

**Special Publication No. BOF 2008-11**

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**Customary and Traditional Use Worksheets:  
Upper Copper and Upper Susitna River Area  
Nonsalmon Finfish Species  
and  
Prince William Sound Salmon**

**Prepared by**

**William E. Simeone**

**for the December 2008 Cordova Board of Fisheries meeting**

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December 2008

Alaska Department of Fish and Game

Division of Subsistence



## Symbols and Abbreviations

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### 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 <sup>3</sup> /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

*all commonly-accepted abbreviations*  
e.g., Mr., Mrs., AM, PM, etc.

*all commonly-accepted professional titles* e.g., Dr., Ph.D., R.N., etc.

Alaska Administrative Code AAC  
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)

### Measures (fisheries)

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

### Mathematics, statistics

*all standard mathematical signs, symbols and abbreviations*

alternate hypothesis	H <sub>A</sub>
base of natural logarithm	e
catch per unit effort	CPUE
coefficient of variation	CV
common test statistics (F, t, χ <sup>2</sup> , 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 <sub>2</sub> , etc.
minute (angular)	'
not significant	NS
null hypothesis	H <sub>0</sub>
percent	%
probability	P
probability of a type I error (rejection of the null hypothesis when true)	α
probability of a type II error (acceptance of the null hypothesis when false)	β
second (angular)	"
standard deviation	SD
standard error	SE
variance	
population	Var
sample	var

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**CUSTOMARY AND TRADITIONAL USE WORKSHEETS:  
UPPER COPPER AND UPPER SUSITNA RIVER AREA  
NONSALMON FINFISH SPECIES  
AND  
PRINCE WILLIAM SOUND SALMON**

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December 2008

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## INTRODUCTION

This publication provides 2 worksheets on customary and traditional uses of: 1) nonsalmon finfish species in the upper Copper and upper Susitna river areas, and 2) Pacific salmon *Oncorhynchus* in the general Prince William Sound area, for the Alaska Board of Fisheries during their December 2008 deliberations pursuant to Alaska Statute 16.05.258 (Subsistence use and allocation of fish and game) and Alaska regulation 5 AAC 99.010 (Boards of fisheries and game subsistence procedures).

### PART 1: CUSTOMARY AND TRADITIONAL USE WORKSHEET, NONSALMON FINFISH SPECIES, UPPER COPPER AND UPPER SUSITNA RIVERS

#### INTRODUCTION

In December 2008, the Board of Fisheries will consider Proposal 2, submitted by the Ahtna Tene Nene' Customary and Traditional Committee to address the customary and traditional (C&T) uses of nonsalmon finfish species in the upper Copper and upper Susitna (UCUS) river drainages (Figure 1). There are no C&T findings (neither positive nor negative) for any nonsalmon finfish stocks in these waters. Nonsalmon finfish species most harvested by residents of the area are presented in Table 1. Nonsalmon fishes not listed on Table 1 generally do not occur in the region.

Table 1.–Nonsalmon finfish species available in the Copper River Basin.

Common name	Linnaean name	Ahtna name
Steelhead trout, “dogfish”	<i>Oncorhynchus mykiss</i>	Dadzeli (CL) <sup>a</sup>
Dolly Varden	<i>Salvelinus malma</i>	Ts'engastlaeggi (CLM); dghalk'aazi (W); Its'eli, tsabaey (MR)
Rainbow trout	<i>O. mykiss</i>	T'aan'delk'esi (L); tsabaey (MR)
Lake trout	<i>S. namaycush</i>	Baet
Longnose sucker	<i>Catostomus catostomus</i>	Dahts'adye (CLW); tahts'adiye (M); tats'ade(M)
Sculpin, bullhead	<i>Cottus cognatus</i>	Ts'es t'aaxi
Burbot	<i>Lota lota</i>	Ts'anyae (CLW); ts'aann (M)
Arctic grayling	<i>Thymallus arcticus</i>	Sde't'aeni (CLW); segele (M)
Humpback whitefish	<i>C. pidschian</i>	Luux
Round whitefish	<i>Prosopium cylindraceum</i>	Xasten'
Least cisco	<i>C. sardinella</i>	Xaal ggaay (M, now absent but said to have inhabited the Mentasta Lake area)

Source: Simeone and Kari n.d. [2004].

<sup>a</sup> Ahtna dialects: U = upper Ahtna, C = central Ahtna, M = middle Ahtna, L = lower Ahtna, W = western Ahtna, MR = Matanuska River.

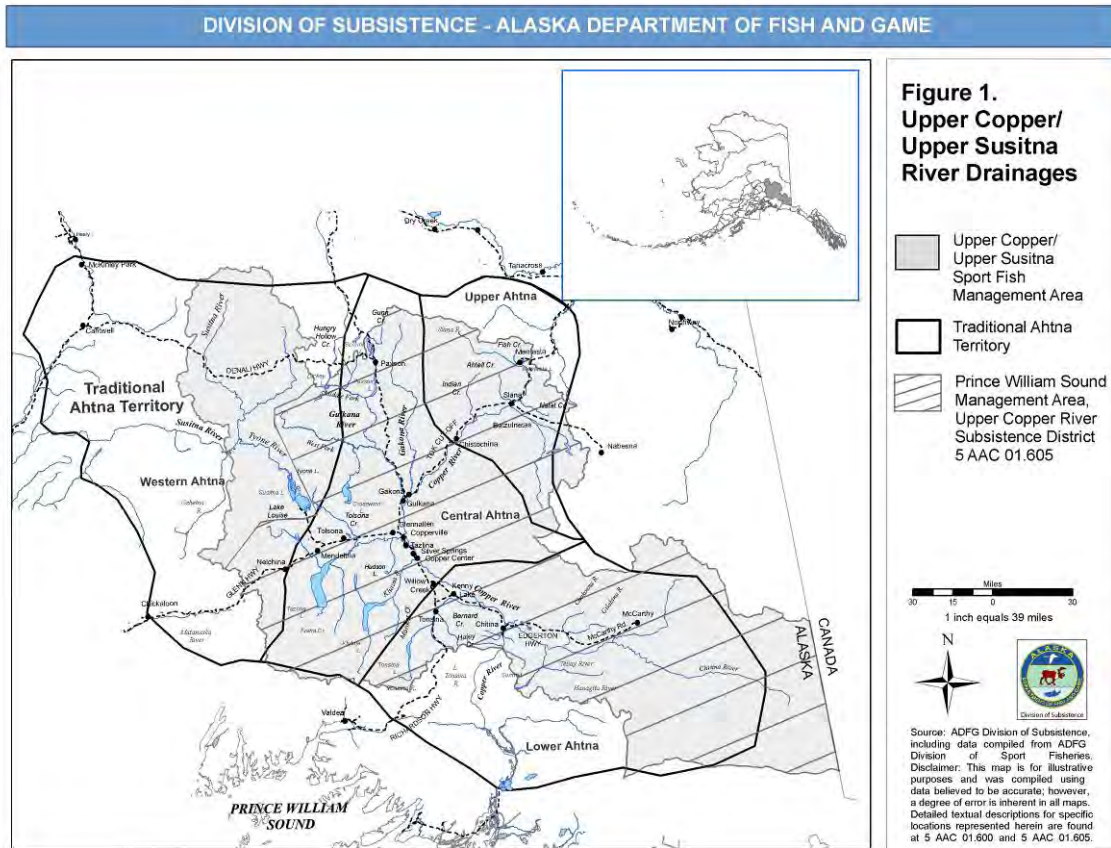


Figure 1.—Upper Copper River and Upper Susitna River drainages, Alaska.

A fish stock means “a species, subspecies, geographic grouping or other category of fish manageable as a unit” (AS 16.05.940 (16)). The Board of Fisheries follows the Joint Boards of Fisheries and Game subsistence procedures in regulation at 5 AAC 99.010 (b) and in statute at AS 16.05.258 (a) to “identify...fish stocks or portions of those...stocks, that are customarily and traditionally taken or used by Alaska residents for subsistence.” The kinds of information required for this analysis are called “the eight criteria.” The Board adopts regulations allowing for subsistence uses only for fish stocks that it finds support customary and traditional uses.

Using the eight criteria, the Board identifies C&T uses of fish stocks by examining a use pattern with a set of criteria (characteristics). It is not possible to describe a use pattern of a fish stock for purposes of a C&T determination without describing how particular groups of people have used that stock. Groups of people and communities establish the use pattern through their activities and perpetuate traditional uses of the fish stock over time. This approach also recognizes that the customary and traditional use pattern of any particular fish stock is embedded within a broader economic, social, and cultural context. Understanding this broader context, including factors that have shaped it over time (its history), is necessary for understanding subsistence uses. Correspondingly, some of the eight criteria pertain directly to the pattern of use and harvest of the particular stock under consideration, but others pertain more broadly to the context in which this C&T pattern has developed and changed. Additionally, understanding this context entails a



comparative approach that enables the C&T pattern to be contrasted with other patterns of use, themselves embedded in contrasting economic, social, and cultural contexts and histories (see also Wolfe 2004<sup>1</sup>).

## **DATA SOURCES AND ORGANIZATION OF THIS WORKSHEET**

This worksheet is based upon the worksheet prepared for the January 1993 meeting of the Alaska Board of Fisheries (Worksheet II-13) (Fall et al. 1993). Two sources of data were used in the preparation of this current worksheet: 1) data from household surveys conducted by the Division of Subsistence in 1982-1983, 1987-1988, and 2001-2002. These data are summarized in Stratton and Georgette 1984, McMillan and Cuccarese 1988, and Simeone and Kari n.d. [2004], and were collected from households throughout the entire Copper River Basin; 2) resident fish species subsistence permits issued by and returned to the ADF&G Glennallen area office. This data set encompasses a 40-year period from 1962-1963 to 2007, and is maintained by the Division of Sport Fish.

Before examining the eight criteria in relation to nonsalmon finfish species it is necessary to provide a general overview of the subsistence use patterns of nonsalmon finfish species established by the Ahtna, who are the original inhabitants of the Copper River Basin. This pattern forms the basis of all customary and traditional uses that have developed in the Basin over the past two centuries.

## **AHTNA CULTURE IN THE LATE 19TH AND EARLY 20TH CENTURIES**

Traditional Ahtna territory ranges over an area of 23,000 square miles and includes the entire Copper River drainage as well as the upper reaches of the Matanuska, Talkeetna, and Susitna river drainages (Figure 1).

In the 19<sup>th</sup> century, Ahtna society was organized into small groups, or bands, that inhabited well-established territories over which they exercised land use rights. These rights were held by common consent and could not be infringed upon without the threat of violence (Reckord 1983:78). Marriage between the groups carried obligations to share (in-laws were obligated to share food); as a result, members of several bands often held access rights to a single territory.

Band territories often included several ecological zones which offered a combination of resources that could be harvested during different seasons. The seasonal round was organized so that Ahtna families spent the summer along the Copper River harvesting salmon and the spring and fall hunting large game and harvesting quantities of whitefishes and Arctic grayling. During the winter and spring, Ahtna fished through the ice for burbot, lake trout, and steelhead trout. Nonsalmon finfish species were crucial to the traditional economy because they were a reliable source of food that could be harvested at practically any time of year, and because they could be relied upon as an alternative to salmon if the salmon runs failed (Simeone and Kari n.d. [2004]).

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<sup>1</sup> In a comprehensive overview of research on subsistence hunting and fishing systems in Alaska, Wolfe (2004: i) concluded that "subsistence is shown to comprise a diverse set of localized systems of food production and distribution, representing relatively unique combinations of ecological, cultural, and economic factors. The report concludes that there is not one subsistence tradition in Alaska, but a multitude of subsistence traditions linked to particular localities. The creators and principal users of these localized subsistence traditions are the long-term residents in the communities and areas where they occur."

Of the nonsalmon finfish species available in Ahtna territory, humpback, or “lake,” whitefish, were the most important to the traditional economy because they could be harvested during much of the year, were very nutritious, and were available in considerable numbers (McPhail and Lindsey 1970:84).

Nonsalmon finfish species figure prominently in Ahtna oral tradition. Fishes that prompt the strongest sense of taboo are lake trout and burbot, 2 species thought to live in a giant form in many of the large lakes of Ahtna country. Over the years, Ahtna elders have mentioned numerous first- and second-hand accounts of giant fish incidents in which herds of caribou and even entire families have been destroyed by the fish. Giant fish are called *ben yïidi*, ‘the one in the lake,’ or *tuu yïi ltaeni*, ‘the one living in the water,’ or *ben ’eltaeni*, ‘the living thing in the lake.’ A theme in giant fish stories is that loud noises can disturb the monsters, often with dire consequences for humans. According to Ahtna elders, Ewan Lake had giant burbot, and Crosswind, Tyone, Dog, Middle, and Tanada lakes had lake trout “as big as a whale.” According to Ahtna oral tradition, giant fish were present until the beginning of the 20th century, but have since disappeared.

