4,934	614	0	283	176	174	21,767
1994	3,038	3,407	83	6,528	3,807	698	144	16	29	50	11,272
1995	2,963	4,839	46	7,848	5,081	1,102	0	0	9	138	14,178
1996	3,472	11,836	2,507	17,815	7,407	832	74	0	246	821	27,195
1997	9,658	7,385	1,080	18,123	8,677	395	94	0	22	449	27,760
1998	2,335	11,115	2,003	15,453	5,815	193	101	419	60	283	22,324
1999	3,221	4,876	937	9,034	8,637	0	104	50	22	187	18,034
2000	4,890	7,650	1,379	13,919	4,057	292	0	178	16	41	18,503
2001	2,947	6,417	1,470	10,834	4,922	21	0	53	158	12	16,000
2002	3,346	8,613	357	12,316	5,645	861	0	13	471	191	19,497
2003	4,165	8,898	293	13,356	5,418	290	0	202	25	135	19,426
2004	1,380	5,433	555	7,368	4,135	521	0	404	173	63	12,664
2005	1,670	4,697	217	6,584	2,651	483	0	0	45	15	9,778
2006	1,805	5,664	204	7,673	2,890	367	0	0	13	114	11,057
2007	1,203	7,254	163	8,620	3,025	31	62	16	275	80	12,109
2008	549	5,389	46	5,984	1,670	15	11	0	132	15	7,827
2009	616	1,469	0	2,085	1,888	79	0	15	164	0	4,231
2010	982	3,719	39	4,740	3,240	39	13	0	181	0	8,213
2011	64	2,372	161	2,597	3,476	72	17	0	802	61	7,025
2012	177	495	13	685	1,118	41	0	0	25	0	1,869
Average 2007–2011	683	4,041	82	4,805	2,660	47	21	6	311	31	7,881
Average 2002–2011	1,578	5,351	204	7,132	3,404	276	10	65	228	67	11,183

Table 10.–Harvest of sockeye salmon by sport anglers fishing UCUSMA drainages, 1993–2012.

Year	Gulkana River Drainage				Klutina River drainage	Tonsina River drainage	Tazlina River drainage	Copper River		Other waters	Area total
	Upper river	Lower river	Unspecified	Total				Upstream of Gulkana	Downstream of Klutina		
1993	784	547	1,714	3,045	1,369	188	9	403	0	274	5,288
1994	1,055	884	564	2,503	3,137	66	95	37	93	602	6,533
1995	978	920	511	2,409	2,549	105	0	115	284	606	6,068
1996	1,828	4,673	917	7,418	4,215	42	25	0	17	134	11,851
1997	1,585	2,469	512	4,566	6,501	39	0	21	201	965	12,293
1998	1,591	3,460	1,319	6,370	4,264	68	58	0	11	413	11,184
1999	1,349	2,142	701	4,192	6,514	0	30	32	65	268	11,101
2000	1,162	1,194	1,951	4,307	7,219	0	35	141	317	342	12,361
2001	524	852	432	1,808	5,834	0	0	0	193	334	8,169
2002	833	1,680	32	2,545	4,704	96	0	0	13	403	7,761
2003	550	843	72	1,465	5,321	21	0	11	203	87	7,108
2004	177	776	23	976	5,069	142	0	11	0	266	6,464
2005	157	939	73	1,169	6,646	0	0	0	180	140	8,135
2006	230	693	0	923	13,222	0	0	0	130	22	14,297
2007	114	1,306	38	1,458	21,255	25	0	0	290	0	23,028
2008	369	206	0	575	10,107	0	0	0	749	0	11,431
2009	362	886	87	1,335	11,759	0	51	0	270	0	13,415
2010	160	1,316	0	1,476	12,238	156	0	0	708	165	14,743
2011	0	684	101	785	6,025	0	46	0	871	0	7,727
2012	0	1,528	0	1,528	21,564	0	0	0	301	0	23,393
Average 2007–2011	201	880	45	1,126	12,277	36	19	0	578	33	14,069
Average 2002–2011	295	933	43	1,271	9,635	44	10	2	341	108	11,411

Table 11.–Summary of sockeye harvests and upriver escapement in the Copper River 1993–2012.

Year	Commercial harvest ^a	CRD subsistence harvest ^b	Sport harvest ^c	Glennallen Subdistrict harvest ^d	Chitina Subdistrict harvest ^d	Total harvest	Upriver return estimate ^e	Estimated total return	Spawning escapement ^f
1993	1,398,234	428	6,609	53,252	93,472	1,551,995	801,181	2,199,843	613,309
1994	1,153,167	474	9,599	68,278	94,024	1,325,542	682,319	1,835,013	472,748
1995	1,271,822	692	6,658	52,516	79,006	1,410,694	547,565	1,820,079	379,329
1996	2,356,365	969	14,086	52,052	95,007	2,518,479	852,125	3,209,459	569,212
1997	2,955,431	1,001	13,265	82,807	148,727	3,201,231	1,107,156	4,063,588	797,882
1998	1,343,127	850	13,199	64,463	137,161	1,558,800	820,554	2,341,546	485,541
1999	1,683,892	1,330	13,956	77,369	141,658	1,918,205	818,507	2,708,888	457,589
2000	881,419	4,360	14,550	59,497	107,856	1,067,682	598,790	1,633,508	345,961
2001	1,325,690	3,072	8,467	83,787	132,108	1,553,124	838,427	2,237,918	533,816
2002	1,249,920	3,067	8,559	58,800	86,543	1,406,889	797,390	2,192,176	583,824
2003	1,192,164	1,607	7,739	60,623	81,513	1,343,646	702,327	2,043,029	507,958
2004	1,048,603	1,822	7,416	73,214	108,527	1,239,582	643,539	1,833,686	448,457
2005	1,333,574	939	8,791	86,140	122,463	1,551,907	824,792	2,276,773	516,996
2006	1,498,423	4,505	14,410	76,056	124,810	1,718,204	891,917	2,592,750	580,202
2007	1,903,858	6,184	24,732	83,338	126,154	2,144,266	873,252	2,961,568	613,129
2008	323,096	4,001	12,656	57,632	82,318	479,703	677,001	1,141,223	477,952
2009	902,940	1,810	14,429	60,517	90,917	1,070,613	677,347	1,721,695	469,089
2010	643,086	2,016	16,057	84,856	140,811	886,826	901,488	1,715,714	502,992
2011	2,061,525	1,818	8,565	75,375	129,985	2,277,268	880,342	3,097,537	607,657
2012	1,874,726	4,334	24,618	92,792	128,058	2,124,528	1,239,902	3,253,887	930,210
Average 2007–2011	1,166,901	3,166	15,288	72,344	114,037	1,371,735	801,886	2,127,547	534,164
Average 2002–2011	1,215,719	2,777	12,335	71,655	109,404	1,411,890	786,940	2,157,615	530,826

^a Includes commercial harvest plus homepack, donated and educational harvests.

^b Includes State and Federal subsistence harvests in the Copper River District.

^c Includes sport harvest in the Copper River Delta and the Upper Copper River upstream of Haley Creek

^d These data are expanded to reflect unreported state harvest and include reported federal harvest (2002–2004) and expanded federal harvest beginning in 2005.

^e Prior to 1999 is the Miles Lake sonar count minus the proportion of king salmon in the Glennallen and Chitina subdistrict fisheries. Starting in 1999, this includes the Miles Lake sonar count minus the king salmon mark-recapture point estimate

^f Upriver return escapement minus upriver sockeye harvests.

Table 12.—Distribution of sockeye salmon in major drainages in the Copper River, 2005–2009.

Year	Percentage of total Copper River escapement by river system						
	Lower Copper River	Chitina River	Tonsina River	Klutina River	Tazlina River	Gulkana River	Upper Copper River
2005	7.4	5.0	4.7	35.1	12.4	7.0	28.4
2006	5.8	8.1	5.5	44.5	11.4	15.6	9.1
2007	9.1	5.4	5.1	54.2	9.8	9.4	7.1
2008	8.2	8.2	1.7	33.7	18.6	19.2	10.3
2009	12.4	5.0	2.7	33.2	5.7	16.4	24.5
Average 2005–2009	6.8	6.3	3.9	40.1	11.6	13.5	15.9

Source: (Smith et al. 2003; Wade et al. 2007; Wade et al. 2009; Wade et al. 2010).

