Fishery Management Report No. 23-05

Fishery Management Report for the Recreational, Personal Use, and Subsistence Fisheries of the Upper Copper River and Upper Susitna River Management Area, 2020 and 2021

by

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and

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May 2023

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

Symbols and Abbreviations

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

Weights and measures (metric)

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

Weights and measures (English)

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

Time and temperature

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

Physics and chemistry

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

General

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

Mathematics, statistics

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

FISHERY MANAGEMENT REPORT NO. 23-05

FISHERY MANAGEMENT REPORT FOR THE RECREATIONAL, PERSONAL USE, AND SUBSISTENCE FISHERIES OF THE UPPER COPPER RIVER AND UPPER SUSITNA RIVER MANAGEMENT AREA, 2020 AND 2021

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

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ABSTRACT

Information specific to sport, personal use, and subsistence fisheries in the Upper Copper River and Upper Susitna River Management Area in 2020 and 2021 are presented. Estimates of fishing effort, total harvest, and catch are summarized through the 2021 season. This information is provided to the Alaska Board of Fisheries, as well as to the general public and interested parties. Major fisheries within the area are detailed, including descriptions of the performance of these fisheries, regulatory actions by the Alaska Board of Fisheries, social and biological issues, and descriptions of ongoing research and management activities.

Keywords: Copper River, Susitna River, Klutina 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

EXECUTIVE SUMMARY

This document provides a wide array of information specific to the sport fishing opportunities and sport, personal use, and subsistence fisheries that exist within the Upper Copper River and Upper Susitna River Management Area (UCUSMA). Information specific to the sport, personal use, and subsistence fisheries within the UCUSMA during 2020 and 2021 are presented, along with a brief recent history of these fisheries and past Alaska Board of Fisheries (BOF) decisions that have affected them.

INTRODUCTION

This report provides information for the UCUSMA and is one in a series of reports annually updating fisheries management information within Region III. The report is provided for the BOF, Fish and Game Advisory Committees (ACs), the general public, and other interested parties. It presents a description of area fisheries; summary of the fisheries' effort, harvest, and catch; fisheries assessment information; and the management strategies that are developed from that information.

The mission of the Division of Sport Fish of the Alaska Department of Fish and Game (ADF&G) is to protect and improve the state's fishery resources. This is achieved by managing for sustainable yield of wild stocks of sport fish, providing diverse sport fishing opportunities, and providing information to assist the BOF in optimizing social and economic benefits from sport 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 and 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.

Division of Sport Fish management and research activities are funded by Fish and Game and Federal Aid in Fisheries Restoration funds. Fish and Game funds are derived from the sale of state sport fishing licenses. Federal Aid funds are derived from federal taxes on fishing tackle and equipment established by the Federal Aid in Sport Fish Restoration Act (also referred to as the Dingell–Johnson Act or D–J Act). D–J funds are provided to the state at a match of up to 3-to-1 with the Fish and Game 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, or in a few cases, State of Alaska general funds (GF).

This area management report provides information regarding the UCUSMA and its fisheries for 2020 and 2021. This report is organized into 2 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 and geographical region or drainage.

Sport fishing effort and harvest of sport fish species in Alaska have been estimated and reported annually since 1977 using a mail survey. The Alaska Sport Fishing Survey (commonly referred to as the Statewide Harvest Survey [SWHS]) is designed to provide estimates of effort, harvest, and catch on a site-by-site basis. It is not designed to provide estimates of effort directed towards a single species. Species-specific catch-per-unit-effort information can seldom be derived from the survey data. A questionnaire is mailed to a stratified random sample of households containing at least 1 individual with a valid fishing license (resident or nonresident). Currently, information gathered from the survey includes participation (number of anglers and days fished), number of fish caught, and number harvested by species and site for both guided and unguided fishing. These surveys estimate the number of angler-days of fishing effort expended by sport anglers fishing Alaska waters as well as the sport harvest. Survey results for each year are not available until the following year; therefore, the results for 2021 were not available until fall 2022. 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 SWHS estimates depends on the number of responses received for a given site (Mills and Howe 1992). In general, estimates from smaller fisheries with low participation are less precise than those of larger fisheries with high participation for estimates from 1977 to 1990. 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.
3. Estimates based on 30 or more responses are generally representative of levels of fishing effort, catch, and harvest.

More recently, SWHS estimates were compared to onsite creel surveys for estimates from 1996 to 2006 and using coefficient of variation (CV) of harvest estimates was recommended to determine precision of estimates (Clark 2009). CVs of harvest estimates from the SWHS should be 0.30 or less before using the estimates for evaluating long-term trends and CVs of 0.20 or less before use in stock assessments.

SECTION I: MANAGEMENT AREA OVERVIEW

MANAGEMENT AREA DESCRIPTION

The UCUSMA consists of all waters and drainages of the Copper River upstream of Haley Creek in Wood Canyon, and all waters and drainages of the Upper Susitna River upstream from the confluence of the Oshetna River (Figure 1). Located within the UCUSMA are the communities of

Glennallen, Gulkana, Gakona, Copper Center, Kenny Lake, Chitina, McCarthy, Chistochina, Paxson, Mentasta, and Slana. Three of the state's major highways (Glenn, Richardson, and Edgerton), 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, and snowmachines are the popular mode of travel to remote fisheries during winter. Principal land managers in the UCUSMA are the National Park Service (Wrangell–St. Elias National Park), Bureau of Land Management (BLM; Gulkana Wild and Scenic River), Ahtna Incorporated, Chitina Native Corporation, and the Alaska Department of Natural Resources.

FISHERY RESOURCES

The UCUSMA offers a variety of freshwater fishing opportunities. Three species of Pacific salmon (Chinook or king *Oncorhynchus tshawytscha*, sockeye *O. nerka*, and coho *O. kisutch*) are available to anglers fishing the Upper Copper River drainage; however, no anadromous runs of salmon return to the Upper Susitna River drainage and waters upstream of the Oshetna River confluence are closed to salmon fishing. Resident stocks of Arctic grayling (*Thymallus arcticus*), burbot (*Lota lota*), Dolly Varden (*Salvelinus malma*), rainbow and steelhead trout (*O. mykiss*), lake trout (*S. namaycush*), and whitefish (*Coregonus*) are present in many UCUSMA waters and are targeted by fishers. Additionally, rainbow trout, coho salmon, Arctic grayling, and Arctic char (*S. alpinus*) reared at the state-owned Ruth Burnett Hatchery in Fairbanks and the William Jack Hernandez Hatchery in Anchorage are stocked in several lakes across the UCUSMA. Stocked-lake fisheries provide additional, diversified angling opportunities and reduce harvest pressure on wild fish stocks.

Wild sockeye salmon stocks from the Copper River drainage are enhanced with fish produced by the Gulkana Hatchery. Production of sockeye salmon began in 1973 to mitigate lost spawning and rearing capacity that occurred with reconstruction of the Richardson Highway and has continued ever since. The Gulkana Hatchery is owned by ADF&G and operated under a lease agreement by Prince William Sound Aquaculture Corporation (PWSAC) and is located on the Upper Gulkana River near the community of Paxson. Egg takes are conducted near the hatchery, and incubation and start-up rearing are accomplished at the hatchery. Fry are subsequently released at Crosswind, Paxson, and Summit Lakes and the returning adults are harvested by the sport, personal use, and subsistence fisheries in the Upper Copper River drainage and by the commercial and subsistence fisheries in the Copper River District located at the mouth of the Copper River.

The BOF has established 1 personal use fishery, 2 subsistence salmon fisheries, and 1 freshwater finfish subsistence fishery in the UCUSMA. The personal use fishery and 1 subsistence fishery target salmon in the Upper Copper River District (UCRD), which is defined by regulation as all waters of the mainstem Copper River from the mouth of the Slana River downstream to an east-west line crossing the Copper River approximately 200 yards upstream of Haley Creek (5 AAC 01.605; Figure 2). Another subsistence salmon fishery occurs on the Copper River and in Tanada Creek in the Batzulnetas Area. The Batzulnetas Area fishery is located upstream of the Slana River and Tanada Creek, near the former Native Village of Batzulnetas, and is outside of the UCRD boundaries (Figure 2). The remaining subsistence fishery targets freshwater finfish (excluding salmon) and occurs in freshwaters throughout the management area. The freshwater finfish subsistence fishery primarily targets whitefish, although other resident fish species may be taken

as specified. In addition to these state fisheries, federal subsistence salmon and freshwater finfish fisheries also occur in the UCUSMA.

Federal subsistence salmon fisheries run concurrently with state fisheries in the UCRD and Batzulnetas Area. The Alaska National Interest Lands Conservation Act (ANILCA) established a rural subsistence use priority of fish and game on lands and waters for which the federal government asserts jurisdiction. Under ANILCA, the federal government asserts management responsibility on federal public lands and waters within the boundaries of any conservation unit (National Park System, National Wildlife Refuge System, National Wild and Scenic Rivers System, National Trails System, National Wilderness Preservation System, or National Forest Monument, and including BLM lands not currently under selection by the State of Alaska or Native Corporations or Villages). Currently, the federal government asserts its authority under ANILCA over waters within and adjacent to the Wrangell–St. Elias National Park and Preserve (including the Copper River mainstem) and the Gulkana River National Wild and Scenic River corridor to ensure the subsistence needs for federally qualified rural residents are met. The State of Alaska has also established a priority for subsistence use of fish and game by Alaskan residents (AS 16.05.258 (b)) and does not discriminate between rural and urban residents (consistent with Alaska State Constitution Article VIII, sections 3 and 15). The federally managed subsistence salmon fisheries in the Upper Copper River District require significant coordination between state and federal managers to ensure state-established Chinook and sockeye salmon escapement goals are attained.

ESTABLISHED MANAGEMENT PLANS AND POLICIES

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

Fisheries-specific management objectives for the area have been identified in management plans for Arctic grayling (5 AAC 52.055), lake trout (5 AAC 52.060), and stocked waters (5 AAC 52.065). A series of general divisional criteria have also been prepared to guide establishment of fishery objectives and include the following:

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

Some UCUSMA salmon fisheries have been the focus of allocative conflicts. These conflicts have led the BOF to establish several management plans and policies to guide management of the fisheries in the area. The goal of these plans is to allocate salmon resources among users and to

provide managers with guidelines to maintain a sustained yield of the fish stocks in the area. The following management plans and policies have been adopted by the BOF for UCUSMA fish stocks:

Copper River District Salmon Management Plan (5 AAC 24.360). This management plan sets the annual allocation of salmon for upriver users and contains spawning escapement goals for sockeye and other salmon; inriver apportionment 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 by the sonar counter at Miles Lake.

Copper River King Salmon Management Plan (5 AAC 24.361). This management plan provides for a sustainable escapement goal (SEG) for Chinook salmon in the Copper River drainage of 24,000 or more fish (Note: Based on an updated analysis this SEG was changed to 21,000–31,000 Chinook salmon effective 2022 [Joy, Haught, et al. 2021; Joy, Savereide, et al. 2021]). To achieve this goal, during statistical weeks 20 and 21 (generally, the first 2 weeks of the commercial fishing season) the commissioner may open no more than one 12-hour fishing period within the inside closure area of the Copper River District.

ADF&G will manage the sport fishery of the Upper Copper River drainage through an annual limit for Chinook salmon 20 inches or greater in length of 4 fish. The department also has 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 Chinook salmon.

In the Chitina Subdistrict personal use fishery, the limit for Chinook salmon is 1 fish and the department has authority to prohibit retention of Chinook salmon as needed.

The department also has authority to restrict the Glennallen Subdistrict subsistence fishery to achieve escapement goals using the following management measures in the following priority order: 1) establish a bag limit for Chinook salmon taken by fish wheel; b) reduce the bag limit for Chinook salmon taken by fish wheel and dip net; c) prohibit the taking of Chinook salmon by fish wheel and dip net; and d) modify methods and means for fish wheels.

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

The *Copper River Personal Use Dip Net Salmon Fishery Management Plan* (5 AAC 77.591) establishes fishing seasons, open area, gear, bag limits, and seasonal harvest level for the Chitina Subdistrict personal use fishery in the Upper 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.

Management of UCUSMA resident freshwater finfish and stocked waters fisheries are also guided by several regional and statewide policies and plans. Components and guidance within these policies and plans can constrain the scope of or may supersede area management plans to ensure sustainable management of affected fish stocks.

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

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

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

The *Wild Trout Management Policy* was adopted by the BOF under statewide sport fish provisions Article 5, Management of Trout 5 AAC 75.210–5AAC 75.222, to provide future BOF, 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.

MAJOR ISSUES

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

Copper River Chinook salmon: Chinook salmon returns have declined from a peak in 1995 of 119,217 fish to an average of 44,629 fish since 2009. Recent declines in Chinook salmon have also occurred in other management areas throughout the state and has required restrictive inseason actions in the UCUSMA sport, personal use, and commercial fisheries to ensure that the spawning escapement goals are achieved. Low Chinook salmon returns

also affect management of Copper River sockeye salmon fisheries using nonselective gear, like gillnets and fish wheels, that are concurrent with the Chinook salmon fisheries. For example, the Copper River District commercial fishery and the Glennallen Subdistrict subsistence fishery have forgone opportunity for sockeye salmon to minimize Chinook salmon harvest in several of the past 10 years.

Copper River personal use and subsistence salmon fisheries: The Chitina Subdistrict personal use dip net salmon fishery has been controversial since before its designation as a personal use fishery in 1984. This fishery attracts upwards of 10,000 users from around the state each year. Although the fishery is tightly managed, the large number of people fishing, camping, and boating in the subdistrict creates several social conflicts in the Chitina area. As a result, the fishery is often characterized as a free-for-all and blamed for perceived declines in salmon abundance.

Land access: Ahtna Incorporated (the regional Alaska Native Corporation) and several village corporations own a majority of the land along the 3 rivers supporting major fisheries in the UCRD. Ahtna Inc. controls the uplands along the Klutina River between Klutina Lake and the Richardson Highway. The corporation owns about ⅓ of the land along the Gulkana River downstream of Sourdough Landing. Ahtna Inc. or its shareholders also own the majority of land along the Copper River within the Glennallen Subdistrict. Several legal challenges have ensued over the years with regards to public access across Ahtna lands resolving some issues while complicating others.

The creation of the Wrangell–St. Elias National Park in 1981 altered allowable land use, access to various fisheries and the Copper River, and the regulatory structure within those federal lands. Some of these issues, such as changing regulations related to fisheries and allowed activities within Park boundaries, still persist.

Finally, there are few established trails on state lands that can accommodate year-round access. Many lakes and sections of rivers that could provide great fishing opportunities are inaccessible in summer due to lack of trails and trail routes established on solid surfaces for non-winter use. Groomed or well-used winter trails are also limited to specific areas and travel in winter often requires backcountry trail-blazing skills not common in the general public.

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. These species are slow growing and long lived. Once-liberal harvest regulations have been greatly reduced, and the use of setlines for burbot, which are generally allowed through most of the state, have been prohibited in most of the UCUSMA. These species remain popular and one of the most common fishing violations are the continued use of setlines in area lakes, which kill both burbot and lake trout.

Freshwater finfish subsistence fisheries: Although these fisheries have existed since statehood, they were relatively small and generated harvests that were clearly sustainable. However, the fisheries gained popularity beginning in 2009 and much of the growth has been concentrated on Paxson Lake. Whitefish harvests (the main species targeted in these fisheries) from Paxson Lake have exceeded 6,000 fish annually from 2018 through 2020 and over 4,000 fish in 2021. This level of harvest appears close to the sustainable maximum level based on similar lakes and harvest levels in Canada (Bruce 1984; Healy 1975).

However, data specific to whitefish populations in lakes in Alaska are limited and directed research is needed to truly assess the impacts of this fishery.

SPORT FISHING EFFORT, HARVEST, AND CATCH

Effort, harvest, and catch statistics for UCUSMA sport fisheries are reported under the headings of the "Upper Copper River Drainage" (Area I) and the "Susitna River Drainage" (Area M) in annual versions of Alaska Statewide Sport Fish Harvest Studies; Participation, Catch, and Harvest in Alaska Sport Fisheries; and Estimates of Participation, Catch, and Harvest in Alaska, accessible through the ADF&G e-library (http://www.adfg.alaska.gov/sf/publications/). Angler effort in the UCUSMA makes up approximately 22% of the sport fishing effort in Region III and about 2% of statewide sport fishing effort. In the UCUSMA, angler effort peaked in the early-to-mid 1990s but generally remained between 40,000 and 60,000 angler-days until 2013 (Somerville 2022). Since 2013, angler effort has been below 40,000 angler-days annually, with a low of 24,766 angler-days in 2021 (Table 1). The decline in sport angler effort in the UCUSMA mimics similar declines in other Region III management areas and statewide. Most of the effort in the UCUSMA occurs in the Gulkana and Klutina River drainages and the Upper Susitna drainage lakes, which includes Lake Louise and Susitna and Tyone Lakes.

A total of 28,357 and 24,766 angler-days of effort occurred in UCUSMA waters during 2020 and 2021 (Table 1), which are the third lowest effort levels since effort was first measured in 1977. The Gulkana and Klutina River drainages accounted for 53% and 46% of all annual effort in 2020 and 2021, whereas Upper Susitna drainage lakes accounted for 18% and 17% of total area effort in those years, respectively. These data are relatively consistent with historic trends in the distribution of angler effort in the UCUSMA (Somerville 2022).

Sockeye salmon have been the predominant species harvested in the UCUSMA, averaging 45% of all species harvested from 2016–2020 and 60% from 2011–2020 and making up 37% of the total harvest in 2020 and 48% in 2021 (Table 2). The next most harvested species from 2016 to 2020 were Arctic grayling (16%) and stocked rainbow trout (11%), followed by Chinook salmon, lake trout, Dolly Varden, burbot, whitefish, wild rainbow trout, and coho salmon. These trends were similar for 2011 to 2020.

Arctic grayling have been the predominant species caught in the UCUSMA representing 52% of all species caught from 2016–2020 and 45% from 2011–2020 and making up 54% of the harvest in 2020 and 35% in 2021 (Table 3). The next most caught species from 2016 to 2020 were sockeye salmon (12%), followed by lake trout, stocked rainbow trout, Chinook salmon, wild rainbow trout, Dolly Varden, whitefish, burbot, and coho salmon. These trends are the same for the period from 2011 to 2020.

SECTION II: FISHERIES

CHINOOK SALMON SPORT FISHERIES

Fishery Description

Overview

The Copper River drainage supports the only anadromous runs of Chinook salmon in the UCUSMA. No anadromous runs of Chinook salmon return to the Upper Susitna River drainage upstream of the Oshetna River (Figure 1). Chinook salmon are found in at least 40 tributaries

distributed throughout the Copper River Basin, and an extensive amount of genetic work has been conducted on Copper River Chinook salmon stocks (Seeb et al. 2006). Chinook salmon stocks have been grouped into genetically distinct groups throughout the Copper River drainage: stocks that spawn in the Chitina River drainage; Middle Copper River stocks composed of the Tonsina, Klutina, and Tazlina drainages; Gulkana River stocks; and Upper Copper River stocks above the Gulkana River confluence. Current technologies and insufficient genetic data preclude managing Copper River Chinook salmon fisheries for stock-specific harvest in season (Seeb, et al. 2009, Templin et al. 2011).

Chinook salmon return to the Copper River drainage in early May. The peak timing in the Lower Copper River is from mid-May to mid-June, with the run essentially complete by July 1. However, small numbers of Chinook salmon continue to enter the Copper River through August. Chinook salmon make their way to spawning areas in the Upper Copper River tributaries through June and July and are targeted in the sport fisheries on the Gulkana, Klutina, and Tonsina Rivers. Spawning occurs in late July through August. There are no known Chinook salmon spawning streams downstream of Haley Creek (Figure 2).

From 1960 to 1998, Chinook salmon harvests gradually increased in the commercial, personal use, subsistence, and sport fisheries of the Copper River drainage; however, since 1998, Chinook salmon harvests in all Copper River fisheries have declined (Somerville 2022; Table 4). Declining harvests appear to be the result of declining stock abundance rather than decreased participation or efficiencies in the various fisheries. In addition to weak return strength, implementation of inseason management restrictions in all Chinook salmon fisheries since 2009 (Table 5) have directly resulted in reduced harvests.

Chinook salmon sport fisheries occur in the Tebay River (Chitina River drainage); Tonsina, Klutina, Tazlina, and Gulkana Rivers; Kaina Creek (Tazlina River drainage); and the East Fork Chistochina River (Figures 1–3). All other tributaries of the Copper River and the north side of the Chitina River are closed to Chinook salmon fishing. Although open to sport fishing, the Copper and Chitina River mainstems are too glacial for successful sport fishing and the south bank tributaries of the Chitina River are generally too remote or glacial to have much, if any, sport fishing effort. The current bag and possession limit for sport-caught Chinook salmon ≥20 inches is 1 fish. The Upper Copper River drainagewide annual bag limit is 4 Chinook salmon ≥20 inches per year.

Fisheries on the Gulkana and Klutina Rivers account for about 90% of the sport-harvested Chinook salmon in the UCUSMA (Table 6). Sport harvest of Chinook salmon in the Upper Copper River demonstrated the same trend as overall harvest with a steady increase from 1977 (the first-year sport harvest of fish was estimated and reported) through 1996 when sport harvest peaked at 9,116 Chinook salmon (Somerville 2022). Chinook salmon sport harvest declined after 1996 to a low of 90 Chinook salmon in 2021 (Table 6). Sport harvest of Chinook salmon appears to trend with overall run abundance (Table 4), inseason regulatory restrictions (Table 5), and resulting declines in angling effort (Table 1).

From 2009 to 2021, inseason management actions including reduction of the annual limit, bait restrictions, and fishery closures were implemented in response to low Chinook salmon run numbers (Table 5). Chinook salmon sport harvests ranged from 90 to 2,416 fish during this period and averaged 1,121 fish. In 2015, 2018, and 2019, no inseason management actions were

implemented and 1,343, 1,280, and 1,565 Chinook salmon, respectively, were harvested each year in the Upper Copper River sport fisheries (Table 6).

The number of guides operating on area rivers increased from the early 1980s through 1990s. For example, prior to the 1986 season, only 1 individual specialized in guiding anglers for Chinook salmon on the Gulkana River. By 1989, 5 guides were operating on the Gulkana River (Potterville and Webster 1990), and from 2007 through 2015, 8–29 guides operated annually on the Gulkana River (Sigurdsson and Powers 2009–2014, 2016). On the Klutina River, 15–28 guides have operated there annually from 2005, when logbooks became required, through 2015. Inseason management actions from 2009 to 2014 affected the number of guides operating in the Upper Copper River and the choice of rivers on which they operated. Freshwater guide logbooks were discontinued after 2018. Currently 7–15 guide services operate on area rivers primarily targeting Chinook salmon and sockeye salmon. Some guides have branched out to also target resident species on the Klutina and Gulkana Rivers.

Gulkana River Chinook salmon sport fishery

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 mainstem upstream from Sourdough Creek was designated as "wild" in 1980 under the Wild and Scenic Rivers Act of 1968. Access to the river, downstream of Paxson Lake, is limited to 7 state and federal trail and site easements and 1 privately owned and controlled site accessible from the Richardson Highway. Anglers use rafts, canoes, and powerboats to gain access to the more remote sections of the river. Raft and canoe anglers frequent the various sections of the river from Paxson Lake downstream to the Richardson Highway Bridge. Powerboat operators generally launch at the BLM Sourdough launch and use the river from approximately 2 miles below Sourdough to several miles upstream of the confluence of the West Fork. Powerboat operators also launch from the Richardson Highway Bridge and fish the 5-mile reach of the river above the bridge. Additionally, powerboat operators access the mouth of the Gulkana River, when the river level is sufficiently high, by launching near the Richardson Highway Bridge and boating down the Gulkana River or, when water levels are lower, by launching in the Gakona River to the north and then boating down the Copper River.

Chinook salmon begin entering the Gulkana River in early to mid-June. The sport fishery peaks during late June/early July but fishing for Chinook salmon continues until the season closes July 20th. Spawning begins in mid-July and continues through late August. Most spawning occurs upstream of the confluence of the West Fork (Figure 3). Until 2009, the Gulkana River drainage supported the largest Chinook salmon sport fishery in the UCUSMA (Tables 6 and 7). Since 2009, harvest and catch of Chinook salmon have been significantly reduced by inseason restrictions to ensure Gulkana River and drainagewide escapement needs.

The regulations used to manage the Gulkana River Chinook salmon fishery attempt to maximize angler opportunity while still providing protection for spawning Chinook salmon and other resident fish species such as Arctic grayling and rainbow/steelhead trout. Twelvemile Creek, the Middle Fork drainage, and all waters of the Gulkana River drainage upstream of the Middle Fork confluence, are closed to fishing for Chinook salmon year-round to protect spawning fish (Figure 3). The remainder of the river is open to Chinook salmon fishing from January 1 through July 19. From June 1 through July 19, anglers may use bait, artificial lures, and treble hooks upstream from the Richardson Highway Bridge to an ADF&G marker located 7.5 miles upstream

of the West Fork confluence. From June 1 through July 31, anglers are limited to using only single-hook, artificial flies downstream from the Richardson Highway Bridge to an ADF&G marker approximately 500 yards downstream of the confluence with the Copper River. In the entire Gulkana River drainage from July 20 to May 31, and year-round in all waters upstream of the ADF&G marker 7.5 miles upstream of the West Fork confluence with the mainstem, only unbaited, single-hook artificial lures may be used. This restriction is intended to protect the resident rainbow trout population and the small population of steelhead that return to the Gulkana River.

Klutina River Chinook salmon sport fishery

The semi-glacial Klutina River drops rapidly out of Klutina Lake and enters the Copper River at the community of Copper Center (Figures 1). Access to the river is available from the old and the new Richardson Highway and along the Klutina Lake Road (also called the Brenwick-Craig Road), which parallels the river. Shore anglers participate in the fishery adjacent to the Richardson Highway and the Klutina Lake Road. Jet-powered riverboats are used by experienced operators to access the upstream portions of the river. The river has considerable stretches of whitewater and is considered very challenging to navigate. Jet boats are launched from private land adjacent to the highway or from a boat launch within the highway right-of-way (ROW) along the new Richardson Highway Bridge. Rafters also use the Klutina River and launch from sites located at mile 4, mile 14, and mile 22 of the Klutina Lake Road and exit the river at the new Richardson Highway Bridge. The fast water of the Klutina River limits the number of resting pools for Chinook salmon to less than 2 dozen good fishing sites that are accessible to most anglers.