## **HISTORICAL BACKGROUND: EVENTS THAT HAVE SHAPED THE PATTERN OF USE IN THE UCUS AREA**

Until the onset of the U.S. involvement in World War II, the Ahtna seasonal round included fishing at lake outlets in the spring and fall for whitefishes and Arctic grayling and fishing for burbot and trout through lake ice in the winter.

The construction of highways in the mid-1940s, which substantially increased the availability of wage employment, a decrease in the price of fur that made it uneconomical to trap, and pressure to keep children in school brought changes to the traditional seasonal round as the Ahtna settled permanently in villages close to the road system. Instead of moving to spring and fall camps, the Ahtna concentrated their subsistence activities along the road system, including fishing for nonsalmon finfish species in lakes and streams close to the road. After statehood, there was a shift from traditional methods such as weirs and traps, which became illegal under state law, toward the use of rod and reel (Reckord 1983:61).

As the state’s population grew, fish populations in lakes and streams along the road system came under increased harvest pressure. In addition, development and improvement of off-road vehicles, particularly snowmachines, increased access to local lakes and further increased pressure on fish populations, most notably on slow-growing species such as lake trout and burbot.

Since statehood, there has been minimal regulation of subsistence fishing for nonsalmon finfish species in the Copper River Basin. A permit is required, with seasons and bag limits determined by the area biologist (5 AAC 01.630, but see below for a synopsis of the regulations). A few people obtained permits from ADF&G but most people harvested nonsalmon finfish species under sport regulations using a rod and reel. Until the late 1970s, state sport fishing regulations for taking nonsalmon species in the Copper River Basin were fairly liberal. Burbot could be harvested using either a setline with up to 15 hooks or by using a rod and reel, and there was no bag limit. In 1979, the daily bag limit for burbot was 15 fish. The daily limit for Arctic grayling and lake trout was 10 fish each,

and the season was open year-round. Under sport fishing regulations, whitefishes could be harvested with a spear year-round. In the late 1980s, conservation concerns prompted the Alaska Board of Fisheries to tighten sport fishing regulations. Tolsona Lake, Hudson Lake, and Lake Louise were closed to all burbot fishing. Conservation concerns have also led to smaller bag limits for lake trout, Arctic grayling, and rainbow trout in lakes not stocked by ADF&G.

The character of the nonsalmon fishery in the Copper River Basin has changed since the Ahtna were the principal users of the resource. Before 1960, the primary species harvested for human consumption were whitefishes and Arctic grayling harvested during the spring and fall. Burbot, steelhead trout, and lake trout were harvested primarily in the winter and spring. After 1960, a new fishing pattern emerged based on the use of rod and reel and setlines to harvest various species of trout, burbot, and Arctic grayling in lakes and streams close to the road system. Whitefishes, however, were not included in this new pattern and continued to be harvested with either gillnet or spear. The results of surveys conducted by the Division of Subsistence in the 1980s and in 2002 show that this pattern of whitefish harvest continues: whitefishes are still harvested for human consumption as well as for dog food, and by a small segment of the local population. More often harvested are rainbow trout and Arctic grayling, harvested from lakes, and burbot and lake trout harvested during the winter in lakes that can be reached by snowmachine.

## **HUMAN POPULATION HISTORY OF THE UCUS AREA**

One factor that has shaped contemporary patterns of use of nonsalmon finfish species in the Copper River Basin is the general accessibility of the area by roads connected to Alaska's population centers at Fairbanks, the Matanuska-Susitna Borough, and Anchorage. Table 2 provides an overview of population estimates for the Copper River Basin, areas connected to the Basin by roads, and for the state, from the 19<sup>th</sup> century through 2007. Figure 2 illustrates the population growth of these areas in relation to population changes in Copper River Basin communities. In the last 2 decades, the population of the Copper River Basin has been relatively stable, while the population of the road-connected areas has grown at a faster rate. Within the Copper River Basin, the non-Native population has steadily increased so that in 2000, non-Natives comprised approximately 72% of the total population (U. S. Census Bureau 2000). Table 3 provides population estimates for Copper River Basin communities for the years in which data presented in this worksheet were collected.

Table 2.—Population of the Copper River Basin, adjacent road-connected areas, and Alaska.

Year	Copper River census subarea <sup>a</sup>	Anchorage Municipality	Matanuska-Susitna Borough <sup>b</sup>	Fairbanks North Star Borough <sup>c</sup>	Southeast Fairbanks census area	Valdez	Alaska
1818	567						
1839	300						
1880	250						33,426
1890	ND						32,052
1900	ND					315	63,592
1910	553		677	7,675		810	64,356
1920	511	1,856	158	2,182		466	55,036
1930	729	2,277	848	3,446		442	59,278
1940	742	3,495	2,354	5,692		529	72,524
1950	808	11,254	3,534	19,409		554	128,643
1960	2,193	54,076	2,320	15,736	605	555	226,167
1970	1,852	124,542	6,509	45,864	4,179	1,005	302,583
1980	2,721	174,431	17,816	53,983	5,676	3,079	401,851
1990	2,763	226,338	39,683	77,720	5,913	4,068	550,043
2000	3,231	260,283	59,322	82,840	6,174	4,036	626,931
2001	3,412	264,840	61,750	83,261	5,906	3,824	632,091
2002	3,378	267,810	64,348	84,749	5,944	3,951	640,522
2003	3,555	273,024	67,532	82,160	5,922	3,894	647,773
2004	3,485	277,810	70,448	85,435	6,143	3,717	657,314
2005	3,494	278,241	74,041	87,650	6,471	3,745	663,661
2006	3,351	283,244	77,274	87,766	6,747	3,675	670,958
2007	3,332	283,823	80,056	90,963	7,022	3,599	676,987

*Sources:* Rollins 1978, for 1818 through 1970; ADOL 1991 for 1980 and 1990; U. S. Census Bureau 2001 for 2000; ADOL (Alaska Department of Labor) 2008 for 2001, 2002, 2003, 2004, 2005, 2006 and 2007.

<sup>a</sup> “Mednovtze” in 1818 and 1830; “Atnah villages” in 1880; no Copper River villages listed for 1890 and 1900; Copper Center District, 1910, 1920; Chitina District 1930, 1940, 1950.

<sup>b</sup> Cook Inlet District (Knik and Susitna) in 1910; Knik, Susitna, and Talkeetna in 1920; Wasilla and Talkeetna districts, 1930; Palmer, Wasilla, and Talkeetna districts, 1940 and 1950.

<sup>c</sup> Fairbanks District, 1910 through 1950.

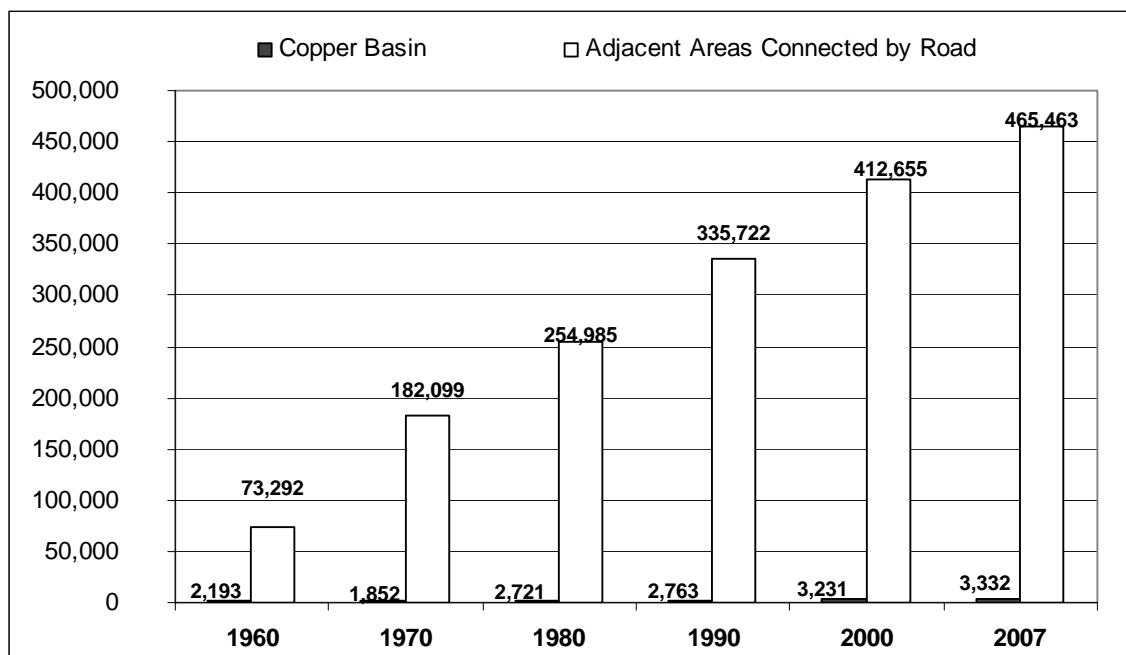


Figure 2.—Population of Copper River Basin and adjacent areas connected by road, 1960-2007.

Sources: Rollins 1978 for 1818 through 1970; ADOL 1991 for 1980 and 1990; U. S. Census Bureau 2001 for 2000; ADOL (Alaska Department of Labor) 2008 for 2001, 2002, 2003, 2004, 2005, 2006 and 2007.

Table 3.—Population estimates for Copper River Basin communities at time of Division of Subsistence research project.

Community	1982	1987	2001
Chistochina	83	78	78
Chitina	43	35	95
Copper Center	434	492	557
Gakona	107	208	251
Glennallen	912	469	572
Gulkana	121	67	63
Kenny Lake	233	320	280
Lake Louise	39	39	86
McCarthy/McCarthy Road	53	38	117
Mendeltna	ND	ND	38
Mentasta	95	77	147
Nelchina	ND	ND	86
Paxson	ND	39	38
Slana	70	57	122
Tazlina/Copperville	ND	365	298
Tolsona	ND	ND	31
Tonsina/Willow Creek	228	298	232
Totals	2,418	2,582	3,091

Sources: ADF&G Community Subsistence Information System (CSIS); ADF&G household survey 2002

## UCUS NONSALMON FISHES REGULATORY HISTORY

Key features of the regulations governing fishing for nonsalmon finfish species in the Copper River Basin from 1963 to 2007 are listed below.

- 1963–The State of Alaska required a permit to harvest whitefishes.
- 1969–The State of Alaska closed Crosswind Lake to subsistence fishing.
- In the Prince William Sound Management Area as defined in 5 AAC 01.605, freshwater fish species may be taken only under the authority of a subsistence fishing permit (5 AAC 01.630(b)). Since 1962, ADF&G has issued 410 permits, mainly for the harvest of whitefishes. Rainbow/steelhead trout taken incidentally by fish wheel or subsistence finfish net gear, except dip net gear, are lawfully taken and may be retained for subsistence purposes. Rainbow/steelhead trout taken by dip net gear must be released immediately and returned to the water unharmed (5 AAC 01.610 (e)).
- Subsistence fishing regulations for portions of the Upper Copper/Upper Susitna Area, namely waters and drainages of the upper Susitna River upstream from the confluence of the Oshetna River, appear in the Cook Inlet Area section of the subsistence fishing regulations (Figure 1). In these waters, gillnets may not be used except for the taking of whitefishes in the Tyone River drainage (5 AAC 01.570(i)), for which a permit is required (5 AAC 01.580). Trout, Arctic grayling, Dolly Varden/Arctic char, and burbot may not be taken in fresh waters (5 AAC 01.575(c)); however, rainbow/steelhead trout taken incidentally in other subsistence finfish net fisheries and through the ice are lawfully taken and may be retained for subsistence purposes (5 AAC 01.560 (a)).
- Most other nonsalmon finfish species, including lake trout, Arctic grayling, and steelhead trout are harvested under sport fishing regulations with rod and reel. Area sport fishing regulations allow the harvest of burbot using a closely attended setline with a total of 15 hooks or the daily bag limit of burbot in the waters being fished (5 AAC 52.023 (b)). State subsistence regulations allow for a wide variety of gear types, but, with few exceptions, do not allow the use of rod and reel.

### CRITERION 1: LENGTH AND CONSISTENCY OF USE

**A long-term consistent pattern of noncommercial taking, use, and reliance on the fish stock or game population that has been established over a reasonable period of time of not less than one generation, excluding interruption by circumstances beyond the user’s control, such as unavailability of the fish or game caused by migratory patterns.**

The Ahtna Athabascan Indians have lived in the Copper River Basin for at least 1,000 years. Nonsalmon finfish species, including humpback whitefish, Arctic grayling, various species of trout, and burbot, played a significant role in the Ahtna diet. Of these, humpback, or “lake,” whitefish were the most important because they were plentiful, and because they were considered to be very nutritious due to high oil content.

