Fishery Management Report No. 08-33

Area Management Report for the Recreational Fisheries of the Upper Copper/Upper Susitna River Management Area, 2006

by

Mark A. Somerville

June 2008

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

Symbols and Abbreviations

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

Weights and measures (metric)

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

Weights and measures (English)

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

Time and temperature

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

Physics and chemistry

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

General

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

Measures (fisheries)

fork length	FL
mideye-to-fork	MEF
mideye-to-tail-fork	METF
standard length	SL
total length	TL

Mathematics, statistics

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

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AREA MANAGEMENT REPORT FOR THE RECREATIONAL FISHERIES OF THE UPPER COPPER/UPPER SUSITNA RIVER MANAGEMENT AREA, 2006

by

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TABLE OF CONTENTS

Page

LIST OF TABLES....iv

LIST OF FIGURES....v

LIST OF FIGURES....v

LIST OF APPENDICES....v

PREFACE....vi

ABSTRACT....1

INTRODUCTION....1

The Alaska Board of Fisheries....2
Advisory Committees....2
Recent Board of Fisheries Actions....3
ADF&G Emergency Order Authority....4
Federal Subsistence....4
Region III Sport Fish Division Research and Management Staffing....5
Statewide Harvest Survey....5

SECTION I: MANAGEMENT AREA OVERVIEW 6

Management Area Description....6
Fishery Resources....7
Established Management Plans and Policies....7
Major Issues....9
Access Programs....11
Information and Education....11
Sport Fishing Effort, Harvest, and Catch....12

SECTION II: FISHERIES 13

King Salmon Sport Fisheries....13
Background and Historic Perspective....13
Gulkana River King Salmon Sport Fishery....15
Background and Historic Perspective....15
Recent Fishery Performance....16
Fishery Objectives and Management....16
Current Issues and Fishery Outlook....17
Recent Board of Fisheries Actions....17
Current or Recommended Research and Management Activities....18
Klutina River King Salmon Sport Fishery....18
Background and Historical Perspective....18
Recent Fishery Performance....20
Fishery Objectives and Management....20
Current Issues and Fishery Outlook....20
Recent Board of Fisheries Actions....21
Current or Recommended Research and Management Activities....21
Other Copper River Basin King Salmon Sport Fisheries....22

TABLE OF CONTENTS (Continued)

Page

Background and Historical Perspective....22
Fishery Objectives and Management....23
Current Issues and Fishery Outlook....23
Recent Board of Fisheries Actions....23
Current or Recommended Research and Management Activities....23
Sockeye Salmon Sport Fisheries....23
Background and Historic Perspective....23
Gulkana River Sockeye Salmon Sport Fishery....24
Background and Historic Perspective....24
Recent Fishery Performance....25
Fishery Objectives and Management....25
Current Issues and Fishery Outlook....26
Recent Board of Fisheries Actions....26
Current or Recommended Research and Management Activities....26
Klutina River Sockeye Salmon Sport Fishery....26
Background and Historical Perspective....26
Recent Fishery Performance....27
Fishery Objectives and Management....27
Current Issues and Fishery Outlook....27
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....31
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
Arctic Grayling Sport Fisheries....35
Background and Historical Perspective....35
Gulkana River Arctic Grayling Sport Fishery....35
Background and Historical Perspective....35
Recent Fishery Performance....36
Fishery Objectives and Management....36
Current Issues and Fishery Outlook....37
Recent Board of Fisheries Actions....37
Current or Recommended Research and Management Activities....37
Other UCUSMA Arctic Grayling Sport Fisheries....37
Background and Historical Perspective....37
Fishery Objectives and Management....37
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....41
Burbot Sport Fisheries....41

TABLE OF CONTENTS (Continued)

Page

Background and Historical Perspective....41
Recent Fishery Performance....43
Fishery Objectives and Management....43
Current Issues and Fishery Outlook....43
Recent Board of Fisheries Actions....44
Current or Recommended Research and Management Activities....44
Wild Rainbow and Steelhead Trout Sport Fisheries....44
Background and Historical Perspective....44
Recent Fishery Performance....45
Fishery Objectives and Management....46
Current Issues and Fishery Outlook....46
Recent Board of Fisheries Actions....46
Ongoing or Recommended Research and Management Activities....47
Dolly Varden Sport Fisheries....47
Background and Historical Perspective....47
Recent Fishery Performance....48
Fishery Objectives and Management....48
Current Issues and Fishery Outlook....48
Recent Board of Fisheries Action....48
Ongoing and Recommended Research and Management....49
Upper Copper / Upper Susitna Management Area stocked waters....49
Background and Historical Perspective....49
Recent Fishery Performance....49
Fishery Objectives and Management....50
Current Issues and Fishery Outlook....50
Recent Board of Fisheries Action....50
Current or Recommended Research and Management Activities....50

REFERENCES CITED....50

LIST OF TABLES

Table **Page**

1. Reported subsistence and personal use (Glennallen and Chitina Subdistricts) harvests of king, sockeye, and coho salmon in the Copper River, 1977-2006. 58
2. Commercial harvests of king and sockeye salmon in the Copper River District, 1977-2007. 61
3. Number of angler-days of sport fishing effort expended by recreational anglers fishing UCUSMA waters, 1977 - 2006. 60
4. Sport fishing effort (angler-days) in the UCUSMA by drainage, 1977 - 2006. 61
5. Number of fish caught, by species, by recreational anglers fishing UCUSMA waters, 1990-2006. 63
6. Number of fish harvested, by species, by recreational anglers fishing UCUSMA waters (including stocked waters), 1977 - 2006. 64
7. Copper River king salmon harvests, 1977-2006. 65
8. Harvest of king salmon by recreational anglers fishing in the UCUSMA by drainage, 1977-2006. 66
9. Summary of king salmon harvests and upriver escapement in the Copper River 1981-2007 67
10. Catch of king salmon by recreational anglers fishing in the UCUSMA by drainage, 1990-2006. 68
11. Summary of sockeye harvests and upriver escapement in the Copper River 1981 - 2007. 71
12. Harvest of sockeye salmon by recreational anglers fishing UCUSMA drainages, 1977 – 2006. 70
13. Distribution of sockeye salmon in major drainages in the Copper River, 2005 – 2006[a]. 71
14. Number of permits issued and estimated salmon harvests during the Glennallen Subdistrict subsistence salmon fishery in the Copper River, 1977-2007 (does not include Federal subsistence fishery permit numbers or harvests). 72
15. Number of permits issued and estimated salmon harvested during the Chitina Subdistrict personal use salmon fishery in the Copper River, 1984-2007 (does not include Federal subsistence fishery permit numbers or harvests). 73
16. Harvest of Arctic grayling by recreational anglers in the UCUSMA by drainage, 1977 - 2006. 74
17. Harvest of lake trout by recreational anglers fishing UCUSMA waters by drainage, 1977 - 2006. 75
18. Percent of lake trout released in lakes with 24” minimum size limit, 1990-2006[a]. 76
19. Sustainable yield (Lake Area Model) and harvest of lake trout from UCUSMA lakes greater than 500 ha in size. 79
20. Harvest of burbot caught by recreational anglers fishing in the UCUSMA by drainage, 1977 – 2006. 78
21. Harvest of wild rainbow trout by sport anglers fishing UCUSMA waters by drainage, 1977 – 2006. 79
22. Sport catch of wild rainbow trout by sport anglers fishing UCUSMA waters by drainage, 1977 – 2006. 80
23. Catch of steelhead trout by sport anglers fishing UCUSMA waters by drainage, 1990 - 2006. 81
24. Harvest of wild Dolly Varden by sport anglers fishing UCUSMA waters by drainage, 1977 – 2006. 82
25. Stocking schedule for remote lakes in the UCUSMA. 83
26. Effort, harvest, and catch statistics by species for stocked lakes in the UCUSMA 1990-2006. 84
27. Socking summary by species for lakes in the UCUSMA 1990-2006. 85

LIST OF FIGURES

Figure **Page**

1. Map of the sport fish regions in Alaska and the six Region III management areas....87
2. The Upper Copper/Upper Susitna Management Area (UCUSMA). 88
3. Gulkana River Drainage....89
4. Upper Copper River fishery subdistricts and areas. 90
5. Map of major lake trout fisheries in the UCUSMA. 91
6. Lakes supporting major burbot fisheries in the UCUSMA. 92

LIST OF APPENDICES

Appendix **Page**

A. Listing of the addresses and contact numbers for information sources regarding UCUSMA information. 95
B. Emergency orders issued for UCUSMA sport, personal use, and subsistence fisheries during 2006 and 2007. 96
C. Summary of regulatory changes affecting the harvest of king salmon in the Copper River Drainage. 100
D. Federal subsistence permits and reported harvest from the Copper River, Chitina Subdistrict 2000 – 2007. 101
E. Federal subsistence permits and reported harvest from the Copper River, Glennallen Subdistrict 2000 - 2007. 101

PREFACE

This report provides information for the 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 state Board of Fisheries, Fish and Game Advisory Committees, the general public, and other interested parties. It presents fisheries assessment information and the management strategies that are developed from that information. In addition, this report includes a description of the fisheries regulatory process, the geographic, administrative, and regulatory boundaries, funding sources, and other information concerning Sport Fish Division management programs within the area.

The goals of the Sport Fish Division of the Alaska Department of Fish and Game 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 optimizing social and economic benefits from recreational fisheries. In order to implement these goals the division has in place a fisheries management process.

A regional review is conducted annually during which the status of important area fisheries is considered and research needs are identified. Fisheries stock assessment research 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.

Sport Fish Division management and research activities are funded by State of Alaska Fish and Game (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 the Dingell-Johnson Act or D-J Act). The D-J funds are provided to the states at a match of up to three-to-one with the ADF&G funds. Additional funding specified for providing, protecting, and managing access to fish and game is provided through a tax on boat gas and equipment established by the Wallop-Breaux (W-B) Act. Other peripheral funding sources may include contracts with various government agencies and the private sector.

This area management report provides information regarding the UCUSMA and its fisheries for 2006, with preliminary information from the 2007 season. This report is organized into two primary sections: a management area overview including a description of the management area and a summary of effort, harvest and catch for the area; and a section on the significant area fisheries including specific harvest and catch by species.

ABSTRACT

Sport fisheries management recommendations and background information for 2006 in the Upper Copper-Upper Susitna Management Area (UCUSMA) are presented. This information is provided as a reference for the Alaska Board of Fisheries, general public, and other interested parties. 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 Chinook (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 angler effort was 39,948 angler-days in 2006. Total sport catch and effort has generally declined in the UCUSMA since 2000. Total sport catch in 2006 was the lowest since tracking began in 1990 with only 75,277 fish caught. Sport harvest totaled 26,235 fish in 2006 with sockeye salmon accounting for 54% of the harvest. Without a record sockeye harvest, overall sport harvest would have continued its general decline from 1998. A total of 60,775 salmon were harvested in the Copper River subsistence fishery in 2006 under State permits. Sockeye salmon made up over 95% of the subsistence harvest. The Copper River Personal use fishery harvest has been increasing over the past 5 years and totaled 129,103 salmon in 2006 with sockeye salmon accounting for over 95% of the harvest. Overall, the UCUSMA fish stocks are healthy and sustainable, but significant challenges exist to maintain sustainable stocks in the face of decreasing returns or increased effort on specific lakes or flowing waters.

Key Words: Copper River, Susitna River, Gulkana River, Chitina Subdistrict, Glennallen Subdistrict, personal use, subsistence, king salmon, Chinook salmon, sockeye salmon, burbot, lake trout, Arctic grayling, sport fish, Fisheries Management, Area Management Report

INTRODUCTION

The Alaska Board of Fisheries (BOF) divides the state into eighteen regulatory areas to organize the sport fishing regulatory system by drainage and fishery. These areas (different from regional management areas) are described in Title 5 of the Alaska Administrative Code Chapters 47–70. Sport Fish Division of the Alaska Department of Fish and Game (ADF&G) divides the state into three administrative Regions with boundaries roughly corresponding to groups of the BOF regulatory areas. Region I covers Southeast Alaska (the Southeast Alaska regulatory area). Region II covers portions of Southcentral and Southwest Alaska (including the Prince William Sound, Kenai Peninsula, Kenai River drainage, Cook Inlet–Resurrection Bay Saltwater, Anchorage Bowl, Knik Arm, Susitna River 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, Kuskokwim–Goodnews regulatory areas) .

Region III is the largest geographic region, encompassing the majority of the landmass of the state of Alaska (Figure 1). The region contains over 1,146,000 km^2 (442,500 mi^2) of land, some of the state's largest river systems (the Yukon, the Kuskokwim, the Colville, Noatak, Upper Copper and Upper Susitna River drainages), thousands of lakes and thousands of miles of coastline and streams. Regional coastline boundaries extend from Cape Newenham in the southwest, around all of western, northwestern and northern Alaska to the Canadian border on the Arctic Ocean. Region III as a whole is very sparsely populated, with the most densely populated center located in the Tanana River Valley. Fairbanks (population about 30,000) is the largest community.

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

The Northwestern/North Slope Management Area (Norton Sound, Seward Peninsula, Kotzebue Sound, and North Slope drainages);

The Yukon Management Area (the Yukon River drainage except for the Tanana River drainage);

The 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);

The Upper Tanana River Management Area (the Tanana River drainage upstream from Banner Creek and the Little Delta River);

The Lower Tanana River Management Area (the Tanana River drainage downstream from Banner Creek and the Little Delta River); and,

The Kuskokwim Management Area (the entire Kuskokwim River drainage and Kuskokwim Bay drainages).

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

THE ALASKA BOARD OF FISHERIES

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

Statewide fisheries issues may be considered at any BOF meeting. 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 fish and game advisory committees, and special interest groups such as fishermen's associations and clubs. The public provides their input concerning regulation changes and allocation through submission of written proposals and testifying directly to the BOF, by participating in local fish and game advisory committee meetings, or by becoming members of local fish and game advisory committees.

ADVISORY COMMITTEES

Local Fish and Game Advisory Committees have been established throughout the state to assist the Boards of Fish and Game in assessing fisheries and wildlife issues and proposed regulation changes. Advisory committee members are nominated from the local public and voted on by all present during an advisory committee meeting. Most active committees in urban areas meet in the fall and winter on a monthly basis. Rural committees generally have only one fall and one spring meeting due to funding constraints. Advisory meetings allow opportunity for direct public interaction with department staff attending the meetings that answer questions and provide clarification concerning proposed regulatory changes regarding resource issues of local and statewide concerns. The Boards Support Section within the Division of Administration provides administrative and logistical support for the BOF and Fish and Game Advisory Committees. During 2006, the department had direct support responsibilities for 81 advisory committees in the state.

Within the Upper Copper/Upper Susitna Management Area (UCUSMA) there are three advisory committees the 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 advisory committees 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, 2005 in Valdez. The board addressed 35 proposals (including 1 Board generated proposal) specific to Copper River subsistence and personal use fisheries and UCUSMA sport fisheries. Of these 12 were adopted, 16 opposed, and no action taken on seven.

Three proposals were adopted that affected the Copper River subsistence fishery in the Glennallen Subdistrict. The BOF adopted a proposal requiring that live boxes on fish wheels be checked every 10 hours. The original proposal requested a 24 hour check period, but based on input from the Alaska Bureau of Wildlife Enforcement (ABWE) an amendment reducing the time to every 10 hours to allow better enforcement of the regulation was adopted. A second proposal required that only one commercial opening can occur inside of the barrier islands, during each of the first two statistical weeks in the Copper River District. The intent of the board regarding this proposal was to provide for Upper Copper River subsistence harvests and escapement of the early Chinook (king) and sockeye salmon stocks. Thirdly, the board generated a proposal that set Amounts Necessary for Subsistence (ANS) in the Glennallen Subdistrict. To measure subsistence harvests, particularly in the upper portion of the subdistrict, the Glennallen Subdistrict was divided into three components and the amounts of salmon that are reasonably necessary for subsistence uses were set at: 1) 25,500 to 39,000 salmon for that portion of the Glennallen Subdistrict from the Chitina-McCarthy Road Bridge to the Tonsina River; 2) 23,500 to 31,000 salmon for that portion of the Glennallen Subdistrict upstream of the Tonsina River to the Gakona River; and, 3) 12,000 to 12,500 salmon for that portion of the Glennallen Subdistrict upstream of the mouth of the Gakona River to the Slana River and including the Batzulnetas fishery. The ANS figures are based on reported harvests and not on final estimated expanded harvests in the three areas. Previously, the ANS for the Glennallen Subdistrict was set at 60,000 to 75,000 for the entire subdistrict.

The BOF rejected or took no action on three proposals requesting changes in the Chitina Subdistrict personal use fishery.

The BOF adopted a proposal to close the waters of the Susitna River drainage above Devils Canyon to all salmon fishing. A small number of these drainages support small stocks of salmon that may not be able to sustain a fishery. No other proposals regarding salmon sport fisheries in the UCUSMA were adopted during the 2005 BOF meeting.

Two proposals were adopted specific to rainbow trout/steelhead by the BOF. (See Wild Rainbow and Steelhead Trout Sport Fisheries, Recent Board of Fisheries Actions, page 44)

Three proposals were adopted specific to Arctic grayling. The first incorporated Moose Lake, Our Creek, and the Gulkana River drainage upstream of Paxson Lake under the conservative management category in the Wild Arctic Grayling Management Plan. The remaining two proposals set the bag and possession limits for Arctic grayling in Moose Lake and Our Creek at

two fish, no size limit, and an open season of June 1 – March 31; and the bag and possession limit for Arctic grayling in the Gulkana River drainage upstream of Paxson Lake at two fish, of which only one may be 14 inches or greater in length. Previously, the Arctic grayling fisheries in Moose Lake and Our Creek were under the background bag and possession limits of five fish, no size limit for the entire year. Department data indicated the Arctic grayling population in this system had declined and the conservative management strategy would allow the population to recover to historic levels. The Gulkana River drainage upstream of Paxson Lake was previously under catch-and-release regulations to provide a trophy Arctic grayling fishery.

The BOF adopted a proposal to allow bait in the entire Tonsina River drainage downstream of Tonsina Lake. This was a housekeeping measure to clarify regulations previously adopted during the 2003 meeting.

Two proposals were adopted by the board for lake trout (See Lake Trout Sport Fisheries, Recent Board of Fisheries Actions, page 40).

The BOF considered two proposals regarding changes to the UCUSMA regulations at the January 2004 meeting. The BOF adopted the Regional Arctic Grayling Management Plan and the Regional Stocked Waters Management Plan (Taube 2006 b).

At its January, 2003 meeting in Cordova, the BOF addressed 50 proposals regarding UCUSMA sport, personal use, and subsistence fisheries (Taube 2006 a). Major changes to the fisheries regulations at this meeting involved the Chitina Subdistrict reclassification to personal use, Glennallen Subdistrict fish wheel identification and fish marking requirements, adjustments to the Copper River king salmon escapement goal, Gulkana River rainbow trout and steelhead closed areas, UCUSMA burbot bag and possession limits and closed waters, UCUSMA Arctic grayling bag and possession limits, methods and means in Paxson and Summit lakes, bow fishing for whitefish and suckers, and ice house registration.

Several major changes regarding the management of Chinook (king) salmon, resident species, and the personal use fisheries in the UCUSMA were passed by the BOF during the 1999 BOF meeting in Valdez (Taube 2002).

ADF&G EMERGENCY ORDER AUTHORITY

ADF&G has emergency order (EO) authority (5 AAC 75.003, 2006) to modify time, area, and bag/possession limit regulations. Emergency orders are implemented to deal with conservation issues that are not adequately controlled by existing regulations. Once implemented, an EO deals with the situation until it is resolved or the BOF can formally take up the issue. Emergency orders are also used as a tool for “in-season” management of fisheries. In-season management is usually in accordance with a fisheries management plan approved by the BOF. Emergency orders issued under this authority for the UCUSMA during 2006-2007 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 rural residents on lands and waters for which the federal government asserts jurisdiction. The state of Alaska also has established a priority for subsistence use of fish and game by Alaskan residents (AS 16.05.258), but cannot discriminate between residents (Alaska State Constitution Article VIII, sections 3 and 15). Since the state did not amend the Alaska Constitution to conform to federal regulations, the federal government has

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 management responsibilities for subsistence fisheries on federal public lands (includes non-navigable waters on public lands). Following the "Katie John" decision by the 9th Circuit Court in 1995, the federal government expanded the definition of public land to include waters for which the federal agencies assert reserved water rights. Under current practice, the federal land management agencies assert management to protect the priority subsistence use by qualified rural residents in non-navigable waters within federal public lands (includes Bureau of Land Management [BLM] lands) and in navigable waters adjacent to or within federal conservation units (generally does not include BLM lands). The state retains all other fish and wildlife management authorities, including management on federal land.

The development of regulations for subsistence fisheries under federal management occurs within the established Federal Subsistence Board (FSB) process. The public provides their input concerning regulation changes by testifying in Federal Subsistence Regional Advisory Council meetings or by becoming council members. Ten Regional Advisory Councils 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 Regional Council 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 under federal management include those in the Prince William Sound Area (including federal waters in the Upper Copper River Drainage). The UCUSMA fisheries fall under the purview of the Southcentral Regional Advisory Council. The council's most recent meeting was held in October, 2007 in Anchorage. At this meeting, no federal fisheries proposals for the Prince William Sound Area were addressed.

REGION III SPORT FISH DIVISION RESEARCH AND MANAGEMENT STAFFING

The Region III Sport Fish Division staff biologists are organized into a research group and a management group. The management group consists of a management supervisor, an area biologist for each of the six management areas, one or more assistant area management biologists, and two stocked water biologists. The 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, advisory committees, and the general public. The stocked waters biologists plan and implement the regional stocking program for recreational fisheries. The regional management biologist assigned to the Region III headquarters 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. The research biologists plan and implement fisheries research projects in order to provide information needed by the management group to meet divisional goals. The duties of the management and research biologists augment one another.

STATEWIDE HARVEST SURVEY

Sport fishing effort and harvest of sport fish species in Alaska have been estimated and reported annually since 1977 using a mail survey (Mills 1979-1980, 1981a-b, 1982-1994; Howe et al.

1995-1996, 2001a-d; Walker et al 2003; Jennings et al. 2004, 2006a-b, 2007, *In prep a-b*). The survey is designed to provide estimates of effort, harvest, and catch on a site-by-site basis. It is not designed to provide estimates of effort directed towards a single species. Species-specific catch-per-unit-effort (CPUE) information can seldom be derived from the report. Two types of questionnaires are mailed to a stratified random sample of households containing at least one individual with a valid fishing license (resident or non-resident). Information gathered from the survey includes participation (number of anglers, trips, 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. The survey results for each year are not available until the following year; hence the results for 2006 were not available until fall 2007. Additionally, creel surveys have been selectively used to verify the mail survey for fisheries of interest, or for fisheries that require more detailed information or inseason management.

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

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

SECTION I: MANAGEMENT AREA OVERVIEW

MANAGEMENT AREA DESCRIPTION

The Upper Copper River Upper Susitna River Management Area 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) (5 AAC 52.005). 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. Snow machines 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), Bureau of Land Management (Gulkana Wild River), Ahtna Incorporated, 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 participants. Three species of Pacific salmon (Chinook or king *Oncorhynchus tshawytscha*, coho *O. kisutch*, and sockeye *O. nerka*) are available to anglers fishing the Upper Copper River drainage. A velocity barrier in Devil's Canyon prevents upstream migration for most salmon species into the Upper Susitna River. Only a few small stocks of Chinook salmon are found in the Upper Susitna River drainage from Devil's Canyon upstream to Fog Creek.

Popular fisheries occur on the area's resident stocks of Arctic grayling (*Thymallus arcticus*), burbot (*Lota lota*), Dolly Varden (*Salvelinus malma*), rainbow and steelhead trout (*O. mykiss*), and lake trout (*Salvelinus namaycush*). Smaller fisheries occur on resident stocks of whitefish (*Coregonus* and *Prosopium sp*).

A total of 29 lakes in the UCUSMA are stocked with rainbow trout, coho salmon, and Arctic char (*S. alpinus)*. The stocked fish are reared at state-owned hatcheries on Fort Richardson and Elmendorf Air Force Base in Anchorage. The stocked-lake fisheries provide additional and 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 overwinter incubation is 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 Board of Fisheries (BOF) has established one personal use and two subsistence salmon fisheries in the Upper Copper River. The Division of Sport Fish has the lead management responsibility for these fisheries (as opposed to Commercial Fisheries Division which manages most of the State subsistence fisheries). From 2001 through 2005, an average of 174,917 salmon was reported harvested annually in these fisheries (Table 1). Sockeye salmon comprise about 95% of the total harvest.

Returns of salmon to the Copper River also support commercial fisheries in the Copper River District, located near the mouth of the Copper River. From 2001 through 2005, an average of 1,227,960 sockeye salmon and 39,759 Chinook salmon were commercially harvested in the Copper River District (Botz et al. 2008; 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 77.025, 5 AAC 77.570, and 5 AAC 77.591 (personal use fishing), in 5 AAC 01.001 through 5 AAC 01.040, 5 AAC 01.580, 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).

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, 2006). 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 Fishery Management Plan (5 AAC 24.361, 2006). 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 fishing period per statistical week 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 four 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.

Copper River Subsistence Salmon Fisheries Management Plan (5 AAC 01.647, 2004). This management plan 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.

Copper River Personal Use Dip Net Salmon Fishery Management Plan (5 AAC 77.591, 2003). This management plan 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.

Lake Burbot Management Plan (5 AAC 52.045, 1989). This management plan stipulates that the burbot fisheries in lakes of the UCUSMA be managed to ensure maximum sustainable harvests, and provides the department the authority to use emergency orders to reduce the time or areas open to fishing and/or prohibit set lines to accomplish this management objective.

Wild Arctic Grayling Management Plan (5 AAC 52.055, 2006). This management plan directs the department to manage wild Arctic grayling populations in the UCUSMA for long-term sustained yield through a conservative harvest regime. The plan establishes and defines three management approaches under which the department 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 the department, public and/or Board to change or address the management approach for a water body or fish stock.

Wild Lake Trout Management Plan (5 AAC 52.060, 2006). This management plan directs the department 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. The

department may take one 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 two 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.

Upper Copper River and Upper Susitna River Area Stocked Waters Management Plan (5 AAC 52.065, 2004). This management plan directs the department to manage stocked waters in the UCUSMA to provide the public diverse fishing opportunities. The plan establishes and defines three management approaches under which the department 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, department or board during the board's meeting cycle.

Cook Inlet & Copper River Basin Rainbow/Steelhead Trout Management Policy. This management policy was adopted by the BOF to provide future boards, 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 through 1999 commercial, subsistence, personal use, and sport harvests of king salmon increased, which raised concerns regarding sustainability of these harvest levels. From 1999 to 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 and LGL, Inc.

As a result of the actions taken through the CRKSMP, king salmon harvest has 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 will remain controversial.

Copper River Personal Use/Subsistence Salmon Fisheries: The Chitina Subdistrict dip net 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 has changed back and forth at different BOF meetings creating animosity among user groups with each change. The repeal of the Chitina Subdistrict as a subsistence fishery in 2003 frustrated some of the more vocal dipnetters. The commercial users were supportive of the repeal, as the Chitina Subdistrict

harvest no longer had a subsistence priority over the commercial harvest allocation. The Alaska Native population was also supportive of the repeal as the villages do not consider the urban dipnetters "true" subsistence users. The classification of the Chitina Subdistrict will continue to remain an issue as well as the allocation of the Copper River salmon harvests between upper and lower river stakeholders.