Table 13.—Number of permits issued and expanded salmon harvests during the Glennallen Subdistrict subsistence salmon fishery in the Copper River, 1993–2012 (does not include federal subsistence fishery permit numbers or harvests).

Year	Number of permits issued	Estimated salmon harvest			
		King	Sockeye	Coho	Total ^a
1993	772	1,434	53,252	77	54,855
1994	970	1,989	68,278	60	70,391
1995	858	1,892	52,516	882	55,323
1996	850	1,482	52,052	557	54,290
1997	1,133	2,583	82,807	187	85,743
1998	1,010	1,842	64,463	533	66,951
1999	1,101	3,278	77,369	1,121	82,119
2000	1,251	4,856	59,497	532	64,885
2001	1,239	3,553	83,787	1,144	88,568
2002	1,121	3,653	50,850	530	55,058
2003	1,012	2,538	47,007	467	50,055
2004	956	3,346	55,510	577	59,497
2005	961	2,229	64,213	154	66,615
2006	984	2,769	57,710	212	60,774
2007	1,174	3,276	65,714	238	69,284
2008	1,186	2,381	43,157	493	46,106
2009	1,090	2,493	46,849	228	49,643
2010	1,321	2,099	70,719	293	73,260
2011	1,306	2,319	59,622	372	62,477
2012	1,527	2,095	76,305	335	78,851
Average 2007–2011	1,215	2,514	57,212	325	60,154
Average 2002–2011	1,111	2,710	56,135	356	59,277

^aTotal harvest includes steelhead and other species.

Table 14.—Number of permits issued and expanded salmon harvested during the Chitina Subdistrict personal use salmon fishery in the Copper River, 1993–2012 (does not include federal subsistence fishery permit numbers or harvests).

Year	Number of permits issued	Estimated salmon harvest			
		King	Sockeye	Coho	Total ^a
1993	7,914	2,846	93,472	1,416	97,767
1994	7,061	3,743	94,024	1,981	99,823
1995	6,760	4,707	79,006	4,870	88,617
1996	7,198	3,584	95,007	3,381	102,108
1997	9,086	5,447	148,727	160	154,349
1998	10,006	6,723	137,161	2,145	146,075
1999	9,943	5,913	141,658	2,128	149,733
2000 ^b	8,151	3,168	107,856	3,657	114,884
2001 ^b	9,458	3,113	132,108	2,720	138,425
2002 ^b	6,804	2,023	85,968	1,934	90,242
2003	6,441	1,903	80,796	2,533	85,496
2004	8,156	2,495	107,312	2,860	113,176
2005	8,230	2,043	120,013	1,869	124,403
2006	8,497	2,663	123,261	2,715	129,103
2007	8,377	2,694	125,126	1,742	130,222
2008	8,041	1,999	81,359	2,711	86,476
2009	7,958	214	90,035	1,712	92,228
2010	9,970	700	138,487	2,013	141,565
2011	9,217	1,067	128,052	1,702	131,265
2012	10,016	567	127,143	1,385	129,362
Average 2007–2011	8,713	1,335	112,612	1,976	116,351
Average 2002–2011	8,169	1,780	108,041	2,179	112,418

^aTotal expanded includes unidentified salmon.

^bFrom 2000 to 2002 the Chitina Subdistrict was classified a subsistence fishery.

Table 15.–Number of freshwater finfish subsistence permits issued and harvest from UCUSMA waters, 1993–2012.

Year	Permits				Harvest ^a				
	Total Issued	Total fished	Water bodies permitted	Water bodies fished	Whitefish	Lake Trout	Burbot	Other	Total
1993	7	4	6	4	876	3	2	11	892
1994	5	5	5	5	1,565	0	0	0	1,565
1995	6	6	5	5	2,964	2	5	5	2,976
1996	8	6	6	5	2,104	0	3	47	2,154
1997	10	5	7	6	1,380	0	0	65	1,445
1998	6	6	4	4	2,032	1	0	7	2,040
1999	9	8	6	5	1,382	1	0	3	1,386
2000	9	8	6	6	1,974	4	0	9	1,987
2001	8	7	5	5	1,670	2	2	36	1,710
2002	12	7	5	3	1,321	4	1	1	1,327
2003	13	7	6	3	1,143	2	8	13	1,166
2004	11	9	5	4	2,125	15	0	25	2,165
2005	17	13	7	5	1,643	13	1	19	1,676
2006	13	10	6	4	1,070	6	3	2	1,081
2007	18	12	5	3	3,094	6	3	6	3,109
2008	16	10	3	2	585	9	2	1	597
2009	28	16	5	3	2,708	28	21	11	2,768
2010	27	19	7	4	2,088	33	13	13	2,147
2011 ^b	25	20	5	5	981	17	1	0	999
2012 ^b	15	10	2	2	648	8	0	0	656
Average 2007–2011	23	16	5	3	1,891	19	8	6	1,924
Average 2002–2011	18	12	5	4	1,676	13	5	9	1,704

^aReported harvest is from set gillnets with the following exceptions; 202 whitefish (WF) were harvested with a seine in 2000, 5 WF and 5 burbot (BB) in 2003, 52 WF in 2006 with fyke nets, and 12 WF and 1 BB by spear in 2011.

^bRetention of species other than whitefish or longnose suckers taken with gillnets was prohibited by permit stipulation beginning in 2011 and permittees were required to provide 24 hour notice prior to setting subsistence gear. Other species listed as harvested after 2010 were not retained and were released either dead or alive.

Table 16.–Harvest of wild Arctic grayling by sport anglers in the UCUSMA by drainage, 1993–2012.

Year	Gulkana River drainage	Upper Susitna River drainage	Klutina River drainage	Tonsina River drainage	Tazlina River drainage		Copper River drainage		Other lakes and streams	Area total
					Mendeltna Creek	Other lakes and streams	Above Gulkana	Below Klutina		
1993	4,071	2,746	681	814	867	481	935	336	821	11,752
1994	4,253	3,662	363	363	906	984	884	123	1,796	13,334
1995	4,159	3,982	285	261	1,041	1,171	953	166	1,661	13,679
1996	3,263	2,949	183	192	570	849	608	194	1,279	10,087
1997	3,228	1,332	165	82	462	468	475	269	1,785	8,266
1998	2,975	1,797	517	495	579	490	527	150	589	8,119
1999	2,482	1,564	530	368	79	650	1,108	67	798	7,646
2000	2,062	2,181	134	123	245	274	588	0	954	6,561
2001	1,753	686	267	128	70	120	589	29	630	4,272
2002	2,646	928	566	180	23	370	2,598	62	537	7,910
2003	2,132	1,047	575	58	23	312	1,466	0	236	5,849
2004	1,331	819	197	112	65	73	805	124	589	4,115
2005	1,553	380	59	86	0	500	432	96	540	3,646
2006	1,179	998	77	8	46	359	194	137	298	3,296
2007	729	387	138	0	97	130	840	144	19	2,484
2008	1,665	1,431	17	59	190	34	616	42	76	4,130
2009	1,522	1,216	47	35	0	85	462	0	1,078	4,445
2010	2,081	1,850	57	12	107	90	210	89	227	4,723
2011	532	1,195	0	10	0	0	14	28	29	1,808
2012	1,393	1,335	42	0	0	710	243	67	144	3,934
Average 2007–2011	1,306	1,216	52	23	79	68	428	61	286	3,518
Average 2002–2011	1,537	1,025	173	56	55	195	764	72	363	4,241

Table 17.–Harvest of lake trout by sport anglers fishing UCUSMA waters by drainage, 1993–2012.