The Klutina River supports the second largest sport fishery for Chinook salmon in the UCUSMA (Tables 6 and 7). Chinook salmon begin entering the Klutina River in late June, with the run continuing into August. The Chinook salmon sport fishery opens on July 1, peaks during the third week of July, and continues until the season closes on August 11. Chinook salmon spawn from late July through August in tributary streams of the river and lake and in the mainstem of the river. Most spawning is believed to occur upstream of a point adjacent to mile 19.2 on the Klutina Lake Road. Open seasons for Chinook salmon and areas closed to sport fishing for Chinook salmon on the Klutina River provide protection to spawning fish. On the Klutina River, from an ADF&G marker located adjacent to mile 19.2 of the Klutina Lake Road upstream to Klutina Lake, Chinook salmon may be taken only from July 1 through July 19. From mile 19.2 downstream to an ADF&G marker at mile 13 of the Klutina Lake Road, Chinook salmon may be taken from July 1 through July 31. From mile 13 downstream to the confluence of the Copper River, Chinook salmon may be taken from July 1 through August 10.

Fishery Management Objectives

The *Copper River King Salmon Management Plan* was adopted by the BOF in 1996 and is the primary guide to management of Chinook salmon stocks in the Copper River drainage. Copper River Chinook salmon stocks are harvested in (1) commercial and subsistence gillnet fisheries in the Copper River District near the mouth of the river, (2) a personal use dip net fishery in the Chitina Subdistrict near Chitina, (3) a subsistence dip net and fish wheel fishery in the Glennallen Subdistrict between the Chitina/McCarthy Bridge and Slana River, and (4) sport fisheries in various tributaries. Because most of these fisheries are composed of mixed stocks, Copper River Chinook salmon are managed in aggregate to achieve a drainagewide spawning escapement of 24,000 or more fish. No tributary-specific escapement goals are established.

To achieve the Chinook salmon escapement goal and ensure sustained yield of the various tributary stocks, inseason run strength indicators are monitored throughout the duration of the season and the management of the fisheries is adjusted accordingly. Inseason run strength is assessed through harvest reporting in the commercial fishery, catch rates at the Native Village of Eyak (NVE) research fish wheels, apportioned Chinook salmon counts at the Miles Lake sonar, Chinook salmon passage past the Gulkana River counting tower, and anecdotal harvest reports in the various upriver fisheries. Area Management Biologists communicate with anglers and guides to gauge sport fishing success and personal use and subsistence fishing success is measured through a Chinook salmon ASL (Age, Sex, Length) sampling project in Chitina as well as through contacts with dipnetters and fish wheel users. Real-time data from all of these sources are monitored and analyzed to make the most well-informed management decisions. Both Sport Fish and Commercial Fisheries managers are involved in ensuring escapement goals are met and the 2 divisions work together closely throughout the run.

Final assessment of annual Chinook salmon run strength occurs postseason through analysis of aerial survey data, interpolation of Chinook salmon escapement from the Gulkana River counting tower, final harvest reporting in the Chitina Subdistrict personal use and Glennallen Subdistrict subsistence fisheries, SWHS data on sport fishing catch and harvest, and the total inriver abundance estimate from NVE fish wheels. The aerial index counts on clearwater tributaries to Klutina Lake and River, the Gulkana River, and the East Fork Chistochina River provide a measure of Chinook salmon spawning distribution throughout the drainage and relative abundance in each of those systems. This aerial survey assessment is captured in an annual Chinook salmon run memo from the Area Management Biologist (Appendix B). Passage data collected from the Gulkana River counting tower is analyzed and expanded to create an annual escapement estimate of Chinook salmon spawning above the tower site. Although no formal escapement goal is in place for the Gulkana River, the escapement data is used to monitor the most popular Chinook salmon sport fishery in the Copper River drainage. Harvest reporting data in the personal use and subsistence fisheries, coupled with SWHS sport harvest estimates, are compiled to produce a total inriver harvest estimate of Chinook salmon. This total inriver harvest is then subtracted from the inriver abundance estimate to produce the annual Chinook salmon drainagewide escapement estimate, which in turn is used to gauge if the management actions of the various Chinook salmon fisheries were successful.

Proposals to change regulations affecting the various Copper River Chinook salmon fisheries are brought before the BOF nearly every cycle. During the 2021 BOF meeting in Cordova, Proposal 5 sought an Optimal Escapement Goal (OEG) for Copper River Chinook salmon that differed from the recommended 21,000–31,000 Chinook salmon SEG). This proposal failed. Proposal 41 sought to remove the mandatory inside area closures in the Copper River District commercial gillnet fishery, potentially affecting the abundance of early returning Chinook salmon stocks returning to the Upper Copper River. This proposal also failed. A proposal to prohibit catch-and-release sport fishing in the UCUSMA was submitted for the December 2017 BOF meeting in Valdez. The proposal failed. There were 3 proposals submitted for the December 2014 BOF meeting in Cordova that could have affected Upper Copper River Chinook salmon sport fisheries. All 3 sought some form of restrictions for barbless hooks. All 3 proposals failed.

Recent Fishery Performance

The 2020 Chinook salmon run to the Copper River was substantially weaker than forecasted and required restrictions to UCUSMA sport fisheries (Table 5). Chinook salmon total sport harvest

was estimated at 967 fish, which was 18% below the last 5-year (2015–2019) and 10% below the last 10-year (2010–2019) average harvest (Table 6). Total sport catch in 2020 was 3,404 fish, which was 23% below the last 5-year (2015–2019) and 12% below the last 10-year (2010–2019) average catch (Table 7). On June 20, 2020, the annual limit of Chinook salmon for the Upper Copper River drainage was reduced from 4 to 1 fish (Table 5; Appendix B). The cumulative commercial harvest of Chinook salmon and escapement past the Gulkana River counting tower were both well below average, and preliminary data from the NVE research fish wheels indicated that the drainagewide escapement goal would not be achieved. In order to ensure sufficient spawning escapement while still providing sport fishing opportunity, the sport fishery annual limit was reduced. Even with the restrictions, 2020 escapement fell below the goal of 24,000 or more Chinook salmon.

The 2021 Chinook salmon run was essentially tied with the 2016 run as the weakest recorded run of Chinook salmon to the Copper River (Table 4). The total run was estimated at 29,275 Chinook salmon, with 21,656 fish entering the Copper River and 18,433 escaping upriver fisheries to spawn All fisheries were managed aggressively in 2021 and the annual sport limit for Chinook salmon was reduced from 4 to 1 fish on June 21 (Appendix B). However, run entry continued to decline and all Chinook salmon sport fisheries were closed effective June 26. These restrictions and restrictive measures in other fisheries (Table 5) were insufficient to achieve the drainagewide Chinook salmon escapement goal of 24,000 or more fish.

In most years, 50% or more of the Chinook salmon sport harvest is taken in the Gulkana River. However, poor fishing conditions in the Gulkana River during June 2020, followed by restrictions to the fishery, reduced harvest from the Gulkana River. About 53% of the Chinook salmon sport harvest in 2020 was taken from the Klutina River followed by 30% from the Gulkana River. Most of the remaining harvest in 2020 came from the Tonsina River (13%). This was the highest percent harvest from the Tonsina River, which normally accounts for less than 5% of the total Chinook salmon sport harvest in any given year. During 2021, the only fishery open prior to the drainagewide closure was the Gulkana River, which accounted for all 90 Chinook salmon harvested in the sport fishery that year.

Overall, Copper River Chinook salmon returns have been poor since about 2009 and have required restrictive management leading to harvest rates in all fisheries that are well below historic averages (Table 4). Additionally, run sizes have demonstrated high interannual variability requiring adaptable inseason management strategies to ensure escapement goals are met. Although escapement failed to achieve the minimum of 24,000 Chinook salmon in 2020 and 2021, escapement in the 3 previous years did achieve escapement above 24,000 Chinook salmon. The outlook for Chinook salmon runs appears to be average to above-average run sizes for at least the next 3 years.

Research and Management Activities

Copper River Chinook salmon stocks have been monitored, studied, and actively managed since the 1960s. With the exception of 1993–1995, aerial escapement surveys have been consistently conducted in 35 systems from 1966 through 2021 (Pirtle 1980; Randall et al. 1981; Brady et al. 1991; Roberson and Whitmore 1991; Taube 2002; Sharp et al. 2000; Hollowell et al. 2007; Bell et al. 2010; Botz et al. 2012; Vega et al. 2019; Russell et al. 2021; Morella et al. 2021; Botz et al. 2021). However, only 9 of these clearwater systems have been considered index streams used for determining annual Chinook salmon abundance and distribution. Radiotelemetry data from 2002–

2004 indicated that only 45% of the Chinook salmon spawned in the aerial index streams and that the remainder spawned in the glacial mainstems of those systems (Savereide 2005a). The study also indicated that the 9 index streams represented only 26–46% of the total escapement in the Copper River drainage and surveys of those streams provided insufficient data to accurately estimate total escapement. Therefore, annual aerial escapement surveys were reduced to just 4 index streams (Manker and St. Anne Creeks in the Klutina River drainage, Gulkana River drainage, and East Fork Chistochina) with the objective to use the surveys to provide comparable year to year indices of escapement and distribution throughout the Copper River drainage. Of these systems, only the indices for the Gulkana River have correlated with drainagewide escapement estimates for Chinook salmon. Results of aerial surveys are reported in an annual internal memo (Appendix C).

From 1999 to 2004, radiotelemetry studies were used to determine Chinook salmon distribution and timing of entry into the spawning streams of the Copper River (Evenson and Wuttig 2000; Wuttig and Evenson 2001; Savereide and Evenson 2002; Savereide 2003, 2004, 2005a). Estimates of total abundance were also obtained during the 1999–2001 studies (Evenson and Wuttig 2000; Wuttig and Evenson 2001; Savereide and Evenson 2002) from a mark–recapture experiment in which Chinook salmon, additional to the ones fitted with transmitters, were captured with dip nets and tagged during the radio transmitter deployment and then recaptured with dip nets in the Chitina Subdistrict personal use fishery. In 2002, a separate mark–recapture study was initiated using only fish wheels as the means to capture (for marking) and recapture marked and unmarked Chinook salmon. The Chinook salmon distribution and run timing study was extended during 2002–2004 (Savereide 2005a) and used the mark–recapture capture fish wheel as the capture site for fitting fish with transmitters. The mark–recapture study, conducted by the NVE, has continued to provide a postseason estimate of annual Chinook salmon inriver abundance since 2003 (Smith et al. 2003; Smith 2004; Smith and van den Broek 2005a-b; van den Broek et al. 2007–2012; Pelekis et al. 2013; Whissel et al. 2014, 2015; Piche et al. 2016–2019, 2022; Piche, Whissel, et al. 2021; Piche, Weaver, et al. 2021).

Several run assessment projects have been implemented and operated on the Gulkana River. A weir was operated on the Gulkana River in 1996 to provide a count of Chinook salmon escapement concurrent with a creel survey conducted that same year (LaFlamme 1997). In 2002, ADF&G initiated a multiyear project with BLM to estimate the escapement of Chinook salmon in the Gulkana River (Taras and Sarafin 2005; Perry-Plake et al. 2007; Perry-Plake and Antonovich 2009; Perry-Plake and Huang 2011; Savereide 2010, 2011; Maclean 2013; Schwanke 2016; Schwanke and Tyers 2019; Hansen and Ocaña *In prep*). A counting tower site was established approximately 2 miles upstream of the West Fork confluence to enumerate Chinook salmon migrating upstream. Tower counts of Chinook salmon have ranged from 1,044 to 8,352 Chinook salmon since 2002 and averaged 3,901 Chinook salmon (Hansen and Ocaña 2022). Tower counts demonstrated a declining trend from 2002 through 2017 but have stabilized since 2017 and may indicate an increasing trend in spawning escapement.

Radiotelemetry data from a drainagewide assessment of Copper River Chinook salmon distribution from 2002–2004 indicated that 50–86% of Gulkana River Chinook salmon passed the counting tower during those years (Saveriede 2005a; Taras and Sarafin 2005; Perry-Plake et al. 2007). A radiotelemetry project tracking Chinook salmon distribution and spawning just in the Gulkana River was initiated in 2013 and ran through 2015 (Schwanke and Tyers 2019). Telemetry data from this project indicated that no more than 50% of Gulkana River Chinook salmon spawned

above the counting tower during those years. The cause of this apparent shift in spawning locations is not clearly identified and could be the result of low water conditions in 2013–2015, a long-term trend due to unidentified environmental factors, or may be a result of differences in capture method and tag deployment between the 2 studies. Preliminary data from another Copper River drainagewide telemetry project conducted from 2019–2021 demonstrated similar distribution results as the 2002–2004 study (Corey Schwanke, ADF&G, personal communication).

Creel surveys monitoring success of guided and unguided anglers and anglers fishing from boat and from shore have been conducted on the Gulkana and Klutina Rivers (LaFlamme 1997; Potterville and Webster 1990; Schwanke 2009a). Data from these studies indicated that guided Chinook salmon anglers were generally more successful than unguided anglers on these rivers. Harvest estimates from guide logbooks also indicated that most Chinook salmon were harvested by guided anglers (Sigurdsson and Powers 2009–2014).

In 2014, a study to assess Copper River Chinook salmon productivity where Chinook salmon smolt and fry were coded-wire-tagged was initiated (Allison Mather, ADF&G Sport Fish Biologist, Fairbanks, personal communication). Tagging continued through 2018. Adult return monitoring began in 2017 and will continue through 2023. Early results indicate good tag returns.

SOCKEYE SALMON SPORT FISHERIES

Fishery Description

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 Upper Copper River tributaries. The primary spawning stocks, in order of magnitude, are the Klutina River, the Upper Copper River drainage upstream of the Gulkana River (Slana River and Tanada Creek), Gulkana River, Tazlina River, the Chitina River drainage (Lakina River [Long Lake] and Tana River), and the Tonsina River (Figure 1). Most of these tributary systems have large rearing lakes associated with them. 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 (Figure 2). Although there was no species apportionment program in place prior to 2019, it was assumed that most of the fish passing the sonar were sockeye salmon. Beginning in 2019, ARIS software was added to the Miles Lake sonar and a study begun to apportion out large Chinook salmon (>750 mm total length) from the overall sonar counts. Since 2019, sockeye salmon have made up no less than 95% of sonar counts in any given year (Shane Shepard, Division of Commercial Fisheries Biologist, ADF&G, Cordova, September 22, 2022; unpublished data). Sonar counts are discontinued July 30 each year, prior to the end of the sockeye run and before significant numbers of coho salmon enter the river.

Sockeye salmon enter the Copper River starting in May and have been first counted at the Miles Lake sonar as early as May 18. Although sockeye salmon are present in the Upper Copper River in late May, they do not arrive in substantial numbers until early June. The Gulkana River sockeye salmon return begins in early June and continues into September and is made up of 2 distinct run timing stocks. Sockeye salmon begin entering the Klutina River in mid-June and continue through August. The Gulkana and Klutina Rivers support the main sockeye salmon sport fisheries in the UCUSMA.

Since 1999, the Klutina River has consistently supported the largest sockeye salmon sport fishery in the UCUSMA, averaging 83% of the area total sport harvest (Table 8). Sport angler effort on the Klutina River is primarily driven by sockeye salmon abundance. The Klutina River is a main producer of sockeye salmon in the drainage, as a previous radiotelemetry study has indicated that 33–54% of tagged Copper River sockeye salmon spawned there from 2005 to 2009 (Wade et al. 2007–2010). Spawning activity is known to occur in various locations of the river, lake, and tributaries.

Prior to 1999, the Gulkana River generally supported the largest sockeye salmon sport fishery in the UCUSMA, accounting for an average 55% of the annual UCUSMA sport harvest (Somerville 2022). On the Gulkana River, the abundance of Chinook salmon drives the level of sport fishing effort, whereas the abundance of sockeye salmon has very little influence. The sockeye salmon run to the Gulkana River is composed of both wild and hatchery stocks and has accounted for 7–19% of the sockeye salmon radiotagged in the Copper River from 2005–2009 (Wade et al. 2007–2010). The Gulkana Hatchery has been producing sockeye salmon since the early 1970s and in the late 1990s, produced enhanced returns of up to 800,000 adult salmon (Sharp et al. 2000). A strontium chloride otolith marking program was initiated for hatchery fish in 2000 and since then, hatchery returns have ranged from about 54,010 to 581,000 sockeye salmon (J. Morella, Division of Commercial Fisheries Biologist, ADF&G, Cordova, April 15, 2022; unpublished data). Spawning takes place in several upper-reach tributaries and lakes of the Gulkana River drainage.

Fishery Management Objectives

Copper River sockeye salmon management is primarily guided by the *Copper River District Management Plan* (5 AAC 24.360) and the *Copper River Subsistence Salmon Fisheries Management Plan* (5 AAC 01.647). Sockeye salmon stocks are harvested in (1) commercial and subsistence gillnet fisheries in the Copper River District near the mouth of the river; (2) a personal use dip net fishery in the Chitina Subdistrict near Chitina; (3) a subsistence dip net and fish wheel fishery in the Glennallen Subdistrict between the Chitina/McCarthy Bridge and Slana River; and (4) sport fisheries in various tributaries (Table 9). Because most of these fisheries are composed of mixed stocks, Copper River sockeye salmon are managed in aggregate to achieve a drainagewide spawning escapement of 360,000–750,000 fish. The ADF&G Divisions of Sport and Commercial fisheries managers are involved in ensuring escapement goals are met and the 2 divisions work closely throughout the run.

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 the following:

- 360,000–750,000 sockeye salmon for spawning escapement;
- 17,500 for spawning escapement of other salmon;
- 61,000–82,500 sockeye salmon (wild stocks only) for subsistence harvest;
- 100,000–150,000 sockeye salmon (including hatchery stocks) for personal use harvest;
- 15,000 salmon (all species) for sport fishery harvest; and
- an amount of sockeye salmon determined annually for hatchery brood and surplus fish.

Management of upriver fisheries is based on the abundance of salmon counted past the Miles Lake sonar and no specific fishery objectives are established for the various tributary sockeye salmon stocks. Overall run strength is assessed through harvest reporting in the commercial fishery and sonar counts at Miles Lake. Inseason, inriver harvest is estimated through anecdotal reports from sport anglers and guides, anecdotal reports from Chitina Subdistrict personal use dipnetters and

observation of effort in that fishery, and the same for the Glennallen Subdistrict subsistence fishery. Upper Copper River sockeye salmon sport fisheries have only been restricted in 2018 and 2020, when run entry data indicated the lower bound of the drainagewide escapement goal might not be achieved. In contrast, sockeye salmon sport fisheries were liberalized in 2013, 2014, 2015, and 2019 when run entry exceeded the upper bound of the sockeye salmon drainagewide escapement goal.

Proposals to change regulations affecting the various Copper River sockeye salmon sport fisheries are brought before the BOF nearly every cycle. During the 2021 BOF meeting in Cordova, Proposal 31 sought to increase the possession limit of sockeye salmon from 3 fish (the daily bag limit) to 6 fish, and passed 4 to 2. At the 2017 BOF meeting in Valdez, there were proposals to set an optimum escapement goal for sockeye salmon in the Copper River and to prohibit catch-and-release sport fishing in the Upper Copper River drainage; however, both proposals failed. A third proposal closing the Gulkana River drainage from the confluence between the East and Middle Fork upstream through Summit Lake to sockeye salmon fishing was carried. There were 3 proposals submitted for the December 2014 BOF meeting in Cordova that could have affected Upper Copper River sockeye salmon sport fisheries. All 3 sought some form of restrictions for barbless hooks and all 3 proposals failed.

Recent Fishery Performance

The 2020 sockeye salmon run to the Copper River was substantially weaker than forecasted and required restrictions to UCUSMA sport fisheries (Appendix B). On August 3, 2020, all waters of the Upper Copper River drainage were closed to sport fishing for sockeye salmon. By this point in the season, the inriver salmon objective, monitored by Miles Lake sonar, was approximately 94,000 salmon below target. Additionally, 95% of the run has usually passed the sonar by July 28 and daily sonar passage in July was trending 72% below the daily objective. Due to overall low sockeye salmon passage and concerns of the sockeye salmon escapement goal not being met, it was justified to close the sockeye salmon sport fishery. Final spawning escapement in 2020 was just above the lower bound of the SEG range at 362,445 sockeye salmon.

In 2021, the Copper River sockeye salmon run came in slightly below forecast, but no restrictions were needed in the sport fisheries. However, the run timing was late and some commercial fishing time was lost to ensure adequate sonar passage. Final spawning escapement in 2021 was 508,253 sockeye salmon.

Sockeye salmon sport harvest and effort were low in 2020 and 2021. From 2016 to 2020, sport harvest of sockeye salmon from UCUSMA waters averaged 6,179 fish, and 11,613 fish from 2011 to 2020 (Table 8). By contrast, the sockeye salmon sport harvest in 2020 (3,483 fish) was the second lowest since 1983 (Somerville 2022). Harvest in 2021 increased to 5,008 sockeye salmon but was still the tenth lowest since 1983. The Klutina River accounted for 81% of the sockeye salmon sport harvest in 2020 and 2021, whereas the Gulkana River accounted for 9% and 17% of the harvest in those years, respectively. Angler effort on the Klutina River in 2020 and 2021 was some of the lowest since the early 1990s (Table 1; Somerville 2022).

Sockeye salmon abundance and harvest in the Copper River drainage has been generally decreasing since the late 1990s with the exception of 2012–2015 (Somerville 2022). On the Klutina River, sockeye salmon harvests doubled in 2006 and remained high through 2014 (Table 8). Since then, harvests have fluctuated between 1,597 and 8,903 sockeye salmon annually. On the Gulkana River, sockeye salmon harvests have trended more with Chinook salmon harvests versus showing

any annual trends up or down. However, sockeye salmon returns to the Gulkana Hatchery have declined with less than 12,000 fish reaching terminal hatchery sites in 2020 and 2021. Although sockeye salmon counts at the Gulkana River Chinook salmon counting tower have been below the overall project average since 2017 (Hansen and Ocaña *In prep*), the data show no long-term annual trends. Tower counts only capture a portion of the Gulkana River main stem sockeye salmon run.

Research and Management Activities

Sockeye salmon stocks of the Copper River have, in general, been consistent and robust for several decades and, for the most part, have been adequately monitored through an extensive aerial survey program and by the Miles Lake sonar project. Except for 1993–1995, the escapement of sockeye salmon to Upper Copper River tributaries has been documented from 1966–2021 by the Division of Commercial Fisheries through aerial index counts to monitor spawner distribution in the drainage (Pirtle 1980; Randall et al. 1981; Brady et al. 1991; Hollowell et al. 2007; Botz et al. 2010, 2012, 2013; Sheridan et al. 2013, 2014; Wiese et al. 2015; Haught et al. 2017; Vega et al. 2019; Russell et al. 2017, 2021; Morella et al. 2021; Botz et al. 2021). Aerial escapement surveys provide distribution and relative abundance data only and are not used for inseason management. The Miles Lake sonar project, located in the Lower Copper River, has operated for over 40 years, and provides a reliable estimate of inriver abundance. The sonar counts are used for inseason management and have been a consistent and critical component in determining if the drainagewide sockeye salmon SEG has been achieved.

Due to the overall stability of Copper River sockeye salmon, few other research studies have targeted the species. A radiotelemetry project designed to monitor spawning distribution and run timing of sockeye salmon in the Upper Copper River was conducted from 2005 to 2009 (Wade et al. 2007–2010). During the study, an average of 40.1% of radio tagged sockeye spawned in the Klutina River drainage, 15.9% in Upper Copper River drainages (upstream of the Gulkana River), 13.5% in the Gulkana River drainage, 11.6% in the Tazlina River drainage, 6.8% in Lower Copper River drainages (downstream of the Chitina River and above Bremner Canyon), 6.3% in the Chitina River drainage, and 3.9% in the Tonsina River drainage. Of these systems, the Tazlina River and Upper Copper River drainages had the earliest mean run timing for sockeye salmon, followed by the Klutina River drainage, the Chitina River drainage, the Lower Copper River drainages, the Gulkana River drainage, and finally the Tonsina River drainage (Wade et al. 2007–2010). Because distribution hasn't been formally examined since 2009, another sockeye salmon radiotelemetry project may be conducted in the near future to reevaluate current distribution trends.

Recently, Copper River sockeye salmon have been the subject of studies by other non-department entities. The Prince William Sound Science Center and University of Alaska have been engaged in studies looking at the energetics of Copper River sockeye salmon stocks (Pete Rand, Prince William Sound Science Center, Cordova, Alaska; personal communication). These studies began in 2019 and are ongoing. Additional studies from the College of William and Mary have identified naturally developed immune signatures for several stocks of sockeye salmon in the Copper River drainage (Zwollow 2012, 2018). Knowledge of salmon energetics and how immune signatures affect migration, homing, and spawning success directly informs development of better management plans and strategies to ensure long-term sustainability of the Copper River sockeye salmon stocks.

COHO SALMON SPORT FISHERIES

Fishery Description

The UCUSMA coho salmon sport fishery is small compared to most coho fisheries in the state, with harvests exceeding 100 fish only once since 2005 (Table 2) and a maximum wild harvest of 496 fish in 1984 (Somerville 2022). Coho salmon begin entering the Copper River in early August and make their way into the upper river from mid-August through September. The number of coho salmon migrating into the Copper River are not assessed. Little is known about coho salmon populations in the Upper Copper River, but it is believed upriver populations are stable and the lack of harvest only reflects the lack of sport angler effort due to late run timing. The primary sport fishery harvest of coho salmon occurs in the Tonsina River drainage with anecdotal reports of harvests from the Klutina River and a few streams in the Chitina River drainage (Figure 1). Coho salmon have not been documented in any waters of the Copper River upstream of Tazlina River.