Land Access: Ahtna Incorporated owns a majority of the land along the three major river 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 Scenic River corridor. Ahtna Incorporated 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. The Klutina Road runs parallel to the north shore of the Klutina River and is a combination of a 17b public easement (managed by the Bureau of Land Management (BLM)), RS 2477, and a DOT ROW and provides free access to Klutina Lake and Klutina River where the river passes within the width of one of these easements. On the Gulkana, public access to the lower river is limited to four public easements along the Richardson Highway (Sailors Pit near Gakona (mp 130.9), Poplar Grove (mile 137), and Mile 141 pullout) and the Richardson Highway Bridge right-of-way (ROW). Access fees angered many of the sport fishing public that traditionally used corporation lands to access the rivers and resulted in some users avoiding these access points.

Access to the Chitina Subdistrict fishery has long been an issue between dipnetters and the two 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. The Alaska Legislature removed the access fee from the permit due to the DOT survey results. 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. During 2005-2006, the Alaska Native corporations placed a fee station at the site and allowed access to the river to those individuals who paid the access fee.

User Conflicts: Since 1991 there has been a significant increase in the use of powerboats above the Richardson Highway on the Gulkana and Klutina Rivers. Increased use by float and powerboat operators on these rivers has intensified conflicts between users. Float and powerboat operators can anchor and fish from their boats on holes in the Gulkana or drop passengers off to fish from the bank on the Gulkana or Klutina Rivers, casting and drifting lures through the holes. Shore anglers are limited to the few holes with public access and feel further limited when a boat angler also fishes those holes. Additionally, reports have been made by float-boat operators that powerboats have bumped into them. The Bureau of Land Management (BLM) updated the

management plan for the Wild portion of the Gulkana River upstream of Sourdough in 2006 to deal with impacts from increased recreational use of the river (BLM 2006).

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 of the larger 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 and lake trout stocks in UCUSMA lakes. Under these management plans, the board adopted more conservative regulations for UCUSMA burbot and lake trout fisheries which allows previously overfished stocks to recover enough to permit sustainable fisheries, and which protect healthy stocks from overharvest. Part of the current regulatory regime is the elimination of unattended setlines from the burbot fishery. Many local anglers oppose elimination of setlines and have submitted proposals to the BOF to have unattended setlines reintroduced to the fishery. ADF&G staff opposes the reintroduction of unattended setline use in lakes, but has allowed use of unattended setlines under conservative sport fishing regulations for the mainstem Copper River.

Invasive species: Introduction of non-native species of fish, macrophytes, or invertebrates is a constant threat within the area. Introduction of such species can disrupt the natural ecology of UCUSMA waters and displace important native species. Northern pike are not native to the waters of the UCUSMA, but anecdotal reports of their presence have been increasing in recent years. Extensive sampling for northern pike was conducted in Tyone and Paxson lakes during spring 2006 (Somerville and Taube 2007). No northern pike were captured during sampling, which suggests there is a low probability that northern pike are present in the UCUSMA.

ACCESS PROGRAMS

The Wallop-Breaux amendment to the Federal Aid in Sport Fish Restoration Act (D-J) mandates that at least 15% of the federal funds collected from taxes on boat gas and sport fishing equipment be used by the states for the development and maintenance of motorized boating access facilities. A broad range of access facilities can be approved for funding if they are constructed to achieve a state fishery management objective. These facilities can include boat ramps and lifts, docking and marina facilities, breakwaters, fish cleaning stations, rest rooms, and parking areas.

In spite of the large land base in the UCUSMA, access to sport fishing is restricted near most popular fisheries due to private ownership. In addition, few roads and trails exist, and suitable locations for boat launches are scarce. 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 emergency orders for the UCUSMA can be found at the Department of Fish and Game, Division of Sport Fish website (www.sf.adfg.state.ak.us/statewide/index.cfm). 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. Ahtna Inc. 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 three regional information and education (I&E) staff located in the Fairbanks office. An Information Officer II and a seasonal Fisheries Technician III respond to questions from the public at the office and via phone and e-mail. In addition, I&E staff distribute and update fishery brochures, fishing regulations, the regional webpage, coordinate the Fairbanks Outdoor Show booth and 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 and harvest statistics for UCUSMA fisheries are reported in the statewide harvest survey (SWHS) under the heading "Glennallen Area" (Area I) (Mills 1979-1980, 1981a-b, 1982–1994, Howe et al. 1995-1996, 2001a-d, Walker et al. 2003, Jennings et al. 2004, 2006a-b, 2007, *In prep* a-b). In 2004, the statewide harvest survey data areas were modified and UCUSMA fisheries are now divided under the headings of the "Upper Copper River Drainage" (Area I) and the "Susitna River Drainage" (Area M) (Jennings et al. 2007, *in prep a*). Angler effort in the UCUSMA averaged 2.0% of the overall statewide effort from 2001-2005, but was only 1.7% of the overall statewide effort in 2006 (Table 3).

Anglers expended a total of 39,948 angler-days of effort in UCUSMA drainages in 2006 (Table 4). This is the lowest effort recorded for the area since 1977 and mainly reflects a large drop in effort in the Gulkana River drainage. With the exception of the Klutina River, where the 2006 effort exceeded the average for the previous five years (2001 – 2005) by 26%, effort expended in all other UCUSMA drainages in 2006 fell below the previous five year average.

Total sport catch in the UCUSMA during 2006 was 75,277 fish (Table 5); this was the lowest recorded catch since documentation began in 1990. Arctic grayling, lake trout, burbot, and rainbow trout catches in 2006 were all 46% to 62% below the previous 5-year (2001-2005) average. Chinook (king) and sockeye salmon were the only species with higher catch in 2006 versus 2005 and only the 2006 sockeye salmon catch exceeded the average catch for the previous five years (2001-2005).

As with effort and catch, the 2006 harvest of 26,235 fish was the lowest for the UCUSMA since 1977 (Table 6). Harvest of lake trout and burbot in 2006 reflected the drop in catch for these species and was 57% and 62% below the average for the previous five years (2001-2005). Arctic grayling harvest was 10% less in 2006 than in 2005 while the catch dropped 50% from 2005 to 2006. Sockeye harvest in 2006 was the highest since 1977 and made-up 54% of all fish harvested in UCUSMA during 2006.

SECTION II: FISHERIES

The following text discusses the major sport fisheries in the UCUSMA. Discussion of each fishery will center on harvest and catch data presented in the 2006 SWHS (Jennings et al. *in prep*). Survey results for 2007 will not be available until the summer of 2008. However, observations or research data regarding these fisheries in 2007 will be presented when available. A summary of the historical sport catch and harvest of fish in the UCUSMA by species is presented in Table 5 and Table 6, respectively.

KING SALMON SPORT FISHERIES

Background and Historic Perspective

The Copper River drainage supports the only anadromous runs of Chinook (king) salmon in the UCUSMA. In the Upper Susitna River drainage, a single anadromous stock of king salmon has been documented above Devils Canyon. This is unusual because Devils Canyon presents a velocity barrier that limits upstream migration of most salmon.

King salmon returning to the Copper River drainage pass through the Copper River Delta and enter the Copper River in early May. The peak migration 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 Copper River tributaries through June and July and spawn mid-July through August.

King salmon are distributed throughout the Copper River basin occurring in at least 40 tributaries. Aerial escapement surveys have been conducted in 35 of these systems, with nine of these systems (Little Tonsina River, Greyling Creek, Mendeltna Creek, Kiana Creek and Indian River, Gulkana River, East Fork Chistochina, Manker and St. Anne Creeks in the Klutina River drainage) surveyed consistently since 1966 (Roberson and Whitmore 1991). Unfortunately, the variability of the proportion of total escapement between years and that the majority of the nine index streams represent early run stocks make aerial surveys an unreliable index of king salmon escapement in the Copper River.

A radiotelemetry study conducted by the department from 2002-2004 showed that only 45% of the 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 2005 a). The study also indicated that the nine index streams represented only 26%-46% of the total escapement. Only four aerial survey streams (Gulkana River and East Fork Chistochina and Klutina River (Manker and St. Anne Creeks) are currently used to provide an inseason index of run strength in the major sport fishery systems, prior to the availability of the total escapement estimates post-season.

The *Copper River King Salmon Fishery Management Plan* is the primary guide to management of king salmon stocks in the Copper River drainage. Copper River king salmon stocks are harvested in a commercial gillnet fishery on the Copper River Delta, 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 along various spawning tributaries. Since 1977, the total harvest of king salmon in these fisheries has ranged from 14,000 to over 85,000 fish (Table 7). From 2001-2005, total harvest of Chinook salmon from the Copper River averaged 51,713 fish. Because most of these fisheries are made up of mixed stocks, the contribution to the harvest by each spawning stock cannot be quantified and

king salmon productivity cannot be assessed using stock specific spawner-recruit relationships (Brady et al. 1991; Roberson and Whitmore 1991).

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 8). The combined sport harvest of king salmon from these two rivers, in 1991, was more than double the previous 10-year average. Effort and harvest continued to increase through 1994 when an annual bag limit of five king salmon was established (Appendix C). The annual bag limit and a subsequent reduction in season on the Klutina River had no apparent effect on effort, which remained generally the same and harvest level which increased through 1999. In 2000, the annual bag limit for king salmon was reduced to 4 kings. Effort and harvest began declining after the reduced limit was imposed and has continued to decline through 2006 to their lowest level since 1990.

To more accurately assess king salmon abundance, research was initiated in 1995 to estimate the timing and contribution of king salmon stocks from major tributaries to the Copper River. In 1996, a weir was operated on the Gulkana River to enumerate king salmon, as well as a creel survey to estimate king salmon harvest (LaFlamme 1997). From 1997-1999, a coded-wire tagging study was conducted in the Gulkana, Klutina, Tonsina, and East Fork Chistochina rivers. Unfortunately, marking wild king salmon smolt 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 1999-2002, radiotelemetry studies were used to determine the distribution of king salmon in the spawning tributaries of the Copper River, as well as timing of entry into the spawning streams and through the personal use fishery (Evenson and Wuttig 2000; Wuttig and Evenson 2001; Savereide and Evenson 2002; Savereide 2003, 2004, 2005a).

As part of these studies from 1999–2002, estimates of total escapement were obtained from a mark-recapture experiment in which king salmon were captured and tagged during the radio-transmitter deployment and fish were recaptured in the Chitina Subdistrict personal use fishery. In 2002 a separate mark-recapture study was initiated using only fish wheels. This study, conducted by the Native Village of Eyak and LGL, Inc., has provided a post-season estimate of Chinook (king) salmon escapement to the Copper River since 2003 (Smith et al. 2003, Smith 2004, Smith and van den Broek 2005a, 2005b).

From 1981 through 1990, king salmon returns to the Copper River were above historical averages, but the resource was showing signs of stress evidenced by a trend of below average escapements to some systems (Roberson and Whitmore 1991). Total harvest (commercial, personal use, subsistence, and sport) of Copper River king salmon remained high through 2003 (Table 9). Aerial surveys on four spawning systems, weir counts on the Gulkana River, and sport harvest levels on the Klutina and Gulkana Rivers still suggest annual variability in return levels between spawning systems. However, overall returns remained at or above historic averages and escapements have surpassed the lower bound of the SEG (24,000 fish or greater) in four of the last five years (2003-2007). From 1999 – 2007 total king salmon returns ranged from 65,820 – 98,864 fish (Table 9) and averaged 81,991 fish over the last 5 years (2002-2006). King salmon escapement has ranged from 16,286 – 58,489 from 1999 – 2007 and averaged 33,270 fish over the last 5 years (2002-2006).

Gulkana River Chinook (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 (Figure 3). The section of the Gulkana River upstream from Sourdough has been designated as "wild" under the Federal Wild and Scenic Rivers Act of 1968. Access to the river is available from various secondary roads and trails off the Richardson Highway, which parallel much of the river. Anglers may 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 Sourdough and use the river from approximately 2 miles below Sourdough upstream to the confluence of the West Fork. More recently powerboat operators have begun launching from the Richardson Highway Bridge and fishing the 5-mile reach of the river above the bridge. Powerboat operators also access the mouth of the Gulkana River using powerboats launched from Gakona and the Richardson Highway Bridge.

The Gulkana River drainage has historically supported the largest sport fishery for the catch (Table 10) and harvest (Table 8) 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, but fishing for king salmon continues until the season closes in mid-July. Spawning begins in mid-July and continues through late August. Most spawning occurs upstream of the confluence of the West Fork.

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

In conjunction with the Bureau of Land Management, ADF&G installed a counting tower in 2002 on the Gulkana River upstream of the West Fork to estimate the escapement of king salmon. The observed escapement passing the counting tower in 2006 was 4,846 (Perry-Plake and Taras *in prep* a) and in 2007 was 4,464 king salmon (Perry-Plake, personal communication). From 2002–2004, a radiotelemetry tracking station was installed at the tower site to provide data in conjunction with the Copper River king salmon radiotelemetry project that enabled the estimation of the proportion of radio-tagged king salmon migrating past the tower to the total entering the Gulkana River. The radio tag data indicated 50%–86% of the Gulkana River king salmon run passed the counting tower during these years (Taras and Sarafin 2005, Perry-Plake and Taras 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 Chinook salmon from the Gulkana River occurs from the Richardson Highway Bridge upstream to the confluence of the West Fork. Potterville and Webster (1990) reported that in 1989 sport anglers on the Gulkana River expended 29,103 angler-hours to catch 2,398 king salmon. Sixty-one percent (1,461 fish) of the catch was estimated to be harvested. This estimate verified the accuracy of the SWHS by closely matching that year's statewide harvest mail survey estimate of

1,630 king salmon harvested in this fishery. LaFlamme (1997) reported 35,080 angler-hours were expended in 1996 to catch 4,920 king salmon with 50% of the catch harvested. These estimates were not consistent with the 1996 SWHS estimates of 17,815 king salmon caught and 5,260 harvested due to bias created by surveying too few access points.

During the creel surveys conducted in 1989 and 1996 few anglers appeared to fish the single-hook, artificial fly-fishing-only area. 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 catch and harvest 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 the 1989 and 1996 creel surveys, approximately 50% of the harvest occurred on weekends.

Regulations used to manage the Gulkana River fisheries are somewhat complex to accommodate concurrent fisheries on other species and to provide maximum opportunity for the wide variety of anglers who target king salmon. All waters above the Middle Fork confluence with the mainstem Gulkana River are closed to fishing for king salmon year-round to protect spawning fish. The remainder of the river is open to king salmon fishing from January 1 through July 19. The closure date is intended to offer protection to spawning fish. The Gulkana River from the Richardson Highway Bridge downstream to a department marker 500 yards downstream of its confluence with the Copper River is an area where only single-hook, artificial flies may be used from June 1 through July 31. In all waters of the Gulkana River drainage, upstream of a marker 7.5 miles upstream of the West Fork confluence with the mainstem, only unbaited, single-hook artificial lures may be used. This regulation is intended to protect rainbow trout stocks that inhabit this area.

Recent Fishery Performance

The sport harvest of Chinook (king) salmon in the Gulkana River averaged 2,885 fish from 2001-2005 and 3,710 fish from 1996-2005 (Table 8). Harvest of Gulkana River king salmon has declined since 1997, with the 2006 harvest of 2,147 king salmon being the fourth lowest since 1991. Annual sport harvest of king salmon on the Gulkana River generally mimics the sport fishing effort, which has also dropped since 1997 (Table 4). Due to the nature of the mail survey, effort is not assigned to individual species, but observations suggest that the majority of effort is directed toward king salmon. Sport fishing effort on the Gulkana River during 2006 was the second lowest since the inception of the SWHS in 1977. It is unclear what is causing these trends as tower counts and aerial surveys of king salmon on the Gulkana River have indicated neither a decreasing nor increasing trend for escapements from 2000–2006.

Fishery Objectives and Management

The underlying goal of past and current management of king salmon on the Gulkana River has been to ensure sustained yield, but there is currently no spawning escapement goal specific to the Gulkana River. An annual spawning escapement objective of 1,200 fish has been established, based on enumeration of spawning fish by aerial surveys. The *Copper River King Salmon Fishery Management Plan* was developed in 1996 to provide for king salmon escapement at or above average historic levels. Since the plan was implemented, aerial escapement counts of king salmon in the Gulkana River drainage have been above the 1987-1996 average (using only years surveyed between July 17 and August 31) of 951 king salmon 80% of the time and met or exceeded the aerial survey escapement objective of 1,200 for the Gulkana River 67% of the time.

Fishing effort for king salmon on the Gulkana River is influenced by water level and clarity, reported inseason run strength, and management actions on other roadside king salmon fisheries (such and the Kenai and Deshka rivers). Declines in effort may continue, but should be anticipated to increase simply due to population increases within Anchorage and Fairbanks. Inseason management depends on voluntary reports from sport anglers, guides; permit returns from Copper River subsistence and personal use fishers; aerial surveys; and counting tower reports.

Current Issues and Fishery Outlook

Since 1991 there has been an apparent increase in the use of powerboats between the Richardson Highway and the Sourdough landing on the Gulkana Rivers. Prior to 2005, there was no way to track the number of guides using the river. In 2005, ADF&G required guides to log the catch and harvest per client, per trip and record what water system the harvests occurred in. These data are not yet available. Prior to the 1986 season, only one individual specialized in guiding anglers for king salmon on the Gulkana River. Commercial guides operating above the Sourdough landing and within the Wild and Scenic Corridor are required to register with the Bureau of Land Management (BLM). Fourteen guides registered with the BLM to operate on Upper Gulkana River (Wild and Scenic River Corridor) in 2006 (Denton Hamby, BLM, personal communication). Available data indicate that guided anglers are more successful than unguided anglers.

Increased use by float and powerboat operators on the Gulkana River has intensified conflicts between these user groups. There were two proposals submitted for the 1999 BOF meeting regarding motorized use on the Gulkana River and one proposal submitted for the 2003 BOF meeting requesting the prohibition of motorized boats for fishing and transporting on the entire Gulkana River drainage. None of these were addressed, as they fell outside the purview of the BOF.

Public access to the Lower Gulkana River complicates management of the king salmon fishery and will continue to be an issue, if fishing pressure begins to increase. Ahtna Corporation, in conjunction with the Department of Transportation, is planning the development of a public use area on its lands near the Richardson Highway Bridge, a popular site for fishing and camping where land ownership is in dispute. This may help reduce overall user impact to the area, but will not increase overall access to the river.

It is anticipated that effort and harvest of king salmon in the Gulkana River will remain at current levels in the near future. The increased effort and harvest that resulted in the early 1990s may have been a result of restrictions on the Cook Inlet sport fisheries (Kenai, Susitna catch-and-release and closures). As these restrictions were lifted, effort on the Gulkana River declined. Recent data indicate a potential for overharvest of the Gulkana River king salmon stocks, if river conditions such as water clarity and water level are conducive to fishing success. The combined data from the counting tower, aerial indices, and the SWHS demonstrate that current king salmon returns to the Gulkana River are about average for this system. There are no indications of a dramatic increase or decrease within the next few years.

Recent Board of Fisheries Actions

There has been no action directed at the Gulkana River king salmon fishery during the past two BOF cycles.

Current or Recommended Research and Management Activities

Managers depend on aerial surveys to index the escapement of Chinook (king) salmon. The surveys are post-season indicators of relative spawning abundance due to their dependence on survey conditions, surveyor, and the residence of fish in the survey area. The Gulkana River counting tower project will hopefully result in an escapement goal set for the Gulkana River king salmon stocks, but at least a 10 year database needs to be collected. The operation of the counting tower does provide inseason data, which once a historic record is built, will provide managers with data previously unavailable. Aerial surveys will be continued to index numbers of spawning salmon, and the results compared to counting tower counts.

Genetic analysis of king salmon stocks in the Copper River drainage was conducted from 2003–2005. The study was intended to document the timing and origins of Chinook salmon stocks in the Copper River fisheries that target them (Seeb et al. 2006). The study identified 4 genetic groups of Chinook salmon in the Upper Copper River, Gulkana River, middle rivers (Tazlina, Klutina and Tonsina rivers) and the Chitina River. The most genetically distinct stocks were located in the Upper Copper River from the Chistochina River upstream. The ultimate objectives of the study are to delineate geographic and temporal stocks within the Copper River, investigate run timing with respect to these stocks, characterize the timing of stocks in the Copper River commercial fishery and determine the proportion of Copper River versus delta stocks within the harvest, and contribute the Copper River data to a coastwide DNA database.

Daily sampling of the Chitina Subdistrict personal use fishery occurs annually from the opening of the fishery in June through the entire king salmon run and the majority of the sockeye salmon run ending at the end of August. Length and age data of sockeye and king salmon harvested in the fishery are collected. Otoliths from a portion of the sampled sockeye salmon are removed to be examined for the presence of a strontium mark that was imprinted on 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 sockeye and king salmon Chitina Subdistrict harvest.

Recommended research projects are the continuation of the Gulkana River counting tower project and support of the NVE/LGL king salmon estimation project. The king salmon estimation project provides data necessary to evaluate whether Copper River fishery management has complied with the Copper River king salmon management plan. Management projects should include continued aerial survey data collection. Continuation of the management project collecting biological data from king and sockeye salmon harvested in the Chitina personal use fishery should also continue.

Klutina River Chinook (King) Salmon Sport Fishery

Background and Historical Perspective

The semi-glacial Klutina River drops rapidly out of Klutina Lake to enter the Copper River at the community of Copper Center. Access to the river is available along the Richardson Highway and from 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. The distance between the Klutina Lake Road and the river varies along the course of the road, with the road running along the ridge above the river. Jet riverboats are used by experienced operators to access the upstream portions of the river. Jet boats are launched

from private land adjacent to the highway or from a site within the highway ROW along the new Richardson Highway Bridge. The river has considerable stretches of whitewater and is considered to be very challenging to jet riverboat operators. The fast water of the Klutina River limits the number of resting pools for king salmon; therefore there are less than two dozen good fishing sites in the lower portion of the river accessible to most anglers.

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. Peak spawning occurs from late July through August. Most spawning occurs upstream of a point adjacent to mile 19.2 on the Klutina Lake Road. The king salmon sport fishery peaks during the second week of July, but fishing continues until the season closes on August 1.

King salmon spawning season closures were established in the UCUSMA during the 1989 BOF meeting to allow king salmon to spawn unperturbed. On the Klutina River upstream of a department marker located adjacent to Mile 19.2 of the Klutina Lake Road, king salmon may be taken only from January 1 through July 19. Downstream of this marker, the king salmon season is from January 1 through July 31. The current daily bag and possession limit for sport caught king salmon over 20 inches is one fish. The Upper Copper River drainage-wide annual bag limit of four king salmon per year includes the Klutina River.

Results of a 1988 creel survey (Roth and Delaney 1989) indicated that sport anglers caught a total of 1,048 king salmon of which 43% were retained. The estimated harvest (450) was close to that reported in the mail survey for 1988 (483), indicating that the SWHS accurately estimates sport harvest in this fishery. A 1989 creel survey (Potterville and Webster 1990) estimated 1,587 king salmon caught of which 65% were retained. The estimated harvest (1,031 fish) was again close to that reported in the mail survey for 1989 (652 fish).

The 1988 creel survey indicated that guided boat anglers accounted for nearly 90% of the catch and 80% of the harvest of king salmon (Roth and Delaney 1989). The 1989 creel survey reported that boat anglers accounted for 88% of the estimated total catch and exhibited significantly higher catch (3.3 fish per hour) and harvest (2.1 fish per hour) rates than did shore anglers (0.5 and 0.4 fish per hour, respectively) (Potterville and Webster 1990). The vast majority of boat anglers that participated in the fishery were guided and therefore insufficient data were available to determine if guided boat anglers had different catch or harvest rates than unguided boat anglers. Daily estimates of CPUE from the 1988 survey were used to estimate the timing of king salmon into the fishery. These data indicated that CPUE peaks during mid-July, with 50% of the run having entered the river by late July. Approximately 12 guides operated on the Klutina River during 1989 and 1990, all of which conducted boat trips. In the 1988 and 1989 creel surveys, the vast majority of shore anglers fished downstream from the Richardson Highway Bridge.

The spawning escapement of king salmon to the Klutina River has been documented by aerial surveys of St. Anne and Manker creeks since 1966 (Brady et al. 1991, Roberson and Whitmore 1991, Taube 2006b). However, radiotelemetry indicated that the aerial surveys only 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 aerial surveys only documented the early portion of the run. The majority of Klutina River king salmon spawn in the mainstem and generally later than those in the clear water tributaries of the river. Thus, the surveys provide an indication of the strength of the early

component of the run to these systems and in conjunction with other data (angler reports, fish wheel study CPUE, personal use/subsistence harvests) may provide the manager a general idea of the inseason run strength to the Klutina River.

Recent Fishery Performance

The sport harvest of Chinook (king) salmon in the Klutina River averaged 1,546 fish from 2001-2005 and 2,162 fish from 1996-2005 (Table 8). The 2006 harvest of king salmon from the Klutina River was the lowest since 1992, but still represented 33% of the total UCUSMA king salmon harvest in 2006. Fishing effort and harvest of kings increased from 1983 through 1999 when both measures peaked. Decreased effort after 1999 was likely in response to regulatory changes affecting bag and possession limits. Sport fishing effort began increasing again in 2004 and in 2006 reached the third highest recorded effort. Increased effort from 2004 through 2006 may reflect effort directed toward strong returns of sockeye rather than king salmon.

Increased use of float and power boats and increasing angler proficiency creates the potential for over harvest of the Klutina River king stocks, particularly if fishing conditions on the Gulkana River are poor and effort is shifted to the Klutina River where water conditions do not impact king salmon fishing success as significantly as those on the Gulkana River. The Copper River drainage harvest trends and aerial survey indices indicate strong king salmon returns through the late 90s, but based upon returns since 1999, it is likely that run size and harvests will decrease or remain stable over the next several years.

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. Continued aerial surveys will be used to monitor Klutina River king salmon returns inseason along with fisher reports from the subsistence, personal use and sport fisheries; and catch data from the Copper River commercial gillnet fishery.

The Klutina River king salmon return is managed as a single stock with the early component of the return used as an indicator of overall run strength. Anglers and guides, however, consider the return to be two separate stocks of kings, one early and one late. 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. However, early and later returning king salmon do spawn in both locations, so whether the temporal differences in Klutina king salmon returns represents two distinct stocks or a single, well distributed stock has yet to be determined.

Current Issues and Fishery Outlook

The Klutina River represented from 10-12% of the total Copper River king salmon return from 2002-2004, compared to the 17-27% represented by the Gulkana River during the same period (Savereide 2005a). The Klutina River cannot sustain harvests or effort at the same level as the Gulkana River. Prior to 1994, the Klutina River harvest generally comprised 25% or less of the overall Copper River Drainage sport harvest, while the Gulkana made-up about 69% of the sport harvest. Popularity of the Klutina River fishery, improved access, and increased guiding activity has increased the proportional king salmon harvest to 35% of the total upper Copper River harvest. Strong sockeye returns over the last two years have also increased popularity of the

river and perhaps increased overall effort to more than can be sustained by the king salmon stocks. Greater exploitation rates on the Klutina River increase the risk of overharvest during years of low production and high angler effort. Further harvest increases may make further restrictions to the fishery necessary.

Increasing use of the swift Klutina River by powerboats and limited use by rafts creates a greater hazard to users. Many sections of the river are not wide enough to allow boats to pass and result in conflicts between the two user groups. Members of the Klutina River Association (members include the guides, charter operators and businesses on the river) have voiced their opposition to improved access which may increase the number of inexperienced boaters operating on the river, citing safety concerns. However, the general public and the department support improved public access to the river.

The number of people exploiting the Klutina River fisheries creates an enforcement issue. Many guides and perennial Klutina River sport anglers continue to report abuse of the daily and annual bag limits by shore-based anglers fishing between the Richardson Highway Bridge and the mouth of the Klutina River. Enforcement of upriver fisheries is complicated by poor road access and the challenges of navigating a boat on the river.