Year	Gulkana River drainage					Upper Susitna River drainage				Klutina River drainage	Tazlina River drainage	Other lakes & streams	Area total
	Paxson Lake	Summit Lake	Crosswind Lake	Other lakes & streams	Gulkana total	Lake Louise	Susitna Lake	Other lakes & streams	Upper Susitna total				
1993	778	344	311	276	1,709	1,316	669	375	2,360	28	0	617	4,714
1994	262	353	429	110	1,154	1,463	426	477	2,366	74	15	743	4,352
1995	507	224	94	90	915	946	200	419	1,565	71	0	547	3,098
1996	297	120	339	336	1,092	662	381	306	1,349	22	11	239	2,713
1997	452	158	96	142	848	585	52	100	737	33	23	342	1,983
1998	205	59	238	39	541	625	131	135	891	12	56	318	1,818
1999	342	220	525	68	1,155	430	176	216	822	35	16	196	2,224
2000	228	79	297	27	631	563	131	93	787	18	83	190	1,709
2001	302	74	44	86	506	259	110	118	487	17	0	235	1,245
2002	328	66	299	60	753	458	152	138	748	0	122	592	2,215
2003	399	102	403	104	1,008	393	128	80	601	52	0	193	1,854
2004	46	107	105	30	288	770	30	347	1,147	14	0	595	2,044
2005	50	32	519	71	672	370	429	478	1,277	66	16	323	2,354
2006	61	10	191	32	294	200	148	42	390	0	0	53	737
2007	77	56	97	54	284	340	61	0	401	0	0	279	964
2008	173	67	90	0	330	604	206	85	895	0	0	245	1,470
2009	191	125	295	18	629	493	217	230	940	25	58	223	1,875
2010	268	192	164	0	624	697	73	101	871	0	54	82	1,631
2011	42	37	50	36	165	239	122	62	423	0	75	63	726
2012	149	0	32	0	181	169	66	94	329	16	0	150	676
Average 2007–2011	150	95	139	22	406	475	136	96	706	5	37	178	1,333
Average 2002–2011	164	79	221	41	505	456	157	156	769	16	33	265	1,587

Table 18.–Percent of lake trout released in 5 UCUS lakes during years with 24” minimum length limits and with no length limits, 1990–2012^a.

Year	Paxson	Summit	Crosswind	Louise	Susitna	Average of all lakes
1990	52%	61%	77%	65%	82%	67%
1991	39%	47%	60%	37%	59%	48%
1992	53%	54%	73%	67%	68%	63%
1993	68%	79%	76%	81%	67%	74%
1994	79%	65%	79%	71%	67%	72%
1995	71%	81%	90%	66%	76%	77%
1996	85%	84%	72%	78%	82%	80%
1997	78%	77%	79%	80%	89%	81%
1998	88%	85%	85%	75%	66%	80%
1999	89%	67%	80%	91%	82%	82%
2000	89%	77%	67%	82%	86%	80%
2001	84%	88%	93%	83%	87%	87%
2002	91%	82%	69%	85%	79%	81%
2003	88%	84%	72%	88%	69%	80%
2004	75%	62%	88%	81%	96%	80%
2005	96%	95%	77%	86%	58%	82%
2006	79%	92%	60%	86%	81%	80%
2007	88%	59%	92%	85%	88%	82%
2008	82%	94%	93%	67%	85%	84%
2009	72%	86%	89%	86%	76%	82%
2010	86%	87%	89%	89%	89%	88%
2011	0%	40%	86%	86%	72%	57%
2012	86%	ND ^b	81%	83%	82%	83%
Average 1990–1993	48%	54%	70%	56%	70%	60%
Average 1994–2005	83%	79%	79%	80%	77%	80%
Average 2006–2011	68%	76%	85%	83%	82%	79%

Note: From 1990 through 1993 in Paxson, Summit and Susitna lakes, and Lake Louise the bag limit for lake trout was 2 fish over 18” and for Crosswind Lake it was 2 fish any size. A 24” minimum size limit went into effect prior to the 1994 fishing season in all 5 lakes. Beginning in 2006 in Paxson and Summit lakes and in 2012 in Lake Louise, and Crosswind and Susitna lakes, the bag limit became 1 lake trout of any size and bait was restricted from April 16 through October 31.

^a Numbers in **bold** print indicate years with a 1 fish over 24” bag limit.

^b No lake trout were reported caught from Summit Lake in 2012.

Table 19.–Sustainable yield (Lake Area model) and harvest of lake trout from UCUSMA lakes greater than 500 ha in size.

Lake	Harvest ^a	Road accessible	Sustainable yield	Size ^b
Crosswind	234	No	361	> 24 inches
Paxson	242	Yes	585	Any Size
Summit	147	Yes	413	Any Size
Tanada	28	No	399	Any Size
Copper	46	No	341	Any Size
Lake Louise	687	Yes	540	> 24 inches
Susitna	199	Yes	321	> 24 inches

^a Average harvest from SWHS 2008–2012 + 10% mortality factor for released fish

^b The length limit in Lake Louise, Susitna, and Crosswind lakes was removed beginning the summer of 2012.

Table 20.–Harvest of burbot by sport anglers fishing in the UCUSMA by drainage, 1993–2012.

Year	Gulkana River drainage				Upper Susitna River drainage				Tazlina River drainage	Klutina River drainage	Other streams and lakes	Area total
	Paxson Lake	Crosswind Lake	Other Gulkana waters	Total	Lake Louise	Susitna and Tyone lakes	Other Susitna waters	Total				
1993	32	225	0	257	0	172	0	172	107	0	1,158	1,694
1994	21	317	291	629	0	766	145	911	238	0	1,091	2,869
1995	69	271	7	347	0	137	46	183	126	0	339	995
1996	65	86	48	199	0	163	49	212	138	0	432	981
1997	535	174	103	812	0	262	52	314	26	0	206	1,358
1998	535	139	17	691	0	149	118	267	460	0	67	1,485
1999	266	503	13	782	0	670	0	670	117	0	292	1,861
2000	291	539	472	1,302	0	609	0	609	222	0	157	2,290
2001	764	173	122	1,059	0	154	36	190	136	0	121	1,506
2002	401	578	259	1,238	0	437	31	468	128	13	377	2,224
2003	173	470	250	893	32	119	33	184	87	65	228	1,457
2004	20	336	0	356	317	91	10	418	0	0	353	1,127
2005	112	859	94	1,065	25	74	10	109	25	0	175	1,374
2006	0	229	0	229	210	46	64	320	13	13	0	575
2007	0	55	30	85	185	30	0	215	0	0	277	577
2008	40	302	0	342	241	452	17	710	111	0	71	1,234
2009	0	452	0	452	489	237	0	726	69	0	1,603	2,850
2010	166	129	533	828	1,231	147	18	1,396	422	18	333	2,997
2011	61	60	36	157	144	36	48	228	146	0	25	556
2012	33	0	0	33	134	67	104	305	0	63	594	995
Average 2007–2011	53	200	120	373	458	180	17	655	150	4	462	1,643
Average 2002–2011	97	347	120	565	287	167	23	477	100	11	344	1,497

Table 21.–Sport catch of wild rainbow trout by sport anglers fishing UCUSMA waters by drainage, 1993–2012.