WILD ARCTIC GRAYLING SPORT FISHERIES

Fishery Description

Wild Arctic grayling are found throughout the UCUSMA and can be found in nearly every stream and most lakes. Wild Arctic grayling were the most harvested fish in the UCUSMA from 1977 to 1995 (Somerville 2022). Harvests declined after 1988 and have been surpassed nearly every year since 1996 by sockeye salmon, and by Chinook salmon in 2005 and 2007 (Table 2). The decline in harvest from 1988 to 1999 most likely resulted from more restrictive regulations that reduced overall bag limits and limited anglers to only 1 fish >14 inches in the Gulkana River drainage to ensure the sustained yield of the area's wild Arctic grayling stocks (Taube 2002). In 2003, the bag and possession limit in all area lakes, outside of the Gulkana River drainage, was reduced to 5 wild Arctic grayling with no size limit. Continued declines in harvest may reflect a general decline in areawide fishing effort since 2002 (Table 1) and increased angler preference for catch-and-release fishing rather than more restrictive regulations or a downturn in population sizes.

Wild Arctic grayling are the most caught species in the UCUSMA (Table 3). Along with harvest, catch has generally declined since 1990 when catch was first monitored (Somerville 2022). Even so, wild Arctic grayling catch, on average, has contributed nearly 50% of the annual total catch of all species in the UCUSMA.

The Gulkana River accounts for 29–61% of the annual wild Arctic grayling harvest (Table 10). From 2003 through 2021, anglers were limited to a bag and possession limit of 5 Arctic grayling with only 1 fish >14 inches in most of the Gulkana River drainage. Upstream of Paxson Lake and those waters of Paxson Lake within a 100-yard radius of the mouth of the East Fork at the end of Paxson Lake, anglers were limited to 2 Arctic grayling with 1 fish >14 inches. Beginning in 2022, the size limits for Arctic grayling in the Gulkana River drainage were removed, although anglers are still limited to a bag and possession limit of 2 fish above Paxson Lake.

In the remainder of the UCUSMA there is no large, single water body that dominates harvest for wild Arctic grayling. Instead, anglers target many different streams and lakes in the Upper Susitna River drainage, which includes Lake Louise, as well as streams and lakes in the Upper Copper River drainage upstream of the Gulkana River. In these areas anglers have a diverse selection of fishing areas to explore and enhance their fishing experience.

Fishery Management Objectives

The Wild Arctic Grayling Management Plan (5 AAC 52.055) was adopted in 2004 and designates 3 management approaches: regional, conservative, and special. Most wild Arctic grayling fisheries in the UCUSMA fall under the regional management approach and are open to fishing all year, with or without bait, and a bag and possession limit of 5 fish with no size limit. Under the conservative management approach, a fishery is open to harvest from June 1–March 31, catch-and-release from April 1–May 31 to protect spawning fish, and may be limited to unbaited, single-hook, artificial lures and a bag and possession limit of 2 fish. Size limits may or may not be imposed. Four fisheries within the UCUSMA are classified under the conservative management approach: Mendeltna Creek (2 fish ≥12 inches), Moose Lake, and Our Creek in the Tazlina drainage (2 fish, no size limit), and the Gulkana River upstream of Paxson Lake (2 fish, only 1 fish ≥14 inches, open all year). Note that the size limits in the Gulkana River drainage were removed by the BOF effective 2022. Under these regulations, current harvest levels of wild Arctic grayling stocks in the UCUSMA are sustainable. As a result, it is anticipated that harvest levels of wild Arctic grayling will remain at sustainable levels.

ADF&G submitted proposals 30 and 34 to the BOF in 2021. Proposal 30 sought to extend the single hook, artificial fly regulations of the Lower Gulkana River upstream to cover the portion of the river under the Richardson Highway bridge. Proposal 34 sought to remove the 14-inch size limit for Arctic grayling in the Gulkana River drainage. Both proposals were carried by the BOF. Proposal 35 sought to move Moose Creek, a small stream flowing through Glennallen, from the regional management approach to the conservative management approach by reducing the bag limit from 5 fish to 2 fish and imposing a spawning closure. This proposal failed. A proposal to prohibit catch-and-release fishing in the UCUSMA was submitted for the 2017 BOF meeting in Valdez. The proposal failed. A proposal to increase the bag limit of Arctic grayling in the Gulkana River drainage to 10 fish, only 5 of which may be >14 inches, was submitted for the 2014 BOF cycle. The proposal failed.

Recent Fishery Performance

Wild Arctic grayling are harvested throughout the UCUSMA. Harvest of wild Arctic grayling has averaged 2,671 fish over the last 10 years (2011–2020) and 2,201 fish over the last 5 years (2016–2020; Table 10). Total harvest of wild Arctic grayling in 2020 was 1,887 fish and in 2021 was 1,397 fish. The 2021 harvest was the lowest wild Arctic grayling harvest ever recorded in the management area. The Upper Susitna River drainage accounted for 52% of the 2020 harvest and 41% of the 2021 harvest. Normally, the Gulkana River drainage dominates the harvest and catch of Arctic grayling in the UCUSMA, but in 2020 and 2021 it accounted for 22% and 36% of the 2020 and 2021 harvests, respectively. Reduced harvests of Arctic grayling in the Gulkana River drainage in 2020 and 2021 are probably related to reduced angler effort resulting from Chinook salmon sport restrictions and closures in those years.

Most wild Arctic grayling are released after being caught rather than retained by anglers. Arctic grayling catch was the lowest ever reported in 2021 at 12,780 fish and was the third lowest ever reported in 2020 at 27,727 fish (Table 11). These low catch rates are also primarily due to reduced effort on the Gulkana River in those years (Table 1).

Research and Management Activities

Research on Wild Arctic grayling in the UCUSMA has been concentrated on the Gulkana River drainage, the area's single largest Arctic grayling fishery. Williams and Potterville (1983) identified a decrease in the maximum size of sport caught Arctic grayling on the Gulkana River from 1968 to 1981. Concerns over this decrease in size and increasing sport effort prompted a change in regulation for Arctic grayling on the Gulkana River limiting anglers to only 1 fish ≥14 inches total length. Additional research conducted by Bosch (1995) verified the size structure of Gulkana River Arctic grayling and indicated that larger fish were predominantly found in the upper tributaries of the drainage and less so in the mainstem. Recent estimates of abundance and size structure (Gryska 2019; Schwanke and Tyers 2019) and radiotelemetry studies (Schwanke 2021; Schwanke and Bernard 2020) demonstrated that larger Arctic grayling seek colder waters in the upper tributaries of the Gulkana River drainage during summer and early fall and only move into mainstem waters to overwinter and to access spawning streams in the early spring before migrating back into upper tributaries. The upper drainage tributaries are in remote locations that greatly limit anglers from exploiting these waters and the larger Arctic grayling within the Gulkana River drainage; however, the portion upstream of Paxson Lake is more accessible. It is because of this research that the department proposed removing the Gulkana River drainage 14-inch size limit from regulation during the 2021 BOF cycle.

With reduced angler effort and a higher propensity for anglers to practice catch-and-release rather than consumptive harvest, the department is reviewing other restrictive regulations for Arctic grayling in the UCUSMA. This is an effort to simplify the regulations and encourage anglers to participate in area fisheries. UCUSMA Arctic grayling stocks are strong and diverse and should remain sustainable even with reduced regulatory complexity and increased angler effort.

LAKE TROUT SPORT FISHERIES

Fishery Description

The UCUSMA is the only area in Alaska where numerous lake trout fisheries exist along the road system (Figure 4). They are fished year-round and are the main species targeted by ice fishing anglers in the area. Lake trout are harvested mainly from lakes within the Tyone River drainage (Lake Louise, and Susitna and Tyone Lakes) and the Gulkana River drainage (Paxson, Summit, and Crosswind Lakes; Table 12). Other popular lakes include Copper and Tanada Lakes in the Upper Copper River drainage. Lake Louise has supported the most popular lake trout fishery in the UCUSMA, with harvest peaking at over 4,000 fish in the early 1980s (Somerville 2022). Paxson Lake was the second-largest fishery with harvests above 2,000 fish also in the early 1980s. More recently, total lake trout harvests in the UCUSMA have been less than 2,000 total fish since 2005 (Table 12) but Lake Louise and Paxson Lake remain the 2 most popular lakes because they are gateway lakes to the Tyone and Gulkana River drainages respectively.

Fishery Management Objectives

Sport fishing regulations for lake trout have gone through several changes since 1960 (Somerville 2022). These changes have had significant impacts on lake trout harvests and angler effort in the UCUSMA. For example, from 1960 through 1982 anglers could harvest up to 10 lake trout of any size per day. From 1983 through 1999 bag limits were reduced from 10 fish to limits of 1–3 fish and various size limits were imposed to protect females through at least 1 spawning cycle. Beginning in 2000, size limits were removed from the larger, most popular UCUSMA lakes

starting with Paxson and Summit Lakes where the bag limit was reduced to 1 lake trout and anglers were limited to single hook gear all year and no bait from November through April. These regulations were extended to Lake Louise and Susitna, Tyone, and Crosswind Lakes in 2012. All other lakes have remained at background regulations of 2 fish of any size with no bait or hook restrictions.

Lake trout populations within the UCUSMA are currently managed conservatively and are considered healthy and sustainable under current regulations. The department initiated a regional review of lake trout regulations and management in 2002 and developed a lake trout management plan that was adopted by the BOF in 2005 (Burr 2006). Under this management plan, the minimum size limit for lake trout was removed in Paxson and Summit Lakes and the bag limit was set to 1 fish per day beginning in 2006. Additionally, the use of bait was prohibited from April 16–October 31 but allowed from November 1–April 15 to provide for the burbot fisheries. In 2012, these same regulations were implemented for Lake Louise and Susitna, Tyone, and Crosswind Lakes, which effectively aligned lake trout management in all large lakes with high angler effort and harvest rates that consistently met or exceeded sustainable levels. These regulation changes reduced fishing mortality below the sustainable yield estimates for these lakes.

Management of lake trout populations in the UCUSMA is guided by the Wild Lake Trout Management Plan (5 AAC 52.060) and the department uses the Lake Area Model (LAM; Evans et al. 1991) as a conservative guideline to determine sustainable harvests of lake trout from area lakes. The LAM is based on a relatively small range of mostly southern Canadian lakes and their observed sustainable yields and provides a general guideline for sustainable harvests. The predicted annual yields from the model are inherently imprecise (Burr 2006); therefore, they are treated as a threshold that should not be exceeded rather than a target level of lake trout exploitation.

The LAM predicted potential yield is the level of sustainable biomass that can be removed from the lake. Based on average lengths and weights of lake trout in the specific lake, or based on average lake trout weight per length, the sustainable yield of fish can be calculated and adjusted based on any size limit restriction. The sustainable yield includes all harvest of lake trout plus an additional 10% of the total catch to compensate for hooking mortality of released fish. In the large, popular lakes, such as Lake Louise, catch levels can drive the management of the fishery more than direct harvest (Table 13).

The LAM adequately protects lake trout populations from overexploitation but may be overly restrictive for most lake trout fisheries in the UCUSMA. Region III Sport Fish staff have begun a review of an updated yield model for lake trout based on a substantially larger sampling of lakes and including lakes in latitudes similar to Alaska (Lester 2021). If harvest levels appear to be sustainable, some liberalization in lake trout regulations may be possible, which could increase angler effort in the UCUSMA.

Reduced bag limits, prohibition of bait during the open water period, and removal of size limits have reduced effective harvest in Lake Louise and Susitna, Tyone, Crosswind, Paxson, and Summit Lakes to sustainable levels (Table 13). However, in some lakes there is a small margin between current harvest and the maximum sustainable harvest. If effort increases, it may be necessary to further restrict some of these fisheries unless newer yield models estimate higher sustainable harvest levels or other regulatory regimes can be developed to allow a mix of harvest opportunities.

Proposals seeking to change lake trout regulations in the UCUSMA appear before the BOF about once every 2 or 3 board cycles. Proposal 36 at the 2021 BOF meeting in Cordova sought an increased bag limit for lake trout on Crosswind Lake. The proposal failed. A proposal to prohibit catch-and-release fishing in the UCUSMA was submitted for the 2017 BOF meeting in Valdez. The proposal failed. No proposals concerning area lake trout sport fisheries were submitted to the BOF for the 2014 board cycle.

Recent Fishery Performance

As with other resident species fisheries, the harvest of lake trout has been declining over the last 10 to 15 years. Total lake trout harvest in 2021 was 552 fish and was the lowest ever recorded for the UCUSMA (Table 12). Harvest in 2020 was 730 lake trout and was the sixth lowest. Total harvest of lake trout averaged 891 fish from 2016 to 2020 with 46% from the Susitna River drainage and 35% from the Gulkana River drainage. Lake Louise (30%), Paxson Lake (15%), and other Susitna drainage lakes (13%) accounted for over half the annual average lake trout harvest in the UCUSMA during those same 5 years. Most anglers sport fishing for lake trout released their catch. In 2020, anglers retained 16% of the lake trout they caught and in 2021, they retained 18%.

In 2020 and 2021, lake trout harvest was only 8% and 5%, respectively, of the annual harvest of all species in the UCUSMA (Table 2). Declines in SWHS harvest data for lake trout may be more a factor of decreased participation and response rates in the SWHS program rather than true declines in harvest. Observations by area biologists indicate an overall increase in effort on area lakes, especially Lake Louise, that do not appear reflected in the survey.

Research and Management Activities

There has been little research done on UCUSMA lake trout populations over the last 20 years. Funding for resident species research is greatly limited and restrictive regulations have brought all fisheries to sustainable levels of harvest. However, those restrictions may be too restrictive and actual sustainable levels of harvest may be much higher than calculated through the LAM. Recent proposals presented to the BOF have highlighted concerns by anglers of overly restricted fisheries. By contrast, comments from anglers in the field demonstrate concern that further restrictions may be needed.

In 2023, the department will begin to assess the lake trout population structure at Crosswind Lake and determine an approximate population estimate for that stock. This work is in conjunction with further review of the Lester Yield Model as a potential metric to establish more realistic yield estimates for lake trout in area lakes. Secondly, assumptions of how much harvest is sustainable with respect to maximum sustain yield will be evaluated. Until then, sustainable yield levels developed from the LAM will continue to drive lake trout management in the UCUSMA.

BURBOT SPORT FISHERIES

Fishery Description

Burbot fisheries primarily occur from November to April using closely attended set lines. Many lakes and rivers of the UCUSMA historically contained large populations of burbot (Figure 4) and prior to 1990, these waters supported an average of 56% of the statewide sport harvest of this species (Somerville 2022 The largest fishery historically occurred in Lake Louise, Susitna, and Tyone Lakes. Other fisheries occur in various lakes of the Gulkana River drainage (e.g., Paxson,

Summit, and Crosswind Lakes), Tazlina River drainage, and smaller remote lakes scattered throughout the UCUSMA.

Lake Louise remains one of the most popular lakes for fishing burbot even with a restrictive bag limit of 1 fish. Overfishing of Lake Louise in the 1980s caused the burbot population to crash (Somerville 2022). Even after several years of closure and the restrictive bag limit, the burbot population failed to recover. However, over the last 4–5 years angler success has improved and the fish being harvested appear healthy and robust, indicating that the population may finally be rebounding.

Fishery Management Objectives

UCUSMA burbot populations are managed for long-term sustainability. Set lines are prohibited in the area with the exception of the Copper River, east bank tributaries of the Copper River, and west bank tributaries of the Copper River downstream of the Richardson Highway and Tok Cut-off (with the exception of the Gulkana River, which is closed to the use of set lines). Anglers are also limited to a bag of 2 burbot in most road-accessible popular lakes and lakes in the entire Tyone River drainage and Paxson Lake along the Richardson Highway. Anglers targeting more remote lakes and roadside lakes that have traditionally low angler effort are limited to a bag of 5 burbot.

One of the most common regulatory violations in the UCUSMA is for the use of unattended set lines. However, no proposals have been submitted to the BOF to again allow unattended set lines in the area. The last proposal directly concerning UCUSMA burbot fisheries was a department-generated proposal in 2011 to reopen Tolsona Lake to burbot fishing with a 2-fish bag limit.

Recent Fishery Performance

SWHS harvest estimates for burbot in the UCUSMA vary greatly from year to year, but these variations are more a result of low response rates in the survey rather than a reflection of harvest effort or burbot population sizes. However, even with annual fluctuations, the harvest of burbot has been comparatively low since about 2006 (Table 14). Average burbot harvest from area waters is 539 fish over the last 5 years (2016–2020) and 652 fish over the last 10 years. Harvest from Lake Louise and Susitna and Tyone Lakes generally account for a combined 48–50% of the UCUSMA annual burbot harvest.

In 2020 and 2021, the estimated harvest of burbot in the UCUSMA was 582 and 576 burbot, respectively (Table 14). Just over 75% of the 2020 harvest and 48% of the 2021 harvest came from Lake Louise and Susitna and Tyone Lakes. Based on observed fishing effort and SWHS estimates, it appears the burbot populations in the UCUSMA are able to sustain current levels of effort and exploitation and in most waters are probably underutilized.

Research and Management Activities

Management of burbot fisheries in the UCUSMA is generally done over a longer-term period and relies on data from the SWHS as well as direct assessment of specific lakes. Inseason management primarily involves conducting angler checks in the field and enforcement action to discourage and limit the illegal use of set lines.

Out of concern that burbot stocks in the UCUSMA were being overexploited, the department began to evaluate the life history of Interior Alaska burbot and determine stock status and sustained yields of burbot fisheries in the UCUSMA. Annual results of these studies are summarized in Lafferty et al. (1990–1992), Lafferty and Bernard (1993), Parker et al. (1987–1989), Schwanke

and Bernard (2005a–b), Schwanke and Perry-Plake (2007), Schwanke (2009b), Taube et al. (1994, 2000), and Taube and Bernard (1995, 1999, 2001, 2004). The results of this work led to the adoption of increasingly restrictive regulations that have achieved sustainable burbot fisheries within the UCUSMA.

Although current regulations have been in place for over 20 years and UCUSMA burbot populations appear stable, the monitoring of specific lakes has continued. Burbot populations in Crosswind Lake (Schwanke 2009b) and in Tanada and Copper Lakes (Schwanke and McCormick 2010) were assessed to establish baseline population sizes for these lakes as recent trends had indicated potential increases in sport effort. Thermal habitat selection by burbot was also investigated in Tanada and Copper Lakes (Scannell et al. 2016). Follow up assessment of the Tolsona Lake burbot population (Schwanke 2014) led to that lake being reopened in 2012 with a 2 fish bag limit, after being closed for 13 years. Assessment of Lake Louise in 2005 (Schwanke and Perry-Plake 2007) determined the burbot in that lake had still not recovered after being closed for 13 years and open with a 1-fish bag limit for 2 years.

Over the last few years, observations by area staff and anecdotal reports from anglers of increased catches of burbot indicated a possible increase in the Lake Louise burbot population. An abundance assessment was conducted in 2021 to determine if the burbot population was larger than last assessed in 2005. The preliminary 2021 catch per unit effort (CPUE) for burbot in Lake Louise was 0.71 (Gutierrez et al. *In prep*), which is 34% greater than the last CPUE of 0.48 in 2005 (Schwanke and Perry-Plake 2007) and is the highest CPUE ever attained in the lake. This indicates that the burbot population in Lake Louise is beginning to recover from the significant overfishing during the late 1980s.

WILD RAINBOW AND STEELHEAD TROUT SPORT FISHERIES

Fishery Description

The Upper Copper River drainage rainbow and steelhead stocks are the northernmost extent of the species' natural range in North America. The area's widely distributed stocks of wild rainbow and steelhead trout display generally low population size and productivity with little ability to sustain harvests. The largest population of rainbow and steelhead trout in the UCUSMA is in the Gulkana River drainage. Other sizable populations can be found in the Tebay and Hanigita River drainages in the Chitina River drainage. Smaller populations are also found in the Klutina and Tazlina River drainages (Figure 1). Anglers specifically targeting steelhead trout in the Copper River drainage tend to be dedicated anglers willing to expend significant fishing hours to land a fish.

Fishery Management Objectives

No management plan has been developed specific to UCUSMA rainbow and steelhead populations. In 2003, the BOF adopted the statewide *Policy for the Management of Sustainable Wild Trout Fisheries* (5 AAC 75.222). This policy provides guidelines to the BOF and ADF&G for developing regulations and managing wild trout populations. All UCUSMA rainbow and steelhead trout fisheries are managed consistent with this plan.

Conservative regulations are used in most Upper Copper River drainages to ensure rainbow and steelhead trout stocks are not overexploited. In 1988, the waters of Lower Hanagita Lake and the Hanagita River, from Lower Hanagita Lake to the Tebay River, were restricted to catch-and-release for rainbow and steelhead trout and all flowing waters of the Tebay River drainage were restricted to unbaited, single-hook artificial lures. In 1990, the Gulkana River drainage fishery was

restricted to catch-and-release and the river section above a point on the mainstem Gulkana River 7.5 miles upstream of the confluence of the West Fork was further restricted to unbaited, single-hook artificial lures. In 1999, the unbaited, single-hook, artificial lure restrictions were extended to all flowing waters of the UCUSMA. In 2005, catch-and-release restrictions were extended to the remainder of the Hanagita River drainage (upstream of Lower Hanagita Lake) and the Tebay River downstream of the Hanagita River confluence. Spawning closures were established around the identified rainbow/steelhead trout spawning areas on the Middle Fork of the Gulkana River in 1997 and Twelvemile Creek (a tributary of the Gulkana River) in 2003 (Figure 3). Additionally, the retention of incidentally caught rainbow or steelhead trout was prohibited in the Copper River personal use dip net salmon fishery (Chitina Subdistrict) in 1997, and then in 2003, retention was prohibited for rainbow trout or steelhead trout caught by dip net in the subsistence salmon fishery (Glennallen Subdistrict).

Few proposals are submitted to the BOF concerning rainbow and steelhead trout in the UCUSMA. However, perceived increases in catch rates by anglers on the Gulkana River have inspired proposals to once again open that fishery to the take of rainbow trout. At the 2021 BOF meeting in Cordova proposals 32 and 33 sought to allow a bag limit of 1 fish over either 18 or 20 inches in the Gulkana River. Both proposals failed but only after lengthy discussions. A proposal to prohibit catch-and-release fishing in the UCUSMA was submitted for the 2017 BOF meeting in Valdez. The proposal failed. In 2014, the BOF adopted an ADF&G proposal to simplify and align current regulations for Summit Lake, in the Chitina River drainage, with its outlet stream Bridge Creek.

Recent Fishery Performance

A total of 258 wild rainbow trout were harvested (Table 2) and 4,395 caught (Table 15) from the UCUSMA in 2020 and in 2021 56 were harvested and 2,097 were caught. The 2020 harvest and catch were consistent with the last several years, but the catch in 2021 (2,097) was the lowest ever reported and the harvest (56) was the second lowest. The largest wild rainbow trout fishery in the UCUSMA continues to be the Gulkana River, which is limited to catch-and-release only. The Gulkana River accounts for the majority of rainbow trout caught in the UCUSMA, making up 62% of the catch over the past 5 years (2016–2020) and 65% of the catch over the last 10 years. No steelhead trout have been reported as harvested in the UCUSMA since 1999; however, 10 steelhead trout were caught in 2020 and none in 2021. Historic trends in the area's wild rainbow and steelhead fisheries are difficult to ascertain because annual harvest and catch estimates have been small and fluctuate markedly.

Research and Management Activities

The most recent rainbow and steelhead trout research in the UCUSMA occurred during the early 2000s. From 2004 to 2006, a project to determine steelhead trout distribution using radiotelemetry was conducted in the Upper Copper River (Savereide 2005b–c, 2008). The study was discontinued after its second year due to the difficulty of capturing and tagging more than 100 fish, which was the minimum sample size necessary to meet the statistical criterion of the study. Results showed that radiotagged steelhead trout migrated into the mainstem Chitina (26%), Tazlina (47%), and Gulkana (27%) Rivers. In 2005, a population estimate of rainbow trout in the Gulkana River from Paxson Lake to 2 miles downstream of Sourdough was conducted (Schwanke and Taras 2009). This study estimated the abundance of rainbow trout ≥11in (275 mm FL) was 5,238 fish (SE = 689; 95% CI = 3,888–6,588) and rainbow trout 6–11 in (160–274 mm FL) was 6,850 fish (SE = 1,023; 95% CI = 4,845–8,855). Then beginning in 2010, a 2-year radiotelemetry study was conducted on

Gulkana River rainbow trout. During this study, approximately 100 rainbow trout were tagged and tracked and previously undocumented spawning areas were identified in the West Fork Gulkana River and the Gulkana River mainstem above the confluence with the West Fork (Schwanke 2015).

No directed work has been conducted on area rainbow trout populations since 2012 because most fisheries are limited to catch-and-release and populations appear to be stable. Two proposals were submitted by the public to allow a 1-fish bag limit for large rainbow trout on the Gulkana River at the 2021 BOF meeting. Despite the public's perception, it is unlikely the rainbow trout stocks of the Gulkana River drainage have grown to a point at which they can sustain even a 1-fish bag limit; however, the department has no direct empirical data to support this. The department is planning to conduct a new abundance assessment for rainbow trout on the Gulkana River in 2023 to provide updated information for the BOF to address any new proposals seeking harvest of rainbow trout in that system. Until then, the restrictive management of rainbow trout in the Gulkana River drainage will continue.

DOLLY VARDEN SPORT FISHERIES

Fishery Description

Dolly Varden are found throughout the Upper Copper River drainage with the exception of the Gulkana River drainage and in some waters of the Upper Susitna River drainage (Figures 1 and 3). They are primarily targeted by sport anglers in the Klutina and Tonsina River drainages. Dolly Varden have been reported in the SWHS as being caught in the Gulkana River, downstream of the Richardson Highway bridge, but these occurrences are rare. In most UCUSMA waters, Dolly Varden rarely exceed 10 or 12 inches, but fish reaching 24 inches or more can be found in the Upper Klutina River and Klutina Lake.

Fishery Management Objectives

There is no established management plan for Dolly Varden in the UCUSMA. The underlying goal of the department is to assure sustained yield and provide fishing opportunity on fishery resources. Harvest and catch of Dolly Varden in the UCUSMA is monitored through the SWHS. Harvest, catch, and overall angler effort for Dolly Varden are low and bag limits liberal (10 fish, any size).

Recent Fishery Performance

Sport harvest of Dolly Varden in the UCUSMA varies greatly from year to year. Total harvest of Dolly Varden in the UCUSMA averaged 650 fish during 2016–2020 and 643 fish during 2011–2020 (Table 16). A total of 203 Dolly Varden were harvested in the UCUSMA in 2020, the lowest harvest ever recorded. Harvest in 2020 was scattered throughout the area. In 2021, the total harvest was 624 Dolly Varden with 100% of them taken from the Klutina River drainage.