There are increasing conflicts between float anglers and motorized boat anglers, as well as between guides and non-guided anglers. There are limited king salmon holding areas on the Klutina River and it is anticipated that these conflicts will not diminish, particularly as effort increases.

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

While numerous proposals have been submitted regarding the Klutina River king salmon fishery, the Board has not adopted any proposals during the past two BOF cycles.

Current or Recommended Research and Management Activities

A creel survey was conducted in 2006 to qualify the current king salmon fishery on the Klutina River and to determine the distribution of fishing effort and harvest on the river (Schwanke and Taras *in prep* b). The results of that survey are not yet available.

Recommended research projects include a hooking mortality study. A portion of the king salmon hooked in the Klutina River is lost in the fast water before they can be landed. It is suspected that many of these fish may not survive to spawn. The hooking mortality of these fish needs to be evaluated, but developing an effective study design is difficult.

The NVE/LGL king salmon estimation project should continue to be supported. The king salmon estimation project provides data necessary to evaluate whether Copper River fishery management has complied with the Copper River king salmon management plan.

Management projects should include continued aerial survey data collection. Aerial surveys on the Klutina clearwater systems provide valuable inseason insight on the early component of the

Klutina king salmon return. Timely information will be needed if inseason adjustments must be made to ensure adequate escapement of king salmon in this system.

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 harvest occurs in the Tonsina River. The 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 both the Richardson Highway and the Edgerton Highway. Shore anglers participate in the fishery adjacent to the Edgerton Highway; some angling is conducted by raft between the Richardson and Edgerton highways; and some angling is conducted by fly-in anglers fishing the outlet of the Tonsina River at Tonsina Lake. Boat anglers access the Tonsina River to fish the mouth by launching at the Chitina-McCarthy Bridge. King salmon run-timing to the Tonsina River drainage occurs in late-June through August, similar to that of the Klutina River.

The sport harvest of king salmon in the Tonsina River averaged 119 fish over the last five years (2001-2005) and 110 fish over the last 10 years (1996-2005) (Table 8). Creel surveys or fishery monitoring of catch or catch rates have not been conducted on the Tonsina River due to low fishing effort and low king salmon catches within this drainage.

The king salmon spawning escapement to the Tonsina River has been documented by aerial surveys of the Little Tonsina River and Greyling Creek since 1966 (Brady et al. 1991, Roberson and Whitmore 1991). The spawning escapement to these index sites averaged 465 fish from 1977 to 1986, but the average index count declined to 310 for 1996-2004. Aerial surveys 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.

Current regulations allow sport fishing for king salmon in the Tonsina River from January 1 through July 19. The July 19 closure date was established in 1989 to allow king salmon to spawn unimpeded. Tonsina Lake and all tributaries to the Tonsina River are closed to king salmon fishing. The current daily bag and possession limit for king salmon over 20 inches in this drainage is one fish, with an annual bag limit of four king salmon over 20 inches for the Copper River drainage.

A limited fishery for king salmon also occurs in the Tazlina River drainage. Tradtionally, most effort was expended at the mouth of Kaina Creek which flows into Tazlina Lake. Effort dramatically dropped after 1999 and no catch or harvest has been reported since. Average escapement index for the Tazlina drainage was 576 king salmon from 1977–2004 (65% from Kaina Creek, 35% from Mendeltna Creek). Aerial surveys on Kaina and Mendeltna creeks were discontinued after 2004, due to minimal sport fishing effort and harvest and based upon the radiotelemetry study that indicated the Tazlina River represented less than 5% of the total Copper River return.

From 1999–2004, a radiotelemetry study on the Copper River 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). Data from 2002–2004, indicates that the Tonsina River king salmon return represents approximately 12% of the total Copper River return, similar to the Klutina River return.

Fishery Objectives and Management

No specific fishery objectives have been established for the Tonsina or Tazlina river stocks. The underlying goal of past and current management is to ensure sustained yield. The aerial survey index had been used as a post-season escapement index, but had limited utility to describe overall escapement on these systems or add to an escapement assessment for the Copper River Drainage as a whole.

Current Issues and Fishery Outlook

Fishing effort within the Copper River drainage can be expected to remain at current levels or increase further. If effort increases on the Gulkana and Klutina River king fisheries it may begin to exceed access opportunities. As this occurs, effort may shift to the Tonsina River. Since the Tonsina River has received relatively little fishing pressure, increased effort may create issues between varied river users and with land owners as the fishery expands. The recent strong king salmon returns and effective management plans have prevented the overexploitation of Copper River king salmon stocks. However, if the Copper River experiences below average king salmon returns, managers may need to take inseason action to prevent potential overexploitation.

Recent Board of Fisheries Actions

At the 2003 BOF meeting, the Board adopted a proposal allowing the use of bait in the mainstem Tonsina River. New data gathered by the department since the bait restriction was put into effect following the 1996 BOF meeting indicated a king salmon run larger than previously thought and of sufficient size to withstand additional sport harvest.

Current or Recommended Research and Management Activities

Assessment of the genetic make-up of Copper River Chinook salmon stocks has included sampling from the Tonsina, Tazlina and Klutina drainages (Seeb et al. 2006). These drainages appear to have a similar genetic make-up that is distinct from the Chitina, Gulkana, and Upper Copper River king salmon stocks.

A survey of salmon habitat was initiated on Greyling Creek entering Tonsina Lake and upper Tonsina River in 2006 (Stillwater Sciences 2007). This study collected biological and fish distribution data as part of a project to model potential salmon habitat within the Tonsina River drainage.

Continued habitat and genetic assessments should be supported. If the SWHS indicates increased effort, catch and harvest from the Tonsina or Tazlina rivers a creel census may need to be considered on these systems to document use patterns.

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 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. From 1966 to 1993, the escapement of sockeye salmon to the Copper River tributaries was documented by CFD aerial surveys of index sites to monitor spawner distribution in the drainage (Brady et al. 1991). This aerial survey program conducted by Commercial Fisheries Division staff in Cordova was discontinued in 1993. A reduced aerial survey program, which targeted high priority index sites, was reinstated in 2000 (Hollowell et al. 2007).

Under the *Copper River District Salmon Management Plan* (5 AAC 24.360, 2006), the department is directed to manage the commercial fishery to achieve an inriver goal of 15,000 salmon, annually, for the sport fishery in the Copper River tributaries. From 2001-2005 sport harvest of sockeye salmon from UCUSMA waters has averaged 7,527 fish (Table 6). The sockeye salmon sport harvest in 2006 (14,297 fish) was the highest since 1977. The primary sport fisheries occur in the Gulkana and Klutina rivers, with approximately 94% of the estimated sockeye salmon sport harvest in the UCUSMA during 2001-2005 coming from these two rivers.

In addition to direct harvests from the recreational fishery, sockeye salmon stocks of the Gulkana and Klutina rivers are subject to harvest from a series of other fisheries that target a mixture of Copper River stocks (Table 11). Specifically, the Copper River District commercial drift gillnet fishery, the Chitina Subdistrict personal use and Glennallen Subdistrict subsistence fisheries. 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 to 82,500 sockeye salmon (wild stocks only) for subsistence harvest, 100,000-150,000 (including hatchery stocks) for personal use harvest, 300,000 sockeye salmon for spawning escapement, and an amount determined annually for hatchery brood and surplus stocks. The direct impact from these downstream fisheries on specific stocks of this mixture is unknown.

Gulkana River Sockeye Salmon Sport Fishery

Background and Historic Perspective

The Gulkana River has historically supported one of the largest sockeye salmon recreational fisheries in the UCUSMA (Table 12). Sockeye salmon are one of the various species within the drainage that are targeted by sport fishers. While the Gulkana River fishery accounted for over 60% of the king salmon harvested from 2001-2005 in the UCUSMA, it accounted for only 21% of the sockeye harvest during those years. The return to this system is composed of both wild and hatchery stocks. 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). Hatchery produced sockeye salmon are available to the sport fishery prior to reaching the hatchery for brood stock.

The sockeye salmon run timing to this system begins in early June and continues into September. The hatchery enhanced return has a run timing that overlaps the late wild stock component. Gulkana River sockeye salmon life history and stock status information is limited beyond basic run timing. A weir was operated downstream of the West Fork in 1996 (LaFlamme 1997). Emphasis of the weir project was directed at king salmon and the escapement counts provided only a partial count for the season's sockeye salmon return. An estimated 183,461 sockeye salmon passed the weir from June 11 to July 31. The proportion of the total return that this count

represented is unknown, as the weir was operated only through a portion of the sockeye salmon run. Escapement of sockeye salmon to the Gulkana River has been documented by aerial surveys of index sites since 1966 (Brady et al. 1991). This aerial survey program was discontinued in 1993 and a reduced program, that targets high priority index sites, including the Gulkana River, replaced it in 2000 (Hollowell et al. 2007).

Creel surveys were performed in 1988, 1989, and 1996 (Roth and Delaney 1989, Potterville and Webster 1990, and LaFlamme 1997). As with the weir, these surveys were directed primarily at king salmon. The 1988 and 1996 creel surveys did not report sockeye salmon data. The 1989 creel survey did include sockeye salmon, but was limited to the fishery downstream of the West Fork, and estimated a harvest of 327 sockeye (Potterville and Webster 1990). Due to the limited coverage of the creel survey for sockeye salmon, the estimated harvest could not be compared to the SWHS estimates for 1989.

In 2002, a counting tower project was initiated on the mainstem Gulkana River upstream of the West Fork (Taras and Sarafin 2005, Perry-Plake and Taras 2007, *in prep*). The primary objective of this project is to estimate king salmon escapement. Sockeye salmon passage is also recorded, but the counts should be considered minimums as sockeye are still entering the system after the tower is closed down. Between 2002 and 2006, an estimated 13,650 to 34,428 sockeye salmon (including hatchery fish) passed the tower from May 27 to August 14 each year. This estimate does not include that portion of the hatchery return that migrates up the West Fork of the Gulkana River to Crosswind Lake.

A radiotelemetry project was begun by NVE in 2005 to study the spawning distribution and run timing of Copper River sockeye salmon. In 2005, 7.0% of all detected radio tagged sockeye were detected in the Gulkana River drainage. In 2006, 15.6% were detected in the Gulkana River (Wade et al. 2007).

Recent Fishery Performance

Based on the SWHS, the estimated 2006 sport harvest of sockeye salmon from the Gulkana River was 923 fish, which was the lowest harvest since 1979. Harvest, catch and effort on the Gulkana River have all declined since 1999. Observations in recent years suggest that most of fishing effort on the Gulkana is directed towards king salmon rather than sockeye salmon which may result in a lower sockeye salmon harvest, even in a year of relatively high sockeye salmon returns. Harvest declines since 1999 likely reflect high water conditions and poor Gulkana hatchery returns that have occurred during that time.

Fishery Objectives and Management

Sockeye salmon fisheries in the Gulkana River are managed to ensure that the harvests do not threaten 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 this drainage have not yet been established.

Sport fish harvests are monitored with the SWHS. Present sport, commercial, and subsistence harvests are thought to be sustainable. The present management guidelines of the commercial and subsistence fisheries are also thought to provide sustainability of the Gulkana River sockeye salmon stocks. If future estimates 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.

Current Issues and Fishery Outlook

It is anticipated that sport angler effort and harvest of sockeye salmon in the Gulkana River will continue at current levels into the near future. The current regulations appear to be maintaining the stocks at historic levels.

Issues and conflicts involving the Gulkana River sockeye salmon fishery are similar to those previously noted for the king salmon fishery.

Recent Board of Fisheries Actions

Beginning in 1999, the bag and possession limit for sockeye salmon was increased from three to six fish from August 1 to December 31, on the West Fork of the Gulkana River upstream of a department marker located ½ mile upstream of the confluence with the mainstem. This action was taken to provide additional opportunity to harvest surplus hatchery salmon. A proposal submitted to the 2002 BOF meeting, requested that these bag and possession limits be put in place in the mainstem Gulkana River on July 20, rather than August 1, to increase harvest opportunity of hatchery stocks. This proposal was not adopted by the Board.

Current or Recommended Research and Management Activities

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

Extending the operation of the counting tower to estimate sockeye salmon escapement could lead to the establishment of an escapement goal for Gulkana River sockeyes salmon, however, this is contingent upon additional funding.

The management and research activities associated with the Gulkana River sockeye salmon sport fishery have not been extensive. Future research should be directed towards a better understanding of sport harvest, effort, and fishing patterns. Specific life history of Gulkana River sockeye salmon and migratory timing of wild and hatchery stocks through the Lower Gulkana River should also be priorities.

Klutina River Sockeye Salmon Sport Fishery

Background and Historical Perspective

The Klutina River (Figure 2) supports the largest sockeye salmon sport fishery in the UCUSMA. The Klutina River accounted for about 73% of the sockeye salmon sport harvest from 2001-2005. The proportion of the UCUSMA sockeye salmon harvested from the Klutina River has risen steadily since 1993. Prior to 1993 the sockeye harvest from the Klutina River averaged only 28% of the overall harvest of sockeye from the UCUSMA.

The run timing of sockeye salmon to this system begins in mid-June and continues through August. Beyond basic run timing, the life history and stock status information for Klutina River sockeye salmon is very limited. Spawning activity is known to occur in various locations of the river, lake, and tributaries.

Creel surveys, which emphasized king salmon, were conducted in 1988, 1989 and 2006 (Roth and Delaney 1989 and Potterville and Webster 1990, Schwanke and Taras *in prep* b). Of these, only the 1989 survey provided information related to sockeye salmon, with an estimated harvest of 361 (Potterville and Webster 1990). This creel survey was conducted only during the Chinook salmon fishery and the estimated sockeye salmon harvest is not directly comparable to the SWHS estimate.

A radiotelemetry project was begun by NVE in 2005 to study the spawning distribution and run timing of Copper River sockeye salmon. In 2005, 35.1% of all detected radio tagged sockeye were detected in the Klutina River drainage (Table 13). In 2006, 44.5% were detected in the Klutina River (Wade et al. 2007).

Recent Fishery Performance

Based on the SWHS, the estimated 2006 sport harvest of sockeye salmon from the Klutina River was 13,222 fish and was nearly double the next highest harvest (Table 12). The 2006 catch of sockeye on the Klutina River was also the highest ever recorded at 18,868 fish. Sockeye salmon harvest from the Klutina River steadily increased through 2000 and stabilized at an average of 5,515 fish for the years 2001 – 2005.

Sport angler effort on the Klutina River peaked in 1999 (Table 4) and then declined sharply from 2000-2003 likely in response to changes in king salmon bag limits in 1999 and reports of low king salmon returns during those years. Traditionally, most of the fishing effort expended on the Klutina River was directed toward king salmon. Since 2004, increased angler effort on the Klutina River appears to be direct more at sockeye salmon versus king salmon, the harvest of which has remained below average. Guide and sport angler reports indicated another strong harvest of sockeye salmon during the 2007 season, but will probably fall below the 2006 harvest.

Fishery Objectives and Management

Sockeye salmon fisheries in the Klutina River are managed to ensure that the harvests do not threaten the sustained yield of the Klutina River stocks.

Sport fish harvests are monitored with the SWHS. Escapement objectives for this drainage have not been established. Present sport, commercial, and subsistence harvests are thought to be sustainable. The present management guidelines of the commercial and subsistence fisheries are also thought to provide sustainability of the Klutina River sockeye salmon stocks. If future estimates indicate significant decreases in abundance or if harvests increase to the point that ADF&G believes that sustained yields are threatened, then regulatory actions will be considered.

Current Issues and Fishery Outlook

Reports by guides and sport anglers of snagging and over limits of sockeye salmon have increased over the last several years. Enforcement of both king and sockeye salmon regulations has also increased and Alaska Wildlife Troopers patrol the Klutina River access points on a regular basis during the fishing season.

It is anticipated that sport angler effort will continue to increase on the Klutina River until sockeye catch and harvest numbers begin to decline. The number of sockeye salmon harvested from the Klutina River may decrease after 2007 as the last of broodyear 2003 Klutina River sockeye pass through the fishery and if following broodyears do not perform as strongly. The current regulations appear to be maintaining the stocks at historic levels.

Recent Board of Fisheries Actions

No proposals regarding Klutina River sockeye salmon have been submitted to the BOF during the past two BOF cycles.

Current or Recommended Research and Management Activities

Sport fish harvests will continue to be monitored with the SWHS. An aerial survey program was reinstated in 2000 for index escapement estimates on priority spawning areas of the drainage.

Future fisheries research on Klutina River sockeye salmon should be directed towards a better understanding of sport harvest, effort, and fishing patterns, in addition to specific life history of Klutina River sockeye salmon.

COPPER RIVER PERSONAL USE AND SUBSISTENCE SALMON FISHERIES

Background and Historical Perspective

There is a long history of salmon harvested for food consumption or for use as bait in the Copper River drainage. The Ahtna natives took salmon, mostly king and sockeye, with funnel traps and spears in clearwater tributaries. Weirs, gillnets, and dip nets were used in the turbid mainstem Copper River and at its delta. Haley Creek was the site of one of the many traditional fishing camps along the Copper River. By 1920, fish wheels and dip nets took over as the means of capturing salmon for personal needs in this river

Historically, the taking of salmon for consumption as food or use as bait in the Copper River drainage was governed under subsistence regulations. In 1978, Alaska passed its first subsistence law. This legislation guaranteed the "customary and traditional use" of fish and game harvest in Alaska and gave this harvest a priority in terms of allocation. Under this law, the Board of Fisheries adopted the *Copper River Subsistence Salmon Fisheries Management Plan* (5 AAC 01.647). This management plan established seasons, open areas, legal gears, permit requirements, and bag limits for a subsistence salmon fishery in the Copper River. The plan also directed the department to manage the Copper River commercial salmon fishery to ensure that an adequate escapement reaches the spawning areas and provides for subsistence harvest.

In 1980, with the passage of the Alaska National Interest Lands Conservation Act (ANILCA), the federal government mandated subsistence hunting and fishing preference for "rural" residents on federal lands. Subsequent rulings by the federal government stated that if the state failed to meet this requirement, the federal government would take over management of fish and game on all federal lands. To comply with this requirement and prevent federal takeover, the joint Boards of Fish and Game adopted a regulation in 1982 stating that only "rural" residents had "customary and traditional use" of fish and game and established eight criteria for identifying "customary and traditional uses." Under this plan, subsistence fishers were given one of four 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. This led the Board of Fisheries 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 were subsistence fisheries.

Due to growth in the fishery, the Board eliminated non-basin residents from the Copper River subsistence fishery based on analyses of the eight-point criteria in 1984. This decision excluded many individuals from participating in the Copper River subsistence fisheries, thereby precluding them from harvesting fish for their personal use. In 1984 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). This fishery was changed to a subsistence fishery by the BOF at the December 1999 meeting (5 AAC 01.647(k)). In 2003, the BOF reversed this decision 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 2000 ruling, based upon the number of fish passing the Miles Lake sonar.

Personal use fisheries differ from sport fisheries in both their objective 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 and to maximize economic benefit to Alaska. Anyone can participate in Alaska's sport fisheries (provided they have a sport fishing license), only Alaska *residents* may participate in personal use fisheries. The Division of Sport Fish manages most of the state's personal use fisheries, while the Division of Commercial Fisheries manages most of the subsistence fisheries. The Glennallen Subdistrict subsistence fishery in the Upper Copper River is managed by the Division of Sport Fish.

Harvests in the Copper River subsistence and personal use fisheries are dominated by sockeye salmon, followed by king and coho salmon (Table 2). Both the 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 and/ or dip nets (Figure 4). The season is open from June 1 through September 30, unless closed by emergency order. Only Alaska residents can participate in this subsistence fishery. A free subsistence permit is required to participate in the fishery. Users must record their harvest on their permit and return the permit upon completing fishing. The limits are 30 salmon for a household of one, 60 salmon for a household of two, and 10 salmon for each additional person in a household of more than two 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 five of the salmon may be king salmon. A subsistence fishery is also allowed in a portion of Tanada Creek, near the traditional Alaska Native fishing site of Batzelnetas, with spears and dip nets.

The Chitina Subdistrict Personal Use Fishery is opened each year by emergency order. Both a valid Alaska sport fishing license and a free personal use permit are required to participate in the fishery. Users must record their harvest on their permit and return the permit after the close of the season. The limits are 15 salmon for a single person and 30 salmon for a household of two or more, only one of which may be king salmon. Only dip nets may be used to harvest salmon in this fishery. 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). The BOF has mandated that Alaskans

can participate in either the subsistence or personal use fishery in the Copper River drainage, but not both.

The BOF has authorized the department to manage the commercial salmon fishery to provide the following inriver goals for salmon escapement as measured at the Miles Lake Sonar (5 AAC 24.360(b)):

Spawning escapement (sockeye salmon)	300,000
Spawning escapement (other salmon)	17,500
Glennallen Subdistrict Subsistence harvest (salmon)	61,000 – 82,500
Chitina Subdistrict Personal Use harvest (salmon)	100,000-150,000
Sport fishery harvest (salmon)	15,000
Hatchery brood stock (sockeye salmon)	Estimated annually
Hatchery surplus (sockeye salmon)	Estimated annually
TOTAL	Announced annually

The subsistence guideline is adjusted annually in order to accommodate the anticipated subsistence harvest. The hatchery brood stock and hatchery surplus are also adjusted annually based on the anticipated return of wild and hatchery stocks.

From 1997-1999, the maximum harvest for the personal use fishery was 100,000 salmon, excluding fish provided in excess of the inriver goal and not including any salmon harvested after August 31. Prior to 1997, this amount was 60,000 salmon. 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 are wild salmon. This harvest range remained in place, following the change of the Chitina Subdistrict back to a personal use fishery in 2003.

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 were taken. 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 have held between 60,000 and 80,000 fish annually including that portion of the harvest taken through federal subsistence permits.

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 a cumulative limit of 200 salmon for a household of one and 500 salmon for a household of two 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 D and E). Although this change did not appear to affect overall subsistence harvest from the Copper River, the number of state permits issued decreased after 2001, with at least a portion of the federally qualified residents opting for a federal rather than state permit.

The percentage of participants in the Glennallen Subdistrict fishery, by community, has remained relatively stable from 1992-2001 and has continued when state and federal permit statistics are combined since 2002. Users of the Glennallen Subdistrict subsistence fishery (averaged from 2002 – 2006) resided in the Copper River Basin (41%), Anchorage (28%), Fairbanks (11%) and Mat-Su Borough (13%) and other smaller communities (6%) throughout Alaska. Harvest level has tracked closely with the total number of state permits issued since 1984 (Table 14).

Harvests in the Chitina Subdistrict fishery have been estimated since its establishment in 1984 (Table 15). From 1984 through 1988, harvests remained relatively stable, averaging about 47,000 salmon annually. After 1988, harvests in the personal use fishery increased annually until 1998. The harvest from the Chitina Subdistrict fishery declined from 1998 through 2003 to levels similar to the early 1990's. Over the last 4 years (2003-2006) the harvest has increased steadily. Overall harvest from the Chitina Subdistrict fishery also tracks closely with the number of permits issued in respective years (Table 15).

Recent Fishery Performance

A total of 1,174 state and 283 federal permits were issued for the Glennallen Subdistrict in 2007 (Table 14; Appendix E). This is the largest number of permits issued for the Glennallen Subdistrict since 1983. The increase in 2007 mainly reflected an increase in dipnetters choosing locations above the bridge and may also reflect an increase of people using boats to access the fisheries.

After a two year decline (2002 and 2003) in the Chitina (Table 15) and Glennallen Subdistricts (Table 14) harvests under state permits, harvests have generally increased through 2007. In 2006, 984 state permit holders harvested 60,775 salmon in the Glennallen Subdistrict. The 2007 harvest was 69,228 salmon by 1,174 state permit holders (Table 14). The 2007 harvest was the largest harvest since 2001, when all Glennallen Subdistrict permits were issued by the state. In contrast, harvests under federal permits declined in 2006 and 2007 after peaking in 2005 (Appendix D).

Sockeye are the primary species harvested in this fishery, while king salmon comprise less than 5% and coho salmon less than 1% of the harvest (Table 14). King salmon are typically present in the Glennallen Subdistrict fishery by June 1 and, on average, 80% of the king salmon harvest is taken by July 12 (Roberson and Whitmore 1991). On average, 80% of the king salmon harvest in the Chitina Subdistrict is taken by July 1 and 95% by July 17 (Roberson and Whitmore 1991).

A total of 8,633 permits were issued for the Chitina Subdistrict personal use fishery in 2006 and 8,377 were issued in 2007 (Table 15). This level of participation yielded a harvest of 129,103 and 130,222 salmon respectively, which are the largest harvests since 2001. A stronger than expected passage in early June past the Miles Lake sonar allowed for a single supplemental harvest period during the 2006 fishing season. In 2007, a steadily high escapement of salmon during June and July past the Miles Lake sonar allowed for four total supplemental periods with three of them being consecutive.

Fishery Objectives and Management

The Glennallen Subdistrict subsistence fishery is managed under a BOF adopted management plan, the *Copper River Subsistence Salmon Management Plan* (5 AAC 01.647, 2004). 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, 2006). In 2005, the BOF determined amounts necessary for subsistence (ANS) for the Glennallen Subdistrict and established these amounts in 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; from the Tonsina River to the mouth of the Gakona River the amount is 23,500–31,000; and from the Gakona River to the mouth of the Slana River (and including the Batzulnetas fishery) the amount is 12,000–12,500 salmon. The ANS amounts are based on reported harvest, not the final estimated harvest which expands the reported harvest to account for non-returned permits.

Inseason management of the Chitina Subdistrict Personal Use Dip Net Salmon fishery follows the objectives and guidelines in the *Copper River Personal Use Dip Net Salmon Fishery Management Plan* (5 AAC 77.591, 2003). The weekly fishing periods and limits established by emergency order 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 for the Chitina Subdistrict is 100,000–150,000 salmon, not including salmon above the inriver goal or salmon harvested after August 31.

The 2006 Copper River Chitina Subdistrict personal use fishery was scheduled to open on June 5, but late break-up and delayed migration of salmon past the Miles Lake sonar below anticipated counts dictated a reduction in fishing time for that week by 112 hours. The fishery opened by emergency order for a 56-hour opening on June 9. Due to Miles Lake salmon counts in excess of anticipated counts, the fishery remained open with consecutive 168-hour periods each week through August 6th. The fishery was open to continuous fishing from August 7th through August 31st and remained open by regulation through September 30th.

The 2007 Copper River Chitina Subdistrict personal use fishery was scheduled to open on June 4, but late break-up, an ice jam at Miles Lake, and delayed migration of salmon past the Miles Lake sonar below anticipated counts dictated a reduction in fishing time for that week by 132 hours. The fishery opened by emergency order for a 36-hour opening on June 9. Due to Miles Lake salmon counts at or above the weekly objective, the fishery remained open with consecutive 168-hour periods each week through August 6th. As a result of a greater than 50,000 salmon surplus over anticipated counts, the second fishing period (June 11-17) was a supplemental period with a 103,111 salmon surplus. Sonar counts continued to be strong and supplemental periods were authorized for fishing periods six (July 9-15), seven (July 16-22), and eight (July 23-29). The salmon surpluses for these periods were 65,872, 94,026, and 112,899 salmon respectively. The 2007 fishery was the first to warrant a total of four supplemental periods much less three consecutive ones. The fishery was open to continuous fishing from August 7th through August 31st and remained open by regulation through September 30th.