Year	Gulkana River drainage ^a				Klutina River drainage	Tazlina River drainage	Tonsina River drainage	Copper River drainage		Other streams and lakes	Area total
	Upper River	Lower River	Gulkana R. other	Total				Upstream of Gulkana	Downstream of Klutina		
1993	2,468	305	0	2,773	958	99	98	79	663	1,954	6,624
1994	3,088	149	143	3,380	95	207	290	161	3,454	4,926	12,513
1995	3,397	495	66	3,958	37	0	234	0	1,233	1,247	6,709
1996	5,140	1,371	183	6,694	42	10	26	0	1,584	2,389	10,745
1997	7,816	199	99	8,114	53	125	0	218	3,062	4,770	16,342
1998	3,429	1,317	682	5,428	8	48	25	0	4,993	557	11,059
1999	5,699	1,743	261	7,703	23	108	83	128	553	1,706	10,304
2000	5,354	1,281	194	6,829	267	0	78	0	1,496	1,622	10,292
2001	2,806	961	381	4,148	256	0	36	0	767	1,120	6,327
2002	5,166	2,525	31	7,722	7	0	105	14	349	1,538	9,735
2003	5,496	676	332	6,504	66	48	0	0	0	6,188	12,806
2004	3,995	787	0	4,782	27	26	81	0	535	761	6,212
2005	2,967	1,251	405	4,623	87	21	331	0	374	1,422	6,858
2006	1,361	405	205	1,971	58	741	67	0	488	465	3,790
2007	3,173	652	210	4,035	21	0	0	0	73	124	4,253
2008	4,183	593	624	5,400	38	0	61	0	1,707	208	7,414
2009	3,700	328	0	4,028	172	101	10	0	0	296	4,607
2010	3,044	999	28	4,071	117	113	15	0	422	188	4,926
2011	1,684	622	615	2,921	132	81	33	0	384	243	3,794
2012	1,815	778	44	2,637	518	17	10	0	530	429	4,141
Average 2007–2011	3,157	639	295	4,091	96	59	24	0	517	212	4,999
Average 2002–2011	3,477	884	245	4,606	73	113	70	1	433	1,143	6,440

^aThe Gulkana River has been closed to the retention of rainbow trout since 1991.

Table 22.–Harvest of wild Dolly Varden by sport anglers fishing UCUSMA waters by drainage, 1993–2012.

Year	Klutina River drainage	Tazlina River drainage	Tonsina River drainage	Copper River drainage		Other streams and lakes	Area total
				Upstream of Gulkana	Downstream of Klutina		
1993	1,818	26	689	106	0	534	3,173
1994	1,250	11	216	56	9	56	1,598
1995	712	44	500	66	48	325	1,695
1996	838	0	462	1,043	24	208	2,575
1997	549	0	107	135	44	257	1,092
1998	1,092	16	98	0	16	367	1,589
1999	1,818	22	363	32	45	110	2,390
2000	257	0	498	10	102	77	944
2001	644	54	795	0	11	65	1,569
2002	725	0	369	22	215	57	1,388
2003	1,009	54	0	67	20	0	1,150
2004	886	0	150	120	891	106	2,153
2005	423	0	82	13	0	373	891
2006	219	0	146	0	58	150	573
2007	362	0	99	154	15	82	712
2008	204	0	0	22	59	0	285
2009	620	0	93	33	0	197	943
2010	268	0	29	88	121	132	638
2011	64	0	96	62	9	0	231
2012	602	0	89	0	0	62	753
Average 2007–2011	304	0	63	72	41	82	562
Average 2002–2011	478	5	106	58	139	110	896

Note: Dolly Varden are not present in the Gulkana River drainage. Data do not include stocked Arctic char.

Table 23.–Stocking schedule for lakes in the UCUSMA, 2011–2013.

Access	Area Lake	Stocking Frequency ^a	Species	Size	Number stocked		
					2011	2012	2013
Glenn Hwy	Arizona	Annual	Grayling	Catchable	0	0	250
	Buffalo	Discontinued	Rainbow	Fingerling	1,000	0	0
		Annual	Rainbow	Catchable	0	540	540
	DJ	Alternate	Rainbow	Fingerling	0	0	400
	Gergie	Alternate	Rainbow	Fingerling	0	0	9,000
	Little Junction	Annual	Grayling	Catchable	0	0	100
	Ryan	Annual	Rainbow	Catchable	0	520	540
		Annual	Grayling	Catchable	0	0	251
	Tex Smith	Discontinued	Rainbow	Fingerling	3,000	0	0
		Annual	Rainbow	Catchable	0	871	1,247
	Tolsona	Annual	Rainbow	Catchable	0	2,015	1,995
Richardson Hwy	Dick	Annual	Arctic Char	Catchable	0	490	508
	Pippin	Annual	Rainbow	Catchable	0	5,958	5,415
	Squirrel Creek	Annual	Rainbow	Catchable	0	1,267	1,429
		Annual	Grayling	Catchable	0	0	270
Lake Louise Rd	Connor	Annual	Grayling	Catchable	0	0	250
	Crater	Alternate	Rainbow	Fingerling	0	2,247	0
	Junction	Annual	Grayling	Catchable	0	0	400
	Old Road	Discontinued	Rainbow	Fingerling	300	0	0
		Annual	Rainbow	Catchable	0	480	573
	Peanut	Alternate	Rainbow	Fingerling	0	2,228	0
	Round	Discontinued	Rainbow	Fingerling	400	0	0
	Annual	Rainbow	Catchable	0	526	570	
Edgerton Hwy	Three Mile	Discontinued	Rainbow	Fingerling	4,000	0	0
		Annual	Rainbow	Catchable	0	1,516	1,493
	Two Mile	Discontinued	Rainbow	Fingerling	4,259	0	0
		Annual	Rainbow	Catchable	0	963	2,001
McCarthy Rd	Sculpin	Alternate	Rainbow	Fingerling	14,246	0	14,000
	Silver ^b	Alternate	Rainbow	Fingerling	0	15,062	20,000
		Annual	Rainbow	Catchable	5,246	0	5,250
	Strelna	Alternate	Rainbow	Fingerling	10,340	0	5,000
		Alternate	Coho	Fingerling	0	5,009	0
Remote	John	Alternate	Arctic Char	Fingerling	2,000	0	2,000
	Kathleen	Discontinued	Rainbow	Fingerling	0	980	0
	North Jans	Alternate	Rainbow	Fingerling	0	4,878	0
	South Jans	Alternate	Rainbow	Fingerling	0	4,878	0
		Alternate	Coho	Fingerling	0	0	0
	Tolsona Mtn.	Alternate	Rainbow	Fingerling	0	0	8,500

^aWith increased availability of catchable sized rainbow trout in 2012, fingerling stockings were discontinued in lakes with low productivity or the potential to winterkill.

^bSilver Lake was stocked with fingerling rainbow trout out of cycle in 2012 to compensate for lack of outstocked fish from Summit Lake.

Table 24.—Effort, harvest, and catch statistics by species for stocked lakes in the UCUSMA 1993–2012.

Year	Days fished (effort)	Catch						Harvest				
		Rainbow trout	Coho salmon	Arctic grayling	Arctic char	Total	Catch rate (catch / effort)	Rainbow trout	Coho salmon	Arctic grayling	Arctic char	Total
1993	4,782	16,676	56	3,760	0	20,492	4.3	6,327	56	852	0	7,235
1994	5,561	12,674	496	4,055	45	17,270	3.1	4,209	80	1,167	0	5,456
1995	5,441	10,270	109	4,189	0	14,568	2.7	4,252	42	804	0	5,098
1996	3,759	9,190	693	6,230	0	16,113	4.3	4,000	414	726	0	5,140
1997	2,160	4,525	444	1,969	0	6,938	3.2	1,677	274	570	0	2,521
1998	3,346	11,224	1039	1,389	0	13,652	4.1	4,739	395	223	0	5,357
1999	3,841	4,505	309	4,694	22	9,530	2.5	3,044	232	1265	0	4,541
2000	3,689	8,038	800	2,954	298	12,090	3.3	2,546	436	521	47	3,560
2001	4,396	13,204	513	3,315	43	17,075	3.9	1,964	282	473	43	2,762
2002	2,377	6,870	0	6,966	179	14,015	5.9	2,901	0	1939	0	4,862
2003	3,374	4,777	0	3,309	495	8,581	2.5	2,426	0	688	428	3,609
2004	1,461	6,624	0	531	0	7,155	4.9	1,615	0	62	0	1,677
2005	2,313	4,096	0	86	0	4,182	1.8	1,440	0	253	0	1,693
2006	2,790	4,125	0	232	357	4,714	1.7	1,618	0	91	204	1,913
2007	1,974	1,666	0	559	0	2,225	1.1	573	0	282	0	855
2008	1,453	2,819	0	275	444	3,538	2.4	694	0	101	111	906
2009	2,254	2,563	0	445	0	3,008	1.3	1013	0	35	0	1048
2010	2,049	5,044	31	208	73	5,356	2.6	1006	31	0	44	1081
2011	3,117	4,498	0	497	0	4,995	1.6	803	0	42	0	845
2012	2,510	5,155	0	610	0	5,765	2.3	936	0	157	0	1,093
Average 2007–2011	2,169	3,318	6	397	103	3,824	1.8	818	6	92	31	947
Average 2002–2011	2,316	4,308	3	1,311	155	5,777	2.6	1,409	3	349	79	1,849