Research and Management Activities

There has been little directed research or management for area Dolly Varden. In 2012, the department collected 20 Dolly Varden from the Upper Klutina River and outlet of Klutina Lake during late October. Otoliths from all 20 fish were analyzed for strontium signatures (Corey Schwanke, ADF&G Sport Fish Biologist, Glennallen; personal communication). None of the fish were anadromous, but chemical signatures in the otoliths suggested the fish may migrate within the greater Copper River drainage or there may be a large variance in strontium isotope concentrations within the Klutina River drainage. Further otolith analyses of Klutina River Dolly

Varden and other stocks and analysis of water chemistry from those systems will augment these findings.

STOCKED WATERS SPORT FISHERIES

Fishery Description

ADF&G stocks approximately 25 lakes in the UCUSMA providing fishing opportunities for popular fish species in locations where fishing opportunities are limited or didn't exist previously (Table 17). The lake stocking program serves a segment of the public who want to fish but must remain on or near the road system. All but 4 of the 25 stocked lakes are road-accessible or within 2 miles of a road and have trail access. This program provides increased fishing opportunities and offers a diversity of species in rural areas where minimal opportunity exists for sport fishing. It also diverts effort from wild populations in areas for which ADF&G has conservation concerns. Of the 25 stocked lakes in the area, Tex Smith Lake along the Glenn Highway and lakes in the vicinity of Chitina and along the McCarthy Road are consistently the most popular stocked lakes.

Fishery Management Objectives

The *Upper Copper River and Upper Susitna River Area Stocked Waters Management Plan* (5 AAC 52.065) requires the department to manage stocked waters in the Area to meet public demand for diverse fishing opportunities. Sport fishing effort and harvest are estimated through the Statewide Harvest Survey. All 25 stocked lakes in the UCUSMA are managed under the regional approach, with a bag and possession limit of 10 fish (all stocked species combined), only 1 fish that can be18 inches or larger.

Recent Fishery Performance

Angler effort on stocked waters was 1,788 angler-days in 2020 and was the 5th lowest since 2002 (Table 18). In 2021 angler effort increased to 4,090 angler-days, which is the highest effort since 2001 (4,396 angler-days). Angler effort has averaged about 2,300 angler-days for the last 20 years and averaged 2,474 angler days over the most recent 5 years (2016–2020).

Anglers harvested 982 stocked fish in 2020 and caught 3,885 fish for a catch rate of 2.2 fish per angler-day (Table 18). In 2021, anglers had the same catch rate as 2020 and harvested and caught 2,029 and 9,069 stocked fish, respectively. The average catch per effort for the last 5 years has been 2.7 fish per angler-day fished and for the last 10 years has been 2.2 fish per angler-day. The average harvest for the last 5 years (2016–2020) was 1,646 stocked fish.

Rainbow trout are the primary species stocked in the UCUSMA and therefore are the most harvested (Table 18). Rainbow trout accounted for 94% of the 2020 harvest and 100% of the 2021 harvest of stocked fish in the UCUSMA. Catch of stocked fish in 2020 included Arctic grayling and Arctic char but was still dominated by rainbow trout, which made up 92% of the catch. In 2021, rainbow trout made up 89% of the stocked fish catch, with landlocked coho salmon, Arctic grayling, and Arctic char making up the remaining 11% of the catch.

Research and Management Activities

There is little directed research on area stocked waters. Each year selected lakes are chosen for assessment to monitor growth and survival in those stocked lakes. The stocked waters program also investigates any lakes that may be proposed for future stocking and performs bathymetric surveys of selected area lakes (both stocked and non-stocked).

UPPER COPPER RIVER PERSONAL USE FISHERY

Fishery Description

A personal use fishery has been prosecuted annually in a portion of the mainstem Copper River, known as the Chitina Subdistrict (CSD), since 1984. Since 1984, the CSD has primarily been managed as a personal use fishery but was managed as a subsistence fishery during 1985 and again from 2000–2002 (Somerville 2022). In 1977, the UCRD was split into 2 subdistricts managed as subsistence fisheries through 1983, the CSD and the Glennallen Subdistrict (GSD). The boundaries of these subdistricts, the gear types allowed, and fishing periods changed several times through about 1985. The CSD personal use dip net fishery is currently bound from an ADF&G marker approximately 200 yards upstream of Haley Creek to the downstream edge of the Chitina-McCarthy Bridge (Figure 2). Dip nets are the only allowable gear in the state fishery and fishing periods are set weekly based on abundance of salmon counted at the Miles Lake sonar station.

Dipnetters walk, bike, and use All Terrain Vehicles (ATVs) to access the CSD personal use dip net salmon fishery from the old Copper River railroad right of way. They also access the fishery by boat, launching at unimproved sites near the Chitina-McCarthy Bridge and through Chitina Native Corporation lands near the outlet of O'Brien Creek. Commercial transporters have operated in the fishery since its inception and drop off dipnetters at specific locations within Woods Canyon that would normally be inaccessible to most people. Additionally, guide services, where dipnetters fish from the guide's boat, have operated since the 1980s but have only become popular since 2014, with 5 guide businesses currently operating up to 7 boats in the fishery. The popularity of the CSD fishery has steadily grown with improved services and access (including improvements to the Glenn, Richardson, and Edgerton Highways) from 44 permits issued in 1960 with a harvest of about 8,800 salmon (Somerville 2022) to 7,222 permits issued in 2021 with a harvest of over 145,006 salmon (Table 19).

Sockeye and Chinook salmon are present in the CSD from mid-May through September 30. Chinook salmon make up about 2% of the annual harvest in the CSD, whereas sockeye salmon make up about 97% in most years (Table 19). Generally, 60% of the Chinook salmon harvest in the CSD occurs by the end of June and 80% by the middle of July. For sockeye salmon, 50% of the harvest is usually achieved between the first and second week of July and 75% by the end of July. Coho salmon are present in the fishery from about August 15 through September 30 and make up less than 1% of the annual harvest.

Fishery Management Objectives

Like subsistence fisheries, personal use fisheries allow more efficient fishing gear and higher annual limits than sport fisheries, but unlike subsistence fisheries, they lack management priority over other fisheries and may be restricted to ensure subsistence needs are met or escapement goals achieved. Personal use fisheries differ from sport fisheries in both their objectives and management. Both fisheries provide Alaskans the opportunity to harvest fish for personal consumption, but personal use fisheries are managed to maximize harvest potential, whereas sport fisheries are managed to provide diversity of opportunity. Anyone can participate in Alaska's sport fisheries provided they have a sport fishing license; however, only Alaska residents may participate in personal use fisheries provided they have a sport fishing license and a permit, if required, for the personal use fishery. The Division of Sport Fish manages the CSD personal use fishery.

The BOF established the *Copper River Personal Use Dip Net Salmon Fishery Management Plan* (5 AAC 77.591) in 1984, which divided the inriver allocation of salmon into subsistence harvest, personal use harvest, sport fishery harvest of sockeye and Chinook salmon, hatchery broodstock, and specific spawning escapement goals for sockeye, Chinook, and other salmon. The BOF apportioned 60,000 salmon for the Chitina Subdistrict personal use fishery at that time. The plan also required management to achieve a set percentage of the apportioned harvest each week through the season (Somerville 2022).

The *Copper River Personal Use Dip Net Salmon Fishery Management Plan* (5 AAC 77.591) has been revised several times since its adoption in 1984 (Somerville 2022). At its 1996 meeting, the BOF adopted changes to the plan, moving the inriver salmon apportionment guidelines from the personal use plan to the *Copper River District Salmon Management* Plan (5 AAC 24.360) within commercial fisheries regulations. The BOF also increased the personal use apportionment to 100,000 salmon and, in conjunction with the creation of the *Copper River King Salmon Management Plan* (5 AAC 24.361), the allowable limit of Chinook salmon in the CSD was reduced from 5 to 4 fish. Finally, the set percent-harvest objectives in the plan were removed and replaced with an abundance-based management objective linked to passage of salmon at the Miles Lake sonar. The fishery has been managed on a weekly basis with fishing time determined each week based on the number of salmon counted at the sonar. The maximum harvest in the CSD personal use dip net salmon fishery is 100,000–150,000 salmon, not including any salmon in excess of the inriver goal or salmon taken after August 31. The apportionment of salmon to this fishery is calculated each year and must be between 100,000–150,000 salmon.

Bag limits have changed significantly in the CSD due to changes in the fishery's status and through proposals to the BOF (Somerville 2022). The current bag limits were established at the 2014 BOF meeting in Cordova: households are limited to an annual limit of 25 salmon for the head of household and 10 salmon for each dependent of the permit holder, except that only 1 Chinook salmon may be retained per household. Households are limited to a single permit and may only possess either a Chitina Subdistrict personal use salmon dip net fishery permit or a Glennallen Subdistrict subsistence fishery permit in any given year, but not both.

The *Copper River Personal Use Dip Net Salmon Fishery Management Plan* directs harvest in the fishery to be distributed throughout the season based on abundance. The department establishes a preseason schedule based on forecast daily salmon passage at the Miles Lake sonar, assigning salmon to the CSD personal use fishery based on the proportion of salmon apportioned to the CSD personal use fishery in the annual inriver goal. To ensure actual harvest is distributed throughout the run, the department opens and closes the CSD personal use fishery based on weekly (Monday to Sunday) sonar counts at Miles Lake. Total fishing hours each week are calculated by dividing the proportion of salmon apportioned to the CSD personal use fishery in the total weekly sonar count by the average (3- to 5-year) catch-per-hour of salmon in the CSD fishery for that week. However, in seasons where it appears the sockeye salmon SEG may not be met, the CSD fishery may be further restricted or closed during a week even though sonar abundance for that week indicates a harvestable surplus of salmon.

Ten proposals were submitted for consideration by the BOF in 2021 that related to the CSD salmon fishery. Proposals prohibiting dipnetting near tributary mouths of the UCRD, dipnetting from a boat in the UCRD, dipnetting from a moving boat in a portion of the CSD, dipnetting from a boat when within 50 feet of a person dipnetting from shore in the CSD, prohibiting the use of gillnet mesh in dip nets, and prohibiting the use of depth or fish finders on boats in the UCRD all failed.

Proposals to extend the lower boundary of the CSD downstream a half mile, to reduce the maximum harvest level in the CSD personal use fishery when the Copper River commercial fishery harvest is 50% below the 10-year average on June 1, to amend the annual limit for salmon in the CSD, and to amend the opening date of the CSD personal use fishery from June 7 to June 1 also failed.

Four proposals were submitted for consideration at the 2017 BOF meeting in Valdez that concerned the CSD personal use fishery. One proposal to remove the automatic reduction to the maximum harvest limit when the Copper River District commercial fishery is closed for 13 or more consecutive days was carried. Proposals to extend the lower boundary of the CSD, prohibit the use of monofilament netting in dip nets, and require logbooks for transporters and guides in the fishery failed.

Nine proposals affecting the CSD personal use fishery were submitted for consideration during the 2014 BOF cycle. The BOF carried a proposal changing the annual limit in the CSD personal use dip net salmon fishery to 25, plus 10 additional salmon per household member, and repealed the supplemental harvest periods. Proposals that failed included (1) prohibiting the use of monofilament webbing in dip nets, (2) requiring that Chinook salmon be kept in the water prior to release, (3) establishing a check station in Chitina for harvest reporting in both the Glennallen and Chitina Subdistricts, (4) opening the CSD personal use fishery 6 days earlier, (5) repealing the 13-day commercial closure trigger for lowering the maximum allowable harvest in the Chitina Subdistrict, (6) establishing a 3,000-fish allocation of Chinook salmon in the CSD, (7) requiring charter operators to maintain daily logbooks and record client harvests; and (8) reducing the maximum harvest to 100,000 salmon in the CSD.

Recent Fishery Performance

Harvest of sockeye salmon in the CSD is directly related to sockeye salmon abundance past the Miles Lake sonar. Copper River sockeye salmon run entry from 2016–2020 averaged 723,460 sockeye salmon compared to the latest 10-year average of 950,3012 sockeye salmon (Table 9). Sockeye salmon harvest in the CSD from 2016–2020 was also low at 124,396 sockeye salmon versus the latest 10-year average of 144,724 sockeye salmon. In 2020, 81,428 sockeye salmon were harvested in the CSD (second lowest since 1995) with total inriver passage of 504,020 sockeye salmon (lowest since 1988).

In 2020, the CSD personal use fishery was restricted for most of the season due to poor sockeye and Chinook salmon run strengths. A total of 6,810 permits were issued for the Chitina Subdistrict personal use fishery with 66% of those permits fished (Table 19). A total of 78,022 sockeye salmon and 751 Chinook salmon were harvested in 2020, which constitutes the lowest sockeye salmon harvest in this fishery since 1995. For Chinook salmon, the 2020 harvest was similar to several other years since 2008 with significant restrictions on Chinook salmon (Table 5).

The 2020 CSD personal use fishery season was opened by EO on June 7 for a 24-hour fishing period. Salmon passage at the Miles Lake sonar was below projection through June 14 and consequently, each week's fishing period was reduced from the preseason schedule. This resulted in an 84-hour fishing period the week of June 8, a 120-hour period the week of June 15, and a 138-hour period the week of June 22 (Appendix B1). Also, beginning June 22, Chinook salmon retention in the personal use fishery was prohibited due to the Chinook salmon run being substantially weaker than forecasted. This closure was justified because the commercial harvest of Chinook salmon, Chinook salmon catches and recapture rates at the Native Village of Eyak

research fish wheels, and the Chinook salmon counts at the Gulkana River counting tower were all below average, which in combination raised concerns that the lower end of the Chinook salmon escapement goal may also not be achieved. Miles Lake sonar passage improved the week of June 15 and more fish than projected passed into the system and the personal use fishery was open 168 hours for the week of June 29 (Appendix B1). However, although sonar passage continued above projection through July 12, total salmon passage at the Miles Lake sonar remained below the inriver objective and the commercial harvest of sockeye salmon was 89% below average, indicating the overall run was well below forecast. As a result, the personal use fishery was restricted to 84-hour fishing periods for the weeks of July 6 and July 13 and a 72-hour period the week of July 20. Sonar passage never improved to the magnitude needed to make up for the salmon deficit, and due to concerns of not achieving the sockeye salmon escapement goal, the personal use fishery was closed from July 27 through August 31. The fishery reopened by regulation from September 1 through 30. Final escapement for sockeye salmon in 2020 was 362,445 fish.

With fewer restrictions and more salmon through the sonar, 2021 had the highest participation rate in the CSD personal use fishery since 2000 (Table 19). A total of 7,222 permits were issued for the fishery and 76.4% were fished in 2021. A total of 143,301 sockeye salmon and 832 Chinook salmon were harvested in 2021. These harvest rates are 21% above the 5-year average and about equal to the 10-year average for sockeye salmon and are 38% and 24% below the 5- and 10-year averages for Chinook salmon. In 2021, the sockeye salmon run was near forecast, whereas the Chinook salmon run was one of the lowest ever recorded and required restrictive action in the CSD personal use fishery (Table 5).

The 2021 Chitina Subdistrict personal use fishery season opened by EO on June 10 for a 96-hour fishing period (Appendix B1). Salmon passage at Miles Lake sonar was below projection through June 1. Consequently, fishing time in the CSD was restricted to 120 hours the week of June 14. Passage at the Miles Lake sonar improved significantly after June 1 due to improved run entry and restricted fishing times in the commercial fishery for Chinook salmon. As a result, the CSD personal fishery remained open for the remainder of the season (Appendix B1). However, the retention of Chinook salmon was prohibited in the fishery beginning June 21 and remained prohibited for the rest of the season.

Research and Management Activities

The department has been sampling sockeye salmon and Chinook salmon harvested in the CSD for over 30 years. Data on length, age (sockeye salmon otoliths and Chinook salmon scales), and sex is collected for use in forecast models for both sockeye and Chinook salmon (Hansen and Ocaña *In prep*). Additionally, collected sockeye salmon otoliths are examined for strontium marks to determine what percentage of the CSD personal use fishery harvest is of hatchery origin (Haught et al. 2019). In conjunction with the National Park Service, genetic tissue will also be collected from CSD sampled sockeye salmon from 2022–2024. This genetic sampling will match similar sockeye salmon sampling in the commercial drift gillnet fishery in the Copper River District and in the Glennallen Subdistrict subsistence fishery.

Inseason management of the CSD personal use fishery requires management staff to be present in the fishery. Both the Area Management Biologist and Assistant Area Management Biologist spend 1–3 days per week in the Chitina Area monitoring the fishery as a means of assessing fishing success. Secondarily, the biologists assist with enforcement of the fishery regulations by acting as the eyes and ears for the Alaska Wildlife Troopers.

UPPER COPPER RIVER SALMON SUBSISTENCE FISHERIES

Fishery Description

Glennallen Subdistrict Subsistence Salmon Fishery

A subsistence salmon fishery is prosecuted each year in the Glennallen Subdistrict (GSD). The GSD extends from the downstream edge of the Chitina-McCarthy Bridge upstream, for approximately 146 miles, to the confluence with the Slana River. Although the GSD covers a long stretch of the Copper River, access to the fishery is very limited. The available shoreline of the Copper River for securing a fish wheel or dipnetting from shore is a mixture of personal private property, Native Corporation and Village lands, Wrangell–St. Elias National Park lands, and unencumbered and encumbered state lands. For the general public, who do not own river front property, the only access to the river is by boat using a public launch site or along the approximate 2 miles of unencumbered state lands along the east bank of the Copper River just upstream of the Chitina-McCarthy Bridge (Figure 2).

Although both the GSD and CSD held subsistence fisheries through 1983, the BOF made a positive customary and traditional (C&T) determination for the GSD and negative C&T for the CSD in 1984. In 1992, the state legislature passed a new subsistence statute that maintained the requirement that subsistence uses be "customary and traditional" and that they retain priority over all other uses. This legislation also required the BOF to establish amounts necessary for subsistence (ANS) when designating a fishery as subsistence. An ANS acts as a metric to measure a subsistence fishery but imparts no inseason management responsibility on the department to ensure achievement of the ANS or that harvest does not exceed the ANS. The BOF can revisit an ANS if a subsistence fishery grows or changes in some fundamental way.

The ANS for the GSD has changed several times since 1992 (Somerville 2022). At the 2005 meeting in Valdez, the BOF divided the GSD into 3 subareas over concern that too few salmon were escaping the personal use and subsistence fisheries in the vicinity of Chitina. The BOF established an ANS for each subarea: the Chitina-McCarthy Bridge to the Tonsina River subarea was assigned an ANS of 25,500–39,000 salmon; the Tonsina River to the Gakona River subarea was assigned an ANS of 23,500–31,000 salmon; and the Gakona River to the Slana River subarea was assigned an ANS of 12,000–12,500 salmon. These ANS numbers were based on the 3 highest reported harvests (both federal and state) from each subarea between 2000 and 2004. The total ANS for the GSD became 61,500–82,500 salmon and this range was added as the 2006 subsistence apportionment in the Copper River inriver goal and has not changed since.

Since 1984, subsistence permit holders in the GSD have been able to use either a dip net or a fish wheel to harvest their fish (Somerville 2022) but must choose one or the other for the season. Fish wheel permit holders harvest more fish per permit (about 83 sockeye salmon and 4 Chinook salmon per permit fished) than dip net permit holders (about 31 sockeye salmon and 1 Chinook salmon per permit fished). Although fish wheels harvest more fish, they require a large time investment and cost in construction and maintenance, as well as launching and retrieving. Dip nets can be readily purchased and are easily transported to the fishing site. With the increased availability of boats capable of navigating the Copper River, dip nets have become a handy method for subsistence permit holders to conveniently access the fishery.

Since 2001, the preferred gear type selected in the GSD subsistence fishery has transitioned away from fish wheels to dip nets. The number of fish wheel permits issued each year peaked at 847

permits in 1997 and averaged 794 permits from 1997–2001 (Somerville 2022). However, after 2001, the number of fish wheel permits declined to a low of 313 in 2021 (Table 20). During this same period, the number of dip net permits rose to a high of 1,354 in 2019 and has remained above 1,200 permits through 2021 (Table 20). The shift from fish wheels to dipnets reflects changes in local demographics and the channel shift of the Kotsina River that adversely impacted access to fish wheels directly upstream of the Chitina-McCarthy Bridge. Secondly, subsistence permit holders from outside the Copper Basin lack connections needed to access the few private fish wheels along the river and find using boats and dip nets a more convenient way to meet their subsistence needs. Finally, many households don't need the amounts of fish normally harvested with a fish wheel.

Subsistence harvests are dominated by sockeye salmon (~96%) and Chinook salmon (~3%; Table 20). Subsistence harvest of sockeye salmon has steadily increased since 1960 and closely tracks with changes in total permits issued (Somerville 2022). From 1960 to 1964, an average of 16,314 sockeye salmon were harvested in the UCRD, compared to the last 5 years (2016–2020) when an average of 63,248 sockeye salmon were harvested in both federal and state subsistence fisheries in the GSD alone (Table 20). Prior to the removal of the CSD from the subsistence fishery in 1984, total sockeye salmon harvest peaked at 110,794 fish in 1983, with 37,596 sockeye salmon harvested from the GSD (Somerville 2022). For the 3 years (2000–2002) when the CSD was again designated as a subsistence fishery, the total sockeye harvest in the UCRD peaked at 215,895 fish in 2001, with 83,787 sockeye salmon taken from the GSD.

Chinook salmon harvests rose from 1960 through 2002 and tracked with the number of permits issued in each subdistrict up until about 2003 (Somerville 2022). After 2003, Chinook salmon harvest in the GSD declined to a range of about 1,700 to 3,200 Chinook salmon, except for 2 high harvest years in 2018 (4,531) and 2019 (3,429). Households fishing with dip nets in the GSD are limited to 5 Chinook salmon per year but have an average harvest of just over 1 Chinook salmon per permit, whereas households utilizing a fish wheel, which have no species-specific limit, harvest an average of about 5 Chinook salmon per permit. From 1960 to 1964, an average of 668 Chinook salmon were harvested in the UCRD, compared to the last 5 years (2016–2020) when an average of 3,038 Chinook salmon have been harvested (in both federal and state subsistence fisheries) in the GSD alone (Table 20). Prior to the removal of the CSD from the subsistence fishery in 1984, total Chinook salmon harvest peaked at 5,950 fish in 1983, with 1,275 Chinook salmon from the GSD. For the 3 years (2000–2002) when the CSD was again designated as a subsistence fishery, the total Chinook salmon harvest in the UCRD peaked at 8,024 fish in 2000, with 4,856 Chinook salmon coming from the GSD.

Batzulnetas Subsistence Salmon Fishery

When the State of Alaska limited subsistence salmon harvest to the mainstem of the Copper River downstream of the confluence of Slana River in 1964, several traditional fishing sites on the Tonsina and Klutina Rivers, on the Copper River upstream of the Slana River, and on Tanada Creek were prohibited. One of these sites consisted of the waters of the Copper River upstream of the Slana River and a portion of Tanada Creek, known as Batzulnetas by the Ahtna people (Figure 2). Batzulnetas was used as a traditional village and fish camp by people originally from Mentasta Village and, in particular, by the families of Katie John and Doris Charley. In 1984, Katie John and Doris Charley presented a proposal to the BOF to allow subsistence fishing at the traditional location. The proposal failed and the following year the Native American Rights Funds filed a lawsuit on behalf of Katie John under Title VIII of ANILCA to compel the State to reopen

the historic Batzulnetas fishery. The legal battle that ensued lasted through 2015. However, several actions and legal decisions during the ensuing years affected management of not only the Batzulnetas fishery but all Upper Copper River fisheries and all subsistence fisheries statewide as well.

The BOF adopted regulations allowing for a subsistence fishery at Batzulnetas at its 1987 meeting. Beginning in 1988, salmon, other than Chinook salmon, could be taken in the Copper River between ADF&G regulatory markers near the mouth of Tanada Creek and approximately 1.5 miles downstream from the mouth and in Tanada Creek between regulatory markers identifying the open waters of the creek. A Batzulnetas subsistence permit was required and allowable gear was limited to fish wheels and dip nets in the Copper River and dip nets and spears in Tanada Creek. The fishery was open 2 days per week in June and 3.5 days per week in July and August. Annual permit limits were set the same as in the GSD. Initially, the fishery was restricted to only residents of Dot Lake and Mentasta Village, but this restriction was removed after the 1989 McDowell decision.

Despite the State of Alaska opening a fishery at Batzulnetas, the litigants believed the fishery was too restrictive and continued the legal case petitioning the federal government to intercede under provisions within ANILCA. Beginning in 1999, the federal government assumed management authority over subsistence fishing in navigable waters of Alaska adjacent to or within federal lands. This included the Copper River, which has since been under dual management for subsistence fishing with federally qualified rural residents able to get a federal subsistence permit in the Batzulnetas subsistence area fishery. Because the western boundary of the Wrangell–St. Elias National Park encompasses both shores of the Copper River upstream of Indian Creek, the federal government does not recognize state-issued subsistence permits in the GSD upstream of Indian Creek or in the Batzulnetas subsistence area. However, if non-federally qualified state residents were to request a state subsistence permit for these waters, one would be issued.

Under state management, subsistence users have harvested salmon from the Batzulnetas fishery as early as 1988 when 22 sockeye salmon were reported harvested (Somerville 2022). Harvest was again reported between 1993 and 1999 with an average annual harvest of 320 sockeye salmon and a range of 0–997 salmon during those 7 years. No Batzulnetas permits were requested in 2000. Beginning in 2001, Batzulnetas permits have been issued through the NPS with participation limited to residents of Dot Lake and Mentasta Village.

Federal Subsistence Salmon Fishery

A stipulation within the 1980 ANILCA legislation requires that fisheries and wildlife managed for subsistence on federal lands and waters must provide a rural priority. The State of Alaska managed the UCRD subsistence fisheries with a rural priority beginning in 1982. However, providing a rural priority in state subsistence fisheries was found, in the McDowell decision, to violate provisions in the Alaska Constitution that require equal opportunity for all Alaska residents to subsistence hunt and fish. Several attempts were made through the state legislature and governor to align Alaska's Constitution with the rural priority requirements of ANILCA, but all failed. In 1999, the United States Fish and Wildlife Service assumed management of the Copper River subsistence fisheries in all waters within or adjacent to federal conservation unit lands such as the Wrangell–St. Elias National Park.