Current Issues and Fishery Outlook

Whether the Chitina Subdistrict is a subsistence or personal use fishery continues to be a primary issue. There was some resentment among the Native community towards urban participants in the Chitina Subdistrict regarding the subsistence classification. The repeal of the 1999 subsistence determination at the 2003 BOF meeting was not well received by the urban based Chitina Dipnetters Association and the Alaska Outdoor Council. They feel the priority for the dipnetters should be above the commercial fishery. This priority was provided under the subsistence classification. The BOF upheld the personal use classification for the Chitina Subdistrict at its 2005 meeting.

Other issues for the Chitina Subdistrict (whether subsistence or personal use) are likely to include uninterrupted fishing time and increased king and sockeye bag limits. In May 2004, the Upper Copper River villages of Chistochina, Mentasta and Slana requested the Federal Subsistence Board to restrict the lower river fisheries as they felt that the early component of the sockeye salmon return was being intercepted by these fisheries and their subsistence needs had not been met in recent years. No action was taken against the state fisheries, but the federal subsistence fishery in the Glennallen Subdistrict was closed from May 15–30, in 2004 and 2005 to allow Upper Copper River salmon stocks to move through the lower Glennallen Subdistrict.

In 2005, the National Park Service–Wrangell-St. Elias National Park and Preserve enforced NPS regulation 36 CFR 2.3 that allows fishing to be conducted within national park boundaries only with closely attended rod and reel. Part 13 of the NPS regulations does allow subsistence uses by rural resident zone community residents within national park boundaries. The enforcement of these regulations prohibited the subsistence fishing by non-rural residents in that portion of the Copper River upstream of Indian River (which includes approximately 15 river miles of the Glennallen Subdistrict and the Batzulnetas fishery) and required a federal subsistence fishing permit to use a fish wheel or dip net within the boundaries of Wrangell-St. Elias National Park and Preserve. Only those rural residents that qualified for federal subsistence salmon harvest in the Glennallen Subdistrict were issued permits to fish in this area. As a result, no state subsistence fishing permits have been issued for this portion of the Glennallen Subdistrict since 2005. In the past, approximately 10–12 non-rural households had fished state permits in this portion of the Glennallen Subdistrict, but since 2005 these households were required to fish downstream of Indian River.

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 fee paid directly to CNC. Increased enforcement by Ahtna and CNC of fee based access continued in 2007. After some initial conflicts, Ahtna and CNC appeared to be getting cooperation from dip netters and some subsistence users. Two key designations are needed to alleviate disparate opinions of land ownership and access to fisheries in the Glennallen and Chitina Subdistricts. These are the navigability of the Kotsina River and what constitutes Ordinary High Water (OHW) with respect to the presence of vegetation.

The Glennallen Subdistrict subsistence fishery continues to be popular and the number of permits issued has remained relatively stable for the last eleven years (1997-2007). The ANS designations established in 2006 increased the overall allocation for subsistence harvest from 75,000 salmon to 82,500 salmon. The 2006 harvest (state and federal combined) was 94% of this upper allocation figure. 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. However, increased pressure in the subsistence fishery, access conflicts and conflicts between rural and non-rural users of the fishery may limit further growth of the fishery.

Harvests of sockeye salmon in the Chitina Subdistrict personal use fishery are dependent on sockeye salmon run strength and is evidenced by the moderate three year rise in permits from 2004-2006. Many participants in the Cook Inlet personal use fishery also participate in the Copper River personal use fishery. If the Cook Inlet fishery is poor, then there is potential for an increase of participation in the Copper River fishery from the Cook Inlet users. Participation in the Chitina Subdistrict personal use fishery also depends on access opportunity. Since 2002 landslides along the Copper River highway easement (O'Brien Creek Road) have limited access to fishing spots downriver of O'Brien Creek and are likely responsible for the reduced participation since these occurred.

During the 2007 season, Chitina Native Corporation continued operating a fee station at O'Brien Creek to provide access to the river and camping areas outside the DOT ROW. Voluntary participation in the fee based access increased over that observed in 2006.

During periods in which a supplemental harvest is allowed, there is potential for increased participation in the fishery. Although harvest numbers resulting from the issuance of supplement permits have been relatively low, the supplemental period is likely an attractant to participants who anticipate high catch rates owing to the escapement surplus. Any increased effort and catch, however, are not measurable.

Recent Board of Fisheries Actions

Although the Chitina Subdistrict personal use fishery is primarily a sockeye salmon fishery, most BOF issues that affect the fishery are concerned with king salmon harvests. The king salmon bag limit of one, provides for an opportunity to harvest a king salmon, but will continue to maintain harvests at historic levels. The board has consistently complied with the Copper River king salmon management plan (5 AAC 24.361) to see no increase in king salmon harvest potential. No proposals regarding the personal use fishery were adopted by the BOF during the December 2005 meeting.

Current or Recommended Research and Management Activities

At present, the Division of Sport Fish issues permits, monitors the fishery, and estimates harvests for both Upper Copper River District salmon fisheries. From 1995 through 2003 Sport Fish staff collected king and sockeye salmon age and length data and heads of adipose fin clipped sockeye salmon from the Chitina Subdistrict fishery to estimate the proportion and timing of sockeye salmon produced by the Gulkana Hatchery from coded wire tag (CWT) recoveries. Beginning in 2000, hatchery sockeye salmon fry were marked with strontium. The last year CWT marked fish returned was in 2003. Strontium marked fish began to return in 2004 and hatchery contribution to the CSD harvest is estimated from a subsample of otoliths collected to estimate age and length composition of the sockeye harvest which are then examined for strontium marking. In time, this monitoring will allow managers to better target hatchery stocks while protecting wild fish. A similar study to determine the hatchery contribution to the subsistence fisheries in the Glennallen Subdistrict would help to fill that data void.

From 2005 - 2007, the department in conjunction with the Native Village of Eyak and LGL, Inc., assisted with the operating of a radiotelemetry study on sockeye salmon to examine their distribution throughout the Upper Copper River drainage and the return timing of the major Copper River stocks. For 2005 and 2006 the Upper Copper River and Tazlina stocks had the earliest mean run timing, followed by the Klutina, then the Chitina and Lower Copper River, Gulkana and finally the Tonsina River stocks (Wade et al. 2007).

The Native Village of Eyak is also conducting mark-recapture studies on king and sockeye salmon to estimate total escapement of these species. The sockeye salmon mark-recapture study in 2007 is specifically designed to act as an independent validation of the Miles Lake sonar passage estimates.

Annual review of the permitting process should be continued to insure quality harvest data that is cost effective.

ARCTIC GRAYLING SPORT FISHERIES

Background and Historical Perspective

Arctic grayling have been the most heavily harvested fish in the UCUSMA (Table 6) having the highest single harvest number annually from 1977 through 1995. Harvests declined after 1988 and have been surpassed annually by sockeye salmon since 1996 and by king salmon in 2005 and 2006. The 2006 harvest of 3,329 grayling is the lowest on record and continues the gradual decline in harvests since 1995. Declines in harvest from 1988 through 1999 were likely a result of more restrictive regulations adopted to ensure the sustained yield of the area's Arctic grayling stocks (Taube 2002). Continued declines may reflect a general decline in resident fishery effort and harvests as well as some additional regulations.

The largest Arctic grayling fishery in the UCUSMA has historically occurred in the Gulkana River drainage (Table 16). From 2001-2005 the harvest from the Gulkana River drainage has averaged 36% of the UCUSMA harvest. Other UCUSMA drainages that have supported significant Arctic grayling fisheries include various Upper Susitna River drainage lakes and streams (15%), the Tazlina River drainage (6%), and the Klutina drainage (6%). Various lakes stocked with Arctic grayling catchables also provide fishing opportunity for this species.

Daily bag and possession limits for Arctic grayling, in all flowing waters in the UCUSMA, were reduced from 15 daily and 30 in possession to 10 fish daily and in possession in 1988. In 1989, the bag and possession limit in rivers was further reduced to five Arctic grayling. For the Gulkana River, anglers were permitted five Arctic grayling per day, of which only one may be over 14 inches. This action was taken to maintain historic size compositions in this drainage. In 2003, the bag and possession limit in lakes was reduced to five Arctic grayling per day and in possession. The bag and possession limit in stocked lakes remained at 10 fish per day and in possession of all stocked species combined.

Gulkana River Arctic Grayling Sport Fishery

Background and Historical Perspective

The Gulkana River drainage has historically supported the largest sport fishery for Arctic grayling in the UCUSMA. A peak harvest of 20,165 fish occurred in 1985 (Table 16) and accounted for 62% of the total harvest in the UCUSMA (Mills 1986). This harvest raised concern that the Arctic grayling stocks in the drainage were in danger of overharvest. Arctic

grayling stocks in several Interior Alaska streams were depressed when subjected to similar harvest rates. Research data also indicated that the maximum size of Arctic grayling observed in the Gulkana River drainage was decreasing as the result of anglers targeting larger fish (Williams and Potterville 1983). Regulations were adopted in 1988 that reduced the bag and possession limit to five fish per day and restricted anglers to only one Arctic grayling over 14 inches.

A research program was initiated by the Division of Sport Fish in 1986 to assess the status of the various Arctic grayling stocks of the Gulkana River drainage (Bosch 1995). Objectives of the research program were to determine stock structure, growth, annual abundance, survival, and recruitment; sustainable yields under a variety of management scenarios; and future monitoring strategies.

During the 1996 meeting the BOF passed a proposal submitted by the department to establish a catch-and-release grayling fishery in the Upper Gulkana River drainage (upstream of Paxson Lake). The intent of this regulation was to protect a small population of large sized grayling (> 18 in) in the Gunn and Fish Creek drainages. The Upper Gulkana River above Paxson Lake is easily accessible from the Richardson Highway by foot and ATV. Bosch (1995) determined that the Upper Gulkana grayling population was independent from the Middle Fork and mainstem populations, and though the population was small, the fish were large. There was dissatisfaction with the BOF action in 1996 on the Upper Gulkana River. Anglers, who had fished the Upper Gulkana River prior to 1996 and harvested Arctic grayling, still desired to do so.

Previous estimates of abundance indicate that current exploitation rates on the major stock units of Arctic grayling in the Gulkana River drainage appear sustainable given current harvest levels. Data from research programs also indicate that the restriction limiting anglers to only one Arctic grayling over 14 inches is allowing the population to reach and maintain historic levels (Fish and Roach 1999).

No stock assessments have been conducted on the Gulkana River since 2002 (Wuttig 2007).

Recent Fishery Performance

The restrictions placed on the fishery during 1988 significantly reduced the total harvest of Arctic grayling in the Gulkana River drainage (Table 16); however, catch and harvest data suggest that the Arctic grayling population remains stable. Harvest of Arctic grayling has generally declined and may reflect the similar decline in overall fishing effort in the Gulkana drainage. The 2006 harvest was 1,179 Arctic grayling from the Gulkana River drainage.

Fishery Objectives and Management

Arctic grayling fisheries in the Gulkana River drainage 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 Arctic grayling are monitored by the SWHS.

In 2004, the Regional Wild Arctic Grayling Management Plan (5 AAC 52.055) was adopted by the BOF. The plan created three management approaches with associated regulatory options; regional management, conservative management, and special management. The regulations adopted under the regional management approach (five fish bag and possession limit, season open year round) did not change the general Arctic grayling regulations in the UCUSMA. Currently, three fisheries within the UCUSMA are classified under the conservative management approach; Mendeltna Creek, Moose Lake and Our Creek (Tazlina drainage), and the Gulkana

River, upstream of Paxson Lake. Under these regulations, the Arctic grayling stocks in the UCUSMA are considered to be able to support current harvest levels.

Current Issues and Fishery Outlook

Overall, Gulkana River drainage Arctic grayling stocks appear healthy. The current management strategy and regulatory regime is within the guidelines of the regional management plan to manage for long-term sustained yield. As a result, it is anticipated that harvest levels of Arctic grayling will remain at current levels.

Data collected through the statewide mail survey suggest that many anglers fishing Arctic grayling in the Gulkana River drainage are practicing catch-and-release. Anglers have released over 90% of their catch on average since 1990 and 96% of their catch for the past ten years (1996-2005). Assuming a 5% release mortality rate, this appears acceptable given current harvest and abundance levels.

Recent Board of Fisheries Actions

In 2005, the BOF adopted a proposal to allow a harvest of two Arctic grayling per day with only one greater than 14 inches in the waters of the upper Gulkana River upstream of Paxson Lake that had previously been catch-and-release. This change provided for a limited harvest from these waters while still achieving the 1996 goal of protecting the larger fish component of the population.

Current or Recommended Research and Management Activities

An objective of the Arctic grayling research program was to develop a plan for monitoring the status of Arctic grayling stocks in the Gulkana River drainage. This consisted of monitoring of the three identified stocks (mainstem, Middle Fork and waters upstream of Paxson Lake) for abundance, age and length composition every three to five years. Stock assessment was conducted in the mainstem in 1998, to determine age and length composition (Fish and Roach 1999). A similar assessment and abundance estimates for Gunn Creek and Fish Lake was conducted in 2002 on the upper reaches to determine the impacts of the 1996 regulatory change and provide background information for future BOF meetings (Wuttig 2007). It is recommended that the monitoring program continue to assure the sustained yield of the fishery.

Other UCUSMA Arctic Grayling Sport Fisheries

Background and Historical Perspective

Mendeltna Creek is a small stream, west of Glennallen, in the Tazlina River drainage and drains into Tazlina Lake. Main access points are at the Glenn Highway wayside and a single lane gravel road (Oil Well Road) off Lake Louise Road. Harvests increased significantly between 1992 and 1993, 255 to 867 Arctic grayling, and peaked in 1995 at 1,041 (Table 16). There is little baseline data on the Arctic grayling population in Mendeltna Creek.

Fishery Objectives and Management

Management of the Arctic grayling population in Mendeltna Creek has been limited to evaluation of the SWHS. Arctic grayling populations can sustain exploitation rates of approximately 10%. Stock assessment conducted on Mendeltna Creek in 1998 resulted in an abundance estimate of 845 fish ≥ 200 mm, with few fish greater than 12 inches (Fish 1999, Scanlon and Fish 2000). At the current population level, only 80 Arctic grayling could be

harvested annually. Based upon examination of the SWHS statistics, bag limit reductions would not reduce the harvest sufficiently to provide for sustainable yield.

The department submitted a proposal for the 1999 BOF meeting to reduce the daily bag limit to two fish over a 12-inch total length. The open season was set from June 1 to March 31, to offer protection to the larger spawning Arctic grayling. The board supported this proposal and the regulation went into effect for the 2000 season. Harvest declined significantly in 2001 and has averaged only 36 fish annually since. Forty-six fish were reported harvested from the stream in 2006.

Current or Recommended Research and Management Activities

Many of the roadside-accessible streams are located in the Tazlina River drainage. Arctic grayling are know to migrate great distances between winter habitats, spring spawning sites, and summer feeding areas that can be in entirely different drainages. Tagging or telemetry studies could provide information regarding timing of grayling through the fisheries, spawning and rearing streams and distributions throughout the drainage.

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 mainly harvested from lakes within the Susitna River drainage (Lake Louise and Susitna and Tyone lakes) and the Gulkana River drainage (Paxson, Summit, and Crosswind lakes) (Table 17). Harvests from the Susitna River drainage averaged 45% of the annual harvest from 2001-2005 and harvests from the Gulkana River drainage accounted for 32%. Lake Louise (23%), Paxson Lake (11%), Crosswind Lake (14%), Susitna Lake (9%), and Summit Lake (4%) accounted for over half the annual average of the lake trout harvest in the UCUSMA from 2001-2005.

Prior to 1987, anglers fishing UCUSMA waters were allowed a daily take of two lake trout over 20 inches and 10 lake trout under 20 inches. Under these regulations, lake trout harvests from UCUSMA waters were relatively stable, averaging about 7,400 fish (Table 17). However, it was found that eight of nine lake populations in the Upper Copper and Delta River drainages were being harvested well over the annual harvest estimated to be sustainable based on lake trout populations in Canada and the Great Lakes (Burr 1987). As a result of these research findings, the daily bag limit for UCUSMA waters was reduced to two fish and a minimum size limit of 18 inches was adopted for Summit and Paxson lakes and the Tyone River drainage in 1987. The minimum size limit was imposed to allow female lake trout to spawn once before reaching harvestable size.

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 assure 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, and 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, Scanlon *in prep*).

In 1994, the minimum size limit for lake trout was increased from 18 to 24 inches in the Tyone River drainage, Crosswind, Paxson and Summit lakes; the bag limit was reduced from two to one

lake trout in the Tyone River drainage and Crosswind Lake. The minimum size limit was increased to better protect female lake trout spawning for the first time in the Tyone River drainage and Crosswind Lake 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.

Recent Fishery Performance

Since adoption of the new regulations in 1987 and further restrictions in 1994, lake trout harvests from UCUSMA lakes and streams have declined. Average annual lake trout harvest for 2001-2005 was 10% less than the 10 year average (1996-2005) indicating a decreasing trend in overall harvest. In general, harvests from both the Gulkana River and Tyone River drainages have remained relatively stable since 1994 (Table 17).

Following the 24" minimum size restriction, the number of lake trout released in Crosswind, Paxson, and Summit lakes and the Tyone River drainage lakes (Lake Louise, Susitna and Tyone lakes) increased from an average of 63% released prior to the restriction (1990-1993) to an average 80% for all the years following (1994-2006) (Table 18). Concerns arose that hooking mortality in combination with harvest was 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). A separate proposal was adopted that removed the minimum size limit for lake trout in Paxson Lake, but reduced the bag limit to one per day. This action was intended to reduce fishing mortality below the sustainable yield estimates for these lakes. Additionally, bait was allowed from November 1 through April 15 to provide for a more effective burbot fishery.

Fishery Objectives and Management

Lake trout are slow to mature and have low reproductive potential. Overexploitation could result in population declines that would take multiple years for recovery. Therefore, a conservative management strategy is desired for the UCUSMA lakes. As a result of the low reproductive potential and late age at maturity impacts of regulatory actions may not be observed for 8-10 years after the regulation is in place.

ADF&G uses the Lake Area model (Evans et al. 1991; Healy 1978) to develop sustained yield caps for lake trout. The Lake Area model involves estimating the level of sustainable harvests for lakes based on an observed lake trout production-lake surface area relationship for northern latitude lakes Estimates of maximum sustainable yield based on a Lake Area model have the potential for overestimating sustainable harvests. The Lake Area model was developed in Ontario, Canada. Ontario lakes have greater productivity than Alaskan lakes, and as a result the estimates of sustainable yield are biased high for UCUSMA lakes, and must be used only as a signal for regulatory adjustments or stock assessment.

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 harvests of 147 to 231 lake trout annually. Lakes, larger than 500 ha,

appear capable of sustaining annual harvests of 340 to 400 lake trout. Estimates of sustained yield for the larger lake trout fisheries in the UCUSMA are found in Table 19.

Lake trout fisheries in the UCUSMA are managed conservatively following the guidelines in the regional lake trout management plan (Burr 2006). The department 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 two consecutive years, stock assessment is initiated for that population.

Current Issues and Fishery Outlook

Under the current regulations, it is anticipated that harvests of lake trout will remain stable. Harvests have declined with the 1994 regulation changes. The overall average harvest for the last 10 years (1996-2005) is 68% less than the average harvest for the years 1984-1993. This trend is matched in the Lake Louise and Susitna Lake fisheries. Average harvest from Paxson and Summit lakes dropped 80%, perhaps reflecting the bait restriction on those lakes. Crosswind Lake had a noticeably lesser drop in harvest with the average harvest for the last ten years only dropping 22% from the average for 1984-1993. The effect of the 1994 regulation changes on Crosswind Lake may have been dampened by improved access, increased private land ownership and recreational cabin construction that occurred between the two comparison periods.

The present regulatory regime should protect all UCUSMA lake trout stocks from overharvest and allow abundance to increase. Management measures to ensure sustainable lake trout production may conflict with concurrent burbot fisheries. Anglers who wished to harvest burbot with bait in Paxson and Summit lakes expressed their dissatisfaction with the no bait, single-hook artificial lure regulations. Undoubtedly this will remain an issue for all lakes in which a minimum size is instituted and both lake trout and burbot populations exist. Hooking mortality must be considered when examining lake trout harvests in a lake when determining whether harvests are approaching sustained yield.

Recent Board of Fisheries Action

Four proposals were submitted to the BOF at the 2003 meeting, three requested increases in the lake trout bag limits on Paxson, Summit and Crosswind lakes, and one requesting a bait restriction on Paxson and Summit lakes. None were adopted. A fifth proposal, requesting the bait restriction that was adopted in 1999 be removed for fisheries that were impacted by the regulation change, was adopted excluding Paxson and Summit lakes. The BOF determined that unbaited, single-hook, artificial lures reduced hooking mortality associated with bait for lake trout released under the current 24” minimum size regulation and additional harvest or mortality would likely exceed MSY for Paxson and Summit lakes.

The BOF adopted a Wild Lake Trout Management Plan at its 2005 meeting. This plan sets bag and possession limits and management strategies to guide the department for lake trout management and the board and public for addressing future proposals. A second proposal was adopted that allowed the use of bait in Paxson and Summit lakes from November 1 to April 15, and reduced the bag and possession limit of lake trout from two fish over 24 inches to one fish any size, to align those regulations with the Lake Trout Management Plan guidelines. The seasonal use of bait allows the burbot fishery to continue with minimal restriction and without adversely impacting the lake trout population.

Current or Recommended Research and Management Activities

Research on lake trout has resumed on a limited basis. Sampling occurred at Paxson Lake in fall 2002–2004 and spring 2003 and 2004 to collect length and weight data and conduct a mark-recapture study to estimate abundance (Scanlon 2004, Scanlon *in prep*). Length and weight data provided specific information for Paxson Lake in application with the Lake Area model and in conjunction with the estimates of abundance resulted in the regulatory change.

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 significant movement of lake trout between Lake Louise, Susitna Lake and Tyone Lake may affect any estimate of population and development of an exploitation rate based on the Lake Area Model. Therefore, a more extensive research project must be developed including radiotelemetry to assess movement of lake trout between the three 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. Current regulations for Susitna and Crosswind lakes and Lake Louise need to be assessed, as harvests have exceeded sustained yield estimates in some years over the past ten years.

Stock abundance and size composition of lake trout in Paxson and Summit Lake should be reassessed to monitor any changes due to implementation of new regulations changes in 2006. Such studies should begin in 2010.

BURBOT SPORT FISHERIES

Background and Historical Perspective

The many lakes and rivers of the UCUSMA support some of the largest populations of burbot in Alaska (Figure 6). Prior to 1990, these waters supported an average of 56% of the statewide sport harvest of this species. The largest fishery has historically occurred in the Lake Louise complex (consisting of Lake Louise, Susitna and Tyone lakes) (Table 20). Other significant fisheries occur in the various lakes of the Gulkana River drainage (e.g., Paxson, Summit, and Crosswind lakes), Tolsona and Moose lakes (Tazlina River drainage), and various smaller remote lakes scattered throughout the UCUSMA. The fishery occurs primarily during the winter months from November to April using closely attended set or hand jig lines.

Prior to 1979, there was no daily bag or possession limits or gear restrictions governing the harvest of burbot in the UCUSMA. In recognition of burbot as an important sport species to be managed for sustained yield, a daily bag and possession limit of 15 burbot was enacted prior to the 1979 winter fishery. Anglers were allowed to harvest burbot by fishing multiple hand lines and unattended setlines with no more than a total of 15 hooks plus two hand-held jig hooks. Under these regulations, the sport harvest of burbot from UCUSMA waters increased dramatically, peaking in 1985 when record harvests of 19,355 burbot were taken (Table 20).

The rapid growth in the fishery raised concern that several UCUSMA burbot stocks were in imminent danger of being overexploited. To prevent this, in 1987 daily bag limits and the number of hooks an angler could fish in area lakes were reduced to five, whether fished on unattended setlines or hand held jig-lines. In several road accessible lakes (Lake Louise, Tyone, Susitna, Tolsona, Moose, and Summit lakes), the daily bag and possession limits were further

reduced to two fish and anglers were restricted to using only two hooks. Also, the sport fishery for burbot in Hudson Lake was closed by emergency order based on findings that this burbot stock had been severely overexploited and was depressed (Lafferty and Vincent-Lang 1991).

During its 1988 meeting, the Board of Fisheries adopted the Lake Burbot Management Plan (5 AAC 52.045) for the burbot fisheries in lakes of the UCUSMA. The plan was adopted as regulation to ensure that the department had the necessary tools through which to manage the area's lake burbot fishery for maximum sustained yield and opportunity to participate. In order to achieve this management objective, the plan gave the department the authority to use time and area closures and method and means restrictions to manage the area's lake burbot sport fisheries. In adopting the plan, the BOF stated its desire to maintain the daily bag and possession limits for burbot at two or more fish for road accessible lakes and five or more fish for remote lakes, as it was considered unreasonable by board members to participate in these fisheries at lower bag limits.

Further actions were implemented during 1989 under the newly adopted management plan. An emergency order was issued that closed the burbot fishery in Lake Louise based on research findings that showed the lake's burbot stocks had become severely depressed due to overfishing. In addition, an emergency order was issued to keep the burbot fishery in Hudson Lake closed, as research showed that burbot in this lake remained depleted. Emergency regulations were also enacted that eliminated set-lines from the sport fishery in all remaining lakes of the Tyone River drainage, given that anglers had begun to seek out previously unexploited lakes in the Tyone River drainage in response to restrictions and closures placed on other area lakes (Lafferty and Vincent-Lang 1991).

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. Results to date have provided managers with the tools to determine stock status using a variety of assessment methods and an estimate of the productivity of the area's burbot fisheries. Annual results of the research project are summarized in Lafferty et al. (1990–1992) Lafferty and Bernard (1993), Parker et al. (1987-1989), Schwanke and Bernard (2005a,b) Schwanke and Perry-Plake (2007), Schwanke and Craig *in prep*, Taube et al. (1994, 2000), and Taube and Bernard (1995, 1999, 2001, 2004).

In 1991, the BOF adopted a department proposal that eliminated *unattended* set lines from all burbot fisheries in the UCUSMA. This proposal was intended to reduce angler efficiency, thereby providing protection from overexploitation to small burbot stocks in the area. Lake Louise and Hudson Lake were closed to burbot fishing at the 1991 board meeting. Both lakes had been closed through emergency orders for the past several years and were expected to remain closed by emergency orders into the future.

Following stock assessment in 1993, the burbot population in Hudson Lake had recovered sufficiently to open the lake to harvest. In the fall of 1993, Hudson Lake was opened by emergency order, with a bag limit of two burbot. During the December 1996 BOF meeting, the board adopted proposals to reopen Hudson Lake by regulation to a two fish bag limit and allow limited use of unattended setlines in the Copper River.

In 2003, the BOF adopted a proposal reopening Lake Louise to a limited burbot fishery. Stock assessment work conducted from 1986–1996 and again in 1999 demonstrated the burbot population had stabilized at below historic abundance levels (Taube et al. 2000). It was

theorized that a portion of the niche formally occupied by burbot had become occupied by lake trout and that the carrying capacity for burbot was reduced. The 12-year closure of the burbot fishery had not resulted in increased abundance.

During the same meeting the BOF closed Tolsona Lake to burbot harvest by regulation. Tolsona Lake had been closed by emergency order since 1998. Sampling in 1997 indicated a drastic decline in abundance between 1996 and 1997. This was attributed to environmental conditions, summer kill in 1990 and 1991, and possibly in 1992, 1994, 1995, and not a result of overfishing. Stock assessment on Tolsona Lake has continued on an annual basis since 1996 and the fishery will reopen when the population rebuilds to 1,500 mature burbot (Taube and Bernard 2001).