Division of Subsistence research revealed that Ahtna elders who were youths during the 1920s and 1930s believed the impact of nonsalmon finfish species to be very significant in the local economy. The harvest estimates provided by the elders were distributed in a wide range, a variance due, in part, to the availability of other fish and game species. For example, one elder estimated that in the 1920s and 1930s half of his family's fish harvest was composed of sockeye salmon *O. nerka* while the other half was composed of humpback whitefish and Arctic grayling. This elder estimated that his family harvested, on an annual basis, between 2,000 and 4,000 Arctic grayling and whitefishes, about 1,000 longnose suckers, which were used primarily for dog food, and lesser amounts of burbot and lake trout. Expanding this elder's estimate generates an annual harvest estimate of approximately 3,000 fish per year for Arctic grayling and whitefishes each. Using a standard Division of Subsistence conversion factor of 0.7 for Arctic grayling and 0.9 for whitefishes, a harvest estimate expanded to include an extended family would be approximately 2,100 lbs of Arctic grayling and 2,700 lbs of whitefishes per year. On the other hand, another elder estimated that her family dried between 300 and 400 lbs of whitefishes each year and harvested about 1,000 longnose suckers, which they used for dog food. If her harvest estimate for whitefishes was combined with that of the first elder (2,700 + 350 lbs), the average annual harvest would be about 1,525 lbs of whitefishes per year. And a third elder reported that his or her annual harvest of whitefishes in Tyone Lake resulted in a cube of fish 8 feet on each side (Reckord 1983:33-34).

As the Ahtna became involved in the wage economy, they settled permanently in villages along the Richardson and Glenn highways. By the mid-1950s, most Ahtna families no longer visited the old lakeside fishing sites and instead harvested nonsalmon finfish species in streams and lakes located close to the road system. At the same time, they also stopped using their traditional harvest methods of weirs and traps, which became illegal under state law, and turned to rod and reel, which was an efficient method for harvesting the daily bag limit when the fish were migrating (Reckord 1983:61).

Household surveys conducted by the Division of Subsistence in 1982, 1987, and 2002 indicated that Copper River Basin residents continued to harvest nonsalmon finfish species but at lower levels than during the 1920s and 1930s. Households in Chistochina, Copper Center, Gakona, Glennallen, Gulkana, Kenny Lake, Lake Louise, and Mentasta harvested an average of 58 lbs of nonsalmon finfish species in 1982, and 52 lbs in 1987 (ADF&G Community Subsistence Information System (CSIS)<sup>2</sup>). In 2002, the average household harvest for these communities was 22 lbs (Simeone and Kari n.d. [2004]). Table 4 provides comparative data on the harvest of Arctic grayling, lake trout, rainbow trout, and whitefishes for selected Copper River Basin communities for 1982, 1987, and 2002.

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<sup>2</sup> <http://www.subsistence.adfg.state.ak.us/CSIS>

Table 4.–Comparison of community harvests of nonsalmon finfish species, usable pounds, Copper River Basin communities, 1982, 1987, 2001.

<b>1982</b>					
Communities	Arctic grayling	Lake trout	Rainbow trout	Whitefishes	Total
Chistochina	308	62	0	142	512
Copper Center	475	334	214	138	1,161
Gakona	598	83	135	259	1,075
Glennallen	1,506	506	13	113	2,138
Gulkana	269	62	68	135	534
Kenny Lake	261	0	261	53	575
Lake Louise	234	459	128	1,206	2,027
Mentasta	167	0	103	146	416
<b>1987</b>					
Communities	Arctic grayling	Lake trout	Rainbow trout	Whitefishes	Total
Chistochina	315	228	0	382	925
Copper Center	1,075	300	114	88	1,577
Gakona	507	340	251	193	1,291
Glennallen	1,482	119	1,538	191	3,330
Gulkana	145	7	12	158	322
Kenny Lake	697	1,699	324	102	2,822
Lake Louise	97	340	0	509	946
Mentasta	298	0	0	1,345	1,643
<b>2001</b>					
Communities	Arctic grayling	Lake trout	Rainbow trout	Whitefishes	Total
Chistochina	129	167	0	58	354
Copper Center	563	256	1,177	488	2,484
Gakona	349	129	133	980	1,591
Glennallen	340	177	488	142	1,147
Gulkana	252	0	58	0	310
Kenny Lake	286	26	664	0	976
Lake Louise	161	126	36	1,891	2,214
Mentasta	327	13	0	612	952

Sources: ADF&G CSIS; ADF&G household survey 2002.

In 2001-2002 the per capita harvest of nonsalmon finfish species for all Copper River Basin communities combined was 6.3 lbs of usable meat. As in the past, whitefishes were the primary species harvested (4,570 lbs), followed by rainbow trout (3,959 lbs), Arctic grayling (3,758 lbs), and burbot (2,852 lbs).

A majority of households within the Copper River Basin use nonsalmon finfish species. Table 5 and Figure 3 provide comparative data for 1982, 1987, and 2001 in terms of the percentage of households using nonsalmon finfish species, the per capita harvest, and the estimated total harvest.



Table 5.–Percentage of households using nonsalmon finfish species, per capita harvests, and estimated harvests of nonsalmon fishes, Copper River Basin communities, 1982, 1987, 2001.

Communities	Percentage of households using			Per capita harvest, lbs			Estimated harvest, lbs		
	1982	1987	2001	1982	1987	2001	1982	1987	2001
Chistochina	63%	78%	66%	9	28	7	758	2,199	533
Chitina	65%	83%	43%	8	25	3	349	902	240
Copper Center	44%	78%	47% <sup>a</sup>	23	6	6 <sup>a</sup>	10,020	3,317	3,257 <sup>a</sup>
Gakona	91%	69%	58%	25	11	8	2,783	2,476	2,038
Glennallen	58%	62%	38%	6	13	3	6,009	6,152	1,637
Gulkana	44%	70%	54%	11	9	7	1,408	629	431
Kenny Lake	66%	88%	59%	2	15	5	670	4,993	1,415
Lake Louise	100%	100%	90%	75	40	32	2,963	1,569	2,738
McCarthy	76%	88%	53% <sup>b</sup>	7	35	3 <sup>b</sup>	398	1,367	379 <sup>b</sup>
Mentasta	89%	83%	75%	5	26	7	559	2,059	967
Slana	81%	86%	88%	18	34	18	1,301	1,943	2,198
Tazlina	ND	51%	38% <sup>c</sup>	ND	18	6 <sup>c</sup>	ND	6,741	1,756 <sup>c</sup>
Tonsina	80%	68%	38%	8	8	5	1,911	2,492	352

Sources: ADF&G CSIS; ADF&G household survey 2002.

<sup>a</sup> Includes Copper Center and Silver Springs.

<sup>b</sup> Includes McCarthy and McCarthy Road.

<sup>c</sup> Includes Tazlina and Copperville.

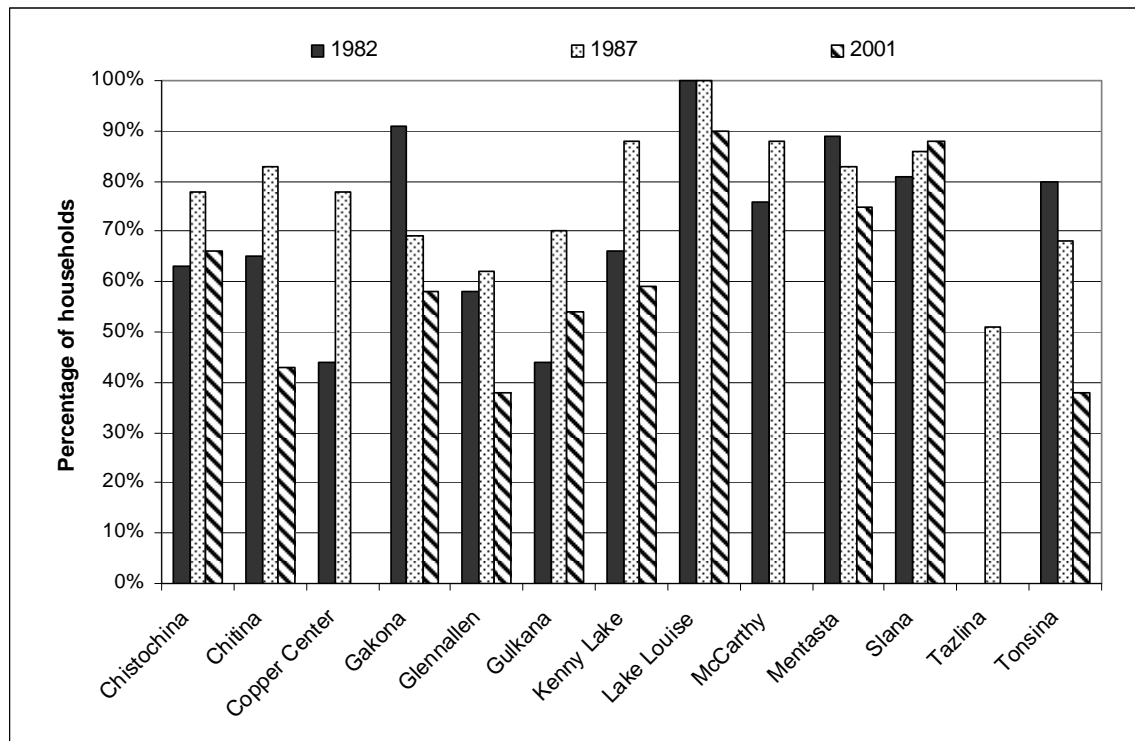


Figure 3.–Percentage of households using nonsalmon finfish species, Copper River Basin communities, 1982, 1987, and 2001.

Although most nonsalmon finfish species are harvested under sport regulations with rod and reel, the ADF&G Glennallen area office has issued subsistence permits since the early 1960s. Table 6 shows that since 1962, ADF&G has issued a total of 410 subsistence permits resulting in a harvest of almost 40,000 whitefishes and lesser amounts of Arctic grayling, trout, and burbot.

Table 6.—Number of permits issued, estimated reported subsistence harvest of nonsalmon fishes, Copper River Basin, 1962-2007.

Year	Residence of permittees			Reported harvest					
	Number of permits	Basin	Non-basin	Whitefishes	Longnose suckers	Dolly Varden	Lake trout	Arctic grayling	Burbot
1962-1963	2	2	0	0	2				
1964	9	3	6	2	2				
1965	6	2	4	70					
1966	12	1	11	317					
1967	18	ND	ND	298					
1968	15	5	10	847	2	704	2		
1969	10	2	8	260			2		
1975	1	0	1	0					
1976	7	0	7	503					
1977	10	1	9	324					
1978	11	3	8	533			6		
1979	12	1	11	412	1,504				
1980	16	3	13	624					
1981	10	2	8	299					
1982	12	2	10	440	5				
1983	12	4	8	393					
1984	9	3	6	789	5		1		1
1985	12	2	10	515					
1986	14	1	13	832	1				
1987	9	5	4	1,371	3		1		
1988	14	12	2	760					
1989	11	8	3	618			8	6	2
1990	8	8	0	849			5	4	4
1991	9	7	2	1,125			4	1	1
1992	9	5	4	898			2	1	
1993	7	5	2	1,074			3	2	4
1994	5	ND	ND	1,556					
1995	7	5	2	2,934			2	2	5
1996	8	8	0	2,104	39				3
1997	9	7	2	1,380	58				
1998	7	5	2	2,032	7		1		
1999	8	6	2	1,382	2		1		
2000	9	6	3	1,974	6				
2001	9	6	3	1,670	36		2		2
2002	11	8	3	1,321					
2003	13	ND	ND	1,142	9		2	2	8
2004	11	7	4	2,185	8		15		
2005	17	7	10	1,653	3		10	1	
2006	13	6	7	1,070			1		2
2007	18	7	11	3,094	4		3		2
Totals	410	165	209	39,650	1,696	704	71	19	34
Avg. (1998-2007)	11	5	4	1,752					

Source: ADF&G Glennallen area office.

## **CRITERION 2: SEASONALITY**

### **A pattern of taking or use recurring in specific seasons of each year.**

The traditional seasonal round included fishing for Arctic grayling and whitefishes in the spring and fall in lake outlets or small streams where fish traps could be deployed. Burbot, lake trout, and steelhead trout were harvested primarily during the winter and spring by jigging or spearing through the ice (Simeone and Kari n.d. [2004]). This seasonal pattern is followed by Copper River Basin residents today. Whitefishes are speared during the fall, usually in October (Stratton and Georgette 1984:164), or harvested during the winter using gillnets under the ice. Arctic grayling are taken in the spring and fall with rod and reel (Reckord 1983:103,155), and burbot and lake trout are harvested while fishing through the ice during winter (Simeone and Kari n.d. [2004]).