At first, the federal system adopted the state regulations and because 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 GSD. Federal subsistence limits remained identical to state limits so federal subsistence users still fished under state subsistence permits that year. In 2002, the Federal Subsistence Board established a federal subsistence fishery in the CSD with an annual cumulative limit of 200 salmon for a household of 1 and 500 salmon for a household of 2 or more for both the Chitina and Glennallen Subdistricts. Federal subsistence users were also allowed to participate in both fisheries, whereas state subsistence users were allowed to participate in either the CSD or GSD fishery but not both. As a result, the National Park Service (NPS) issued separate federal subsistence fishing permits to federally qualified subsistence users beginning in 2002 (Appendices B1 and B2). Although this change did not affect overall subsistence harvest from the Copper River, the number of state permits issued decreased after 2001 (Somerville 2022) due to a portion of the federally qualified residents opting for federal permits rather than state permits. Over the last 5 years (2016–2020), average harvest under federal permits accounted for less than 1.0% of the total harvest in the CSD and 21% in the GSD.

Fishery Management Objectives

Glennallen Subdistrict Subsistence Salmon Fishery

Management of the GSD state subsistence fishery is guided by provisions in state regulations 5 AAC 01.600 through 5 AAC 01.645. These regulations set the allowable gear types, fishery boundaries, annual limits, ANS, and permit stipulations. The *Copper River Subsistence Fisheries Management Plan* (5 AAC 01.647) further directs how the Copper River District commercial drift gillnet fishery will be managed to ensure adequate escapement occurs and that subsistence uses are accommodated. The GSD fishery is managed to provide reasonable opportunity for harvesting salmon for subsistence uses consistent with the principles of sustained yield.

A free subsistence permit is required to participate in the GSD fishery. All Alaska residents are eligible to obtain a permit. The annual permit limits are 30 salmon for a household of 1, 60 salmon for a household of 2, and 10 salmon for each additional person in a household of more than 2 people. Individuals may request additional salmon up to a maximum of 200 salmon, and households of 2 or more may request up to 500 salmon. For people using dip nets, only 5 fish of the annual limit may be Chinook salmon. Fishers must record their harvest on their permit each day they fish prior to leaving the fishing site and must report their permit harvest to the department no later than October 30. Nonresidents may not participate in the subsistence fishery in any capacity.

The GSD fishery has rarely been restricted. The fishery opens by regulation on June 1 and remains open continuously through September 30. In 2017, a limit of 2 Chinook salmon per season was imposed on the fishery preseason in response to the lowest ever Copper River Chinook salmon forecast. This restriction was lifted on June 4 when it was clear the Chinook salmon run was much stronger than forecast. In 2018, the fishery was restricted to 48 hours of fishing time per week June 25–July 7 to reduce the harvest of sockeye salmon in the fishery. In 2021, the Chinook salmon run was one of the weakest on record and resulted in Chinook salmon retention being prohibited in the GSD from June 28–July 31. Even with the Chinook salmon restriction in place, the fishery remained open continuously to allow for the harvest of sockeye salmon.

A total of 11 proposals that concerned the GSD subsistence fishery were submitted for consideration by the BOF at the 2021 meeting in Cordova. Proposal 6 sought to require inseason reporting of subsistence, sport fish, and personal use harvests and effort. Proposals 8 through 17 sought to limit dipnetting in the fishery by prohibiting dipnetting near tributary streams, dipnetting

from a boat, using gillnet mesh in dip nets, prohibiting the use of depth finders, or by requiring special permits for dipnetting from a boat. Proposals 6 and 8–17 all failed. Proposal 7 sought to prohibit guiding in the subsistence fishery; after being revised to limit the prohibition to guiding from a boat, it was carried.

There were 5 proposals submitted for consideration at the 2017 BOF meeting in Valdez that affected the GSD subsistence fishery. Proposals requiring live boxes to be installed on fish wheels or that the fish wheels be closely attended, prohibiting dipnetting from a boat, or requiring an automatic delay of 7 days in the opening of the fishery based on the preseason Chinook salmon forecast all failed. Two proposals prohibiting the use of monofilament in dip nets and requiring logbooks for transporters or guides in both the GSD and CSD fisheries also failed.

A total of 10 proposals were submitted for consideration during the 2014 BOF cycle for the UCUSMA subsistence fisheries. The BOF carried a proposal specific to the Glennallen Subdistrict providing Emergency Order (EO) authority for ADF&G to establish an annual bag limit for Chinook salmon taken by fish wheel, modify the annual limit for Chinook salmon taken by dip net, and modify methods and means in the subsistence fishery to reduce harvest of Chinook salmon. Proposals to prohibit the use of monofilament webbing in dip nets, establish a check station in Chitina for harvest reporting in both the Glennallen and Chitina Subdistricts, and require charter operators to maintain daily logbooks and record client harvests all failed.

Batzulnetas Subsistence Salmon Fishery

Management of the Batzulnetas subsistence fishery is guided by the *Copper River Subsistence Fisheries Management Plan.* The fishery opens by regulation on June 1 and remains open through September 1 or until closed by emergency order. Fishing periods are 12:00 noon Friday through 12:00 noon Sunday from June 1 through June 30, and from 12:00 noon Friday through 12:00 noon Monday from July 1 through September 1. The Batzulnetas fishery is managed to provide reasonable opportunity for harvesting salmon for subsistence uses consistent with the principles of sustained yield. There have been no state permits issued for this fishery since 2000.

Very few proposals have been submitted to the BOF regarding the Batzulnetas subsistence fishery. No proposals regarding the Batzulnetas fishery were submitted to the BOF in 2021. One proposal was submitted by ADF&G at the 2017 BOF meeting in Valdez seeking a change in regulations to automatically open the Batzulnetas area subsistence fishery each season rather than require an EO to be issued. The proposal was carried. There were no proposals seeking changes to the Batzulnetas fishery submitted to the BOF in 2014.

Federal Subsistence Salmon Fishery

The National Park Service manages federal subsistence fisheries in the CSD, GSD, and Batzulnetas area. Federal subsistence salmon fisheries are managed to ensure sufficient fish are available to meet the subsistence needs of federally qualified rural residents. The federal government has no management responsibilities for ensuring escapement or the needs of other users.

Under federal regulation, households of 1 may harvest up to 200 salmon in the combined GSD, CSD, and Batzulnetas Area fisheries and households of 2 or more may harvest up to 500 salmon. Participants may use fish wheels, dip nets, and rod and reel in the Copper River; and in Tanada Creek they may use dip nets, spears, and rod and reel, as well as fyke nets, after consultation with

NPS biologists. Permit holders are limited to 5 Chinook salmon taken with a dip net or rod and reel. The federal fisheries are open continuously from May 15 through September 30.

Recent Fishery Performance

Glennallen Subdistrict Subsistence Salmon Fishery

A total of 1,665 state subsistence permits were issued for the Glennallen Subdistrict in 2020 (Table 20). Sixty percent or 994 of these permits were fished. The total harvest from the GSD state subsistence fishery for 2020 was 36,903 salmon. The 2020 sockeye salmon run size was the lowest since 1981 and run entry into the river fell below the inriver goal (Table 9). As a result, fishing was poor in the GSD and the harvest level was the lowest since 1990, a year when only 406 permits were fished (Somerville 2022).

A total of 1,518 state subsistence permits were issued for the Glennallen Subdistrict in 2021 (Table 16). Seventy-two percent of these permits were fished, which was the highest participation rate since 2013. Total harvest from the GSD state subsistence fishery for 2021 was below average at 44,509 salmon. Average total harvest over the last 10 years (2012–2020) has been 63,098 salmon and over the last 5 years has been 50,475 salmon (Table 20). The 2021 sockeye salmon run size of 1,306,841 fish was just under the most recent 5-year average run size (Table 9). Based on participation rates, the total run size, and the number of salmon that passed the Miles Lake sonar, a higher subsistence harvest was expected for 2021. The lack of expected performance may be due to the low number of fish wheel permits in the fishery.

Batzulnetas Subsistence Salmon Fishery

There have been no state permits issued for the Batzulnetas subsistence fishery since 1999. All harvest in the Batzulnetas subsistence fishery since 2000 has been taken under federal subsistence permits.

Federal Subsistence Salmon Fishery

In the CSD federal subsistence fishery, 96 Chinook salmon and 3,406 sockeye salmon were harvested in 2020, and 113 Chinook salmon and 5,415 sockeye salmon were harvested in 2021 (Appendix C2). Harvest has been increasing in the CSD federal fishery since 2018 due to a change in the federal management of the subdistrict. Prior to 2018, the CSD federal fishery was limited to the same openings as the state CSD personal use fishery. However, beginning in 2018, the federal fishery has been opened continuously and is unaffected by any closures in the state personal use fishery. This has attracted more federally qualified rural residents to fish in the CSD during periods when the state personal use fishery is closed and competition is greatly reduced.

In the GSD federal subsistence fishery, 670 Chinook salmon and 11,234 sockeye salmon were harvested in 2020, and 505 Chinook salmon and 14,847 sockeye salmon were harvested in 2021 (Appendix C1). These harvest rates are consistent with those in the state GSD fishery where harvest declined in 2020 due to the weak run size and increased in 2021. The 2021 federal harvest was also less than expected and also reflects lower effort in the fishery with only 173 permits fished. Most federal GSD permit holders use fish wheels.

Harvest in the Batzulnetas area under federal management has ranged from 0–867 salmon since 2001 and has averaged 144 sockeye salmon annually. Only a single permit was fished in the Batzulnetas area in 2020 and 2021; therefore, the harvests remain confidential.

Research and Management Activities

The department has been sampling sockeye and Chinook salmon harvested in the GSD since 2019 (Hansen and Ocaña *In prep*). Data on length, age (sockeye salmon otoliths and Chinook salmon scales), and sex are collected for use in forecast models for both sockeye and Chinook salmon. Additionally, collected sockeye salmon otoliths are examined to determine what percentage of the CSD personal use fishery harvest is of hatchery origin (Haught et al. 2019). Gulkana Hatchery sockeye salmon make up approximately 15–20% of the GSD harvest on average.

Both the Area Management Biologist and Assistant Area Management Biologist spend 1–3 days per week in the Chitina Area monitoring the fishery. Assessing fishing success is the primary driver of being in the fishery each week. Secondarily, the biologists assist with enforcement of the fishery regulations, acting as eyes and ears for the Alaska Wildlife Troopers.

FRESHWATER FINFISH SUBSISTENCE FISHERIES

Fishery Description

Freshwater finfish subsistence fishing permits have been issued in the UCUSMA since 1960 (Somerville 2022). The majority of permits issued have been for fishing with gillnets targeting whitefish between October 1 and March 31 in several area lakes. The fishery is a carryover from the territorial period and, from 1960 through 2008, the department issued freshwater subsistence permits from the Glennallen office without a formal C&T determination by the BOF. At the 2008 BOF meeting in Cordova, Ahtna Native Corporation submitted a proposal for C&T determination for the freshwater fishes within the entire UCUSMA. The BOF made a positive C&T finding for freshwater finfish with an ANS of 25,000–42,000 usable pounds for the entire Prince William Sound Area (PWSA), which included all freshwaters of Alaska between the longitude of Cape Fairfield and the longitude of Cape Suckling south of the Yukon Area as described in 5 AAC 05.100. The BOF also expanded the PWSA to include all waters of the Upper Susitna River drainage upstream of the Susitna River confluence with the Oshetna River under subsistence regulations.

After the BOF action, freshwater finfish subsistence fishery participation increased from an average 15 permits for the 5 years prior to the BOF action (2003–2007) to an average of 25 permits for the 5 following years (2008–2012). Starting in 2009, some subsistence whitefish gillnetters at Lake Louise began targeting lake trout and left large piles of fish carcasses on beaches. The public reaction was strong and resulted in the department adding several stipulations to the permit including prohibiting retention of any bycatch, a requirement to relocate nets capturing more than 5 lake trout, and a requirement that all gillnetters provide the department with 24-hour notice prior to fishing their gear. At the 2011 BOF meeting in Valdez, a total of 15 proposals were submitted specific to the UCUSMA freshwater subsistence fishery. These proposals mainly addressed the subsistence fishery in Lake Louise and Susitna and Tyone Lakes to reduce the incidental catch of lake trout. Because most proposal concerns were addressed through permit stipulations, the BOF only amended and adopted a single proposal to prohibit subsistence gillnetting in the channels between Lake Louise and Susitna Lake and between Susitna Lake and Tyone Lake.

Fishery Management Objectives

There are no specific management objectives for the freshwater finfish subsistence fishery other than ensuring reasonable opportunity to meet subsistence needs and ensuring sustained yield.

Permit stipulations are in place to protect nontarget species. There are several gear type options and permits can be customized to meet the permittee's needs.

Four proposals were submitted for consideration by the BOF in 2021 concerning the freshwater finfish subsistence fishery in the UCUSMA. Proposal 22 sought to reverse a portion of the freshwater finfish subsistence C&T determination that overlaps the Chitina Subdistrict C&T determination for subsistence harvest of salmon, and proposal 23 sought to establish a separate ANS specific to rainbow trout under the current C&T. Both of these proposals failed. Proposals 24 and 25 were submitted by ADF&G and sought to establish the daily bag and annual limits for Dolly Varden in regulation and to establish gear specifications for gillnets and fyke nets in regulation. Both proposals were carried, successfully correcting an omission error with Dolly Varden limits in regulations and moving the gear specifications from permit stipulations into regulation so they may be legally enforced. There were no proposals submitted to the BOF in 2017 or 2014 concerning the freshwater subsistence fishery in the UCUSMA.

Recent Fishery Performance

Most freshwater subsistence fishing effort has occurred on Paxson Lake and Lake Louise, but Susitna and Tyone Lakes in the Tyone River drainage and Salmonberry Lake in the Gulkana River drainage have also been fished over the last 10 years. Participation and harvest over the last 5 years (2016–2020) has averaged 38 permits issued and 4,659 fish harvested annually (Table 21). In 2020 and 2021, 55 and 44 permits were issued, and 38 and 27 permits were fished, respectively. Total harvest was 7,678 fish in 2020 and 4,042 fish in 2021. Over 99% of the fish harvested in both years were whitefish, and nearly all—99.6% in 2020 and 97.2% in 2021—of the whitefish harvested in the fishery were taken from Paxson Lake.

Research and Management Activities

There is concern that the level of whitefish harvest from Paxson Lake in the freshwater subsistence fishery may be exceeding maximum sustainability. Bruce (1984) estimated a sustainable exploitation for whitefish in Smallwood Reservoir in Western Labrador, which is substantially larger than Paxson Lake, was 1.30kg of whitefish/ha. Using this metric, approximately 4,000 whitefish can be sustainably harvested from Paxson Lake annually. However, determining the sustainable yield from a previously unexploited whitefish population requires data on population size, age structure, age at maturity, and natural mortality rates (Healy 1975), which we have yet to determine. Since 2018, about 4,000–7,500 whitefish have been harvested from Paxson Lake each year. Furthermore, the bulk of the Paxson Lake harvest has been taken from a concentrated spawning population in December. Because little data have been collected on the movement, composition, or abundance of whitefish in Paxson Lake, a telemetry study was initiated in 2021, and has continued into 2022, to identify spawning areas and seasonal movements of whitefish in the lake (Schwanke and Tyers 2021). Preliminary results from this study indicate that nearly all whitefish in Paxson Lake spawn in a single area in the south end of the lake. Secondly, because few radio tags were recovered, it is likely the spawning population exceeds 50,000 fish. Location data collected from the ongoing radiotelemetry project will be insightful for the mark–recapture project scheduled to occur in 2023, which will be used to estimate abundance and better gauge exploitation of the species.

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TABLES AND FIGURES

Table 1.–Sport fishing effort (angler-days) in the Upper Copper River and Upper Susitna River Management Area (UCUSMA) by drainage, 2002–2021.

	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[a]	Stocked lakes	Lakes	Streams	Total	Area total
2002	5,910	18,060	23,970	4,991	531	5,522	9,111	751	1,381	675	301	2,377	945	1,580	2,525	46,613
2003	6,682	19,164	25,846	7,934	844	8,778	8,897	773	879	1,947	330	2,858	1,382	449	1,831	52,139
2004	3,257	17,351	20,608	6,071	819	6,890	10,472	241	1,007	1,431	2,608	1,406	1,611	318	1,929	46,592
2005	5,209	15,277	20,486	3,793	801	4,594	10,516	613	593	1,133	539	2,313	721	293	1,014	41,801
2006	2,545	11,910	14,455	4,032	1,111	5,143	12,285	587	716	734	855	2,790	738	804	1,542	39,107
2007	3,297	19,323	22,620	7,689	520	8,209	16,512	593	562	1,180	578	1,974	150	459	609	52,837
2008	4,099	16,794	20,893	7,089	1,383	8,472	12,677	641	653	1,216	1,349	1,453	807	210	1,017	48,371
2009	4,373	13,340	17,713	7,595	1,250	8,845	15,665	802	645	1,653	508	2,254	1,407	3,917	5,324	53,409
2010	2,880	13,834	16,714	9,896	1,424	11,320	16,534	1,540	725	1,726	974	2,049	400	250	650	52,232
2011	2,407	6,134	8,541	4,609	1,423	6,032	9,915	1,366	535	408	1,366	3,117	233	480	713	31,993
2012	2,524	5,593	8,117	6,625	1,163	7,788	18,030	1,067	380	894	628	2,510	721	233	954	40,368
2013	2,658	6,322	8,980	5,240	1,758	6,998	16,357	1,331	898	1,589	1,717	1,163	166	405	571	39,604
2014	2,972	5,503	8,475	5,549	639	6,188	17,276	741	436	332	652	1,331	139	283	422	35,853
2015	2,385	6,840	9,225	3,696	1,271	4,967	12,371	742	737	1,393	692	2,171	121	62	183	32,481
2016	3,048	6,129	9,177	3,120	1,264	4,384	9,974	693	437	1,548	563	3,014	241	196	437	30,227
2017	3,217	8,001	11,218	3,106	670	3,776	10,075	559	517	554	1,082	2,041	826	244	1,070	30,892
2018	1,461	6,552	8,013	4,447	1,063	5,510	4,682	1,738	351	1,512	426	1,869	685	458	1,143	25,244
2019	1,851	9,006	10,857	7,267	479	7,746	9,284	1,102	501	724	2,173	3,659	795	207	1,002	37,048
2020	3,930	6,025	9,955	5,040	1,827	6,867	5,238	358	828	683	456	1,788	1,531	653	2,184	28,357
2021	1,514	3,736	5,250	4,145	1,465	5,610	6,302	1,488	292	625	804	4,090	90	215	305	24,766
Average 2016–2020	2,701	7,143	9,844	4,596	1,061	5,657	7,851	890	527	1,004	940	2,474	816	352	1,167	30,354
Average 2011–2020	2,645	6,611	9,256	4,870	1,156	6,026	11,320	970	562	964	976	2,266	546	322	868	33,207

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

Table 2.–Number of fish harvested by species and sport anglers fishing Upper Copper River and Upper Susitna River Management Area waters, 2002–2021.

Year	Chinook salmon	Sockeye salmon	Coho salmon[a]	Rainbow trout (wild)	Rainbow trout (stocked)	Dolly Varden[a]	Lake trout	Arctic grayling[a]	Burbot	Whitefish	Landlocked salmon[b]	Other fish	Total fish
2002	5,098	7,761	384	393	2,901	1,388	2,215	9,849	2,224	2,288	282	54	34,837
2003	5,717	7,108	277	1,335	2,426	1,578	1,854	6,537	1,457	422	51	104	28,866
2004	3,435	6,464	131	696	1,615	2,153	2,044	4,177	1,127	885	0	1,629	24,356
2005	4,093	8,135	72	378	1,440	891	2,354	3,899	1,374	1,089	122	16	23,863
2006	3,425	14,297	54	486	1,618	777	737	3,387	575	662	42	111	26,171
2007	5,113	22,965	0	32	573	712	964	2,766	577	124	0	17	33,843
2008	3,616	11,431	56	324	694	396	1,470	4,231	1,234	655	0	18	24,125
2009	1,355	13,381	36	241	1,013	943	1,875	4,480	2,850	569	44	81	26,868
2010	2,416	14,743	90	158	1,006	682	1,631	4,723	2,997	759	78	0	29,283
2011	1,753	7,727	21	262	803	231	726	1,849	556	298	10	12	14,248
2012	535	23,404	0	512	936	753	676	4,091	995	107	11	0	32,020
2013	285	26,611	0	129	246	1,036	1,096	3,606	1,576	586	0	21	35,192
2014	931	18,005	89	240	353	148	819	2,264	458	597	0	0	23,904
2015	1,343	9,489	16	339	1,517	1,012	1,062	4,775	238	345	0	0	20,136
2016	327	7,555	0	131	1,547	1,545	1,443	2,903	555	10	83	0	16,099
2017	1,731	9,568	72	193	1,359	270	997	2,267	611	143	49	13	17,273
2018	1,280	2,943	387	218	969	1,125	732	1,945	474	223	21	0	10,317
2019	1,565	7,346	0	64	3,019	151	553	2,265	472	68	0	0	15,503
2020	967	3,483	0	258	925	260	730	1,887	582	405	0	0	9,497
2021	90	5,008	100	56	2,029	624	552	1,397	576	50	0	0	10,482
Average 2016–2020	1,174	6,179	92	173	1,564	670	891	2,253	539	170	31	3	13,738
Average 2011–2020	1,072	11,613	59	235	1,167	653	883	2,785	652	278	17	5	19,419

[a] Includes fish caught in stocked waters.

[b] Landlocked salmon includes stocked Chinook and coho salmon.

Table 3.–Number of fish caught by species and sport anglers fishing Upper Copper River and Upper Susitna River Management Area waters, 2002–2021.

Year	Chinook salmon	Sockeye salmon	Coho salmon[a]	Steelhead trout	Rainbow trout (stocked)	Rainbow trout (wild)	Dolly Varden[a]	Lake trout	Arctic Grayling[a]	Burbot	Whitefish	Landlocked salmon[b]	Other fish	Total fish
2002	19,497	12,181	471	129	6,870	9,735	4,714	12,197	106,424	3,878	3,756	927	100	180,879
2003	19,400	15,718	585	112	4,777	12,806	3,720	12,425	90,190	2,496	2,338	169	356	165,092
2004	12,664	10,912	478	64	6,624	6,212	5,622	8,212	51,219	1,626	1,420	0	1,637	106,690
2005	9,704	16,093	172	64	4,096	6,858	2,551	11,057	50,760	2,150	2,259	279	32	106,075
2006	10,971	21,778	72	50	4,125	3,790	2,189	4,043	25,524	1,054	1,023	42	111	74,772
2007	12,109	30,875	11	99	1,666	4,253	3,647	6,125	29,815	1,503	273	0	26	90,402
2008	7,827	16,912	57	61	2,819	7,414	1,814	9,140	47,718	1,482	1,605	0	36	96,885
2009	4,231	19,788	36	20	2,563	4,607	3,211	12,843	76,559	3,471	1,076	554	81	129,040
2010	8,213	19,489	114	84	5,044	4,926	1,089	14,082	54,882	5,897	1,994	282	10	116,106
2011	7,025	11,873	21	0	4,498	3,794	1,058	3,846	19,738	1,157	483	10	23	53,526
2012	1,869	30,336	0	0	5,155	4,141	1,712	4,217	30,320	1,853	373	66	0	80,042
2013	1,195	36,246	229	58	1,149	4,826	2,304	8,218	29,991	2,162	691	0	42	87,111
2014	2,248	24,943	129	0	1,931	3,405	493	4,491	26,163	821	2,400	0	0	67,024
2015	4,165	13,654	16	0	2,846	2,313	3,163	7,680	28,702	493	721	0	0	63,753
2016	1,508	8,718	0	0	5,416	5,521	2,510	6,319	44,661	758	217	83	0	75,711
2017	7,508	12,465	150	19	7,504	4,680	2,522	6,152	34,060	734	335	115	13	76,257
2018	5,087	4,112	387	62	3,689	3,064	3,023	5,383	24,217	853	477	41	0	50,395
2019	4,454	8,630	42	0	9,998	2,115	877	7,153	38,843	2,680	355	0	0	75,147
2020	3,404	4,430	0	10	3,566	4,395	1,228	4,924	28,239	1,062	669	0	0	51,927
2021	590	7,034	607	0	8,087	2,097	917	3,083	13,230	1,643	279	550	0	38,117
Average 2016–2020	4,392	7,671	116	18	6,035	3,955	2,032	5,986	34,004	1,217	411	48	3	65,887
Average 2011–2020	3,846	15,541	97	15	4,575	3,825	1,889	5,838	30,493	1,257	672	32	8	68,089

[a] Includes fish caught in stocked waters.

[b] Landlocked salmon includes stocked Chinook and coho salmon.

Table 4.–Summary of Chinook salmon harvests and upriver escapement in the Copper River, 2002–2021.

Year	Commercial harvest[a]	Copper River District subsistence harvest	Sport harvest[b]	Glennallen Subdistrict harvest[c]	Chitina Subdistrict harvest[c]	Total harvest	Upriver return estimate	Estimated total return	Upriver escapement	Estimate source
2002	39,552	549	5,098	4,217	2,056	51,472	32,873	72,974	21,502	ADF&G
2003	49,031	710	5,717	3,092	1,921	60,471	44,764	94,505	34,034	NVE
2004	38,889	1,106	3,435	3,982	2,502	49,914	40,564	80,559	30,645	NVE
2005	35,764	260	4,093	2,618	2,094	44,829	30,333	66,357	21,528	NVE
2006	31,309	779	3,425	3,229	2,681	41,423	67,789	99,877	58,454	NVE
2007	40,274	1,145	5,113	3,939	2,722	53,193	46,349	87,768	34,575	NVE
2008	12,067	470	3,616	3,218	2,022	21,393	41,343	53,880	32,487	NVE
2009	10,398	212	1,355	3,036	223	15,224	32,400	43,010	27,786	NVE
2010	10,582	276	2,416	2,425	718	16,417	22,323	33,181	16,764	NVE
2011	19,788	212	1,753	3,062	1,080	25,895	33,889	53,889	27,994	NVE
2012	12,623	237	535	2,510	572	16,477	31,452	44,312	27,835	NVE
2013	9,445	854	285	2,522	762	13,868	32,581	42,880	29,012	NVE
2014	11,011	153	931	1,785	733	14,613	24,158	35,322	20,709	NVE
2015	23,701	167	1,343	2,614	1,585	29,410	32,306	56,174	26,764	NVE
2016	13,161	73	327	2,471	726	16,758	16,009	29,243	12,485	NVE
2017	14,628	778	1,731	3,366	1,973	22,476	40,725	56,131	33,655	NVE
2018	7,303	1,356	1,280	7,668	1,374	18,981	52,524	61,183	42,202	NVE
2019	18,605	808	1,565	4,315	2,689	27,982	43,714	63,127	35,145	NVE
2020	6,119	657	967	2,892	847	11,482	26,293	33,069	21,587	NVE
2021	6,995	624	90	2,190	945	10,844	21,656	29,275	18,341	NVE
Average 2016–2020	11,963	734	1,174	4,142	1,522	19,536	35,853	48,551	29,015	
Average 2011–2020	13,638	530	1,072	3,321	1,234	19,794	33,365	47,533	27,739	

Note: ND = no data; ADF&G = Alaska Department of Fish and Game; NVE = Native Village of Eyak.