Recent Fishery Performance

With the adoption of the more conservative regulations in 1987, harvests of burbot from UCUSMA waters decreased (Table 20). Burbot harvest has averaged 1,566 fish from 1996–2005 and appears to have stabilized around this average. However, burbot harvest in 2006 was the lowest ever recorded at 588 fish. Crosswind Lake has supported the highest average harvest for 1996-2005 (386 fish) and the past five years (2001-2005) (483 fish). Burbot harvest at Crosswind Lake in 2005 increased to 859 fish, the highest since 1978, but the 2006 harvest was close to average with 229 burbot harvested. An abundance survey of the burbot population in Crosswind Lake was begun in 2006 (Schwanke and Craig *in prep*) to provide a basis to compare future estimates of abundance should harvest levels significant change.

Reductions in harvest have allowed some previously overexploited burbot stocks to recover to levels at which sustainable fisheries can occur. However, the sustainable yields from many of these lakes are substantially lower than maximum sustained yields the fisheries are capable of supporting and are far less than historic harvest levels. Larger lakes which were severely overexploited (e.g., Lake Louise) in the early to mid 1980s remain depressed. Stocks in larger lakes take longer to recover from overexploitation than do smaller and moderately-sized lakes. In Lake Louise, historically the largest burbot fishery in Alaska, the burbot stock remains low. The number of mature burbot in this lake appears to have leveled off at 4,000 fish (Taube et al. 2000). The current level of burbot abundance in this lake has remained stable since 1991 (Schwanke and Craig *in prep*).

Fishery Objectives and Management

As outlined in the lake burbot management plan (5 AAC 52.045), the burbot fisheries in lakes of the UCUSMA are to be managed for maximum sustained yield and opportunity to participate. The majority of burbot fisheries in the UCUSMA are assessed through the SWHS. Several lakes of concern are sampled on a yearly or three to five year rotation. These lakes currently include Tolsona Lake, Lake Louise and Crosswind Lake. Assessment includes estimation of abundance, catch per unit effort (CPUE), and length composition.

Current Issues and Fishery Outlook

Many anglers remain convinced that the changes made to the burbot fisheries of the UCUSMA in the late 1980s and early 1990s were unduly restrictive and unfair. This is particularly true with the action taken to eliminate unattended setlines from the burbot fisheries of the UCUSMA. To promote participation, staff have encouraged anglers to shift to alternative gear types that are legal (attended setlines or tip ups); however, angler participation continues to remain low since many anglers prefer the convenience of unattended setlines.

Historically, a few anglers using unattended setlines overharvested several UCUSMA lake burbot populations within a short time. Once overexploited, these fisheries were restricted or closed. Given life history characteristics of burbot, recovery of a depressed stock is slow, often taking many years to rebuild to a condition capable of sustaining a fishery. Even with current gear and bag limit restriction, targeted increases in effort can still lead to overexploitation followed by further unpopular restrictions. Spreading effort across the many lakes supporting burbot is the way to achieve the area's fishery management goals.

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. There is increasing recreational snowmachine activity in the UCUSMA each year and undoubtedly some snowmachiners may include ice fishing in their trips. This may account for the increasing burbot harvest in recent years, especially on Crosswind Lake.

Recent Board of Fisheries Actions

In addition to the 2003 closing of Tolsona Lake and reopening of Lake Louise to burbot fishing the BOF increased the bag and possession limit for burbot from 2 to 5 fish per day on the Copper River mainstem and the lower portions of its tributaries, with the exception of the Gulkana River, which remains closed to setlines to protect steelhead trout. The upper boundaries to which setlines are permitted are the Richardson Highway bridges to the west and the Tok Cutoff (Glenn Highway) bridges to the north. The total number of hooks used may not exceed five and gear must comply with that specified for burbot in the general sport fishing regulations.

Current or Recommended Research and Management Activities

The burbot stock assessment program has resumed on a limited scale. A monitoring program has been proposed for Lake Louise on a three to five year schedule. Lake Louise was last assessed in 1999 and was 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. The Tolsona Lake population should continue to be sampled for abundance and length composition on a yearly basis, as well as for water quality. The lakes that were assessed during the mid-to-late 1980s should be revisited to determine if the populations have recovered to historic levels. Baseline data was collected on the Copper River burbot population in 2003, dependent on future harvest levels, this population should be monitored (Schwanke and Bernard 2005b). Staff should continue to try to educate the angling public and seek their input in managing these important ice fisheries.

WILD RAINBOW AND STEELHEAD TROUT SPORT FISHERIES

Background and Historical Perspective

The UCUSMA 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 and variable production. To assure that these stocks are not overexploited, a conservative regulation plan has been developed to manage the fisheries targeting these stocks. This plan has been guided by the *Upper Cook Inlet and Copper River Basin Rainbow/Steelhead Trout Management Policy* (CISFPT 1987).

Under this policy, the entire Gulkana River drainage has been managed as a catch-and-release fishery for rainbow and steelhead trout since 1990. Managers believe that the abundance of

rainbow/steelhead trout in this drainage is low and that the stocks are incapable of supporting any level of long-term sustainable harvest. Additional protection was provided in 1990 through the establishment of an unbaited, artificial lure only area in all flowing waters of the Gulkana River drainage 7.5 miles upstream of the confluence of the West Fork. The identified rainbow/steelhead trout spawning areas on the Middle Fork of the Gulkana River were closed to all sport fishing during the adult spawning and egg incubation period of April 15 through June 14. The retention of rainbow or steelhead trout incidentally taken in the Copper River Personal Use Fishery is also prohibited. At the 2003 BOF meeting, Twelvemile Creek was closed to fishing during the spawning and egg incubation period. This site was identified as a rainbow and steelhead trout spawning area during research conducted in 2000-2001 Figure 3; Fleming 2004).

The policy has guided development of regulations for the Tebay River drainage. In Summit Lake and Bridge Creek in the Tebay drainage, special regulations were established in 1988 to provide anglers the opportunity to harvest a "trophy trout" in the UCUSMA. These regulations stated that rainbow/steelhead trout less than 32 inches in length could not be possessed or retained and the daily bag and possession limit for those over 32 inches was one. Research had once shown 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. However, more recent research (Fleming 2000) reported that only 27% of all rainbow trout sampled (> 3,000 fish) were greater than 12 inches, with a maximum size of 18 in. These results indicate a drastic change in the size composition of this population. As a result, the “trophy trout” regulations were repealed at the 1999 BOF meeting and changed to a daily bag and possession limit of 10 per day, maximum size limit of 12 inches, and an open season of July 1 through 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*).

The waters of Lower Hanagita Lake and the Hanagita River from Lower Hanagita Lake to the Tebay River have been managed as a catch-and-release fishery since 1988. In all these waters, only unbaited, single-hook, artificial lures have been permitted.

All other waters supporting wild rainbow/steelhead trout stocks are managed under a two fish daily and possession limit of which only one fish may be over 20 inches. The season is year-round with the exception of the Middle Fork Gulkana River and Twelvemile Creek spawning closure and Our Creek (tributary to Moose Lake), which is closed from April 1 through May 31 to protect spawning grayling.

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 board and department for developing regulations and managing wild trout populations.

Recent Fishery Performance

A total of 486 wild rainbow trout were reported harvested from the UCUSMA in 2006, which is slightly below the 5 year (2001-2005) average harvest of 651 fish (Table 21). The overall catch of wild rainbow trout dropped by 44% from 2005 to 2006 to the lowest ever catch of 3,686 fish (Table 22). The largest reduction in catch was in the Gulkana River drainage.

No steelhead trout have been reported harvested since 1999. Steelhead catch has decreased steadily since 1999 with 50 steelhead reported caught in 2006 (Table 23). Historically, the

Gulkana River drainage represents the largest proportion of steelhead catch in the UCUSMA. 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*.

In 1998, the first directed assessment by the department of wild rainbow trout and steelhead trout was conducted on the Gulkana River (Fleming 1999). Length, age and genetic data were gathered from rainbow trout and steelhead within the spawning area on the Middle Fork and mainstem Gulkana. In 1999, the Middle Fork spawning areas were sampled again and aerial surveys of the West Fork were conducted to locate other spawning areas (Fleming 2000). In addition, Fleming (2000) sampled Summit Lake in the Tebay drainage for abundance, age and length composition, and water quality. These studies were conducted to provide data regarding proposals submitted by the department for the 1999 BOF meeting, which were adopted by the board. These proposals addressed several fishery regulations and offered replacement language so that the UCUSMA regulations regarding rainbow and steelhead trout would comply with the *Upper Cook Inlet and Copper River Basin Rainbow/Steelhead Trout Management Policy.*

Current Issues and Fishery Outlook

The rainbow trout and steelhead trout populations and distribution are still not fully understood in the UCUSMA. Some populations may yet be unidentified and further investigation is needed to assess all the current spawning areas used by these fishes.

With the passage of the department submitted proposals in 1999, it is anticipated that the harvests of rainbow and steelhead trout will remain stable or decline slightly from the historic average. It is hoped that these actions will protect existing stocks and allow those that may be depleted to recover and provide the opportunity to catch rainbow and steelhead trout.

Recent Board of Fisheries Actions

Two changes to the UCUSMA rainbow and steelhead trout regulations were adopted at the December 1999 BOF meeting. A new regulation providing additional protection permits the use of only unbaited, single-hook, artificial lures in all flowing waters of the UCUSMA, with the exception of the Klutina River drainage and other drainages specifically listed in the regulations. As previously discussed the second change applied to Summit Lake in the Tebay River drainage, where the bag and possession limit became 10 per day, with a maximum size limit of 12 inches.

The Board adopted a department proposal at the 2003 BOF meeting to close Twelve Mile Creek, a tributary of the Gulkana River, from April 15-June 14 to protect spawning rainbow trout and steelhead trout. This proposal was submitted as a result of research conducted during 2000-2001 to locate rainbow trout spawning areas in the Gulkana River (Fleming 2004).

At the 2005 meeting the BOF adopted two proposals specific to rainbow trout/steelhead. The first reduced the bag and possession limit for rainbow trout/steelhead in Lake Louise, Susitna, Tyone lakes and the Tyone River drainage to two fish, of which only one may be over 20 inches. This aligned the regulations on those lakes with the background regulations recommended by the *Cook Inlet and Copper River Basin Rainbow/Steelhead Trout Management Policy*. The second proposal established catch-and-release regulations in the entire Hanagita River drainage.

Previously, a harvest of two fish, one over 20 inches was allowed upstream of Lower Hanagita Lake. This action was taken to protect the relatively small population of steelhead that spawns above Lower Hanagita Lake.

Ongoing or Recommended Research and Management Activities

Two rainbow/steelhead trout projects were conducted during 2002 and 2003 in the UCUSMA (Fleming 2004, Wuttig et al. 2004). These were conducted on the Gulkana and Hanagita (Tebay River Drainage) rivers. Weirs were operated on the Gulkana River downstream of Dickey Lake in spring of 2002 and Hungry Hollow Creek (an Upper Middle Fork Gulkana River tributary) in spring 2003. The second weir was operated on the Hanagita River in Fall 2002 to enumerate migrating steelhead. Genetic samples were also taken from each site. There was no genetic difference between rainbow trout and steelhead spawning below Dickey Lake, but there were significant genetic differences between those steelhead and rainbow trout spawning at Dickey Lake versus Hungry Hollow Creek. There were even greater genetic differences between the Gulkana River rainbow trout and steelhead and those steelhead spawning in the Hanagita River.

Stock assessment of the Gulkana River rainbow trout population was initiated in 2004. This project objective was to estimate abundance of rainbow trout from Paxson Lake to two miles downstream of Sourdough. Feasibility work was conducted in August and September of 2004 and a mark-recapture study was conducted in 2005 (Schwanke and Taras *in prep* a). A steelhead trout distribution study was initiated in 2004. The project objective was to determine steelhead distribution in the Upper Copper River using radiotelemetry. Feasibility work was conducted in September in 2004 and the full project was conducted in fall 2005 and 2006 (Savereide 2005 *b, c, in prep*).

DOLLY VARDEN SPORT FISHERIES

Background and Historical Perspective

Dolly Varden is a popular sport fish species in the UCUSMA, particularly among local residents fishing in the Klutina and Tonsina river drainages. Resident and anadromous populations are found throughout the Upper Copper River drainage. Dolly Varden are likely not present in the Gulkana River drainage, no juvenile or adult fish have been captured during any of the department stock assessment projects on the river. A single report of a Dolly Varden caught through the ice in the lower river during the 1999/2000 winter, is the only documentation of any Dolly Varden in the Gulkana River. Dolly Varden is found in the Copper River tributaries upstream of the Gulkana River, in the Chitina River drainage, and in drainages downstream of the Gulkana River. There is no explanation as to why this species is not present in the Gulkana River. Based upon harvest and catch reports from the SWHS, a minor harvest occurs in the Upper Susitna River drainage, though due to the barrier at Devils Canyon it is believed these are resident populations.

There is limited knowledge regarding the Dolly Varden populations in the UCUSMA, there have been only two projects directed towards this species. A University of Alaska Fairbanks graduate study was conducted on the Tiekel and Little Tonsina rivers in 1985 and 1986 (Gregory 1988). This study documented the biological characteristics of Tiekel 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 Tiekel River and identified habitat important to Dolly Varden (Martin 1988).

There are directed sport fisheries in the Klutina and Tonsina river drainages for Dolly Varden. These occur primarily in the Little Tonsina River and the Upper Klutina River near the outlet of the lake, generally before the king salmon fishery begins in late June and after the king salmon fishery closes at the end of July. Harvests of Dolly Varden, in the UCUSMA, peaked at 6,001 fish in 1985 (Table 24). Harvests from the Klutina and Tonsina river drainages accounted for an average of 72% of Dolly Varden harvested in the UCUSMA over the last 10 years (1996-2005. The bag and possession limit for Dolly Varden has been at 10 per day and 10 in possession since at least the early 1970s.

Recent Fishery Performance

Harvests of Dolly Varden have been declining since 1985 (Table 24). The 2006 harvest of 562 Dolly Varden is the lowest reported harvest since 1977. The past 10 year (1996-2005) Dolly Varden harvest average was 1,551 fish while the past five year (2001-2005) harvest average was 1,385 fish.

Fishery Objectives and Management

There are currently no specific management objectives for Dolly Varden. The underlying goal of the department, however, has been to assure sustained yield and provide fishing opportunity on fish resources. The Dolly Varden fisheries of the UCUSMA are assessed through the SWHS.

Current Issues and Fishery Outlook

There is a lack of biological and stock data for UCUSMA Dolly Varden populations. It is not known whether both resident and anadromous populations exist within individual systems. It is assumed, based upon the observed size of Dolly Varden harvested from the Klutina and Tonsina river drainages, that these fish are anadromous Dolly Varden. In addition, there is very little data, aside from the SWHS, and auxiliary data from the CWT king salmon project and lake and stream evaluation data on distribution of Dolly Varden from the 1960s and 1970s regarding distribution of Dolly Varden in the UCUSMA. Based on harvest and catch data from the SWHS, there is a significant fishery for Dolly Varden in the UCUSMA and a need for data concerning these exploited stocks.

With little biological or stock assessment data on the Dolly Varden stocks of the UCUSMA, it is uncertain whether the recent decline in harvests is a result of stock decline or reduced fishing effort. The SWHS does not distinguish effort between individual species, but in the Klutina River sport fisheries, it is assumed that most effort is directed at king salmon. The recent regulatory restrictions towards king salmon in the Tonsina River may have resulted in effort shifting towards other species, such as Dolly Varden or Arctic grayling. 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 increase also.

Recent Board of Fisheries Action

As a result of biological concern regarding the Tonsina River king salmon stock, the use of bait was restricted and only unbaited, single-hook, artificial lures were permitted following the 1996 BOF meeting. At the March 1999 BOF meeting, the bait restriction was modified to allow bait to be used with a hook gap of 3/8 inch or less. This regulatory modification was made to permit fisheries for Dolly Varden and Arctic grayling in the Tonsina River using traditional gear to harvest these species, while still reducing the harvest of king salmon. This restriction was

repealed at the 2003 and 2005 BOF meetings when bait was permitted in the entire Tonsina River drainage downstream of Tonsina Lake.

Ongoing and Recommended Research and Management

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 for microprobe analysis from any Dolly Varden that may be sampled. This will determine if the fish are anadromous or resident. Creel surveys will also provide data on fishing effort directed toward Dolly Varden.

UPPER COPPER / UPPER SUSITNA MANAGEMENT AREA STOCKED WATERS

Background and Historical Perspective

The Alaska Department of Fish and Game stocks approximately 29 lakes in the UCUSMA to provide fishing opportunities for popular game species in locations where fishing opportunities are limited or don't exist (Table 25). The lake stocking program serves a segment of the public who want to fish, but must remain on or near the road system. This program provides increased fishing opportunities and offers a diversity of species in rural areas where minimal or no opportunities exist for sport fishing. It also diverts effort from wild populations in areas for which the department has conservation concerns. Stocked lakes vary in size from 1.5 to 500 acres.

ADF&G stocks fingerling size fish (2-4 inches) in some lakes and catchable size fish (6-12 inches) in other lakes. Most large lakes can produce sufficient numbers of catchables from stockings of fingerling to meet angler demand. Smaller lakes or the more popular large lakes are stocked with catchables because stockings of fingerlings can not provide sufficient numbers of catchables to meet angler demand.

Recent Fishery Performance

Angler effort on stocked waters averaged 2,816 days fished over the last five years (2001-2005) and 3,088 days over the last ten years (1996-2005) (Table 26). This level of effort has produced an average catch of 10,496 stocked fish and an average harvest of 2,921 fish over the last five years. The average catch per effort for the last five years has been 3.9 fish per day fished. Rainbow trout are the predominant stocked species making up 89% of the catchable sized fish and 85% of the fingerling sized fish stocked from 2001-2005 (Table 27). Rainbow trout also dominated the stocked lakes catch and harvest, comprising 68% of the catch and 71% of the harvest from 2001-2005.

Rainbow trout comprised 87% of the catch and 84% of the harvest from stocked waters in 2006. Arctic grayling and Arctic char comprise the remaining catch and harvest. The total effort on stocked lakes has generally decreased from the early 1990s through 2006 (Table 26). Decreasing fishing effort reflects the overall decline in fishing effort in the UCUSMA as well as a decrease in the number of stocked fish since 1994.

Of all the stocked lakes in the UCUSMA, Silver Lake has been the most popular. Over the last five years (2001-2005) Silver Lake has accounted for over 50% of the harvest from area stocked lakes. When added with the harvests from Two and Three Mile lakes in Chitina on the Edgerton Highway and Sculpin and Strelna lakes on the McCarthy Road they accounted for over 75% of the

harvest from UCUSMA stocked lakes from 2001-2005. In 2006 Silver Lake accounted for 48% of the harvest of rainbow trout from UCUSMA stocked waters while the combined harvest from all Edgerton Highway and McCarthy road stocked waters accounted for 85% of the 2006 stocked rainbow harvest (Jennings et al. *in prep b*).

Fishery Objectives and Management

The Arctic-Kuskokwim-Yukon Region Stocked Waters Management Plan (5 AAC 70.065), 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.

Current Issues and Fishery Outlook

The DNA of the causative agent for Whirling Disease in rainbow trout and the freshwater carrier organism were identified in the ADF&G Elmendorf Hatchery catchable size rainbow trout in 2007. Although the disease has not been confirmed, all stocking of catchable rainbow trout was discontinued in UCUSMA to protect endemic rainbow trout populations in the area. Therefore, only fingerling rainbow trout will be stocked until new hatchery facilities are constructed. This decision, in conjunction with reduced hatchery production, has lead to an overall reduction in stocked waters in the area as some stocked lakes consistently winterkill.

Recent Board of Fisheries Action

During the January 2004 AYK Board of Fisheries meeting the board adopted a Regional Stocked Waters Management Plan (5 AAC 70.065). The plan created three Management Categories: Regional Management, Conservative Management, and Special Management Approach. All stocked lakes in the UCUSMA are categorized under the Regional Management Approach. The regulations for each management category are applied regionwide, and changed the general regulations for stocked waters in some areas. The primary change in the UCUSMA stocked waters was from a daily bag of 10 fish per species to a daily bag of 10 fish all species combined under the Regional Management Approach.

During the October 2007 BOF work session in Anchorage, the Board accepted as an Agenda Change Request an ADF&G proposal to amend the Area Stocked Waters Management Plan to provide ADF&G with EO authority to reduce bag limits, allow catch-and-release only, or alter methods and means in stocked waters. Reduced hatchery production may require such alterations to provide a diverse opportunity for anglers targeting stock waters.

Current or Recommended Research and Management Activities

Population status of stocked species may be assessed by periodic on-site sampling or as a component of research projects in stocked waters. 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) harvests of Chinook (king), sockeye, and coho salmon in the Copper River, 1977-2006.

Year	Chinook (king) harvest	Sockeye harvest	Coho harvest	Total
1977	2,213	36,349	454	39,016
1978	1,947	22,416	587	24,950
1979	2,515	23,599	752	26,866
1980	2,256	21,437	639	24,332
1981	1,913	53,008	849	55,770
1982	2,532	96,799	1,246	100,577
1983	5,421	100,995	1,690	108,106
1984	2,007	65,078	789	67,874
1985	1,673	50,488	544	52,705
1986	2,916	64,684	785	68,385
1987	3,280	61,900	498	65,678
1988	3,417	58,905	719	63,041
1989	2,913	80,557	890	84,360
1990	3,221	94,001	1,544	98,766
1991	5,164	111,788	3,477	120,429
1992	4,705	127,670	1,817	134,192
1993	4,037	138,211	1,428	143,676
1994	5,423	153,049	1,958	160,430
1995	6,330	125,573	5,547	137,450
1996	4,881	141,337	3,817	150,035
1997	7,798	224,499	334	232,631
1998	8,334	195,567	2,607	206,508
1999	8,807	209,917	3,160	221,884
2000	7,819	161,570	4,051	173,440
2001	6,176	200,421	3,486	210,083
2002[a]	5,748	132,202	2,317	140,267
2003[a]	4,584	130,165	2,472	137,221
2004[a]	5,897	164,157	2,987	173,041
2005[a]	4,128	182,985	1,729	188,843
2006[a]	4,958	175,925	2,144	183,027
2001-2005 average	4,528	142,434	1,360	171,917
1996-2005 average	6,418	175,092	2,732	184,242

[a] Includes Federal fishery harvests in the Glennallen and Chitina Subdistricts, and Batzulnetas.

Table 2.–Commercial harvests of Chinook (king) and sockeye salmon in the Copper River District, 1977-2007.

Year	Chinook (king) harvest	Sockeye harvest
1977	21,722	602,737
1978	29,062	249,872
1979	17,678	80,528
1980	8,454	18,908
1981	20,178	477,662
1982	47,362	1,177,632
1983	52,500	626,735
1984	38,957	900,043
1985	42,214	927,553
1986	40,670	780,808
1987	41,001	1,180,782
1988	30,741	576,950
1989	30,863	1,025,923
1990	21,702	844,778
1991	34,787	1,206,811
1992	39,810	970,938
1993	29,727	1,398,234
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	29,935	1,462,445
2007	39,095	1,901,773
2001-2005 average	39,759	1,227,960
1996-2005 average	46,814	1,535,618

Table 3.–Number of angler-days of sport fishing effort expended by recreational anglers fishing UCUSMA waters, 1977 - 2006.

	Effort (angler-days)			% Effort by UCUSMA	
Year	UCUSMA	Region III	Statewide	Region III	Statewide
1977	51,485	174,646	1,198,486	29.5%	4.3%
1978	44,566	190,058	1,285,063	23.4%	3.5%
1979	57,266	183,362	1,364,739	31.2%	4.2%
1980	50,518	210,784	1,488,962	24.0%	3.4%
1981	53,499	202,385	1,447,886	26.4%	3.7%
1982	54,953	253,744	1,640,644	21.7%	3.3%
1983	51,512	250,637	1,755,408	20.6%	2.9%
1984	51,964	251,005	1,874,064	20.7%	2.8%
1985	48,707	235,590	1,953,716	20.7%	2.5%
1986	51,563	246,276	2,087,268	20.9%	2.5%
1987	52,324	269,433	2,185,359	19.4%	2.4%
1988	45,867	279,426	2,348,595	16.4%	2.0%
1989	52,262	291,888	2,297,133	17.9%	2.3%
1990	50,791	296,420	2,455,468	17.1%	2.1%
1991	64,207	284,129	2,476,588	22.6%	2.6%
1992	72,052	253,904	2,564,754	28.4%	2.8%
1993	77,870	298,842	2,559,408	26.1%	3.0%
1994	85,520	295,507	2,719,911	28.9%	3.1%
1995	102,951	373,092	2,787,670	27.6%	3.7%
1996	64,407	265,573	2,006,528	24.3%	3.2%
1997	56,257	295,113	2,079,514	19.1%	2.7%
1998	56,706	227,841	1,856,976	24.9%	3.1%
1999	77,619	304,522	2,499,152	25.5%	3.1%
2000	58,194	241,574	2,627,805	24.1%	2.2%
2001	48,879	194,138	2,261,941	25.2%	2.2%
2002	46,613	220,276	2,259,091	21.2%	2.1%
2003	52,051	206,705	2,219,398	25.2%	2.3%
2004	46,592	217,041	2,473,961	21.5%	1.9%
2005	41,782	183,448	2,463,929	22.8%	1.7%
2006	39,948	175,274	2,298,092	22.8%	1.7%
2001-2005 Average	47,183	204,322	2,335,664	23.1%	2.0%
1996-2005 Average	54,910	235,623	2,274,830	23.3%	2.4%

Table 4.–Sport fishing effort (angler-days) in the UCUSMA by drainage, 1977 - 2006.

	Gulkana River Drainage			Upper Susitna Drainage						Copper River			Other Sites			Area
Year	Lakes	Streams	Total	Lakes	Streams	Total	Klutina	Tazlina	Tonsina	Upstream of Gulkana	Downstream of Klutina	Stocked Lakes	Lakes	Streams	Total	Total
1977	8,281	4,165	12,446	14,899	ND[a]	14,899	ND[a]	234	ND[a]	ND[a]	ND[a]	1,776	ND[a]	ND[a]	22,130	51,485
1978	8,917	6,570	15,487	13,161	ND[a]	13,161	ND[a]	0	ND[a]	ND[a]	ND[a]	2,584	ND[a]	ND[a]	13,334	44,566
1979	7,750	17,323	25,073	12,199	ND[a]	12,199	ND[a]	63	ND[a]	ND[a]	ND[a]	1,036	ND[a]	ND[a]	18,895	57,266
1980	7,725	13,752	21,477	10,539	ND[a]	10,539	ND[a]	129	ND[a]	ND[a]	ND[a]	1,737	ND[a]	ND[a]	16,636	50,518
1981	7,902	14,430	22,332	14,397	ND[a]	14,397	ND[a]	0	ND[a]	ND[a]	ND[a]	1,473	ND[a]	ND[a]	15,297	53,499
1982	8,855	14,979	23,834	14,024	ND[a]	14,024	ND[a]	34	ND[a]	ND[a]	ND[a]	1,810	ND[a]	ND[a]	15,251	54,953
1983	7,791	17,484	25,275	13,217	321	13,538	1,568	1,282	1,332	1,333	1,013	3,188	1,466	1,517	2,983	51,512
1984	6,906	13,031	19,937	15,186	643	15,829	3,257	1,722	1,009	2,571	1,697	2,433	1,835	1,674	3,509	51,964
1985	7,543	15,607	23,150	11,756	347	12,103	3,260	1,403	1,526	173	121	3,000	1,301	2,670	3,971	48,707
1986	4,543	14,351	18,894	16,619	415	17,034	5,346	1,853	332	410	175	3,214	2,381	1,924	4,305	51,563
1987	7,578	17,755	25,333	9,399	163	9,562	6,394	2,489	621	827	193	5,122	1,080	703	1,783	52,324
1988	7,593	11,330	18,923	9,768	418	10,186	6,192	1,907	723	1,294	217	3,528	1,796	1,101	2,897	45,867
1989	7,747	15,769	23,516	9,272	330	9,602	6,053	1,564	980	2,103	1,322	3,468	2,326	1,328	3,654	52,262
1990	7,172	19,112	26,284	8,334	860	9,194	5,556	2,082	498	1,197	537	2,599	1,804	1,040	2,844	50,791
1991	9,047	21,285	30,332	8,342	1,325	9,667	12,145	2,295	2,072	989	313	4,693	663	1,038	1,701	64,207
1992	8,816	26,039	34,855	10,594	1,408	12,002	6,398	3,486	2,240	540	1,255	7,484	1,759	2,033	3,792	72,052
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

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Table 4.–Page 2 of 2.