## **CRITERION 3: MEANS AND METHODS OF HARVEST**

### **A pattern of taking or use consisting of methods and means of harvest that are characterized by efficiency and economy of effort and cost.**

Historically, the Ahtna harvested whitefishes and Arctic grayling in fish traps, dip nets, gillnets or with spears. Lake trout were harvested with hook and line. Burbot were most easily harvested in the winter using a jig through lake ice, but could also be taken in fish traps at certain times of the year (Simeone and Kari n.d. [2004]).

Household survey data collected by the Division of Subsistence in the 1980s indicated that most nonsalmon finfish species were harvested using rod and reel or a hook and line variation of such. Spears were used to harvest whitefishes in Mentasta Lake and the Slana River (Reckord 1983:61), and a few residents occasionally used gillnets (Stratton and Georgette 1984:152). Household survey data collected in 2002 showed a similar pattern, with most respondents reporting the use of rod and reel and ice fishing to harvest nonsalmon finfish species. In addition, respondents reported using gillnets, dip nets, setlines, fish spears, and fish wheels. Table 7 provides data on methods used to harvest nonsalmon finfish species in each of the Copper River Basin communities.

Table 7.–Nonsalmon fish species, pounds harvested by gear type, Copper River Basin communities, 2001.

Method <sup>a</sup>	Chistochina	Chitina	Copper Center	Glennallen	Gulkana	Mentasta	Kenny Lake	Lake Louise	McCarthy Road
Gillnet	33	0	0	0	0	23	0	1865	0
Dip net	0	10	0	0	0	0	0	0	2
Fish wheel	4	0	229	0	44	0	16	0	0
Setline	0	0	0	0	0	15	0	0	0
Other subsistence method	30	0	409	133	0	501	0	0	10
Ice fishing	242	23	782	150	108	0	59	474	272
Rod and reel	224	208	1,837	1,354	279	428	1,342	400	94

Method	Willow Creek	Nelchina	Paxson	Sourdough	Slana	Tazlina	Tolsona	Gakona	Mendeltna	Tonsina
Gillnet	0	0		0	0	0	0	927	0	0
Dip net	0	0		0	0	0	0	0	0	0
Fish wheel	0	0		0	106	87	0	0		0
Setline	0	0		0	0	12	5	0	0	0
Other subsistence method	0	0		0	114	161	0	58	0	0
Ice fishing	24	51		24	48	504	18	452	76	24
Rod and reel	440	475		217	1,931	992	62	602	84	329

Source: ADF&G Division of Subsistence household survey 2002.

<sup>a</sup> Under state regulations subsistence gear includes spear (used for harvesting whitefish in the Slana River), longline or setline, jigging gear, fish wheel, dip net, and gillnet. Setlines or longlines are allowed either under sport fishing regulations or personal use regulations. Rod and reel is allowed only under sport fishing regulations. Federal subsistence regulations allow the use of rod and reel.

Figure 4 shows combined community harvests by gear type. Note that a majority of the harvest was taken by rod and reel, followed by jigging through the ice and gillnet.

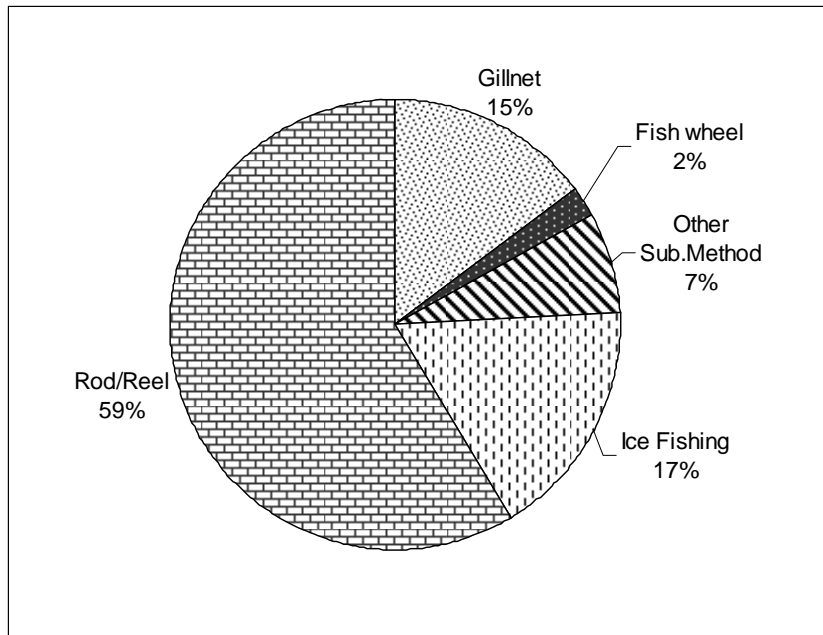


Figure 4.—Combined community harvests of nonsalmon finfish species by gear type, 2001.

Source: ADF&G Division of Subsistence household survey 2002.

#### **CRITERION 4: GEOGRAPHIC AREAS**

**The area in which the noncommercial, long-term, and consistent pattern of taking, use, and reliance upon the fish stock and game population has been established.**

Historical Ahtna fishing sites for nonsalmon finfish species are scattered throughout the Copper River Basin. Locations of some of the more important fishing sites are provided on Figures 5 through 8, while a more complete list is provided in Tables 8 through 10. Figure 5 is an orientation map showing the locations within the Copper River Basin of Figures 6, 7, and 8. Letters on the maps represent the species of fish harvested at each site.

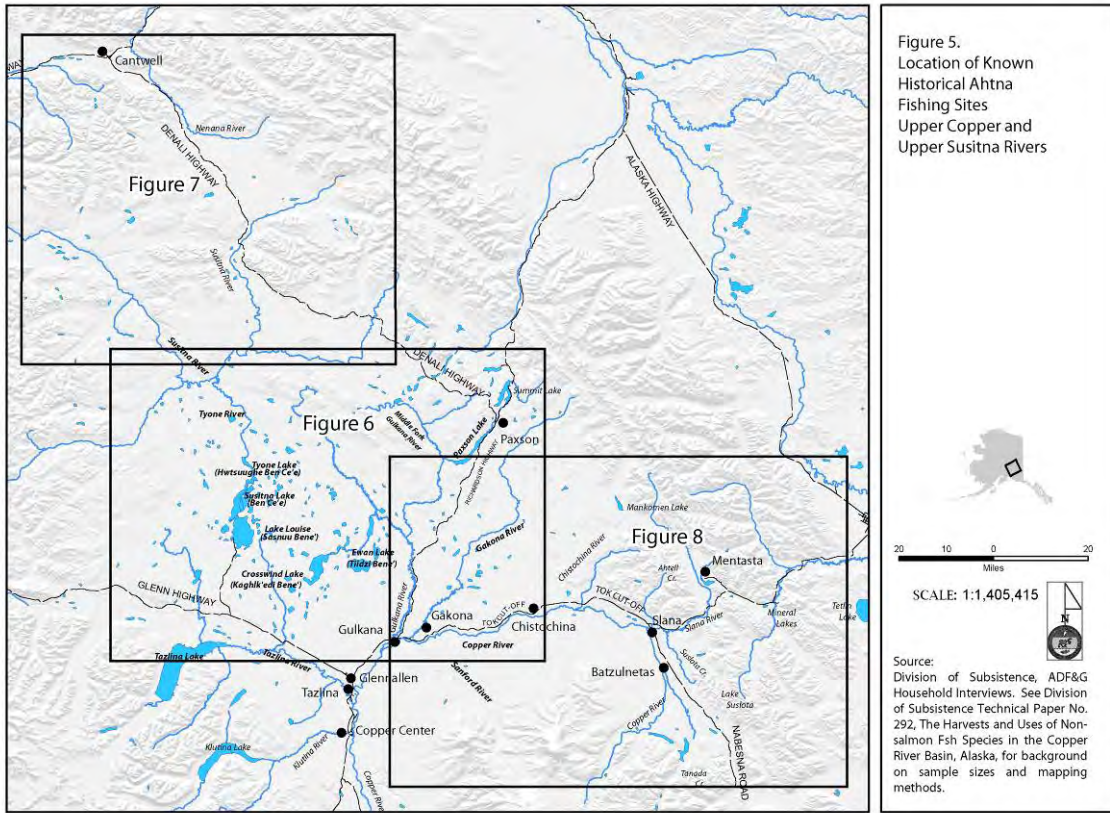


Figure 5.—Location of known historical Ahtna fishing sites, Upper Copper and Upper Susitna rivers.

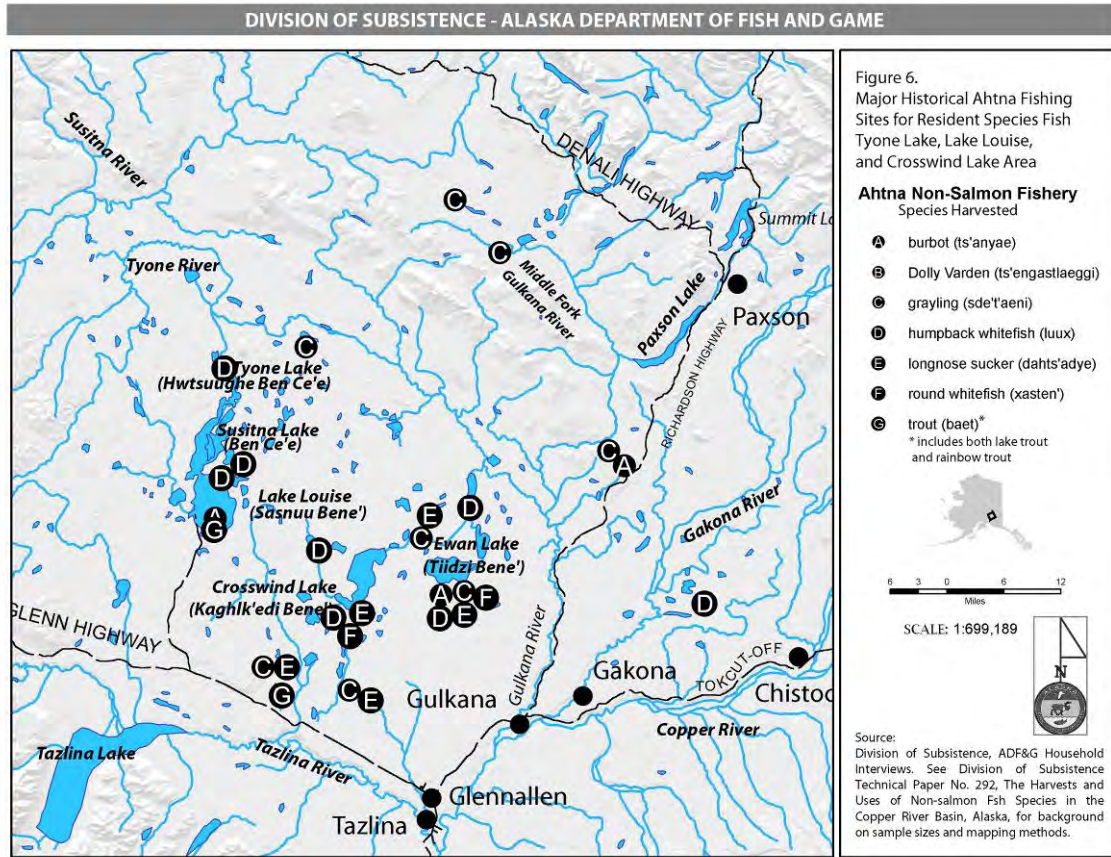


Figure 6.–Major historical Ahtna fishing sites for nonsalmon finfish species, Tyone Lake, Lake Louise, and Crosswind Lake areas.

Table 8.–Major historical Ahtna fishing sites for nonsalmon finfish species, Tyone Lake, Lake Louise, and Crosswind Lake areas.