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

[b] Includes sport harvest from Copper River District and Delta and Upper Copper Rivers.

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

Table 5.–Chinook salmon regulatory action history for the Copper River District commercial and Upper Copper River sport, personal use, and subsistence salmon fisheries, 2009–2021.

Year	Escapement[a,b]	Date	Copper River District[c]	Chitina Subdistrict	Glennallen Subdistrict	Upper Copper River sport fishery
2009	27,787	21-May	Inside area closed 6 out of 13 periods		No action	
		8-Jun		Prohibit retention		
		16-Jun				Reduce annual limit from 4 to 2, only 1 of the 2 from any tributary or Copper River mainstem.
		29-Jun				Close the Gulkana River drainage.
		27-Jul				Prohibit retention and use of bait and treble hooks in Klutina River
2010	**16,764**	20-May	Inside area closed 5 out of 12 periods		No action	
		21-Jun		Prohibit retention		Reduce annual limit from 4 to 2, only 1 of the 2 from any tributary or Copper River mainstem.
2011	27,994	16-May	Inside area closed 5 out of 14 periods		No action	
		25-Jun				Reduce annual limit from 4 to 2, only 1 of the 2 allowed from any tributary or Copper River mainstem and prohibited retention in Copper River drainage upstream of Klutina River
		27-Jun		Prohibit retention		
2012	27,835	17-May	Inside area closed 10 out of 13 periods		No action	
		18-Jun		Prohibit retention		
		30-Jun				Reduce annual limit from 4 to 1 and prohibit retention and the use of bait and treble hooks in Gulkana River
		28-Jul				Prohibit retention and use of bait and treble hooks in Klutina River and Upper Copper River drainage downstream of Klutina River
2013	29,008	16-May	Inside area closed 4 out of 9 periods		No action	
		15-Jun				Reduce annual limit from 4 to 1 and prohibit retention and use of bait and treble hooks in Gulkana River
		24-Jun		Prohibit retention		

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Table 5.–Page 2 of 3.

Year	Escapement[a,b]	Date	Copper River District[c]	Chitina Subdistrict	Glennallen Subdistrict	Upper Copper River sport fishery
2014	**20,709**	15-May	Inside area closed 11 out of 13 periods			
		14-Jun				Reduced annual limit from 4 to 1
		16-Jun		Prohibit retention		
2015	26,764	15-May	Expanded inside area and closed 10 out of 15 periods	No action	No action	No management actions taken
2016	**12,826**	15-May	Expanded inside area and closed 12 out of 14 periods	No action	No action	No management actions taken
		18-Jun				Prohibit retention and the use of bait and treble hooks in Copper River drainage upstream of the Klutina River
		20-Jun		Prohibit retention		
		25-Jun				Closed Upper Copper River drainage to sport fishing for Chinook salmon
2017	33,655	15-May	Expanded Inside area and closed 9 out of 13 periods			
		1-Jan			Reduced limit to 2 fish and fish wheels required to be closely attended	Close Upper Copper River drainage to sport fishing for Chinook salmon.
		1-Jun		Prohibit retention		
		4-Jun			Rescinded all restrictions	
		5-Jun				Open Upper Copper River drainage sport fishing for Chinook salmon with 2-fish annual bag limit
		19-Jun		Allow retention		
2018	42,202	15-May	Inside area closed for 3 out of 3 periods	No action	No action	No management actions taken

-continued-

Table 5.–Page 3 of 3.

Year	Escapement[a,b]	Date	Copper River District[c]	Chitina Subdistrict	Glennallen Subdistrict	Upper Copper River sport fishery
2019	45,149	15-May	Inside area closed for 6 out of 13 periods	No action	No action	No management actions taken
2020	**21,587**	15-May	Expanded Inside area and closed 4 out of 5 periods		No action	
		20-Jun				Annual limit reduced from 4 to 1 fish.
		22-Jun		Prohibit retention		
2021	**18,433**	17-May	Expanded inside area and closed for 9 out of 9 periods			
		21-Jun		Prohibit retention		Upper Copper River drainage Chinook salmon annual limit reduced from 4 to 1 fish.
		26-Jun				Close Upper Copper River drainage to sport fishing for Chinook salmon.
		28-Jun			Prohibit retention and fish wheels required to be closely attended	
		1-Aug			Allow retention	
2022	ND	20-Jun	Expanded inside area and closed for 9 out of 12 periods		No action	
		20-Jun		Prohibit retention		Close Upper Copper River drainage to retention of Chinook salmon.
		27-Jun		Allowed retention		Allowed retention, but reduced annual limit from 4 to 2 fish

[a] Numbers in **bold** are below the escapement goal.

[b] 2022 escapement data have not been finalized.

[c] Reflects number of periods excluding the portion of the Copper River District in and around the barrier islands through the end of the Chinook salmon run (approximately June 30).

Table 6.–Harvest of Chinook salmon by sport anglers in the Upper Copper River and Upper Susitna River Management Areas by drainage, 2002–2021.

	Gulkana River				Klutina	Tonsina	Tazlina	Copper River			
Year	Upper river	Lower river	Unspecified	Total	River drainage	River drainage	River drainage	Upstream of Gulkana	Downstream of Klutina	Other waters	Area total
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
2007	467	2,639	163	3,269	1,683	0	0	0	113	48	5,113
2008	241	2,036	46	2,323	1,160	0	0	0	118	15	3,616
2009	62	454	0	516	733	58	0	0	48	0	1,355
2010	401	1,038	13	1,452	863	0	0	0	101	0	2,416
2011	0	536	27	563	1,043	0	0	0	107	40	1,753
2012	14	106	76	196	314	0	0	0	25	0	535
2013	0	0	0	0	223	51	0	0	0	11	285
2014	16	431	0	447	414	16	0	0	54	0	931
2015	116	658	0	774	481	50	0	20	18	0	1,343
2016	0	225	68	293	0	0	0	0	34	0	327
2017	34	502	94	630	832	111	0	0	137	21	1,731
2018	0	558	20	578	616	86	0	0	0	0	1,280
2019	123	671	54	848	589	128	0	0	0	0	1,565
2020	67	225	0	292	516	127	0	0	32	0	967
2021	0	68	22	90	0	0	0	0	0	0	90
Average 2016–2020	45	436	47	528	511	90	0	0	41	4	1,174
Average 2011–2020	37	391	34	462	503	57	0	2	41	7	1,072

Note: Harvest data are from the Alaska Sport Fishing Survey (http://www.adfg.alaska.gov/sf/sfpublic/sportfishingsurvey/). Although data are presented for all waters, data in bold result from fewer than 12 respondents and are subject to high variance. Bold data show relative distribution of annual effort and, as presented, only indicate that sport fishing occurred in these waters, or, in cases where harvest or catch is reported, that some level of harvest occurred.

Table 7.–Catch of Chinook salmon by sport anglers in the Upper Copper River and Upper Susitna River Management Area by drainage, 2002–2021.

	Gulkana River							Copper River			
Year	Upper river	Lower river	Unspecified	Total	Klutina River drainage	Tonsina River drainage	Tazlina River drainage	Upstream of Gulkana	Downstream of Klutina	Other waters	Area total
2002	3,384	8,575	357	12,316	5,645	861	0	13	471	191	19,497
2003	4,161	8,876	293	13,330	5,418	290	0	202	25	135	19,400
2004	1,380	5,433	555	7,368	4,135	521	0	404	173	63	12,664
2005	1,596	4,697	217	6,510	2,651	483	0	0	45	15	9,704
2006	1,719	5,664	204	7,587	2,890	367	0	0	13	114	10,971
2007	1,203	7,254	163	8,620	3,025	31	62	16	275	80	12,109
2008	549	5,389	46	5,984	1,670	15	11	0	132	15	7,827
2009	616	1,469	0	2,085	1,888	79	0	15	164	0	4,231
2010	982	3,719	39	4,740	3,240	39	13	0	181	0	8,213
2011	64	2,372	161	2,597	3,476	72	17	0	802	61	7,025
2012	177	495	13	685	1,118	41	0	0	25	0	1,869
2013	0	327	0	327	560	285	0	0	0	23	1,195
2014	34	1,000	0	1,034	955	130	0	0	129	0	2,248
2015	516	2,533	0	3,049	835	210	33	20	18	0	4,165
2016	54	474	509	1,037	361	40	36	0	34	0	1,508
2017	47	1,731	443	2,221	3,458	1,367	0	0	441	21	7,508
2018	197	2,387	218	2,802	2,018	85	0	0	182	0	5,087
2019	1,000	2,224	73	3,297	940	217	0	0	0	0	4,454
2020	272	662	0	934	1,406	1,032	0	0	32	0	3,404
2021	0	304	87	391	177	0	0	0	22	0	590
Average 2016–2020	314	1,496	249	2,058	1,637	548	7	0	138	4	4,392
Average 2011–2020	236	1,421	142	1,798	1,513	348	9	2	166	11	3,846

Note: Harvest data are from the Alaska Sport Fishing Survey (http://www.adfg.alaska.gov/sf/sfpublic/sportfishingsurvey/). Although data are presented for all waters, data in bold result from fewer than 12 respondents and are subject to high variance. Bold data show relative distribution of annual effort and, as presented, only indicate that sport fishing occurred in these waters, or, in cases where harvest or catch is reported, that some level of harvest occurred.

Table 8.–Harvest of sockeye salmon by sport anglers in the Upper Copper River and Upper Susitna River Management Area drainages, 2002–2021.

	Gulkana River				Klutina	Tonsina	Tazlina	Copper River			
Year	Upper river	Lower river	Unspecified	Total	River drainage	River drainage	River drainage	Upstream of Gulkana	Downstream of Klutina	Other waters	Area total
2002	809	1,680	32	2,521	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	33	776	23	832	5,069	142	0	11	0	266	6,464
2005	57	939	73	1,069	6,646	0	**0**	0	180	140	8,135
2006	230	693	**0**	923	13,222	**0**	0	**0**	130	22	14,297
2007	70	1,300	**38**	1,408	21,242	**25**	0	0	290	**0**	22,965
2008	369	206	**0**	575	10,107	0	0	0	749	**0**	11,431
2009	328	886	**87**	1,301	11,759	**0**	51	0	**270**	0	13,381
2010	160	1,316	**0**	1,476	12,238	**156**	0	0	708	165	14,743
2011	0	684	**101**	785	6,025	**0**	**46**	**0**	871	**0**	7,727
2012	11	1,528	**0**	1,539	21,564	0	**0**	**0**	301	0	23,404
2013	25	1,953	**0**	1,978	23,721	**0**	**97**	0	**687**	**128**	26,611
2014	0	586	**123**	709	17,004	**0**	**0**	**0**	292	**0**	18,005
2015	31	502	**0**	533	8,903	**0**	0	0	53	**0**	9,489
2016	21	770	**64**	855	6,421	**52**	**0**	15	**105**	**107**	7,555
2017	0	1,309	**0**	1,309	7,695	**42**	**0**	**21**	481	**20**	9,568
2018	0	676	**0**	676	1,597	**0**	**0**	**0**	**488**	182	2,943
2019	0	1,006	**0**	1,006	6,118	**0**	**18**	**0**	**0**	**204**	7,346
2020	0	242	64	306	2,817	**21**	**0**	**24**	**188**	**127**	3,483
2021	0	883	0	883	4,063	**62**	**0**	**0**	**0**	**0**	5,008
Average 2016–2020	4	801	26	830	4,930	23	4	12	252	128	6,179
Average 2011–2020	9	926	35	970	10,187	12	16	6	347	77	11,613

Note: Harvest data are from the Alaska Sport Fishing Survey (http://www.adfg.alaska.gov/sf/sfpublic/sportfishingsurvey/). Although data are presented for all waters, data in bold result from fewer than 12 respondents and are subject to high variance. Bold data show relative distribution of annual effort and, as presented, only indicate that sport fishing occurred in these waters, or, in cases where harvest or catch is reported, that some level of harvest occurred.

Table 9.–Summary of sockeye harvests and upriver escapement in the Copper River, 2002–2021.

Year	Commercial harvest[a]	CRD subsistence harvest[b]	Sport harvest[c]	Glennallen Subdistrict harvest[d]	Chitina Subdistrict harvest[d]	Total harvest	Upriver return estimate[e]	Estimated total return	Spawning escapement[f]
2002	1,249,920	3,067	8,492	58,800	86,543	1,406,822	797,390	2,192,176	581,717
2003	1,192,164	1,607	7,549	60,623	81,513	1,343,456	702,327	2,042,839	507,895
2004	1,048,603	1,822	7,383	73,214	108,527	1,239,549	628,950	1,819,064	433,945
2005	1,333,574	939	8,803	86,140	122,463	1,551,919	824,792	2,276,785	515,599
2006	1,498,423	4,505	14,455	76,056	124,810	1,718,249	891,917	2,592,795	579,552
2007	1,904,038	6,184	24,713	83,338	126,154	2,144,427	873,252	2,961,792	612,147
2008	323,096	4,001	12,682	57,632	82,318	479,729	677,001	1,141,249	480,597
2009	902,941	1,810	14,374	60,517	90,917	1,070,559	677,348	1,721,676	469,124
2010	643,086	2,016	16,085	84,856	140,811	886,854	901,488	1,715,742	502,992
2011	2,061,525	1,818	8,565	75,375	129,985	2,277,268	880,342	3,097,537	607,657
2012	1,874,726	4,334	24,168	92,792	128,058	2,124,078	1,262,948	3,276,472	953,245
2013	1,617,717	5,741	26,997	90,788	182,915	1,924,158	1,234,479	3,009,733	860,929
2014	2,062,265	1,751	18,179	98,535	158,879	2,339,609	1,194,260	3,386,860	864,988
2015	1,761,443	1,555	9,619	108,696	225,425	2,106,738	1,313,794	3,209,312	930,061
2016	1,184,901	1,185	7,801	81,839	150,303	1,426,029	785,584	2,075,016	513,546
2017	731,932	2,602	9,768	56,110	134,294	934,706	682,701	1,531,335	465,539
2018	45,917	5,189	2,965	56,093	80,542	190,706	649,053	817,121	478,701
2019	1,265,956	6,233	7,346	76,387	175,413	1,531,335	995,940	2,391,059	721,033
2020	103,731	7,091	3,896	45,811	81,428	241,957	504,020	726,495	362,445
2021	397,747	5,338	5,008	57,485	148,716	614,294	729,606	1,306,841	508,715
Average 2016–2020	666,487	4,460	6,762	63,248	124,396	865,353	723,460	1,508,612	508,253
Average 2011–2020	1,271,011	3,750	12,134	78,243	144,724	1,509,862	950,312	2,352,297	675,806

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

[b] Includes state and federal subsistence harvests in the Copper River District (CRD).

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

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

[e] This includes the Miles Lake sonar count minus the Chinook salmon mark–recapture point estimate

[f] Upriver return escapement minus upriver sockeye harvests.

Table 10.–Harvest of wild Arctic grayling by sport anglers in the Upper Copper River and Upper Susitna River Management Area by drainage, 2002–2021.

Year	Gulkana River drainage	Upper Susitna River drainage	Klutina River drainage	Tonsina River drainage	Tazlina River drainage		Copper River drainage		Other lakes and streams	Area total
					Mendeltna Creek	Other lakes and streams	Above Gulkana	Below Klutina		
2002	2,646	928	566	**180**	**23**	370	2,598	62	537	7,910
2003	2,132	1,047	575	58	**23**	312	1,466	**0**	236	5,849
2004	1,331	819	197	112	**65**	73	805	124	589	4,115
2005	1,553	380	59	86	**0**	**500**	432	96	540	3,646
2006	1,179	998	77	**8**	**46**	**359**	**194**	137	298	3,296
2007	729	387	138	**0**	**97**	**130**	840	144	**19**	2,484
2008	1,665	1,431	17	59	**190**	34	616	42	**76**	4,130
2009	1,522	1,216	47	**35**	**0**	85	462	**0**	1,078	4,445
2010	2,081	1,850	57	**12**	107	**90**	210	89	227	4,723
2011	532	1,195	0	**9**	**0**	**0**	**14**	28	**29**	1,807
2012	1,393	1,335	42	0	**0**	**710**	**243**	67	144	3,934
2013	436	1,340	0	**0**	**23**	**401**	1,087	**72**	**0**	3,359
2014	501	700	49	**0**	**81**	**243**	**220**	0	**77**	1,871
2015	1,299	1,530	92	**33**	**82**	**963**	655	82	**0**	4,736
2016	1,025	1,201	73	**64**	**31**	**0**	509	**0**	**0**	2,903
2017	1,485	442	12	**0**	**0**	**29**	**227**	0	**0**	2,195
2018	850	586	0	**0**	**0**	**0**	**288**	**0**	208	1,932
2019	1,280	431	0	**0**	**194**	**0**	**39**	**0**	**146**	2,090
2020	406	978	32	0	7	25	95	0	344	1,887
2021	500	569	28	0	0	100	150	50	0	1,397
Average 2016–2020	1,009	728	23	13	46	11	232	0	140	2,201
Average 2011–2020	921	974	30	11	42	237	338	25	95	2,671

Note: Harvest data are from the Alaska Sport Fishing Survey (http://www.adfg.alaska.gov/sf/sfpublic/sportfishingsurvey/). Although data are presented for all waters, data in bold result from fewer than 12 respondents and are subject to high variance. Bold data show relative distribution of annual effort and, as presented, only indicate that sport fishing occurred in these waters, or, in cases where harvest or catch is reported, that some level of harvest occurred.

Table 11.–Catch of wild Arctic grayling by sport anglers in the Upper Copper River and Upper Susitna River Management Area by drainage, 2002–2021.

					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 River	Below Klutina River	Other lakes and streams	Area total
2002	65,826	12,038	2,119	463	334	1,715	9,300	346	7,101	99,242
2003	66,014	5,895	1,706	210	396	1,533	8,657	81	2,264	86,756
2004	34,543	4,828	1,407	301	269	171	3,904	238	5,011	50,672
2005	40,344	2,718	805	343	129	1,321	2,623	96	2,209	50,588
2006	15,638	5,628	232	25	250	716	1,578	143	850	25,060
2007	20,103	1,828	1,486	274	711	438	3,342	246	269	28,697
2008	35,613	6,055	276	278	1,036	474	1,788	1,095	553	47,168
2009	41,749	6,046	795	435	1,078	590	3,478	187	21,311	75,669
2010	38,766	10,074	248	141	776	1,247	1,353	181	1,680	54,466
2011	13,363	3,296	449	136	1,150	71	141	28	110	18,744
2012	17,358	6,679	798	0	141	1,569	1,245	398	912	29,100
2013	17,129	8,198	840	155	69	1,176	534	234	620	28,955
2014	13,163	7,107	129	342	471	849	1,179	0	1,328	24,568
2015	12,731	9,317	513	552	287	1,686	3,140	232	0	28,458
2016	35,188	5,614	199	429	234	593	1,788	199	345	44,589
2017	24,222	4,523	376	124	0	2,298	227	881	1,237	33,888
2018	14,442	6,924	781	0	0	776	361	0	309	23,593
2019	24,534	7,009	24	40	387	912	1,247	122	326	34,601
2020	13,111	10,531	707	177	188	661	1,087	0	1,265	27,727
2021	5,447	5,160	668	36	0	787	312	340	30	12,780
Average 2016–2020	22,299	6,920	417	154	162	1,048	942	240	696	32,880
Average 2011–2020	18,524	6,920	482	196	293	1,059	1,095	209	645	29,422

Note: Harvest data are from the Alaska Sport Fishing Survey (http://www.adfg.alaska.gov/sf/sfpublic/sportfishingsurvey/). Although data are presented for all waters, data in bold result from fewer than 12 respondents and are subject to high variance. Bold data show relative distribution of annual effort and, as presented, only indicate that sport fishing occurred in these waters, or, in cases where harvest or catch is reported, that some level of harvest occurred.

Table 12.–Harvest of lake trout by sport anglers in the Upper Copper River and Upper Susitna River Management Area by drainage, 2002–2021.

	Gulkana River drainage					Upper Susitna River drainage							
Year	Paxson Lake	Summit Lake	Crosswind Lake	Other lakes and streams	Gulkana total	Lake Louise	Susitna Lake	Other lakes and streams	Upper Susitna total	Klutina drainage	Tazlina drainage	Other sites	Area total
2002	328	66	299	**60**	753	458	152	138	748	0	122	592	2,215
2003	399	102	403	104	1,008	393	128	80	601	52	0	193	1,854
2004	46	107	105	**30**	288	770	30	347	1,147	14	0	595	2,044
2005	50	32	519	**71**	672	370	429	478	1,277	66	**16**	323	2,354
2006	61	10	191	**32**	294	200	148	42	390	0	0	53	737
2007	77	56	**97**	**54**	284	340	61	0	401	0	0	279	964
2008	173	67	**90**	**0**	330	604	206	85	895	0	0	245	1,470
2009	191	125	295	**18**	629	493	**217**	230	940	25	58	223	1,875
2010	268	192	**164**	**0**	624	697	73	101	871	0	54	82	1,631
2011	**42**	37	**50**	**36**	165	239	**122**	62	423	0	**75**	63	726
2012	149	**0**	**32**	**0**	181	169	**66**	94	329	16	**0**	150	676
2013	132	**0**	**300**	**113**	545	239	**108**	35	382	0	**21**	148	1,096
2014	155	**109**	**16**	**11**	291	278	**120**	86	484	0	**0**	44	819
2015	213	**59**	**56**	**0**	328	297	**194**	111	602	16	0	116	1,062
2016	200	**37**	**47**	**203**	487	201	**0**	380	581	21	**0**	354	1,443
2017	**175**	**66**	**211**	**37**	489	273	**0**	59	332	26	**0**	150	997
2018	49	**0**	**27**	**0**	76	396	**56**	104	556	0	**0**	100	732
2019	98	**104**	**29**	**0**	231	191	**49**	0	240	0	**0**	82	553
2020	141	**44**	**75**	**22**	282	252	**44**	25	321	**0**	**0**	127	730
2021	10	**0**	**0**	**0**	10	29	**10**	144	183	**0**	**0**	359	552
Average 2016–2020	133	50	78	52	313	263	30	114	406	9	0	163	891
Average 2011–2020	135	46	84	42	308	254	76	96	425	8	10	133	883

Note: Harvest data are from the Alaska Sport Fishing Survey (http://www.adfg.alaska.gov/sf/sfpublic/sportfishingsurvey/). Although data are presented for all waters, data in bold result from fewer than 12 respondents and are subject to high variance. Bold data show relative distribution of annual effort and, as presented, only indicate that sport fishing occurred in these waters, or, in cases where harvest or catch is reported, that some level of harvest occurred.

Table 13.–Catch of lake trout by sport anglers in the Upper Copper River and Upper Susitna River Management Area by drainage, 2002–2021.

	Gulkana River drainage					Upper Susitna River drainage							
Year	Paxson Lake	Summit Lake	Crosswind Lake	Other lakes and streams	Gulkana total	Lake Louise	Susitna Lake	Other lakes and streams	Upper Susitna total	Klutina drainage	Tazlina drainage	Other sites	Area total
2002	3,834	372	975	**1,011**	6,192	2,985	713	642	4,340	0	122	1,543	12,197
2003	3,437	644	1,438	1,139	6,658	3,145	410	374	3,929	64	0	1,774	12,425
2004	182	279	861	**683**	2,005	3,985	794	845	5,624	14	0	569	8,212
2005	1,365	689	2,256	**182**	4,492	2,570	1,011	1,309	4,890	98	**321**	1,256	11,057
2006	287	128	483	**380**	1,278	1,468	791	151	2,410	0	30	325	4,043
2007	650	136	**1,212**	**516**	2,514	2,342	495	182	3,019	0	0	477	6,010
2008	969	1,168	**1,338**	**221**	3,696	1,838	1,394	1,125	4,357	15	0	725	8,793
2009	677	906	2,657	**768**	5,008	3,571	**923**	1,107	5,601	134	288	1,277	12,308
2010	1,908	1,434	**1,489**	**209**	5,040	6,386	671	305	7,362	21	272	845	13,540
2011	**42**	62	**360**	**452**	916	1,758	**436**	173	2,367	24	**373**	129	3,809
2012	1,078	**0**	**167**	**336**	1,581	974	**363**	990	2,327	32	**0**	59	3,999
2013	462	**43**	**1,483**	**223**	2,211	4,372	**608**	277	5,257	0	**463**	104	8,035
2014	843	**109**	**336**	**293**	1,581	1,559	**646**	624	2,829	0	**37**	44	4,491
2015	666	**1,168**	**775**	**238**	2,847	2,809	**1,203**	309	4,321	49	**0**	227	7,444
2016	1,823	**123**	**135**	**770**	2,851	1,296	**205**	599	2,100	21	**43**	150	5,165
2017	**949**	**66**	**3,280**	**294**	4,589	969	**272**	72	1,313	26	**0**	29	5,957
2018	353	**0**	**99**	**152**	604	2,814	**570**	1,031	4,415	129	**0**	235	5,383
2019	889	**404**	**138**	**204**	1,635	2,791	**2,626**	0	5,417	0	**0**	24	7,076
2020	683	**113**	**569**	**362**	1,727	2,305	**364**	47	2,716	0	**0**	177	4,620
2021	119	**18**	**36**	**0**	173	403	**1,274**	287	1,964	0	**0**	897	3,034
Average 2016–2020	939	141	844	356	2,281	2,035	807	350	3,192	35	9	123	5,640
Average 2011–2020	779	209	734	332	2,054	2,165	729	412	3,306	28	92	118	5,598

Note: Harvest data are from the Alaska Sport Fishing Survey (http://www.adfg.alaska.gov/sf/sfpublic/sportfishingsurvey/). Although data are presented for all waters, data in bold result from fewer than 12 respondents and are subject to high variance. Bold data show relative distribution of annual effort and, as presented, only indicate that sport fishing occurred in these waters, or, in cases where harvest or catch is reported, that some level of harvest occurred.