FIGURES

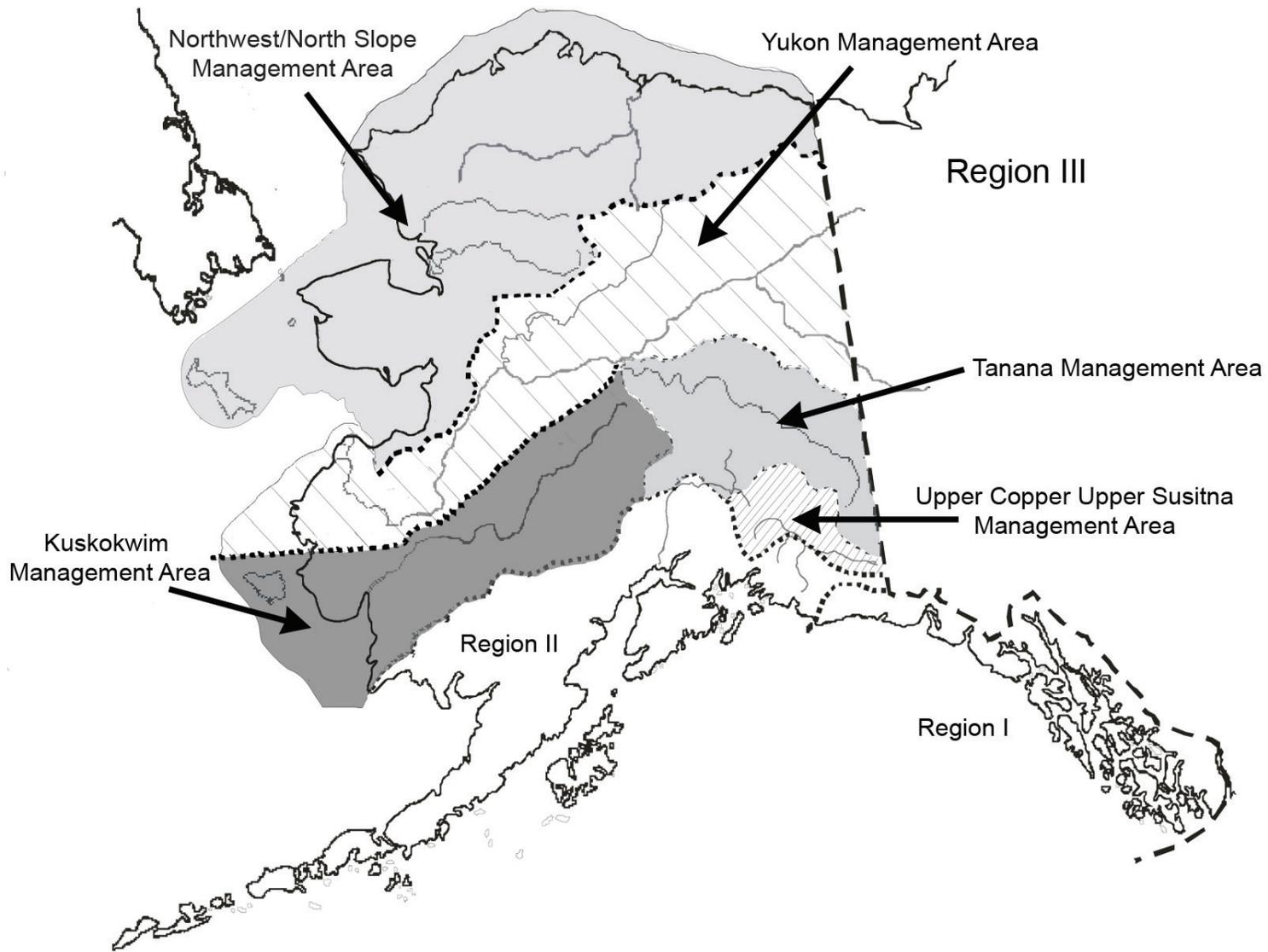


Figure 1.—Map of the sport fish regions in Alaska and the 5 Region III management areas.

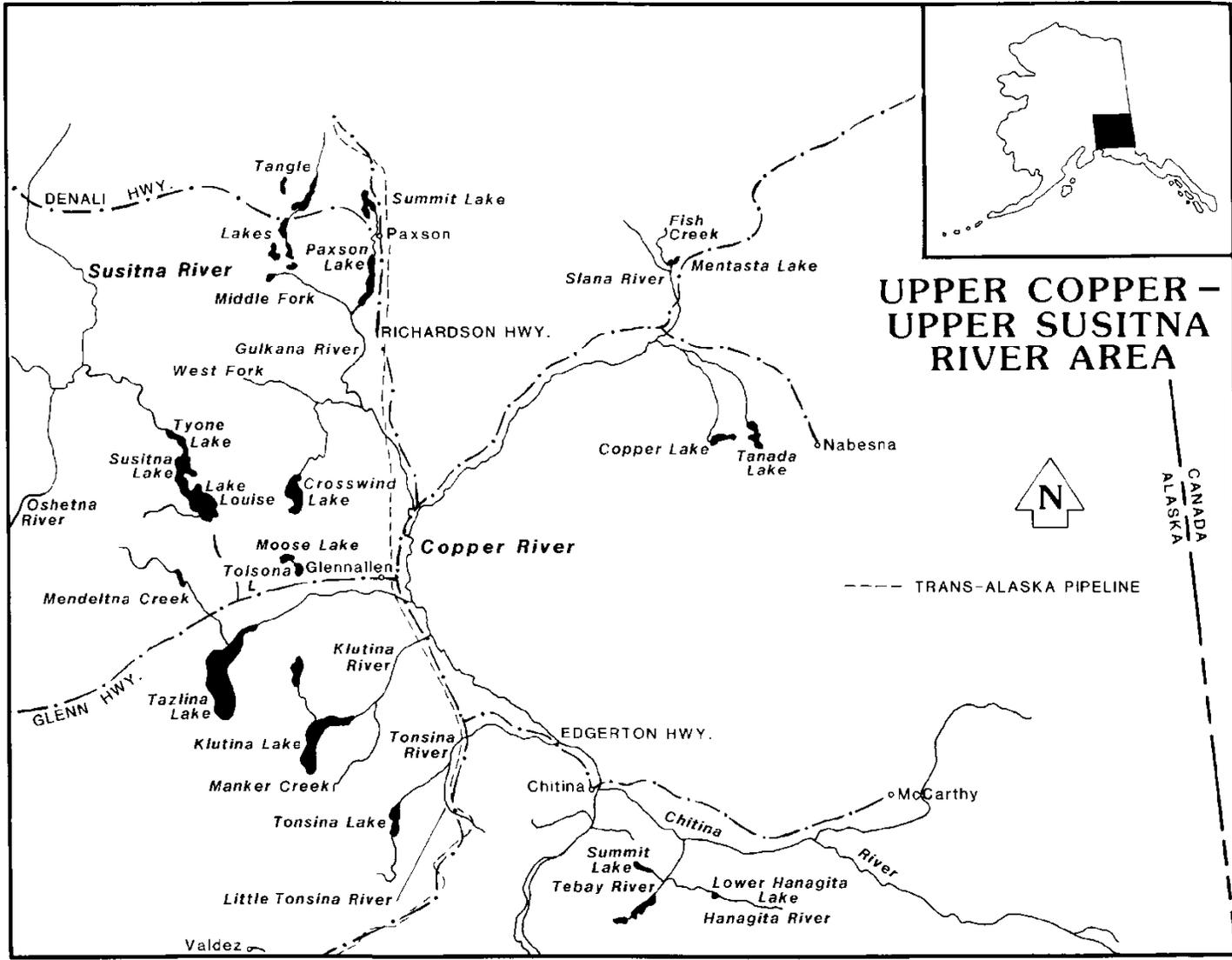


Figure 2.—The Upper Copper/Upper Susitna Management Area (UCUSMA).