	Gulkana River Drainage			Upper Susitna Drainage						Copper River			Other Sites			
Year	Lakes	Streams	Total	Lakes	Streams	Total	Klutina	Tazlina	Tonsina	Upstream of Gulkana	Downstream of Klutina[c]	Stocked Lakes	Lakes	Streams	Total	Area Total
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	7,983	756	8,739	8,897	724	917	1,393	231	3,374	1,382	548	1,930	52,051
2004	3,290	17,318	20,608	6,041	819	6,860	10,472	241	1,007	1,376	2,264	1,461	1,641	662	2,303	46,592
2005	5,191	15,277	20,468	3,793	801	4,594	10,516	124	669	1,199	159	2,514	1,133	406	1,539	41,782
2006	2,545	11,910	14,455	4,873	1,111	5,984	12,285	738	716	950	263	3,015	738	804	1,542	39,948
2001-2005 average	5,379	18,820	24,199	6,549	837	7,386	9,713	840	1,117	937	812	3,059	1,447	955	2,402	50,466
1996-2005 average	6,169	23,424	29,593	7,987	1,129	9,117	11,050	1,471	1,440	996	826	3,384	1,623	1,528	3,151	61,027

[a] Prior to 1983, harvest included in “other sites”.

[b] Not including the Tonsina drainage.

Table 5.–Number of fish caught, by species, by recreational anglers fishing UCUSMA waters, 1990-2006.

Year	Chinook Salmon	Sockeye Salmon	Coho Salmon	Steelhead Trout	Rainbow Trout[a]	Dolly Varden[a]	Lake Trout	Arctic Grayling[a]	Burbot	Whitefish	Landlocked Salmon[a]	Other Fish	Total Fish
1990	6,057	8,474	0	136	12,312	5,639	15,335	80,300	2,872	2,276	51	0	133,452
1991	10,079	10,243	120	140	14,842	8,620	10,444	55,214	946	1,566	389	47	112,650
1992	12,340	9,344	169	39	27,412	6,243	12,886	59,051	2,222	4,074	670	22	134,472
1993	21,767	10,813	354	102	23,300	7,903	17,728	80,497	2,471	2,670	145	53	167,803
1994	11,272	11,700	417	332	25,187	5,947	13,368	80,302	4,064	3,368	550	660	157,167
1995	14,178	10,383	254	51	16,979	3,129	10,937	67,000	2,375	1,826	109	70	127,291
1996	27,195	25,265	502	121	19,935	4,595	11,209	77,381	1,639	3,017	1,244	6	172,109
1997	27,760	26,724	304	126	20,867	3,439	9,101	69,463	2,646	1,075	1,095	81	162,671
1998	22,324	21,359	1,535	196	22,283	4,156	8,184	71,625	2,849	1,612	1,708	80	157,911
1999	18,034	20,782	73	264	14,809	6,971	14,184	64,166	3,173	907	309	58	143,730
2000	18,503	19,348	596	346	18,330	3,034	9,388	50,467	4,316	2,019	800	58	127,205
2001	16,000	15,843	733	234	19,531	6,145	6,913	46,586	2,527	3,069	513	233	118,327
2002	19,497	12,181	471	129	16,605	4,535	12,197	99,458	3,878	3,756	927	100	173,734
2003	19,426	15,718	585	112	17,583	3,225	12,425	86,881	2,496	2,338	169	356	161,314
2004	12,664	10,912	478	64	12,836	5,675	8,242	50,688	1,646	1,420	0	1,637	106,262
2005	9,778	16,093	172	64	10,985	2,551	11,057	50,657	2,150	2,259	279	32	106,077
2006	11,057	21,778	72	50	8,377	1,857	4,377	25,358	1,067	1,023	42	219	75,277
2001-2005 average	15,473	14,149	488	121	15,508	4,426	10,167	66,854	2,539	2,568	378	472	133,143
1996-2005 average	19,118	18,422	545	166	17,376	4,433	10,290	66,737	2,732	2,147	704	264	142,934

[a] Includes rainbow trout, Arctic grayling, Arctic char, Chinook (king) and coho salmon caught in stocked waters.

Table 6.–Number of fish harvested, by species, by recreational anglers fishing UCUSMA waters (including stocked waters), 1977 - 2006.

Year	Chinook (king) salmon	Sockeye Salmon	Coho Salmon	Steelhead Trout	Rainbow Trout[a]	Dolly Varden[a]	Lake Trout	Arctic Grayling[a]	Burbot	Whitefish	Landlocked Salmon[a]	Other Fish
1977	532	3,662	269	187	2,808	2,251	7,699	25,991	5,628	2,445	1,750	236
1978	641	1,606	126	45	4,366	904	5,433	26,488	7,223	3,634	2,819	27
1979	2,948	1,599	412	55	3,372	5,890	7,271	37,232	3,808	2,408	1,918	645
1980	2,101	2,109	164	34	3,255	835	8,067	32,106	10,159	2,507	1,919	973
1981	1,717	1,523	0	76	5,358	2,452	8,337	32,982	9,007	2,420	3,251	292
1982	1,802	3,343	398	73	3,060	2,148	8,699	33,586	8,006	1,824	4,726	126
1983	2,579	2,619	84	21	2,460	4,509	7,246	27,094	6,555	2,810	4,175	63
1984	2,787	3,267	496	137	8,926	5,200	6,311	19,272	10,329	3,010	992	256
1985	1,939	4,752	410	162	8,149	6,001	8,686	32,511	19,355	3,745	2,238	417
1986	3,663	4,137	202	58	8,510	5,205	6,779	24,185	10,030	3,915	89	178
1987	2,301	4,876	330	134	7,838	2,023	6,721	27,359	4,386	2,096	0	76
1988	1,562	3,038	291	91	6,695	5,185	6,277	21,937	3,747	2,474	109	0
1989	2,356	4,509	18	84	5,835	3,979	7,147	16,629	3,396	2,991	281	0
1990	2,302	3,569	0	34	3,924	3,159	5,503	13,775	1,836	1,784	17	0
1991	4,884	5,511	69	114	6,868	2,140	4,864	13,278	793	717	111	47
1992	4,412	4,560	113	8	9,373	1,997	4,251	11,125	1,495	1,150	433	11
1993	8,217	5,288	249	0	7,245	3,173	4,569	12,504	1,694	815	56	9
1994	6,431	6,533	209	7	5,808	1,598	4,058	14,066	2,869	1,149	134	128
1995	6,709	6,068	160	10	4,671	1,695	2,934	14,289	995	898	42	30
1996	9,116	11,851	192	0	5,076	2,575	2,632	10,534	981	384	751	0
1997	8,346	12,293	96	0	2,812	1,092	1,923	8,583	1,358	134	331	56
1998	8,245	11,184	289	0	5,182	1,589	1,723	8,275	1,485	584	477	0
1999	6,742	11,101	24	8	3,842	2,390	2,135	8,245	1,861	317	232	0
2000	5,531	12,361	324	0	2,877	991	1,700	6,590	2,290	451	436	22
2001	4,904	8,169	92	0	2,416	1,612	1,185	4,450	1,506	1,135	282	207
2002	5,098	7,761	384	0	3,294	1,388	2,067	7,910	2,224	2,288	282	54
2003	5,717	7,108	277	0	3,761	1,578	1,831	5,908	1,457	422	51	104
2004	3,435	6,464	131	0	2,311	2,166	1,938	4,115	1,127	885	0	1,629
2005	4,093	8,135	72	0	1,907	742	2,513	3,716	1,374	1,089	122	16
2006	3,425	14,297	54	0	2,307	802	818	3,329	588	462	42	111
2001-2005 Average	4,649	7,527	191	0	2,738	1,497	1,907	5,220	1,538	1,164	147	402
1996-2005 Average	6,123	9,643	188	1	3,348	1,612	1,965	6,833	1,566	769	296	209

[a] Includes rainbow trout, Arctic grayling, Arctic char, Chinook (king) and coho salmon harvested from stocked waters.

Table 7.–Copper River Chinook (king) salmon harvests, 1977-2006.

Year	Commercial Harvest[a]	Copper River District Subsistence Harvest	Commercial Personal Use Harvest[a]	Sport Harvest	Upper Copper Subsistence Harvest[b]	Upper Copper Personal Use Harvest[b, c]	Total Harvest[d]
1977	21,722	10	ND	532	2,555	ND	24,819
1978	29,062	37	ND	641	2,239	ND	31,979
1979	17,678	45	ND	2,948	3,416	ND	24,087
1980	8,454	19	ND	2,101	3,035	ND	13,609
1981	20,178	48	ND	1,717	2,410	ND	24,352
1982	47,362	60	ND	1,802	2,764	ND	51,988
1983	52,500	79	ND	2,579	5,950	ND	61,108
1984	38,957	68	ND	2,787	509	1,760	44,081
1985	42,214	88	ND	1,939	629	1,329	46,199
1986	40,670	86	ND	3,663	686	2,367	47,472
1987	41,001	49	ND	2,301	813	2,968	47,132
1988	30,741	59	ND	1,562	992	2,994	36,348
1989	30,863	56	ND	2,356	787	2,251	36,313
1990	21,702	60	ND	2,302	647	2,708	27,419
1991	34,787	136	ND	4,884	1,328	4,056	45,191
1992	39,810	142	ND	4,412	1,449	3,405	49,218
1993	29,727	120	ND	8,217	1,434	2,846	42,344
1994	47,061	164	ND	6,431	1,989	3,743	59,388
1995	65,675	154	ND	6,709	1,892	4,707	79,137
1996	55,646	276	2,169	9,116	1,482	3,584	72,273
1997	51,273	200	1,243	8,346	2,583	5,447	69,092
1998	68,827	295	1,411	8,245	1,842	6,723	87,343
1999	62,337	353	1,115	6,742	3,141	5,913	79,601
2000	31,259	689	740	5,531	4,856	3,168	46,243
2001	39,524	826	935	4,904	3,553	3,113	52,855
2002	38,734	549	773	5,098	4,218	2,056	51,428
2003	47,721	710	1,068	5,717	3,091	1,921	60,233
2004	38,191	1,106	525	3,435	3,980	2,504	49,755
2005	34,624	260	767	4,093	2,666	1,967	44,296
2006	30,278	779	779	3,425	3,199	2,676	41,136
2001-2005 average	39,759	690	816	4,649	3,467	2,332	51,713
1996-2005 average	46,814	526	1,076	6,123	3,124	3,649	61,312

[a] G. Hollowell, personal communication. Commercial personal use harvest was not required to be reported until 1998, prior to this reporting was voluntary.

[b] These figures are expanded to reflect unreported permits and include reported Federal subsistence harvest figures (starting with 2002). See Table 2 for reported harvests.

[c] The personal use fishery was established in 1984.

[d] Total also includes fish harvested for educational and donation purposes.

Table 8.–Harvest of Chinook (king) salmon by recreational anglers fishing in the UCUSMA by drainage, 1977-2006.

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		
1977	0	ND	421	421	ND	ND	0	ND	0	111	532
1978	0	ND	606	606	ND	ND	-	ND	0	35	641
1979	0	ND	2,440	2,440	ND	ND	0	ND	0	508	2,948
1980	0	ND	1,688	1,688	ND	ND	0	ND	0	413	2,101
1981	0	ND	1,469	1,469	ND	ND	0	ND	0	248	1,717
1982	283	ND	1,320	1,603	ND	ND	0	ND	0	199	1,802
1983	273	0	1,951	2,224	189	52	31	10	21	52	2,579
1984	513	410	975	1,898	667	0	0	17	51	154	2,787
1985	373	199	684	1,256	249	37	37	0	124	236	1,939
1986	643	587	1,603	2,833	710	16	56	32	0	16	3,663
1987	194	330	1,107	1,631	495	19	49	0	0	107	2,301
1988	313	152	568	1,033	483	0	9	9	28	0	1,562
1989	362	419	849	1,630	652	11	40	0	11	12	2,356
1990	239	525	863	1,627	583	23	17	17	0	35	2,302
1991	483	1,321	1,187	2,991	1,709	89	32	0	25	38	4,884
1992	416	1,395	1,260	3,071	1,075	152	8	18	55	33	4,412
1993	694	1,894	3,304	5,892	1,989	172	0	47	64	53	8,217
1994	1,352	2,071	279	3,702	2,189	349	105	16	20	50	6,431
1995	984	2,250	322	3,556	2,485	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	3,344	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	3,489	0	0	25	11	124	6,742
2000	1,318	2,304	555	4,177	1,303	0	0	0	10	41	5,531
2001	967	1,793	514	3,274	1,465	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	1,873	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
2001-2005 average	713	1,967	206	2,885	1,546	119	0	3	20	77	4,649
1996-2005 average	965	2,356	389	3,710	2,162	110	16	4	22	100	6,123

Table 9.–Summary of Chinook (king) salmon harvests and upriver escapement in the Copper River 1981-2007

Year	Commercial Harvest[b]	CR[a] Subsistence Harvest	Sport Harvest	Glennallen Subdistrict Harvest	Chitina Subdistrict Harvest	Total Harvest	Upriver Return Estimate	Estimated Total Return	Upriver Escapement	Estimate Source
1981	20,178	48	1,717	585	1,824	24,352	ND	ND	ND	ND
1982	47,362	60	1,802	681	2,083	51,988	ND	ND	ND	ND
1983	52,500	79	2,579	1,275	4,675	61,108	ND	ND	ND	ND
1984	38,957	68	2,787	509	1,760	44,081	ND	ND	ND	ND
1985	42,214	88	1,939	629	1,329	46,199	ND	ND	ND	ND
1986	40,670	86	3,663	686	2,367	47,472	ND	ND	ND	ND
1987	41,001	49	2,301	813	2,968	47,132	ND	ND	ND	ND
1988	30,741	59	1,562	992	2,994	36,348	ND	ND	ND	ND
1989	30,863	56	2,356	787	2,251	36,313	ND	ND	ND	ND
1990	21,702	60	2,302	647	2,708	27,419	ND	ND	ND	ND
1991	34,787	136	4,884	1,328	4,056	45,191	ND	ND	ND	ND
1992	39,810	142	4,412	1,449	3,405	49,218	ND	ND	ND	ND
1993	29,727	120	8,217	1,434	2,846	42,344	ND	ND	ND	ND
1994	47,061	164	6,431	1,989	3,743	59,388	ND	ND	ND	ND
1995	65,675	154	6,709	1,892	4,707	79,137	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	63,452	353	6,742	3,141	5,913	79,601	32,082	95,534	16,286	ADFG
2000	32,005	689	5,531	4,856	3,168	46,249	38,047	70,052	24,492	ADFG
2001	40,459	826	4,904	3,553	3,113	52,855	39,778	80,237	28,208	ADFG
2002	39,536	549	5,098	4,218	2,056	51,457	32,873	72,409	21,501	ADFG
2003	48,797	710	5,717	3,091	1,921	60,236	44,764	93,561	34,035	NVE
2004	38,735	1,106	3,435	3,980	2,504	49,760	40,564	79,299	30,645	NVE
2005	35,487	260	4,093	2,494	2,065	44,399	30,333	65,820	21,681	NVE
2006	31,075	779	3,425	3,199	2,676	41,154	67,789	98,864	58,489	NVE
2007	40,276	690	3,800	3,872	2,721	51,359	46,349	86,625	35,956	NVE
2002-2006 Average	38,726	681	4,354	3,396	2,244	49,401	45,960	81,991	33,270	
1997-2006 Average	45,230	577	5,554	3,296	3,559	58,215	40,779	81,972	29,417	

[a] Includes state and federal subsistence harvests from the Copper River District

[b] Includes commercial, personal use, donations, and educational harvests from the Copper River District

Table 10.–Catch of Chinook (king) salmon by recreational anglers fishing in the UCUSMA by drainage, 1990-2006.

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		
1990	2,728	1,055	ND	3,783	1,493	35	146	17	0	583	6,057
1991	3,956	2,731	ND	6,687	3,036	146	134	0	25	63	10,079
1992	4,635	3,419	ND	8,054	3,822	222	8	18	160	56	12,340
1993	10,592	4,994	ND	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	32	138	16,000
2002	3,346	8,613	357	12,316	5,645	861	0	13	0	662	19,497
2003	4,165	8,898	293	13,356	5,418	290	0	202	12	148	19,426
2004	1,380	5,433	555	7,368	4,135	521	0	404	106	130	12,664
2005	1,596	4,771	217	6,584	2,651	483	0	0	15	45	9,778
2006	1,805	5,664	204	7,673	2,890	367	0	0	13	114	11,057
2001-2005 average	2,687	6,826	578	10,092	4,554	435	0	134	33	225	15,473
1996-2005 average	3,701	7,699	1,080	12,480	5,736	389	37	132	53	290	19,118

Table 11.–Summary of sockeye harvests and upriver escapement in the Copper River 1981 - 2007.

Year	Commercial Harvest[b]	CRD[a] Subsistence Harvest	Sport Harvest	Glennallen Subdistrict Harvest	Chitina Subdistrict Harvest	Total Harvest	Upriver Return Estimate	Estimated Total Return	Spawning[c] Escapement
1981	477,662	145	1,523	30,545	37,352	547,227	535,263	1,012,925	465,843
1982	1,177,632	634	3,343	39,968	68,643	1,290,220	467,306	1,644,938	355,352
1983	626,735	107	2,619	37,596	79,392	746,449	545,724	1,172,459	426,117
1984	900,043	324	3,267	27,941	48,236	979,811	536,806	1,436,849	457,362
1985	927,553	261	4,752	30,666	30,885	994,117	436,313	1,363,866	370,010
1986	780,808	348	4,129	27,441	41,054	853,780	509,275	1,290,083	436,651
1987	1,180,782	359	4,876	33,106	43,492	1,262,615	483,478	1,664,260	402,004
1988	576,950	226	3,038	29,194	42,331	651,739	488,398	1,065,348	413,835
1989	1,025,923	339	4,509	28,360	55,778	1,114,909	607,869	1,633,792	519,222
1990	844,778	469	3,569	31,765	66,432	947,013	581,859	1,426,637	480,093
1991	1,206,811	830	5,511	39,599	77,590	1,330,341	579,412	1,786,223	456,712
1992	970,938	785	4,560	45,232	86,724	1,108,239	601,952	1,572,890	465,436
1993	1,398,234	428	5,288	53,252	93,472	1,550,674	833,387	2,231,621	681,375
1994	1,152,220	474	6,533	68,278	94,024	1,321,529	715,577	1,867,797	546,742
1995	1,271,822	692	6,068	52,516	79,006	1,410,104	599,265	1,871,087	461,675
1996	2,356,365	969	11,851	52,052	95,007	2,516,244	906,239	3,262,604	747,329
1997	2,955,431	1,001	12,293	82,807	148,727	3,200,259	1,148,079	4,103,510	904,252
1998	1,343,127	850	11,184	64,463	137,161	1,556,785	866,957	2,210,084	654,149
1999	1,683,892	1,330	11,101	77,369	141,658	1,915,350	850,951	2,534,843	620,823
2000	881,419	4,360	12,361	59,497	107,856	1,065,493	587,497	1,468,916	407,783
2001	1,325,690	3,072	8,169	83,787	132,108	1,552,826	833,569	2,159,259	609,505
2002	1,249,920	3,067	7,761	58,799	86,543	1,406,090	819,886	2,069,806	666,783
2003	1,192,164	1,607	7,108	60,623	81,513	1,343,015	708,118	1,900,282	558,874
2004	1,048,603	1,822	6,464	73,299	108,862	1,239,050	669,646	1,718,249	481,021
2005	1,333,574	830	8,135	83,657	121,278	1,547,474	854,268	2,187,842	641,198
2006	1,434,333	4,355	14,297	74,321	124,640	1,651,946	892,731	2,327,064	554,528
2007	1,833,337	3,000	8,753	80,939	126,055	2,052,084	926,438	2,759,775	681,999
2002-2006 Average	1,251,719	2,336	8,753	70,140	104,567	1,437,515	788,930	2,040,649	580,481
1997-2006 Average	1,444,815	2,229	9,887	71,862	119,035	1,647,829	823,170	2,267,986	609,892

a Includes state and federal subsistence harvests from the Copper River District

b Includes commercial, personal use, donations, and educational harvests from the Copper River District and includes delta stocks

c Excludes hatchery surplus fish

Table 12.–Harvest of sockeye salmon by recreational anglers fishing UCUSMA drainages, 1977 – 2006.

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		
1977	0	ND	1,180	1,180	ND	ND	0	ND	0	2,482	3,662
1978	0	ND	662	662	ND	ND	-	ND	0	944	1,606
1979	0	ND	545	545	ND	ND	0	ND	0	1,054	1,599
1980	0	ND	1,248	1,248	ND	ND	0	ND	0	861	2,109
1981	0	ND	1,447	1,447	ND	ND	0	ND	0	76	1,523
1982	660	ND	1,226	1,886	ND	ND	0	ND	0	1,457	3,343
1983	260	0	1,661	1,921	274	0	0	27	41	356	2,619
1984	633	103	958	1,694	496	0	34	120	274	649	3,267
1985	771	149	1,804	2,724	622	50	0	0	0	1,356	4,752
1986	1,069	197	1,444	2,710	1,291	0	48	0	24	64	4,137
1987	669	297	2,736	3,702	1,085	0	89	0	0	0	4,876
1988	437	127	1,055	1,619	1,419	0	0	0	0	0	3,038
1989	999	222	1,836	3,057	1,383	0	9	9	51	0	4,509
1990	681	552	1,464	2,697	802	40	0	0	30	0	3,569
1991	779	599	988	2,366	2,435	200	60	0	240	210	5,511
1992	805	255	1,068	2,128	1,356	99	0	90	649	238	4,560
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
2001-2005 average	448	1,018	126	1,593	5,515	52	0	4	118	246	7,527
1996-2005 average	976	1,903	603	3,482	5,629	41	15	22	120	335	9,643

Table 13.–Distribution of sockeye salmon in major drainages in the Copper River, 2005 – 2006.

	River System						
Year	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
Average	6.6	6.6	5.1	39.8	11.9	11.3	18.8

Source: Smith et al. 2006; Wade et al. 2007)

Table 14.–Number of permits issued and estimated salmon harvests during the Glennallen Subdistrict subsistence salmon fishery in the Copper River, 1977-2007 (does not include Federal subsistence fishery permit numbers or harvests).

Year	Number of Permits Issued	Estimated Salmon Harvest			
		Chinook (king)	Sockeye	Coho	Total[a,b]
1977	4,066	2,555	41,978	523	45,208
1978	3,705	2,239	25,783	675	28,715
1979	3,200	3,416	33,096	928	37,585
1980	3,203	3,035	31,041	822	35,100
1981	4,078	2,410	65,168	1,077	68,687
1982	6,090	2,764	105,432	1,361	109,726
1983	7,541	5,950	110,794	1,855	118,734
1984	475	509	27,941	167	28,631
1985	ND	629	30,666	294	31,614
1986	405	686	27,441	291	28,423
1987	445	813	33,106	161	34,142
1988	417	992	29,194	372	30,755
1989	386	787	28,360	69	29,308
1990	406	647	31,765	92	32,524
1991	712	1,328	39,599	232	41,205
1992	655	1,449	45,232	350	47,095
1993	773	1,434	53,252	77	54,854
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	85,744
1998	1,010	1,842	64,463	533	66,951
1999	1,102	3,141	77,369	1,121	81,631
2000	1,253	4,856	59,497	532	64,885
2001	1,239	3,553	83,787	1,154	88,578
2002	1,121	3,654	50,849	530	55,059
2003	1,012	2,537	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	2,770	57,710	212	60,775
2007	1,174	3,276	65,714	238	69,284
2001-2005 average	1,058	3,064	60,088	665	63,881
1996-2005 average	1,064	2,936	63,663	626	67,361

[a] Total harvest includes steelhead and other species.

[b] Total harvest prior to 1984 includes both harvest from the Chitina and Glennallen subdistricts.

Table 15.–Number of permits issued and estimated salmon harvested during the Chitina Subdistrict personal use salmon fishery in the Copper River, 1984-2007 (does not include Federal subsistence fishery permit numbers or harvests).

Year	Number of Permits Issued	Estimated Salmon Harvest			
		Chinook (king)	Sockeye	Coho	Total[b]
1984	5,415	1,760	48,236	717	50,734
1985	ND	1,329	30,885	361	32,586
1986	4,031	2,367	41,054	538	44,047
1987	4,245	2,968	43,492	424	46,908
1988	4,251	2,994	42,331	504	45,855
1989	4,582	2,251	55,778	857	58,941
1990	5,689	2,708	66,432	1,511	70,812
1991	6,222	4,056	77,590	3,354	85,059
1992	6,385	3,405	86,724	1,517	91,683
1993	7,914	2,846	93,472	1,416	97,767
1994	7,061	3,743	94,024	1,981	99,822
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	2,174	149,779
2000	8,151	3,168	107,856	3,657	114,878
2001	9,467	3,113	132,108	2,720	138,425
2002	6,851	2,023	85,968	1,934	90,241
2003	6,526	1,903	80,796	2,533	85,495
2004	8,386	2,495	107,312	2,860	113,164
2005	8,230	2,043	120,013	1,869	124,403
2006	8,633	2,663	123,261	2,715	129,103
2007	8,377	2,694	125,126	1,742	130,222
2001-2005 average	7,874	2,315	105,239	2,383	110,348
1996-2005 average	8,375	3,614	115,021	2,332	121,215

[a] From 2000 to 2002 the Chitina Subdistrict was classified a subsistence fishery.

[b] Total estimate includes unidentified salmon.

Table 16.–Harvest of Arctic grayling by recreational anglers in the UCUSMA by drainage, 1977 - 2006.