Ahtna name	Common name	Species present
Kaghalk'edi Bene'	Crosswind Lake	Humpback and round whitefish, longnose sucker, lake and rainbow trout, Arctic grayling, and burbot
Liidzi Bene' ("Upper Water Lake")	Ewan Lake	Round whitefish, burbot, Arctic grayling, and longnose sucker
Sasnuu Bene' ("Sand Island Lake")	Lake Louise	Whitefishes, longnose sucker, lake and rainbow trout, Arctic grayling, and burbot
Hwstuughe Ben Ce'e ("Lower Big Lake")	Tyone Lake	Whitefishes, Arctic grayling
Ben K'atgge ("between the lakes")	Tyone Village	
Nekey'dghinic'et'den	[Unnamed isthmus on Lake Louise]	
K'estsiik'eden	"Outlet place" at Crosswind Lake	
'Usts'eni Na' ("Forward-side Creek")	West Fork Gulkana River	
Bendziina' ("Head lake Creek")	Middle Fork Gulkana River	
C'uul C'ena ("Tearing River")	Gulkana River	
Kutaghi'aa Na' ("where bay extends in")	Unnamed stream on the west side of Crosswind Lake	} Humpback and round whitefish, longnose sucker, lake and rainbow trout, Arctic grayling, and burbot
Kutaghi'aa Bene'	Unnamed lake off Crosswind Lake	
I'dzak'ehi Bene'	Salmon Berry Lake	

-continued-

**Table 8. Page 2 of 2.**

Ahtna name	Common name	Species present
Nkaal Bene' ("tracks")	Game Trail Lake	} Humpback and round whitefish, longnose sucker, lake and rainbow trout, Arctic grayling, and burbot
I'dzak'ehi Na' ("Salmonberry Lake")	Salmon Berry Creek	
Kanilen Na' ("Flows-through Creek")		
Taltsogh Na'	Tolsona Creek	Those Arctic grayling that come up from the Tazlina
Sitelyaa Bene'	Moose Lake	Arctic grayling, sucker and rainbow trout
Ndez'aayi	Island Lake	None
Tezdlen Na'	Tazlina River	Salmon, small populations of whitefishes
Bendil Bene'	Tazlina Lake	
Bendil Na'	Mendeltna Creek	Sockeye salmon, Arctic grayling
Bendaes Bene'	Old Man Lake	Those sockeye salmon from the Tazlina River
Hwniindi Ndaa' Bene' & Hwdaandi Ndaa' Bene'	Twin Lakes	} Arctic grayling and longnose sucker
Ciisi K'ena	Moose Creek	
Hwghil'aa Bene'	Fish Lake	} Humpback and round whitefish, Arctic grayling, longnose sucker
C'obeni ("Off-lake")	Middle Lake	
C'obeni Na' ("Off-lake Creek")	Middle Lake Outlet	
Li'ke Bene' ("Dog's Lake")	Dog Lake	
Tak'ats' Bene' ("Springwater Lake")	Paxson Lake	Salmon, Arctic grayling, whitefishes, lake trout
Hwdagguus Bene' ("Celerymouth Lake")	Meiers Lake	Arctic grayling and small populations of salmon
Bendzii Bene' ("Head-lake Lake")	Dickey Lake	Chinook salmon
Natazghot' Na' ("Bentwater Stream")	Unnamed stream into McLaren River	Arctic grayling
Cots' Bene' ("Down Feathers Lake")	Unnamed lake off McLaren River	Arctic grayling
Skosii'den	Unnamed lake southwest of Lake Louise	Whitefishes
K'ey Tsaay Bene' ("Dwarf Birch Lake")	Hogan Hill Lake	Arctic grayling, longnose sucker, small populations of whitefish, burbot
K'ey Nuu Na' ("Birch Island Creek")	Unnamed creek flowing into the south end of Ewan Lake	Arctic grayling, burbot, longnose suckers, and whitefishes
Taatggye Na' ("Upper water Creek")	Unnamed creek flowing into the south end of Ewan Lake	Arctic grayling, longnose suckers, burbot
Kuyxi Na'	"Whistler Creek"	Arctic grayling, longnose suckers, burbot
Nac'etkasi Bene'	Unnamed lake northeast of Tyone Lake	Longnose suckers
Da'sc'elaes Na'	"Boat Creek"	Whitefishes
Niygge Bene'	Unnamed lake northeast of Tyone Lake	Arctic grayling
T'ox Na' Ce'e Bene'	Poplar Grove Creek Lake	Arctic grayling
Scent'aa Na'	Unnamed creek at Mile 142 Richardson Highway	Arctic grayling
Taltsogh Cae'e ("Yellow Water Mouth")	Tom Neeley's camp on the Gulkana Rive	Arctic grayling, burbot, and longnose suckers
Hwggandi C'ezaeni Bene' ("Downriver [?] Lake")	Second Hill Lake	Humpback whitefish
C'ezaeni Na'	Unnamed creek outlet of Second Hill Lake	Humpback whitefish
Hwtsiindi C'ezaeni Bene' ("Upriver [?] Lake")	First Hill Lake	
Nek'ey'laay Bene'	Horseshoe Lake	Whitefishes
Nitil Bene'	Tangle lakes, Upper Tangle Lake	Lake trout

Source: Simeone and Kari n.d. [2004].



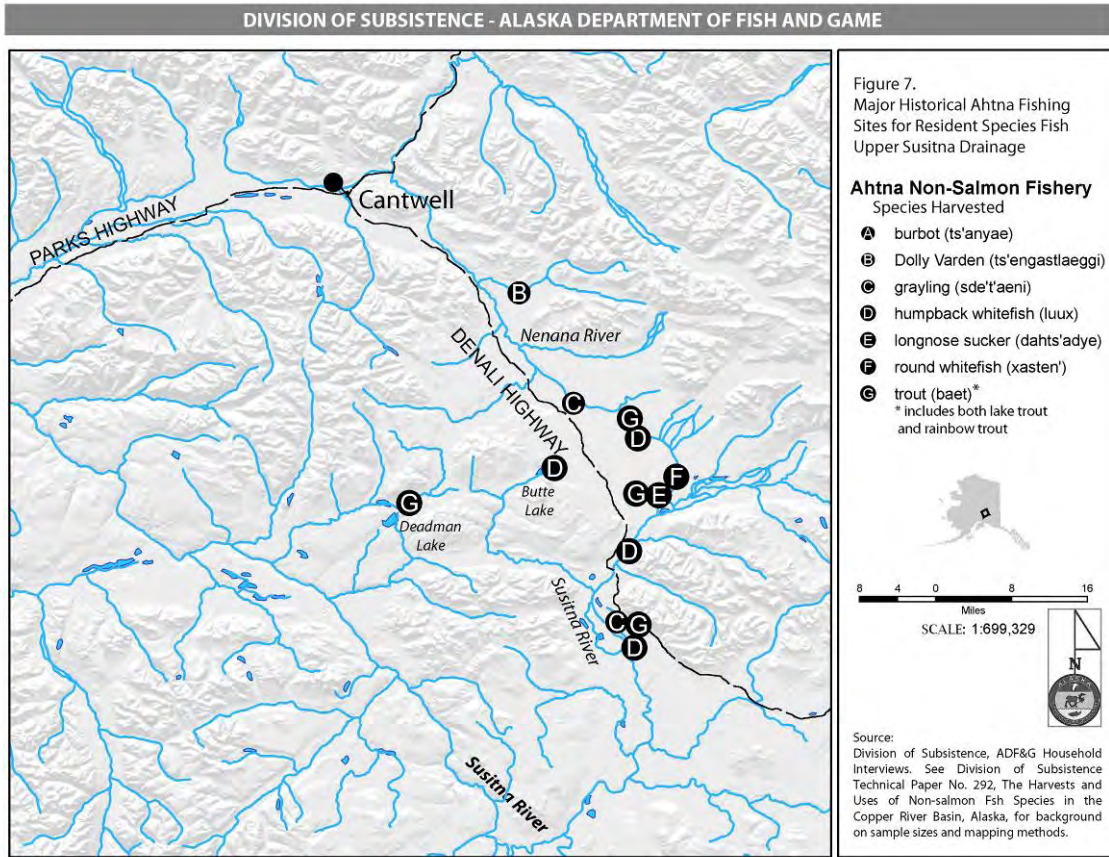


Figure 7.–Major historical Ahtna fishing sites for nonsalmon finfish species, Upper Susitna drainage.

Table 9.–Major historical Ahtna fishing sites for nonsalmon finfish species, Upper Susitna drainage.

Ahtna name	Common name	Species present
C'ilaan Na'	Valdez Creek	
Xanc'eltl'aes Na'	“Fish Creek”	Round and humpback whitefish
Xanc'eltl'aes Bene'	“Peter's Lake” or “Fish Lake”	
Ben Datgge' Na'	“Upper lake creek”	Round whitefish
Ben'sdeltsiini	Snodgrass Lake	Round whitefish
Bedlaexi Bene'	Roosevelt Lake	Dolly Varden and lake trout
Hwniidi Bene'	Butte Lake	Whitefishes and burbot
Nts'ezi Bene'	Tsusena Lake	Lake trout
Kacaagh Bene'	Deadman Lake	Lake trout
Benhwil'aade	Unnamed lake west of Susitna River	Whitefishes
Taben'aa Bene'	Unnamed lake of West Fork of Susitna River	Whitefish
Cetakolyaes Cene'	Monahan Flat	Arctic grayling
Bes Ggeze Na'	Wells Creek	Sculpin, bullhead

Source: Simeone and Kari n.d. [2004].

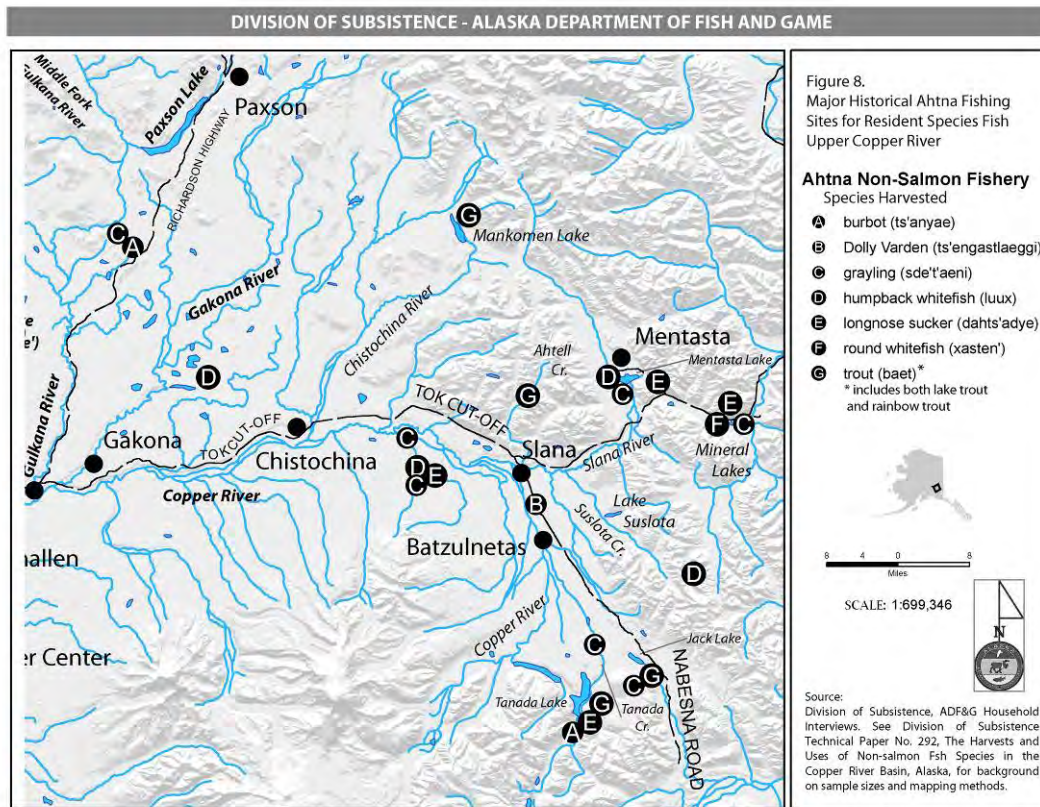


Figure 8.—Major historical Ahtna fishing sites for nonsalmon finfish species, Upper Copper River.

Table 10.—Major historical Ahtna fishing sites for nonsalmon finfish species, Upper Copper River.