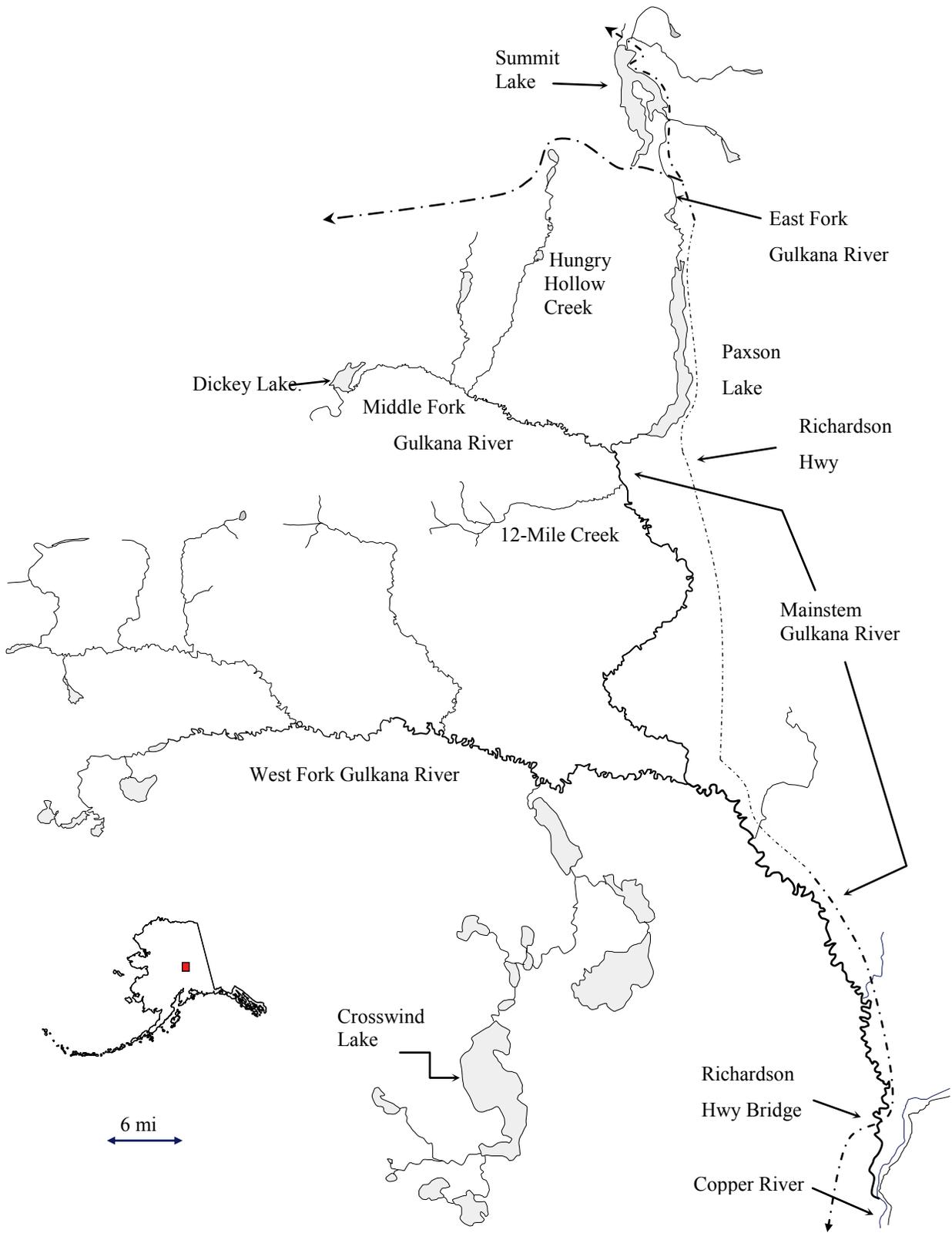


Figure 3.—Gulkana River drainage.

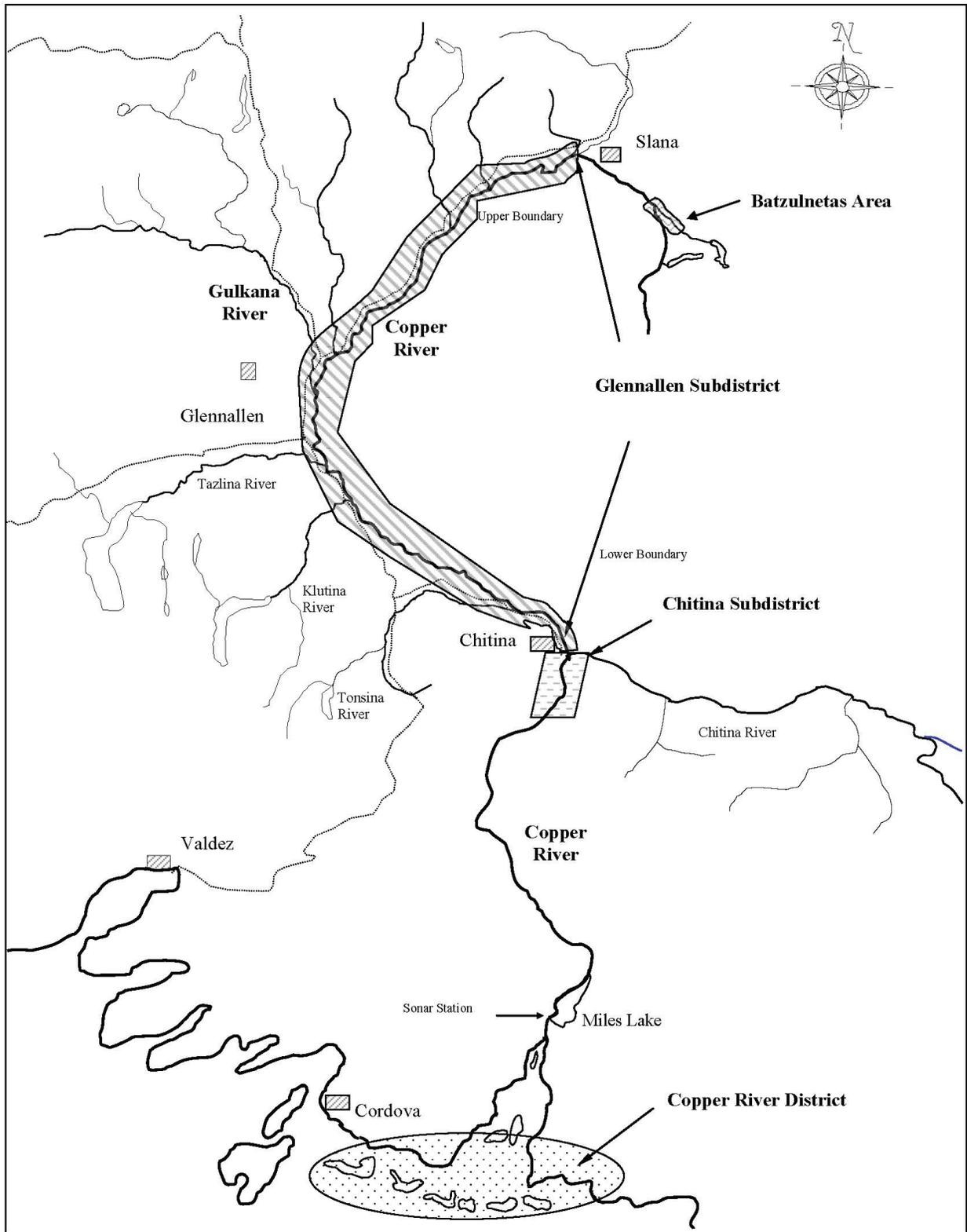


Figure 4.—Upper Copper River fishery subdistricts and areas.