					Tazlina River Drainage		Copper River Drainage				
Year	Gulkana River Drainage	Upper Susitna River Drainage	Klutina River Drainage	Tonsina River Drainage	Mendeltna Creek	Other Lakes and Streams	Above Gulkana	Below Klutina	Stocked Lakes	Other Lakes and Streams	Area Total
1977	5,929	3,557	ND	ND	ND	ND	ND	ND	ND	16,505	25,991
1978	9,619	2,278	ND	ND	ND	ND	ND	ND	ND	14,591	26,488
1979	13,789	2,936	ND	ND	ND	ND	ND	ND	ND	20,507	37,232
1980	10,530	4,477	ND	ND	ND	ND	ND	ND	ND	17,099	32,106
1981	11,933	4,892	ND	ND	ND	ND	ND	ND	ND	16,157	32,982
1982	14,273	3,532	ND	ND	ND	ND	ND	ND	ND	15,781	33,586
1983	13,480	5,035	734	661	231	1,015	1,700	1,196	472	2,570	27,094
1984	10,021	3,214	958	188	171	1,248	1,471	428	222	1,351	19,272
1985	20,165	4,092	1,058	867	347	1,352	468	0	35	4,127	32,511
1986	13,138	4,898	1,702	72	234	500	395	0	460	2,786	24,185
1987	14,021	2,975	729	1,056	387	2,082	2,958	446	639	2,066	27,359
1988	8,585	2,783	1,673	345	1,037	910	1,583	473	1,401	3,147	21,937
1989	6,961	2,755	1,041	629	272	882	1,078	600	947	1,464	16,629
1990	5,383	3,193	544	289	170	578	1,070	136	935	1,477	13,775
1991	6,458	1,978	1,092	296	102	1,195	795	45	726	591	13,278
1992	3,991	2,044	346	811	255	475	143	15	1,623	1,422	11,125
1993	3,828	2,746	681	814	867	724	826	336	852	830	12,504
1994	4,229	3,662	363	363	906	1,008	441	123	1,167	1,804	14,066
1995	4,071	3,982	285	261	1,041	1,259	724	166	804	1,696	14,289
1996	3,263	2,949	183	192	570	849	329	194	726	1,279	10,534
1997	3,228	1,332	165	82	462	468	222	269	570	1,785	8,583
1998	2,975	1,797	517	495	579	490	410	150	223	639	8,275
1999	2,426	1,564	530	368	79	706	400	67	1,265	840	8,245
2000	2,062	2,181	134	123	245	274	96	0	521	954	6,590
2001	1,753	686	267	128	70	120	294	29	473	630	4,450
2002	2,646	928	566	180	23	370	527	62	1,939	669	7,910
2003	2,132	1,047	575	58	23	312	837	0	688	236	5,908
2004	1,331	819	197	112	65	73	645	124	62	687	4,115
2005	1,553	380	59	86	0	500	249	96	253	540	3,716
2006	1,179	940	77	8	46	359	70	91	137	422	3,329
2001-2005[a]	1,883	772	333	113	36	275	510	62	683	552	5,220
1996-2005[a]	2,337	1,368	319	182	212	416	401	99	672	826	6,833

[a] Average for years listed.

Table 17.–Harvest of lake trout by recreational anglers fishing UCUSMA waters by drainage, 1977 – 2006.

	Gulkana River Drainage					Upper Susitna River Drainage							
Year	Paxson Lake	Summit Lake	Crosswind Lake	Other Lakes & Streams	Gulkana Total	Lake Louise	Susitna Lake	Other Lakes & Streams	Upper Susitna Total	Klutina Drainage	Tazlina Drainage	Other Sites	Area Total
1977	ND	ND	252	1,435	1,687	ND	ND	2,838	2,838	ND	ND	16,505	25,555
1978	ND	ND	714	1,103	1,817	ND	ND	2,522	2,522	ND	ND	14,591	23,269
1979	ND	ND	609	2,281	2,890	ND	ND	2,618	2,618	ND	ND	20,507	31,523
1980	ND	ND	895	2,324	3,219	ND	ND	2,609	2,609	ND	ND	17,099	28,755
1981	ND	ND	540	2,041	2,581	ND	ND	4,093	4,093	ND	ND	16,157	29,505
1982	ND	ND	734	2,777	3,511	ND	ND	4,056	4,056	ND	ND	15,781	30,915
1983	ND	ND	388	2,769	3,157	ND	ND	3,251	3,251	136	210	1,122	14,284
1984	787	581	188	188	1,744	2,018	650	240	2,908	34	34	1,026	10,398
1985	1803	520	832	832	3,987	2,341	763	781	3,885	35	34	3,138	18,951
1986	944	428	137	74	1,583	2,227	1,114	702	4,043	750	0	1,470	13,472
1987	1457	1,368	401	521	3,747	1,636	401	75	2,112	134	149	1,829	13,830
1988	1310	528	382	1,147	3,367	1,801	418	55	2,274	163	55	2,201	13,701
1989	1557	863	272	404	3,096	1,979	441	544	2,964	150	0	1,050	13,320
1990	2139	968	306	170	3,583	1,036	187	119	1,342	68	51	782	10,751
1991	1248	981	463	98	2,790	1,332	308	196	1,836	84	42	579	9,957
1992	1118	524	378	240	2,260	1,033	324	348	1,705	39	62	678	8,709
1993	778	344	311	276	1,709	1,316	669	375	2,360	28	0	774	8,940
1994	262	353	429	110	1,154	1,463	426	477	2,366	74	15	913	8,042
1995	507	224	94	90	915	946	200	419	1,565	71	0	1,215	6,246
1996	297	120	339	336	1,092	662	381	306	1,349	22	11	774	5,689
1997	452	158	96	142	848	585	52	100	737	33	23	982	4,208
1998	205	59	238	39	541	625	131	135	891	12	56	468	3,400
1999	342	220	525	68	1,155	430	176	216	822	35	16	572	4,577
2000	228	79	297	27	631	563	131	93	787	18	83	265	3,202
2001	302	74	44	86	506	259	110	118	487	17	0	188	2,191
2002	328	66	299	60	753	458	152	138	748	0	122	669	3,793
2003	399	102	403	104	1,008	393	128	80	601	52	0	325	3,595
2004	46	107	105	30	288	770	30	347	1,147	14	0	489	3,373
2005	50	32	519	71	672	370	429	637	1,436	66	16	323	4,621
2006	61	10	191	32	294	200	148	123	471	0	0	53	1,583
2001-2005	225	76	274	70	645	450	170	264	884	30	28	399	3,515
1996-2005	265	102	287	96	749	512	172	217	901	27	33	506	3,865

Table 18.–Percent of lake trout released in lakes with 24” minimum size limit, 1990-2006[a].

Year	Paxson [b]	Summit [b]	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	56	82
2006	79	92	60	86	81	81
1990-1993	53	60	72	63	69	63
1994-2005	84	79	79	80	78	80

[a] The 24” minimum size limit went into effect prior to the 1994 fishing season.

[b] Starting in 2006, the bag limit for lake trout in Paxson and Summit Lakes became one lake trout of any size and bait was allowed from November 1 through April 15.

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
Crosswind	274	No	361	> 24 inch
Tanada	22	No	399	> 24 inch
Copper	57	No	341	> 24 inch
Summit	76	Yes	413	Any size
Paxson	225	Yes	585	Any size
Lake Louise	450	Yes	540	> 24 inch
Susitna	170	Yes	321	> 24 inch

[a] Average harvest from SWHS 2001-2005.

Table 20.–Harvest of burbot caught by recreational anglers fishing in the UCUSMA by drainage, 1977 – 2006.

	Gulkana River Drainage				Upper Susitna River Drainage				Tazlina Drainage						
Year	Paxson Lake	Crosswind Lake	Other Gulkana Waters	Total	Lake Louise	Susitna and Tyone Lakes	Other Susitna Waters	Total	Tolsona & Moose Lakes	Hudson Lake	Other Tazlina Waters	Total	Klutina Drainage	Other Sites	Area Total
1977	ND	291	216	507	ND	ND	ND	3,157	ND	467	ND	467	ND	1,497	5,628
1978	ND	868	316	1,184	ND	ND	ND	2,947	ND		ND	0	ND	3,092	7,223
1979	ND	100	418	518	ND	ND	ND	2,363	ND	118	ND	118	ND	809	3,808
1980	ND	646	904	1,550	ND	ND	ND	6,612	ND	34	ND	34	ND	1,963	10,159
1981	ND	367	778	1,145	ND	ND	ND	5,292	ND	0	ND	0	ND	2,570	9,007
1982	ND	262	282	544	ND	ND	ND	5,565	ND	0	ND	0	ND	1,897	8,006
1983	ND	178	661	839	ND	ND	ND	4,070	713	441	273	1,427	0	219	6,555
1984	86	0	598	684	2,445	1,368	0	3,813	1,864	1,334	1,949	5,147	17	668	10,329
1985	945	665	35	1,645	3,710	7,210	0	10,92	1,050		2,310	3,360	35	3,395	19,355
1986	452	48	273	773	2,954	2,704	105	5,763	1,243	1,211	613	3,067	0	859	10,462
1987	119	327	149	595	506	684	30	1,220	684	446	862	1,992	0	579	4,386
1988	200	364	91	655	655	273	200	1,128	73	327	546	946	36	982	3,747
1989	366	19	47	432	976	656	66	1,698	94	ND	403	497	0	769	3,396
1990	221	340	17	578	255	323	0	578	408	ND	0	408	0	272	1,836
1991	45	271	54	370	0	45	54	99	108	ND	81	189	0	135	793
1992	127	152	152	431	0	533	8	541	127	ND	220	347	0	151	1,470
1993	32	225	0	257	0	172	0	172	21	0	86	107	0	1,158	1,694
1994	21	317	291	629	0	766	145	911	93	31	114	238	0	1,091	2,869
1995	69	271	7	347	0	137	46	183	23	103	0	126	0	339	995
1996	65	86	48	199	0	163	49	212	81	0	57	138	0	432	981
1997	535	174	103	812	0	262	52	314	0	ND	26	26	0	206	1,358
1998	535	139	17	691	0	149	118	267	0	59	401	460	0	67	1,485
1999	266	503	13	782	0	670	0	670	0	ND	117	117	0	292	1,861
2000	291	539	472	1,302	0	609	0	609	0	ND	222	222	0	157	2,290
2001	764	173	122	1,059	0	154	36	190	0	ND	136	136	0	121	1,506
2002	401	578	259	1,238	0	437	31	468	0	ND	128	128	13	377	2,224
2003	173	470	250	893	32	119	33	184	0	ND	87	87	65	228	1,457
2004	20	336	0	356	317	91	10	418	0	0	0	0	0	353	1,127
2005	112	859	94	1,065	25	74	10	109	0	0	25	25	0	175	1,374
2006	0	229	0	229	210	46	13	269	0	0	77	77	13	0	588
2001-2005[a]	294	483	145	922	75	175	24	274	0	0	75	75	16	251	1,538
1996-2005[a]	316	386	138	840	37	273	34	344	8	15	120	134	8	241	1,566

[a] Average for years depicted

Table 21.–Harvest of wild rainbow trout by sport anglers fishing UCUSMA waters by drainage, 1977 – 2006.

Year	Gulkana River Drainage[a]				Klutina River Drainage	Tazlina River Drainage	Tonsina River Drainage	Copper River Drainage		Other Sites	Area Total
	Upper River	Lower River	Gulkana R. Other	Total				Upstream of Gulkana	Downstream of Klutina		
1977	305	ND	447	752	ND	0	ND	ND	ND	1,465	2,217
1978	316	ND	940	1,256	ND	-	ND	ND	ND	669	1,925
1979	473	ND	982	1,455	ND	0	ND	ND	ND	1,345	2,800
1980	293	ND	956	1,249	ND	0	ND	ND	ND	1,317	2,566
1981	216	ND	1,253	1,469	ND	0	ND	ND	ND	2,560	4,029
1982	565	ND	692	1,257	ND	21	ND	ND	ND	870	2,148
1983	607	83	765	1,455	0	0	0	0	26	120	1,601
1984	1,129	0	137	1,266	0	34	68	17	4,634	513	6,532
1985	1,421	589	486	2,496	347	121	0	0	0	694	3,658
1986	552	109	475	1,136	81	24	0	0	0	3,300	4,541
1987	536	238	773	1,547	208	15	595	178	149	506	3,198
1988	1,037	36	236	1,309	18	146	18	0	0	273	1,764
1989	375	0	281	656	56	9	38	0	601	366	1,726
1990	204	34	187	425	17	170	17	68	17	1,036	1,750
1991	14	0	150	164	96	0	14	0	177	259	710
1992	0	0	8	8	63	24	103	0	214	792	1,204
1993	0	0	40	40	108	0	40	0	0	730	918
1994	0	0	0	0	8	8	87	0	515	981	1,599
1995	0	0	0	0	37	0	28	0	94	260	419
1996	0	0	0	0	0	10	26	0	148	892	1,076
1997	0	0	0	0	12	36	0	0	132	955	1,135
1998	0	0	0	0	8	48	8	0	176	203	443
1999	0	0	0	0	0	73	24	0	117	584	798
2000	0	0	0	0	0	0	33	0	0	298	331
2001	0	0	0	0	81	0	0	0	56	315	452
2002	0	44	0	44	0	0	58	0	23	268	393
2003	0	0	0	0	55	18	0	0	0	1,262	1,335
2004	0	0	0	0	0	14	27	0	128	527	696
2005	0	0	0	0	9	0	11	0	116	331	467
2006	0	0	0	0	0	0	48	0	72	366	486
2001-2005 average	0	9	0	9	29	6	19	0	65	523	651
1996-2005 average	0	4	0	4	17	20	19	0	90	555	704

[a] In 1991, the Gulkana River was closed to the harvest of rainbow trout.

Table 22.–Sport catch of wild rainbow trout by sport anglers fishing UCUSMA waters by drainage, 1977 – 2006.

Year	Gulkana River Drainage[a]				Klutina River Drainage	Tazlina River Drainage	Tonsina River Drainage	Copper River Drainage		Other Sites	Area Total
	Upper River	Lower River	Gulkana R. Other	Total				Upstream of Gulkana	Downstream of Klutina		
1990	2,344	51	ND	2,395	34	645	17	509	153	2,768	6,521
1991	1,256	14	ND	1,270	246	792	41	342	109	1,106	3,906
1992	1,496	166	ND	1,662	103	253	293	0	1,908	2,581	6,800
1993	2,468	305	ND	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	2,757	1,251	405	4,413	87	11	331	0	374	1,333	6,549
2006	1,361	405	205	1,971	58	756	67	222	147	465	3,686
2001-2005 average	4,044	1,240	230	5,514	89	17	111	3	405	2,188	8,326
1996-2005 average	4,766	1,211	257	6,234	84	38	77	36	1,371	2,198	10,037

[a] In 1991, the Gulkana River was closed to the harvest of rainbow trout.

Table 23.–Catch of steelhead trout by sport anglers fishing UCUSMA waters by drainage, 1990 - 2006.

Year	Gulkana River Drainage[a]				Klutina River Drainage	Tazlina River Drainage	Tonsina River Drainage	Copper River Drainage		Other Sites	Area Total
	Upper River	Lower River	Gulkana R. Other	Total				Upstream of Gulkana	Downstream of Klutina		
1990	68	0	ND	68	0	0	0	0	0	68	136
1991	26	0	ND	26	0	0	0	0	0	114	140
1992	31	8	ND	39	0	0	0	0	0	0	39
1993	92	10	ND	102	0	0	0	0	0	0	102
1994	0	0	0	0	0	0	212	0	113	7	332
1995	43	8	0	51	0	0	0	0	0	0	51
1996	36	85	0	121	0	0	0	0	0	0	121
1997	23	54	49	126	0	0	0	0	0	0	126
1998	23	82	4	109	0	0	0	0	87	0	196
1999	136	120	0	256	0	0	0	0	0	8	164
2000	121	36	12	169	0	0	0	0	177	0	346
2001	116	103	0	219	15	0	0	0	0	0	234
2002	107	22	0	129	0	0	0	0	0	0	129
2003	42	70	0	112	0	0	0	0	0	0	112
2004	0	33	0	33	0	0	31	0	0	0	64
2005	0	64	0	64	0	0	0	0	0	0	64
2006	25	25	0	50	0	0	0	0	0	0	50
2001-2005 average	53	58	0	111	3	0	6	0	0	0	121
1996-2005 average	60	67	7	134	2	0	3	0	26	1	166

[a] In 1991, the Gulkana River was closed to the harvest of rainbow trout/steelhead.

Table 24.–Harvest of wild Dolly Varden by sport anglers fishing UCUSMA waters by drainage[a], 1977 – 2006.

Year	Klutina River Drainage	Tazlina River Drainage	Tonsina River Drainage	Copper River Drainage		Other Sites	Area Total
				Upstream of Gulkana	Downstream of Klutina		
1977	ND	0	ND	ND	ND	2,251	2,251
1978	ND	-	ND	ND	ND	904	904
1979	ND	0	ND	ND	ND	5,890	5,890
1980	ND	0	ND	ND	ND	835	835
1981	ND	0	ND	ND	ND	2,452	2,452
1982	ND	0	ND	ND	ND	2,148	2,148
1983	1,742	220	1,363	640	10	534	4,509
1984	1,215	51	1,540	600	0	1,794	5,200
1985	3,069	104	2,012	0	0	816	6,001
1986	3,631	16	266	97	0	1,195	5,205
1987	1,695	60	238	0	0	30	2,023
1988	2,838	455	509	0	0	1,383	5,185
1989	2,402	188	1,023	38	234	94	3,979
1990	2,156	476	459	0	0	68	3,159
1991	1,448	0	179	26	154	333	2,140
1992	1,294	57	630	0	0	16	1,997
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	0	102	77	934
2001	644	54	795	0	11	65	1,569
2002	725	0	369	0	166	106	1,366
2003	1,009	54	0	0	20	0	1,083
2004	886	0	150	120	891	119	2,166
2005	423	0	82	13	0	224	742
2006	219	0	146	0	58	139	562
2001-2005 average	737	22	279	27	218	103	1,385
1996-2005 average	824	15	292	134	132	153	1,551

a Dolly Varden are not present in the Gulkana River drainage. Data does not include stocked Arctic char.

Table 25.–Stocking schedule for remote lakes in the UCUSMA.

Area (Access)Lake	Lake Size (Acres)	Species	Stocking Years	Year Last Stocked	Number Stocked [a]
		Glenn Highway			
Arizona Lake	25	Grayling	Alternate	2003	800 F
Buffalo Lake	4	Rainbow	Annual	2007	4,000 F
DJ Lake	4	Rainbow	Alternate	2006	400 F
Gergie Lake	60	Rainbow	Alternate	2006	8,000 F
Little Junction Lake	5	Grayling	Alternate	2000	200 C
Ryan Lake	45	Rainbow	Annual	2007	2,000 F
Tex Smith Lake	15	Rainbow	Annual	2007	5,000 F
		Richardson Highway			
Dick Lake	40	Arctic Char	Alternate	2007	3,000 S
Pippin Lake	160	Rainbow	Annual	2007	10,000 F
Squirrel Creek Pit	5	Grayling	Annual	2001	800 C
		Rainbow	Annual	2006	420 C
		Lake Louise Road			
Connor Lake	18	Grayling	Alternate	2003	775 F
Crater Lake	16	Rainbow	Alternate	2006	3,000 F
Junction Lake	18	Grayling	Alternate	2003	793 F
Little Crater Lake	2	Rainbow	Alternate	2004	2,439 F
Old Road Lake	1.5	Rainbow	Annual	2007	1,500 F
Peanut Lake	12	Rainbow	Alternate	2006	2,300 F
Round Lake	2	Rainbow	Annual	2007	1,500 F
		Edgerton Highway			
Three Mile Lake	20	Rainbow	Alternate	2007	4,000 F
Town Lake	40	Rainbow	Annual	2005	533 C
Two Mile Lake	17	Rainbow	Alternate	2007	8,000 F
		McCarthy Road			
Sculpin Lake	190	Rainbow	Annual	2007	20,000 F
Silver Lake [b]	500	Rainbow	Annual	2007	4,655 S/C
Strelna Lake	290	Coho	Annual	2004	17,147 F
		Rainbow	Alternate	2007	20,000 F
Van Lake	280	Rainbow	Alternate	2005	14,000 F
		Remote Lakes			
John Lake	160	Rainbow	Alternate	2006	6,824 F
Kathleen Lake		Rainbow	Alternate	2007	5,000 F
North Jans Lake	58	Rainbow	Alternate	2006	2,388 F
South Jans Lake	100	Coho	Annual	2000	19,983 F
		Rainbow	Alternate	2006	8,059 F
Tolsona Mt. Lake	75	Rainbow	Alternate	2006	5,987 F

[a] F = fingerling, C = catchable, and S = subcatchable

[b] Silver Lake has been stock with fish transferred from Summit Lake in the Chitina River Drainage since 2003.

Table 26.–Effort, harvest, and catch statistics by species for stocked lakes in the UCUSMA 1990-2006.

Year	Effort		Catch						Harvest				
	Anglers	Days Fished (effort)	Rainbow trout	Coho Salmon	Arctic grayling	Arctic char	Total	Catch rate (catch / effort)	Rainbow trout	Coho Salmon	Arctic grayling	Arctic char	Total
1990	2,480	2,665	5,791	51	2,531	68	8,441	3.2	2,548	17	935	34	3,534
1991	3,536	4,812	10,936	347	1,920	243	13,446	2.8	6,240	69	726	243	7,278
1992	5,236	7,623	20,612	508	3,998	0	25,118	3.3	8,280	379	1,623	0	10,282
1993	3,397	4,782	16,676	56	3,760	0	20,492	4.3	6,327	56	852	0	7,235
1994	3,079	5,561	12,674	496	4,055	45	17,270	3.1	4,209	80	1,167	0	5,456
1995	2,952	5,441	10,270	109	4,189	0	14,568	2.7	4,252	42	804	0	5,098
1996	2,307	3,759	9,190	693	6,230	0	16,113	4.3	4,000	414	726	0	5,140
1997	1,670	2,160	4,525	444	1,969	0	6,938	3.2	1,677	274	570	0	2,521
1998	2,370	3,346	11,224	1,039	1,389	0	13,652	4.1	4,739	395	223	0	5,357
1999	1,654	3,841	4,505	309	4,694	22	9,530	2.5	3,044	232	1,265	0	4,541
2000	1,908	3,689	8,038	800	2,954	298	12,090	3.3	2,546	436	521	57	3,560
2001	1,795	4,396	13,204	513	3,315	43	17,075	3.9	1,964	282	473	43	2,762
2002	1,661	2,377	6,870	0	6,966	179	14,015	5.9	2,901	0	1,939	22	4,862
2003	1,662	3,374	4,777	0	3,309	495	8,581	2.5	2,426	0	688	495	3,609
2004	929	1,461	6,624	0	531	0	7,155	4.9	1,615	0	62	0	1,677
2005	1,212	2,473	4,096	0	1,560	0	5,656	2.3	1,440	0	253	0	1,693
2006	1,008	2,667	4,095	0	235	364	4,694	1.8	1,612	0	93	208	1,913
2001-2005	1,452	2,816	7,114	103	3,136	143	10,496	3.9	2,069	56	683	112	2,921
1996-2005	1,717	3,088	7,305	380	3,292	104	11,081	3.7	2,635	203	672	62	3,572

Table 27.–Stocking summary by species for lakes in the UCUSMA 1990-2006.

Year	Stocked catchables and subcatchables					Stocked fry and fingerling				
	Rainbow trout	Coho Salmon	Arctic grayling	Arctic char	Total	Rainbow trout	Coho Salmon	Arctic grayling	Arctic char	Total
1990	2,725	ND	0	0	2,725	236,296	84,800	254,386	0	575,482
1991	3,152	ND	0	0	3,152	116,022	26,831	168,500	0	311,353
1992	3,055	ND	0	0	3,055	224,514	49,400	337,100	0	611,014
1993	2,507	ND	0	0	2,507	114,268	25,900	174,200	900	315,268
1994	3,019	ND	0	0	3,019	149,254	30,812	291,000	23,200	494,266
1995	0	ND	0	0	0	101,765	60,942	2,000	4,000	168,707
1996	0	ND	0	0	0	400	49,079	127,100	4,000	180,579
1997	5,074	ND	0	0	5,074	74,524	35,145	0	0	109,669
1998	7,550	ND	0	1,000	8,550	14,947	34,907	0	0	49,854
1999	11,300	ND	512	0	11,812	208,139	53,428	0	0	261,567
2000	7,179	ND	7,562	1,521	16,262	0	35,938	0	0	35,938
2001	15,228	ND	4,716	0	19,944	170,000	0	0	0	170,000
2002	10,354	ND	0	0	10,354	0	34,000	0	4,000	38,000
2003	11,409	ND	0	2,162	13,571	66,542	0	2,368	0	68,910
2004	16,833	ND	0	0	16,833	58,610	17,147	0	0	75,757
2005	15,681	ND	0	2,014	17,695	28,015	0	0	0	28,015
2006	1,970	ND	0	0	1,970	38,594	0	0	0	38,594
2001-2005	13,901		943	835	15,679	64,633	10,229	474	800	76,136
1996-2005	10,061		1,279	670	12,010	62,118	25,964	12,947	800	101,829

FIGURES

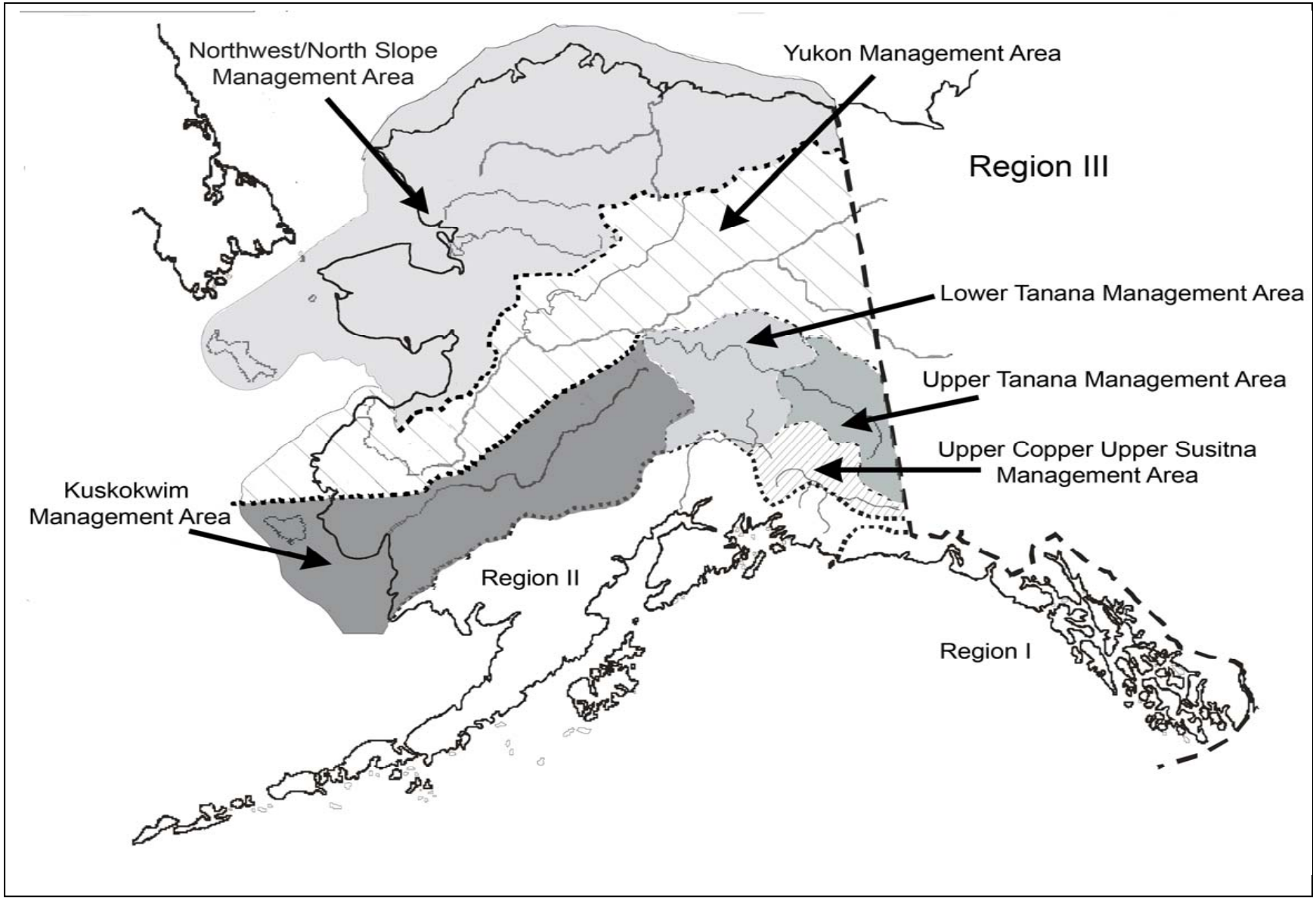

Figure 1.–Map of the sport fish regions in Alaska and the six Region III management areas.