Ahtna name	Common name	Species present
Mendaes Menn'	Mentasta Lake	Sockeye salmon, humpback whitefish; historically, least cisco, Arctic grayling, burbot
Mendaes Na'	Mentasta Creek	
Stl'aa Na'	Slana River	Humpback and round whitefish
Tak'ats Na'	Rufus Creek	Dolly Varden
Natael Na'	Tanada Creek	Arctic grayling and sockeye salmon
Tanaadi Menn'	Tanada Lake	Sockeye salmon, lake trout, burbot, Arctic grayling
Tadinihts'aegge Menn'	Jack Lake	Arctic grayling, rainbow trout
Sasluuggu' Menn'	Suslota Lake	Whitefishes
Di'idaedl Na'	Indian River	Chinook salmon
Tsiis Tl'edze' Na'	Chistochina River	Sockeye and Chinook salmon
Ggax KuNa'	Gakona River	Sockeye salmon
Sasluuggu'	Suslota Village	
Men Tl'ets	Indian Pass Lake	Lake trout
Tatgga Bene'	Mankomen Lake	Lake trout
Tsabaey Na'	Unnamed creek near Cobb Lake	Arctic grayling
Tsabaey Na'	Fish Creek	Round and humpback whitefish, longnose suckers, Arctic grayling

-continued-

**Table 10. Page 2 of 2.**

Ahtna name	Common name	Species present
Tacdlaxa Na'	Mabel Creek	Round and humpback whitefish, longnose suckers, Arctic grayling
Men Tac'iltende	Mineral Lake	Arctic grayling, round whitefish, burbot
Nedzighilen Bene'	"Gene Lake"	Whitefishes

*Source:* Simeone and Kari n.d. [2004].

The heaviest concentration of historical Ahtna fishing sites was located within the territory of the Central Ahtna (Figure 6), which was between the upper Susitna and upper Gulkana river drainages, in the vicinity of Tyone Lake, Lake Susitna, Lake Louise, Crosswind Lake, and Ewan Lake. Several species of nonsalmon finfish species could often be harvested at a single site. Figure 7 shows where nonsalmon finfish species were harvested in the upper Susitna drainage and Figure 8 shows sites on the upper Copper River.

Table 11 lists all the locations where respondents of a 2002 Division of Subsistence household survey said they harvested nonsalmon finfish species in 2001, in alphabetical order, as well as the type of transportation used. Note that many of these fishing sites are the same as those historically used by the Ahtna, which are listed on Tables 8 through 10. Only a few are located on federal land, specifically on Tanada, Nelson, Silver, and Strelna lakes. Sites located on the Copper River are the locations of fish wheels where users reported a harvest of nonsalmon species on their permits. Residents traveling on snowmachines more frequently fish the lakes off the road system.

Table 11.—Reported harvest locations for nonsalmon finfish species, Copper River Basin communities, 2001.

Location	Name
2 Mile Lake (aka Second Lake) - Chitina Road	Little Lake Louise
3 Mile Lake (aka Third/Three Mile Lake) - Chitina Road	Little Tonsina River
First Lake 135 (aka One Mile Lake) - Chitina Road	Little Woods Creek - Mile 154 Glenn Highway
46.9 Mile Lake - Richardson Highway	Tonsina River - upper and lower
Ahtell Creek - Tok Cutoff	Mankomen Lake - upper Chistochina drainage
Arizona Lake - Glenn Highway	Meiers Lake - Richardson Highway
Buffalo Lake - Mile 156 Glenn Highway	Mendeltna Creek - Glenn Highway
Cache Creek - Glenn Highway	Mentasta Creek
Caribou Lake - North of Glenn Highway	Mentasta Lake
Carlson Lake - Tok Cutoff	Mineral Lakes - Tok Cutoff
Chitina River	Moose Creek - West Fork of Gulkana River
Clarence Lake - Northwest of Lake Louise near the Susitna River	Moose Creek - Glenn Highway, stocked
Coleman Creek	Old Road Lake
Copper Lake – fly-in or all-terrain vehicle (ATV)	Paxson Lake
Copper River - Copper Center freshwater fishery	Pippin Lake - Edgerton Cutoff
Crosswind Lake - stocked by ADF&G – fly-in or ATV	Poplar Grove Lake - Richardson Highway
Crosswind Lake Tributaries – fly-in or ATV	Pup Lake - south of outlet at Crosswind Lake
Dick Lake - east of Richardson Highway	Ranger Lake
Dog Lake (flows into Lake Louise)	Rock Creek - Denali Highway
Emerald Lake - Wrangell Mountains – fly-in	Rock Lake - east of Crosswind Lake
Ewan Lake – fly-in or ATV	Round Lake - east of Crosswind Lake
Fielding Lake - Richardson Highway, stocked	Rufus Creek - Nabesna Road
Fish Creek (tributary to Mentasta Lake)	Ryan Lake
Fish Creek - Tok Cutoff	Sculpin Lake (aka Nelson Lake) - McCarthy Road, stocked
Fish Lake	Silver Lake (aka Van Lake) - McCarthy Road, stocked
Gakona River	Slana River
George Lake - Mile 155 Glenn Highway	Snowshoe Lake- Glenn Highway
Gravel Pit Lake (aka Squirrel Creek Gravel Pit)	Sourdough Creek- Richardson Highway
Grizzly Creek	South Lake (northeast of Palmer)
Grizzly Lake - Tok Cutoff	Strelna Lake - McCarthy Road
Gulkana River - float Sourdough to Richardson Highway	Sucker Lake - south of Glenn Highway
Gulkana River	Summit Lake (near Paxson)
Gulkana River - float Paxson to Sourdough Campground	Susitna Lake
Gulkana River - other fishing below Paxson and Summit lakes	Susitna River (upper portion)
Hanagita lakes – fly-in	Tanada Creek
High Lake - east of Tazlina Lake, stocked	Tanada Lake
Hudson Lake – fly-in or ATV	Tangle Lakes - Denali Highway
Indian Pass Lake – fly-in or ATV	Tazlina Lake
Indian River - Tok Cutoff	Tex Smith Lake - Glenn Highway, stocked
Jack Creek - Nabesna Road	Tiekle River - ATV
Jan Lake - southeast of Lake Louise	Tolsona Creek - stocked by ADF&G
Upper and Lower Kaina Creek/River - east of Tazlina Lake	Tonsina Lake
Kaina Lake- fly-in or ATV	Tonsina River (aka Lower Tonsina River)
Klutina Lake - ATV	Town Lake - Chitina
Klutina River - boat or by foot	Tyone Creek
Lake Dinty- Lake Louise area	Tyone Lake
Lake Louise - stocked by ADF&G	Upper Kaina Creek (aka Kaina Creek/River)
Lake Susitna - stocked by ADF&G, boat or fly-in	Upper Susitna River (aka Susitna River)
Landmark Gap Lake - 25 miles north of Denali Highway	Willow Creek (23 miles northeast of Paxson)
Leila Lake - Glenn Highway, Tahneeta Pass	Willow Creek (Richardson Highway, 13 miles north of Tonsina)
Little Tok River, Tok Cutoff	Woods Creek - Glenn Highway

Source: ADF&G Division of Subsistence household survey 2002.

## **CRITERION 5: MEANS OF HANDLING, PREPARING, PRESERVING, AND STORING**

**A means of handling, preparing, preserving, and storing fish or game that has been traditionally used by past generations, but not excluding recent technological advances where appropriate.**

Historically, whitefishes were dried or frozen depending on the time of year when they were harvested. If harvested in the fall, whitefishes were frozen and stored in a cache pit. In the spring, whitefishes were split, dried, and made into bales of 50 fish each. Whitefishes were also fermented in the ground and then stored in birch bark containers. One advantage of fermented fish was that it did not freeze and thus could be kept through winter and into spring. Residents used nonsalmon fishes to make *dzenax*, “long-term” fermented fish, except that humpback whitefish were most often used to make “moist fish,” which was made by hanging the fish until it was slightly spoiled. Residents also left roe inside split whitefishes and then fermented them. Both dried and fermented fish were kept through the winter in underground storage pits lined with birch bark. The Ahtna used highly effective methods of covering the caches so as to protect the contents from spoilage, animals, or enemies (Simeone and Kari 2002).

Arctic grayling could be harvested almost year-round but were available in quantity only for a very short time in the spring and fall. When harvested during their fall seasonal movements, they were sometimes split, dried, and smoked. Burbot were harvested not only for their flesh, but also for their roe and livers, the latter of which was rendered for oil. Lake trout were eaten fresh. Today, most nonsalmon finfish species are eaten fresh or are frozen. Some residents continue to dry whitefishes. Arctic grayling and trout are usually eaten fresh, fried with onions and potatoes (Reckord 1983).

## **CRITERION 6: INTERGENERATIONAL TRANSMISSION OF KNOWLEDGE, SKILLS, VALUES, AND LORE**

**A pattern of taking or use that includes the handing down of knowledge of fishing or hunting skills, values, and lore from generation to generation.**

Ahtna fishing lore and oral tradition includes a body of stories about giant-sized fish. For example, giant burbot and lake trout were said to inhabit certain lakes in the Copper River Basin. The Ahtna also had songs that were sung when fishing.

Ahtna elder Martha Jackson said that “Kids he fish and he sing that song. You sing, that way you get lots of fish.”

*fish go ahead agha tilitaas go ahead, swallow. That’s your grandma’s spit*

*nzaegge’ go ahead your grandma’s spit, you swallow it*

*Bite that things – get caught his nose.*

Figure 9.–Ahtna song sung when fishing, for luck.

Source: de Laguna unpublished field notes in possession of the author.

Table 12 shows residents’ efforts, in terms of percentage points, in the harvest and processing of nonsalmon finfish species, based on Division of Subsistence surveys. Slana, Mentasta, and Chitina reported the highest rates of individual participation in both fishing and processing nonsalmon species. Fishing is often a family activity. Children are often involved in the harvest, during which they learn skills and values, such as sharing.

Table 12.–Percentage of population harvesting or processing nonsalmon fishes, Copper River Basin communities, 2001.

Community	Percentage fishing	Percentage processing
Chistochina	26.6%	23.4%
Chitina	51.2%	43.9%
Copper Center	37.7%	21.9%
Gakona	53.8%	26.2%
Glennallen	30.5%	13.8%
Gulkana	42.9%	38.1%
Kenny Lake	53.5%	32.6%
Lake Louise	56.5%	34.8%
McCarthy/McCarthy Road	47.0%	50.0%
Mendeltna	46.7%	20.0%
Mentasta	63.2%	62.1%
Nelchina	38.6%	21.1%
Paxson	55.6%	27.8%
Slana	87.8%	87.8%
Tazlina	37.3%	19.0%
Tolsona	51.6%	25.8%
Tonsina	31.5%	24.1%
Willow Creek	24.0%	20.0%

Source: ADF&G Division of Subsistence household survey 2002.

A Division of Subsistence survey for another project in 2000 found that most Basin residents learned how to fish in the Copper River from a parent (53%) or other relative (34%).



## CRITERION 7: DISTRIBUTION AND EXCHANGE

**A pattern of taking, use, and reliance where the harvest effort or products of that harvest are distributed or shared, including customary trade, barter, and gift-giving.**

Table 13 summarizes the percentage of households in each community that received or gave away nonsalmon fishes. Households in every community reported receiving some nonsalmon fishes and households in 14 of the 18 communities reported giving away nonsalmon fishes. These fish are also shared during formal occasions, such as potlatches and other ceremonies.

Table 13.—Rates of sharing nonsalmon fish species, Copper River Basin communities, 2001.

Community	Received	Gave away
Chistochina	20.0%	13.3%
Chitina	12.5%	0.0%
Copper Center	12.7%	11.5%
Gakona	8.1%	16.3%
Glennallen	6.5%	9.7%
Gulkana	27.3%	9.1%
Kenny Lake	13.6%	0.0%
Lake Louise	72.7%	36.4%
McCarthy/McCarthy Road	7.7%	19.2%
Mendeltna	22.2%	0.0%
Mentasta	40.6%	28.1%
Nelchina	16.7%	0.0%
Paxson	30.0%	20.0%
Slana	36.0%	24.0%
Tazlina	8.1%	8.9%
Tolsona	26.7%	6.7%
Tonsina	3.8%	15.4%
Willow Creek	3.8%	15.4%

Source: ADF&G Division of Subsistence household survey 2002.

## CRITERION 8: DIVERSITY OF RESOURCES IN AN AREA; ECONOMIC, CULTURAL, SOCIAL, AND NUTRITIONAL ELEMENTS

**A pattern that includes taking, use, and reliance for subsistence purposes upon a wide variety of fish and game resources and that provides substantial economic, cultural, social, and nutritional elements of the subsistence way of life.**

Research by ADF&G shows that residents of communities distant from populations centers harvest and use a variety of species, and have a high per capita harvest. Research also shows that there is less full-time employment in rural areas of the state and more part-time and seasonal employment. As a result, households in rural areas generally have low monetary incomes.

Division of Subsistence household surveys conducted in 1983 and in 1988 (Stratton and Georgette 1984:39) showed that Copper River Basin communities used a variety of subsistence resources (Table 14). A 1982 Division of Wildlife Conservation survey of

caribou *Rangifer tarandus* permit holders found that those holding subsistence permits frequently used more wild resources on a regular basis than those hunters who participated in general hunts (who were primarily residents from urban areas). Among other resources, those holding subsistence permits used black bears *Ursus americanus*, whitefishes, birds other than waterfowl, and small game (Stratton 1983:17).