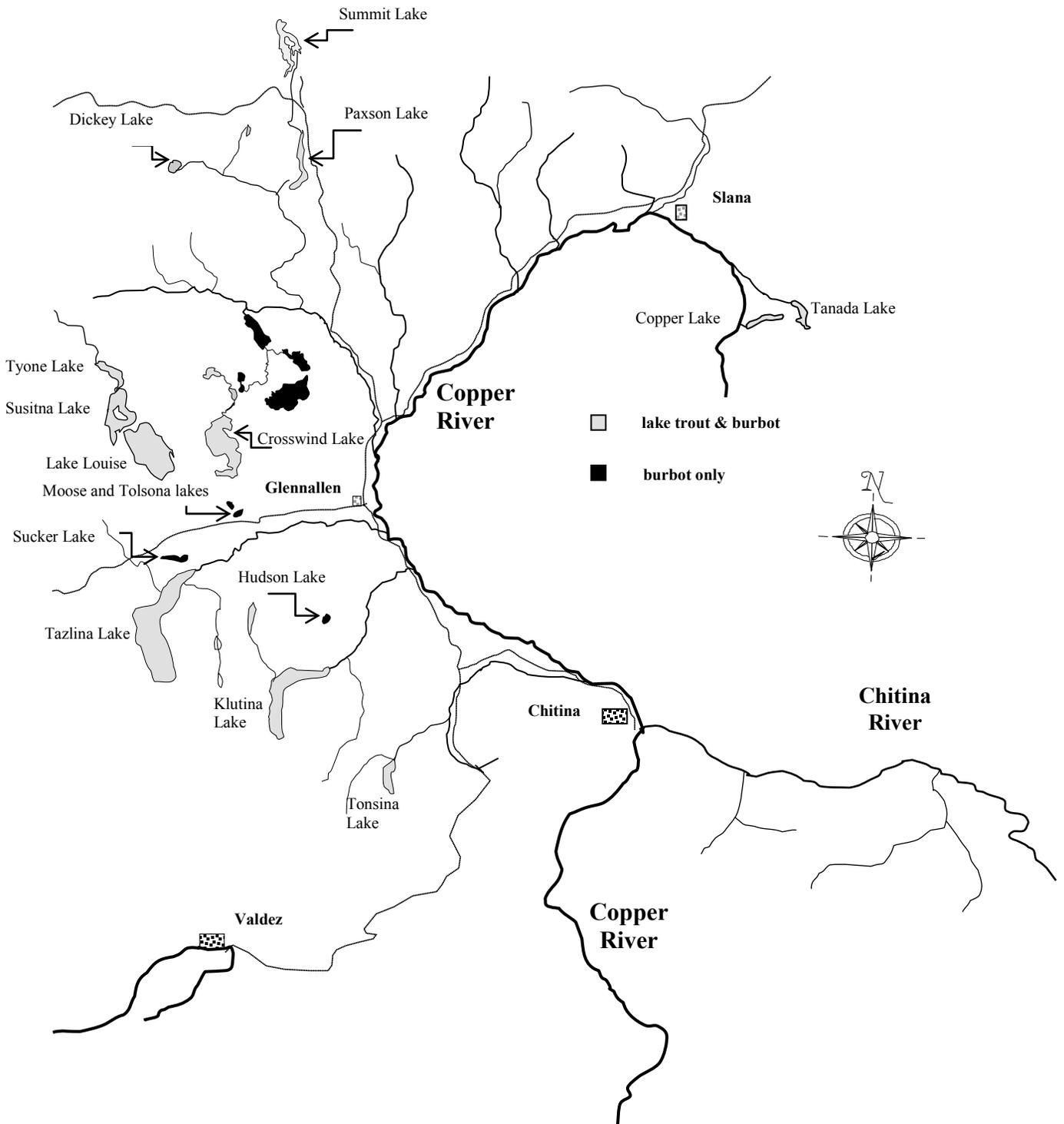


Figure 5.—Lake trout and burbot fisheries in the UCUSMA.

APPENDIX A

Appendix A1.—Listing of the addresses and contact numbers for information sources regarding UCUSMA information.

Organization	Address	Phone	Internet address
Alaska Department of Fish and Game,			http://www.adfg.alaska.gov/index.cfm?adfg=home.main
Glennallen Area office	PO Box 47 Glennallen, AK 99588-0047	(907) 822-3309	
Fairbanks Regional office	1300 College Road Fairbanks, AK 99701-1599	(907) 459-7207	
U.S. Bureau of Land Management	PO Box 147 Glennallen, AK 99588-0147	(907) 822-3217	http://www.blm.gov/ak/st/en/fo/gdo.html
Wrangell-St. Elias National Park & Preserve	PO Box 439 Copper Center, AK 99573	(907) 822-5234	http://www.nps.gov/wrst/index.htm
Ahtna, Inc	PO Box 649 Glennallen, AK 99588-0649	(907) 822-3476	www.ahtna-inc.com
Chitina Native Corporation	PO Box 3 Chitina, AK 99566	(907) 823-2223	http://www.chitanative.com/corp/default.htm
Greater Copper Valley Chamber of Commerce	PO Box 469 Glennallen, AK 99588-0469	(907) 822-5555	http://www.coppervalleychamber.com

APPENDIX B

Appendix B1.—Emergency orders issued for UCUSMA sport, personal use, and subsistence fisheries during 2012 and 2013.

Year	E. O. Number	Explanation
2012	3-RS-01-12	Establishes a weekly fishing period for the Batzulnetas Area subsistence salmon fishery. The weekly fishing period will be 48-hours in duration from 12:00 noon Friday to 12:00 noon Sunday, beginning Friday, June 1, 2012. Beginning on Friday, July 6, the weekly fishing period will be increased to 84-hours in duration from 12:00 noon Friday to 11:59 P.M. Monday each week through September 1, or until closed by emergency order.
2012	3-RS-01-12	Establishes the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River District through August 31, 2012. The Chitina Subdistrict will be open for a 96-hour period from 12:01 a.m. Thursday, June 7 through 11:59 p.m. Sunday, June 10. In addition, this emergency order establishes the weekly period when a supplemental permit for 10 additional sockeye salmon will be valid for the personal use dip net salmon fishery in the Chitina Subdistrict of the Copper River.
2012	3-RS-02-12	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the period June 11–June 17, 2012. The Chitina Subdistrict will be open from 12:01 a.m. Monday, June 11 until 11:59 p.m. Sunday, June 17. In addition, this emergency order establishes the weekly period when a supplemental permit for 10 additional sockeye salmon will be valid for the personal use dip net salmon fishery in the Chitina Subdistrict of the Copper River.
2012	3-RS-03-12	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the period June 18–June 24, 2012. The Chitina Subdistrict will be open from 12:01 a.m. Monday, June 18 until 11:59 p.m. Sunday, June 24. In addition, this emergency order closes the Chitina Subdistrict Personal Use Dip Net Salmon Fishery to the retention of king salmon for the remainder of the 2012 season.
2012	3-RS-04-12	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the period June 25–July 1, 2012. The Chitina Subdistrict will be open from 12:01 a.m. Monday, June 25 until 11:59 p.m. Sunday, July 1.
2012	3-KS-05-12	Reduces the sport fish annual limit for king salmon 20 inches or more in length in the Upper Copper River drainage from 4 fish to 1 fish. This emergency order also prohibits retention of king salmon in the Gulkana River and that portion of the Copper River from the confluence of the Gulkana and Copper Rivers to an ADF&G marker located approximately 500 yards downstream effective 12:01 a.m. Saturday, June 30, 2012. The use of bait and treble hooks in these waters is also prohibited. Any king salmon retained prior to June 30 is counted toward the annual limit of 1 king salmon.
2012	3-RS-05-12	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the period July 2–July 8, 2012. The Chitina Subdistrict will be open from 12:01 a.m. Monday, July 2 until 11:59 p.m. Sunday, July 8.