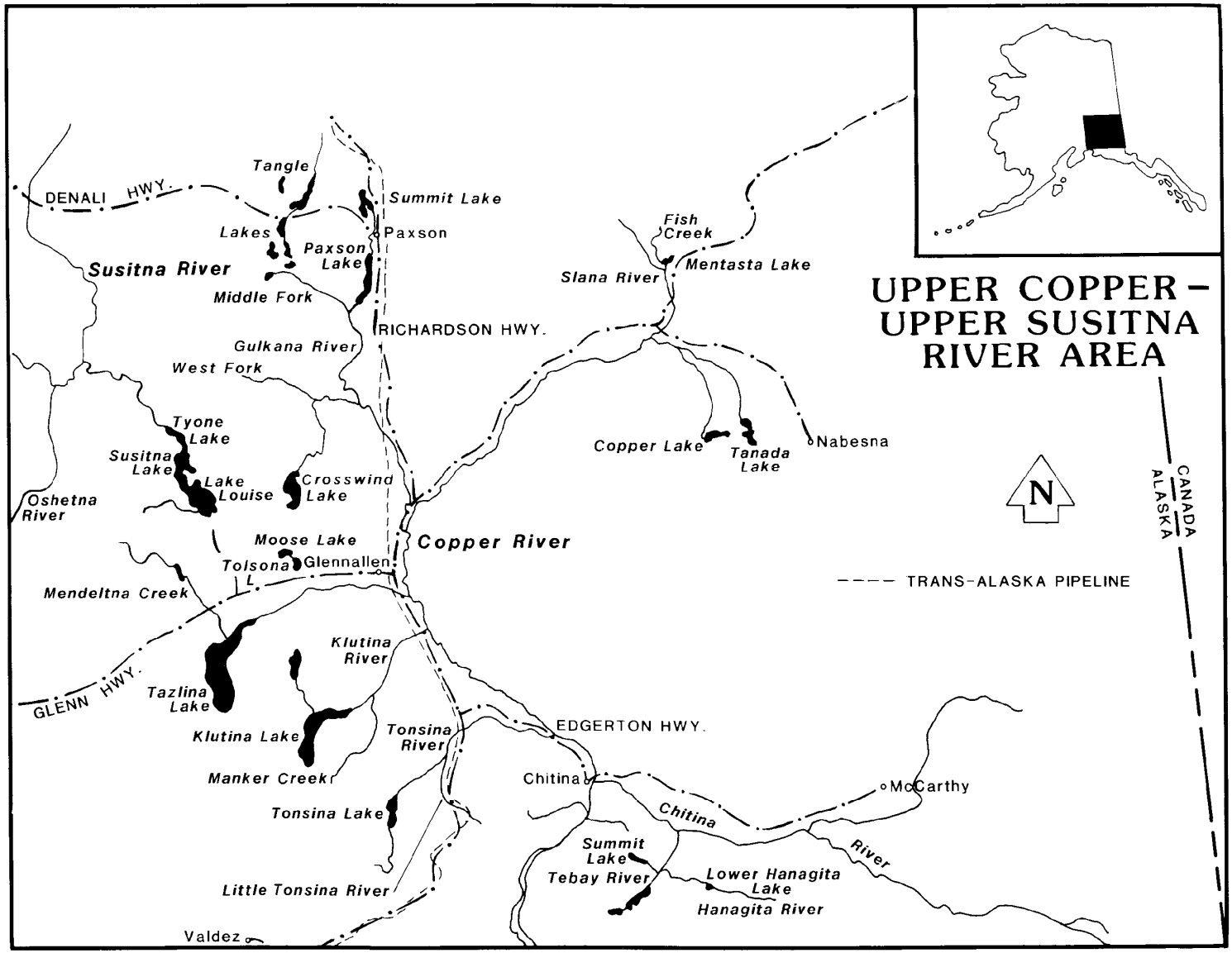

Figure 2.–The Upper Copper/Upper Susitna Management Area (UCUSMA).

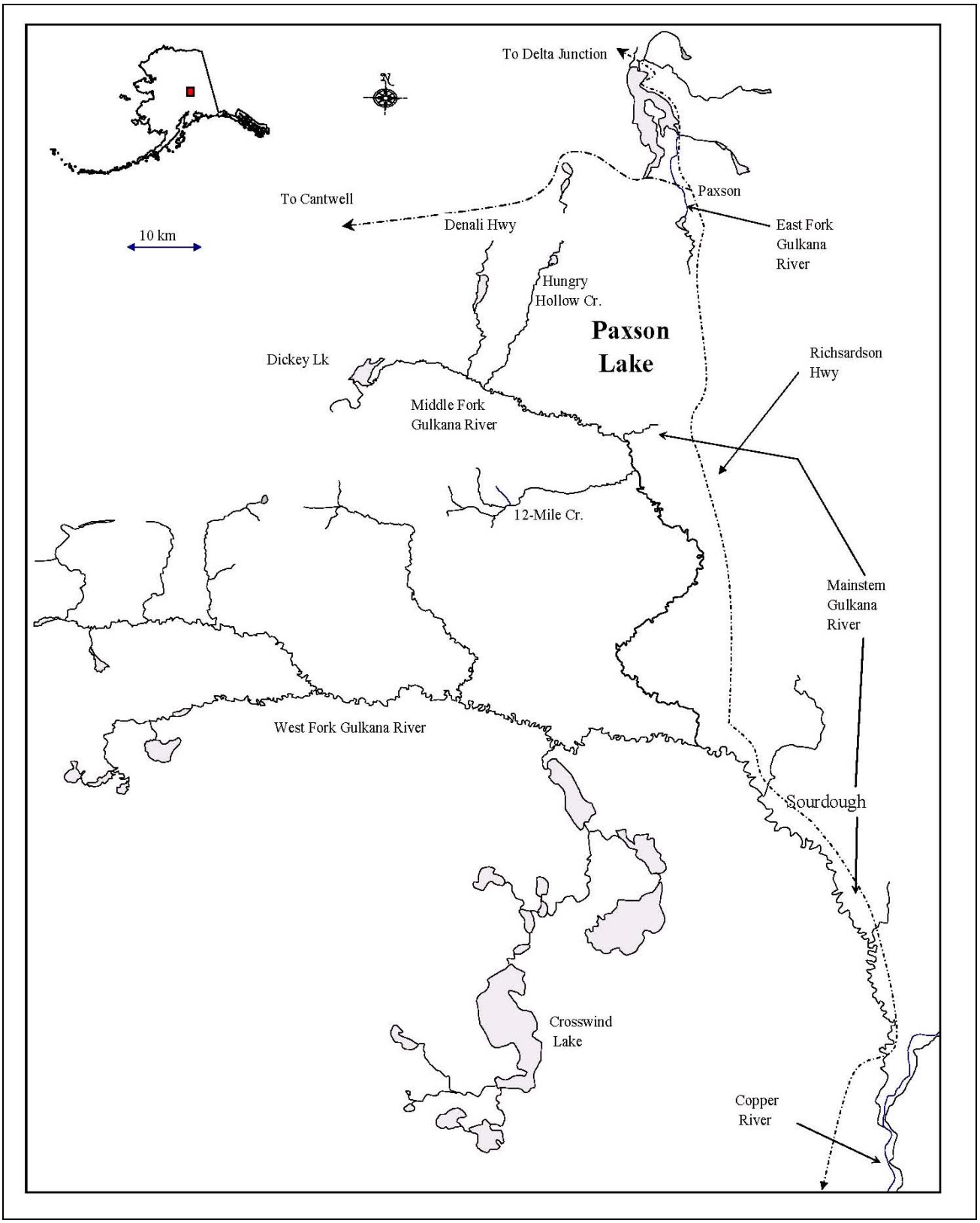

Figure 3.–Gulkana River Drainage

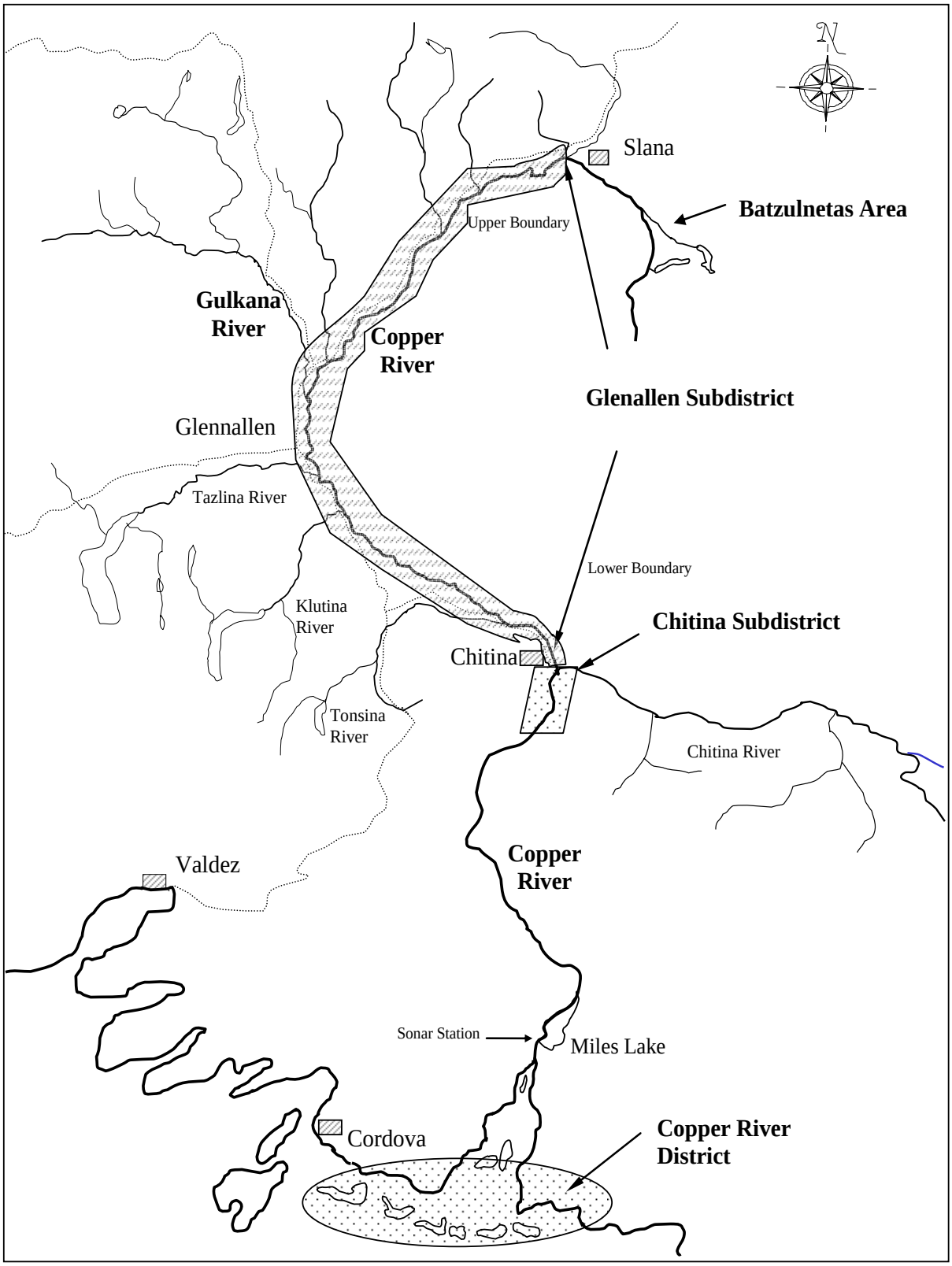

Figure 4.–Upper Copper River fishery subdistricts and areas.

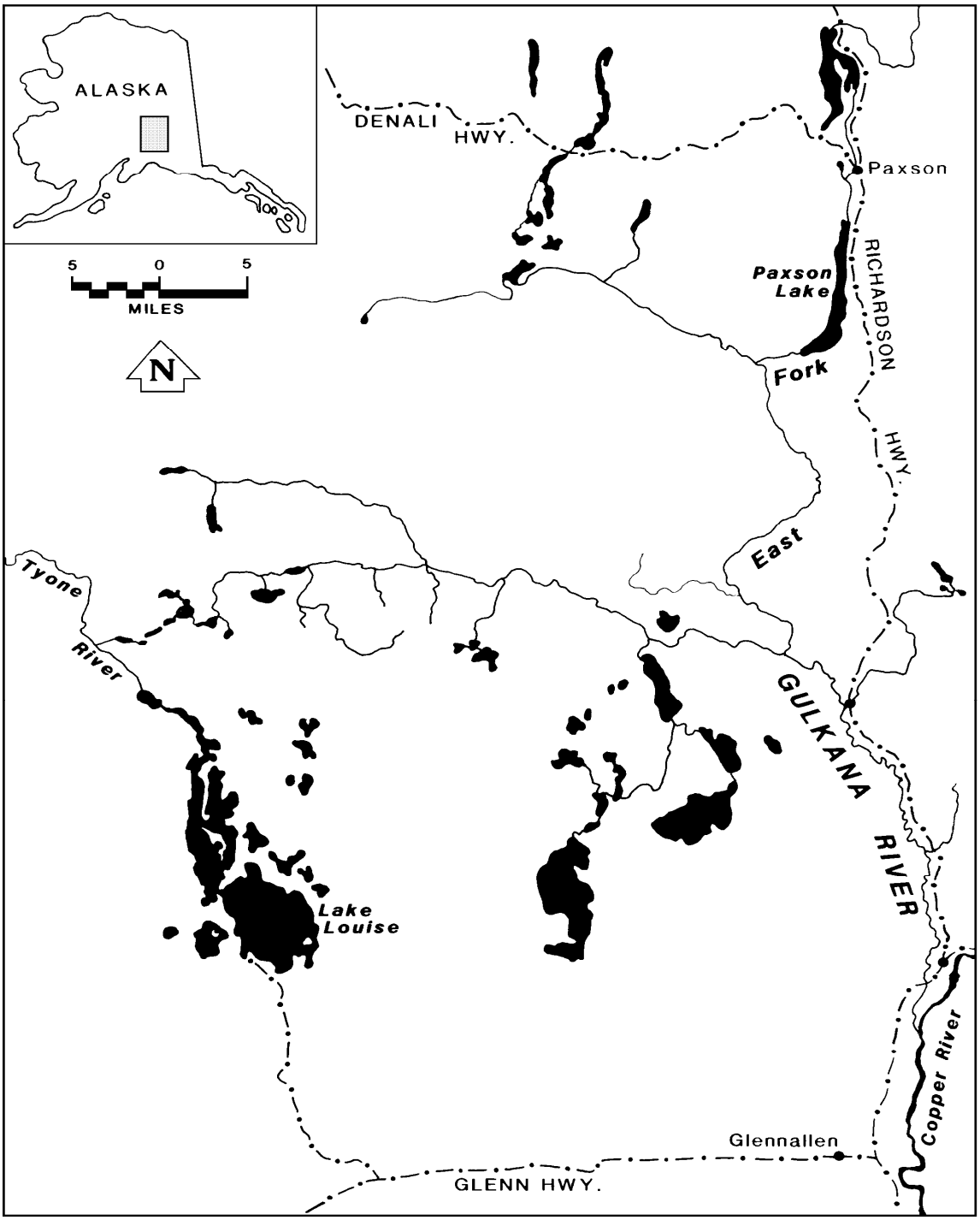

Figure 5.–Map of major lake trout fisheries in the UCUSMA.

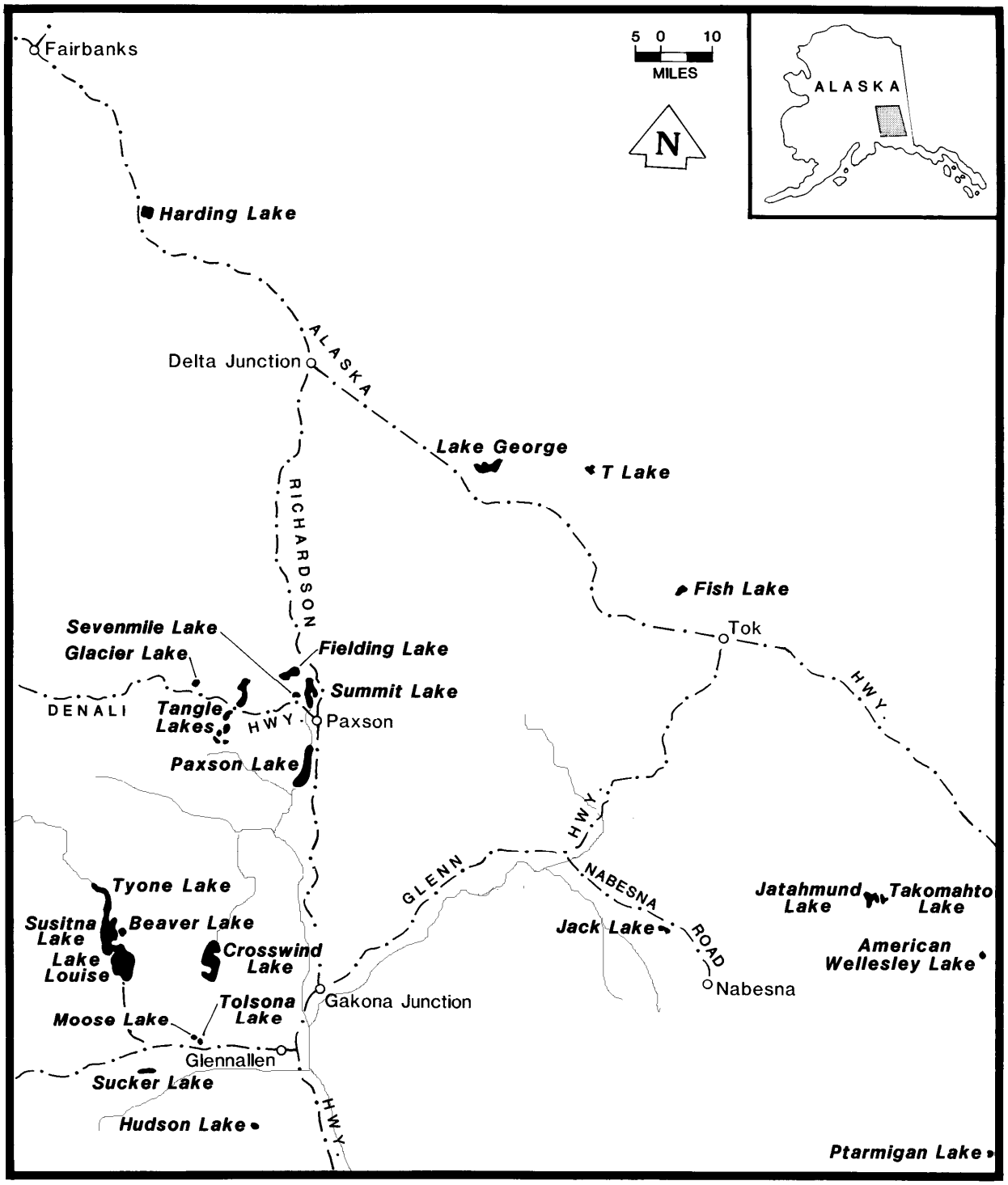

Figure 6.–Lakes supporting major burbot fisheries in the UCUSMA.

APPENDICES

Appendix A.–Listing of the addresses and contact numbers for information sources regarding UCUSMA information.

Organization	Address	Phone	Internet address
Alaska Department of Fish and Game, Glennallen Area office	**PO Box 47 Glennallen, AK 99588-0047**	**(907) 822-3309**	www.adfg.state.ak.us
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**	www.glennallen.ak.blm.gov
Wrangell-St. Elias National Park & Preserve	**PO Box 439 Copper Center, AK 99573**	**(907) 822-5234**	www.nps.gov/wrst
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**	
Greater Copper Valley Chamber of Commerce	**PO Box 469 Glennallen, AK 99588-0469**	**(907) 822-5555**	www.traveltoalaska.com

Appendix B.–Emergency orders issued for UCUSMA sport, personal use, and subsistence fisheries during 2006 and 2007.

Year	E. O. Number	Explanation
2006	3-RS-01-06	Establishes the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River through August 31, 2006. The Chitina Subdistrict will remain closed through at least 12:01 A.M. Monday June 5.
2006	3-RS-02-06	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 2, 2006. Beginning on Saturday July 1, 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.
2006	3-RS-03-06	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the period June 5 – June 11. The Chitina Subdistrict will be open from 12:01 P.M. Friday June 9 until 8:00 P.M. Sunday June 11.
2006	3-RS-04-06	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the period June 12 – June 18, 2006. The Chitina Subdistrict will be open from 12:01 A.M. Monday June 12 until 11:59 P.M. Sunday June 18. 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 Upper Copper River.
2006	3-RS-05-06	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the period June 19 – June 25, 2006. The Chitina Subdistrict will be open from 12:01 A.M. Monday June 19 until 11:59 P.M. Sunday June 25.
2006	3-RS-06-06	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the period June 26 – July 2, 2006. The Chitina Subdistrict will be open from 12:01 A.M. Monday June 26 until 11:59 P.M. Sunday July 2.
2006	3-RS-07-06	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the period July 3 – July 9, 2006. The Chitina Subdistrict will be open from 12:01 A.M. Monday July 3 until 11:59 P.M. Sunday July 9.

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2006	3-RS-08-06	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the period July 10 – July 16, 2006. The Chitina Subdistrict will be open from 12:01 A.M. Monday, July 10 until 11:59 P.M. Sunday, July 16.
2006	3-RS-09-06	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the period July 17 – July 23, 2006. The Chitina Subdistrict will be open from 12:01 A.M. Monday, July 17 until 11:59 P.M. Sunday, July 23.
2006	3-RS-10-06	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the period July 24 – July 30, 2006. The Chitina Subdistrict will be open from 12:01 A.M. Monday, July 24 until 11:59 P.M. Sunday, July 30.
2006	3-RS-11-06	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the period July 31 – August 6, 2006. The Chitina Subdistrict will be open from 12:01 A.M. Monday, July 31 until 11:59 P.M. Sunday, August 6.
2006	3-RS-12-06	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the period August 7 – August 31, 2006. The Chitina Subdistrict will be open from 12:01 A.M. Monday, August 7 until 11:59 P.M. Thursday, August 31.
2007	3-RS-01-07	Establishes the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River through August 31, 2007. The Chitina Subdistrict will remain closed through at least 12:01 A.M. Monday, June 4.
2007	3-RS-02-07	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the period June 4 – June 10. The Chitina Subdistrict will be open from 08:00 A.M. Saturday, June 9 until 8:00 P.M. Sunday, June 10.
2007	3-RS-03-07	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, 2007. Beginning on Sunday, July 1, 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.

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2007	3-RS-04-07	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, 2007. The Chitina Subdistrict will be open from 12:01 A.M. Friday, 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 Upper Copper River.
2007	3-RS-05-07	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, 2007. The Chitina Subdistrict will be open from 12:01 A.M. Monday, June 18 until 11:59 P.M. Sunday, June 24.
2007	3-RS-06-07	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, 2007. The Chitina Subdistrict will be open from 12:01 A.M. Monday, June 25 until 11:59 P.M. Sunday, July 1.
2007	3-RS-07-07	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, 2007. The Chitina Subdistrict will be open from 12:01 A.M. Monday, July 2 until 11:59 P.M. Sunday, July 8.
2007	3-RS-08-07	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, 2007. The Chitina Subdistrict will be open from 12:01 A.M. Monday, July 9 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 Upper Copper River.
2007	3-RS-09-07	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, 2007. 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 Upper Copper River.

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Appendix B.–Page 4 of 4.

2007	3-RS-10-07	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, 2007. 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 Upper Copper River.
2007	3-RS-11-07	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, 2007. The Chitina Subdistrict will be open from 12:01 A.M. Monday, July 30 until 11:59 P.M. Sunday, August 5.
2007	3-RS-12-07	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, 2007. The Chitina Subdistrict will be open from 12:01 A.M. Monday, August 6 until 11:59 P.M. Friday, August 31.

Appendix C.–Summary of regulatory changes affecting the harvest of Chinook (king) salmon in the Copper River Drainage.

Year	Regulation Change
1970	Bag limit is one king salmon per day, one in possession. Season open year round.
1989	Bag limit is one king salmon per day, one in possession. Season open January 1–July 19 to protect spawning fish, exceptions in Lower Klutina (January 1–August 10) and Gulkana (January 1–July 31) rivers. Five king salmon household limit implemented for Chitina Subdistrict.
1991	Bag limit is one king salmon per day, one in possession. Fish, Indian, Bernard, Ahtel, and Natat creeks and Little Tonsina River are closed to king salmon fishing to protect spawning stocks.
1994	Annual sport bag limit of five king salmon was established.
1997	The *Copper River King Salmon Fishery Management Plan* was established. The plan prohibited sport fish guiding on Tuesdays, reduced the Chitina Subdistrict king salmon limit to four per household, and allowed for commercial fishery restrictions in the inside waters of the Copper River District during the first two weeks of the season. In addition, Manker Creek, Klutina Lake and its tributaries, Tonsina Lake and its tributaries, all tributaries to the Tonsina River, Tazlina Lake and its tributaries (except the mouth of Kaina Creek), the Chokosna and Gilahina rivers and the clearwater tributaries of the Gakona River were closed to king salmon fishing. Open season reduced from August 10 to August 1 on Klutina River below mile 19.2 of the Klutina Lake Road. Only unbaited, single-hook artificial lures may be used on the Tonsina River.
2000	The *Copper River King Salmon Fishery Management Plan* was amended to reduce the annual sport bag limit to four king salmon. Sport fish guide restrictions were lifted due to ineffectiveness in reducing sport harvests. Measures were put in place to allow for additional restrictions in the commercial fishery during the first three weeks of the fishery. The Chitina Subdistrict king salmon limit was reduced to one per household in conjunction with the reclassification of the fishery as subsistence to maintain king salmon harvests at historic levels. The bait restriction on Tonsina River was modified to permit fisheries for Dolly Varden and Arctic grayling using traditional gear to harvest these species, while still reducing the harvest of king salmon.
2003	Allowed the use of bait with multiple hooks in the mainstem of the Tonsina River. New data from ADF&G indicated the king salmon run was larger than previously believed and of sufficient size to withstand additional sport fish.
2006	The *Copper River King Salmon Fishery Management Plan* was amended to allow only one commercial opening per week within the inside waters of the Copper River District during the statistical weeks 20 and 21 (first two weeks of the season) to reduce king salmon harvest.

Appendix D.–Federal subsistence permits and reported harvest from the Copper River, Chitina Subdistrict 2000 – 2007.

Year	Issued	Chinook	Sockeye	Coho	Steelhead	Other
2002	122	33	575	0	0	
2003	120	18	689	70	0	
2004	109	7	1,215	18	0	
2005	75	22	1,265	0	0	
2006	76	13	1,379	20	0	
2007	97	26	929	40	0	

Appendix E.–Federal subsistence permits and reported harvest from the Copper River, Glennallen Subdistrict 2000 - 2007.

Year	Issued	Chinook	Sockeye	Coho	Steelhead	Other
2002	201	564	7,950	81	62	
2003	221	554	13,616	152	5	
2004	262	653	17,789	152	12	
2005	275	339	19,444	70	5	
2006	270	430	16,611	28	15	
2007	292	596	15,225	34	6	121