Table 14.—Mean number of species harvested and used by communities, Copper River Basin, 1982-1983 and 1987-1988.

Communities	1983		1988	
	Harvested	Used	Harvested	Used
Chistochina	7.1	10.6	7.0	11.0
Chitina	6.5	8.3	5.2	6.2
Copper Center	4.6	6.0	5.5	7.9
Gakona	10.0	11.6	7.0	9.0
Glennallen	4.7	6.4	3.4	5.3
Gulkana	5.9	6.8	5.2	6.9
Kenny Lake	8.4	9.0	6.7	7.2
Lake Louise	12.8	15.4	7.4	5.6
McCarthy	8.0	10.2	10.8	8.4
Mentasta	8.3	11.6	8.3	8.2
Slana	9.6	11.6	8.8	7.2
Tazlina	N/D	N/D	4.4	6.5
Tonsina	10.4	11.4	6.3	7.8

Sources: Stratton and Georgette 1984; McMillan and Cuccarese 1988.

Data collected by the Division of Subsistence in 1982-1983 and 1987-1988 showed that Copper River Basin households had higher per capita harvests of wild foods than those located in more populated areas: 111 lbs in 1982-1983 and 140 lbs in 1987-1988 (Simeone and Fall 1996:80-81; McMillan and Cuccarese 1988; Stratton and Georgette 1984). Based on ADF&G Division of Wildlife Conservation harvest ticket and permit records for 1989 to 1991, the estimated per capita harvest of wild foods among Fairbanks/Delta Junction residents was 16 lbs per person; for the Matanuska-Susitna Borough, 27 lbs per person; and for Anchorage 19 lbs per person.<sup>3</sup> Analysis of updated data for the late 1990s provided the following estimates: Anchorage, 18 lbs per person; Fairbanks North Star Borough, 21 lbs per person; and the Matanuska-Susitna Borough, 25 lbs per person (Wolfe and Fischer 2002:10).

Table 4 in this report provided comparative data on the harvest of Arctic grayling, lake trout, rainbow trout, and whitefishes in selected Copper River Basin communities for 1982, 1987, and 2001. The data (Figure 10) show a consistent harvest over time, although harvest amounts have fluctuated.

<sup>3</sup> Date from ADF&G Division of Wildlife Conservation harvest ticket database.



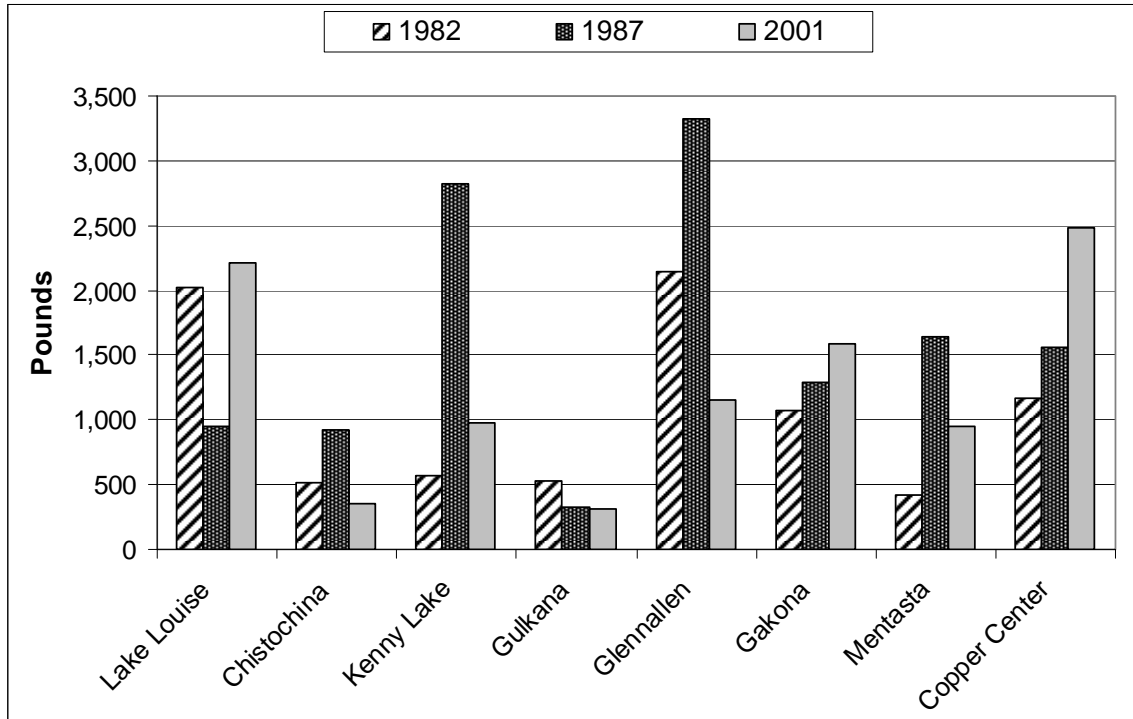


Figure 10.—Changes in community harvests for selected Copper River Basin communities, 1982, 1987, 2001.

The Division of Subsistence survey in 2000 found that 80% of fishers in the Glennallen Subdistrict of the Upper Copper River Management Area said that wild foods were important in their diet (Simeone and Fall 2003). Most Basin residents fished in the Glennallen Subdistrict (Simeone and Fall 2003).

Also in the 2000 survey, 54% of Basin residents reported that they were employed, with only 30% employed full time. When asked if they took time off from work to fish, 23% of residents responded “Yes.” This suggests that, since most residents did not have full-time jobs, and since their fishing areas were close to their homes and work, because of the proximity of their fishing sites to their homes and places of work, taking leave from a job was not necessary and that subsistence fishing in the Glennallen Subdistrict was integrated into the round of economic activities in the Copper River Basin. This is in contrast to the predominant pattern of urban fishers who are more likely to take leave from work activities (see Wolfe and Ellanna 1983:256).

## PART 2: CUSTOMARY AND TRADITIONAL USE WORKSHEET, PRINCE WILLIAM SOUND SALMON

### Prince William Sound Management Area, Coghill, Northwestern, Unakwik, Eshamy, Montague, Southeastern, and Bering River districts

#### BACKGROUND

The Prince William Sound Management Area is divided into 11 commercial fishing districts (Figure 10). By regulation, subsistence fishing for salmon in all districts has been allowed since statehood. The Alaska Board of Fisheries first addressed customary and traditional uses of salmon in a portion of the management area in 1987 when, in response to proposals from the Prince William Sound communities of Chenega Bay and Tatitlek, it made positive C&T determinations for 1) the Chenega Bay area, which is the Southwestern District and the waters along the northwestern shore of Green Island within the Montague District; and 2) the Tatitlek area, which is a portion of the Eastern and Northern districts that includes those waters north of a line from Porcupine Point to Granite Point and south of a line from Point Lowe to Tongue Point. These findings were based on the primary areas used for subsistence salmon fishing by residents of Chenega Bay and Tatitlek, respectively.

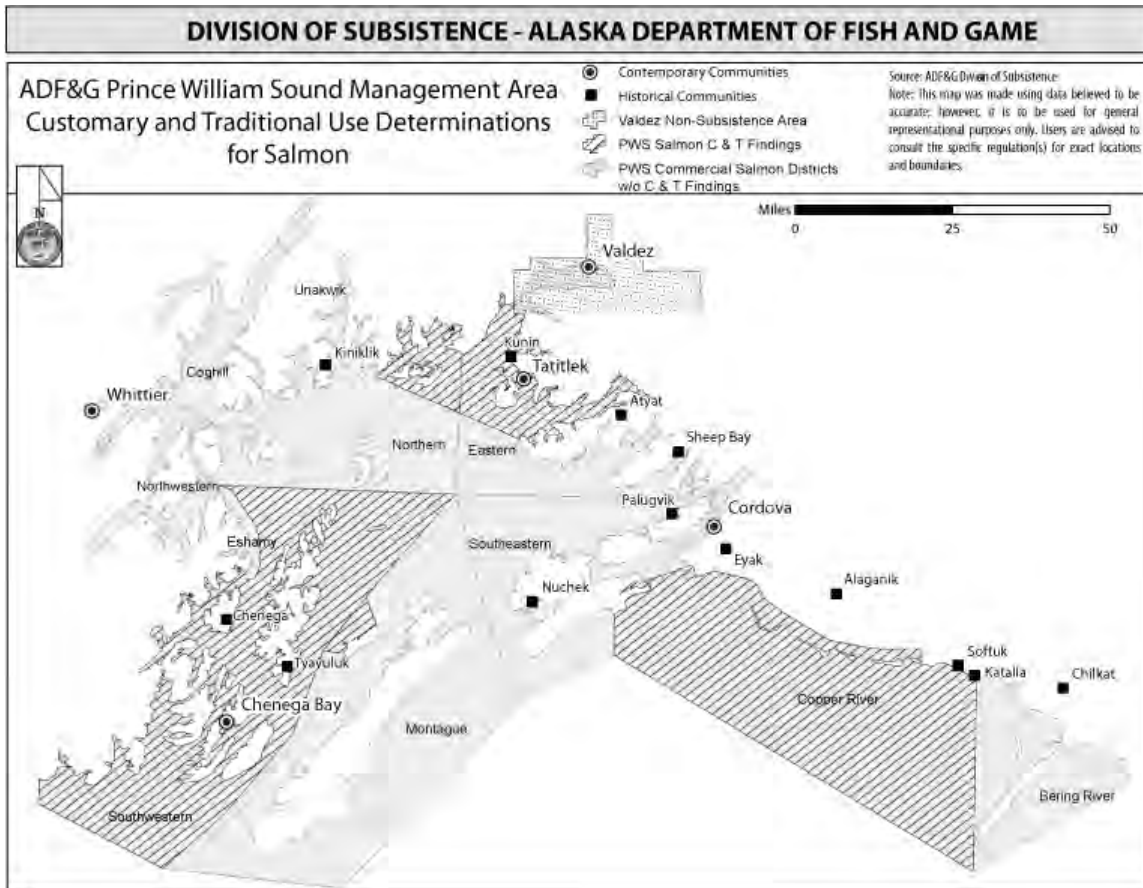


Figure 11.—Prince William Sound Management Area customary and traditional use determinations.

In December 1996, the Board made a positive C&T finding for the salmon stocks of the Copper River District. The Board has also made positive C&T findings for the following fisheries stocks within the 11 Prince William Sound commercial fishing districts (except those portions within the Valdez Nonsubsistence Area):

- Groundfish, herring, herring spawn on kelp, and smelt (5 AAC 01.616(c)).
- Shrimp, tanner crabs, Dungeness crabs, king crabs, and miscellaneous shellfish (5 AAC 02.208(a)).

However, the Board has not made C&T determinations for other marine water districts in those waters of the Prince William Sound Management Area that are currently open to subsistence salmon fishing. The commercial fishing districts addressed in this worksheet that do not have C&T determinations are Coghill, Northwestern, Eshamy, Unakwik, Montague (portion), Southeastern, Bering River, Northern (portion), and Eastern (portion) (5 AAC 24.200 (a-i)) (Figure 11). A portion of the Eastern District is within the Valdez Nonsubsistence Area (5 AAC 99.015 (a) (5)) and is not subject to C&T determinations.

In addition to making positive C&T determinations for the areas currently used by the communities of Chenega Bay and Tatitlek, the Board also established amounts necessary for subsistence (5 AAC 01.616) for the salmon stocks in those areas and adopted regulations for the taking of subsistence salmon (5 AAC 01.648) in those districts that differ in some respects from those of the rest of the Prince William Sound Area. The Board also established an ANS for the Copper River District, but regulations governing the taking of subsistence salmon in that district are very similar to those of the remainder of the management area.

In this worksheet, the “general Prince William Sound Area” means those districts that do not have C&T determinations.

Current subsistence salmon regulations for the general Prince William Sound Area are as follows:

- Season: in conformance with commercial salmon fishery openings (5 AAC 01.645(b)).
- Gear: in conformance with gear allowed in the commercial salmon fishery (5 AAC 01.645(b)).
- Permit: required; only one issued per household per year; a record of harvest must be kept on the permit (5 AAC 01.630(b),(d),(e))
- Bag and possession limits (5 AAC 01.645(b)):
  - 15 salmon for a one-person household
  - 30 salmon for a two-person household
  - 10 salmon for each additional household member
  - no more than 5 Chinook salmon *O. tshawytscha* per permit
- Marking: not required

## **CRITERION 1: LENGTH AND CONSISTENCY OF USE**

**A long-term consistent pattern of noncommercial taking, use, and reliance on the fish stock or game population that has been established over a reasonable period of time of not less than one generation, excluding interruption by circumstances beyond the user's control, such as unavailability of the fish or game caused by migratory patterns.**

Substantial archaeological and ethnohistorical data demonstrate the importance of the subsistence uses of salmon by the indigenous Chugach Alutiiq and Eyak Indians in the present-day Prince William Sound Area prior to contact until the present time (Birket-Smith and De Laguna 1938; Birket-Smith 1953; De Laguna 1956; North Pacific Rim 1981). In the 18th century, some Tlingits from Yakutat moved eastward, eventually settling in the communities of Chilkat and Katalla. Some residents of Cordova trace their ancestry back to this community.