Table 14.–Harvest of burbot by sport anglers in the Upper Copper River and Upper Susitna River Management Area waters by drainage, 2002–2021.

	Gulkana River drainage				Upper Susitna River drainage							
Year	Paxson Lake	Crosswind Lake	Other lakes and streams	Gulkana total	Lake Louise	Susitna and Tyone Lakes	Other lakes and streams	Upper Susitna total	Tazlina drainage	Klutina drainage	Other sites	Area total
2002	401	578	259	1,238	0	437	31	468	128	13	377	2,224
2003	173	470	250	893	32	119	33	184	87	65	228	1,457
2004	20	336	0	356	317	91	10	418	0	0	353	1,127
2005	112	859	94	1,065	25	74	10	109	25	0	175	1,374
2006	0	229	0	229	210	46	64	320	13	13	0	575
2007	0	55	30	85	185	30	0	215	0	0	277	577
2008	40	302	0	342	241	452	17	710	111	0	71	1,234
2009	0	452	0	452	489	237	0	726	69	0	1,603	2,850
2010	166	129	533	828	1,231	147	18	1,396	422	18	333	2,997
2011	61	60	36	157	144	36	48	228	146	0	25	556
2012	33	0	0	33	134	67	104	305	0	63	594	995
2013	35	421	18	474	266	407	0	673	83	0	346	1,576
2014	0	0	0	0	221	237	0	458	0	0	0	458
2015	16	0	0	16	71	0	48	119	39	0	64	238
2016	0	76	0	76	84	90	0	174	129	0	176	555
2017	0	117	11	128	55	55	0	110	0	0	373	611
2018	0	68	0	68	213	21	0	234	76	0	96	474
2019	0	0	0	0	305	104	0	409	0	0	63	472
2020	0	101	0	101	302	132	0	434	0	0	47	582
2021	0	0	25	25	139	142	0	281	0	0	270	576
Average 2016–2020	0	72	2	75	192	80	0	272	41	0	151	539
Average 2011–2020	15	84	7	105	180	115	20	314	47	6	178	652

Table 15.–Catch of wild rainbow trout by sport anglers fishing Upper Copper River and Upper Susitna River Management Area waters by drainage, 2002–2021.

	Gulkana River drainage[a]							Copper River drainage			
Year	Upper River	Lower River	Other	Total	Klutina River drainage	Tazlina River drainage	Tonsina River drainage	Upstream of Gulkana	Downstream of Klutina	Other lakes and streams	Area total
2002	5,166	2,525	**31**	7,722	7	0	**105**	14	349	1,538	9,735
2003	5,496	676	332	6,504	66	48	0	0	**0**	6,188	12,806
2004	3,995	787	**0**	4,782	27	26	81	0	535	761	6,212
2005	2,967	1,251	**405**	4,623	87	**21**	331	0	374	1,422	6,858
2006	1,361	405	**205**	1,971	58	741	**67**	**0**	488	465	3,790
2007	3,173	652	**210**	4,035	21	0	**0**	0	73	**124**	4,253
2008	4,183	593	**624**	5,400	38	0	61	0	1,707	**208**	7,414
2009	3,700	328	**0**	4,028	172	101	**10**	0	**0**	296	4,607
2010	3,044	999	**28**	4,071	117	113	**15**	0	422	188	4,926
2011	1,684	622	**615**	2,921	132	**81**	**33**	**0**	384	**243**	3,794
2012	1,815	778	**44**	2,637	518	**17**	10	**0**	530	429	4,141
2013	2,835	185	**819**	3,839	0	**687**	**0**	13	**287**	**0**	4,826
2014	1,587	110	**0**	1,697	410	**0**	**0**	**196**	308	**794**	3,405
2015	1,260	308	**0**	1,568	33	73	**0**	0	339	**300**	2,313
2016	3,250	643	**236**	4,129	255	**86**	**0**	0	**1,004**	**47**	5,521
2017	2,557	454	110	3,121	23	**360**	**0**	**18**	875	**283**	4,680
2018	1,932	36	**0**	1,968	126	**77**	**0**	**0**	**11**	882	3,064
2019	864	34	**0**	898	0	**319**	**0**	**0**	**354**	**544**	2,115
2020	1,825	241	**0**	2,066	135	**50**	**0**	**34**	**331**	**1,779**	4,395
2021	929	81	**500**	1,510	389	**0**	**63**	**0**	**50**	**85**	2,097
Average 2016–2020	2,086	282	69	2,436	108	178	0	10	515	707	3,955
Average 2011–2020	1,961	341	182	2,484	163	175	4	26	442	530	3,825

Note: Harvest data are from the Alaska Sport Fishing Survey (http://www.adfg.alaska.gov/sf/sfpublic/sportfishingsurvey/). Although data are presented for all waters, data in bold result from fewer than 12 respondents and are subject to high variance. Bold data show relative distribution of annual effort and, as presented, only indicate that sport fishing occurred in these waters, or, in cases where harvest or catch is reported, that some level of harvest occurred.

[a] The Gulkana River has been closed to the retention of rainbow trout since 1991.

Table 16.–Harvest of Dolly Varden by sport anglers fishing Upper Copper River and Upper Susitna River Management Area waters by drainage, 2002–2021.

Year	Klutina River Drainage	Tazlina River drainage	Tonsina River drainage	Copper River Drainage		Other sites	Area total
				Upstream of Gulkana	Downstream of Klutina		
2002	725	0	369	22	215	57	1,388
2003	1,009	54	0	67	20	0	1,150
2004	886	0	150	120	891	106	2,153
2005	423	0	82	13	0	373	891
2006	219	0	146	0	58	150	573
2007	362	0	99	154	15	82	712
2008	204	0	0	22	59	0	285
2009	620	0	93	33	0	197	943
2010	268	0	29	88	121	132	638
2011	64	0	96	62	9	0	231
2012	602	0	89	0	0	62	753
2013	244	0	460	37	295	0	1,036
2014	148	0	0	0	0	0	148
2015	459	0	143	410	0	0	1,012
2016	842	0	225	478	0	0	1,545
2017	13	0	0	212	0	0	225
2018	118	0	0	951	0	56	1,125
2019	50	0	0	0	0	101	151
2020	38	0	52	0	0	113	203
2021	624	0	0	0	0	0	624
Average 2016–2020	212	0	55	328	0	54	650
Average 2011–2020	258	0	107	215	30	33	643

Table 17.–Stocking schedule for the Upper Copper River and Upper Susitna River Management Area lakes, 2019–2021.

Access	Area Lake	Stocking Frequency	Species	Size	2019	2020	2021
Glenn Hwy	Arizona	Annual	Grayling	Catchable	491	494	0
	Buffalo	Annual	Rainbow	Catchable	536	549	556
		Alternate	Arctic Char	Catchable	0	462	0
	DJ	Alternate	Rainbow	Fingerling	801	0	808
	Gergie	Suspended	Arctic Char	Catchable	0	0	0
		Annual	Rainbow	Catchable	0	0	0
	Ryan	Annual	Arctic Char	Catchable	0	616	0
		Annual	Grayling	Catchable	699	579	0
		Annual	Rainbow	Catchable	574	543	543
	Tex Smith	Annual	Arctic Char	Catchable	0	500	0
		Annual	Rainbow	Catchable	506	1,099	1,093
	Tolsona	Annual	Rainbow	Catchable	2,540	2,542	2,300
Richardson Hwy	Dick	Annual	Arctic Char	Catchable	1,001	1,097	1,040
	Pippin	Annual	Grayling	Catchable	2,492	2,411	0
		Annual	Rainbow	Catchable	5,926	6,008	5,893
	Squirrel Creek	Annual	Rainbow	Catchable	1,363	1,358	1,445
		Annual	Grayling	Catchable	999	1,001	0
Lake Louise Rd	Connor	Annual	Grayling	Catchable	491	508	0
	Crater	Alternate	Arctic Char	Fingerling	1,506	0	1,500
		Alternate	Rainbow	Fingerling	0	2,000	0
	Junction	Annual	Grayling	Catchable	443	466	0
		Annual	Rainbow	Catchable	460	466	453
	Old Road	Annual	Rainbow	Catchable	706	747	797
	Peanut	Alternate	Rainbow	Fingerling	0	1,502	0
	Round	Annual	Rainbow	Catchable	714	758	758
Edgerton Hwy	Three Mile	Annual	Grayling	Catchable	1,028	1,041	0
		Annual	Rainbow	Catchable	1,462	1,430	0
	Two Mile	Annual	Arctic Char	Catchable	0	1,012	0
		Annual	Rainbow	Catchable	2,151	2,035	2,154
McCarthy Rd	Sculpin	Alternate	Rainbow	Fingerling	8,027	3,000	8,004
	Silver	Alternate	Rainbow	Fingerling	20,024	9,580	20,008
	Strelna	Alternate	Rainbow	Fingerling	5,000	3,125	5,000
		Alternate	Coho	Fingerling	7,038	0	2,632
Remote	John	Alternate	Arctic Char	Fingerling	2,000	0	2,000
	North Jans	Alternate	Rainbow	Fingerling	0	0	0
	South Jans	Alternate	Rainbow	Fingerling	0	0	0
		Alternate	Coho	Fingerling	0	0	0
	Tolsona Mtn.	Alternate	Rainbow	Fingerling	10,009	0	10,009

Table 18.–Effort, harvest, and catch by species for stocked lakes in the Upper Copper River and Upper Susitna River Management Area, 2002–2021.

		Catch						Harvest				
Year	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
2002	2,377	6,870	0	6,966	179	14,015	5.9	2,901	0	1,939	0	4,862
2003	3,374	4,777	0	3,309	495	8,581	2.5	2,426	0	688	428	3,609
2004	1,461	6,624	0	531	0	7,155	4.9	1,615	0	62	0	1,677
2005	2,313	4,096	0	86	0	4,182	1.8	1,440	0	253	0	1,693
2006	2,790	4,125	0	232	357	4,714	1.7	1,618	0	91	204	1,913
2007	1,974	1,666	0	559	0	2,225	1.1	573	0	282	0	855
2008	1,453	2,819	0	275	444	3,538	2.4	694	0	101	111	906
2009	2,254	2,563	0	445	0	3,008	1.3	1,013	0	35	0	1,048
2010	2,049	5,044	31	208	73	5,356	2.6	1,006	31	0	44	1,081
2011	3,117	4,498	0	497	0	4,995	1.6	803	0	42	0	845
2012	2,510	5,155	0	610	0	5,765	2.3	936	0	157	0	1,093
2013	1,034	1,149	0	518	0	1,667	1.6	246	0	247	0	493
2014	1,380	1,931	0	1,280	0	3,211	2.3	353	0	393	0	746
2015	2,171	2,846	0	122	0	2,968	1.4	1,517	0	39	0	1,556
2016	3,014	5,416	0	37	0	5,453	1.8	1,547	0	0	0	1,547
2017	2,041	7,504	115	86	130	7,835	3.8	1,359	49	72	45	1,525
2018	1,869	3,689	0	312	0	4,001	2.1	969	0	13	0	982
2019	3,659	9,998	0	2,121	0	12,119	3.3	3,019	0	175	0	3,194
2020	1,788	3,566	0	256	63	3,885	2.2	925	0	0	57	982
2021	4,090	8,087	607	225	150	9,069	2.2	2,029	0	0	0	2,029
Average 2016–2020	2,474	6,035	23	562	39	6,659	2.7	1,564	10	52	20	1,646
Average 2011–2020	2,258	4,575	12	584	19	5,190	2.2	1,167	5	114	10	1,296

Table 19.–Number of permits issued and expanded salmon harvests for the Chitina Subdistrict personal use salmon fishery in the Copper River, 2002–2021.

	Permits		Estimated salmon harvest			
Year	Issued	Fished	Chinook	Sockeye	Coho	Total[a]
2002[b]	6,804	4,480	2,023	85,968	1,934	90,242
2003	6,441	4,257	1,903	80,796	2,533	85,496
2004	8,156	4,955	2,495	107,312	2,860	113,176
2005	8,230	5,330	2,043	120,013	1,869	124,403
2006	8,497	5,291	2,663	123,261	2,715	129,103
2007	8,377	5,549	2,694	125,126	1,742	130,222
2008	8,041	4,803	1,999	81,359	2,711	86,476
2009	7,958	4,830	214	90,035	1,712	92,228
2010	9,970	6,075	700	138,487	2,013	141,565
2011	9,217	5,710	1,067	128,052	1,702	131,265
2012	10,016	5,781	567	127,143	1,385	129,362
2013	10,592	6,768	744	180,663	797	182,904
2014	11,717	7,116	719	157,215	1,129	159,392
2015	12,635	7,829	1,570	223,080	841	226,832
2016	11,394	6,219	711	148,982	1,182	151,480
2017	9,490	6,161	1,961	132,694	715	136,043
2018	4,982	3,044	1,273	77,051	1,436	80,135
2019	8,071	5,467	2,611	171,203	1,064	175,487
2020	6,810	4,466	751	78,022	815	79,818
2021	7,222	5,565	832	143,301	439	145,006
Average 2016–2020	8,149	5,071	1,461	121,590	1,042	124,593
Average 2011–2020	9,492	5,856	1,197	142,411	1,107	145,272

[a] Total includes steelhead trout and unidentified salmon.

[b] During 2000–2002 the Chitina Subdistrict was classified as a subsistence fishery.

Table 20.–Number of permits issued and expanded salmon harvests for the Glennallen Subdistrict subsistence salmon fishery in the Copper River, 2002–2021.

	Permits issued			% permits	Harvest			
Year	Dip net	Fish wheel	Total	fished	Chinook	Sockeye	Coho	Total[a]
2002	469	652	1,121	73%	3,653	50,850	530	55,058
2003	399	613	1,012	77%	2,538	47,007	467	50,055
2004	330	626	956	77%	3,346	55,510	577	59,497
2005	363	598	961	76%	2,229	64,213	154	66,615
2006	338	646	984	77%	2,769	57,710	212	60,774
2007	467	707	1,174	75%	3,276	65,714	238	69,284
2008	536	650	1,186	72%	2,381	43,157	493	46,106
2009	469	621	1,090	72%	2,493	46,849	228	49,643
2010	620	701	1,321	72%	2,099	70,719	293	73,260
2011	617	689	1,306	74%	2,319	59,622	372	62,477
2012	867	660	1,527	69%	2,095	76,305	335	78,851
2013	808	531	1,339	73%	2,148	73,728	143	76,044
2014	1,148	508	1,656	66%	1,365	75,501	233	77,131
2015	1,128	503	1,631	70%	2,212	81,800	77	84,105
2016	1,300	469	1,769	64%	2,075	62,474	45	64,617
2017	1,264	368	1,632	64%	2,935	39,859	57	42,862
2018	1,312	347	1,659	61%	4,531	39,359	151	44,073
2019	1,354	359	1,713	68%	3,429	60,257	204	63,920
2020	1,290	375	1,665	60%	2,222	34,577	67	36,903
2021	1,205	313	1,518	72%	1,685	42,638	166	44,509
Average 2016–2020	1,304	384	1,688	63%	3,038	47,305	105	50,475
Average 2011–2020	1,109	481	1,590	67%	2,533	60,348	168	63,098

[a] Total includes steelhead trout and unidentified salmon.

Table 21.–Number of freshwater finfish subsistence permits issued and harvest from Upper Copper River and Upper Susitna River Management Area waters, 2002–2021.

	Permits				Harvest[a,b]				
Year	Total Issued	Total fished	Water bodies permitted	Water bodies fished	Whitefish	Lake Trout	Burbot	Other	Total
2002	12	7	5	3	1,321	4	1	0	1,326
2003	13	6	6	3	1,143	2	8	9	1,162
2004	11	4	5	4	2,125	15	0	8	2,148
2005	17	14	7	5	1,643	13	1	18	1,675
2006	13	10	6	4	1,070	6	3	2	1,081
2007	18	12	5	3	3,094	6	3	4	3,107
2008	16	10	3	2	585	9	2	1	597
2009	28	17	5	3	2,708	28	21	11	2,768
2010	27	19	7	4	2,088	33	13	13	2,147
2011	25	20	5	5	981	17	1	0	999
2012	15	10	2	2	648	8	0	0	656
2013	25	19	5	5	1,259	10	0	18	1,287
2014	19	12	5	3	697	19	0	20	736
2015	15	10	4	4	664	6	1	2	673
2016	25	14	8	2	959	14	0	6	979
2017	26	11	10	5	1,208	2	1	14	1,225
2018	42	25	8	3	6,981	12	0	156	7,149
2019	44	33	6	2	6,250	7	1	6	6,264
2020	55	38	7	3	7,597	7	9	65	7,678
2021	44	27	7	2	4,024	18	0	0	4,042
Average 2016–2020	38	24	8	3	4,599	8	2	50	4,659
Average 2011–2020	29	19	6	3	2,724	10	41	29	2,765

[a] Reported harvest is from set gillnets with the following exceptions: 5 whitefish (WF) and 5 burbot (BB) in 2003, 52 WF in 2006 with fyke nets, and 12 WF and 1 BB by spear in 2011.

[b] Retention of species other than whitefish or longnose suckers taken with gillnets was prohibited by permit stipulation beginning in 2011. Species other than whitefish listed as harvested after 2010 were not retained and were released either dead or alive.

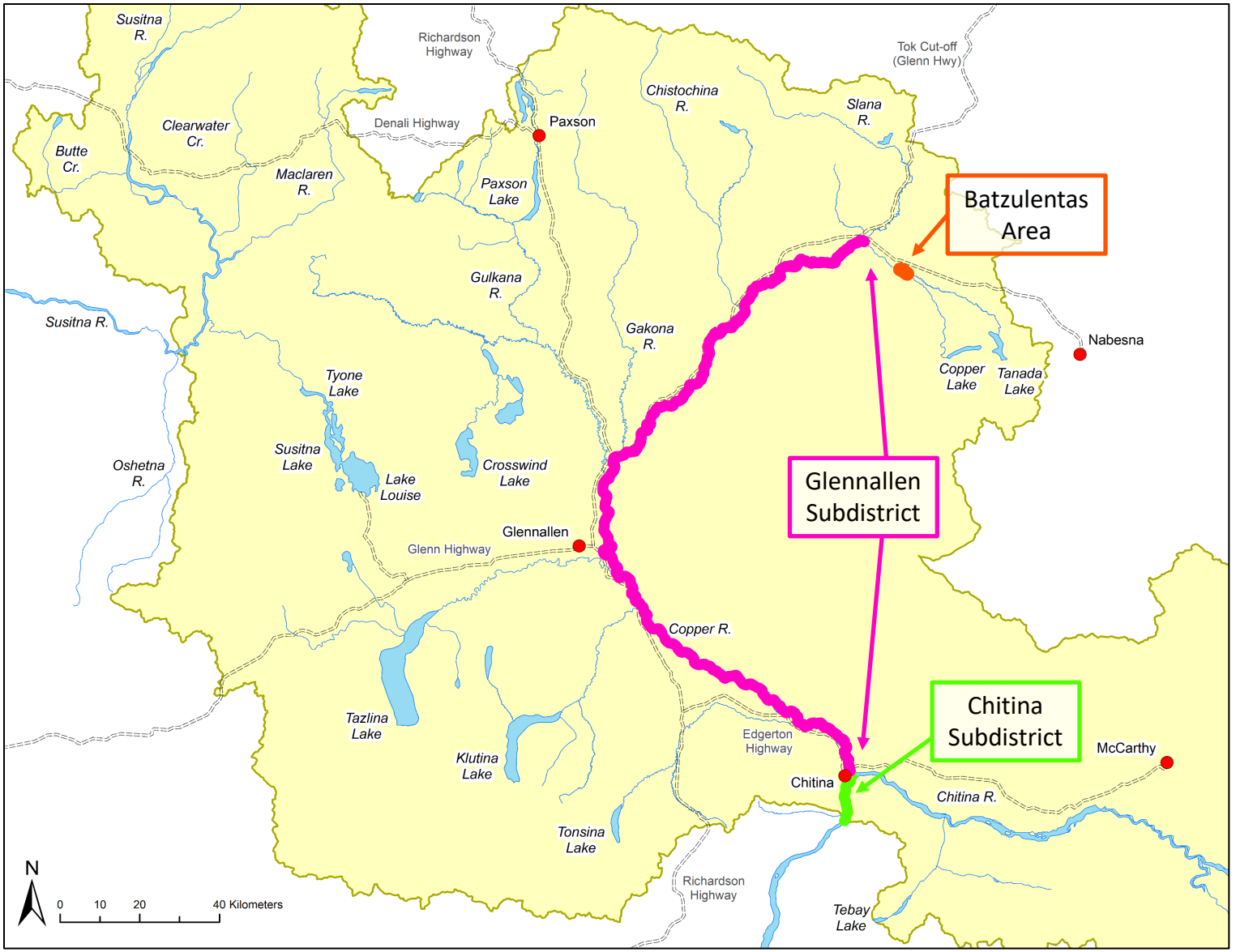

Figure 1.–The Upper Copper River and Upper Susitna River Management Area (UCUSMA).

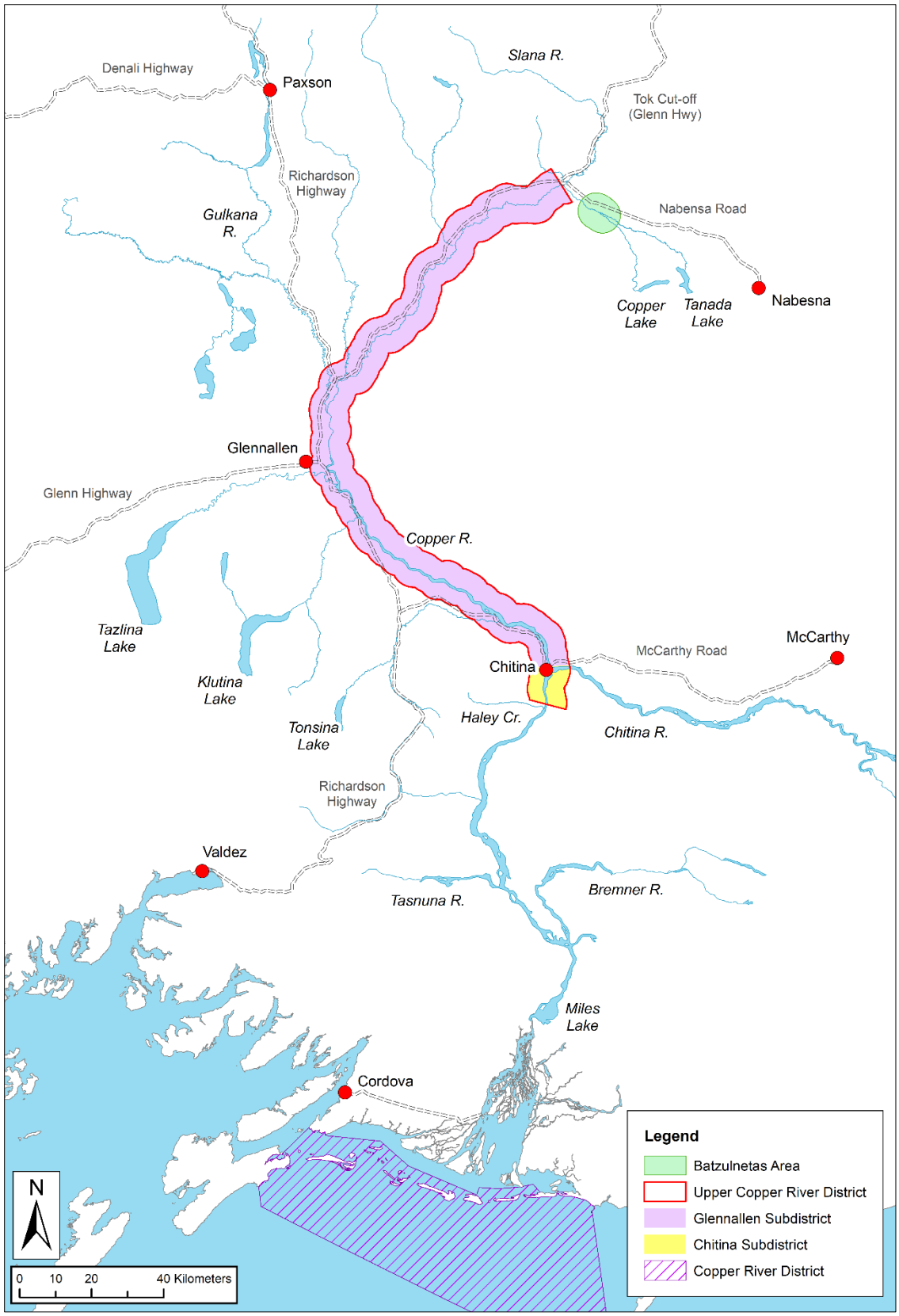

Figure 2.–Upper Copper River fishery subdistricts and areas.