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Year	E. O. Number	Explanation
2012	3-RS-06-12	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the period July 9–July 15, 2012. The Chitina Subdistrict will be open from 12:01 a.m. Monday, July 16 until 11:59 p.m. Sunday, July 15. In addition, this emergency order establishes the weekly period when a supplemental permit for 10 additional sockeye salmon will be valid for the personal use dip net salmon fishery in the Chitina Subdistrict of the Copper River.
2012	3-RS-07-12	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the period July 16–July 22, 2012. The Chitina Subdistrict will be open from 12:01 a.m. Monday, July 16 until 11:59 p.m. Sunday, July 22. In addition, this emergency order establishes the weekly period when a supplemental permit for 10 additional sockeye salmon will be valid for the personal use dip net salmon fishery in the Chitina Subdistrict of the Copper River.
2012	3-RS-08-12	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the period July 23–July 29, 2012. The Chitina Subdistrict will be open from 12:01 a.m. Monday, July 23 until 11:59 p.m. Sunday, July 29. In addition, this emergency order establishes the weekly period when a supplemental permit for 10 additional sockeye salmon will be valid for the personal use dip net salmon fishery in the Chitina Subdistrict of the Copper River.
2012	3-KS-08-12	Prohibits retention in the king salmon sport fishery from the Klutina River and all waters of the Upper Copper River drainage downstream of the upstream bank of the Klutina River effective 12:01 a.m. Saturday, July 28, 2012. The use of bait in these waters is also prohibited.
2012	3-RS-09-12	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the period July 30–August 5, 2012. The Chitina Subdistrict will be open from 12:01 a.m. Monday, July 30 until 11:59 p.m. Sunday, August 5. In addition, this emergency order establishes the weekly period when a supplemental permit for 10 additional sockeye salmon will be valid for the personal use dip net salmon fishery in the Chitina Subdistrict of the Copper River.
2012	3-RS-10-12	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the period August 6–August 31, 2012. The Chitina Subdistrict will be open from 12:01 a.m. Monday, August 6 until 11:59 p.m. Friday, August 31. In addition, this emergency order establishes the weekly period from 12:01 a.m. Monday, August 6 until 11:59 p.m. Sunday, August 12 when a supplemental permit for 10 additional sockeye salmon will be valid for the personal use dip net salmon fishery in the Chitina Subdistrict of the Copper River.

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Year	E. O. Number	Explanation
2013	3-RS-01-13	Establishes the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River through August 31, 2013 and amends the schedule for the period June 7–June 9, 2013. The Chitina Subdistrict will remain closed through 11:59 p.m. Sunday June 9, 2013.
2013	3-RS-02-13	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the period June 10–June 16, 2013. The Chitina Subdistrict will be open from 12:01 a.m. Monday, June 10 until 11:59 p.m. Sunday June 16.
2013	3-KS-05-13	Reduces the sport fish annual limit for king salmon 20 inches or more in length in the Upper Copper River drainage from 4 to 2 fish. This emergency order also prohibits retention of king salmon in the Gulkana River and that portion of the Copper River from the confluence of the Gulkana and Copper rivers to an ADF&G marker located approximately 500 yards downstream effective 12:01 a.m. Saturday, June 15, 2013. The use of bait and treble hooks in the Gulkana River is also prohibited.
2013	3-RS-03-13	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the period June 17–June 23, 2013. The Chitina Subdistrict will be open from 12:01 a.m. Monday, June 17 until 11:59 p.m. Sunday, June 23. In addition, this emergency order establishes the weekly period when a supplemental permit for 10 additional sockeye salmon will be valid for the personal use dip net salmon fishery in the Chitina Subdistrict of the Copper River.
2013	3-RS-04-13	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the period June 24–June 30, 2013. The Chitina Subdistrict will be open from 12:01 a.m. Monday, June 24 until 11:59 p.m. Sunday, June 30. In addition, this emergency order establishes the weekly period when a supplemental permit for 10 additional sockeye salmon will be valid for the personal use dip net salmon fishery in the Chitina Subdistrict of the Copper River. Also, this emergency order closes the Chitina Subdistrict Personal Use Dip Net Salmon Fishery to the retention of king salmon.
2013	3-RS-05-13	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the period July 1–7, 2013. The Chitina Subdistrict will be open from 12:01 a.m. Monday, July 1 until 11:59 p.m. Sunday, July 7.

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Year	E. O. Number	Explanation
2013	3-RS-01-13	Liberalizes the sport fish bag and possession limit in the Copper River drainage for sockeye salmon 16 inches or longer. Beginning at 12:01 a.m., Saturday, July 6, the limit for sockeye salmon in the Copper River drainage is six fish per day, six in possession.
2013	3-RS-06-13	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the period July 8–14, 2013. The Chitina Subdistrict will be open from 12:01 a.m. Monday, July 8 until 11:59 p.m. Sunday, July 14. In addition, this emergency order establishes the weekly period when a supplemental permit for 10 additional sockeye salmon will be valid for the personal use dip net salmon fishery in the Chitina Subdistrict of the Copper River.
2013	3-RS-07-13	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the period July 15–21, 2013. The Chitina Subdistrict will be open from 12:01 a.m. Monday, July 15 until 11:59 p.m. Sunday, July 21. In addition, this emergency order establishes the weekly period when a supplemental permit for 10 additional sockeye salmon will be valid for the personal use dip net salmon fishery in the Chitina Subdistrict of the Copper River.
2013	3-RS-08-13	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the period July 22–28, 2013. The Chitina Subdistrict will be open from 12:01 a.m. Monday, July 22 until 11:59 p.m. Sunday, July 28. In addition, this emergency order establishes the weekly period when a supplemental permit for 10 additional sockeye salmon will be valid for the personal use dip net salmon fishery in the Chitina Subdistrict of the Copper River.
2013	3-RS-09-13	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the period July 29–August 31, 2013. The Chitina Subdistrict will be open from 12:01 a.m. Monday, July 29 until 11:59 p.m. Sunday, August 31. In addition, this emergency order establishes the weekly period from 12:01 a.m. Monday, July 29 until 11:59 p.m. Sunday, August 4 when a supplemental permit for 10 additional sockeye salmon will be valid for the personal use dip net salmon fishery in the Chitina Subdistrict of the Copper River.

APPENDIX C

Appendix C1.–Federal subsistence permits and harvest^a from the Copper River, Chitina Subdistrict, 2002–2012.

Year	Permits issued	Permits returned	Species harvested				
			King	Sockeye	Coho	Steelhead	Other
2002	122	89	33	575	0	0	0
2003	100	82	18	717	70	0	0
2004	111	83	7	1,215	18	0	0
2005	76	64	51	2,450	0	0	0
2006	75	62	18	1,549	20	0	0
2007	97	86	28	1,028	41	0	0
2008	82	70	23	959	100	0	0
2009	68	62	9	882	11	0	0
2010	92	79	18	2,324	30	0	0
2011	85	68	13	1,933	10	0	0
2012	92	80	5	915	8	8	0
Average 2007–2011	84	73	18	1,425	38	0	0
Average 2002–2011	91	75	22	1,363	30	0	0

^a Reported harvest only 2002–2004; Expanded (estimates harvest from non-returned permits) harvest 2005–2012

APPENDIX D

Appendix D1.—Federal subsistence permits and harvest from the Copper River, Glennallen Subdistrict, 2002–2012.

Year	Permits issued	Permits returned	Species harvested				
			King	Sockeye	Coho	Steelhead	Other
2002	201	162	564	7,950	81	62	0
2003	221	184	554	13,616	152	5	0
2004	262	206	636	17,704	152	12	0
2005	275	224	389	21,927	187	0	41
2006	254	220	460	18,346	28	15	71
2007	281	238	663	17,624	57	9	122
2008	270	219	837	14,475	229	26	52
2009	274	227	543	13,668	34	19	110
2010	269	236	326	14,137	81	42	62
2011	277	240	743	15,753	223	5	317
2012	271	244	415	16,487	173	42	106
Average 2007–2011	276	232	622	15,131	125	20	133
Average 2002–2011	258	216	572	15,520	122	20	78

Note: Reported harvest only 2002–2004; Expanded (estimates harvest from non-returned permits) harvest 2005–2012.