At the time of contact, the Chugach Alutiiq were organized into at least 8 groups in a number of villages throughout Prince William Sound. Known communities included Palugvik, Nuchek, Alukaq, Atyat, Tatitlek, Kunin, Kiniklik, Chenega, and Tyayuluk (Birket-Smith 1953:20-21) (Figure 11). By the 1930s, all but Tatitlek and Chenega were abandoned. Chenega was destroyed by the 1964 Great Alaska Earthquake, but was reconstituted in the early 1980s as the community of Chenega Bay.

Historically there were at least 4 Eyak villages in the present-day Cordova area. By 1889, what had been the village of Eyak had become the staging area for the fledgling commercial salmon fishing industry. The city of Cordova was founded in 1906 at the present-day site of "Old Town," the last Eyak village (Stratton 1989:14-15). Until 1939, Cordova was the terminus of the Copper River and Northwestern Railroad. Since then, commercial fishing and processing has dominated the cash sector of the Cordova economy.

Table 15 shows permit data collected by the ADF&G Division of Commercial Fisheries for the general Prince William Sound Area (i.e., districts other than Chenega Bay, Tatitlek, and Copper River, which are monitored separately). Data prior to 1988 likely include harvests from the Chenega Bay and Tatitlek areas, however. Since 1960, ADF&G has issued 474 permits for the general Prince William Sound Area, resulting in a total reported harvest of 7,182 salmon. In recent years, most of the reported harvest has been on sockeye salmon *O. nerka*, although pink salmon *O. gorbuscha* were more often reported as harvested over the duration of the permit program.

Table 15.—Historical subsistence salmon harvests, general Prince William Sound Area, 1960-2007.

Year	Permits		Estimated salmon harvest					Total
	Issued	Returned	Chinook salmon	Sockeye salmon	Coho salmon	Chum salmon	Pink salmon	
1960	50		1	139	505	27	1,292	1,964
1961	12		3	41	123	3	732	902
1962	9		0	0	119	142	214	475
1963	9		0	0	406	24	298	728
1964	15		0	11	0	0	900	911
1965	22	16	0	0	0	34	246	281
1966	3	3	0	3	19	50	20	92
1967	4	3	0	0	5	0	5	11
1968	4	3	0	0	27	0	208	235
1969	7	3	0	0	37	0	0	37
1970	1	1	0	0	0	0	0	0
1971	3	2	0	0	0	0	69	69
1972	0	0	0	0	0	0	0	0
1973	19	16	0	0	343	0	0	343
1974	3	1	0	0	0	0	0	0
1975	2	0						
1976	0	0	0	0	0	0	0	0
1977	4	4	0	0	0	0	0	0
1978	3	2	0	0	0	0	0	0
1979	15	2	0	0	0	0	0	0
1980	26	15	0	12	10	0	0	23
1981	12	8	0	5	44	3	0	51
1982	35	27	0	109	5	31	40	185
1983	26	21	0	27	45	98	11	181
1984	8	8	0	10	0	2	11	23
1985	22	16	1	37	22	36	19	116
1986	25	14	0	9	27	0	0	36
1987	18	17	5	33	6	17	0	61
1988	7	7	2	51	7	9	10	79
1989	11	7	0	0	0	5	0	5
1990	8	8	0	0	7	0	4	11
1991	9	5	0	4	0	0	0	4
1992	10	6	0	33	0	0	0	33
1993	6	6	1	104	10	0	0	115
1994	5	4	0	0	0	0	0	0
1995	4	2	0	0	0	0	0	0
1996	10	7	0	0	0	0	0	0
1997	4	3	0	4	0	0	0	4
1998	4	3	0	0	0	0	0	0
1999	3	3	0	0	0	0	0	0
2000	3	3	0	0	0	0	0	0
2001	5	5	0	0	0	0	0	0
2002	11	9	0	38	0	9	11	57
2003	11	11	0	48	0	3	0	51
2004	8	7	0	12	0	5	0	17
2005	14	13	0	4	0	0	0	4
2006	11	9	0	20	30	0	0	50
2007	3	3	0	30	0	0	0	30
5 year average	9	9	0	23	6	2	0	30
10 year average	7	7	0	15	3	2	1	21
All years average	11	7	0	17	38	11	87	153

Source: ADF&G Division of Subsistence Alaska Subsistence Fisheries Database (ASFDB) 2007.

Data on the place of residence of permit holders are available only since 2003. Table 16 shows place of residence and the number of permits issued since 2003. Of the total 47 issued, 40% have been issued to Anchorage-area residents (including Chugiak and Eagle River), 13% to Fairbanks-area residents (including Ester), 17% to residents of Whittier, 15% to residents of Wasilla, 11% to residents of other Prince William Sound communities, and 4% to other Alaska communities.

Table 16.—Place of residence and number of general Prince William Sound Area subsistence permits issued.

Place of residence	Number of permits
Anchorage	16
Wasilla	7
Chugiak	1
Nenana	1
Valdez	2
Eagle River	2
Fairbanks	5
Healy	1
Cordova	3
Ester	1
Whittier	8
Total permits	47

Source: ASFDB Version 3.5.

## **CRITERION 2: SEASONALITY**

### **A pattern of taking or use recurring in specific seasons of each year.**

In Prince William Sound, the Chugach Alutiiq fished for salmon as the runs came in. For example, residents of the old village of Chenega fished for Chinook salmon until mid-June, then began fishing for sockeye, then pink salmon, and, in late summer, coho salmon *O. kisutch* (Birket-Smith 1953:21). For the Eyak, who fished the Copper River Delta, the run of Chinook salmon began in early May, followed by a run of sockeye salmon and then a run of coho salmon in August (Birket-Smith and De Laguna 1938:114). Currently in all districts, salmon may be taken only during openings established by ADF&G emergency order (5 AAC 24.310).

## **CRITERION 3: MEANS AND METHODS OF HARVEST**

### **A pattern of taking or use consisting of methods and means of harvest that are characterized by efficiency and economy of effort and cost.**

In Prince William Sound, salmon were speared and gaffed above weirs placed in stream mouths. They were also taken in traps, with hook and line, and with nets (Birket-Smith 1953:41, 96). In the Cordova area, the Eyak Indians took salmon from the lower Copper River using spears and dip nets while standing on man-made platforms. They also caught salmon in small traps (Birket-Smith and De Laguna 1938:117, 118).

Currently, for the balance of the general Prince William Sound Area, subsistence gear is limited to that allowed in the commercial salmon fishery. Drift gillnets may be used in the Coghill, Eshamy, Unakwik, Copper River, and Bering River districts; set gillnets in the Eshamy District; and purse seine may be used in all districts except for the Eshamy, Copper River, and Bering River districts (5 AAC 24.330).

**CRITERION 4: GEOGRAPHIC AREAS**

**The area in which the noncommercial, long-term, and consistent pattern of taking, use, and reliance upon the fish stock and game population has been established.**

Historically, most of the Prince William Sound and Copper River Delta areas were used for subsistence salmon fishing. In the early 1960s, residents of Chenega fished for salmon in portions of the Coghill, Northwestern, Eshamy, Northern, and Southwestern districts (Stratton and Chisum 1986:29). In the late 1980s, areas used by Tatitlek residents for subsistence salmon fishing within their lifetimes included the Northern and Eastern districts (ADF&G 1990). Between 2002 and 2007, fishers who received subsistence salmon permits to fish in the “the general Prince William Sound Area” fished in the Coghill, Eshamy, and Unakwik districts.

Table 17.–Number of permits issued, by district, for general Prince William Sound Area, 2002-2007.

Year	Commercial salmon district	Number of permits issued
2002	Coghill	2
2004	Coghill	3
	Eshamy	4
2005	Eshamy	4
	Unakwik	1
2006	Coghill	1
	Eshamy	4
	Unakwik	1
2007	Unakwik	2

**CRITERION 5: MEANS OF HANDLING, PREPARING, PRESERVING, AND STORING**

**A means of handling, preparing, preserving, and storing fish or game that has been traditionally used by past generations, but not excluding recent technological advances where appropriate.**

There is limited information about the subject matter of this criterion in the general Prince William Sound Area. In Cordova at the present time, a variety of methods are used to preserve salmon, including freezing, smoking, canning, jarring, salting, pickling, and kippering (McNeary 1978:7; Stratton 1989:86). Similar methods are used in Tatitlek and Chenega Bay (Stratton and Chisum 1986; Stratton 1990).

## **CRITERION 6: INTERGENERATIONAL TRANSMISSION OF KNOWLEDGE, SKILLS, VALUES, AND LORE**

**A pattern of taking or use that includes the handing down of knowledge of fishing or hunting skills, values, and lore from generation to generation.**

As for Criterion 5, there is limited information about the subject matter of this criterion in the general Prince William Sound Area. In other areas of Prince William Sound, and Alaska, Division of Subsistence research reveals that subsistence fishing is generally conducted by families, and is a context in which fishing skills and values are shared and learned.

## **CRITERION 7: DISTRIBUTION AND EXCHANGE**

**A pattern of taking, use, and reliance where the harvest effort or products of that harvest are distributed or shared, including customary trade, barter, and gift-giving.**

Division of Subsistence household survey data from Healy, Valdez, Whittier, and Cordova show that sharing is common in these communities (Table 18). There is no comparable information for communities other than those listed in Table 17, whose residents are recent participants in the subsistence salmon fishery in the general Prince William Sound Area. Also, note that while several years of data are available for Cordova and Valdez, there is only one year of data for Whittier and Healy.

Table 18.—Rates of sharing subsistence resources, Prince William Sound, 1987-1993.

Community	Year	Giving	Receiving
Healy	1987	46%	77%
Valdez	1991	65%	88%
	1992	68%	86%
	1993	66%	86%
Whittier	1990	66%	77%
Cordova	1985	61%	58%
	1988	75%	54%
	1991	70%	58%
	1992	73%	76%
	1993	64%	76%

Source: ADF&G CSIS.

## **CRITERION 8: DIVERSITY OF RESOURCES IN AN AREA; ECONOMIC, CULTURAL, SOCIAL, AND NUTRITIONAL ELEMENTS**

**A pattern that includes taking, use, and reliance for subsistence purposes upon a wide variety of fish and game resources and that provides substantial economic, cultural, social, and nutritional elements of the subsistence way of life.**

In the communities for which comprehensive Division of Subsistence survey data are available, the per capita subsistence salmon harvests range from a high of 233 lbs in Cordova (1988) to 79 lbs in Valdez (1993) (Table 19). The percentage of residents harvesting wild resources ranges from 93% in Healy (1987) to 72% in Cordova (1985)



and the percentage of residents using subsistence resources ranges from 100% in Cordova in 1992 and 1993 to 91% in Cordova in 1985 (Table 19).

Table 19.—Percentage of households using and harvesting wild resources, and per capita harvests, Healy, Nenana, Valdez, Whittier, and Cordova.

Community/Resource/Year	Percentage using	Percentage harvesting	Lbs per capita harvest
<b>Healy</b>			
All resources			
1987	97%	93%	132
<b>Valdez</b>			
All resources			
1991	98%	90%	88
1992	92%	83%	103
1993	97%	83%	79
<b>Whittier</b>			
All resources			
1990	94%	77%	80
<b>Cordova</b>			
All resources			
1985	91%	72%	163
1988	95%	79%	233
1991	96%	86%	189
1992	100%	90%	163
1993	100%	78%	127

Table 20 provides information on the harvest and uses of salmon in the communities for which comprehensive Division of Subsistence survey data are available. In all communities, over 64% (or more) of households surveyed reported using salmon. The percentage of households harvesting salmon varied from 37% in Healy to 90% in Cordova.

Table 20.—Percentage of households reporting harvesting and using salmon.

Community/Resource/Year	Percentage using	Percentage harvesting
<b>Healy</b>		
1987	64%	37%
<b>Valdez</b>		
1991	89%	73%
1992	83%	69%
1993	66%	57%
<b>Whittier</b>		
1990	77%	54%
<b>Cordova</b>		
1985	95%	72%
1988	95%	82%
1991	96%	86%
1992	100%	90%
1993	100%	78%

Source: ADF&G CSIS.

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