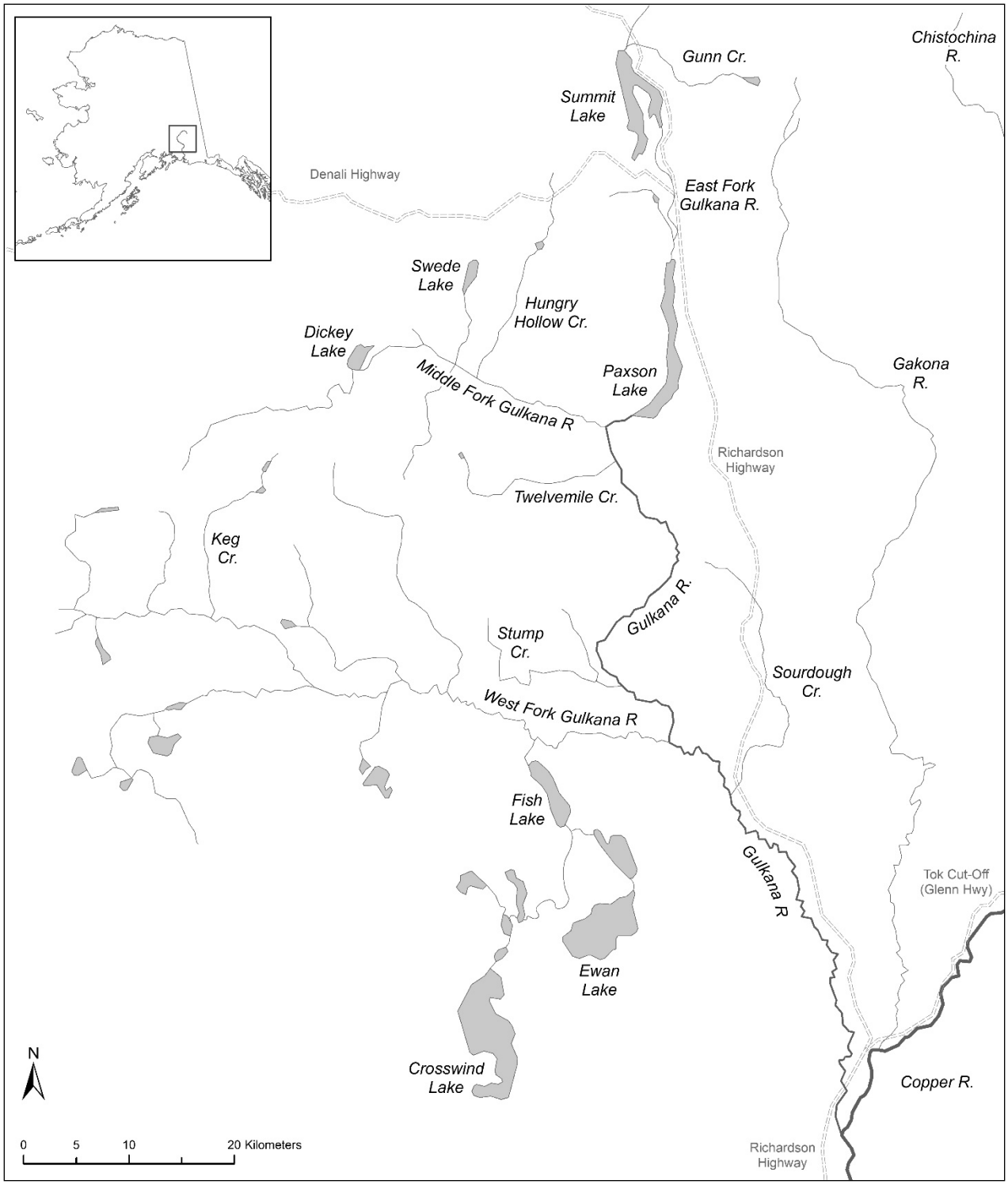

Figure 3.–Gulkana River drainage.

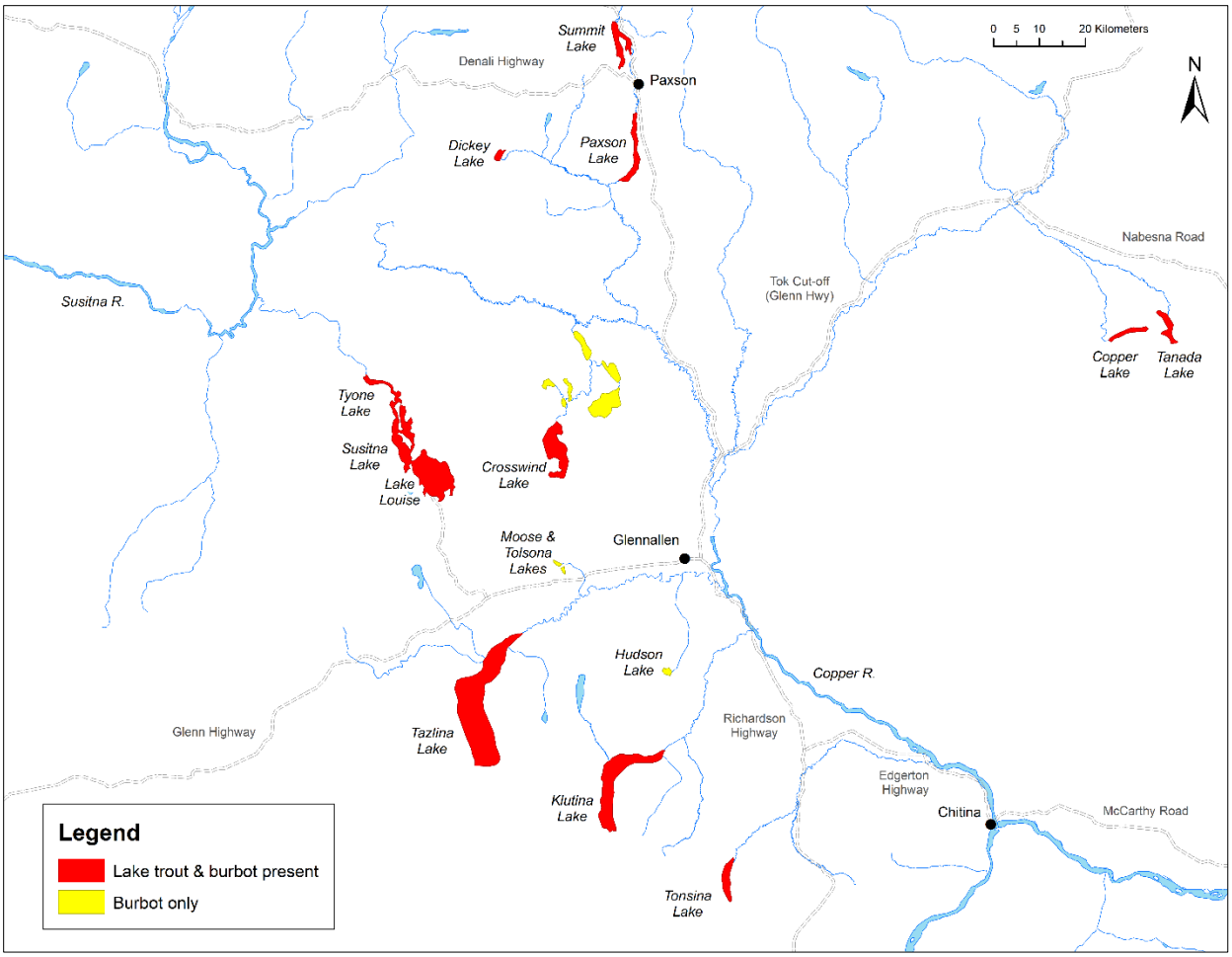

Figure 4.–Upper Copper River and Upper Susitna River Management Area lake trout and burbot fisheries.

APPENDIX A: EMERGENCY ORDERS

Appendix A1.–Emergency orders (EO) issued for Upper Copper River and Upper Susitna River Management Area (UCUSMA) sport, personal use, and subsistence fisheries during 2020 and 2021.

Year	EO Number	Explanation
2020	3-RS-I-01-20	Establishes the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River through August 31, 2020, and opens the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for a 24-hour period on June 7, 2020. The Chitina Subdistrict of the Upper Copper River District will be open from 12:01 a.m. Sunday, June 7, through 11:59 p.m. Sunday, June 7.
2020	3-RS-I-02-20	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the week of June 8, 2020. The Chitina Subdistrict will be open from 12:01 a.m. Thursday, June 11, through 11:59 p.m. Sunday, June 14, 2020.
2020	3-RS-I-03-20	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the week of June 15, 2020. The Chitina Subdistrict will be open from 12:01 a.m. Thursday, June 18, through 11:59 p.m. Sunday, June 21, 2020.
2020	3-KS-I-03-20	Reduces the sport fish annual limit for Chinook salmon 20 inches or greater in length in the Upper Copper River drainage. Beginning 12:01 a.m. Saturday, June 20, 2020, the annual limit for Chinook salmon in the Copper River drainage is one fish. Any Chinook salmon harvested from the Upper Copper River drainage prior to June 20 does not count toward the one fish annual limit.
2020	3-RS-I-04-20	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the week of June 22, 2020. The Chitina Subdistrict will be open from 12:01 a.m. Monday, June 22, through 11:59 p.m. Monday, June 22, and open from 6:00 a.m. Wednesday, June 24, through 11:59 p.m. Sunday, June 28, 2020. In addition, this emergency order closes the Chitina Subdistrict personal use dip net salmon fishery to the retention of Chinook salmon. Chinook salmon incidentally taken may not be retained and must be released immediately and returned to the water unharmed.
2020	3-RS-I-05-20	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the week of June 29, 2020. The Chitina Subdistrict will be open from 12:01 a.m. Monday, June 29, through 11:59 p.m. Sunday, July 5, 2020.
2020	3-RS-I-07-20	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the week of July 13, 2020. The Chitina Subdistrict will be open from 12:01 p.m. Thursday, July 16, through 11:59 p.m. Sunday, July 19, 2020.
2020	3-RS-I-08-20	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the week of July 20, 2020. The Chitina Subdistrict will be open from 12:01 a.m. Friday, July 24, through 11:59 p.m. Sunday, July 26, 2020.

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Year	EO Number	Explanation
2020	3-RS-I-09-20	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the week of July 27, 2020. The Chitina Subdistrict will be closed from 12:01 a.m. Monday, July 27, through 11:59 p.m. Sunday, August 2, 2020.
2020	3-RS-I-10-20	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the period of August 3–31, 2020. The Chitina Subdistrict will be closed from 12:01 a.m. Monday, August 3, through 11:59 p.m. Monday, August 31, 2020.
2020	3-RS-I-01-20	Closes all waters of the Upper Copper River drainage upstream of the south bank of Haley Creek to sport fishing for sockeye salmon, effective 12:01 a.m. Monday, August 3, 2020. Sockeye salmon may not be taken or possessed and must be released immediately.
2021	3-RS-I-01-21	Establishes the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River through August 31, 2021, and opens the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for a 96-hour period on June 10, 2021. The Chitina Subdistrict of the Upper Copper River District will be open from 12:01 a.m. Thursday, June 10, through 11:59 p.m. Sunday, June 13.
2021	3-RS-I-02-21	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the week of June 14, 2021. The Chitina Subdistrict will be open from 12:01 a.m. Wednesday, June 16, through 11:59 p.m. Sunday, June 20.
2021	3-RS-I-03-21	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the week of June 21, 2021. The Chitina Subdistrict will be open from 12:01 a.m. Monday, June 21, through 11:59 p.m. Sunday, June 27. In addition, this emergency order closes the Chitina Subdistrict Personal Use Dip Net Salmon Fishery to the retention of Chinook salmon.
2021	3-KS-I-04-21	Reduces the annual limit for Chinook salmon 20 inches or greater in length in the Upper Copper River drainage from 4 to 1 fish effective 12:01 a.m. Monday, June 21, 2021.
2021	3-RS-I-04-21	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the week of June 28, 2021. The Chitina Subdistrict will be open from 12:01 a.m. Monday, June 28, through 11:59 p.m. Sunday, July 4.
2021	3-KS-I-06-21	Closes the Upper Copper River drainage upstream of the south bank of Haley Creek to sport fishing for Chinook salmon effective 12:01 a.m. Saturday, June 26. In addition, the use of bait in specified waters is also prohibited.
2021	3-KS-I-01-21	Closes the Glennallen Subdistrict subsistence salmon fishery to the retention of Chinook salmon from 12:01 a.m. Monday, June 28, through 11:59 p.m. Sunday, August 1. In addition permit holders fishing fish wheels must closely attend those wheels while in operation.

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Year	EO Number	Explanation
2021	3-RS-I-05-21	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the week of July 5, 2021. The Chitina Subdistrict will be open from 12:01 a.m. Monday, July 5, through 11:59 p.m. Tuesday, July 6 and from 12:01 a.m. Thursday, July 8, through 11:59 p.m. Sunday, July 11.
2021	3-RS-I-06-21	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the week of July 12, 2021. The Chitina Subdistrict will be open from 12:01 a.m. Monday, July 12, through 11:59 p.m. Sunday, July 18.
2021	3-RS-I-07-21	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the week of July 19, 2021. The Chitina Subdistrict will be open from 12:01 a.m. Monday, July 19, through 11:59 p.m. Tuesday, July 20 and from 12:01 a.m. Thursday, July 22, through 11:59 p.m. Sunday, July 25.
2021	3-RS-I-08-21	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the week of July 26, 2021. The Chitina Subdistrict will be open from 12:01 a.m. Monday, July 26, through 11:59 p.m. Sunday, August 1.
2021	3-RS-I-09-21	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the week of August 2, 2021. The Chitina Subdistrict will be open from 12:01 a.m. through 11:59 p.m. Monday, August 2, and from 12:01 a.m. Friday, August 6, through 11:59 p.m. Sunday, August 8.
2021	3-RS-I-10-21	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River through August 31, 2021. The Chitina Subdistrict will be open from 12:01 a.m. Monday, August 9, through 11:59 p.m. Tuesday, August 31.

APPENDIX B: FEDERAL SUBSISTENCE PERMITS

Appendix B1.–Federal subsistence permits and harvest from the Copper River, Glennallen Subdistrict, 2002–2021.

Year	Permits issued	Permits fished	Estimated harvested				
			Chinook	Sockeye	Coho	Steelhead	Other
2002	201	107	564	7,950	81	62	0
2003	221	127	554	13,616	152	5	0
2004	262	148	636	17,704	152	12	0
2005	267	197	389	21,927	187	0	41
2006	254	170	460	18,346	28	15	71
2007	281	224	663	17,624	57	9	122
2008	270	139	837	14,475	229	26	52
2009	274	170	543	13,668	34	19	110
2010	269	175	326	14,137	81	42	62
2011	277	173	743	15,753	223	5	317
2012	275	169	415	16,487	173	42	106
2013	273	160	374	17,060	21	7	88
2014	315	206	420	23,034	29	10	59
2015	325	210	402	26,896	78	7	201
2016	320	171	396	19,365	11	7	368
2017	332	212	431	16,251	1	7	533
2018	335	199	3,137	16,734	0	4	46
2019	343	209	886	16,130	0	1	53
2020	376	185	670	11,234	1	6	54
2021	355	173	505	14,847	0	1	0
Average 2016–2020	341	195	1,104	15,943	3	5	211
Average 2011–2020	317	189	787	17,894	54	10	183

Note: Reported harvest only 2002–2004; expanded harvest (estimates include harvest from non-returned permits) after 2004.

Appendix B2.–Federal subsistence permits and harvest from the Copper River, Chitina Subdistrict, 2002–2021.

Year	Permits issued	Permits fished	Chinook	Sockeye	Coho	Steelhead	Other
2002	122	ND	33	575	0	0	0
2003	100	ND	18	717	70	0	0
2004	109	ND	7	1,215	18	0	0
2005	76	27	51	2,450	0	0	0
2006	75	29	18	1,549	20	0	0
2007	98	74	28	1,028	41	0	0
2008	82	38	23	959	100	0	0
2009	68	39	9	882	11	0	0
2010	92	38	18	2,324	30	0	0
2011	85	42	13	1,933	10	0	0
2012	90	33	5	915	8	8	0
2013	99	39	18	2,252	8	2	10
2014	113	49	14	1,664	69	10	0
2015	111	52	15	2,345	14	7	0
2016	128	43	15	1,321	11	0	4
2017	132	47	12	1,600	8	0	0
2018	131	58	101	3,491	34	0	0
2019	181	90	78	4,210	20	0	0
2020	215	95	96	3,406	23	0	0
2021	194	102	113	5,415	3	0	0
Average 2016–2020	157	67	60	2,806	19	0	1
Average 2011–2020	129	55	37	2,314	21	3	1

Note: Reported harvest only 2002–2004; expanded harvest (including estimated harvest from non-returned permits) after 2004. Beginning in 2019 the federal fishery was open 24/7 in the Chitina Subdistrict. Prior to 2019 the fishery was opened and closed on a weekly basis consistent with the state personal use fishery.

APPENDIX C: CHINOOK SALMON MEMO

Memorandum

To: Jeff Estensen, Regional Supervisor

Thru: Klaus Wuttig, Regional Management Supervisor

From: Mark Somerville, Area Management Biologist
Tracy Hansen, Assistant Area Management Biologist

Date: 11/23/2022

Subject: Upper Copper River king salmon aerial survey summary

Tracy Hansen conducted aerial king salmon surveys for the East Fork Chistochina River and Manker and St. Anne Creeks in the Klutina River drainage on July 28, and for the Gulkana River on August 3. All surveys were conducted in a Piper Super Cub (PA-18) piloted by Harley McMahan. The Gulkana River survey was conducted one day past the operation plan guideline dates of July 1 – August 2. Weather during July prevented the king salmon surveys from occurring any earlier.

Survey conditions were rated very good (2.0 on a scale of 5) during the East Fork Chistochina River survey. King salmon were distributed throughout the river with most in the middle to upper reaches. An index count of 383 king salmon was observed (Table 1). This index count was 41% below the escapement objective of 650 king salmon (Table 2) and was the third lowest count over the past 10 years. The 2022 East Fork Chistochina count was 46% below the overall average (1977-2019) for this creek, 62% below the most recent 10-year average, and 54% below the most recent 10-year median aerial counts for this stream.

Survey conditions were rated excellent (1.0 on a scale of 5) during the Manker and St. Anne surveys. King salmon were evenly distributed in Manker Creek with most fish in the middle to upper reaches of the creek. No king salmon were observed in St. Anne Creek during the survey. St. Anne Creek was flown twice to ensure there were no king salmon being missed. A combined index count of 176 king salmon was observed for Manker and St. Anne creeks (Table 1). This index count was 55% below the combined escapement objective of 385 king salmon for the Klutina River drainage (Table 2). The 2022 combined Manker and St. Anne count was 44% below the overall average (1977-2021) for the Klutina River system, 34% below the most recent 10-year average, and 5% below the most recent 10-year median aerial counts. The count of zero king salmon in St. Anne Creek was the first time zero fish were counted in this system. The count of 176 king salmon for Manker Creek was the fourth highest count over the last 10 years.

Survey conditions were rated good to very good (2.0 – 3.0 on a scale of 5) during the Gulkana

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River survey except for the mainstem below the West Fork which was too muddy to survey. Approximately 86% of king salmon were counted in the mainstem Gulkana River, 3% of king salmon counted were counted in the West Fork Gulkana River, and 10% were counted in the Middle Fork Gulkana River. Of the fish counted in the mainstem, 100% were counted above Sourdough and 89% were counted above the counting tower. An index count of 1,142 king salmon was observed (Table 1), which was 9% above the escapement objective of 1,050 king salmon (Table 2). The 2022 Gulkana River count was 9% above the overall average (1977-2021), 17% above the most recent 10-year average, and 46% above the most recent 10-year median aerial counts for this river.

2022 Inseason Management

The 2022 king salmon run to the Copper River was forecast at 40,000 fish with a potential range of 28,000 – 52,000 fish. The actual run came in about 9 days late and compressed which complicated inseason assessments of overall run strength. The run also had a prolonged tail. The final run size is estimated at around 51,000 king salmon as of the writing of this memo.

Based on the late start of the Copper River king salmon run and performance of the runs in previous years, run size data in early to mid-June indicated the run could come in under forecast. Therefore, from June 20 – 26 the Chitina Subdistrict personal use fishery and all Upper Copper River sport fisheries were closed to the retention of king salmon. Fortunately, run strength indicators improved substantially during the closed period and retention of king salmon was again allowed in the Chitina Subdistrict personal use fishery and in the Upper Copper River sport fisheries with a 2 fish annual limit.

The commercial salmon fishing season in the Copper River District began on Monday, May 16. The inside king salmon closed area in the Copper River District was in effect through June 22 when the run was estimated to be 95% complete. The commercial harvest of 11,631 king salmon was about equal to the most recent 10-year average harvest.

The final Native Village of Eyak (NVE) inriver mark/recapture estimate of king salmon was 38,459 fish. Overall, the project held a consistent 8% recapture rate through most of the season. Unprecedented high-water events slowed fish down in the beginning of the season and delayed and prolonged inriver migration timing.

King salmon apportionment estimates using the ARIS sonar system at Miles Lake were helpful in informing inseason management decisions during 2022. This was the 4th year of apportionment testing, but the data are still not ready for use as a standalone management tool.

King salmon counts at the Gulkana River Counting tower were consistent with the observed run strength past the sonar and the higher than usual harvest rates of king salmon in the personal use and subsistence fisheries during 2022 (Figure 1). A total of 5,184 king salmon were counted through August 13, 2022. This is the fourth highest count since the project began in 2002.

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Table 1.–2022 Upper Copper River king salmon aerial survey indices.

Water Body	Date	Chinook		
		Alive	Dead	Total
E Fork Chistochina	**28-Jul**	**383**	**0**	**383**
Gulkana River				
Mouth to Bridge	NS			
Bridge to Sourdough	NS			
Sourdough to West Fork	NS			
West Fork to Tower	3-Aug	104	4	108
Tower to Middle Fork	3-Aug	861	9	870
Middle Fork to Paxson Lake	3-Aug	21	0	21
Middle Fork to Dickey Lake	3-Aug	107	5	112
West Fork (mouth to Moose Creek)	3-Aug	30	1	31
Gulkana River total	**3-Aug**	**1,123**	**19**	**1,142**
Klutina River				
Manker Creek	28-Jul	176	0	176
St. Anne Creek	28-Jul	0	0	0
Klutina River total	**28-Jul**	**176**	**0**	**176**

Table 2.–Upper Copper River king salmon aerial survey objectives and average counts 1977–2021.

Drainage	Waterbody	Objective[a]	Average (1977-2021)[b]	Average (10-year)[c]	Median (10-year)[c]
Chistochina	East Fork Chistochina	650	704	988	817
Gulkana	Gulkana River	1,050	1,048	972	781
Klutina	Manker Creek	385	190	205	107
	St. Anne Creek		128	62	39

[a] Escapement index objectives are the average indices from flights conducted between July 17 to August 10, 1977–1995, and developed at the time of Copper River King Salmon Management Plan. Index objectives for Manker Creek and St. Anne Creek, Greyling Creek and Little Tonsina River, and Mendeltna Creek and Kaina Creek are combined by drainage.

[b] Includes index counts conducted between July 17 and July 31, with the number of years included specific to each stream.

[c] Includes the most recent 10 years of index counts conducted between July 17 and July 31.

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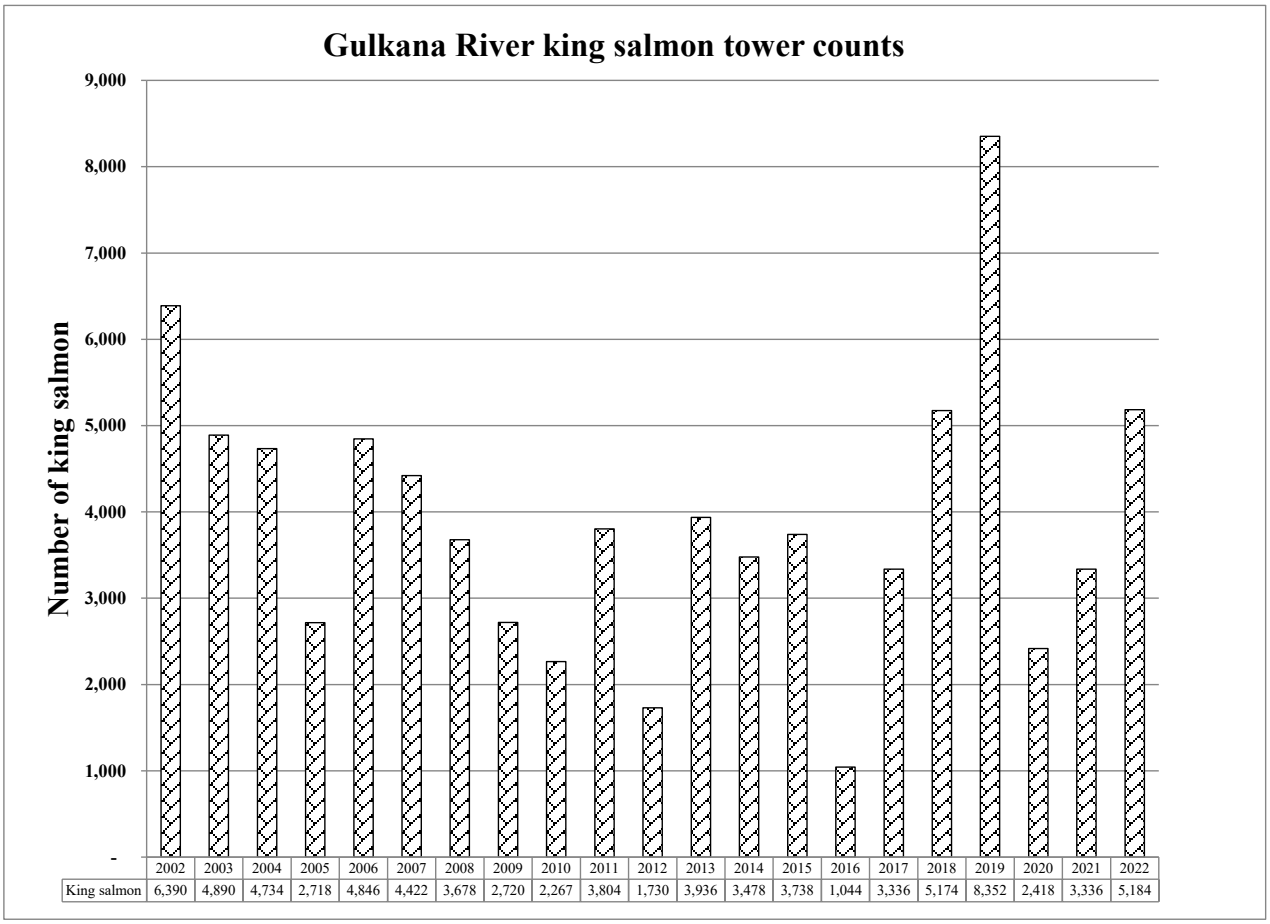

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
King salmon	6,390	4,890	4,734	2,718	4,846	4,422	3,678	2,720	2,267	3,804	1,730	3,936	3,478	3,738	1,044	3,336	5,174	8,352	2,418	3,336	5,184

Figure 1.–Final escapement counts for Chinook salmon.